Baseline Human Health Risk Assessment

Columbia Falls Aluminum Company

2000 Aluminum Drive
Columbia Falls, Flathead County, Montana

Prepared for:

Columbia Falls Aluminum Company LLC

Prepared by:

EHS Support

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Volume I of II

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Acronyms

µg/L	micrograms per liter
ABS	activity-based sampling
ACM	asbestos containing material
AOC	Agreement and Order on Consent
ARM	Administrative Rules of Montana
ATV	all-terrain vehicle
AUF	area use factor
BCF	bioconcentration factor
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BHHRA	Baseline Human Health Risk Assessment
BMP	Block Management Program
BTEX	benzene, toluene, ethylbenzene, xylene
BTV	background threshold value
°C	degrees Celsius
CEM	conceptual exposure model
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFAC	Columbia Falls Aluminum Company LLC
COPC	constituent of potential concern
Cr(III)	trivalent chromium
Cr(VI)	hexavalent chromium
CSF	cancer slope factor
CSM	Conceptual Site Model
CTE	central tendency exposure
DLC	dioxin-like compounds
DM	dry matter
DNRC	Department of Natural Resources and Conservation
DSR	Data Summary Report
DU	Decision Unit
DW	dry weight
EF	exposure frequency
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
EPD	effective predictive domain
ESV	ecological screening value
°F	degrees Fahrenheit
FS	Feasibility Study

ft	foot/feet
ft-amsl	feet above mean sea level
ft-bgs	feet below ground surface
ft/ft	feet per feet
ft^3/s	cubic feet per second
g/day	grams per day
GIS	Geographic Information System
GSD	geometric standard deviation
HI	hazard index
HQ	hazard quotient
IAEA	International Atomic Energy Agency
in	inch
IRIS	Integrated Risk Information System
ISM	Incremental Sampling Methodology
ITRC	Interstate Technology and Regulatory Council
kg/day	kilograms per day
m^3/s	cubic meters per second
MAF	mutagenic adjustment factor
MBMG	Montana Bureau of Mines and Geology
MCA	Montana Code Annotated
MCL	maximum contaminant level
MDEQ	Montana Department of Environmental Quality
MDL	method detection limit
mg/µg	milligrams per microgram
mg/kg	milligrams per kilogram
mg/day	milligrams per day
mi^2	square miles
MOA	mode of action
MPDES	Montana Pollutant Discharge Elimination System
MR	migration ratio
NOAEL	no observed adverse effect level
ORNL	Oak Ridge National Laboratory
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEF	particulate emission factor
pg/g	picograms per gram
Phase I SC	Phase I Site Characterization
Phase II SC	Phase II Site Characterization
PPRTV	provisional peer-reviewed reference toxicity values

PWS	public water supply
QA/QC	quality assurance/quality control
RAGS	Risk Assessment Guidance for Superfund
RBA	relative bioavailability
RBSL	risk-based screening level
RBSSL	risk-based soil screening level
RfC	reference concentration
RfD	reference dose
RI/FS	Remedial Investigation/Feasibility Study
RME	reasonable maximum exposure
RSD	relative standard difference
RSL	Regional Screening Level
RTI	Research Triangle Institute
SAP	Sampling and Analysis Plan
SDG	sample delivery group
SSL	soil screening level
SVOC	semi-volatile organic compound
TCDD	2,3,7,8-tetrachlorodibenzodioxin
TEF	toxicity equivalency factors
TEQ	Toxic Equivalency
THQ	target hazard quotient
UCL	upper confidence limit
URF	unit risk factor
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VISL	Vapor Intrusion Screening Level
VOC	volatile organic compound
WP	Work Plan
WW	wet weight

1 Introduction

On behalf of Roux Environmental Engineering and Geology, D.P.C. (referred to herein as Roux) and Columbia Falls Aluminum Company, LLC (CFAC), EHS Support, LLC (EHS Support) has prepared this Baseline Human Health Risk Assessment (BHHRA) as part of the ongoing Remedial Investigation/Feasibility Study (RI/FS) of the former CFAC aluminum reduction facility (commonly referred to as an aluminum smelter) Superfund Site located near Columbia Falls, in Flathead County, Montana (Site). The RI/FS is being conducted pursuant to the Administrative Settlement Agreement and Order on Consent (AOC) dated November 30, 2015, between CFAC and the United States Environmental Protection Agency (USEPA) (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 08-2016-0002).

A BHHRA Work Plan (EHS Support, 2018a) was developed in accordance with the scope of work included with the RI/FS Work Plan for the Site (Roux, 2015a); and relied on background information and data collected during the Phase I Site Characterization (Phase I SC), the Supplemental South Pond Assessment, and the Phase II Site Characterization (Phase II SC). The Phase I SC, Supplemental South Pond Assessment, and Phase II SC will collectively be referred to as "Site Characterization". As part of those investigations, samples of soil, sediment, groundwater, and surface water were collected and analyzed for a variety of chemicals. The results of the Phase I SC and Phase II SC are provided under separate cover in the Phase I SC Data Summary Report (DSR) and the Phase II SC DSR (Roux, 2017a and 2019).

1.1 Objective

The objective of the BHHRA is to characterize the potential risks to human receptors posed by exposure to affected environmental media at the Site in the absence of any remedial action. The BHHRA will provide the basis for determining whether remedial action is necessary to address potential risk to human health in the various exposure areas identified at the Site, as well as the extent of remedial action required. The BHHRA will support the Feasibility Study (FS) in the evaluation of remedial alternatives to address any unacceptable current or future risk to human receptors from exposure to constituents of potential concern (COPCs).

1.2 Framework

The format for the BHHRA follows the USEPA Risk Assessment Guidance for Superfund (RAGS) Part D (USEPA, 2001). The regulatory guidance for conducting the BHHRA includes RAGS Parts A through F (USEPA, 1989, 1991a, 1991b, 2001, 2004, and 2009), and other guidance documents and procedures that USEPA has issued in addition to the RAGS guidance. The additional guidance and procedures are referenced, as applicable, in the BHHRA Work Plan as well as within this BHHRA report where appropriate.

This BHHRA was conducted in accordance with the final BHHRA Work Plan submitted to USEPA and the Montana Department of Environmental Quality (MDEQ) on September 28, 2018 (EHS Support, 2018a). Additionally, an interim deliverable titled *"Technical Memorandum to Support the Baseline Human Health Risk Assessment at the Columbia Falls Superfund Site,"* dated February 28, 2019, was submitted separately to USEPA and MDEQ (EHS Support, 2019a). As specified in the BHHRA Work Plan (WP), the

Interim Deliverable provides additional details regarding the overall approach and methodology for the following elements of the BHHRA:

- Selection of COPCs in biota
- Calculation of exposure point concentrations (EPCs) for the applicable exposure scenarios, including an example calculation for one COPC per exposure area scenario for both point samples and incremental soil samples
- RAGS Volume I: Part D Table 4 series (i.e., the equations used to calculate uptake of COPCs, as well as the exposure assumptions used for each receptor and exposure pathway)
- RAGS Table 5 and 6 series (i.e., the non-cancer and cancer toxicity data for the COPCs evaluated in the BHHRA) for COPCs identified in the BHHRA WP

The BHHRA framework includes the following primary elements of the BHHRA, including:

- Conceptual exposure model (CEM) – Site history, environmental setting, and releases to potentially complete exposure pathways.
- Hazard identification – data usability, statistical evaluation of data, and selection of COPCs.
- Exposure assessment – calculations of the EPC of COPCs in each medium, identification of the exposure assumptions, and presentation of the equations for calculation of the daily intake dose based on magnitude, frequency, and duration of exposures over a specified exposure period of time.
- Toxicity assessment – the relationship between the potential extent of exposure and toxicological effects of the exposure for each COPC-specific toxicity criteria are presented, including cancer slope factors (CSFs) or unit risk factors (URFs) for carcinogens, and reference doses (RfDs) or reference concentrations (RfCs) for non-carcinogens.
- Risk characterization - integration of the toxicity and exposure assessments to derive quantitative estimates of potential human health risks for carcinogens and non-carcinogens, and presentation of the uncertainties and limitations inherent in the estimation of the potential risks.

2 Conceptual Exposure Model

The CEM provides a means of documenting and periodically updating general facility information and data regarding potential releases to the environment and exposure of receptors. The CEM also provides a framework for problem definition and aids in the identification of data gaps. The CEM defines the potentially complete exposure pathways. The CEM updates the Conceptual Site Model (CSM) developed for the Site in the RI/FS Work Plan (Roux, 2015a) as well as the CEM presented in the BHHRA Work Plan. The CEM includes the identification of complete exposure pathways based on current and potential future land use at the Site. In addition, it provides a Site background including Site location, history, and hydrogeology.

2.1 Site Background

Site background for the CFAC Site is provided below. This section describes the information about the Site location and presents a summary of the operational history of the facility. Additional background information regarding the Site can be found within the RI/FS Work Plan (Roux, 2015a).

2.1.1 Site Location

The Site is located at 2000 Aluminum Drive in Columbia Falls, Montana (**Figure 1**). The Site is situated in the central portion of Flathead County, approximately two miles northeast of the City of Columbia Falls. According to the 2013 Census (www.census.gov), the total population of Columbia Falls is 4,796. The Site is accessed by Aluminum Drive via North Fork Road (County Road 486). The Site is generally bounded by the Cedar Creek Reservoir Overflow Ditch to the north, Teakettle Mountain to the east, Flathead River to the south, and Cedar Creek to the west (**Figure 1**).

2.1.2 Operational History

The Site was operated as a primary aluminum reduction facility (commonly referred to as an aluminum smelter) from 1955 until 2009. A detailed description of the operational history at the Site is provided in Section 2.7.2 of the RI/FS Work Plan (Roux, 2015a).

Buildings and industrial facilities remaining at the Site at the start of the Phase I SC program included offices, warehouses, laboratories, mechanical shops, the Paste Plant, coal tar pitch tanks, pump houses, the Casting Garage, and the Potline Facility. The Site also includes seven closed landfills, one inactive but not closed landfill, former material loading and unloading areas, two closed leachate ponds, and several stormwater percolation ponds. By January 2018, most structures on Site had been removed as part of ongoing decommissioning efforts. Structures removed include: West Rectifier, Rod Mill Building, Paste Plant, Quonset Hut, West Aluminum Unloader, Compressor Building, Laboratory, the Main Plant building (i.e., Pot Rooms 1 through 10), and the Change House. Several structures remain at the Site, including the administration building, the main warehouse, two ancillary warehouses, the fabrication shop, and five silos. **Figure 2** illustrates the locations of historical Site features.

2.2 Environmental Setting

The BHHRA study area consists of approximately 1,340 acres, which includes the former aluminum reduction facility (referred to as the Main Plant) and support buildings, landfills and ponds, and surrounding undeveloped areas. The nearest residences are located adjacent to the southwest Site boundary, approximately 0.80-mile west of the historic footprint of Site manufacturing operations, in a neighborhood referred to as Aluminum City. The nearest groundwater wells used for drinking water are located within the Aluminum City neighborhood. Several on-site production wells within the Site historically pumped groundwater that was used for industrial operations and for potable water. However, electric power to these wells has been terminated. Therefore, existing on-site wells are non-operational and are not currently used for potable water.

Some of the undeveloped areas of the Site have been previously used for recreational purposes such as hunting and fishing; in these areas, the vegetation was described by Weston Solutions, Inc. (Weston; Weston, 2014) as consisting of coniferous forest and grasses characteristic of the Montana mountain environment.

2.2.1 Regional Climatic Conditions

The Site is located at a latitude of 48º 23’ N. The elevation of the Site ranges from approximately 3,008 feet above mean sea level (ft-amsl) along the Flathead River to the south to 3,270 ft-amsl at the base of Teakettle Mountain to the east. Its mid-hemisphere latitude and intermontane setting results in wide seasonal climatic swings. Average annual precipitation in the region ranges from about 14 inches (in) to 25 in depending on the year. Greater precipitation at higher elevations is common; much of the precipitation is stored as snow. The regional climate is considered modified maritime. This means much of the precipitation regime is influenced by moist air masses from the Pacific Ocean traveling from west to east. Dry, cold air masses often move in the north to south direction from Canada. Mean annual temperature for nearby Kalispell, Montana is 43.25 degrees Fahrenheit (°F; 6.25 degrees Celsius,[°C]).

2.2.2 Localized Hydrogeology

The following sections describe the regional and Site-specific features that influence surface water and groundwater flow in the region and the Site.

2.2.2.1 Surface Water Hydrology and Watershed Characteristics

The Site is located within the Flathead River watershed. As discussed above, the Site is bordered by surface water features of varying hydrology on each side, including the Flathead River to the south, Cedar Creek to the west, Cedar Creek Reservoir to the north, and intermittent Cedar Creek Reservoir Overflow Ditch to the north and northeast (**Figure 2**).

The Flathead River is a tributary to the Columbia River, which flows into the Pacific Ocean. The North Fork of the Flathead River originates in the province of British Columbia, Canada. The Middle Fork of the Flathead River originates in the Bob Marshall Wilderness located south of Glacier National Park. The confluence of the North Fork and Middle Fork of the Flathead River is approximately 10 miles upstream of the Site, north of Coram, Montana. The South Fork joins the main stem of the Flathead River at the entrance of Badrock Canyon located approximately 2 miles upstream of the Site. The Flathead River

flows west through Badrock Canyon towards the City of Columbia Falls where its course is then southerly toward Flathead Lake. At the Site, the drainage area of the Flathead River is approximately 4,470 square miles (mi^2), which includes the drainage area of Cedar Creek to the west.

The United States Geological Survey (USGS) maintains three gauging stations on the Flathead River in the general vicinity of the Site. The closest station is located approximately three miles southwest of the Site near Columbia Falls (USGS Station #12363000). Two stations are located approximately 10 miles north/northeast of the Site, i.e., the north fork station on the Flathead River and the middle fork station immediately west of Glacier National Park (USGS Station #12355500 and #12358500, respectively). For the October 1951 to September 2016 period of record at the Columbia Falls USGS station, the mean monthly discharge was lowest in August with an average flow rate of 151 cubic meters per second (m^3/s; 5,340 cubic feet per second [ft^3/s]) (EHS Support, 2018a). Mean monthly discharge was greatest in June with an average flow rate of 705 m^3/s (24,900 ft^3/s). The increased discharge in June corresponds to the period when average precipitation in the region is greatest. Meltwater from high elevation snowpack also contributes to the increased discharge in May and June (EHS Support, 2018a). Variability in the flow rates of the Flathead River are discussed in more detail in the Phase II DSR (Roux, 2019).

Cedar Creek originates north of the Site in the area contributing to the Cedar Creek Reservoir. At the outlet of the Cedar Creek Reservoir, the upgradient catchment area is 12.5 mi^2. From the reservoir outlet, Cedar Creek flows approximately 3 miles southwest towards the City of Columbia Falls. The elevation of Cedar Creek is higher than groundwater elevations within the Site, indicating that Cedar Creek is a losing stream rather than a gaining stream. According to the USGS National Hydrology Dataset, a tributary to Cedar Creek may have historically flowed in the northern area of the Site. This feature was situated along the eastern side of the Industrial Landfill and joined Cedar Creek approximately 0.5 mile to the southwest of the Industrial Landfill. This feature was not observed during Site reconnaissance; however, surface water ponding and wetland type grasses were observed to be present in the area south and southeast of the Industrial Landfill. Based on field observations, the source of the ponding seemed to be from the nearby cliff. This feature was generally mapped by Roux field personnel and is identified on **Figure 2** as the Northern Surface Water Feature. At the western Site boundary, Cedar Creek drains an additional 1.5 mi^2, predominately from the western two-thirds of the Site.

The Cedar Creek Reservoir Overflow Ditch flows intermittently in the spring and regulates flow for Cedar Creek and the Cedar Creek Reservoir (Hydrometrics, 1985). Based upon proximity and land surface topography, some surface water runoff from the eastern side of the Site, originating from the East Landfill and the Sanitary Landfill, as well as runoff from the western flank of Teakettle Mountain, flows to the Cedar Creek Reservoir Overflow Ditch (**Figure 2**). Excluding potential upgradient contributions from the Cedar Creek Reservoir, the Overflow Ditch has a catchment area of approximately 2.0 mi^2. About 20 percent of this catchment area originates on-site and the remaining catchment extends to the peak of Teakettle Mountain to the east. Like Cedar Creek, the elevation of Cedar Creek Overflow Drainage is higher than surrounding groundwater elevations within the Site, indicating that the Cedar Creek Overflow drainage is a losing stream.

Based on the Montana Water Use Classifications for surface waterbodies in the Administrative Rules of Montana (ARM) Title 17 Chapter 30 Subchapter 6 and the Montana Code Annotated (MCA) 2015, the classifications of the surface water bodies on the Site are summarized in the following table:

Waterbody	Classification	Rationale
Flathead River	B-1, per ARM 17.30.608(a)	Segment of Flathead River above Flathead Lake.
Cedar Creek	B-1, per ARM 17.30.608(a)	Cedar Creek is a tributary of Flathead River above Flathead Lake.
Cedar Creek Reservoir Overflow Ditch	D-1, per ARM 17.30.615(a)	This water body is a constructed, non-irrigation drainage ditch.
North Percolation Pond	Exempt, No Classification, per MCA 75-5-103	Pond used solely for management of historical wastewater discharge; therefore, not considered water of the state.
South Percolation Pond	Exempt, No Classification, per MCA 75-5-103	Pond used solely for management waste water; therefore, not considered water of the state.
Northern Surface Water Feature	E-3, per ARM 17.30.615(e)	This feature is considered a seasonal lake or pond that periodically holds water from precipitation or snow and ice melt.

ARM = Administrative Rules of Montana
MCA = Montana Code Annotated

According to the ARM, the following water uses are associated with each classification:

- B-1 – maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply.
- D-1 – maintained to be suitable for agricultural purposes and secondary contact recreation.
- E-3 – maintained suitable for agricultural purposes, secondary contact recreation, and wildlife.

2.2.2.2 Site Hydrogeological Units

The stratigraphic units underlying the Site form a complex hydrogeologic framework that influences groundwater elevations, groundwater flow, and potential COPC migration beneath the Site. Three major stratigraphic units were identified during the Phase I SC and are described in the Phase I SC DSR (Roux, 2017a). The three stratigraphic units consist primarily, from land surface down, of:

- A layer of glaciofluvial and alluvial coarse-grained soils, varying in vertical extent and grain size depending on vicinity to Site features (i.e., Teakettle Mountain, Flathead River)
- A layer of dense, poorly sorted glacial till with interbedded deposits of glaciolacustrine clays and silts
- Bedrock

The findings described in the Phase I SC DSR (Roux, 2017a) indicate that the glacial outwash vertical thickness appears to be relatively consistent in areas north and west of the Main Plant Area, with average thicknesses ranging from 50 to 80 feet thick. The glacial outwash north of the Main Plant Area reaches maximum vertical thickness in the areas beneath the Former Drum Storage Area, West Landfill,

Wet Scrubber Sludge Pond, and Center Landfill, where thickness was typically observed to range from 125 to 150 feet. The thickness tends to decrease close to Teakettle Mountain where bedrock elevations are shallower. Near the Flathead River, the vertical extent of the alluvial deposits is approximately 100 feet thick beneath the western and south-central portion of the Site.

The maximum vertical extent of the glacial till is unknown in the areas to the north, west, and south of the Site, as the next lithologic layer was not encountered during drilling. This indicates that the till is typically at least 200 feet thick or greater in these areas. The glacial till unit was observed to have pockets of wet, coarse grained soils interbedded in the till layer, and also interbedded layers of primarily silt or primarily clay.

Based on regional geologic literature, beneath the unconsolidated glacial deposits are pre-Cambrian aged bedrock. The literature indicates that the depth to bedrock increases in a southwestern direction across the Site, proceeding away from Teakettle Mountain. This was confirmed during the Phase I SC DSR (Roux, 2017a). Bedrock was encountered in soil boring CFMW-023a, which is located in the eastern portion of the Site near Teakettle Mountain, at approximate depths of 150 feet below ground surface (ft-bgs). Weathered bedrock was also encountered in soil boring CFMW-008a (also located near Teakettle Mountain) at approximately 130 ft-bgs, and a more competent bedrock within the same boring at approximately 245 ft-bgs. Bedrock was not encountered in any of the other deep soil borings completed at the Site, indicating that depth to bedrock is greater than 300 ft-bgs across most of the Site.

The coarse-grained glacial outwash and alluvium deposits that are found above the glacial till are collectively referred to as the “upper hydrogeologic unit” at the Site (Roux, 2017a). The coarse-grained glacial deposits that comprise the upper hydrogeologic unit account for the main water bearing unit beneath the Site. While the upper hydrogeologic unit appears to be continuous across the Site, the groundwater within the upper hydrogeologic unit appears to exist under perched water-table conditions. Slug testing results suggest that the geometric mean hydraulic conductivity of the upper hydrogeologic unit is higher than the geometric mean hydraulic conductivity of the materials beneath the upper hydrogeologic unit.

The glacial tills found below the upper hydrogeologic unit were typically characterized as containing a higher percentage of fines, denser, and drier than the overlying outwash and alluvium deposits. The glacial till is considered the “below upper hydrogeologic unit”. The till deposits were often characterized as stiff and either moist or dry. These observations indicate that the till deposits likely have a lower hydraulic conductivity than the overlying outwash and alluvium deposits in the upper hydrogeologic unit. This is also supported by slug testing data that were collected from monitoring wells screened in the glacial till. Slug testing data indicate that the minimum, maximum, and geometric mean hydraulic conductivities measured in the glacial till were lower than the upper hydrogeologic unit.

The bedrock beneath the till has metamorphosed over time, resulting in a tightly compacted, low porosity and low permeability unit. Based upon the CSM, bedrock is considered to define the bottom of the hydrogeologic system beneath the Site.

2.2.2.3 Groundwater Occurrence and Flow

Groundwater flow in the region tends to follow surface topography. Groundwater is typically recharged from direct infiltration and surface water sources, which includes reservoirs, ponds, streams, and lakes

(LaFave and McDonald, 2004). Groundwater in the region may also discharge to surface water bodies, depending on the season and localized conditions.

Groundwater occurrence and movement was evaluated during the Phase I Site Characterization described in the Phase I SC DSR (Roux, 2017a) and the *Groundwater and Surface Water Data Summary Report* (GW/SW DSR; Roux, 2018a), and during the Phase II Site Characterization described in the Phase II DSR (Roux, 2019). During the Phase I Site Characterization, 64 monitoring wells were visited on the following dates to measure depth to groundwater across the Site: August 30, 2016; November 29, 2016; March 14-15, 2017; and June 16, 2017. During the Phase II Site Characterization, 77 monitoring wells (including 8 newly installed monitoring wells and 5 former production wells) were visited on June 4-5, 2018 and October 1-2, 2018, to measure depth to groundwater across the Site. Pressure transducers were also installed in selected wells to monitor groundwater elevations throughout the Phase I and Phase II Site Characterization. The elevation data collected from gauging and with the pressure transducers indicate that groundwater elevations fluctuate seasonally at varying magnitudes depending on the area of the Site and the hydrogeologic unit where the well is screened. Additionally, groundwater elevations measured in monitoring well clusters, where there is a well screened within the upper hydrogeologic unit and an adjacent deep well screened below the upper hydrogeologic unit, indicates a downward vertical gradient exists. However, the differences in elevations between the glacial till and the upper hydrogeologic unit is typically greater than 25 ft, and in some cases, exceeds 50 ft. This large difference is indicative of limited (if any) hydraulic connectivity between the two water bearing zones.

The depth to groundwater within the Main Plant Area and the landfill areas to the north ranges from approximately 40 feet below ground surface (ft-bgs) to more than 125 ft-bgs based on the groundwater elevation data collected during the Site Characterization. The depth to groundwater was also observed to vary by more than 50 feet around the landfill area in response to seasonal fluctuations. Near the Flathead River, the depth to groundwater is typically less than 20 ft-bgs.

Groundwater flow across the Site in the upper hydrogeologic unit is generally in the south-southwest direction towards the Flathead River. While the southerly flow direction is consistent across the Site, the discussion of the hydraulic gradient can be divided into three distinct areas:

- Near Teakettle Mountain and in the landfill area of the Site, the groundwater hydraulic gradient is steep (approximately 0.059 feet per feet [ft/ft]) and generally mirrors the steeper topography in that portion of the Site.
- Groundwater elevations in the center of the Site (near the North Percolation Ponds, former Operational Area, and northern half of the Main Plant Area) are consistent over long distances (typically within 1 foot over distances greater than 1,000 feet), indicating a relatively flat groundwater hydraulic gradient (approximately 0.0045 ft/ft) across the center of the Site.
- The gradient then increases in the southern area of the Site between the Main Plant Area and the Flathead River (approximately 0.031 ft/ft), which is also consistent with the steep drop in topography between the Railroad and the Flathead River.

Additional detail on the hydrogeologic gradients are provided in the Phase II SC DSR (Roux, 2019).

2.2.2.4 Groundwater Surface Water Interaction

The percolation ponds were identified as potential sources within the preliminary CSM in the RI/FS Work Plan due to their use as wastewater discharge locations during historical operations, and based upon the

historical sampling conducted during the USEPA Site Reassessment in 2013 (Weston Solutions, Inc., 2014). The results of the Phase I SC indicated the North-East Percolation Pond and its influent ditch typically contained among the highest concentrations of cyanide and polycyclic aromatic hydrocarbons (PAHs) in the soil and sediment, followed by the effluent ditch and the North-West Percolation Pond.

The North-East Percolation Pond and North-West Percolation Pond are located hydraulically downgradient of the primary groundwater source areas (West Landfill and Wet Scrubber Sludge Pond). As presented in the Phase II SC DSR, the concentrations of cyanide and fluoride in groundwater downgradient (south) of the North-East Percolation Pond and North-West Percolation Pond are less than their concentrations in wells upgradient of the ponds. This continued decrease in concentrations as groundwater flows beneath the ponds suggests that, currently, the ponds are not a significant source of the cyanide and fluoride concentrations observed in groundwater (i.e., if the ponds were a significant source, an increase in cyanide and fluoride concentrations would be expected).

Cyanide and fluoride have historically been found at similar concentrations to the North Percolation Ponds in the former Montana Pollutant Discharge Elimination System (MPDES) permitted discharge located at the west end of the South Ponds, indicating that the discharge from the outfall can be a source of the cyanide and fluoride in the South Ponds. However, cyanide has not been detected in the discharge to the South Ponds since October 2015. The water level in the South Percolation Ponds has been observed to correlate closely with surface water elevations in the Flathead River. This observation indicates that a hydraulic connection exists between the two water bodies. Therefore, there is the potential for affected surface water within the South Ponds to migrate to the river and to potentially affect surface water, sediment, sediment pore water, and biota within the Flathead River.

The Backwater Seep Sampling Area, Riparian Area, and South Percolation Ponds are locations where groundwater is expressed from the upper hydrogeologic unit. Thus, the groundwater is the primary source of the COPCs in these areas. Groundwater from the upper hydrogeologic unit discharges to the sediment pore water located within extent of the “Seep Area,” and then to surface water.

Concentrations of cyanide in surface water, sediment, and sediment pore water up-river in the Flathead River were typically below detection levels, further supporting that groundwater discharge is the source of the cyanide in these areas. The Phase II SC findings confirm that the elevated levels of cyanide and fluoride found in groundwater and in the Backwater Seep Sampling Area, Riparian Area, and the South Percolation Pond, are not measurably impacting surface water, sediment, or sediment pore water quality within the main channel of the Flathead River. In addition, historic direct discharges into the South Percolation Ponds may have contributed to surface water and sediment impacts in this area.

Additional information regarding migration of COPCs from source areas can be found in Section 7.3 of the Phase II SC DSR (Roux, 2019).

2.3 Site and Regional Groundwater Usage

Regional groundwater resources and uses were presented in the RI/FS Work Plan for the Site (Roux, 2015a). There is no current or planned future use of groundwater as a potable resource at the Site. In addition, based upon the depth to groundwater and current and future Site use, there is no potential for direct exposure of humans (i.e., construction workers) to groundwater at the Site. However, as a

conservative measure and as requested by the USEPA, the potential risks from the potential future potable use of groundwater are assessed in this BHHRA.

Groundwater is used as the primary source of drinking water for the residential community referred to as Aluminum City located immediately west of the Site. Groundwater is also used in the City of Columbia Falls, which is located further west of the Site. Therefore, the people who regularly obtain their drinking water from wells that are in the vicinity of the Site are potential receptors in the event that groundwater contamination migrates off-site into these areas. According to the Site Reassessment Report (Weston, 2014), a query of the Montana Bureau of Mines and Geology (MBMG) Montana Groundwater Information Center database indicated that 533 wells were reported within a roughly 4-mile radius of the Site within Flathead County (Department of Natural Resources and Conservation [DNRC], 2013). Of the 533 wells, depth to water was ranged between 12 to 620 ft-bgs with an average depth to water of approximately 164 ft-bgs (DNRC, 2013). As noted in **Section 2.2.2.3** above, groundwater elevation data collected during the Phase I SC and Phase II SC indicates groundwater flow across the Site in the upper hydrogeologic unit is to the south-southwest towards the Flathead River and not towards Aluminum City.

2.4 Nature and Extent of Affected Media

In 2013, Weston completed an investigation at the Site on behalf of the USEPA Region 8. The results were summarized in the April 2014 report *Site Reassessment for Columbia Falls Aluminum Company* (Weston, 2014). As part of the investigation, a total of 68 groundwater, surface water, sediment, and soil samples were collected at the Site during the investigation. Results were utilized by the USEPA to establish if an observed release had occurred at the Site as that term is defined in the USEPA Hazardous Ranking System Guidance Manual. The data collected during the Weston investigation was considered when developing the Scope of Work for the Phase I SC, which was completed by Roux on behalf of CFAC, in 2016 and 2017.

The Phase I SC program was designed to identify and/or confirm source areas and broadly characterize the nature and extent of associated chemicals of concern across the Site and around Site features. Site features that were investigated by Weston were reinvestigated during the Phase I SC, and additional Site features were investigated based on the preliminary CSM presented in the RI/FS Work Plan. The nature and extent of contamination was evaluated from the following Site features identified as potential source areas (**Figure 2**):

- Landfills (including the closed Wet Scrubber Sludge Pond and the closed leachate ponds)
- Former Drum Storage Area
- Percolation ponds
- Waste and raw materials storage and handling areas
- Plant drainage system including drywells and associated discharge points
- Underground storage tanks and aboveground storage tanks

The results of the Phase I SC program indicated that cyanide, fluoride, and PAHs are the primary constituents identified within the potential source areas and Site features (Roux, 2017a). A summary of key findings regarding the nature and extent of contaminants as it relates to the CEM include:

- Elevated cyanide and fluoride concentrations in groundwater within the upper hydrogeologic unit appear to originate immediately to the west of the Wet Scrubber Sludge Pond, with maximum concentrations immediately downgradient of the West Landfill and Wet Scrubber

Sludge Pond; cyanide and fluoride concentrations in groundwater to the east and northeast of these Site features, and downgradient of other Site landfills are generally orders of magnitude lower.

- Soils adjacent to the West Landfill contained elevated concentrations of cyanide, fluoride, and PAHs.
- Elevated cyanide and fluoride concentrations were observed in soil and groundwater in the Former Drum Storage Area, located immediately to the west of the West Scrubber Sludge Pond and West Landfill.
- Concentrations of PAHs and cyanide in the Percolation Ponds were typically greatest in soil and sediment in the Northeast Pond and its influent ditch, followed by the effluent ditch, Northwest Pond, and West Pond; concentrations of these constituents decreased with increasing depth in the Percolation Ponds.
- Primary constituent concentrations in soil and sediment in the South Percolation Pond was similar to the other percolation ponds, but were generally much lower than the northern ponds.
- Cyanide, fluoride, and PAHs were the primary constituents detected in soils throughout the Main Plant Area.
- Low level detections of benzene, toluene, ethylbenzene, and xylene (BTEX) were the primary volatile organic compounds (VOCs) in soils across the Site. The presence of BTEX may be related to petroleum coke and pitch materials used at the Site.
- Pesticides and polychlorinated biphenyls (PCBs) were not detected in any soil samples collected during the Phase I SC; however, mean and median minimum detection levels for some pesticides and most PCBs exceeded the lowest screening criteria.
- Low-level dioxin and furan detections were observed in soil samples from the Rectifier Yard; however, concentrations were below USEPA Residential Regional Screening Levels (RSLs).
- Consistent with the preliminary CSM, soil and groundwater results from the Phase I SC indicate low potential for soil vapor exposure based on low VOC concentrations detected in soil and groundwater.

Subsequent to the Phase I SC, CFAC conducted a Supplemental South Percolation Pond Assessment (Roux, 2019). Roux conducted soil, sediment, and surface water sampling activities in and around the South Percolation Ponds, Backwater Seep Sampling Area, and Riparian Sampling Area (South Percolation Ponds Area) in accordance with the *Expedited Risk Assessment Sampling and Analysis Plan* (SAP) (Roux, 2017b) in October and November 2017. The draft sampling results from the Supplemental South Pond Assessment were provided to the USEPA on March 16, 2018 via email correspondence. Further detail regarding the sampling activities is provided in the Phase II SC DSR (Roux, 2019). Ultimately, CFAC decided to include the documentation of the data collected and evaluation of results in the Phase II DSR (Roux, 2019) and the overall risk assessment for the Site and the USEPA concurred with that decision.

The Phase II SC program was performed to refine the understanding of the nature and extent of COPCs around the Site and address data gaps identified in the BHHRA WP and Baseline Ecological Risk Assessment (BERA) WP (EHS Support, 2018a and 2018b). As part of the Phase II SC, a Background Investigation was conducted to characterize the concentrations of COPCs in areas outside the Site that were unaffected by historical Site operations or other readily identifiable, anthropogenic sources of contamination (Roux, 2019). A summary of the findings in the Phase II SC Background Investigation is presented in **Section 6.2**.

The findings from the Phase II sampling effort were generally similar to Phase I:

- Cyanide, fluoride, and PAHs are primary COPCs in soil at the Site. The Site-wide soil quality observed during the Phase II SC is consistent with the findings of the Phase I SC. The highest concentrations of these COPCs in soil were generally found in the industrial areas of the Site including the Main Plant Area, the North Percolation Ponds, and the Central Landfill Area.
- Dioxin and furan compounds were detected in all soil samples collected during the Phase I SC and Phase II SC. Concentrations were highest within or adjacent to the Rectifier Yards (immediately south and northeast) but not at locations within the remainder of Main Plant Area or in the Western Undeveloped Area. Low concentrations of dioxin and furan compounds are wide-spread and are present at similar concentrations in the Western Undeveloped Area.
- PCBs were detected in some soil samples, primarily in locations just south of the Wet Scrubber Sludge Pond; however, PCBs are not widespread in Site-wide soils.
- VOCs were frequently detected in soil samples across the Site. The widespread distribution of petroleum VOCs across the Site is somewhat similar to that of PAHs. The frequent detection of petroleum-related VOCs at trace levels in soil is likely attributed to the presence of these VOCs, albeit at low concentrations, in the petroleum coke and pitch materials that were used in manufacturing at the Site and were the primary sources of PAHs at the Site.
- Concentrations of cyanide and fluoride measured in Backwater Seep Sampling Area and the South Percolation Ponds were consistent with the suspected areas where groundwater is expressed from the upper hydrogeologic unit.
- Surface water sampling confirmed that many naturally occurring metals were detected frequently in surface water samples. The Phase II DSR presents a point-by-point comparison of surface water sample results to the USEPA Tapwater RSLs (USEPA, 2018a), the USEPA Maximum Contaminant Level (MCL), and the MDEQ Circular DEQ-7 Surface Water Standards (MDEQ, 2017). Concentrations exceeding screening values were most commonly observed in the North and South Percolation Ponds and Flathead Riparian Area Channel.
- Semi-volatile organic compounds (SVOCs, primarily PAHs) were detected in surface water samples, but were not observed at elevated concentrations.
- Cyanide, fluoride, and PAHs in sediment samples were detected most frequently in the Backwater Seep Sampling Area, Flathead Riparian Area Channel, and North and South Percolation Ponds. Cyanide concentrations exceeded the USEPA Residential RSL in five sediment samples, including sediment samples within and west of the Backwater Seep Sampling Area, the western most South Percolation Pond, and the North-East Percolation Pond. PAHs were most frequently detected in the North Percolation Ponds, the Backwater Seep Sampling Area, and the South Percolation Ponds.
- Similar to Site-wide sediment and surface water quality data, cyanide and fluoride were detected most frequently and at the highest concentrations in sediment pore water samples in the Backwater Seep Sampling Area, Flathead Riparian Area Channel, and South Percolation Ponds. Cyanide concentrations in pore water which exceeded the MDEQ Circular DEQ-7 Acute Aquatic Life Standard (MDEQ, 2017) occurred in the Backwater Seep Sampling Area, Flathead Riparian Area Channel, and the South Percolation Ponds. Fourteen different dissolved metals were detected in sediment pore water during the Site Characterization.

During the Phase I SC and Phase II SC, a sampling program following the incremental sampling methodology (ISM) was also conducted within the Operational Area to assess whether any potential source areas were present in this area (Roux, 2017a; Roux, 2019). A comparison of detected constituents between the ISM sampling and the discrete soil sample is presented in **Appendix A1** The constituents detected in the discrete soil samples were consistent with the constituents detected in the

ISM samples. Additional discussion on the ISM sampling, analytical results, and data adjustments is presented in **Section 3.1.1.2**.

2.4.1 Aluminum City Groundwater Quality

The Phase II SC DSR (Roux, 2019) included results from sampling events of water supply wells located in the residential area (also referred to as Aluminum City) located immediately west of the Site boundary, which were completed by the USEPA and CFAC since 2013. The sampling of groundwater from water supply wells in the residential areas near the Site was not part of the Scope of Work outlined in the RI/FS Work Plan because the residential area is outside of the RI/FS Site boundary. However, the data was included as part of both the Phase I and Phase II SC DSRs because the data is valuable to understanding the groundwater conditions immediately west of the Site, and for evaluating potential exposure pathways in the residential area (closest area to the Site where permanent residents are present) as part of the BHHRA.

The first residential well sampling event occurred in 2013 as part of the investigation activities completed by Weston on behalf of the USEPA. The data from this sampling was summarized in the USEPA Site Reassessment Report (Weston, 2014) and included four residential well locations. During the 2013 sampling event, cyanide was detected in one well at a concentration of 111 micrograms per liter (µg/L); which was less than the USEPA MCL/MDEQ Circular-7 Numeric Water Quality Standard of 200 µg/L (MDEQ, 2017) but exceeded the USEPA Tapwater RSL of 0.15 µg/L (USEPA, 2018a). Additionally, a residential water supply well located north of the Site at a residence on the north shore of Cedar Creek Reservoir was sampled and cyanide was detected at a concentration of 18.5 µg/L. After the 2013 sampling event, two additional rounds of sampling were completed by Weston on behalf of the USEPA - April 2014 (20 wells sampled) and November 2014 (10 wells sampled). Following those sampling events, CFAC offered to conduct quarterly sampling of water supply wells for any Aluminum City residents that desired additional sampling of their well locations. As a result, sampling events have been completed quarterly by Hydrometrics on behalf of CFAC from June 2015 through September 2018. The quarterly events included June 2015 (9 wells sampled), September 2015 (10 wells sampled), December 2015 (10 wells sampled), March 2016 (10 wells sampled), June 2016 (10 wells sampled), September 2016 (12 wells sampled), December 2016 (13 wells sampled), March 2017 (13 wells sampled), June 2017 (13 wells sampled), September 2017 (14 wells sampled), December 2017 (13 wells sampled), March 2018 (12 wells sampled), June 2018 (13 wells sampled), and September 2018 (13 wells sampled).

Cyanide has not been detected in any of the wells during any of the sampling events completed by USEPA and/or CFAC since the cyanide was detected in the 2013 sampling. The method detection limits (MDLs) reported for cyanide (5 µg/L and 10 µg/L) represent the lowest MDLs achievable by the laboratory analyzing the groundwater samples from Aluminum City residential wells. Although well below the MCLs, the MDLs exceed the USEPA Tapwater RSL (0.15 µg/L). The sampling results indicate that cyanide is not present in the groundwater beneath Aluminum City at concentrations at or above the detection limit.

During the Aluminum City sampling fluoride has been detected in the residential wells at concentrations ranging from non-detect to 280 µg/L. The detected concentrations of fluoride were all below the USEPA MCL and MDEQ Circular-7 Numeric Water Quality Standard of 4,000 µg/L, but exceeded the USEPA Tapwater RSL of 80 µg/L in some sampling events. A discussion of the concentrations of fluoride in the Aluminum City wells compared to concentrations in background is presented in **Section 6.2**.

The results of the groundwater monitoring programs described above indicate that groundwater beneath Aluminum City has not been affected by Site-related COPCs. This finding is consistent with the results of six rounds of monitoring that show the groundwater flow direction beneath the Site is directed towards the Flathead River, not towards Aluminum City.

2.4.2 Soil Vapor

The preliminary CSM in the RI/FS Work Plan indicated there was low potential for soil vapor concerns at the Site based upon the limited detections of VOCs, and the low concentrations detected in groundwater during prior investigations. In addition, groundwater within the Main Plant Area and areas to the north ranges from approximately 40 ft-bgs to 125 ft-bgs. To confirm this initial finding, the Phase II SC DSR assessed the potential for soil vapor intrusion. The maximum concentrations of each VOC detected in groundwater within the upper hydrogeologic unit during the Site Characterization were entered into the USEPA Vapor Intrusion Screening Level (VISL) Groundwater Concentration to Indoor Air Concentration Online Calculator (USEPA, 2018b [November 2018]) and presented in Appendix CC of the Phase II SC DSR (Roux, 2019). The average groundwater temperature in the upper hydrogeologic unit for the respective round where the maximum concentration occurred was utilized in the calculator. The results of the VISL evaluation indicate that all estimated vapor intrusion carcinogenic risks are less than $1.0x10^{-6}$; and all estimated hazard quotients (HQs) are less than 0.1 (**Appendix B**).

2.4.3 Asbestos

Surficial soil sampling was conducted in the Asbestos Landfills as part of the Phase I SC program (Roux, 2017c); the methods and findings of the sampling program are presented in **Appendix C**. As described in the RI/FS Work Plan, two areas were identified as being former asbestos landfills based on historic information (**Figure 2**). The areas are referred to as the North Asbestos Landfills and the South Asbestos Landfills. The North Asbestos Landfills are located north of the West Landfill and consist of two separate areas (i.e., North West and North East Asbestos Landfills); the South Asbestos Landfills are located south of the East Landfill, near the eastern boundary of the Site, and consist of two separate areas (i.e., South West and South East Asbestos Landfills). Together, the four landfills are referred to as the Asbestos Landfills. The Asbestos Landfills were constructed as early as the late 1970s or early 1980s, and were in use from 1993 to 2009. Details regarding landfill construction are unknown; however, based on the Phase I observations during field reconnaissance and test pitting activities, the landfills have a natural soil cover that overlies the asbestos materials within the landfills. There is no evidence of an engineered cap or liner. The approximate boundaries of the landfills and the sampling locations are presented on Plate 1 of the Surficial Soil Sampling Results from Asbestos Landfills Report (Roux, 2017c). Asbestos containing material (ACM), including asbestos pipe and asbestos bags, were observed at depth during test pitting. No samples of ACM were collected during the test pitting activities. The historical knowledge of asbestos landfill operations at the Site, a previous Site reconnaissance, and test pitting activities indicated that asbestos containing materials were buried in the landfills underneath a soil cover. However, it could not be determined from visual field inspection if asbestos is present in the surface soil. Therefore, the surficial soil sampling was conducted to determine the presence, or lack thereof, of asbestos in the surface soil, and the extent of the asbestos, if present.

Surficial soil samples were analyzed via the California Air Resources Board 435 method using polarized light microscopy. The laboratory analytical data for 56 surficial soil samples collected from the 56 grids across the Asbestos Landfills was summarized in Table 1 of the Surficial Soil Sampling Results from

Asbestos Landfills Report (Roux, 2017c). Analytical data for surficial soils were compared to the laboratory method detection limit. The surficial soil sampling results from the Asbestos Landfills indicate the following:

- Surficial soil was non-detect for asbestos in 55 of the 56 surficial soil samples collected from the Asbestos Landfills based upon the asbestos concentration. Point counting was not performed on these samples because no asbestos fibers were detected.
- One surficial soil sample, CFAS-03-SO-0-0.5, had a chrysotile asbestos concentration less than 0.25 percent but there were no asbestos fibers identified for counting during the point count. This sample was collected from grid CFAS-03 located in the northeast corner of the South-West Asbestos Landfill.
- One potential ACM sample was visually identified and sampled during the surficial soil sampling event. Sample CFAS-55-Wire had an asbestos concentration of 90 percent chrysotile asbestos. The surficial soil sample collected from the same grid cell, CFAS-55-SO-0-0.5, was determined to be non-detect for asbestos.

Based on the lack of asbestos in the surface soil, and the current and future use of the Site, there is no potential for exposure to asbestos by human receptor activity in the Asbestos Landfills. This finding is based only on the surficial sampling of soils. Disturbance of asbestos-containing subsurface soils, if present, may expose receptors to asbestos. In addition, subsurface asbestos-containing building material, if present, may have a tendency to rise in the soil column due to uplift of soil and materials in the soil due to annual freezing and thawing cycles.

2.4.4 Dioxins and Dibenzofurans

As described in the Phase I SC DSR (Roux, 2017a), dioxin and furan compounds are by-products that can occur when PCB fluid is partially burned; but also can be by-products produced during forest fires and other combustion sources as well. Chemicals like PCBs differ in the number and location of chlorine atoms, and act like dioxins, based on their level of toxicity. These chemicals are known as dioxin-like compounds (DLCs).

Soil samples collected within and around the Rectifier Yards were analyzed for dibenzo-p-dioxins and polychlorinated dibenzofurans, and were assessed in the Phase I SC DSR (Roux, 2017a) as well as the Phase II SC DSR (Roux, 2019). Additional samples were collected within the Main Plant Area and Western Undeveloped Area to develop a better understanding of the distribution and concentrations of dioxin and furan compounds at the Site (Roux, 2019). Toxicity equivalency factors (TEFs) were used for the concentrations of dioxins and furans on the basis of how toxic they were in comparison with the toxicity of 2,3,7,8-tetrachlorodibenzodioxin (TCDD), the most potent dioxin. Dioxin-like TEFs used for comparison were based on the table provided in the USEPA report, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds* (USEPA, 2010a). The total Toxic Equivalency (TEQ) values were compared to the USEPA RSLs for TCDD and are presented in Appendix M7 and M8 in the Phase II SC DSR (Roux, 2019).

The DLC and total TEQ data for Site-wide soil samples collected during the Phase I and Phase II SC indicate the following:

- DLCs were detected in the majority of samples analyzed for dioxin and furan compounds. All individual DLC concentrations detected were below their respective USEPA Residential and Industrial RSLs, with the exception of 1,2,3,4,6,7,8-HpCDD detected in a surface soil sample

collected northeast of the East Rectifier Yard (CFSB-236), with a concentration of 6.04 picograms per gram (pg/g) that marginally exceeded the USEPA Residential RSL of 4.8 pg/g.

- TCDD was detected in 21 percent of all soil samples and decreased in frequency of detection with increasing depth. TCDD did not exceed USEPA Industrial or Residential RSLs. TCDD was detected above the USEPA Protection of Groundwater Risk-Based Soil Screening Level (RBSSL) of 0.059 pg/g in 31 percent of detected samples collected.
- Total TEQ values were compared to the USEPA RSLs for TCDD. Total TEQ did not exceed USEPA Industrial RSLs, but exceeded USEPA Residential RSLs in the surficial sample collected from CFMW-040 located in the West Rectifier Yard, the shallow sample collected from CFSB-080 located in the East Rectifier Yard, the surface surficial soil sample collected from CFSB-234 located southeast of the East Rectifier Yard, and the surficial and shallow soil sample collected from CFSB-236 located northeast of the East Rectifier Yard. Total TEQ exceeded USEPA Protection of Groundwater RBSSLs in 95 percent of soil samples.
- Dioxin and furan compounds were analyzed in 10 surface soil and 10 shallow soil samples collected in the Western Undeveloped Area to determine if dioxin and furan compounds are present outside the industrial areas of the Site (i.e., Main Plant Area). DLCs were detected in 9 of the 10 surface samples (90 percent); and 8 of the 10 shallow samples (80 percent). Total TEQ values did not exceed USEPA Industrial or Residential RSLs in any of the samples from the Western Undeveloped Area. However, concentrations were frequently detected above USEPA Protection of Groundwater RBSSLs.

As noted in **Section 2.4**, the Background Investigation was conducted as part of the Phase II SC to characterize the concentrations of COPCs in areas outside the Site that are unaffected by historic Site operations or other readily identifiable, anthropogenic sources of contamination, in accordance with the Background Investigation Sampling and Analysis Plan (Background SAP) (Roux, 2018b). The dioxin and furan compound data for background soil samples collected during the Background Investigation indicate the following:

- Individual DLC concentrations frequently exceeded USEPA Protection of Groundwater RBSSLs, with 95 percent of samples having at least one DLC with an exceedance of RBSSLs. All individual DLC concentrations for detected samples were below their respective USEPA Residential and Industrial RSLs in background soil.
- TCDD was detected in 30 percent of all background soil samples, but did not exceed USEPA Industrial or Residential RSLs. TCDD was detected at concentrations above USEPA Protection of Groundwater RBSSL of 0.059 pg/g in 33 percent of samples collected.
- Total TEQ values were compared to the USEPA RSLs for TCDD. Total TEQ did not exceed USEPA Industrial or Residential RSLs. Total TEQ exceeded USEPA Protection of Groundwater RBSSLs in 100 percent of soil samples.

Total TEQs exceeding the USEPA Protection of Groundwater RBSSLs and USEPA Residential RSL occurred in one surficial soil sample located in the West Rectifier Yard, and one shallow soil sample collected in the East Rectifier Yard. The West Rectifier Yard is part of the Main Plant Exposure Area, which is an industrial land use area for assessment in the BHHRA; therefore, there are no potential risks based on the lack of exceedance of the USEPA Industrial RSL.

2.5 Potentially Complete Exposure Pathways

This BHHRA evaluated the nature and extent of contamination presented in the Phase II SC DSR (including data from the Site Characterization), and potential current and future land use to refine the potential complete exposure pathways identified in the BHHRA WP (EHS Support, 2018a). An exposure pathway is comprised of the following:

- A source and mechanism of constituent release to the environment
- A transport or exposure medium containing the constituent
- An exposure point where receptors (humans) can contact the exposure medium
- An exposure route (e.g., inhalation, ingestion, direct contact)

All four elements of an exposure pathway must be present for an exposure to occur. The potential completeness of exposure pathways was evaluated based on available Site investigation data, and current and potential future land use scenarios.

2.5.1 Migration Pathways

The fate and transport of Site-related COPCs released into the environment depends on the physicochemical properties of the constituent and environmental media, and the physical characteristics of the migration pathway. Constituents may partition in various environmental media, such as surface water, sediment, and soil, which affects the potential risks posed to human receptors.

Based on the chemical and physical properties of the COPCs, and the known physical, topographic, meteorological, and hydrologic conditions at the Site, migration and transport of COPCs from the source areas is limited to the following potential pathways:

- Airborne transport of dust (particulates) from Site surface soils (if disturbed) and subsurface soils (during intrusive activities) resulting from wind erosion or physical disturbance of soils
- Leaching of COPCs in surface soils to subsurface soils; and leaching of COPCs in subsurface soils to groundwater
- Migration of COPCs in surface soil to surface water via stormwater runoff from Site
- Volatilization of VOCs in subsurface soils and groundwater to soil gas
- Volatilization of COPCs in sub-slab or shallow soil gas to enclosed spaces, including indoor air of occupied structures
- Volatilization of COPCs in shallow zone groundwater to construction trench air
- Migration of COPCs in groundwater
- Discharge of COPCs in groundwater to surface water and sediments
- Migration of COPCs in surface water
- Migration of COPCs in sediment

The final BHHRA WP presented the potential exposure pathways considered complete because the four elements of an exposure pathway are present for an exposure to a receptor to occur. Pathways were considered incomplete if they lack one of the four elements discussed in **Section 2.5**.

2.5.2 Potential Receptors

Potential receptors are defined as human populations or individuals and environmental systems susceptible to COPC exposure from the Site. Both current and future land use conditions were considered in identifying potential receptors and exposure scenarios in the BHHRA WP (EHS Support, 2018a).

The current use of the Site consists of the former aluminum reduction facility (operational area and associated infrastructure) and the surrounding area. The Site is currently being decommissioned, and many of the former structures have been removed. Current activities at the Site include decommissioning activity, Site assessment as part of the ongoing RI/FS activities, potential recreational hunting and fishing, and potential for all-terrain vehicle (ATV) recreational riding by occasional trespassers. In addition, the Flathead River is a designated wild and scenic river that includes boating, floating, kayaking, hunting, fishing, and bird watching water activities.

A definitive future land use plan has not been developed for the Site. However, it is CFAC's intent that the future use of the Main Plant Area, as well as the surrounding historical operational areas and undeveloped areas to the north and east of the Main Plant Area, be restricted to industrial or commercial land use. The western portion of the Site, where there have been no industrial or waste disposal activities, may be considered for future residential and recreational uses. It is CFAC's intent to prohibit the future use of groundwater as a potable water source at the Site. However, as a conservative measure, and at the request of the USEPA, groundwater as a source of future potable use was evaluated in this BHHRA.

Based on the current and reasonable foreseeable future use of the Site, and the potential for exposure to affected soil, groundwater, surface water, and sediment, the following potential receptors within the overall Site boundary and associated Flathead River were identified. It is noted that the potential receptors will vary by specific area as further described in **Section 2.5.3**:

- Current receptors could include:
  - Trespassers exposed to soil, surface water, and sediments
  - Recreational users exposed to biota, soil, surface water, and sediments
- Future receptors could include:
  - Industrial or commercial workers exposed to soils and groundwater
  - Construction workers exposed to soils and groundwater
  - Residents exposed to soils and groundwater
  - Trespassers exposed to soil, surface water, and sediments
  - Recreational users exposed to biota, soil, surface water, and sediments

Recreational uses of the Site primarily include hunting, fishing, boating, floating, and ATV riding activities. Fishing is permitted in the Flathead River, as well as boating and floating activities. However, CFAC does not promote recreational activity on the Site, and the CFAC property is posted "No Trespassing" prohibiting hunting and ATV riding recreational activity. Therefore, recreational hunters and ATV riders that trespass on the CFAC property are designated as "recreational trespassers (hunter/ATV rider)" in the BHHRA.

Site assessment workers are excluded from the list of potential receptors because they conduct their assessment activities in adherence to the Occupational Safety and Health Administration's Hazardous

Waste Operations and Emergency Response Standard. Also, decommissioning workers are excluded from the list of potential receptors because the work is conducted under a different regulatory program, is following Site-specific health and safety procedures developed for that work, and is expected to be completed within the year.

2.5.3 Exposure Pathways

Exposure areas were defined to characterize risks to potential human receptors within the different current and reasonable anticipated future exposure scenarios based on the multiple land uses for the Site. Areas designated for future industrial development would be expected to have different exposure scenarios and potential receptors than those areas designated for potential residential or recreational use. The Site location and infrastructure remaining after decommissioning (i.e., large warehouse buildings, Bonneville Power Authority, main rail line access) makes it readily available and suitable for future use as industrial or commercial land use across two-thirds of the eastern portion of the Site (i.e., exposure areas 1 through 6). As noted in **Section 2.5.2**, it is CFAC's intent that the future use of this area be restricted to industrial or commercial land use. Alternatively, although the western third of the Site has industrial and commercial land use potential, it is reasonable to expect that the future use could potentially be residential or recreational land use based on the proximity to existing residential development, relatively flat land for development in the southern portion of the area, and the presence of Cedar Creek within the area. These reasonably anticipated future land uses are supported by the USEPA Directive that is intended to facilitate consideration of future remedial decisions in developing reasonable assumptions regarding future land use (USEPA, 2010b). CFAC recognizes that if these reasonably anticipated future land uses are revised by CFAC or future landowners (i.e., develop land use plans that propose alternative land use than those defined above), the BHHRA will be updated.

The RI/FS Work Plan presented preliminary exposure areas that were refined based on the results of the Phase I SC and Phase II SC programs. The spatial extents of the refined exposure areas are illustrated in **Figure 3**. The potential exposure pathways evaluated in each exposure area include exposure to Site soils, groundwater via vapor intrusion, surface water, and sediment, as applicable. As discussed above, it is CFAC's intent to prohibit the future use of groundwater as a potable water source at the Site. However, as a conservative measure and at the request of the USEPA, the potential Site groundwater exposure pathway from potable water use is evaluated on an exposure-area basis and potential future use of groundwater.

The following sections discuss the exposure areas that were assessed in this BHHRA, and the potential complete exposure pathways and receptors that will be assessed for each exposure area. Incomplete exposure pathways also are identified that will not be assessed further in the BHHRA. **Table 1-1** through **Table 1-9A** present the potential media-specific and route-specific exposure pathways for each receptor and each exposure area and provide the rationale for selection or exclusion of the exposure pathway in the BHHRA. **Figure 4** presents the human health exposure pathways for soils and biota including source, affected environmental media, and receptor. **Figure 5** presents the human health exposure pathways for groundwater, surface water, sediments, and biota. **Figures 4** and **5** present a summary of the potential exposure pathways to human receptors throughout the Site as presented in **Table 1-1** through **Table 1-9A**. They also provide an overall perspective of the sources identified at the Site, the affected environmental media and fate and transport through the environment, and the Site-specific human receptors that may be exposed. Not all exposure pathways presented as complete in these figures are applicable to each of the exposure areas. The reader should refer to the exposure area-specific

complete exposure pathways in **Table 1-1** through **Table 1-9A** for the complete exposure pathways identified for each exposure area.

2.5.3.1 Main Plant Area

The Main Plant Area (Exposure Area 1) is the area of historical manufacturing operations including the former Main Plant, associated buildings and infrastructure, and the former Rod Mill; this exposure area is undergoing decommissioning. The Main Plant Area is also covered by impervious surfaces (e.g., concrete, asphalt), or by crushed stone, gravel, and rubble. There are no areas of significant vegetation other than weeds common to roadsides and disturbed areas. **Figure 3** presents the extent of the unvegetated area within the Main Plant Area. Also included in the Main Plant Area are some undeveloped lands to the east and west that include roadways, water tanks, storage areas, rail siding, and railroad right-of-way. These are otherwise vegetated with grassland and deciduous shrubland. Due to the remote location from residential areas, flat land, and remaining post-decommissioning infrastructure, the foreseeable future use of this area is industrial or commercial.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Main Plant Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-1**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil
  - Industrial or commercial worker
  - Construction worker
  - Trespasser

The following potential exposure pathways for receptors in the Main Plant Area are considered incomplete for the CEM:

- Exposure of human receptors (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - There are no surface waters within the Main Plant Area.
- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Exposure of human receptors (ingestion) with COPCs in biota:
  - There are no areas within the Main Plant Area that have been or will be used by a recreational trespasser (hunting).
- Exposure of human receptors (inhalation) with COPCs in ATV-generated fugitive dust:
  - There are no attractive areas within the Main Plant Area that have been or may potentially be used by a recreational trespasser (ATV riding).

2.5.3.2 North Percolation Pond Area

The North Percolation Pond Area (Exposure Area 2) is a water management area of historical waste water discharge, and consists of two ponds (North-East and North-West) connected by an approximately 1,440-foot long unlined influent and overflow ditch. The North-East and North-West ponds are approximately 2 acres and 8 acres in size, respectively. During historic manufacturing operation, these ponds were open water areas due to the continuous discharge of process water as well as periodic

stormwater. Because manufacturing has ceased, these areas only receive stormwater. Standing water has not been observed in the North-West pond during the course of the Site Characterization; and in the North-East pond only during limited time periods following precipitation or snow melt. According to the BERA, the North Percolation Ponds are intermittently or seasonally-wetted habitat and, as such, it is unlikely that permanent aquatic communities would be established in this area (EHS Support, 2019b). Therefore, game fish are not likely to be present in this water body. As a result of the depressed topography, the foreseeable future use of this area is industrial stormwater management.

Table 1-2 presents the current and future potential complete exposure pathways based on the potential migration pathways and receptors that may be exposed to COPCs at the North Percolation Pond Area:

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Industrial worker (Stormwater Management Worker)
  - Trespasser
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Industrial worker (Stormwater Management Worker)
  - Trespasser

The following potential exposure pathways for receptors in the North Percolation Pond Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Exposure of human receptors (ingestion) with COPCs in biota:
  - There are no areas within the North Percolation Pond Area that have been or will be used by a recreational trespasser (hunting).
- Exposure of human receptors (inhalation) with COPCs in ATV-generated fugitive dust:
  - There are no attractive areas within the North Percolation Pond Area that have been or may potentially be used by a recreational trespasser (ATV riding).

2.5.3.3 Central Landfill Area

The Central Landfill Area (Exposure Area 3) consists of 12 distinct Site features (**Figure 2**) that are associated with waste management and disposal activities, including the following:

- West Landfill
- Wet Scrubber Sludge Pond / Landfill
- Center Landfill
- East Landfill
- North Leachate Pond
- South Leachate Pond
- North West Asbestos Landfill
- North East Asbestos Landfill
- South West Asbestos Landfill
- South East Asbestos Landfill
- Sanitary Landfill
- Former Drum Storage Area

Each of the landfills and the two leachate ponds are currently closed, with either an engineered cap or soil cover. Details regarding the construction and use of each landfill, as well as capping details, are provided within the RI/FS Work Plan (Roux, 2015a). The Central Landfill Area also includes the lands between these features and historical operational area between the Main Plant Area and the landfills.

The Central Landfill Area comprises an approximately 124-acre area. This area also includes roadways and open areas between and around the landfill. The area is vegetated primarily with grassland with deciduous shrubland and forest on the eastern border of the area. The Cedar Creek Reservoir Overflow Ditch transects the eastern half of the Central Landfill Area and flows from north to south through the area and, as noted in **Section 2.2.2.1**, is classified as a constructed, non-irrigation drainage ditch. According to the BERA, the Cedar Creek Reservoir Overflow Ditch is an area of intermittently- or seasonally-wetted habitat and it is unlikely that permanent aquatic communities would be established in this water body (EHS Support, 2019b). Therefore, game fish are not likely to be present in this water body.

Based on the existing Site features associated with waste management and disposal activities, the foreseeable future use of the Central Landfill Area is industrial (i.e., landfill management and maintenance activities). Additionally, while no recreational trespassers (ATV riders) have been observed, the topography and existence of roadways and open areas could be appealing to ATV riding.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Central Landfill Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-3**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Industrial worker (Landfill Management Worker)
  - Trespasser
  - Recreational trespasser (ATV riding)
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment within the Cedar Creek Reservoir Overflow Ditch:
  - Industrial worker (Landfill Management Worker)
  - Trespasser
  - Recreational trespasser (ATV riding)

The following potential exposure pathways for receptors in the Central Landfill Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Exposure of human receptors (ingestion) with COPCs in biota:
  - There are no areas within the Central Landfill Area that have been or will be used by a recreational trespasser (hunting).

2.5.3.4 Industrial Landfill Area

The Industrial Landfill Area (Exposure Area 4) began operations in the 1980s. It is an inactive, uncapped landfill in the northern part of the Site, encompassing approximately 12.4 acres. The aerial dimensions of the landfill are approximately 720 feet by 800 feet, though the shape is irregular. The Industrial Landfill Area received non-hazardous waste and debris (CFAC, 2013). The area includes roadways and the landfill, and is otherwise vegetated primarily with grassland with deciduous shrubland and forest on the borders of the area. Fencing is in place to restrict access to the inactive, uncapped landfill and there are no future plans to remove the existing fencing. There were no observations of recreational

trespassers (ATV riders and hunters) in this area. Therefore, based on the existing Site features associated with waste management and disposal activities, the foreseeable future use of this area is industrial (i.e., landfill management and maintenance).

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Industrial Landfill Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-4**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Industrial worker (Landfill Management Worker)
  - Trespasser

The following potential exposure pathways for receptors in the Industrial Landfill Area are considered incomplete for the CEM:

- Exposure of human receptors (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - There are no surface waters within the Industrial Landfill Area.
- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Exposure of human receptors (ingestion) with COPCs in biota:
  - There are no areas within the Industrial Landfill Area that have been or will be used by a recreational trespasser (hunting).
- Exposure of human receptors (inhalation) with COPCs in ATV-generated fugitive dust:
  - There are no attractive areas within the Industrial Landfill Area that have been or may potentially be used by a recreational trespasser (ATV riding).

2.5.3.5 Eastern Undeveloped Area

The Eastern Undeveloped Area (Exposure Area 5) is undeveloped and vegetated with forest and shrubland, except for the area that includes the Borrow Pit Area. There were no operational activities conducted within this area. Soil from the Borrow Pit Area within this exposure area was used as backfill material for Main Plant building basements. The Cedar Creek Reservoir Overflow Ditch transects the Eastern Undeveloped Area from north to south. As noted in **Section 2.5.3.3** and the BERA (EHS Support, 2019b), the Cedar Creek Reservoir Overflow Ditch is unlikely to support permanent habitat due to the intermittent- and seasonally-wetted habitat. Therefore, game fish are not likely to be present in this water body. Based on limited accessibility (i.e., steep rugged terrain), landfills on the northern portion, Teakettle Mountain eastern portion, main rail line and Flathead River in the southern portion, and the Main Plant Area west of the area, the foreseeable future use of this area is industrial or undeveloped.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Eastern Undeveloped Area, the following current and/or future potential exposure pathways are considered complete in the CEM (**Table 1-5**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Industrial or commercial worker
  - Construction worker
  - Trespasser

- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Trespasser

The following potential exposure pathways for receptors in the Eastern Undeveloped Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Exposure of human receptors (ingestion) with COPCs in biota:
  - There are no areas within the Eastern Undeveloped Area that have been or will be used for recreational trespasser (hunting); it is also noted that these areas are inaccessible.
- Exposure of human receptors (inhalation) with COPCs in ATV-generated fugitive dust:
  - There are no attractive areas within the Eastern Undeveloped Area that have been or may be used by a recreational trespasser (ATV riding); it is also noted that these areas are inaccessible.

2.5.3.6 North-Central Undeveloped Area

The North-Central Undeveloped Area (Exposure Area 6) includes roadways (i.e., dirt access roads) and a mixed vegetation of grassland, deciduous shrubland, and forest. The Cedar Creek Reservoir Overflow Ditch transects the northeastern portion of the area from north to south. In addition, a surface water drainageway exists that originates east of the Industrial Landfill and flows south to a shallow ephemeral ponded area between the Industrial Landfill and the North-West Percolation Pond (referred to as the Northern Surface Water Feature on **Figure 2**). As discussed in **Section 2.2.2.1**, this feature is considered a seasonal lake or pond that periodically holds water from precipitation or snow and ice melt. Both the North-West Percolation Pond and the Cedar Creek Reservoir Overflow Ditch are intermittently- or seasonally-wetted habitat and it is unlikely that permanent aquatic communities would be established in these water bodies (EHS Support, 2019b). Therefore, game fish are not likely to be present in this water body. Based on the proximity to landfills and the presence of the Northern Surface Water Feature, the foreseeable future use of this area is industrial or undeveloped.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the North-Central Undeveloped Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-6**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Industrial or commercial worker
  - Construction worker
  - Trespasser
  - Recreational trespasser (hunting) (Recreationist)
  - Recreational trespasser (ATV riding) (Recreationist)
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Trespasser
  - Recreational trespasser (hunting)
  - Recreational trespasser (ATV riding)

- Direct contact (ingestion) with COPCs in biota:
  - Recreational trespasser (hunting)

The following potential exposure pathways for receptors in the North-Central Undeveloped Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.

2.5.3.7 Western Undeveloped Area

The Western Undeveloped Area (Exposure Area 7) includes roadways and a mixed vegetation of grassland, deciduous shrubland, and forest in the western third of the Site. Cedar Creek transects the area along the northwestern border from north to south and is classified as a tributary of the Flathead River. The habitats within Cedar Creek may support multiple aquatic receptor groups, including fish (EHS Support, 2019b). However, while some game fish may be present in Cedar Creek, the stream system lacks enough habitat and volume to support a sustainable game fish population that would be actively caught and ingested by a fisher.

The southwestern portion of the Western Undeveloped Area is adjacent to the off-Site residential area referred to as Aluminum City. Based on the proximity to existing residential development, existing vegetative habitat, main rail right-of-way immediately south of the area, the foreseeable future use of this area could be industrial, commercial, residential, or undeveloped for recreational use. Currently, the Western Undeveloped Area is posted “No Trespassing” to prohibit hunting and ATV riding. However, in the future, CFAC may consider permitting hunting and ATV riding in this area.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Western Undeveloped Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-7**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Resident
  - Industrial or commercial worker
  - Construction worker
  - Recreational trespasser (hunting/ATV riding) (Recreationist)
  - Trespasser
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Recreational trespasser (hunting/ATV riding) (Recreationist)
  - Trespasser
- Direct contact (ingestion) with COPCs in biota:
  - Recreational trespasser (hunting) – current scenario
  - Recreational (hunting) – future scenario

The following potential exposure pathways for receptors in the Western Undeveloped Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:
  - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.

2.5.3.8 South Percolation Pond Area

The South Percolation Pond Area (Exposure Area 8) includes a series of three water management ponds located on the south side of the Site, adjacent to the Flathead River. The ponds are 2.4, 1.2, and 6.6 acres (from west to east) forming a total of 10.2 acres. Wastewater enters the South Percolation Pond system from a concrete pipe located on the west end of the pond system. From the pipe, water flows into the ponds through an unlined ditch. The water management ponds within the South Percolation Pond Area are used solely for management wastewater; therefore, they are not considered waters of the state. According to the BERA, the aquatic habitat is intermittent in this area; therefore, the South Percolation Ponds do not likely support permanent communities of fish (EHS Support, 2019b).

An industrial worker (stormwater management worker) employed by CFAC conducts periodic inspections of the South Percolation Ponds. In addition to the ponds, this area includes riparian forest vegetation, and the main rail right-of-way along the northern border of the area. Based on the existing operational ponds, riparian vegetation, and adjacent Flathead River, the foreseeable future use of this area is industrial water management or undeveloped.

Site-specific activity and recreational use information was compiled based on a review of local and regional river water information sources (e.g., fishing regulations, recreational use Internet sites), and an interview with Mr. Richard Birdsell of Northern Rockies Outfitters, Kalispell, Montana (personal communication, March 7, 2018). Mr. Birdsell is a fishing guide on the Flathead River, with approximately 26 years of experience on the river. According to Mr. Birdsell, recreational users do not frequent the South Percolation Ponds Area. Therefore, the floaters, fishers, and boaters will not be considered receptors for the South Percolation Pond Area. Additionally, the South Percolation Ponds are not considered habitat for the primary-fished species of the Flathead River (**Section 2.5.3.9**).

Based on the potential migration pathways and receptors that may be exposed to COPCs at the South Percolation Pond Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-8**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Stormwater management worker
  - Trespasser
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Stormwater management worker
  - Trespasser

The following potential exposure pathways for receptors in the South Percolation Pond Area are considered incomplete for the CEM:

- Exposure of human receptors (inhalation) to COPCs in Site groundwater via volatilization of COPCs:

    - Assessment of groundwater using the VISL calculator showed no concentrations in groundwater exceeding screening criteria.
- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
    - Recreationist
- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
    - Recreationist
- Direct contact (ingestion) with COPCs in biota:
    - Recreationist

2.5.3.9 Flathead River Area

The Flathead River Area (Exposure Area 9) runs along the southern border of the Site. In addition to the main river, this area includes riparian forest vegetation. Groundwater from the upper hydrogeologic unit at the Site discharges to the Flathead River.

The current and future use of the Flathead River is recreational, and the river is a designated wild and scenic river that includes boating, floating, kayaking, hunting, fishing, and bird watching water activities. Based on review of local and regional river water information sources (e.g., fishing regulations, recreational use Internet sites), and the interview with Mr. Richard Birdsell, the following presents the current and future expected recreational use activities on the reach of the Flathead River adjacent to the Site.

Recreational uses within this reach of the river typically include floating, boating, fishing, and swimming. The recreation season primarily occurs in July and August in the vicinity of the Site, with occasional use in June depending on temperature and river flow. Recreational-use observations indicate recreational users and fishers would spend less than 1 hour per visit, and an estimated reasonable maximum frequency of use is approximately 10 times in a season.

According to Mr. Birdsell, the primary fishes within the reach of the Flathead River adjacent to the South Percolation Pond Area actively fished by recreational users included Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) and Rainbow Trout (*Oncorhynchus mykiss*), and, to a lesser extent, Mountain Whitefish (*Prosopium williamsoni*). These species of fish are migratory. Trout migrate upstream in the spring to spawn in fast flowing waters and tributaries to the Flathead River. Whitefish spawning takes place in October through early December and is preceded by upstream movement in the Flathead River to suitable spawning areas in fast-flowing tributaries. Creel limits for Rainbow Trout is two per day; although most fishers reportedly do not keep fish caught within this reach of the Flathead River (Mr. Birdsell, personal communication, March 7, 2018). Cutthroat Trout are actively managed and must be released immediately as part of a catch-and-release program in Montana waters including the Flathead River.

As noted previously, the Flathead River is a designated wild and scenic river that includes boating, floating, kayaking, hunting, fishing, and bird watching water activities. Based on the designated use of the Flathead River as well as local recreational uses, the current and future use of the Flathead River is recreational (e.g., used for floating, boating, fishing, and swimming activities). The floater and swimmer receptors were combined as a single receptor (i.e., Recreationist [Floater]) because of similarities in exposure (e.g., full body surface area, incidental ingestion rates). Due to the steep embankment

adjacent to the Site, access from the Site to the river is limited due to crossing an active railroad line and descending an approximate 100-ft embankment. Due to Site access limitations, a recreational child receptor is not included as a potential receptor for this exposure area.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Flathead River Area, the following current and future potential exposure pathways are considered complete in the CEM (Table 1-9):

- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Recreationist (Floater)
  - Recreationist (Fisher)
- Direct contact (ingestion) with COPCs in biota:
  - Recreationist (Fisher)

There were no potential exposure pathways for receptors in the Flathead River Area that are considered incomplete for the CEM.

2.5.3.10 Backwater Seep Sampling Area

The Backwater Seep Sampling Area (Exposure Area 9a) is a backwater area of the Flathead River that is west of the South Percolation Pond Area along the southern border of the Site. The Backwater Seep Sampling Area connects to the main river, and includes riparian forest vegetation along a steep slope to the main rail right-of-way along the northern border of the area. Groundwater from the Site discharges to the Backwater Seep Sampling Area. Site groundwater discharges from the base of the cliffs adjacent to this area and flows overland into the Backwater Seep Sampling Area. Based on the presence of the steep relief and the backwater, it is foreseeable that the current and future use of this area will remain undeveloped; however, recreational users of the Flathead River may use the area for recreational purposes. Due to the steep embankment, access from the Site to the river adjacent to the Site, including the Backwater Seep Sampling Area, is limited due to crossing an active railroad line and descending an approximate 100-ft embankment. An industrial worker (stormwater management worker) that is a CFAC employee conducts periodic sampling of the Backwater Seep Sampling Area.

A sand and gravel bar at the inlet to the Backwater Seep Sampling Area is a location that Mr. Birdsell has observed some floaters, fishers, and boaters stop for lunch or swimming. Because of its lotic characteristics, the Backwater Seep Sampling Area would not provide habitat for potential spawning areas for the primary fishes noted above. However, there may be the potential for fish to enter the Backwater Seep Sampling Area, and a recreational fisher may catch fish within surface waters of this area. The recreational receptors for the Backwater Seep Sampling Area includes a swimmer or floater (adolescent and adult) and an adult fisher. Due to Site access limitations, a recreational child receptor is not included as a potential receptor for this exposure area.

Based on the potential migration pathways and receptors that may be exposed to COPCs at the Backwater Seep Sampling Area, the following current and future potential exposure pathways are considered complete in the CEM (**Table 1-9a**):

- Direct contact (incidental ingestion, inhalation, and dermal contact) with COPCs in soil:
  - Stormwater management worker
  - Trespasser

- Direct contact (incidental ingestion and dermal contact) with COPCs in surface water and sediment:
  - Stormwater management worker
  - Trespasser
  - Recreationist (Floater)
  - Recreationist (Fisher)
- Direct contact (ingestion) with COPCs in biota:
  - Recreationist (Fisher)

There were no potential exposure pathways for receptors in the Backwater Seep Sampling Area that are considered incomplete for the CEM.

2.5.3.11 Site-wide Groundwater

Although there is no current or planned future use of groundwater as a potable resource at the Site and groundwater flow direction is away from the current potable water wells in the off-Site Aluminum City community, the potential Site groundwater exposure pathway from direct contact (potable water use) was conservatively considered complete for the CEM as required by the USEPA. As discussed in **Section 2.2.2.2**, there are two primary water bearing zones beneath the Site: the upper hydrogeologic unit and the below upper hydrogeologic unit. The Phase I SC and Phase II SC concluded that there is little communication between the two water bearing zones; therefore, COPCs detected in the upper hydrogeologic unit would not likely migrate to the below upper hydrogeologic unit.

Three exposure scenarios were evaluated for potential future use of groundwater at the Site. First, potential future residential land use was evaluated for the Western Undeveloped Area. Therefore, potable use of groundwater in the upper hydrogeologic unit in the Western Undeveloped Area was evaluated for the potential future residential receptors within this area. Second, as required by the USEPA, a potential worse-case scenario for groundwater with the highest concentrations of COPCs (i.e., "plume core") was evaluated as source of potable water for potential future residential receptors. The plume core was identified as monitoring wells with detected concentrations of cyanide of greater than 300 µg/l (Plate 13 of the Phase II SC; Roux, 2019) or monitoring wells with fluoride concentrations of greater than 2,000 µg/l (Plate 15 of the Phase II SC; Roux, 2019). Third, Site-wide groundwater within the below upper hydrogeologic unit was evaluated as source potable water for potential future residential receptors.

Based on the potential migration pathways and receptors (and exposure sets discussed above) that may be exposed to COPCs in the Site groundwater, the following current and future potential exposure pathways are considered complete in the CEM:

- Direct contact (ingestion and dermal contact) with COPCs in groundwater

The following potential exposure pathways for receptors to Site groundwater are considered incomplete for the CEM:

- Exposure of human receptors to COPCs in Site groundwater through migration of volatile COPCs in groundwater
- Exposure of human receptors to COPCs in Site groundwater used for irrigation

The current and reasonable anticipated future use of the Site is not agricultural. The BHHRA will be updated if CFAC or any future owner proposes to use the groundwater for irrigation purposes.

3 Hazard Identification

The purpose of the hazard identification process is to summarize the environmental media data, assess its quality, and screen the data to determine the COPCs that will be evaluated further in the risk assessment process. The following sections discuss the evaluation of available data and data selected to be used in the risk assessment, data usability and data decisions, and selection of COPCs to be evaluated further for each exposure area.

3.1 Data Used in the Risk Assessment

The environmental media data used in the BHHRA were managed in an electronic database, and were compiled by constituent, medium, sample location, and sample depth, if applicable. All descriptive and statistical analysis of the data was performed using ProUCL Version 5.1 that was developed for the USEPA (2016).

The environmental media data collected within the human health exposure areas defined in the BHHRA (**Figure 2**) during the Site Characterization were included in the BHHRA database. **Appendix D** presents the list of samples included in each dataset for each exposure medium; **Appendix E** presents the analytical data tables for each media by exposure area that were used in the BHHRA. The tables in **Appendix D** and **Appendix E** and the figures are grouped by exposure area then exposure media. The MDLs are provided in the tables in **Appendix E** and include the data qualifiers. As was noted in the Nature and Extent of Affected Media section (**Section 2.4.3**), the analysis of asbestos in the Asbestos Landfills indicated there was no potential for exposure. Therefore, no asbestos data is included in **Appendix E** or further evaluated in this BHHRA.

As was noted previously, the data collected during the Weston investigation informed the Scope of Work for the Phase I SC that was completed by Roux, on behalf of CFAC, in 2016 and 2017. The Phase I SC program comprehensively identified preliminary source areas. The Supplemental South Pond Assessment provided additional data to complete the characterization of the South Percolation Pond Area, Flathead River Area, and Backwater Seep Sampling Area. The Phase II SC program was performed to refine the understanding of the nature and extent of COPCs around the Site and address data gaps identified in the BHHRA WP and BERA WP (EHS Support, 2018a and 2018b). The Phase II SC program addressed the data gaps identified and provided a robust dataset for the BHHRA. The Site Characterization program data was utilized for preparation of this BHHRA.

Figures 6 through **Figure 34** present the soil, surface water, and sediment sample locations for each dataset. **Figure 35** through **Figure 37** present the location of the monitoring wells for each of the three groundwater scenarios evaluated. **Figure 38** presents the soil samples utilized to evaluate the recreational trespasser (ATV riding) and recreational trespasser (hunting). The soil samples collected within the vegetated areas and used to evaluate the potential for uptake of COPCs by game (e.g., white tail deer) for the hunter scenario are also presented on **Figure 38**.

The following sections provide a summary of the environmental media data utilized in the BHHRA. For further detail on specific sample collection, analyses, and quality, refer to the Phase I SC DSR (Roux, 2017a) and Phase II SC DSR (Roux, 2019). It should be noted that the following discussions are based on six rounds of sampling that cover a range of temporal and seasonal variability over three years. A detailed evaluation of temporal variability was provided in the Phase II SC DSR (Roux, 2019), which

documented that the sampling covered a range of seasonal conditions to provide an adequate data set for conducting the risk assessment. In addition, during development of the Phase II SC Sampling and Analysis Plan, additional sampling locations were added to address any data gaps that were identified as part of the Phase I SC or during development of the risk assessment work plans. A summary of the data adequacy evaluation conducted as part of the Phase II SAP is provided below. Plates presenting all of the samples collected as part of the Site Characterization were provided in the Phase II DSR (Roux, 2019).

Based upon an initial review of the Draft BHHRA WP and Draft BERA WP, USEPA requested further evaluation of the temporal variability in groundwater and surface water and discussion of how it may affect the Phase II SAP Scope of Work and/or risk assessments. Therefore, as part of the preparation of the Phase II SAP Scope of Work, Roux evaluated the temporal variability of the hydrologic and concentration data for the surface water features and groundwater at the Site to plan the proposed Phase II sampling locations and events such that the data could be used as an adequate dataset for the BHHRA and BERA.

As part of the Phase II SC, additional sampling was conducted in each exposure area to supplement the Phase I findings and to develop a sufficient data set for calculation of representative EPCs during the risk assessment. Two additional comprehensive rounds of groundwater and surface water sampling (i.e., first during the high-water season and the second during low-water seasons) were conducted as part of the Phase II SC to reduce uncertainty associated with temporal variations of COPC concentrations within these media. Additional sampling points were also collected to improve the spatial representativeness of the sample datasets for surface water, sediment / sediment pore water, and groundwater.

Calculation of statistically valid 95 percent upper confidence limit (UCL) of the mean concentrations typically requires a minimum of 8 to 10 observations, or more, depending upon the variability of the population. Therefore, exposure areas evaluated in the BHHRA and BERA typically had a minimum of 8 to 10 observations for each matrix evaluated in the exposure analysis, and in most cases well more than 8 to 10 observations, with multiple rounds of surface water sampling (typically six rounds of samples) at each location. With respect to groundwater, there are approximately 30 wells distributed throughout the cyanide and fluoride plumes, and additional wells outside the plumes, with multiple rounds of groundwater sampling (typically six rounds of samples) at each location.

Due to variability within the soil data and the large size of some of the terrestrial exposure areas, a statistical evaluation of the existing soil dataset for each exposure area was performed to approximate minimum sample size requirements for computation of the 95 percent UCL of the mean concentration of indicator COPCs, including cyanide, fluoride, benzo(a)pyrene, and select metals. A detailed description of the analytical approach was provided in Appendix D of the Phase II SAP. The results of the analysis indicated that the proposed Phase II sampling, when combined with the Phase I data, should provide an adequate dataset for calculating the 95 UCL_{mean} concentration of the indicator COPCs.

The final BHHRA datasets used in the risk assessment are shown in **Figures 6** through **38** and are considered statistically robust and representative for use in the calculation of the EPCs for the risk assessment.

3.1.1 Soil

The soil quality data was collected using two different sampling methodologies during the Site Characterization programs. First, a Site-wide sampling program was conducted at discrete sampling locations at depths from 0 to 0.5 ft-bgs, 0 to 2 ft-bgs, and greater than 2 ft-bgs. A second sampling program following the ISM was also conducted within the Operational Area to assess whether any potential source areas were present in this area. The Site-wide sampling results presented a robust dataset for soil across the Site and within the exposure areas, and was the primary dataset to evaluate potential exposures to COPCs in soils. The ISM soil samples and their inclusion in the BHHRA are discussed in further detail in **Section 3.1.1.1**.

For the primary soil database, soil data were grouped according to exposure area and whether the soil sample was collected from within the soil depth range for potentially complete exposure pathways. As presented in the BHHRA WP (EHS Support, 2018a) and the BHHRA Interim Deliverable (EHS Support, 2019a), three depth ranges for soil were evaluated for receptors potentially exposed to COPCs in soils: surficial soil from 0 to 0.5 ft-bgs; shallow soil from 0 to 2 ft-bgs; and intermediate soil from 0 to 12 ft-bgs. Soil samples collected from a depth greater than 12 ft-bgs were not included in the BHHRA datasets because it is unlikely that soils deeper than 12 ft-bgs would be redistributed to the surface as a result of development.

Generally, potential exposures to soil for current trespassers and recreational trespassers (ATV riding and hunting) were evaluated using the surficial soil dataset. Current industrial workers, including landfill management workers and stormwater management workers, were evaluated for the potential exposure to COPCs within shallow soil. Should the potential for redevelopment occur within an exposure area, future exposures to soils were evaluated using the intermediate soils (0 to 12 ft-bgs) to evaluate the potential for COPCs to be redistributed from depth to the surface as part of redevelopment activities. If future development activities are not planned for an exposure area, the future soil dataset included samples from the shallow soils (0 to 2 ft-bgs). **Tables 1-1** through **Table 1-9a** provide additional details on the soil depth ranges evaluated for each receptor within the individual exposure areas. If a soil sample was collected from a depth range that began within the specified interval but extended beyond the exposure media range, the sample was included in the dataset for the specified depth interval. For example, six samples from the Main Plant Area were collected from 10 to 12.5 ft-bgs. These samples were included in the soil dataset for the purposes of evaluating the future soil exposures to redistributed soils in the Main Plant Exposure Area (i.e., potential exposure to soil from 0 to 12 ft-bgs; **Appendix D, Table D-2**).

Additionally, for the Main Plant Area, the dataset was further refined for the current scenario (e.g., trespasser) to include only those samples collected from locations collected in vegetated or uncovered/unpaved areas. Samples collected from beneath pavement, concrete, or within a building footprint were not included in the dataset for this receptor as the current trespasser would not be able to encounter this material as it is currently covered. The future scenario in the Main Plant Area includes the potential for redevelopment. At this time, future redevelopment plans are not known, and current infrastructure and covered areas may remain for future industrial/commercial use. Therefore, as a conservative measure, all soil samples collected from ground surface to 12 ft-bgs in the Main Plant Area were included in dataset for all receptors in the future exposure scenarios (i.e., industrial workers, construction workers, and trespassers).

In addition to the evaluation of soils for the potential exposure through direct contact and/or inhalation, the soil analytical data was used to evaluate the potential for leaching of constituents to groundwater. Refer to **Section 3.4** and **Table 2-50** for additional discussion on the method for evaluation of the three soil datasets for the potential of leaching to groundwater as well as the conclusions regarding the exclusion of COPCs that exceeded the relevant criteria presented in **Section 3.4**.

3.1.1.1 Chromium Speciation

In an effort to reduce uncertainty in the risk assessment results with respect to chromium in soil, CFAC developed a Site-specific ratio of hexavalent chromium [Cr(VI)] to trivalent chromium [Cr(III)] by collecting soil samples that were analyzed for both total chromium and Cr(VI). Twenty soil samples within the depth the depth range of 0 to 2 ft-bgs were analyzed for both Cr(VI) and total chromium (Roux, 2019). Cr(VI) was detected in only 3 of the 20 samples and comprised a maximum of 3.96 percent of the total chromium in the samples where it was detected. To determine the representative ratio of Cr(VI) to Cr(III) in soil at the Site, the Cr(III) concentration for each of the samples analyzed for Cr(VI) was calculated as the difference in concentration between total chromium concentration and the Cr(VI) concentration. For non-detect Cr(VI) concentrations at these locations, one-half of the MDL was used for the calculation. The ratio of Cr(VI) to Cr(III) was calculated for each sample. The Cr(III) and Cr(VI) results from soil sample CFSB-290-SO-0-0.5 were excluded from the dataset because both total chromium and Cr(VI) were not detected at this location. The 95 percent UCL on the mean of all the ratios was calculated using ProUCL Software (USEPA, 2016). ProUCL fit the dataset to a lognormal distribution and returned a 95 percent UCL on the mean ratio of 0.0198 based on the H-statistic method. To be conservative and to follow suggestions from the ProUCL output form, the lognormal distribution result was rejected, and instead, the nonparametric 95 percent UCL on the mean ratio of 0.0275 was adopted as the representative ratio.

Concentrations of Cr(III) and Cr(VI) were then estimated for the remaining samples for which only total chromium was analyzed using the above-calculated ratio of Cr(VI) to Cr(III), *r*, the Total Chromium concentration, *Cr(T)*, and the following equations. The raw dataset and calculations are provided in the Phase II DSR (Roux, 2019):

$$[Cr(III)] = \frac{1}{1+r} * Cr(T) \qquad \textbf{Equation 1a}$$

$$[Cr(VI)] = r * [Cr(III)] \qquad \textbf{Equation 1b}$$

Both the measured total chromium results as well as the estimated Cr(III) and Cr(VI) concentrations based on the above ratio are included in the database for each soil exposure area.

3.1.1.2 Incremental Sampling Methodology Soil Samples

In addition to discrete soil sampling, incremental soil sampling was conducted within an area known as the Operational Area. The Operational Area comprises approximately 43 acres within the northern portion of the Main Plant Area and southern portion of the Central Landfill Area where aerial photographs indicate historical operations may have been conducted but no known source area exists. An incremental soil sampling program was conducted within the Operational Area to assess whether any potential source areas are present in this area. The work was performed in accordance with the Scope of

Work outlined in the Phase I and Phase II SAPs (Roux, 2015b and 2018a) as well as SAP Field Modification #4 (described in the Phase I DSR).

The Operational Area soil investigation was conducted from June 14, 2016 to May 23, 2018. The Operational Area was divided into 43 grid cells, also referred to as Decision Units (DUs); each approximately one acre in size. Sampling was conducted at the frequency of one incremental surface soil sample (0 to 0.5 ft-bgs) and one incremental shallow soil sample (0.5 to 2 ft-bgs) per DU, for a total of 43 incremental soil samples from each interval. The grid where samples were collected in the Operational Area is shown on **Figure 3**. As described in the Phase I DSR, samples from the first 15 DUs (designated CFISS-001 through CFISS-015) were collected using field processing methods which included the hand removal of coarse-grained material greater than approximately 0.5 inches in diameter, and hand mixing of the soil volumes in the field from the 32 grab samples. As documented in Field Modification #4, field processing by Roux Associates/Hydrometrics was discontinued at the request of USEPA since the field processing method did not include drying and breaking up of soil aggregates and/or sieving as specified in the Interstate Technology and Regulatory Council (ITRC) ISM guidance and as would be done in the lab processing of incremental soil samples (ITRC, 2012a). Three of the initial DUs were re-sampled to allow for a comparison of the results from the two methods. After the results were considered, it was determined that the remaining 12 DUs would be re-sampled as part of the Phase II SC effort.

The 43 DUs spatially overlapped the Main Plant Area and Central Landfill Area that were assessed in the Site-wide sampling program (**Figure 6**, **Figure 7**, and **Figure 12 through Figure 14**). The spatial DU soil sampling data cannot be statistically combined with the discrete Site-wide sampling data for purposes of an EPC for the exposure assessment. Therefore, the incremental sampling data was assessed separately to identify COPCs within the incremental soil sampling DUs; based on the COPCs identified, DU-specific EPCs were evaluated in the BHHRA. The EPCs were calculated separately for discrete versus ISM samples for each applicable exposure area and each exposure scenario.

A single replicate was collected from most of the grid cells in the Operational Area. However, three replicates (or triplicates) were collected from both the 0 to 0.5 ft and the 0.5 to 2 ft soil intervals from four DUs (i.e., 10 percent of the DUs; CFISS-001, -004, -011, and -015) during the Phase II investigation. The results of the triplicate ISM results were consolidated into a single representative concentration using the updated ITRC 95 percent UCL_{mean} calculator (ITRC, 2012b), as described in the wildlife ingestion BERA work plan interim deliverable (**Appendix A2** from BERA). An adjustment was made to the detected constituents in the 39 DUs collected from the single incremental sample locations based on the variability in that constituent collected from triplicate sample locations. The relative standard deviations (RSDs) calculated and presented in the Phase II DSR (Roux, 2019) for DUs with triplicate incremental samples were used to estimate the potential variance associated with single incremental sample results. The arithmetic mean of RSDs for each constituent and sampling interval combination was used as the adjustment factor for the 39 DUs lacking replicate samples. This adjustment factor was used to calculate the potential range for each non-replicated DU in each depth interval as follows:

$$\textit{RSD-adjusted EPC} = (\textit{single ISM result}) \times (1 \pm (\textit{mean RSD}/100)) \qquad \textbf{Equation 2}$$

The ISM triplicate 95 percent UCL_{mean} calculations are presented in **Appendix A2**. For the four DUs with triplicate incremental samples, 95 percent UCL_{mean} values were calculated for constituents detected in at least one of the three incremental samples using the ITRC calculator as described above. One-half the MDL was used as the surrogate values for non-detects (ITRC, 2012a and 2012b). A 95 percent UCL_{mean}

calculated using only three results will always be greater than the maximum detected concentrations; therefore, the 95 percent UCL_{mean} generated by the ITRC 95 percent UCL_{mean} calculator was always selected as the EPC for the ISM triplicate sample results. For DUs where only a single incremental sample was collected, the results were adjusted based on the variance observed for each chemical in each soil depth interval, as reflected by the average RSD for that chemical across the four DUs where triplicate samples were collected.

3.1.2 Surface Water and Sediment

Surface water and sediment samples collected within exposure areas during Site Characterization were included in the BHHRA database to evaluate the receptors with potentially complete exposure pathways for these environmental media. Surface water and sediment samples were collected from Site surface water features that were observed to contain water during the Phase I SC. In the Supplemental South Pond Assessment, surface water and sediment samples were collected from the South Percolation Pond Area and Backwater Seep Sampling Area. In the Phase II SC, surface water and sediment samples were collected from locations previously sampled in the Phase I SC and Supplemental South Pond Assessment, and additional locations added for the Phase II SC as outlined in the Phase II SAP (Roux, 2018c). Additional surface water sample locations were added to the Flathead River, Cedar Creek Reservoir Overflow Ditch, Cedar Creek, North-West Percolation Pond, North-East Percolation Pond, and South Percolation Ponds to refine the understanding of surface water and quality in these features. Ten locations were added to the Northern Surface Water Feature, which had been previously unsampled.

The following is a summary of the surface water samples for each exposure area with potential contact with COPCs in surface water:

- North Percolation Pond Area:
  - 2 surface water locations; 2 samples collected April 2017 and June 2017
  - 2 sediment locations; 3 samples collected in September 2016
- Central Landfill Area:
  - 4 surface water locations; 15 surface water samples collected from June 2016 to June 2018
  - 3 sediment locations; 4 samples collected in September 2016
- Eastern Undeveloped Area:
  - 3 surface water locations; 7 samples collected from June 2016 to October 2018
  - 1 sediment location; 1 sediment sample collected in September 2016
- North-Central Undeveloped Area:
  - 13 surface water locations; 25 samples collected from June 2016 to June 2018
  - 11 sediment locations; 14 samples collected from September 2016 to June 2018
- Western Undeveloped Area:
  - 6 surface water locations; 38 samples collected from August 2016 through October 2018
  - 6 sediment locations; 11 samples collected from August 2016 through October 2018
- South Percolation Pond Area:
  - 9 surface water locations; 36 samples collected from June 2016 through October 2018
  - 11 sediment locations; 20 samples collected from September 2016 through October 2018
- Flathead River Area:
  - 13 surface water locations; 54 samples collected from September 2016 through October 2018
  - 13 sediment locations; 23 samples collected from September 2016 through October 2018
- Backwater Seep Sampling Area:

- 6 surface water locations; 31 samples collected from September 2016 through October 2018
- 6 sediment locations; 18 samples collected from September 2016 through October 2018

Select samples were not collected in some areas because surface water was not observed in the area at the time of sampling. Further discussion on surface water and sediment sample activities is presented in the Phase II SC DSR (Roux, 2019).

3.1.3 Groundwater

As discussed in **Section 2.5.3.11**, three exposure areas were identified for groundwater: Western Undeveloped Area Upper Hydrogeologic Unit, Plume Area Upper Hydrogeologic Unit, and Site-Wide Below Upper Hydrogeologic Unit. The monitoring wells included in each groundwater exposure area dataset are:

- Western Undeveloped Area Upper Hydrogeologic Unit – CFMW-056B, CFMW-057b, CFMW-059, CFMW-065, CFMW-068, CFMW-069, CFMW-071
- Plume Area Upper Hydrogeologic Unit – CFMW-002, CFMW-010, CFMW-011, CFMW-012, CFMW-014, CFMW-015, CFMW-016, CFMW-016A, CFMW-017, CFMW-019, CFMW-021, CFMW-022, CFWM-027, CFMW-028, CFMW-028A, CFMW-029, CFMW-031, SFMW-032, CFMW-033, CFMW-034, CFMW-038, CFMW-040, CFMW-042, CFMW-043, CFMW-044, CFMW-044A, CFMW-045, CFMW-047, CFMW-053, CFMW-054, CFMW-070
- Site-Wide Below Upper Hydrogeologic Unit – CFMW-003A, CFMW-011A, CFMW-012A, CFMW-019A, CFMW-025A, CFMW-032A, CFMW-044B, CFMW-053A, CFMW-056, CFMW-056A, CFMW-057, CFMW-057A, CFMW-059A

Groundwater data collected from the wells presented above from 2016 to 2018 are included in each dataset for the evaluation of potential exposure to COPCs in groundwater through future potable use.

3.2 Data Usability

To determine the data quality and usability in the BHHRA, data verification and validation were performed to confirm that the project data met the data quality objectives outlined in the RI/FS Work Plan (Roux, 2015a), Phase I SAP (Roux, 2015b), Expedited Risk Assessment Sampling and Analysis Plan for the South Percolation Ponds (Roux, 2017b), and Phase II SAP (Roux, 2018c). All samples proposed in the various project SAPs were compared to samples collected during the Site Characterization programs. Deviations from the proposed sample counts provided in the Phase I SAP were described in the Phase I SAP Addendum and the Phase I SC DSR (Roux, 2017a); deviations for the Supplemental South Pond Assessment SAP and Phase II SC SAP were discussed in the Phase II SC DSR (Roux, 2019).

Approximately 51 laboratory sample delivery groups (SDGs) were submitted to Laboratory Data Consultants (Roux's data validation subcontractor) for review as part of the data validation process for the Phase I SC program (Roux, 2017a). An additional 232 laboratory SDGs were submitted for review as part of the data validation for samples collected during the Supplemental South Pond Assessment and the Phase II SC (Roux, 2019). The results of the data validation are summarized in data validation reports (Appendix H of the Phase I SC DSR and Appendix VV of the Phase II SC DSR) produced by Laboratory Data Consultants. Data qualifiers added as a result of the data validation processes were included in the BHHRA database.

A review of the data validation reports was completed in the Phase I SC and Phase II SC DSRs to evaluate the completeness of the data in accordance with the Phase I SAP quality assurance/quality control (QA/QC) procedures. Overall, approximately 130 analyses were rejected out of an estimated 135,000 analyses (approximately 0.1 percent) performed as part of the Phase I SC activities. Approximately 490 analyses were rejected out of an estimated 438,538 analyses (approximately 0.1 percent) performed as part of the sampling activities summarized in the Phase II SC DSR (Roux, 2019). This suggests that the overall data set generated during the work is usable and complete. The analytical results that were rejected during data validation are not reliable and were thus excluded from the BHHRA database.

3.3 Data Decisions

As part of the sampling activities, field duplicates were collected in accordance with the sampling and analysis plans for each sampling event. Results from duplicate samples were included in the datasets for selection of COPC process discussed in **Section 3.4**. For calculation of the EPCs, two concentration results for a parent sample-duplicate pair were reduced to a single value for each contaminant as follows:

- If both the parent sample and the duplicate sample results were detected, the maximum detected concentration was retained, and the result was flagged as a detect.
- If both the parent sample and the duplicate sample results were qualified as not detected, the maximum MDL was retained, and the result was flagged as a non-detect.
- If one result from the sample pair was detected, while the other was qualified as not detected, the detected concentration was retained, and the result was flagged as a detect.

In some soil samples (e.g., in the North Percolation Pond Area), PAHs were analyzed using two laboratory analytical methods, 8270D and 8270D-SIM. The latter method includes an analysis of additional alkylated compounds that are lacking in the 8270D method, and was intended to enable the calculation of equilibrium partitioning sediment benchmark toxic units in the BERA based on the full list of 34 PAH compounds. For the samples that were analyzed by both methods, the 8270D-SIM PAH test was more sensitive (i.e., had lower reporting limits) and were used preferentially over the 8270D method for compounds detected using both methods.

3.4 Selection of Constituents of Potential Concern

The purpose of this section was to select COPCs in order to focus the risk assessment on potentially important Site-related chemicals for quantitative evaluation. An initial screening level evaluation of soil, groundwater, surface water, and sediment quality data identified above from the Phase I SC program was conducted as part of the BHHRA WP to identify preliminary COPCs to be evaluated in the BHHRA (EHS Support, 2018a). The evaluation in the BHHRA WP was considered a preliminary screening of COPCs because the BHHRA database was subsequently updated with the results of the Supplemental South Pond Assessment and the Phase II SC programs. The approach utilized to complete the final screening of COPCs is summarized below.

3.4.1 Selection Hierarchy

Consistent with the recommendations of the USEPA RSL guidance (USEPA, 2018a), the RSLs that had a target hazard quotient (THQ) equal to 0.1 were used to screen the COPCs. This THQ was used to address multiple chemicals that may have non-carcinogenic effects based on the same toxic endpoint and the

same mode-of-action. For carcinogenic effects, RSLs with a target risk equal to 1 x 10^{-6} were used in the selection process. Because there are no risk-based screening criteria to assess COPCs in sediments for human receptor exposure, the RSL residential soil screening level was used. It is noted that the lead RSL is being considered for revision; however, the MDEQ updated the lead screening value to 154 milligrams per kilogram (mg/kg) for direct contact (MDEQ, 2018a). The screening of COPCs used the November 2018 USEPA RSL (USEPA, 2018a) or the MDEQ guidance (MDEQ, 2017, 2018a, and 2018b). The sources for human health risk-based screening criteria for the selection of COPCs are summarized below for soil, groundwater, surface water, and sediments:

- Soil:
  - USEPA Residential Soil RSLs
  - USEPA Protection of Groundwater RBSSLs
  - MDEQ Risk-Based Screening Level (RBSL) for Residential Surface Soil, Depth to Water less than 10 ft
- Groundwater:
  - USEPA Tapwater RSLs
  - MDEQ Circular DEQ-7 Human Health Numeric Water Quality Ground Water Standards
  - USEPA Drinking Water MCLs
- Surface Water:
  - USEPA Tapwater RSLs
  - MDEQ Circular DEQ-7 Human Health Numeric Water Quality Ground Water Standards
- Sediments:
  - USEPA Residential Soil RSLs

The identification of COPCs was based on comparing the maximum measured COPC concentration by exposure area identified in the CEM with the lowest risk-based screening concentration. If the maximum COPC concentration in soil, groundwater, surface water, and sediment exceeded the risk-based screening concentration, the COPC was selected for further assessment in the BHHRA.

In addition, the following were considered in the COPC selection process:

- COPCs that are essential nutrients were identified. Constituents identified as essential nutrients (i.e., calcium, magnesium, sodium and potassium) were not included as COPCs (USEPA, 1989).
- Frequency of detection was evaluated:
  - For data sets with at least 20 samples, a COPC detected in 5 percent or fewer of the samples was not retained as a COPC (USEPA, 1989), provided samples with detected concentrations do not indicate the presence of potential hot spots (i.e., small spatial area).
  - An evaluation of detection limits was conducted to ensure that COPCs eliminated based on frequency of detection do not have detection limits above screening levels. If detection limits above screening levels are identified for a given COPC, that COPC was not eliminated based on frequency of detection.
- Detected COPCs classified by USEPA as known human carcinogens (USEPA, 2005a) were retained as COPCs regardless of frequency of detection. The weight-of-evidence classification provided on USEPA's Integrated Risk Information System (IRIS) (USEPA, 2018c) was consulted to identify COPCs classified as known carcinogens based on strong evidence of human carcinogenicity (historically characterized as Category A under the 1986 Guidelines for Carcinogen Risk Assessment) (USEPA, 1986).
- If a COPC did not have an applicable risk-based screening criteria, it was not selected as a COPC and its exclusion was discussed in the uncertainty section of the BHHRA.

- If a COPC was not detected, it was not selected as a COPC and its exclusion was discussed in the uncertainty section of the BHHRA.

If a COPC in soil exceeded the USEPA RBSSL for potential to leach to groundwater, but did not exceed the USEPA RSL or MDEQ RBSL for direct contact with soil, and was not a selected as a COPC in either the Western Undeveloped Area Upper Hydrogeologic Unit or Plume Core Area groundwater, it was not selected as a COPC in soil. This decision is based upon the groundwater data indicating that leaching of the COPC in the soil is not affecting the groundwater quality. The BHHRA WP presented the supporting rationale for this approach, and it was noted that this approach to evaluating groundwater data to determine that leachability is not a concern is also consistent with MDEQ guidance (MDEQ, 2018b).

To select COPCs for the ingestion of fish exposure pathway, the RSLs were calculated using the USEPA RSL Calculator for Ingestion of Fish (USEPA, 2018a) for COPCs detected in surface water samples collected in the applicable exposure areas. Consistent with USEPA and MDEQ guidance (MDEQ, 2017) on derivation of water quality standards, an annually normalized fish ingestion rate of 22 grams per day (g/day), or 22,000 milligrams per day (mg/day) was used in the calculation of screening levels for fish ingestion. A THQ of 0.1 was also used in the calculation to account for the potential of multiple COPCs with the same toxicological endpoint.

The concentration of a COPC in fish tissue was determined by applying a bioconcentration factor (BCF) to the maximum surface water concentration using **Equation 3**:

$$C_{fish} = C_{sw} * BCF * CF \qquad \textbf{Equation 3}$$

Where:

- C_{fish} = concentration of COPC in fish (milligrams COPC per kilogram wet weight [mg/kg WW])
- C_{sw} = dissolved phase concentration of COPC in surface water (µg/L)
- BCF = bioconcentration factor (liter per kilogram fish tissue)
- CF = conversion factor (0.001 milligrams per micrograms [mg/µg])

The source of the BCF was the Oak Ridge National Laboratory (ORNL) Risk Assessment Information System (ORNL, 2019).

There currently are no RSLs for the selection of COPCs for the ingestion of the game tissue exposure pathway. Therefore, the residential soil RSLs were used as a conservative method to select potential COPCs for the exposure of recreational trespasser (hunters) to game tissue potentially affected by Site environmental media. Consistent with the recommendations of the USEPA RSL guidance, the selection of COPCs were based on a THQ equal to 0.1 to address multiple chemicals that may have non-carcinogenic effects based on the same toxic endpoint and the same mode-of-action, and a target risk equal to 1×10^{-6} for carcinogenic effects.

The soil, surface water, and sediment COPCs for the recreational trespassers (ATV riding and hunters) were the same as those selected for the exposure areas in which they are expected to trespass. As discussed in **Section 2.5.3**, the recreational trespasser (ATV rider) may be in the Central Landfill Area, North-Central Undeveloped Area, and Western Undeveloped Area. The recreational trespasser (hunter) may access the North-Central Undeveloped Area and Western Undeveloped Area.

3.4.1.1 Essential Nutrients

Essential nutrients including calcium, magnesium, potassium, and sodium were evaluated in sediment and soil matrices. The range of observed nutrient concentrations and their means across exposure areas in Site surface soil (0 to 2 ft-bgs) and sediment were compared to background threshold values (BTVs) developed for the Site, and to the range of typical values for western soils described in *Element Concentrations in Soils and other Surficial Materials of the Conterminous United States* (USGS, 1984):

Cationic Metal	CFAC Site	CFAC Site, Range of Means	CFAC Background (Range of BTVs)	Western U.S. Soils (USGS, 1984)	
	Concentration Range (mg/kg)	Concentration Range (mg/kg)	Concentration Range (mg/kg)	Geomean ± GSD Concentration (mg/kg)	Concentration Range (mg/kg)
Calcium	427 to 313,000	8,152 to 125,544	16,691 to 47,061	18,000 ± 30,500	600 to 320,000
Magnesium	442 to 27,500	6,329 to 10,607	8,275 to 16,202	7,400 ± 22,100	300 to 100,000
Potassium	101 to 10,900	678 to 1,797	1,844 to 2,167	18,000 ± 7,100	1,900 to 63,000
Sodium	26.5 to 61,300	58 to 11,037	69.94 to 293.3	9,700 ± 19,500	500 to 100,000

BTV = background threshold value
CFAC = Columbia Falls Aluminum Company LLC
GSD = geometric standard deviation
mg/kg = milligrams per kilogram
USGS = United States Geological Survey
USGS. (1984). Element Concentrations in Soils and other Surficial Materials of the Conterminous United States. USGS Professional Paper 1270.

The range of Site surficial soils and sediments exceeded the range of BTVs for all nutrients, which is not unexpected given the substantial disparity in sample size between the Site (n greater than 550) and the background (n = 10 per soil background area) data sets. With such a large sample size, the opportunity for sampling naturally occurring nutrients in a highly concentrated "nugget" in the soil matrix is high. A comparison of the mean concentrations to each exposure area reveals that with the exception of calcium, all mean ranges were below site BTVs. The range of detected concentrations for these four nutrients also fell within the geometric mean ± geometric standard deviation (GSD) for western conterminous U.S. soils for all cationic metals except calcium and sodium. Calcium concentrations above the upper GSD of the geometric mean for western conterminous U.S. soils were noted in soils and sediments from the South Percolation Pond Exposure Area. Only two results for sodium fell outside of the geometric mean ± GSD for western conterminous U.S. soils, and both results were well within the overall concentration range of western U.S. soils. A summary of total (T) and dissolved (D) nutrients in surface water at the Site compared with reference areas is provided in the following table. Although maximum concentrations of all nutrients were well above BTVs, the range of mean concentrations of all nutrients approximated the range of BTVs identified in reference areas, with the exception of sodium, which had means for both total and dissolved fractions that exceeded the highest BTV in four of the six exposure areas (South Percolation Pond Area, Northern Surface Water Feature, North Percolation Pond Area, and the Flathead River) where surface water data were collected.

Cationic Metal	CFAC Site	CFAC Site, Range of Means	CFAC Background (Range of BTVs)
	Concentration Range (µg/L)	Concentration Range (µg/L)	Concentration Range (µg/L)
Calcium (T)	7,860 to 506,000	28,266 to 73,042	27,776 to 55,600
Calcium (D)	7.020 to 147,000	7,020 to 55,073	23800 to 61,264
Magnesium (T)	804 to 63,900	6,510 to 17,100	7,455 to 17,601
Magnesium (D)	384 to 24,600	384 to 15,859	5,990 to 15,852
Potassium (T)	242 to 9,100	367 to 1,426	463 to 919
Potassium (D)	237 to 9,310	389 to 1,518	354 to 751
Sodium (T)	666 to 108,000	1,410 to 19,279	1,232 to 3,064
Sodium (D)	554 to 169,000	1,730 to 18,653	809 to 2,801

µg/L = micrograms per liter
BTV = background threshold value
CFAC = Columbia Falls Aluminum Company, LLC
D = dissolved
T = total

3.4.1.2 Volatile Organic Compounds

Multiple VOCs have been detected at the Site in various media. However, evaluation of multiple lines of evidence support the conclusion that VOCs are not COPCs at the Site, and that the vapor pathway for exposure to VOCs is incomplete. Therefore, VOCs do not require further evaluation within the BHHRA. Key points supporting this conclusion are outlined below:

- A total of 296 soil samples were analyzed for VOCs during the Phase I and Phase II Site Characterizations. No VOCs were detected at concentrations exceeding USEPA Residential RSLs or Minimum ESVs.
- Maximum detected concentrations in soil, typically (with the exception of two constituents) were less than 10 percent of the USEPA Residential RSLs.
- A total of 184 groundwater samples over six rounds of sampling were collected across the Site including within and adjacent to all known or suspected source areas. A comparison of the maximum concentrations of VOCs from all six rounds of groundwater sampling to VISL yielded results below de minimis levels (i.e., carcinogenic risk were less than 1.0×10^{-6} and all estimated HQs were less than 0.1).
- No VOCs in groundwater samples were detected at concentrations exceeding minimum screening criteria (i.e., USEPA Tapwater RSLs) with the exception of one constituent; trichloroethene in four samples collected during Phase I at CFMW-003 had at a maximum estimated concentration of 0.76 µg/L compared to the Tapwater RSL of 0.28 µg/L.

Therefore, VOCs were not considered COPCs, and the potential for exposure to VOCs through vapor migration from subsurface soils or groundwater was not evaluated in the BHHRA.

3.4.1.3 Lead

Although lead was detected in various media at the Site, multiple lines of evidence show that lead is not a COPC at the Site and that lead does not require further evaluation within the BHHRA. Key points are outlined below:

- Approximately 777 soil samples were collected and analyzed for lead as part of the Site Characterization; none of which contained lead at concentrations exceeding the USEPA Residential RSL of 400 mg/kg.
- Only three of the 777 samples (0.4 percent) exceeded the MDEQ Residential criteria of 154 mg/kg and the MDEQ leaching to groundwater criteria of 140 mg/kg. These samples were located in Northeast Percolation Pond.
- All lead concentrations were below the MDEQ Construction Work Exposure or MDEQ Commercial/Industrial criteria of 696 mg/kg and 923 mg/kg, respectively.
- Groundwater sample data collected in the Upper Hydrogeologic Unit during six rounds of sampling (464 groundwater samples; 162 total and 302 dissolved) showed that there are no exceedances of lead groundwater criteria (DEQ-7 Human Health Standard, USEPA MCL, or USEPA Tapwater RSL of 15 µg/L); indicating that lead in soil is not a source to groundwater.
- Similarly, of surface water sample data collected during seven rounds of sampling (315 surface water samples; 190 total and 125 dissolved) two surface water samples exceeded the DEQ-7 Human Health Standard/USEPA MCL of 15 µg/L, in two unfiltered samples collected from the eastern-most South Percolation Pond and Riparian Area, with a maximum concentration of 38.5 µg/L.

Based on these results, lead is not considered a COPC that requires further evaluation at the Site. Therefore, the potential exposure to receptors to lead in soils, surface water, and groundwater will not be carried further in the risk assessment.

3.4.2 Exposure Areas

Section 3.4.2.1 through **Section 3.4.2.10** present the Selection of COPCs for each exposure area discussed in **Section 2.5**. As groundwater may overlap multiple exposure areas, the discussion on selection of COPCs for the three groundwater exposure scenarios evaluated is presented in a separate section (**Section 3.4.2.11**). The ISM DUs were evaluated as a separate dataset versus the discrete soil sample datasets; the selection of COPCs for these samples was presented in **Section 3.4.2.12**. **Table 2-1** through **Table 2-45** present the descriptive statistics and the preliminary selection of COPCs by media and exposure area including the rationale for selection or deletion from the BHHRA. The tables are in the RAGS Part D format. A summary of the COPCs selected for each exposure area and receptor is discussed below. **Table 2-46** through **Table 2-49** provide a summary of the COPCs selected by exposure area for soils, surface water, sediments, and groundwater. **Table 2-50** provides a summary of the detected constituents in soil that had COPC concentrations that exceeded the USEPA RBSSL for potential to leach to groundwater but was not selected as a COPC in soil because the concentration did not exceed the USEPA RSL or MDEQ RBSL for direct contact with soil, and it was not selected as a COPC in Site-wide groundwater. This decision was based on groundwater data that indicated leaching of the COPC in the soil was not affecting the groundwater quality. The analysis to support this decision was presented in the final BHHRA Work Plan.

3.4.2.1 Main Plant Area

Soil data from the Main Plant Area (Exposure Area 1) were compared to the risk-based screening concentrations. **Table 2-1** through **Table 2-2** present the selected COPCs for the two exposure scenario depths from 0 to 0.5 ft-bgs and 0 to 12 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below and on **Table 2-46**. The following inorganics and PAHs were selected as COPCs for soil in the Main Plant Area from 0 to 0.5 ft-bgs:

- Cyanide
- Fluoride
- Aluminum
- Antimony
- Arsenic
- Chromium, Hexavalent - Estimated
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Chrysene
- Dibenz(a,h)A\anthracene
- Indeno(1,2,3)pyrene
- Naphthalene
- Pyrene

For soil in the Main Plant Area from 0 to 12 ft-bgs, the COPC list included all COPCs from the 0 to 0.5 ft-bgs and the following COPCs: beryllium, cadmium, thallium, dibenzofuran, fluoranthene. No VOCs were selected as COPCs for either soil depth interval in the Main Plant Area.

As discussed in **Section 2.4**, BTVs were developed as part of a Site-specific background evaluation. A comparison of maximum concentrations of the COPCs to background BTVs indicated that cyanide, manganese, and selenium had maximum concentrations less than the BTVs in the 0 to 0.5 ft-bgs dataset. For the intermediate soil dataset, the maximum concentration of the COPC manganese did not exceed the BTV.

3.4.2.2 North Percolation Pond Area

Soil, surface water, and sediment data from the North Percolation Pond Area (Exposure Area 2) were compared to the risk-based screening concentrations. **Table 2-3** and **Table 2-4** present the selected COPCs for the two soil exposure depths from 0 to 0.5 ft-bgs and 0 to 2 ft-bgs, respectively. The selected COPCs for soil were the same for all sampling depths with the exception that barium was only selected as a COPC at depth of 0 to 2 ft-bgs.

The COPCs selected for soils include:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Antimony
- Arsenic
- Barium (0 to 2 ft-bgs only)
- Beryllium
- Cadmium
- Chromium, Hexavalent
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel

- Selenium
- Thallium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Chrysene
- Dibenz(a,h)anthracene
- Dibenzofuran
- Fluoranthene
- Indeno(1,2,3)pyrene
- Naphthalene
- Pyrene

A comparison of maximum concentrations of the inorganic soils COPCs to background BTVs indicated that arsenic, iron, and manganese had maximum concentrations less than the BTVs.

Table 2-5 and **Table 2-6** present the selected COPCs in surface water and sediment, respectively. For surface water, both total and dissolved metals were analyzed during the Site Characterization programs. For human health risk assessments, total metals are the preferred analysis for risk characterization and were utilized in the selection of COPCs. The surface water COPCs include cyanide, fluoride, aluminum, antimony, arsenic, cadmium, cobalt, nickel, thallium, vanadium and select PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and indeno[1,2,3-c,d]pyrene). The maximum concentrations in surface water for these COPCs exceeded the Site-specific BTVs developed in the background evaluation.

Similar to surface water, the sediment COPCs included cyanide, select metals (aluminum, arsenic, cadmium, cobalt, iron, nickel, thallium, vanadium), and select PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-c,d]pyrene). The maximum concentrations of the inorganic COPCs in sediment for these COPCs exceeded the Site-specific BTVs developed in the background evaluation.

3.4.2.3 Central Landfill Area

Soil, surface water, and sediment data from the Central Landfill Area (Exposure Area 3) were compared to the risk-based screening concentrations. **Table 2-7** through **Table 2-9** present the selected COPCs in soil for the three exposure depths from 0 to 0.5 ft-bgs, 0 to 2 ft-bgs, and 0 to 12 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for all three sampling depths.

Soil COPCs for the Central Landfill Area include the following:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Antimony
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- PCB-1254 (Aroclor 1254)
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Chrysene
- Dibenz(a,h)anthracene
- Dibenzofuran

- Indeno(1,2,3)pyrene
- Naphthalene

A comparison of maximum concentrations of the inorganic soils COPCs to Site-specific BTVs indicated that mercury and selenium in the 0 to 0.5 ft-bgs depth interval did not exceed the Site-specific BTVs. However, these COPCs did exceed the Site-specific BTVs at deeper depth intervals.

Table 2-10 and **Table 2-11** present the selected COPCs in surface water and sediment, respectively. The COPCs selected for surface water in the Central Landfill Area include fluoride, antimony, and arsenic. The maximum detected arsenic concentration was less than the minimum Site-specific BTVs developed for surface water.

Aluminum, arsenic, cobalt, iron, manganese and select PAHs (benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-c,d]pyrene) were selected as COPCs for sediment within the Central Landfill Area. A comparison of maximum concentrations of the inorganic COPCs in sediment to Site-specific BTVs indicated that the inorganic COPCs all had maximum concentrations less than the Site-specific BTVs.

3.4.2.4 Industrial Landfill Area

Soil data from the Industrial Landfill Area (Exposure Area 4) were compared to the risk-based screening concentrations. **Table 2-12** and **Table 2-13** present the selected COPCs for the two exposure depths from 0 to 0.5 ft-bgs and 0 to 2 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for both sampling depth intervals. The following COPCs were selected for both sample depth intervals for soil in the Industrial Landfill Area:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Antimony
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Chrysene
- Dibenz(a,h)anthracene
- Indeno(1,2,3)pyrene
- Naphthalene

A comparison of maximum concentrations of the inorganic soils COPCs to Site-specific BTVs indicated that cyanide, mercury, and selenium had maximum concentrations less than the BTVs.

3.4.2.5 Eastern Undeveloped Area

Soil, surface water, and sediment data from the Eastern Undeveloped Area (Exposure Area 5) were compared to the risk-based screening concentrations. **Table 2-14** and **Table 2-15** present the selected COPCs for the two exposure depths from 0 to 0.5 ft-bgs and 0 to 12 ft-bgs, respectively. The two depth intervals had the same COPC list. A summary of the COPCs for the soil data is presented below.

- Cyanide
- Fluoride

- Chromium, Hexavalent - Estimated
- Aluminum
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Dibenz(a,h)anthracene
- Indeno(1,2,3)pyrene
- Naphthalene

A comparison of maximum concentrations of the COPCs in soil to the Site-specific BTVs indicated that cyanide (0 to 0.5 ft-bgs depth interval only), aluminum, arsenic, copper, iron, mercury, selenium, and thallium had maximum concentrations less than the Site-specific BTVs.

The surface water and sediment selection of COPCs are presented on **Table 2-16** and **Table 2-17**, respectively. The COPCs selected for surface water for the Eastern Undeveloped Area include cyanide (free), fluoride, antimony, and arsenic. The maximum concentrations for these COPCs were compared to the minimum of the Site-specific BTVs and cyanide (free) and arsenic were less than the BTVs. For sediment, the COPCs selected were aluminum, arsenic, cobalt, iron, manganese, and benzo(a)pyrene. The maximum concentration for the metals did not exceed the Site-specific BTVs.

3.4.2.6 North-Central Undeveloped Area

Soil, surface water, and sediment data from the North-Central Undeveloped Area (Exposure Area 6) were compared to the risk-based screening concentrations. **Table 2-18** and **Table 2-19** present the selected COPCs for the two exposure depths from 0 to 0.5 ft-bgs and 0 to 12 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for both depth intervals and include:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Naphthalene

A comparison of maximum concentrations of the soils COPCs to background BTVs indicated that cyanide, mercury, selenium, and vanadium did not exceed the Site-specific BTVs developed as part of the Background Evaluation.

Table 2-20 and **Table 2-21** present the selected COPCs in surface water and sediment, respectively. Cyanide (total and free), fluoride, aluminum, antimony, arsenic, cobalt, iron, and manganese were selected as COPCs for surface water in the North-Central Undeveloped Area. Free cyanide and

manganese did not exceed the Site-specific BTVs when the maximum concentrations of the COPCs were compared to the Site-specific BTVs for surface water.

Aluminum, arsenic, cobalt, iron, and manganese were selected as COPCs for sediment within the North-Central Undeveloped Area. A comparison of maximum concentrations of the COPCs in sediment to Site-specific BTVs indicated that cobalt and iron had maximum concentrations less than the BTVs.

3.4.2.7 Western Undeveloped Area

Soil, surface water, and sediment data from the Western Undeveloped Area (Exposure Area 7) were compared to the risk-based screening concentrations. **Table 2-22** and **Table 2-23** present the selected COPCs for the exposure depths from 0 to 0.5 ft-bgs and 0 to 12 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for both sampling depth intervals with the exception that antimony and thallium were only selected as COPCs at a depth of 0 to 12 ft-bgs. The following presents a summary of the soil COPCs for the Western Undeveloped Area:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Antimony (0 to 12 ft-bgs)
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium (0 to 12 ft-bgs)
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Naphthalene

A comparison of maximum concentrations of the soils COPCs to Site-specific BTVs indicated that cyanide, cobalt, nickel, selenium, and vanadium had maximum concentrations less than the BTVs.

Table 2-24 and **Table 2-25** present the selected COPCs in surface water and sediment, respectively. Cyanide (total and free) and fluoride were the COPCs selected for surface water for the Western Undeveloped Area. The maximum concentration of the COPCs were less than the Site-specific BTVs developed for surface water.

Aluminum, arsenic, cobalt, iron, and manganese were selected as COPCs for sediment in this exposure area. A comparison of maximum concentrations of the inorganic COPCs in sediment to Site-specific BTVs indicated that all COPCs had maximum concentrations less than the BTVs.

3.4.2.8 South Percolation Pond Area

Soil, surface water, and sediment data from the South Percolation Pond Area (Exposure Area 8) were compared to the risk-based screening concentrations. **Table 2-26** through **Table 2-28** present the selected COPCs for the three exposure depths from 0 to 0.5 ft-bgs, 0 to 2 ft-bgs, and 0 to 12 ft-bgs, respectively. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for all three sampling depths, except for bis(2-ethylhexyl) phthalate that was only

selected as a COPC for the 0 to 2 ft-bgs and 0 to 12 ft-bgs intervals. The following presents a summary of the soil COPCs:

- Cyanide
- Fluoride
- Chromium, Hexavalent - Estimated
- Aluminum
- Antimony
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Dibenz(a,h)anthracene
- Indeno(1,2,3)pyrene
- Naphthalene

A comparison of maximum concentrations of the inorganic soils COPCs to background BTVs indicated that arsenic (0 to 0.5 ft-bgs only), cobalt, iron, manganese, selenium, and thallium had maximum concentrations less than the BTVs.

Table 2-29 and **Table 2-30** present the selected COPCs in surface water and sediment, respectively. The surface water COPCs for the South Percolation Pond Area include the following constituents:

- Cyanide
- Cyanide (Free)
- Fluoride
- Aluminum
- Antimony
- Arsenic
- Barium
- Cadmium
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Thallium
- Vanadium
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Indeno(1,2,3)pyrene

The maximum concentrations of the COPCs were compared to the Site-specific BTVs and the maximums concentrations for all COPCs exceeded the Site-specific BTVs.

The COPCs for sediment within the South Percolation Pond Area include cyanide, select metals (aluminum, arsenic, cobalt, iron, and manganese), and select PAHs (benzo[a]pyrene, benzo[b]fluoranthene, dibenzo[a,h]anthracene, indeno[1,2,3-c,d]pyrene). The metals selected as COPCs, with the exception of aluminum, had maximum concentrations less than the Site-specific BTVs for sediment.

3.4.2.9 Flathead River Area

Surface water and sediment data from the Flathead River Area (Exposure Area 9) were compared to the risk-based screening concentrations. **Table 2-31** and **Table 2-32** present the selected COPCs in surface water and sediment, respectively. A summary of the COPCs for the surface water, sediment data, as well as fish consumption is presented below. The following COPCs were selected for surface water in the Flathead River Area:

- Cyanide
- Cyanide (Free)
- Fluoride
- Aluminum
- Arsenic
- Barium
- Cobalt
- Iron
- Manganese
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Bis(2-ethylhexyl) phthalate
- Dibenz(a,h)anthracene

A comparison of maximum concentrations to the Site-specific COPCs for surface water was conducted; the maximum concentrations exceeded the Site-specific BTVs for all COPCs.

The sediment COPCs in the Flathead River Area include cyanide, aluminum, arsenic, cobalt, iron, manganese, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene (**Table 2-32**). A comparison of maximum concentrations of the inorganic COPCs in sediment to Site-specific BTVs indicated that cobalt, iron and manganese had maximum concentrations less than the BTVs.

As discussed in **Section 3.4**, the COPCs for fish consumption for this exposure area were selected from the surface water COPCs (**Table 2-33**). The fish tissue concentrations for the surface water COPCs were compared to fish ingestion RSLs developed using the RSL calculator. All surface water COPCs were retained as COPCs for the fish ingestion scenario with the exception of cyanide (total and free) and barium. No BCF was available for cyanide, the COPCs were not further evaluated as this COPC does not bioaccumulate in fish (ATSDR, 2006).

3.4.2.10 Backwater Seep Sampling Area

Soil, surface water, and sediment data from the Backwater Seep Sampling Area (Exposure Area 9a) were compared to the risk-based screening concentrations. **Table 2-34** and **Table 2-35** present the selected COPCs in soil from two depth intervals: 0 to 0.5 and 0 to 2 ft-bgs. A summary of the COPCs for the environmental media is presented below. The same COPCs were selected for both soil depth intervals with the exception of selenium that was only identified as a COPC for the 0 to 2 ft-bgs interval. The following are the COPCs for the soil exposure scenarios:

- Cyanide
- Fluoride
- Chromium, Hexavalent – Estimated
- Aluminum
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium (0 to 2 ft-bgs)
- Vanadium
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Naphthalene

A comparison of maximum concentrations of the COPCs in soil to Site-specific BTVs indicated that aluminum, arsenic, copper, iron, manganese, mercury, nickel, selenium (0 to 2 ft-bgs only), vanadium, and benzo(b)fluoranthene in soil had maximum concentrations less than the BTVs.

Table 2-36 and **Table 2-37** present the selected COPCs in surface water and sediment. Cyanide (total and free), fluoride, arsenic, cobalt, iron, manganese, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, and dibenz(a,h)anthracene were selected as surface water COPCs. The maximum concentration of arsenic did not exceed the Site-specific BTVs.

The COPCs selected for sediment within the Backwater Seep Sampling Area include cyanide, aluminum, arsenic, cobalt, iron, manganese, thallium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)floranthene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene. Maximum concentrations of arsenic, cobalt, iron, and manganese did not exceed the Site-specific BTVs for sediment.

The selected COPCs for the fish ingestion scenario are presented on **Table 2-38**. All surface water COPCs were retained as COPCs for fish ingestion with the exception of cyanide (total and free). No BCF was available for cyanide, the COPCs were not further evaluated as this COPC does not bioaccumulate in fish (ATSDR, 2006).

3.4.2.11 Groundwater

The hydrogeologic studies (i.e., groundwater elevation data and surface water elevation data) indicate that groundwater discharges to the Flathead River. Groundwater typically flows southwest away from Teakettle Mountain toward the Landfill Area. From the Landfill Area, groundwater continues to flow southwest until it reaches the center of the Site, where topography is relatively flat, and then flows south. Groundwater flows south from the center of the Site toward the Flathead River. In the Western Undeveloped Area, groundwater flows southeast, away from Aluminum City, and toward the Flathead River.

As shown in Plates 13 and 15 of the Phase II SC DSR (Roux, 2019), affected groundwater in the upper hydrogeologic unit appears to generally migrate southward from the source areas, and flow towards the Flathead River. Groundwater from the upper hydrogeologic unit is expressed to the sediment pore water located within extent of the "Seep Area", and then to surface water. The Backwater Seep Sampling Area, the Riparian Area, and the South Percolation Pond Area are all located within the extent of the "Seep Area" that has historically been a permitted discharge under the Site's former MPDES Permit (#MT00300066). The Seep is the area defined in the permit which has potential to receive groundwater expressed from the upper hydrogeologic unit to the Flathead River. Historically, groundwater in the Backwater Seep Sampling Area has consistently been observed to discharge from the banks and has been sampled as part of the requirements for the Site's former MPDES Permit (#MT00300066) that MDEQ provided a Notice of Intent on January 24, 2019 to terminate.

In the BHHRA WP, two exposure scenarios for groundwater were evaluated for Site-wide groundwater – water bearing zones (upper hydrogeologic unit and below upper hydrogeologic unit). The upper hydrogeologic unit was further divided into two exposure areas: groundwater within the Western Undeveloped Area (which is closest in proximity to residential development and has the potential for future residential development) and groundwater within the Plume Core Area. As discussed in **Section 2.5.2** and **Section 2.5.3**, CFAC intends to prohibit the use of groundwater beneath the Site for potable use. However, as required by the USEPA, this scenario was evaluated as a conservative evaluation of potential health risk in the absence of any controls.

The Plume Core is defined as the area containing monitoring wells with cyanide concentrations exceeding 300 µg/L or fluoride concentrations exceeding 2,000 µg/L in any of the six sampling rounds.

As shown on **Figure 36**, the aerial extent of the wells within the Plume Core Area in the upper hydrogeologic unit includes the southwestern portion of the Central Landfill Area, southeastern corner of the North-Central Undeveloped Area, and the Main Plant Area.

As discussed in **Section 3.4**, the COPCs selected from the two upper hydrogeologic unit areas were used to evaluate the list of soil constituents that had maximum detections exceeding the RBSSLs. If the constituent in soil was not also included as a COPC in the upper hydrogeologic unit, then it was not retained as a COPC for soil. The COPCs selected for the three groundwater exposure scenarios are presented on **Table 2-39** through **Table 2-41** and summarized on **Table 2-49** and discussed in the following sections.

3.4.2.11.1 Upper Hydrogeologic Unit – Western Undeveloped Area

Groundwater data monitoring wells located within the Western Undeveloped Area and screened within upper hydrogeologic unit were compared to the risk-based screening criteria. **Table 2-39** present the selected COPCs in this groundwater exposure scenario. The COPCs selected for this exposure scenario were cyanide (total and free), fluoride, antimony, manganese, bis(2-ethylhexyl)phthalate, and naphthalene.

3.4.2.11.2 Upper Hydrogeologic Unit – Plume Core Area

Groundwater data from monitoring wells within the Plume Core Area of the upper hydrogeologic unit were compared to the risk-based screening criteria. **Table 2-40** presents the selection of COPCs for groundwater within Plume Area of the upper hydrogeologic unit. The COPCs selected include the following:

- Cyanide
- Cyanide (Free)
- Fluoride
- Aluminum
- Antimony
- Arsenic
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Selenium
- Vanadium

3.4.2.11.3 Site-wide Groundwater – Below Upper Hydrogeologic Unit

Groundwater data from monitoring wells across the Site and screened within the below upper hydrogeologic unit were compared to the risk-based screening criteria. **Table 2-41** presents the selected COPCs in groundwater. The following constituents were selected as COPCs for this exposure scenario:

- Cyanide
- Cyanide (Free)
- Fluoride
- Aluminum
- Antimony
- Arsenic
- Barium
- Cobalt
- Iron
- Manganese
- Vanadium
- Zinc
- 1,2-dichloroethane

3.4.2.12 Incremental Sampling DU

Soil from the incremental sampling DUs were compared to the risk-based screening criteria. **Table 2-42** through **Table 2-45** present the selected COPCs for the exposure depths from 0 to 0.5 ft-bgs and 0 to 2 ft-bgs for the Main Plant Area and Central Landfill Area ISM DU samples. A summary of the COPCs for the soil data is presented below. The selected COPCs for soil were the same for all sampling depths, with the exception of PCB-1254, 2-methylnaphthalene, biphenyl, bis (2-ethylhexyl) phthalate, dibenzofuran, fluoranthene, and pyrene, which were only selected in COPCs the Central Landfill Area ISM DUs. PCB-1254, bis (2-ethylhexyl) phthalate, dibenzofuran, and fluoranthene were selected as COPCs in both depth intervals in the Central Landfill Area ISM DUs; 2-methylnaphthalene, biphenyl, and pyrene were retained as COPCs for only the 0 to 2 ft-bgs interval.

The COPCs selected for the ISM DU soils were:

- Cyanide
- Fluoride
- Aluminum
- Antimony
- Arsenic
- Chromium, Hexavalent - Estimated
- Cobalt
- Copper
- Iron
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- PCB-1254 (Central Landfill Area)
- 2-Methylnaphthalene (Central Landfill Area)
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Biphenyl (Central Landfill Area)
- Bis (2-ethylhexyl) phthalate (Central Landfill Area)
- Chrysene
- Dibenz(a,h)anthracene
- Dibenzofuran (Central Landfill Area)
- Fluoranthene (Central Landfill Area)
- Indeno(1,2,3)pyrene
- Naphthalene
- Pyrene (Central Landfill Area)

4 Exposure Assessment

The purpose of the exposure assessment was to predict the magnitude and frequency of potential human exposure to each identified COPC based on the hazard identification. The CEM presented the potential receptors by potentially complete exposure pathways and environmental media of concern. The following sections present the development of EPCs, exposure equations, and exposure assumptions for receptors.

4.1 Exposure Point Concentration

Medium-specific EPCs were based on the exposure areas for the Site environmental data for each receptor and exposure pathway. The EPC for each environmental media and exposure pathway was the 95 percent UCL on the mean. The soil EPCs were calculated separately for discrete versus ISM samples for each applicable exposure area. For the ISM samples, the 95 percent UCL on the mean was calculated using Chebyshev UCL method in ProUCL (ITRC, 2012a).

The surface water and sediment EPCs were calculated for each individual exposure area and for overlapping exposure areas as discussed in **Section 4.1.1** and **Section 4.1.2**. The groundwater EPCs were calculated using the data discussed in **Section 3.4.2.11** for each of the three exposure scenarios (Western Undeveloped Area Upper Hydrogeologic Unit, Plume Core Area Upper Hydrogeologic Unit, and Site-wide Below Upper Hydrogeologic Unit).

The 95-percent UCL of the arithmetic mean was calculated using ProUCL Version 5.1 that was developed for USEPA (2016), and was dependent on the distribution of the data. If the 95 percent UCL of the arithmetic mean exceeded the maximum detected concentration of a COPC, the recommendation provided by the ProUCL software and guidance was used to develop the EPC. In addition, if a sufficient number of data points (i.e., 10 or greater) were not available for the exposure scenario, the maximum detected concentration was selected as the EPC if ProUCL software and guidance did not provide an alternative recommendation. Recommendations provided by the ProUCL software for the evaluation of sample results qualified as below the detection level (non-detect) were followed. **Appendix F** provides ProUCL model outputs for each EPC.

The overall approach and methodology for calculation of the EPCs across multiple exposure areas or for the biota (e.g., venison) uptake exposure scenarios were presented in the Interim Deliverable (EHS Support, 2019a; **Appendix G**). In addition, the approach and methodology for calculation of EPCs for ISM samples was included in the Interim Deliverable. **Table 3-1** through **Table 3-52** present the EPCs developed for each exposure point. The following sections present discussion on EPCs calculated for the recreational trespasser (ATV riding and hunter), fish, and game with exposure scenarios that include environmental media from multiple exposure areas.

4.1.1 Recreational Trespasser (ATV Rider)

To evaluate potential exposure of the recreational trespasser (ATV rider) to COPCs in surface soil through direct contact or inhalation of fugitive dusts, an EPC was calculated by applying an area weight factor to the EPCs from each of the individual exposure areas. The analytical data used to develop the EPC included samples located in the Western Undeveloped Area and North-Central Undeveloped Area where recreational trespasser-ATV use observations were noted (CFAC personal communication), and

the Central Landfill area where ATV use is assumed (**Figure 2**). The 95 percent UCL of the arithmetic mean calculated from all samples within the three areas were used because of limited sampling locations along the observed trails in the Western Undeveloped Area and North-Central Undeveloped Area, the lack of an observed trail in the Central Landfill area, and the assumption that ATVs will stray from the established ATV trails. An area weight factor, calculated based on the relative size for each exposure area, was applied to the EPCs from each of the three exposure areas, and were then combined to generate a single EPC for each COPC. The area weight factor and EPCs are presented on **Table 3-40**. The surface water and sediment EPCs were calculated by including all surface water and sediment data collected within the three exposure areas as an input to the ProUCL software (**Tables 3-41 and 3-42**). The potential bias associated with the inclusion of all surface water and sediment samples without an adjustment factor (area weight factor) is presented in **Section 6.3.3.2**.

4.1.2 Recreational Trespasser (Hunter)

The soil EPCs for the recreational trespasser (hunter) were calculated in a similar manner as the Recreationist (ATV Rider), except the exposure areas for the recreational trespasser (hunter) only included the Western Undeveloped Area and the North-Central Undeveloped Areas (**Table 3-43**). The surface water and sediment EPCs were calculated by including all surface water and sediment data collected within the two exposure areas as an input to the ProUCL software (**Tables 3-44 and 3-45**). The EPC calculated for venison uptake was presented in the Interim Deliverable (EHS Support, 2019a; **Appendix G**) and described in **Section 4.1.2.1**; the individual venison models used to calculate the EPCs for uptake of soil COPCs through ingestion of venison are presented in **Appendix H**. The EPCs for venison uptake are presented on **Table 3-46**. The potential bias associated with the inclusion of all surface water and sediment samples without an adjustment factor (area weight factor) is presented in **Section 6.3.3.2**.

4.1.2.1 Game Tissue

As presented in the Interim Deliverable (**Appendix G**), the white-tailed deer was used as the example game species to estimate the EPC for a recreational trespasser (hunter). Data specific to deer to estimate COPC concentrations in venison were not identified in the literature, but the following assumptions were used to estimate an EPC for the hunter exposure pathway:

- Deer are ruminants and, as such, are not unlike cattle; thus, it is reasonable to assume they may have similar physiological processes that could yield similar biotransfer factors. Unlike beef, however, deer meat does not undergo marbling with fat, and deer fat is quite unpalatable and likely to be trimmed rather than consumed. Therefore, the biotransfer factors for edible venison are derived by adjusting biotransfer factors for beef to account for differences in the fat content of table-ready beef. Based on data in the United States Department of Agriculture's (USDA) Food Composition Databases (USDA, 2018), a representative value for the lipid content of a strip steak was 14.6 percent, compared with 2.2 percent for ground venison (USDA, 2018).
- Transfer of COPC concentration from soil is considered; although other complete pathways may contribute to the total tissue concentration of a given contaminant in the deer (e.g., ingestion of surface water), they are likely to be negligible compared with the contributions from soil pathways.
- Bioavailability of the contaminant in soil is assumed to be 100 percent.

To reflect the assumptions previously noted, venison biotransfer factors were estimated by multiplying beef biotransfer factors by 2.2/14.6 (or 0.2, rounded). Thus:

$$Bv = 0.2(Bb)$$ **Equation 4**

Where:

- Bv = biotransfer factor for venison (Days per kilogram tissue wet weight [D/kg tissue WW])
- 0.2 = factor to reflect differences in fat content between beef and venison (0.2, unitless, see above)
- Bb = biotransfer factor for beef (D/kg tissue WW)

For organic compounds, biotransfer to beef factors may be estimated using the following model by Research Triangle Institute (RTI) (2005) and recommended by USEPA (2005b):

$$Log\ Bb = -0.099\ x \log(Kow)^2 + 1.07\ x \log(Kow) - 3.56$$ **Equation 5**

Where:

- Bb = biotransfer factor for beef (D/kg tissue WW, calculated)
- K_{ow} = octanol/water partition coefficient (unitless)

Equation 5 is appropriate for organic chemicals lacking empirical biotransfer data and having a log K_{ow} below 8.2.

Values for inorganic Bb values were obtained from ingestion-to-beef parameters presented in Baes et al. (1984) or International Atomic Energy Agency (IAEA) (1994), which are representative of the fraction of the daily elemental intake in feed that is transferred and remains in a kilogram of beef until slaughter. The Bb value for fluoride (fluorine) in this reference is 0.15 D/kg tissue WW (Baes et al., 1984).

Deer were assumed to be exposed to COPCs by ingesting browse growing on affected soil. It is estimated that deer consume approximately 1.74 kg of browse per day (Sample and Suter, 1994), which is approximately 50 percent dry matter (DM), or 0.87 kg browse DM per day (Mautz et al., 1976). The COPC concentration in browse is estimated from **Equation 6**, which was originally developed for estimating the contaminant concentration in forage to which cattle may be exposed (USEPA, 1994):

$$Cp = (Cs)(BAFplant)$$ **Equation 6**

Where:

- Cp = concentration of contaminant in (plant) forage (mg/kg plant tissue dry weight [DW], calculated)
- Cs = concentration of contaminant in soil (mg/kg soil DW)
- BAFplant = soil-to-plant biotransfer factor (mg/kg plant DW per mg/kg soil DW, simplified to kg soil/kg plant)

The soil-to-plant bioaccumulation factors obtained from the literature and used to estimate plant tissue COPC concentrations were used for the BAFplant input variable in the venison model. BAFplant values for some inorganic COPCs were obtained from Baes et al. (1984), which presents plant uptake factors for elemental constituents in both vegetative and reproductive portions of the plant. Because deer browse year-round, and the vegetative parts are more available for the greater part of the year, BAFplant values for the vegetative parts were used. The use of the vegetative BAFplant is because the translocation of

nutrients and elements tends to be greater to the vegetative portion of plants. The vegetative BAFplant for fluoride (fluorine) as presented in Baes et al. (1984) is 0.06.

The concentration of a COPC in venison can be estimated from **Equation 7** (adapted from USEPA [1994]), which includes contributions from both ingestion of browse and incidental soil ingestion by the deer. The soil ingestion rate for deer is assumed to be equal to 2 percent of its diet (Beyer et al., 1994):

$$Cv = [(FIRbrowse)(Cp)(Bv) + (SIR)(Cs)(Bv)] \quad \textbf{Equation 7}$$

Where:

- Cv = contamination concentration in venison (mg/kg WW, calculated)
- FIRbrowse = browse ingestion rate (0.87 kg DW/day)
- Cp = contamination concentration in browse DW (mg/kg)
- Bv = biotransfer factor for venison (D/kg tissue WW)
- SIR = soil ingestion rate (estimated as 2 percent of the browse ingestion rate)
- Cs = concentration in soil (mg/kg soil DW)

An area use factor (AUF) was applied as an additional adjustment in the calculation of the EPC concentration in venison. As opposed to cattle, which forage in a single location or area, deer are wide-ranging species that may only be exposed to soil in the affected Site for a fraction of their daily activities. The AUF is simply a ratio of the size of the Site to the size of a deer's home range. The home range of a deer was assumed to be the upper bound of the foraging range presented in Sample and Suter (1994). The example includes a hypothetical deer foraging randomly with the terrestrial exposure areas of the CFAC facility (excluding Flathead River and the Backwater Seep Sampling Area). The AUF-adjusted COPC tissue concentrations were used to calculate the Site-wide venison concentration based on the (spatially weighted) deer tissue concentrations at each individual exposure area. The spatial weighting was based on Geographic Information System (GIS) aerial mapping of the Site exposure areas versus Site vegetative habitat and was adjusted to take into account portions of the facility that do not support foraging habitat for the deer. For example, the spatial footprint of a paved parking lot was excluded from the AUF calculations, and any soil samples from that area were excluded from the soil exposure point concentration for the venison model, due to the lack of vegetation for browsing. **Appendix H** presents the venison COPC uptake models and AUF EPCs for assessing the recreational trespasser (hunter) exposure scenario. **Table 3-46** presents the EPCs for the consumption of venison.

4.1.3 Fish Tissue

Equation 3 (refer to **Section 3.4**) was used to calculate an EPC for fish tissue; however, the BCF was applied to the 95 percent UCL of the arithmetic mean of surface water data rather than the maximum concentration used for selection of COPCs. As with the selection of COPCs for the fish ingestion scenarios, the source of the BCF is the ORNL Risk Assessment Information System (ORNL, 2019). **Table 3-47** and **Table 3-48** present the EPCs for fish within the Flathead River Area and Backwater Seep Sampling Area, respectively.

4.2 Exposure Assumptions, Equations, and Models

The exposure assumptions used in the BHHRA were presented in the final Interim Deliverable (EHS Support, 2019a) based on Site-specific conditions or default reasonable maximum exposure (RME)

exposure assumptions. The RME is defined as the highest exposure that could reasonably be expected to occur for a given exposure pathway at the Site. If the exposures result in an unacceptable hazard or risk, a central tendency exposure (CTE) may additionally be calculated. The CTE is designed to reflect a more typical, though still conservative, exposure. The RME and CTE are intended to account for variability of the exposure parameters.

There is evidence that certain chemicals exhibit a mutagenic mode of action (MOA) that may cause irreversible changes to DNA and would have greater effect in early-life (e.g., a child) than later-life (e.g., adult) exposure (USEPA, 2005a; USEPA, 2005b). Therefore, it is recommended to use age-specific values for assessing children exposures because children are expected to have exposures that differ from adults based on size, physiology, and behavior. Additionally, the dose may be greater in children because of intake, metabolism, or absorption rates. Therefore, there are multiple equations to calculate the chronic daily intake for carcinogens to address the potential mutagenic MOA in early life stages. To adjust for the mutagenic MOA, different mutagenic adjustment factors (MAFs) are applied at different age intervals: a MAF of 10 is applied to children within the first 2 years of life (i.e., 0 to 2 years old); a MAF of 3 is applied for children from age 2 to 16 years of age; and no MAF is applied to children above the age of 16 or adults. Where applicable (i.e., selected COPCs that are mutagenic), the equations from the USEPA (2018a) RSL guidance document (e.g., see Section 4.1.1.4 for residential soil equations in USEPA 2018a) were used to address COPCs with a mutagenic MOA. These equations are presented with the other exposure equations.

The time-weighted average intake rates were calculated for lifetime cancer risks when the receptors spanned a range of age groups (e.g., child, adolescent, adult). These receptors include the recreationist (floater) and potential future resident.

Default exposure assumptions were used for the residents. Default exposure assumptions are presented in the following guidance documents:

- USEPA RSLs Table (USEPA, 2018a)
- Exposure Factors Handbook (USEPA, 2011)
- Update for Chapter 5 of the Exposure Factors Handbook Soil and Dust Ingestion (USEPA, 2017)
- Update for Chapter 11 of the Exposure Factors Handbook Intake of Meats, Dairy Products, and Fats (USEPA, 2018d)
- Risk Assessment Guidance for Superfund, Volume I Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment (USEPA, 2004)
- Risk Assessment Guidance for Superfund, Volume I Human Health Evaluation Manual, Part F - Supplemental Guidance for Inhalation Risk Assessment (USEPA, 2009)
- Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Parameters. OSWER Directive 9200.1-120 (USEPA, 2014)
- Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A) (USEPA, 1989)
- Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2002a)
- Standard Default Exposure Factors. OSWER Directive 9285.6-03 (USEPA, 1991d)
- MDEQ Development of Montana-Specific Default Soil Exposure Frequencies (MDEQ, 2016)
- MDEQ Frequently Asked Questions web site http://deq.mt.gov/Land/StateSuperfund/FrequentlyAskedQuestions#riskAssessment

The MDEQ has determined that there was no location in Montana for which climate data were available that did not have a minimum of four months of an average snow depth with at least 2 inches, or an average temperature at or below freezing, or both (MDEQ, 2016). The MDEQ calculated the exposure frequencies using 75 percent of the typical exposure frequency (e.g., for residents, 75 percent of 365 days equaled 270 days of exposure to soils). Therefore, this same conservative exposure frequency assumption (i.e., 75 percent) for surface soil and dust exposure (ingestion, dermal, and inhalation) was used for exposures to COPCs in soil and fugitive dust.

Site-specific exposure assumptions were used for the following receptors:

- Trespassers
- Industrial workers (stormwater, landfill, industrial)
- Construction workers
- Recreational (hunters, ATV riders, fisher, floaters)

Site-specific exposure assumptions for the workers (i.e., industrial, stormwater, and construction), recreationists (i.e., boater, floater, hunter, ATV rider, and fisher), and trespasser were used in place of default exposure assumptions. These Site-specific assumptions were based on factors such as type of recreation anticipated (e.g., hunting, fishing, boating, floating), Site features (e.g., accessibility, vegetation), and proximity to residential properties. Other exposure assumptions (e.g., body weight, skin surface area) are based upon the type of receptor and were provided in the default guidance documents referenced in the BHHRA Work Plan and listed in the reference section herein. The Montana Fish, Wildlife, and Parks website (e.g., Hunter access guide https://myfwp.mt.gov/fwpPub/hunterAccessGuide) was searched for Site-specific information on hunting and fishing seasons, recreational fish and game species, breeding and foraging habitat requirements, creel and bag limits, harvest reports, and distribution and population statistics. Interviews were also conducted with the following individuals:

- Steve Wright, Health and Safety Coordinator, Columbia Falls Aluminum Company LLC – Mr. Wright provided observational information on the activities of recreational trespassers that engage in hunting and ATV riding.
- Richard Birdsell, Owner of Northern Rockies Outfitters, Kalispell, Montana – Mr. Birdsell provided local knowledge regarding recreational and fishing use of the Flathead River near the CFAC Site.
- Kristy Personett, Montana Fish, Wildlife, and Parks, Region 1 – Ms. Personett manages CFAC's Block Management Program (BMP) that provides managed hunting on their land south of the Flathead River; she provided local information on hunting in this area.

The exposure assumptions utilized in the BHHRA are presented on **Table 4-1** through **Table 4-6**. The following presents a discussion on Site-specific exposure assumptions that were presented in the Interim Deliverable (EHS Support, 2019a; **Appendix G**) and that were used in the BHHRA:

- A stormwater management worker is anticipated to conduct an inspection of the North Percolation Pond and Central Landfill areas once per week for approximately 1 hour per inspection (Steve Wright, personal communication). Consistent with the MDEQ exposure frequency surface soil recommendations, the stormwater management worker is assumed to be exposed to soils 8 months of the year or 38 weeks; therefore, the exposure frequency (EF) is 38 days per year for this receptor. The same EF is assumed for surface water and sediment.
- The reasonable maximum exposure for the recreationist (i.e., boater and floater) receptor is an exposure frequency of 10 days per year for 1 hour per lunch visit to the Backwater Seep

Sampling Area (Richard Birdsell, personal communication). An adolescent recreationist is considered to be 6 to 16 years old; therefore, the exposure duration for the adolescent recreationist is 10 years. An exposure duration of 20 years is assumed for the adult recreationist. For the purposes of dermal exposure, the surface area is assumed to be whole body and is based on USEPA defaults for the adolescent and adult floaters and the exposure time is assumed to be 1 hour per visit.

- The fisher has an estimated EF of 10 days per year for 20 years and an exposure time of 1 hour per lunch visit to the Backwater Seep Sampling Area (Richard Birdsell, personal communication). Access to the Flathead River Area and Backwater Seep Sampling Area is via boat; however, exposure assumptions consistent with wading activities were used. Additionally, a fisher is conservatively assumed to keep two fish per day of fishing to consume, which corresponds to two fish meals. A typical meal is assumed to be 8 ounces per day, or 227 grams per day of fish. Therefore, the fish ingestion rate, normalized for one year, of 12,971 milligrams per day is assumed for this receptor.
- Because of the migratory nature of the fish caught by the fisher, and the lack of spawning areas along the reach of the Flathead River adjacent to the Site, the fish are not expected to be exposed to the surface waters within the Backwater Seep Sampling Area except for incidental incursions (Richard Birdsell, personal communication). Therefore, a migration ratio (MR) of 10 percent was applied to the relative percentage of time the fish would be exposed to COPCs within the Backwater Seep Sampling Area. This is a conservative migration ratio given the small surface water habitat within the Backwater Seep Sampling Area and the migratory nature of the fish species.
- The trespasser is an adolescent from 6 to 16 years of age and is assumed to access the Site seven days per year (Steve Wright, personal communication).
- The recreational trespasser (hunter) is assumed to access the Site 14 days per hunting season (Rich Birdsell, personal communication); for deer, the hunting season is September through November, and one deer is bagged for home consumption. The average weight of dressed deer is approximately 63 kg (average buck and doe, MDEQ website), and approximately 50 percent is edible venison. Therefore, the venison ingestion rate, normalized for one year, is 0.086 kilograms per day (kg/day).
- The recreationist trespasser (ATV rider) is assumed to access the Site one day per month (Steve Wright, personal communication).

A typical fish meal is assumed to be 8 ounces per day of uncooked fish, which is measured as wet weight (i.e., as calculated in **Equation 3**). To address intake rates based on what individuals actually consumed, USEPA (2011) estimated net cooking loss for various foods (see Table 13-69; USEPA, 2011) based on dripping and volatile losses during cooking, and losses from cutting, shrinkage, excess fat, bones, scraps, and juices. The equation used to convert the Cfish intake rate is presented on **Table 4-5**.

The following is the equation to convert the Cfish intake rate (see Equation. 13-3; USEPA, 2011):

$$IA = I \times (1 - L1) \times (1 - L2) \qquad \textbf{Equation 8}$$

where:

- IA = the adjusted intake rate
- I = the wet weight intake rate
- L1 = the cooking or preparation loss (31.5 percent; USEPA, 2011)

- L2 = the post-cooking loss (10.5 percent; USEPA, 2011)

Similarly, the concentration of COPCs in venison is presented in **Appendix H** as WW. Therefore, the intake rate of venison is adjusted to account for intake of DW versus WW using the following equation (USEPA, 2018d):

$$IR_{dw} = IR_{ww} (100\text{-}W/W) \qquad \textbf{Equation 9}$$

where:

- IR_{dw} = dry-weight intake weight
- IR_{ww} = wet-weight intake rate
- W = percent water content

Intake dose equations for ingestion and dermal contact and exposure concentration equations for inhalation to estimate non-carcinogenic health effects - average daily intake and carcinogenic effects - lifetime average daily intake were based on the USEPA RSL exposure equations. **Table 4-1** through **Table 4-6** present the intake equations and values in the RAGS Part D format. **Table 4-7** presents the chemical-specific parameters utilized in the risk assessment including, but not limited to, whether a COPC has a mutagenic mode of action, and whether the chemical is found to be within the effective predictive domain (EPD) for dermal exposures to water.

Bioavailability or the extent that chemicals are absorbed by the body is variable, and all chemicals are not absorbed by the body to the same extent (USEPA, 2007). To adjust the chemical concentration to account for the degree it was absorbed from the gastrointestinal tract into the body, a relative bioavailability (RBA) factor was included in the intake equations. If a specific RBA was not available, the RBA was assumed to be 1 (USEPA, 1989). **Table 4-7** presents the RBAs for the selected COPCs.

The chemical-specific particulate emission factor (PEF) for the recreational trespasser (ATV rider) is presented on **Table 4-7**. The exposure concentration equations for inhalation of fugitive dust while riding an ATV requires that a PEF be estimated that describes the amount of respirable dust that is in the air. The amount of dust generated is dependent on a number of factors including speed, type and weight of the vehicle, and the type of soil. The PEFs used to evaluate the generation of fugitive dust while riding an ATV were the PEFs recommended by the USEPA from an ATV activity-based sampling (ABS) study from the Nelson Tunnel Superfund Site in Colorado (TechLaw, 2017), and are representative of a mountain west soil condition (Erin Formanek, CDM Smith, personal communication on February 8, 2019).

5 Toxicity Assessment

The purpose of the toxicity assessment is to determine the relationship between the dose of a COPC taken into the body, and the probability that an adverse effect will result from that dose. The primary sources of toxicity values used in the risk assessment are based on the USEPA Superfund hierarchy of human health toxicity values, and were used to evaluate risk from both chronic and sub-chronic exposures. **Table 5-1** and **Table 5-2** present Non-cancer Toxicity Criteria, and **Table 6-1** and **Table 6-2** present Cancer Toxicity Criteria in the RAGS Part D format.

Sources of toxicity values in order of preference are as follows:

- USEPA IRIS
- Provisional peer-reviewed reference toxicity values (PPRTVs)
- Agency for Toxic Substances and Disease Registry's Minimal Risk Levels
- California Environmental Protection Agency Office of Environmental Health Hazard Assessment risk assessment health values
- Other sources (screening values from "PPRTV Appendix" sources and other specific individual toxicity values, and the USEPA Superfund program Health Effects Assessment Summary Table)

Quantitative estimates of the potency of COPCs include two sets of toxicity values, one for carcinogenic effects and one for non-carcinogenic effects. For carcinogenic effects, the USEPA assumes a non-threshold toxicological mechanism that assumes there is no level of exposure that does not pose a probability that an adverse effect will result from that dose. Toxicity criteria for non-carcinogens assume that there is a threshold effects level, below which adverse health effects are not expected to occur.

5.1 Non-Carcinogenic Effects

Non-carcinogenic effects, such as organ damage or reproductive effects are evaluated by RfDs for oral exposure, or RfCs for inhalation exposure. The basis of a chronic RfD or RfC calculation is usually the highest dose that result in a no observed adverse effect level (NOAEL) after chronic (usually lifetime) exposure in animal experiments. The NOAEL is then divided by a safety factor, and occasionally an additional modifying factor, to obtain the RfD or RfC. Uncertainty factors are typically factors of 10 that account for interspecies variation and sensitive human populations. Additional factors of 10 are included in the uncertainty factor if the RfD or RfC is based on the lowest observed adverse effect level instead of the NOAEL, or an experiment that includes a less-than-lifetime exposure. In addition, the non-carcinogenic dose-response values include the source and primary target organ, which is the organ that is affected at the lowest dose and experiences critical organ effects.

Additionally, some metals have different toxicity values for different chemical forms. The following discusses the toxicological values of cadmium and manganese relative to the exposure media that is being assessed either in the selection of COPCs, or in the risk characterization.

Two oral RfD values are available for cadmium, depending on exposure medium (food or water). The value for water is assumed to apply to surface water and groundwater, while the value for food is assumed to apply to all other media (i.e., soil, sediment, fish and game tissue, and air).

Two oral RfD values are available for manganese depending on exposure medium (diet or non-diet). The value for diet is assumed to apply to items in the diet (i.e., fish and game tissue), while the value for

non-diet is assumed to apply to all other media types (i.e., soil, sediment, air, and water). The non-diet RfD for manganese (4.7E-02 mg/kg-day) is based on the oral RfD of 1.4E-01 mg/kg-day in the diet.

5.2 Carcinogenic Effects

For carcinogenic effects, USEPA (USEPA, 2005a) assigns a weight-of-evidence descriptor to each COPC, and if applicable, a CSF or URF is subsequently calculated. The weight-of-evidence descriptor is based on the likelihood that the COPC is a human carcinogen. The following are the weight-of-evidence descriptors:

- Carcinogenic to humans – convincing epidemiologic evidence demonstrating causality between human exposure and cancer, or exceptionally when there is strong epidemiological evidence, extensive animal evidence, knowledge of the mode of action, and information that the mode of action is anticipated to occur in humans and progress to tumors.
- Likely to be carcinogenic to humans – available tumor effects and other key data are adequate to demonstrate carcinogenic potential to humans, but does not reach the weight-of-evidence for the descriptor of carcinogenic to humans.
- Suggestive evidence of carcinogenic potential – evidence from human or animal data is suggestive of carcinogenicity, which raises a concern for carcinogenic effects but is judged not sufficient for a stronger conclusion.
- Inadequate information to assess carcinogenic potential – available data are judged inadequate to perform an assessment.
- Not likely to be carcinogenic to humans – available data are robust for deciding that there is no basis for human hazard concern.

USEPA determines CSFs for oral exposure and URFs for inhalation exposure for those chemicals that are known or likely human carcinogens. The CSFs and URFs are upper-bound estimates of the excess cancer risk due to continuous exposure to a COPC averaged throughout the course of a 70-year lifetime. A CSF has units of 1/milligram (mg) of COPC/kilogram (kg) of body weight/day, or $(mg/kg\text{-}day)^{-1}$. A URF is expressed in units of 1/microgram (μg) of COPC/cubic meter (m^3) air or $(\mu g/ m^3)^{-1}$. The basis of CSFs and URFs are data from lifetime animal bioassays, although human data are used when available.

6 Risk Characterization

The purpose of the risk characterization is to provide a conservative estimate of the potential risk resulting from exposure to COPCs identified in the environmental media of the Site. Included in this section is a quantitative estimate of potential carcinogenic and non-carcinogenic risks for each complete exposure pathway for each receptor.

As noted in USEPA RAGS Parts A (USEPA, 1989), the baseline risk assessment approach retains all COPCs that exceed risk-based screening criteria. Evaluation of background risk, and the contribution of background conditions to the Site overall risk, is discussed in the risk characterization. COPCs that have both release-related and background-related sources and that have concentrations of naturally occurring elements at a site that exceed risk-based screening levels should be discussed qualitatively in the risk characterization (USEPA, 2002b). The contribution was evaluated and discussed in **Section 6.2** as applicable to the risk drivers for each complete exposure pathway.

This section also includes concentrations of COPCs in soil and sediment from the exposure areas that are statistically similar to naturally-occurring metals in background concentrations, which may represent regional conditions that are not related to Site activities. As discussed in **Section 2.4**, a Background Investigation was conducted concurrent with the Phase II SC activities to develop Site-specific BTVs for soil, surface water, and sediment. Potential risks from these COPCs would be similar to regional conditions, and would not be considered risk drivers for Site remedial activities. Data from the Background Investigation was used to provide a better understanding of what COPCs, and potentially associated risks or hazards, are related to Site activities or are comparable to background risks **Section 6.2**.

Cancer risks were expressed as the upper-bound, increased likelihood of an individual developing cancer because of exposure to a specific COPC. The following equation was used to estimate the excess cancer risk:

$$Cancer\ Risk = LADI \times CSF\ or\ EC \times IUR \qquad \textbf{Equation 10}$$

Where

- LADI = Lifetime average daily intake (mg/kg-day)
- CSF = Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$
- EC = Exposure concentration $(\mu g/m^3)$
- IUR = Inhalation Unit Risk $(\mu g/m^3)^{-1}$

Cancer risk estimates for individual chemicals were summed by media and exposure pathway to generate an estimate of cumulative risk. The National Oil and Hazardous Substances Pollution Contingency Plan states that for carcinogens, acceptable exposure represents an excess upper-bound lifetime cancer risk to an individual between 10^{-6} and 10^{-4}. Cancer risks less than 1×10^{-6} are generally considered *de minimis*. The level of total excess cancer risk that is of concern is a matter of personal, community, and regulatory judgement. In general, the USEPA considers excess cancer risks that are below 10^{-6} to be negligible, and are generally considered *de minimis;* excess risks above 10^{-4} are sufficiently large that some sort of intervention or remediation is desirable. Excess cancer risks that range between 10^{-4} and 10^{-6} are generally not considered large enough to warrant action under Superfund (USEPA, 1991c), although this is evaluated on a case by case basis and USEPA may determine

that risks lower than 10^{-4} are not sufficiently protective and warrant remedial action. Additionally, the MDEQ allowable cancer risk level is 10^{-5}.

Noncancer effects from exposure to a COPC are expressed as an HQ. An HQ is the ratio of the estimated intake or exposure concentration of a COPC to the corresponding COPC-specific RfD or RfC. The following equation is used to estimate the noncancer risk:

Hazard Quotient = ADI/RfD or EC/RfC **Equation 11**

Where

- ADI = Average daily intake (mg/kg-day)
- RfD = Reference dose (mg/kg-day)
- EC = Exposure concentration (mg/m^3)
- RfC = Reference concentration (mg/m^3)

The COPC- and pathway-specific HQs are combined as a hazard index (HI), which is then compared to a typically accepted benchmark level of 1. If the HI exceeds 1, then combined Site-specific exposures exceed the RfDs and/or RfCs, and there is a potential for non-cancer adverse effects to result from exposure to Site COPCs under the evaluated receptor scenario(s). However, if the total HI is greater than 1, separate endpoint-specific HIs were calculated based on target organs (e.g., HQs for neurotoxins are summed separately from HQs for renal toxins). If a target-organ-specific HI was greater than 1, there is potential health effects for that target organ and receptor. If the calculated HI is greater than 1 and an individual COPC HQ is not greater than 1, then an evaluation of the target-organ-specific HI will be conducted. The specific target organ endpoints for each COPC were identified through review of IRIS and in consultation with the USEPA and were presented on **Table 5-1** and **Table 5-2.**

If after application of the target-organ-specific HI, an HQ or HI exceeds 1, there is the potential that non-cancer effects may occur; however, an HQ or HI above 1 does not indicate an effect will definitely occur. The toxicity values used in this BHHRA have a margin of safety inherent in their derivation; therefore, the greater the HQ or HI value exceeds 1, the more likely it is that an adverse effect may occur. However, it is important to recognize that this relationship is not linear; i.e., the increase HQ or HI does not necessarily result in a 1 to 1 increase in the potential for adverse effect.

Table 7-1 through **Table 7-35** present Calculation of Cancer Risks and Non-cancer Hazards in the RAGS Part D format. Radiological parameters were not identified as COPCs; therefore, the RAGS Part D format Table 8 series will not be presented as this series is specific only to radiological parameters. **Table 9-1** through **Table 9-35** series are included to summarize the cancer risk and non-cancer hazards for each receptor by medium, exposure medium, exposure route, and exposure point. **Table 9-36** presents a summary of the cumulative excess lifetime cancer risk (ELCR) and the HI for each receptor in each exposure area. The following risk characterization incorporates the USEPA risk range of 10^{-4} and 10^{-6} and MDEQ management of 10^{-5} for carcinogens. For non-carcinogens, the risk characterization uses HI of 1 and target organ specific evaluation as applicable.

On **Table 9-36**, the ELCR is bold and italicized if it is greater than the *de minimis* level and is color coded in the following manner:

- Blue – less than USEPA *de minimis* (10^{-6})
- Green – between USEPA *de minimis* and MDEQ risk management level (10^{-5})

- Yellow – between MDEQ risk management (10^{-5}) and USEPA risk range upper limit 10^{-4}
- Grey – above USEPA risk range upper limit (greater than 10^{-4})

For non-carcinogenic hazards, if the target-organ specific HI is greater than 1, the HI is bold and italicized and color coded in the following manner:

- Blue – less than 1
- Green – between 1 and 10
- Yellow – between 10 and 100
- Grey – greater than 100

6.1 Exposure Areas

The following sections present the calculated risks and hazards for each receptor within an individual exposure area, for receptors with potential exposures to COPCs across multiple exposure areas (e.g., recreational trespassers), and for the three groundwater exposure scenarios. Refer to **Section 2.5.3** for specifics on the potentially complete exposure pathways evaluated in this BHHRA.

6.1.1 Main Plant Area

This section presents the risk characterization for the Main Plant Area receptors identified in **Section 2.5.3.1** in the current (trespasser) and future (trespasser, industrial worker, construction worker) land use scenarios. **Table 7-1** through **Table 7-4** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-1** through **Table 9-4** present the summary of cancer risk and non-cancer for each receptor.

6.1.1.1 Trespasser (Current)

The cumulative cancer risk for the trespasser in the current scenario did not exceed *de minimis* risk level of 1×10^{-6} at 6×10^{-7} (**Table 7-1**, **Table 9-1**). The cumulative HI did not exceed the target HI of 1 at 0.007.

6.1.1.2 Industrial worker (Future)

Table 7-2 and **Table 9-2** present the cancer risks and non-cancer hazards for the future industrial worker potentially exposed to COPCs in soils (0 to 12 ft-bgs) in the Main Plant Area. The cumulative cancer risk for this receptor is within the acceptable exposure range of 10^{-4} to 10^{-6} at 8×10^{-6}; with the primary risk drivers of benzo(a)pyrene (4×10^{-6}) and arsenic (1×10^{-6}). The relative contribution from background for these two COPCs was discussed in **Section 6.2**. The HI was less than the accepted benchmark level of 1 at 0.1.

6.1.1.3 Construction worker (Future)

The calculated cumulative cancer risk and HI for the construction worker in the future scenario for the Main Plant Area were 8×10^{-7} and 2 (**Table 7-3** and **Table 9-3**). The cumulative risk did not exceed the *de minimis* cancer threshold, and the HI slightly exceeded the non-cancer threshold of 1.

Exposure to aluminum, manganese, and benzo(a)pyrene in the air via inhalation of fugitive dust accounted for 80 percent of the elevated HI. However, as presented on **Table 9-3**, none of these

individual chemicals had an HQ of greater than 1. Therefore, an evaluation of the specific target organ endpoint HI was conducted (**Table 9-3**). The HI for each of the target endpoints were less than 1; therefore, there was an acceptable non-cancer hazard for this receptor in this exposure area.

6.1.1.4 Trespasser (Future)

The cancer risks and non-cancer hazards calculated for the future trespasser in the Main Plant Area are presented on **Table 7-4** and summarized on **Table 9-4**. Similar to the trespasser in the current scenario, the cumulative cancer risk did not exceed the *de minimis* cancer risk of 10^{-6} at 6 x 10^{-7} and the HI is below the threshold of 1 at 0.007.

6.1.1.5 Incremental Sampling DU Evaluation

The potential receptors in the Main Plant Area were also evaluated for potential exposure to COPCs in the ISM DU. **Appendix I** presents the calculations of risks and hazards for these receptors.

6.1.1.5.1 Trespasser (Current)

The ELCR for the current trespasser potential exposed to COPCs in the ISM DU within the Main Plant Area was 4 x 10^{-6} and exceeds the *de minimis* level of 10^{-6}. The primary risk driver was benzo(a)pyrene in the soil. The HI (0.03) for this receptor did not exceed the target of 1. **Appendix I Table I-1** and **Table I-2** present the calculation of the risks and hazards for this receptor.

6.1.1.5.2 Industrial Worker (Future)

The ELCR for the industrial worker potentially exposed to COPCs in the ISM DU within the Main Plant Area was 2 x 10^{-5} and slightly exceeds the MDEQ risk management level of 10^{-5}, but is within the acceptable USEPA risk range of 10^{-6} to 10^{-4}. The primary risk drivers were exposure to arsenic (3 x 10^{-6})) and benzo(a)pyrene (1 x 10^{-5}), benzo(b)fluoranthene (1 x 10^{-6}), and dibenzo(a,h)anthracene (3 x 10^{-6}) in the soil.

The HI (4) for this receptor exceeded the target HI of 1; however, the target-organ specific endpoint HIs did not exceed 1. Therefore, there were no unacceptable levels of non-cancer hazard for this receptor. **Appendix I Table I-3** and **Table I-4** present the calculation of the risks and hazards for this receptor.

6.1.1.5.3 Construction Worker (Future)

The construction worker in the Main Plant Area ISM DU had an ELCR slightly above the *de minimis* level of 1 x 10^{-6} at 2 x 10^{-6}; however, the HI was 4. A target-organ specific HI evaluation was not conducted because a single COPC (benzo[a]pyrene) had an HQ of 2. **Appendix I Table I-5** and **Table I-6** present the calculation of the risks and hazards for this receptor.

6.1.1.5.4 Trespasser (Future)

Similar to the trespasser in the current scenario, the trespasser in the future scenario potentially exposed to COPCs in the Main Plant Area ISM DU soils had an ELCR above the *de minimis* level at 2 x 10^{-6} and an HI below the target threshold at 0.02. **Appendix I Table I-7** and **Table I-8** present the calculation of the risks and hazards for this receptor.

6.1.2 North Percolation Pond Area

This section presents the risk characterization for the North Percolation Ponds Area receptors identified in **Section 2.5.3.2** in the current and future scenarios: stormwater management worker and trespasser. **Table 7-5** through **Table 7-6** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-5** through **Table 9-6** present the summary of cancer risk and non-cancer for each receptor.

6.1.2.1 Stormwater Management Worker (Current/Future)

Table 7-5 and **Table 9-5** present the calculations and summaries of the cancer risks and non-cancer hazards for the current and future stormwater management worker in the North Percolation Pond Area. The cumulative cancer risk for this receptor was within the acceptable exposure range of 10^{-4} to 10^{-6} at 1 x 10^{-4}. The cumulative HI for this receptor was 0.8 and did not exceed the threshold of 1.

Potential exposure to select PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a)anthracene, and indeno(1,2,3-c,d)pyrene) through direct contact (incidental ingestion and dermal contact) with soils and potential exposure to arsenic and the same select PAHs in sediment through direct contact accounted for greater than 90 percent of the cumulative cancer risk at 8 x 10^{-5}. Of these COPCs, the cumulative cancer risk from direct contact with benzo(a)pyrene and dibenzo(a,h)anthracene soils is 7 x 10^{-5}. The relative contribution from background for these COPCs is discussed in **Section 6.2**.

6.1.2.2 Trespasser (Current/Future)

The cumulative cancer risk calculated for the current and future trespasser in the North Percolation Pond Area exceeded the *de minimis* level of 10^{-6}, but was within the acceptable risk range of 10^{-4} to 10^{-6} at 5 x 10^{-5} (**Table 7-6** and **Table 9-6**). Similar to the stormwater management worker, select PAHs (benzo[a]anthracene, benzo[a(]pyrene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d]pyrene) through direct contact (incidental ingestion and dermal contact) with soils and potential exposure to the same select PAHs in sediment were risk drivers. Potential exposure to the soil COPCs listed through direct contact is 5 x 10^{-5}. The relative contribution from background for these COPCs is discussed in **Section 6.2**.

The HI for this receptor did not exceed the non-cancer hazard threshold of 1 at 0.4. Therefore, there were no unacceptable non-cancer hazards for this receptor.

6.1.3 Central Landfill Area

This section presents the risk characterization for the Central Landfill Area receptors identified in **Section 2.5.3.3** in the current and future land use scenarios: landfill management worker and trespasser. **Table 7-7** through **Table 7-9** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-7** through **Table 9-9** present the summary of cancer risk and non-cancer for each receptor.

6.1.3.1 Landfill Management Worker (Current)

Table 7-7 and **Table 9-7** present the calculated cancer risks and non-cancer hazards for the landfill management in the Central Landfills Area in the current scenario. The HI for this receptor (0.3) did not exceed the target HI of 1. While the cumulative cancer risk for this receptor (1×10^{-5}) exceeded the *de minimis* level, it was within the acceptable cancer range 10^{-4} to 10^{-6}. Greater than 60 percent of the cumulative risk estimate was from direct contact with soil containing arsenic and benzo(a)pyrene, and sediment containing arsenic. The relative contribution from background for these COPCs was discussed in **Section 6.2**.

6.1.3.2 Trespasser (Current/Future)

The trespasser in the current and future scenarios for the Central Landfill Areas had a cumulative cancer risk of 6×10^{-7} (**Table 7-8** and **Table 9-8**) and did not exceed the *de minimis* risk level of 10^{-6}. The cumulative HI for the trespasser in the Central Landfill Area (0.02) did not exceed the target HI of 1.

6.1.3.3 Landfill Management Worker (Future)

Similar to the landfill management worker in the current scenario, the landfill management worker in the future scenario in the Central Landfills Area had a cumulative cancer risk greater than the *de minimis* level of 10^{-6}, but within the acceptable cancer range 10^{-4} to 10^{-6}, at 7×10^{-6} (**Table 7-9** and **Table 9-9**). The exposure pathways and COPCs contributing to the majority of the estimated risk were direct contact with soil containing arsenic (2×10^{-6}) and benzo(a)pyrene (2×10^{-6}), and sediment containing arsenic (1×10^{-6}). The relative contribution from background for these COPCs was discussed in **Section 6.2**. The HI for this receptor (0.2) did not exceed the target HI of 1.

6.1.3.4 Incremental Sampling DU Evaluation

The potential receptors in the Central Landfill Area also were evaluated for potential exposure to COPCs in the ISM DU. **Appendix I** presents the calculations of risks and hazards for these receptors.

6.1.3.4.1 Landfill Management Worker (Current/Future)

The Landfill Management worker in the current and future scenario for the ISM DUs within the Central Landfill Area had a cumulative ELCR of 3×10^{-5} that was within the acceptable range of 10^{-4} to 10^{-6}, but above the MDEQ risk management level of 10^{-5}. The primary risk drivers included potential exposure to arsenic and select PAHs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene) in soils via direct contact. The HI for this receptor was 0.3 and was below the target HI of 1. **Appendix I Table I-9** and **Table I-10** present the calculation of the risks and hazards for this receptor.

6.1.3.4.2 Trespasser (Current)

The ELCR estimated for the current trespasser in the Central Landfill ISM DUs was 2×10^{-6} and slightly exceeded the *de minimis* level of 10^{-6}. While no individual COPC ELCR exceeded the *de minimis* level of 1×10^{-6}, the primary contributor was benzo(a)pyrene. The HI for this receptor was 0.02 and was below

the threshold of 1. **Appendix I Table I-11** and **Table I-12** present the calculation of the risks and hazards for this receptor.

6.1.3.4.3 Trespasser (Future)

The future trespasser was evaluated for potential exposure to COPCs in soil from 0 to 2 ft-bgs. **Appendix I Table I-13** and **Table I-14** present the calculation of the risks and hazards for this receptor. The ELCR slightly exceeded the *de minimis* level of 10^{-6} at 2 x 10^{-6}; similar to the trespasser in the current scenario, direct contact with benzo(a)pyrene was the primary contributor to the ELCR at 1 x 10^{-6}. The HI was below the target threshold HI at 0.02.

6.1.4 Industrial Landfill Area

This section presents the risk characterization for the Industrial Landfills Area receptors identified in **Section 2.5.3.4** in the current and future land use scenarios: landfill management worker and trespasser. **Table 7-10** and **Table 7-11** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-10** through **Table 9-11** present the summary of cancer risk and non-cancer for each receptor.

6.1.4.1 Landfill Management Worker (Current/Future)

Table 7-10 and **Table 9-10** present the calculated risks (1 x 10^{-5}) and non-cancer HI (0.2) for the current and future landfill management worker in the Industrial Landfill Area. Potential exposure to arsenic, benzo(a)pyrene, and dibenzo(a,h)anthracene in soils each have calculated risks exceeding the *de minimis* level. The relative contribution from background for these COPCs was discussed in **Section 6.2**.

6.1.4.2 Trespasser (Current/Future)

The cumulative cancer risk for trespasser in the current and future scenario for the Industrial Landfill Area was within the slightly exceeded the de minimis cancer level of 10^{-6}, at 2 x 10^{-6} and the HI was less than the target HI of 1 at 0.02 (**Table 7-11** and **Table 9-11**). Direct contact with benzo(a)pyrene in soils is the primary risk driver with a cancer risk of 1.5 x 10^{-5}. The relative contribution from background for these COPCs was discussed in **Section 6.2**.

6.1.5 Eastern Undeveloped Area

This section presents the risk characterization for the Eastern Undeveloped Area receptors identified in **Section 2.5.3.5** in the current land use scenario (trespasser) and the future land use scenario (trespasser, landfill management worker, and construction worker). **Table 7-12** through **Table 7-14** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-12** through **Table 9-14** present the summary of cancer risk and non-cancer for each receptor.

6.1.5.1 Trespasser (Current/Future)

The calculated cumulative cancer risk for the trespasser potentially exposed to COPCs in soil, surface water, and sediment in the Eastern Undeveloped Area did not exceed the *de minimis* level of 10^{-6} at 1 x 10^{-7} (**Table 7-12** and **Table 9-12**). The HI for this receptor was less than the target HI of 1 at 0.01.

6.1.5.2 Industrial Worker (Future)

Table 7-13 and **Table 9-13** present the cumulative cancer risk and non-cancer HI for the future industrial worker in the Eastern Undeveloped Area. The cumulative cancer risk (2×10^{-6}) slightly exceeded the *de minimis* level of 10^{-6} that was due to direct contact with soils containing arsenic. The relative contribution from background for this COPC was discussed in **Section 6.2**. The non-cancer HI (0.09) did not exceed the target level for this receptor in this exposure area.

6.1.5.3 Construction Worker (Future)

The cumulative cancer risk for the future construction worker in the Eastern Undeveloped Area (3×10^{-7}; **Table 7-14** and **Table 9-14**) did not exceed the *de minimis* level of 10^{-6}. The calculated HI for this receptor exceeded the target HI at 3. Potential exposure to manganese through inhalation of fugitive dust and vapors was calculated to be 2; therefore, because one COPC exceeded the target HI, a target-organ-specific evaluation was not conducted for this receptor. The relative contribution from background for this COPC was discussed in **Section 6.2**.

6.1.6 North-Central Undeveloped Area

This section presents the risk characterization for the North-Central Undeveloped Area receptors identified in **Section 2.5.3.6** in the current land use scenario (trespasser) and the future land use scenario (trespasser, industrial worker, and construction worker). **Table 7-15** through **Table 7-17** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-15** through **Table 9-17** present the summary of cancer risk and non-cancer for each receptor.

6.1.6.1 Trespasser (Current/Future)

Table 7-15 and **Table 9-15** present the cumulative risk and non-cancer HI calculations for the current and future trespasser in the North-Central Undeveloped Area. Both the cumulative cancer risk of 1×10^{-7} and HI (0.01) were less than the *de minimis* risk of 10^{-6} and HI threshold of 1.

6.1.6.2 Industrial Worker (Future)

The cumulative cancer risk and HI were calculated for the future industrial worker in the North-Central Undeveloped Area for potential exposure to COPCs in soils through direct contact and inhalation (**Table 7-16** and **Table 9-16**). The cumulative cancer risk at 2×10^{-6} was within the acceptable cancer risk range of 10^{-4} to 10^{-6}, with potential exposure to arsenic in soils through direct contact contributing to greater than 90-percent of the cumulative risk. The relative contribution from background for this COPC was discussed in **Section 6.2**. The HI of 0.08 was less than the threshold value of 1 for cumulative non-cancer hazards.

6.1.6.3 Construction Worker (Future)

The future construction worker in the North-Central Undeveloped Area calculated cumulative cancer risk and non-cancer HI were presented on **Table 7-17** and **Table 9-17**. For this receptor, the cumulative cancer risk for this receptor was 3×10^{-7} and was less than the *de minimis* incremental cancer risk of 10^{-6}. The calculated HI (2) slightly exceeded the threshold of 1 and was due to the potential inhalation of

manganese through the inhalation of fugitive dust and vapors. A target-organ-specific evaluation for this receptor was conducted and the target-organ-specific HIs did not exceed 1; therefore, there is no unacceptable level of hazard for this receptor.

6.1.7 Western Undeveloped Area

As discussed in **Section 2.5.3.7**, the potentially complete exposure pathways for the Western Undeveloped Area included potential exposure to COPCs in surface soils, surface water, and sediments for the current and future trespasser. In the future scenario, the potentially complete exposure pathways included potential exposures to COPCs in redistributed soils for resident adult and children, industrial workers, and construction workers. In addition to the redistributed soils, the future trespasser may also be exposed to COPCs in surface waters and sediments within the Western Undeveloped Area.

Potable use of groundwater within the Western Undeveloped Area is not occurring; however, at the request of the USEPA, potential potable use of groundwater in the upper hydrogeologic unit of the Western Undeveloped Area was also evaluated for the future resident adult and child. The following sections present the risk characterization for the Western Undeveloped Area receptors for the current and future land use scenarios. **Table 7-18** through **Table 7-23** present the calculations of carcinogenic risks and non-carcinogenic hazards for each receptor; **Table 9-18** through **Table 9-23** present the summary of cancer risk and non-cancer for each receptor.

6.1.7.1 Trespasser (Current)

The calculated cumulative risk and non-cancer hazards calculated for the current trespasser in the Western Undeveloped Area were presented on **Table 7-18** and **Table 9-18**. Both the excess cancer risk (7×10^{-8}) and the non-cancer HI (0.009) were below the cancer *de minimis* level of 10^{-6} and the HI threshold of 1.

6.1.7.2 Resident Adult (Future)

Table 7-19 and **Table 9-19** present the calculation and summary of the cancer risks for each COPC and exposure pathway for the future resident adult in the Western Undeveloped Area. The cumulative cancer risk was calculated to 2×10^{-5} and the HI was 1 for this receptor. Potential exposure to bis(2-ethylhexyl)phthalate in groundwater from potable use of the upper hydrogeologic unit of the Western Undeveloped Area accounted for 1×10^{-5} of the excess cancer risk for this receptor. Additionally, potential exposure to arsenic in redistributed soils also exceeded the *de minimis* level of excess cancer risk at 6×10^{-6}. The relative contribution from background soils for these COPC is discussed in **Section 6.2.**

6.1.7.3 Resident Child (Future)

The calculation of non-cancer HI was presented on **Table 7-20** and **Table 9-20** for the potential future resident child in the Western Undeveloped Exposure Area. As discussed in **Section 4.2**, a cumulative cancer risk is not calculated for the residential child, but rather a lifetime weighted average ELCR was calculated as noted above for the resident adult in this exposure area (**Section 6.1.7.2**). The HI for this receptor is 3 and exceeded the target of 1. As no individual COPC HI exceeded 1, a target-organ-specific evaluation was conducted for this receptor (**Table 9-20**). The HI for the individual target organs did not

exceed the threshold of 1. Therefore, there was no unacceptable non-cancer hazard for the future resident child in the Western Undeveloped Area.

6.1.7.4 *Industrial Worker (Future)*

The cumulative cancer risk for the future industrial worker potentially exposed to COPCs in redistributed soils in the Western Undeveloped Area (1×10^{-6}) did not exceed *de minimis* risk level of 1×10^{-6} (**Table 7-21**, **Table 9-21**). The cumulative HI did not exceed the target HI of 1 at 0.06. The excess cancer risk from potential exposure to arsenic (1.3×10^{-6}) was the primary contributor to the cumulative excess cancer risk. The relative contribution from background for this COPC is discussed in **Section 6.2.**

6.1.7.5 *Construction Worker (Future)*

Table 7-22 and **Table 9-22** present the calculation and summary of the cancer risks for each COPC and exposure pathway for the future construction worker within the Western Undeveloped Area. The excess cancer risk (1×10^{-7}) was below the *de minimis* level of 10^{-6} and the HI (0.1) was below the threshold of 1 for this receptor.

6.1.7.6 *Trespasser (Future)*

The excess cancer risks and non-cancer HI are calculated and summarized on **Table 7-23** and **Table 9-23** for the future trespasser in the Western Undeveloped Area. The excess cancer risks (7×10^{-8}) did not exceed the *de minimis* level of 10^{-6} and the HI (0.009) was below the threshold of 1 for this receptor.

6.1.8 South Percolation Pond Area

The following sections discuss the excess cancer risks and non-cancer HI from potential exposures to COPCs in soils, surface water and sediment within the South Percolation Pond Area for current and future receptors identified in **Section 2.5.3.8**: stormwater management workers and trespassers. **Table 7-24** and **Table 7-25** present the calculation of the cancer risks and hazards for each receptor; **Table 9-24** and **Table 9-25** summarize the cancer risks and non-cancer hazards by COPC.

6.1.8.1 *Stormwater Management Worker (Current/Future)*

Table 7-24 and **Table 9-24** presented the calculated excess cancer risk and non-cancer HI for the current and future stormwater management worker potentially exposed to COPCs in soil, sediment, and surface water within the South Percolation Pond Area. At 1×10^{-6}, the excess cancer risk did not exceed the *de minimis* risk level of 10^{-6}. The non-cancer HI for the stormwater management worker was 0.09 and did not exceed the HI threshold of 1.

6.1.8.2 *Trespasser (Current/Future)*

The excess cancer risks and non-cancer HI were calculated and summarized on **Table 7-25** and **Table 9-25** for the current and future trespasser in the South Percolation Pond Area. The excess cancer risks (1×10^{-7}) did not exceed the *de minimis* level of 10^{-6} and the HI (0.03) was below the threshold of 1 for this receptor.

6.1.9 Flathead River Area

The potential current and future receptors identified in **Section 2.5.3.9** for the Flathead River included recreationists involved in floating (adult and adolescent) and fishing (adult). The calculated excess cancer risks and non-cancer hazards from potential exposure to COPCs in surface water, sediment, and biota (recreationist [fisher]) were presented on **Table 7-26** through **Table 7-28** and were summarized on **Table 9-26** through **Table 9-28**. The following sections discuss the excess cancer risks and non-cancer hazards for each receptor in this exposure area.

6.1.9.1 Recreationist – Floater Adult (Current/Future)

The excess cancer risks and non-cancer hazards calculated for the recreationist (floater, adult) in for the Flathead River Area in the current and future scenario were presented on **Table 7-26** and summarized on **Table 9-26**. Neither the excess cancer risk of 1×10^{-7} nor the non-cancer hazard of 0.006 calculated for this receptor exceeded the *de minimis* cancer level of 10^{-6} or non-cancer HI threshold of 1.

6.1.9.2 Recreationist – Floater Adolescent (Current/Future)

Table 7-27 and **Table 9-27** present the excess cancer risk and non-cancer hazards for the current and future recreationist (floater, adolescent) in the Flathead River Area. Similar to the resident (child) in the Western Undeveloped Area (**Section 6.1.7.3**), an ELCR was not calculated for the recreationist (floater, adolescent) because a lifetime weighted average ELCR was calculated and presented for the recreationist (floater, adult). The non-cancer HI (0.01) was below the non-cancer HI threshold of 1.0.

6.1.9.3 Recreationist – Fisher (Current/Future)

The recreationist (fisher) was evaluated for potential exposure to COPCs in surface water and sediment in the Flathead River Area and in biota through ingestion of fish caught within the Flathead River Area (**Table 7-28** and **Table 9-28**). The cumulative cancer risk for this receptor of 2×10^{-7} was less than the *de minimis* level of 10^{-6}. The non-cancer HI calculated for this recreationist fisher in the Flathead River Area was 0.005 and did not exceed the HI threshold of 1.

6.1.10 Backwater Seep Sampling Area

As discussed in **Section 2.5.3.10,** the potentially complete exposure pathways and receptors in the Backwater Seep Sampling Area in the current and future scenario included exposure to COPCs in soil, surface water, and sediment by the stormwater management workers, trespassers, and recreationists involved in floating activities (adult and adolescent) and fishing (adult). Additionally, the recreationist (fisher) may be exposed to COPCs via ingestion of biota (**Table 7-29** through **Table 7-33** and summarized on **Table 9-29** through **Table 9-33)**. The following sections discuss the excess cancer risks and non-cancer hazards for each receptor in this exposure area.

6.1.10.1 Stormwater Management Worker (Current/Future)

Table 7-29 and **Table 9-29** presented the calculation and summary of excess cancer risks and non-cancer hazards for the current and future stormwater management worker in the Backwater Seep Sampling Area. The cumulative cancer risk for this receptor of 7×10^{-7} was less than the *de minimis* level of 10^{-6}.

The non-cancer HI calculated for the stormwater management worker in the Backwater Seep Sampling Area was 0.1 and did not exceed the HI threshold of 1.

6.1.10.2 Trespasser (Current/Future)

The excess cancer risks and non-cancer hazards calculated for the current and future trespasser in the Backwater Seep Sampling Area are presented on **Table 7-30** and **Table 9-30**. The estimated excess cancer risk was 1 x 10^{-7} and the non-cancer HI was 0.03. Both the excess cancer risk and the HI were below the threshold of 10^{-6} and 1, respectively.

6.1.10.3 Recreationist– Floater Adult (Current/Future)

For the current and future recreationist (floater, adult) in the Backwater Seep Sampling Area, **Table 7-31** and **Table 9-31** present the calculated excess cancer risks and non-cancer HQ for each COPC and summarize the cumulative cancer risks and HI. The lifetime timeweighted average ELCR for this receptor of 2 x 10^{-7} was less than the *de minimis* level of 10^{-6}. The non-cancer HI calculated for the recreationist (floater, adult) in the Backwater Seep Sampling Area was 0.03 and did not exceed the HI threshold of 1.

6.1.10.4 Recreationist – Floater Adolescent (Current/Future)

Table 7-32 and **Table 9-32** present the calculated non-cancer hazards for the recreationist (floater, adolescent). The HI (0.06) was below the threshold of 1. The cancer risk for this receptor was included in the lifetime weighted average estimate presented on **Table 7-31** and **Table 9-31** for the recreationist (floater adult).

6.1.10.5 Recreationist – Fisher (Current/Future)

The recreationist (fisher) was evaluated for potential exposure to COPCs in surface water and sediment in the Backwater Seep Sampling Area and in biota through ingestion of fish caught within the Backwater Seep Sampling Area (**Table 7-33** and **Table 9-33**). The cumulative cancer risk for this receptor of 2 x 10^{-7} was less than the *de minimis* level of 10^{-6}. The non-cancer HI calculated for this recreationist fisher in the Backwater Seep Sampling Area was 0.03 and did not exceed the HI threshold of 1.

6.1.11 Recreational Trespasser (ATV Riding)

As discussed in **Section 2.5.3**, a recreational trespasser (ATV riding) has either been observed or believed to have accessed portions of the Western Undeveloped Area, North-Central Undeveloped Area, and Central Landfill Area. **Table 7-34** and **Table 9-34** present the cancer risk and non-cancer hazard calculations and a summary by COPC for this receptor. The ELCR of 5 x 10^{-7} was less than the *de minimis* cancer risk level of 10^{-6}, and the HI calculated for this receptor was 0.1 and is less than the target HI of 1.

6.1.12 Recreational Trespasser (Hunter)

The recreational trespasser (hunter) exposure area included both the North-Central Undeveloped Area and the Western Undeveloped Area. The ELCR calculated for the recreational trespasser (hunter) was less than the *de minimis* risk level of 10^{-6} at 2 x 10^{-7} (**Table 7-35** and **Table 9-35**). The cumulative HI (0.01, **Table 7-35** and **Table 9-35**) calculated for this receptor did not exceed the target level of 1.

6.1.13 Additional Groundwater Evaluation

In addition to potential future potable use of groundwater in the Western Undeveloped Area, the potential future potable use of the upper hydrogeologic unit Plume Core area and the below the upper hydrogeologic unit across the Site were evaluated at the request of the USEPA. The following sections present the risk characterization of potable use of groundwater from these exposure areas. **Appendix J** presents the calculation of risks and hazards and summary of COPC tables for these scenarios.

6.1.13.1 Upper Hydrogeologic Unit Plume Core Area

As discussed in **Section 2.5.2** and **Section 2.5.3**, CFAC intends to prohibit the use of groundwater beneath the Site for potable use. However, as required by the USEPA, this scenario was evaluated as a conservative evaluation of potential health risk in the absence of any controls. For future potable use of groundwater in the upper hydrogeologic unit within the Plume Core Area (**Figure 36**), the lifetime time weighted average ELCR for the resident receptor slightly exceeded the upper limit of USEPA risk range of 10^{-4} at 2 x 10^{-4} and exceeded the target HI of 1 at 80 (**Appendix J**, **Table J-1** and **Table J-2**). The primary cancer risk driver was arsenic through ingestion of drinking water. Total cyanide was the primary contributor to the elevated HI for the resident receptor, with an ingestion HQ of 7 x 10^{+1}. However, ingestion of free cyanide (2) and fluoride (5) also exceeded the target HI. As individual COPC HQs exceeded the target HI, a target-organ specific evaluation was not conducted for this receptor.

The calculated HI for the resident child exceeded the target HI of 1 at 100 (**Appendix J**, **Table J-3** and **Table J-4**). Similar to the resident adult, exposure to cyanide (total and free) and fluoride were the primary contributors to the elevated HI. Additionally, potential exposure to arsenic in the upper hydrogeologic unit groundwater within the Plume Core Area also resulted in an HQ greater than 1 at 2. As individual COPC HQ exceeded the target HI, a target-organ specific evaluation was not conducted for this receptor.

6.1.13.2 Below Upper Hydrogeologic Unit

As discussed in **Section 2.5.2** and **Section 2.5.3**, CFAC intends to prohibit the use of groundwater beneath the Site for potable use. However, as required by the USEPA, this scenario was evaluated as a conservative evaluation of potential health risk in the absence of any controls. The risks and hazards associated with the potential future potable use of groundwater in the below upper hydrogeologic unit across the Site are presented in **Appendix J**, **Table J-5** through **Table J-8**. The resident lifetime time weighted average cancer risk did not exceed the upper limit of the USEPA risk range; however, it did exceed the MDEQ management level of 10^{-5} at 4 x 10^{-5} and slightly exceed the target HI of 1 at 3 (**Appendix J**, **Table J-5** and **Table J-6**). Arsenic was the primary cancer risk driver and antimony was the primary non-carcinogenic hazard driver. A target-organ specific evaluation was conducted for this receptor and no target-organ specific HI exceeded the target of 1.

Appendix J, Table J-7 and **Table J-8** present the hazards for the resident child for potential future exposure to COPCs in the Below Upper Hydrogeologic Unit groundwater through potable use. The cumulative HI for this receptor is 4, with potential exposure to antimony resulting in an HQ of 2. As the HQ for antimony exceeded the target HI of 1, a target-organ specific evaluation was not conducted for this receptor.

6.2 Characterization of Background Risk Contribution

The results of the Phase I SC program indicated that naturally-occurring metals were detected in soil and sediment samples across the Site. Concentrations of some metals are consistent with regional estimates of background concentrations; however, the areal distribution and magnitude of metals concentrations around certain Site features (e.g., North Percolation Ponds and associated ditches) indicate that some metals may be present as a result of Site operations. The Phase II SC Scope of Work included a Background Investigation to characterize the concentrations of COPCs in areas outside the Site that are unaffected by historic Site operations or other readily identifiable, anthropogenic sources of contamination. The background investigation generated the data necessary to frame the risk characterization results with the relative contribution of background COPC concentrations described in **Section 6.1.1** through **Section 6.1.13**.

The Background Investigation developed data for numerous potentially Site-related COPCs including cyanide, fluoride, PAHs, metals, and dioxin and furan compounds (Roux, 2019). Soil samples were collected from four background reference areas that were determined to be representative of the various soil types at the Site. Surface water and sediment samples were collected from upstream areas within Cedar Creek and the Flathead River. The Phase II SC DSR (Roux, 2019) provides a detailed description of the scope and results of the Background Investigation including a detailed statistical evaluation of the data for comparison of the background analytical media data to the Site analytical media data generated within the various Site exposure areas.

As described in the Phase II Data Summary Report, (Roux, 2019) soil background locations were distal to industrial operations at CFAC and have no known waste materials present. Background soil samples were collected from similar soil types as soils identified on the Site. Surface water and sediment sampling locations targeted areas hydraulically upgradient of the Site. Background locations for aquatic environments were located upstream of the Site in locations with similar habitats and substrate characteristics to aquatic exposure areas at the Site. Data from these samples were used to calculate general statistics on background constituents, including BTVs that are intended to represent upper-bound background concentrations. A full description of the background area sampling and data evaluation is presented in the Phase II DSR (Roux, 2019).

The results of the background sampling from the Phase II SC and statistical data analysis indicate that many of the metal concentrations observed in soil samples are likely a result of metals present at background concentrations. However, the areal distribution of metal detections and the magnitude of metal concentrations around certain Site features indicate that some metals may also be present as a result of the former operations. The low concentrations of dioxin and furan compounds observed throughout the Site (including the Western Undeveloped Area) similar to concentrations in background reference locations.

The concentrations of fluoride observed in Aluminum City wells are consistent with background concentrations of fluoride that are reported within Flathead County, Montana by MDEQ (2017) (https://dphhs.mt.gov/publichealth/oralhealth/OHFluoride.aspx). **Appendix K** includes a statistical analysis that was performed on the groundwater samples from Aluminum City water supply wells and Flathead County public water supply (PWS) wells including groundwater data, outlier tests, graphs, and

ProUCL output. The results of the analysis indicate the mean fluoride concentration beneath Aluminum City is less than the mean concentration in Flathead County PWS wells. The comparison of background and Site surface water analytical data indicated that total cyanide, free cyanide, fluoride, select total and dissolved metals, and select PAHs in surface water are potentially Site-related within most or all (specific to analyte and feature) of the surface water features.

As described in the risk characterization and summarized in **Table 9-36**, estimated risks exceeding *de minimis* levels (i.e., ELCR greater than 10^{-6}) or HI greater than 1 were only identified for a limited number of exposure scenarios, and only within selected exposure areas. In addition, as identified in the applicable **Table 9s** that correspond to these scenarios, only a limited number of COPCs were found to be contributing to estimated risks exceeding *de minimis* levels. These COPCs included select PAHs, arsenic, and manganese. The following two sections provide further discussion of these COPCs to frame the results of the risk characterization for the exposure scenarios and exposure areas where estimated risks exceeded *de minimis* levels.

6.2.1 Hypothesis Testing Outcomes

The statistical evaluation of the background data in the Phase II DSR included two-sided hypothesis testing to compare the analyte concentrations detected within background areas to those detected within the Site. The hypothesis testing was conducted using Background Test Form 2 with alpha at 0.10. When using Form 2, if the null hypothesis was accepted, the analyte was retained as a potentially Site-related COPC. If the null hypothesis was rejected, the analyte was considered as not Site-related.

Table 9-37 presents the outcome of the hypothesis testing for the COPCs contributing to estimated risks exceeding *de minimis* levels discussed in **Section 6.1.1** through **Section 6.1.13**; however, exposure scenarios for the North Percolation Pond sediment data, Operational Area soil ISM data, and groundwater data were not included because these three scenarios and associated media were not evaluated during the background investigation.

The data within **Table 9-37** indicated that PAHs were considered potentially Site-related in all instances. Hypothesis testing identified arsenic in soil as potentially Site-related in three of the exposure areas where estimated risks exceed *de minimis* levels: Central Landfills Area, Industrial Landfills Area, and, the North-Central Undeveloped Area. Manganese was not Site-related in the two exposure areas where it contributed to estimated risks exceeding *de minimis* levels.

Although hypothesis testing results indicated arsenic was potentially Site-related in three exposure areas, it should be noted that this is not conclusive evidence that the COPC is, in fact, Site-related. As noted above, the analytical approach utilized Background Test Form 2 that starts with the presumption (i.e., the null hypothesis) that the COPC is Site-related. Overcoming this presumption (i.e., rejecting the null hypothesis) requires that the data contain evidence of no substantial contamination; a burden of proof that is difficult to achieve statistically. Therefore, this was a conservative approach, designed to be protective of human health and the environment by minimizing the potential to erroneously dismiss a Site-related COPC from further evaluation in the risk assessment.

6.2.2 Relative Contribution of Background to Estimated Risk

The statistical evaluation of the background data included calculation of mean concentrations and BTVs for each constituent within each background area dataset. **Table 9-37** presents the mean concentration for the primary risk drivers exceeding *de minimis* (10^{-6}) and HI of 1. As noted previously, North Percolation Pond sediment data, soil ISM data, and groundwater data were not evaluated during the background investigation; therefore, an evaluation of potential contribution from background was not conducted.

The relative contribution of background to estimated risk is directly proportional to the percentage of the EPC that is comprised of background concentration. **Table 9-37** provides relative percentages based upon the comparison of the background mean concentration to the EPC and the calculated ELCR and HQ for each constituent based on the applicable background concentration for the exposure scenario. The use of arithmetic mean provides a lower end estimate of the relative contribution.

Although PAHs were detected in many background samples, **Table 9-37** indicated that the PAH background relative contribution to estimated risk was always less than 1 percent, the ELCR ranged from 10^{-9} to 10^{-11}, and the HI ranged from 10^{-5} to 10^{-6}. This provided further support in the hypothesis testing outcome that identified PAHs as potentially Site-related in all instances.

With respect to arsenic, the background relative contribution to estimated risk based upon the mean background concentration ranged from 50 percent to 87 percent and the ELCR ranged from 9×10^{-7} to 1 to 10^{-6} (**Table 9-37**). This provided further support in the hypothesis testing outcomes that indicated arsenic was not Site-related. In addition, within the three areas where hypothesis testing indicated arsenic was potentially Site-related, the background concentrations accounted for the majority, if not all, of the ELCR.

With respect to manganese, the background relative contribution to estimated risk based upon the mean background concentration ranged from 72 percent to 75 percent and the HI was 1 (**Table 9-37**). This provided further support in the hypothesis testing outcomes that indicated manganese was not Site-related.

6.3 Uncertainty Analysis

The procedures and assumptions used to assess potential human health risks in this and similar BHHRAs are subject to a wide variety of uncertainties. However, the presence of uncertainty is inherent in the risk assessment process, from the sampling and analysis of chemicals in environmental media to the assessment of exposure and toxicity, and risk characterization. The USEPA recommends multiple lines of evidence and collection of additional data as appropriate to reduce the uncertainty. In addition, USEPA (1989) addresses the approach for conducting an uncertainty analysis. An analysis of uncertainty associated with the risk estimates and characterization was conducted in a semi-quantitative approach, and was used to address potential data gaps. Typically, uncertainty exists in characterization of the nature and extent of contamination, in environmental fate and transport modeling, and in the magnitude and duration of exposure of various receptors, and in toxicological values used to characterize risks or hazards. Accordingly, Site investigations and evaluations should include a discussion of the likely bias and magnitude of errors associated with uncertainties in estimating the risk. A fair and balanced characterization of uncertainty is important because most risk estimates are not highly precise

and many risk managers are tempted to over-interpret the resulting values. Risk characterization, including a well-performed uncertainty analysis, will place the risk estimates in the proper perspective for informed decision-making.

The term "uncertainty" is often used in risk assessment to describe what are, in reality, two conceptually different terms: uncertainty and variability. Uncertainty can be described as the lack of a precise knowledge resulting in a fundamental data gap. Variability describes the natural heterogeneity of a population. Uncertainty can sometimes be reduced or eliminated through further measurements or study. By contrast, variability is inherent in what is being observed. Although variability can be better understood, it cannot be reduced through further measurement or study, although it may be more precisely defined. However, the additional cost of further data collection may become disproportional to the reduction in uncertainty.

The BHHRA's approach to presenting the potential risks was consistent with the goal of RME representing the high end of the possible risk distribution, which is generally considered to be greater than the 90th percentile. However, these estimates were based on numerous and often conservative assumptions and, in the absence of definitive information, assumptions were used to ensure that actual Sites risks were not underestimated. The cumulative effect of these assumptions can result in an analysis with an overall conservativeness greater than the individual components.

Accordingly, it is important to note that the risks presented in the BHHRA were based on numerous conservative assumptions in order to be protective of human health, and bias risk estimates toward an overestimation of risk rather than an underestimation. Because of this conservative bias, actual risks are likely to be less than the estimates.

The following discussion provides an evaluation of uncertainty throughout the data acquisition and evaluation process including Site characterization and sampling program design, sample collection and analysis, and estimate of risk. The table below summarizes the results of the uncertainty discussion and provides the perceived magnitude of uncertainty and associated impact on estimating risk.

Summary of Uncertainty

Risk Assessment Section	Description of Uncertainty	Magnitude of Uncertainty	Effect on Risk Assessment
Site Characterization	Adequacy of Site characterization.	Low	Low potential to underestimate risks.
Hazard Identification – Data quality and robustness	Lack of sufficient samples to characterize environmental media.	Low	Low potential to underestimate or overestimate risks.
Hazard Identification – spatial and temporal representativeness of each media type	Lack of sufficient samples to characterize environmental media spatially or over time.	Low	Low potential to underestimate or overestimate risks.

Risk Assessment Section	Description of Uncertainty	Magnitude of Uncertainty	Effect on Risk Assessment
Hazard Identification – estimation of Cr(III) and Cr(VI) concentrations	Chromium speciation was not performed on all soil samples; therefore, the concentrations of Cr(III) and Cr(VI) were estimated based on available total and Cr(VI) soil data.	Low	Low potential to underestimate or overestimate risks.
Hazard Identification – Cr(VI) assumed to be present at all soil locations	Cr(VI) was calculated for each soil sample; however, Cr(VI) was only detected in 15 percent of the samples analyzed for Cr(VI).	Moderate	Moderate potential to overestimate risks.
Hazard Identification – Non-Detected COPCs	Evaluated using maximum MDL.	Low to moderate	Low potential to underestimate risks.
Hazard Identification – Background Evaluation	Statistical evaluation of background data was conducted using conservative Background Test Form 2 approach.	Low	Low potential to overestimate risks.
Hazard Identification – Selection of COPCs – Exclusion of COPCs Exceeding SSLs	Exclusion of constituents detected in soil that exceed RBSSLs, but were not identified as COPCs in groundwater.	Low	Low potential to underestimate risks.
Hazard Identification – Selection of COPCs – COPCs without Screening Levels	Lack of screening levels to compare constituent data.	Low	Low potential to underestimate risks.
Hazard Identification – Selection of COPCs – COPCs with Detection Limits Exceeding Screening Level	Constituents not detected, but whose detection limit exceeded applicable screening level.	Low	Low potential to underestimate risks.
Hazard Identification – Selection of COPCs – Use of Surrogate Screening level	Use of surrogate screening values in selection of COPC (e.g., Cr(VI) screening level for total chromium).	Low to Moderate	Low to medium potential to overestimate risks.
Fate and Transport – BCF in Fish	Literature BCF values were used instead of results from Site-specific fish tissue samples.	Moderate-High	High potential to overestimate risks, particularly for estimated PAH concentrations in fish tissue based on literature-based BCF values.

Risk Assessment Section	Description of Uncertainty	Magnitude of Uncertainty	Effect on Risk Assessment
Exposure Assessment – Exposure Pathways Not Evaluated	The CEM presented an extensive list of known potential complete exposure pathways and receptors based on input from USEPA, MDEQ, regional authorities, and CFAC personnel; however, the unlikely potential exist for an unknown receptor or exposure pathway.	Low	Low potential to potentially exclude exposure pathways and underestimate risks.
Exposure Assessment – Exposure Point Concentrations	The 95-percent UCL on the mean for the EPCs was not always calculated due to insufficient sample size, and the maximum concentration represented the EPC.	Low	Low potential to overestimate or underestimate risk.
Exposure Assessment – Estimate of fish and game tissue concentrations	Fish consumption EPCs used literature BCF values versus Site-specific fish tissue samples.	Moderate	This has the high potential to overestimate risks, particularly for estimated PAH concentrations in fish tissue based on literature-based BCF values.
Exposure Assessment – Exposure Assumptions	Landfill management worker exposure frequency was assumed to be the same exposure as full-time industrial worker; however, the worker exposure may actually be less.	Moderate	This has a moderate potential to overestimate risks
Exposure Assessment – Exposure Assumptions	Recreational receptor exposure assumptions based on personal observations; however, the actual recreational activity may be lower or higher.	Moderate	Moderate potential to overestimate or underestimate risks based on comprehensive interviews and surveys of recreational activity.
Exposure Assessment – Exposure Assumptions	The adjustment of venison EPCs based on fat content.	Low	Low potential to underestimate risks.
Toxicity Assessment - Toxicity Values	Toxicity values are often based on non-human receptors.	Moderate	Moderate potential to overestimate or underestimate risk.
Toxicity Assessment - Surrogates	Surrogate toxicity criteria used for risk characterization (e.g., free cyanide RfD used to estimate potential hazards associated with exposure to total cyanide).	Moderate	Moderate potential to overestimate or underestimate risk.

Risk Assessment Section	Description of Uncertainty	Magnitude of Uncertainty	Effect on Risk Assessment
Cumulative Risk	Multiple exposure scenarios per receptor.	Low	Low to moderate potential to overestimate risks.

BCF = bioconcentration factor
CEM = conceptual exposure model
CFAC = Columbia Falls Aluminum Company
COPC = constituent of potential concern
EPC = exposure point concentration
MDEQ = Montana Department of Environmental Quality
MDL = method detection limit
PAH = polycyclic aromatic hydrocarbons
RBSSL = risk-based soil screening level
RfD = reference dose
SSL = soil screening level
UCL = upper confidence level
USEPA = United States Environmental Protection Agency

6.3.1 Uncertainties in Site Characterization

The Phase II SC DSR (Roux, 2019) and the updated CEM (**Section 2**) support the position that the Site was well characterized, aside from some localized areas as discussed further in **Section 6.3.2.1**, and the nature and extent of contamination was defined. While there was inherent uncertainty related to the adequacy of release characterization, identification of COPCs, and complexity of the subsurface environment, the phased investigation approach and broad suite of chemicals analyzed as COPCs minimized the potential for underestimating the extent of potential contamination. Therefore, while there was a potential uncertainty related to the completeness of characterization, because of the robustness of the dataset, the potential to underestimate risks to the receptors was considered low.

6.3.2 Uncertainties in Hazard Identification

The following sections present an evaluation of the potential uncertainties associated with the Hazard Identification. As discussed in **Section 3**, the components of the Hazard Identification include the data used in the BHHRA and selection of COPCs.

6.3.2.1 Quality of Data and Robustness Used in Risk Assessment

The data used in the BHHRA were collected during the Site Characterization in accordance with sampling and analyses plans, and the quality was evaluated in the Phase I and Phase II SC DSRs (Roux, 2017a and Roux, 2019). Based on the data validation, approximately 0.1 percent of the analyses were rejected. The magnitude of uncertainties associated with data collection and quality of laboratory analyses were considered to be low.

A potential source of uncertainty in sample data was the lack of sufficient samples to characterize environmental media. Risks and hazards calculated based on a low number of samples may result in an under- or over-estimate of risk because the samples may not be spatially or temporally representative of the exposure area. Efforts were made to reduce this source of uncertainty by increasing the sample quantity from the Phase I SC program during the Supplemental South Pond Assessment and the Phase II SC. Of the 53 exposure scenario datasets evaluated in this BHHRA, only 7 had fewer than 10 samples within the dataset. The primary environmental media in the limited datasets were surface water and sediment in the undeveloped areas of the Site (**Appendix D**). The datasets with fewer than 10 samples included the North Percolation Pond surface water and sediment, Central Landfill sediment, Eastern

Undeveloped Area surface water and sediment, Western Undeveloped area sediment, and Backwater Seep Sampling Area soil (0-0.5 ft-bgs). Therefore, it was possible that the data for these exposure scenarios may not adequately characterize Site concentrations because of the limited number of samples collected; however, the magnitude of this source of uncertainty was considered low to medium because the limited number of samples usually was due to lack of available media to be sampled. Either surface water was not present, or if surface water was not present, the sediment sample was considered soil material and incorporated in the soil media risk evaluations.

For the ISM samples, a single replicate was collected from most of the grid cells in the Operational Area. For DUs where only a single incremental sample was collected, the results were adjusted based on the variance observed for each chemical in each soil depth interval, as reflected by the average RSD for that chemical across the four DUs where triplicate samples were collected. The use of a single replicate sample has the potential to overestimate or underestimate risks associated with exposures to COPCs in the ISM samples; and this potential may vary from high to low based on the overall variability of the concentrations of the COPCs in the DU. However, because the ISM requires a high number of DUs to be sampled, the potential to overestimate or underestimate risks is equally likely. In addition, as a conservative practice, the highest adjusted concentration was used to evaluate potential risks to receptors in the ISM exposure areas (Main Plant Area and Central Landfill Area).

Another source of uncertainty within the dataset is the potential for soil samples with finer fractions to have higher concentrations, specifically of metals, than coarser materials. To evaluate this potential, a statistical analysis of the difference between bulk lead concentrations versus sieved lead concentrations was performed as part of the Phase I SC. Details regarding this analysis were presented in the Phase I SC DSR (Roux, 2017a). The result of this analysis concluded that there was a tendency of lead to concentrate in the finer fractions of soils at the Site. Because of the potential for metals concentrations to be higher in finer fractions of soils, the EPCs calculated using bulk soil sample results may be biased low, and therefore result in a potential underestimation of risks. However, based on the conservative nature of the PEF utilized, the magnitude of the uncertainty is considered to be low to medium.

6.3.2.2 Data Adequacy - Spatial and Temporal Representativeness of Each Media Type

A potential source of uncertainty associated with the data used in the BHHRA was the spatial and temporal representativeness of each media type. Adequate spatial distribution of sampling was identified as a data gap in the BHHRA WP and samples were included in the Phase II SC program to provide additional spatial coverage of samples. Additionally, multiple rounds of surface water and groundwater samples were collected at both low-water and high-water seasons to assess the temporal variability of surface water and groundwater quality at the Site. Therefore, the magnitude of this uncertainty was low. The potential uncertainty could result in an over- or under-estimate of risks and hazards.

Additional soil samples were collected during the Phase II SC to increase the spatial density of sampling locations within exposure areas where limited sampling occurred during Phase I SC, and to characterize undeveloped areas of the Site where historical Site operations did not occur (Roux, 2019). Given that these areas were not developed as part of Site operations, potential COPC migration pathways to these areas are limited primarily to overland surface runoff and potentially localized historical atmospheric deposition. As described in the Phase II SAP (Roux, 2018c), the variability in the Phase I data set for each exposure area was evaluated using ProUCL to estimate the number of additional samples required to support the calculation of statistically valid EPCs. As a result of this analysis, additional samples also

were added to some of the exposure areas that were more densely sampled during Phase I. Therefore, the magnitude of this uncertainty was considered low. As described in the Phase II DSR, concentrations of COPCs generally decrease with increasing depth. The surface soil interval (0 to 0.5 ft-bgs) generally has the greatest concentrations of COPCs. Because surface samples were collected from 0 to 0.5 ft-bgs, there is the potential that COPC concentrations could be higher in the 0 to 2-inch interval due to greater potential for surficial affects from historical atmospheric deposition (specifically PAHs).

Another source of potential uncertainty is the spatial variability in constituent concentrations for AOCs where residential land use is a potential future use (i.e., Western Undeveloped Area) and the potential for hot spots. In the Western Undeveloped Area, cyanide concentrations in surface soil (0-0.5 ft-bgs) typically exceeded the USEPA RBSSL of 0.0015 mg/kg. No concentrations of cyanide exceeded the USEPA Residential RSL of 2.3 mg/kg in the surface or shallow intervals (0-2 ft-bgs). Concentrations decreased with increasing depth such that cyanide was typically not-detected or exceeded only the USEPA RBSSL in the shallow (0.5-2 ft-bgs) and intermediate (2-10 and 10-17 ft-bgs) depth interval. Similarly, concentrations of fluoride in the Western Undeveloped Area did not exceed the USEPA Residential RSL of 310 mg/kg in any depth interval. In surface soil, fluoride exceeded the USEPA RBSSL of 12 mg/kg in only two locations. Concentrations decreased with increasing depth such that fluoride was not detected above the USEPA RBSSL in any shallow or intermediate depth samples. Benzo(a)pyrene was detected at concentrations exceeding the USEPA Residential RSL of 0.11 mg/kg in one three surface soil and one shallow soil sample locations.

In an effort to evaluate if potential hot spots in soil are present across the Site, Site-wide concentrations for cyanide, fluoride, and benzo(a)pyrene were compared to their respective BTVs. Background datasets representative of the primary soil types identified on-Site were compared to corresponding human health exposure areas on-Site. A summary table presenting which background reference areas were compared to the on-Site exposure areas is presented below.

Background Reference Area	Onsite Exposure Area / Site Feature
SO #1 – Glacial Till and Alluvium	Main Plant Area (Exposure Area #1) North Percolation Pond Area (Exposure Area #2) Central Landfill Area (Exposure Area #3) Industrial Landfill Area (Exposure Area #4) North-Central Undeveloped Area (Exposure Area #6) Western Undeveloped Area (Exposure Area #7)
SO #2 and #3 – Fluvial Deposits and Riverwash	South Percolation Pond Area (Exposure Area #8) Flathead River Area (Exposure Area #9) Backwater Seep Sampling Area (Exposure Area #9a)
SO #4 – Mountainous Land with Glacial Deposits	Eastern Undeveloped Area (Exposure Area #5)

As presented in the thematic maps included in **Appendix L**, Site concentrations were compared to the following criteria ranges:

- Analyte not detected
- Not Detected to less than the BTV
- Greater than the BTV
- Greater than 10x the BTV

The thematic maps indicate that hot spots, or areas of elevated concentrations as compared to background concentrations, are not present in the Western Undeveloped Area. COPCs in the Western Undeveloped Area are not present at concentrations greater than 10 times (10x) the BTV at any depth intervals (0 to greater than 22 ft-bgs).

Concentrations of cyanide in the Western Undeveloped Area sporadically exceeded the respective BTV of 0.273 mg/kg, but were generally less than the BTV. Site-wide concentrations were also typically less than the BTV, with the exception of industrial areas of the Site (i.e., North Percolation Ponds, Main Plant Area, South Percolation Ponds). Concentrations of cyanide typically decreased with increasing depth, such that only one sample exceeded 10x the BTV (2.73 mg/kg) in intermediate depth intervals (10-17 ft-bgs) in the former cathode soaking pit.

Concentrations of fluoride in the Western Undeveloped Area often exceeded the respective BTV of 4.171 mg/kg, but did not exceed 10x the BTV (41.71 mg/kg). Similar to cyanide, concentrations in the industrial areas of the Site typically exceeded 10x the BTV. Concentrations of fluoride in the Western Undeveloped Area decreased with increasing depth such that no samples exceeded the BTV in the intermediate depth interval (10-17 ft-bgs), with the exception of one sample along the boundary of the Western Undeveloped Area and Main Plant Area.

Concentrations of benzo(a)pyrene in the Western Undeveloped Area sporadically exceeded the respective BTV of 0.0317 mg/kg, but were generally less than the BTV. Concentrations in the Western Undeveloped Area decreased with increasing depth, such that concentrations in the shallow interval (0.5-2 ft-bgs) were either non-detect or less than the BTV, with the exception of one sample. In industrial areas of the Site, concentrations typically exceeded 10x the BTV (0.317 mg/kg).

Based on a review of the statistical data, thematic maps from the Phase II DSR, and thematic maps attached to this response to comments, it is not evident that localized hot spots are present within the Western Undeveloped Area. If residential development is considered by CFAC in the future, the need for denser sampling will be considered and addressed if appropriate as part of a pre-design investigation for a selected remedy or specific property development plan. Therefore, the magnitude of this uncertainty was low. The potential uncertainty could result in an over- or under-estimate of risks and hazards.

6.3.2.3 Calculation of Hexavalent and Trivalent Chromium Concentrations

Twenty soil samples were analyzed for both total and Cr(VI). To determine the most appropriate areas to collect soil samples to be analyzed for total chromium and Cr(VI), the total chromium results from the Phase I dataset were compared to the USEPA Residential and Industrial RSLs for Cr(VI) (carcinogenic and non-carcinogenic, HQ=0.1). The exceedances of the non-carcinogenic Residential RSLs were concentrated in the northern portion of the Main Plant Area and southern portion of the former Operational Area, and therefore, the 10 proposed samples were placed throughout this area, since this

is the area in which chromium concentrations appears to be elevated relative to undeveloped areas of the Site.

A statistical evaluation was performed to develop a Site-specific ratio of Cr(VI) and Cr(III) to total chromium results based on these samples (Phase II SC DSR, Roux 2019). The ratio was applied to the remainder of the soil data set for total chromium to calculate estimated concentrations of Cr(VI) and Cr(III). Because there were a relatively low number of soil samples analyzed for Cr(VI) versus the number of total chromium samples, the ratio may under- or over-estimate the ratio of Cr(III) and Cr(VI) present in Site soils. The magnitude of this uncertainty was believed to be low based on the statistical analyses of the data distributions and comparison between and within sampling areas.

Additionally, Cr(VI) was only detected in 15 percent of the soil samples submitted for chromium speciation analyses. However, an estimated Cr(VI) concentration was derived for each soil sample and treated as a detection of Cr(VI). Therefore, there was a moderate potential to overestimate risks associated with potential exposure to Cr(VI).

6.3.2.4 Background Analysis and Hypothesis Testing

A statistical comparison of background and Site analytical data for soil, surface water, and sediment was performed in accordance with the methods described in the Background Investigation Sampling and Analysis Plan (Background SAP, Roux, 2018b). It should be noted that inclusion of an analyte in these tables was not conclusive evidence that the analyte was, in fact, Site-related. The statistical evaluation was performed to determine if concentrations of COPCs in Site soil, surface water, and sediment were comparable to or exceeded the COPC concentrations in the background reference areas; and, therefore, were at least in part attributable to a Site-related source. If COPC concentrations at the Site were not significantly different from background concentrations, the COPC concentrations may represent regional conditions that were not related to Site activities. Details regarding the analytical approach were described in the Phase II SC DSR (Roux, 2019).

The results of these comparisons were included in the Phase II SC DSR (Roux, 2019) Section 5.5 as summary tables that identified COPCs retained as potentially Site-related in each exposure area for soil, surface water, and sediment. As shown in these tables, a large number of analytes have been retained for some exposure areas. The analytical approach utilized Background Test Form 2 that starts with the presumption (i.e., the null hypothesis) that the analyte is Site-related. Overcoming this presumption (i.e., rejecting the null hypothesis) requires that the data contain evidence of no substantial contamination; a burden of proof that is difficult to achieve statistically. This was a conservative approach, designed to be protective of human health and the environment by minimizing the potential to erroneously dismiss a Site-related analyte from further evaluation in the risk assessment. Therefore, the potential to overestimate risks was low.

6.3.2.5 Non-Detect Results - Detection Limit Adequacy

A detailed evaluation of detection limit adequacy was performed in the Phase II SC DSR (Roux, 2019). Overall, the evaluation of MDLs indicated that the MDL for non-detect results were sometimes above the lowest screening criteria (i.e., USEPA Protection of Groundwater RBSSLs, USEPA Tapwater RSLs) for multiple COPCs including cyanide. As noted above, these RSLs were designed to be conservative

screening levels, and these RSLs were often not attainable in the laboratory. However, the MDLs were largely adequate for the other screening levels evaluated during the multiple rounds of sampling.

During scoping of the RI/FS, CFAC and Roux required that each laboratory being considered for use on the project provide a list of attainable MDLs. During the analytical laboratory selection process, Roux evaluated the proposed MDLs against the desired limits based on the screening criteria. This information was provided in the Phase I SAP (Roux, 2015b), Phase I SAP Addendum (Roux, 2016), and Phase II SAP (Roux, 2018c). TestAmerica was selected to be the primary analytical laboratory because of their ability to achieve the most desired detection limits of all laboratories considered. While efforts were made to achieve the lowest detection limits technically possible, the potential to under-estimate risks due to this source of uncertainty was low to high (refer to **Section 6.3.2.6.2** for additional discussion).

6.3.2.6 Selection of COPC Process

The selection of COPC process outlined in **Section 3.4** resulted in the exclusion of some constituents that exceed the RBSSL, constituents that were not detected but had an MDL greater than an available risk-based screening level, or constituents without risk-based screening levels because no peer reviewed toxicity values were available. The following sections discuss these potential sources of uncertainty in further detail.

6.3.2.6.1 Constituents Exceeding the RBSSL but Not Retained as COPCs

Table 2-50 identifies the constituents in soils that were not selected as COPCs, but the maximum detection exceeded the RBSSL. These COPCs were not selected for soils because the COPCs were not detected in groundwater within the Upper Hydrogeologic Unit. Therefore, these constituents were not a concern for the leaching to groundwater exposure pathway. This exclusion of these COPCs had the potential to underestimate the risks; however, the magnitude of the uncertainty was expected to be low.

6.3.2.6.2 Non-Detect Results with Detection Limits Exceeding Screening Levels

Table 10-1a through **Table 10-1d** identify constituents that were not detected but had MDLs in one or more samples that exceeded the screening levels used in the selection of COPC process. For the soil samples (**Table 10-1a**), all but one chemical had a frequency of the MDL exceeding the screening level at less than 6 percent, and only 7.5 percent of the MDLs for 4,6-dinitro-2-methylphenol exceeded screening levels. Similar to soils, the MDLs for 4,6-dinitro-2-methylphenol of 13 percent of the sediment samples exceeded the screening levels while the remaining constituent MDLs exceeded less than 4 percent of their respective screening levels (**Table 10-1b**).

Constituents not detected in surface water samples (**Table 10-1c**) and groundwater samples (**Table 10-1d**) also had MDLs exceeding the relevant screening criteria. For surface water samples the exceedance frequency ranged from 25 to 100 percent; for groundwater samples, the exceedance frequency ranged from 1.6 percent to 100 percent.

There is the potential to underestimate risks by not selecting COPCs where MDLs were greater than the screening levels. Given the frequency at which the MDLs exceeded the screening levels, the magnitude of this uncertainty is low for soils and sediments and moderate to high for surface water and groundwater.

6.3.2.6.3 Constituents without Screening Levels

Table 10-2a through **Table 10-2d** identify constituents that do not have screening levels. These constituents were excluded from the selection of COPC process for soil, surface water, sediment, and groundwater. In soil samples collected across the Site, 19 of the 34 constituents in soils that did not have screening levels were not detected in any soil sample across the Site (**Table 10-2a**). Of the remaining 15 constituents, 4 are essential nutrients (calcium, magnesium, potassium, and sodium) that were discussed in **Section 3.4.1.1.** Calcium, magnesium, and potassium were found to not be of concern because they are within the upper limits of naturally occurring metals in the western U.S. (EHS Support, 2019b). Therefore, the inability to quantify risks associated with elevated nutrients such as calcium, magnesium, and potassium in soil at the Site represents a relatively minor uncertainty. The remaining metal detected in soil samples without a screening level is total chromium, which was evaluated using hexavalent and trivalent data and conservative estimates of hexavalent and trivalent chromium concentrations (**Section 3.1.1.1)**. Therefore, there is minor uncertainty associated with the lack of a screening level for total chromium in soils. There are VOCs that did not have screening levels; however, as discussed in **Section 3.4.1.2,** VOCs were determined not to be COPCs at the Site due to the multiple line of evidence approach presented in **Section 3.4.1.2**. Therefore, there is minor uncertainty associated with the lack of screening levels for VOCs. Total PCBs were only detected in 10 of 434 samples (or 2 percent) and were excluded on the basis of low frequency of detection. Therefore, there is a minor uncertainty associated with the lack of screening toxicity value for total PCBs. The remaining 7 constituents are SVOCs, 5 of which are PAHs (acenaphthylene, benzo(g,h,i)perylene, benzo[e]pyrene, perylene, and phenanthrene).

As select PAHs were found to be primary risk drivers in some soil exposure scenarios, additional evaluation of these chemicals was conducted. A common toxicological surrogate for non-carcinogenic PAHs such as acenaphthylene, benzo(g,h,i)perylene, and phenanthrene is pyrene. The USEPA RSL for Residential Soil for pyrene is 180 mg/kg. No detected concentrations of acenaphthylene exceed the RSL for pyrene in any soil sample at the Site. Benzo(g,h,i)perylene, benzo[e]perylene, phenanthrene, perylene were detected at concentrations greater than the pyrene screening level in the North Percolation Pond Area; benzo(g,h,i)perylene and phenanthrene were detected in the Main Plant Area above the pyrene RSL; and, phenanthrene was detected in the Central Landfill Area above the pyrene RSL. The table below presents a summary of the maximum detected concentrations of these chemicals and pyrene, and the maximum HI for pyrene in each exposure scenario where pyrene was selected as a COPC. For the Main Plant Area and the North Percolation Pond, the concentrations of these chemicals are less than that of pyrene; the HI for pyrene is 3 orders of magnitude below 1. Potential contribution to the cumulative hazards presented by these chemicals would be lower than that of pyrene. While pyrene was not selected as a COPC for the Central Landfill Area, the receptors are similar to those evaluated in the Main Plant Area and North Percolation Pond Area, and the concentration of phenanthrene is less than pyrene in both exposure areas. Therefore, exclusion of these constituents without screening levels results in a minor uncertainty in the risk assessment.

Constituent	Maximum Concentration (mg/kg)		
	Main Plant Area	North Percolation Pond Area	Central Landfill Area
Benzo(g,h,i)perylene	290	2200	62

Constituent	Maximum Concentration (mg/kg)		
	Main Plant Area	North Percolation Pond Area	Central Landfill Area
Benzo[e]pyrene	NA	2100	NA
Perylene	NA	850	NA
Phenanthrene	440	1300	240
Pyrene	730	3200	150
Maximum HI for Pyrene	1×10^{-3}	6×10^{-3}	Not Selected As COPC

NA = not analyzed
mg/kg = milligrams per kilogram
COPC = constituent of potential concern

For surface water samples, of the 22 constituents, 12 were not detected in any sample collected from the Site (**Table 10-2b**). Similar to soils, the remaining detected constituents were either essential nutrients or SVOCs including the PAHs benzo(g,h,i)perylene, benzo[e]pyrene, perylene, and phenanthrene. As discussed in previous sections, the exclusion of essential nutrients represents a relatively minor source of uncertainty. The USEPA Tapwater RSL for pyrene that was used to select COPCs for surface water is 12 µg/L; no concentration of these PAHs exceeded this screening level. Therefore, exclusion of these constituents from further evaluation as COPCs in this risk assessment represents a source of minor uncertainty.

Table 10-2c presents the 34 constituents in the sediment samples that did not have a screening level. Similar to soil and surface water, the 13 detected constituents were essential nutrients, chromium, SVOCs and VOCs. As noted previously, the essential nutrients are considered a source of minor uncertainty in the risk assessment. The maximum concentration of chromium did not exceed the BTVs developed for sediment, and the PAHs did not exceed the screening level for pyrene. Therefore, the exclusion of these constituents from the sediment COPC lists represents as source of minor uncertainty.

Seventeen constituents in groundwater samples did not have screening levels (**Table 10-2d**). Of these constituents, 11 were not detected in any groundwater sample and 2 were only detected in 3 percent of the samples. The remaining constituents were essential nutrients and, as discussed previously, are considered a minor source of uncertainty. Therefore, exclusion of these constituents in groundwater from the risk assessment represents a minor source of uncertainty.

6.3.3 Uncertainties in Exposure Assessment

The following sections present an evaluation of the potential uncertainties associated with the Exposure Assessment. As discussed in **Section 4**, the purpose of exposure assessment was to predict the magnitude and frequency of potential human exposure to COPCs based on potentially complete exposure pathways.

6.3.3.1 Exposure Pathways Not Evaluated

Potential risks or hazards associated with exposure pathways not evaluated as part of this BHHRA were believed to be minor and or insignificant in compared to the major pathways evaluated for the receptors identified in **Section 2.5**. Exposure pathways were considered incomplete for a receptor within an exposure area if the media was not present (e.g., exposure pathways associated with exposure to COPCs in surface water and sediment were not evaluated for the Main Plant Area because there are no water bodies present within this exposure area) or a receptor was not observed or believed to be accessing the exposure area (e.g., recreational trespasser [ATV rider] within the Main Plant Area). While the potential to underestimate risk was present, the magnitude of this uncertainty was considered low.

6.3.3.2 Exposure Point Concentrations

The EPCs for the majority of the exposure pathways was the 95-percent UCL on the mean. In some instances, the 95-percent UCL on the mean was not calculated because the dataset was not of sufficient size to perform meaningful statistics. In these instances, the maximum concentration was used to represent the EPC for the exposure. However, because of the small sample size it was not known if the maximum concentration was an overestimate or underestimate of the EPC.

To develop an estimated hexavalent chromium concentration, the total chromium concentrations were adjusted by a factor 0.0275, or 2.75 percent. This ratio is based on the statistical analysis presented in the Phase II DSR (Roux, 2019) on the subset of soil samples submitted for analysis for both total and hexavalent chromium. The sample locations of this subset of soil samples were biased toward the highest detected concentrations of total chromium observed in samples collected at the Site. Therefore, while the calculated mean ratio used to estimate the hexavalent chromium concentrations is less than the maximum ratio of 4 percent observed in the hexavalent chromium dataset, it is considered conservative because of the initial bias toward the greatest concentrations of total chromium. Additionally, hexavalent chromium was only detected in 3 of the 20 samples analyzed for hexavalent chromium; however, this ratio was applied to all chromium results across the Site. Therefore, the potential to underestimate potential risks associated with exposure to hexavalent chromium in Site soils is considered low.

Both total and free cyanide were selected as COPCs for surface water and groundwater. Free cyanide was a component of total cyanide; however, both were carried through the BHHRA. This may result in a potential double-counting of potential hazards from exposure to cyanide in surface water and groundwater.

The samples from the various water bodies on the Site were used to calculate the EPC for the recreationists (ATV rider and hunter). However, there were an unequal number of samples collected in each of the water bodies. This inequality in samples may bias the surface water and sediment EPCs for receptors in less sampled water bodies versus receptors from water bodies with more samples. Any potential bias or uncertainty associated with an individual water body was addressed in the evaluation of the exposure areas where the water body occurs, which assumes 100 percent exposure to that water body. For example, the Recreational Trespasser (Hunter) scenario included the Western Undeveloped Area and the North-Central Undeveloped Areas. The potential exposure to surface waters and sediments within these individual areas were each evaluated for potential exposure based on the surface water and sediment samples located within one exposure area. Therefore, any bias in the

surface water and sediment EPCs associated with the unequal sampling design between the water bodies is considered a minor source of uncertainty.

Studies have shown that biotransfer factors for organic compounds in beef and milk are directly proportional to octanol-water partition coefficients (Travis and Arms, 1988), which is a measure of a chemical's tendency to move from the aqueous phase into lipids. Therefore, an adjustment based on fat content is necessary for venison to avoid overestimating tissue concentrations for organic compounds.

For constituents that were not selected as a COPC for an exposure area, the concentration in soil in the Venison Uptake Model presented in **Appendix H** was not applicable, or effectively set to 0. The constituent was not selected as a COPC for an exposure area because either the constituent was not detected above residential soil screening levels (SSLs) or the constituent was not detected above detection limits. Surrogate concentrations were not used in the Venison Uptake Model because these constituents are assumed to pose minimal and/or negligible risk because these constituents were not selected as COPCs for an exposure area. Including a surrogate value for these chemicals would add uncertainty to the BHHRA.

The EPCs developed for fish consumption used literature BCF values instead of results from Site-specific fish tissue samples. This has the high potential to overestimate risks, particularly for estimated PAH concentrations in fish tissue based on literature-based BCF values. Because the BCF assumes continuous exposure to COPCs in surface water, the migratory nature of the fish would result in less than continuous exposure to the COPCs, and therefore less bioconcentration of COPCs in the fish tissue. The overestimation of the fish tissue concentration would be proportional to the relative degree of time exposed to COPCs.

6.3.3.3 Exposure Assumptions

For the landfill management worker, the exposure frequency was assumed to be the same exposure as full-time industrial worker. Should the landfill management worker not spend the entirety of their shift outside in the landfill exposure areas, the estimated risk could potentially be overestimated. Depending upon the difference between the industrial worker and landfill management worker exposure assumptions, the magnitude of this risk could be low to medium.

Exposure assumptions of recreational receptors were based on personal observations (e.g., Mr. Rich Birdsell, Mr. Steve Wright); however, these observations may overestimate or underestimate actual access to the Site and recreational areas. Based on the anecdotal evidence of knowledgeable guides or facility personnel, the potential uncertainty was considered moderate, and the overall effect on the risk estimate was low.

6.3.4 Uncertainties in Toxicological Assessment

The toxicity assessment step in the BHHRA characterized the relationship between the magnitude of exposure to a COPC and the nature and magnitude of adverse health effects that may result from such exposure (i.e., dose-response relationships). The results of animal studies are used to predict the potential health effects of chemicals in humans. Extrapolation of toxicological data from animal tests is a large source of uncertainty in any risk assessment. There may be important but unidentified differences in uptake, metabolism, and distribution in the body between the test species and humans. Typically, the

animals are administered high doses of a chemical in a standard diet while humans are generally exposed to much lower doses in a highly variable diet. Humans have a 70-year lifetime and may be exposed intermittently for an exposure period ranging from months to a full lifetime. Because of these differences, extrapolation is a source of uncertainty in a risk assessment.

Many carcinogenic compounds have not been shown to be genotoxic. It is currently assumed that exposure to small amounts of any carcinogen poses some probability of causing cancer. Therefore, the guidance for carcinogens assumes that no threshold dose (dose below which no effect would occur) exists for carcinogens. However, non-genotoxic chemicals may indeed have a threshold due to varying mechanisms of toxicity. There is currently considerable scientific and regulatory policy debate on this issue and if an actual threshold does exist for certain compounds; the use of a linear non-threshold approach in this assessment will overestimate risk.

Another source of uncertainty was the use of toxicological surrogates. The RfD used to evaluate total cyanide was the toxicological value for free cyanide. Free cyanide was a component of total cyanide, which also may consist of other, less toxic components. Therefore, the use of the free cyanide RfD had the potential to overestimate risks from exposure to total cyanide.

6.3.5 Uncertainties in Risk Characterization

The purpose of the risk characterization is to provide a conservative estimate of the potential risk resulting from exposure to COPCs identified in the environmental media in the vicinity of the Site. Included in this section is a quantitative estimate of potential carcinogenic and non-carcinogenic risks for each complete exposure pathway for each receptor.

Uncertainties from different sources listed above may be compounded in the risk characterization. For example, if a chronic daily intake for a COPC measured in the environment was compared to an RfD to determine potential health hazard, the uncertainties in the concentration measurement, exposure assumptions, and the toxicology were all expressed in the potential risk characterized. In order to ensure that human health was adequately protected, the BHHRA incorporated conservative (unlikely to underestimate risk) approaches and uncertainty factors.

The BHHRA evaluated multiple exposure scenarios for a given receptor by summing the potential risks for each scenario to estimate the cumulative risks. However, a potential uncertainty in risk characterization was the double counting of risks from exposure to soil and sediment from ephemeral water bodies. For example, for the Landfill Management Worker in the Central Landfill Area, the potential exposure to sediment had an estimated cancer risk of 2×10^{-6}, which exceeds the *de minimis* risk level. If the sediment samples from this water body were included with the soil dataset, the cancer risk would be approximately one-third of the currently estimated scenario. Similarly, the recreational trespasser (ATV rider) exposure included both sediment and soil; however, the likelihood that exposure to both would co-occur at the same exposure frequency during the same ATV ride was low, especially in areas where sediment was collected from an ephemeral water body. The summing of potential receptor risk exposure scenarios (and potentially double counting) was conservative and was a source of uncertainty in the BHHRA. This conservative approach potentially overestimated the cumulative receptor risk, and the potential for overestimation of cumulative risks for a given receptor was considered a moderate magnitude.

7 Summary and Conclusions

This BHHRA evaluated potential human health risks to receptors at the Site. Data collected during the Site Characterization investigation activities within each exposure area were used to characterize potential risks. The receptors evaluated in the current and future scenarios, as appropriate, included industrial workers (industrial worker, landfill management worker, stormwater management worker), construction workers, recreational trespassers (ATV rider and hunter), adolescent trespassers, adolescent and adult recreationist (boaters, floaters, and fisher), and residents (adult and child). The BHHRA included the evaluation of potential exposures to COPCs in soil, surface water, sediment, and groundwater, as well as the potential exposure to COPCs in fish (i.e., uptake of COPCs in surface water) by the recreationist (fisher) and exposure to COPCs in venison (i.e., uptake of COPCs in soil) by recreational trespassers (hunter). Default and Site-specific exposure assumptions were developed for these receptors.

Table 9-1 through **Table 9-35** and **Appendix I** and **Appendix J** presented the calculated cumulative risks for each receptor by COPC in each potentially complete exposure scenario identified in the CEM. **Table 9-36** presents a summary of the ELCR and HI for each receptor. As discussed in **Section 6.2**, a Background Investigation was included in the Phase II SC DSR (Roux, 2019). **Table 9-37** presents a comparison of the calculated risks and hazards with the relative background contribution. The evaluation of potential contribution to risks and hazards from background identified the following and supported the hypothesis testing:

- PAH background contribution to estimated risk in all cases was less than 1 percent.
- Arsenic background contribution of 50 percent to 87 percent for the mean concentration.
- Manganese background contribution of 72 percent to 75 percent.

The cumulative cancer risks and non-cancer hazards were below the *de minimis* ELCR level of 10^{-6} and the target HI of 1 for all receptors in the following exposure areas and exposure scenarios:

- South Percolation Pond Area
  - Stormwater Management Worker – cancer risk of 1 x 10^{-6}; HI of 0.09
  - Trespassers – cancer risk of 1 x 10^{-7}; HI of 0.03
- Flathead River Area
  - Adult recreationist (swimmer/floater) – cancer risk of 1 x 10^{-7}; HI of 0.006
  - Adolescent recreationist (swimmer/floater) – HI of 0.01
  - Recreationist (fisher) – cancer risk of 2 x 10^{-7}; HI of 0.005
- Backwater Seep Sampling Area
  - Stormwater Management Worker – cancer risk of 7 x 10^{-7}; HI of 0.1
  - Adolescent recreationist (swimmer/floater) – HI of 0.06
  - Adult recreationist (swimmer/floater) – cancer risk of 2 x 10^{-7}; HI of 0.03
  - Recreationist (fisher) – cancer risk of 2 x 10^{-7}; HI of 0.03
  - Trespassers – cancer risk of 1 x 10^{-7}; HI of 0.03
- Recreational Trespasser (ATV Riding) – cancer risk of 5 x 10^{-7}; HI of 0.1
- Recreational Trespasser (Hunter) – cancer risk of 2 x 10^{-7}; HI of 0.01

The risks and hazards for the following receptors had cumulative cancer risks and non-cancer hazards below the *de minimis* ELCR level of 10^{-6} and the target HI of 1 or a target-organ specific HI less than 1:

- Main Plant Area
  - Trespasser – ELCR of 6 x10^{-7}; HI of 0.007

  - Construction Worker – ELCR of 8 x 10^{-7}; HI of 2 (target organ-specific HIs less than 1)
- Central Landfill Area
  - Trespasser – cancer risk of 6 x 10^{-7}; HI of 0.02
- Eastern Undeveloped Area
  - Trespasser - cancer risk of 1 x 10^{-7}; HI of 0.01
- North-Central Undeveloped Area
  - Trespasser - cancer risk of 1 x 10^{-7}; HI of 0.01
  - Construction Worker - cancer risk of 3 x 10^{-7}; HI of 2 (target organ-specific HIs less than 1)
- Western Undeveloped Area
  - Trespasser – cancer risk of 7 x 10^{-8} to 7.2 to 10^{-8}; HI of 0.009
  - Industrial Worker – cancer risk of 1 x 10^{-6}; HI of 0.06
  - Construction Worker – cancer risk of 1 x 10^{-7}; HI of 0.1

The risks and hazards for the following receptors had a cumulative HI or target-organ specific HI less than 1 and the ELCR exceeded the *de minimis* level of 10^{-6} but was less than the MDEQ management level of 10^{-5}. Findings from the evaluation of the potential background risk contribution is included where the background risk contribution was conducted (**Section 6.2**).

- Main Plant Area
  - Industrial Worker – cancer risk of 8 x 10^{-6}; HI of 0.1
    - Primary risk divers were arsenic (ELCR of 1 x 10^{-6}) and benzo(a)pyrene (4 x 10^{-6}). The following summarizes the evaluation of contribution of background for these COPCs:
      - Arsenic was found to be comparable to background with a background contribution to risk potentially accounting 83 percent to 100 percent of risk associated with arsenic for this scenario. The ELCR calculated for the background arsenic concentration was 1 x 10^{-6}.
      - Benzo(a)pyrene was found to be potentially Site-related and the contribution from background estimated to be less than 1 percent. The ELCR calculated for the background benzo(a)pyrene concentration was 6 x 10^{-9}.
  - ISM DUs
    - Trespasser– cancer risk ranging from 2 x 10^{-6} to 4 x 10^{-6}; HI ranging from 0.02 to 0.03
- Central Landfill Area
  - Landfill Management Worker – cancer risk ranged from 7 x 10^{-6} to 1 x 10^{-5}; HI ranged from 0.2 to 0.3
    - Primary risk drivers include arsenic (ELCR of 2 x 10^{-6}) and benzo(a)pyrene (ELCR of (3 x 10^{-6}) in soils and arsenic (ELCR of 1 x 10^{-6}) in sediment.
      - Arsenic and benzo(a)pyrene were found to be potentially Site-related, with negligible potential risk contribution from background for benzo(a)pyrene. For arsenic, the potential contribution of risk from background concentration ranged from 52 percent to 92 percent. The ELCR calculated for arsenic from background ranged from 9 x 10^{-7} to 1 x 10^{-6} (for soil and sediment) and the ELCR calculated for benzo(a)pyrene was 6 x 10^{-9}.
      - Arsenic in sediment was found to be comparable to background with a potential risk contribution ranging from 86 to percent up to 100 percent.
  - ISM DUs
    - Trespasser – ELCR of 2 x 10^{-6}; HI range of 0.02
- Industrial Landfill Area
  - Landfill Management Worker - ELCR of 1 x 10^{-5}; HI of 0.03

        - Primary risk driver arsenic, benzo(a)pyrene and dibenzo(a,h)anthracene in soils. These COPCs were found to be potentially Site-related as part of the background evaluation; however, potential contribution from background to risks associated with arsenic may contribute from 50 percent to 80 percent of the total risk from exposure to arsenic in soils. The ELCR for background arsenic was 9×10^{-7}, for benzo(a)pyrene was 6×10^{-9}, and for dibenzo(a,h)anthracene was 1×10^{-9}.
    - Trespasser - cancer risk of 2×10^{-6}; HI of 0.02
        - Primary risk driver is exposure to benzo(a)pyrene and dibenzo(a,h)anthracene in soils. These COPCs were identified as potentially Site-related and potential background risk contribution was found to be negligible (less than 1 percent). The ELCR calculated for background benzo(a)pyrene was 5×10^{-10}.
- Eastern Undeveloped Area
    - Industrial Worker – cancer risk of 2×10^{-6}; HI of 0.09
        - Arsenic (ELCR of 2×10^{-6}) is the primary risk driver and was found to be comparable to background with a potential risk contribution of 63 percent and an ELCR of 9×10^{-7}.
- North-Central Undeveloped Area
    - Industrial Worker – cancer risk of 2×10^{-6}; HI of 0.08
        - Background evaluation indicated arsenic potentially Site-related; however, background contribution was 74 percent and the ELCR of background arsenic was 1×10^{-6}.

The following receptors had an ELCR above *de minimis* level of 10^{-6}, but less than the MDEQ management level of 10^{-5}, or had an HI that exceeded the target of 1.0 (includes target-organ approach, as applicable), but the primary risk driver was comparable to background concentrations.

- Eastern Undeveloped Area
    - Construction Worker – cancer risk of 3×10^{-7}; HI of 3
        - Elevated HI from exposure to manganese; however, manganese concentrations in this exposure area were comparable to background. The relative contribution from background was 75 percent and the ELCR from background was 1.

The following receptors had an ELCR above the MDEQ management level of 10^{-5}, but less than the USEPA upper risk level of 10^{-4}, or had an HI that exceeded the target of 1.0:

- Main Plant Area – ISM DUs
    - Industrial Worker – cancer risk of 2×10^{-5}; HI of 4 (target organ specific HI less than 1.0)
        - Primary risk driver is exposure to arsenic, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene in soils
    - Construction worker – cancer risk of 2×10^{-6}; HI of 4
        - Primary risk driver is exposure to arsenic, benzo(a)pyrene, and dibenzo(a,h)anthracene through direct contact with soil; and manganese in soil via inhalation
- Central Landfill Area – ISM DUs
        - Landfill Management Worker – cancer risk of 3×10^{-5}; HI of 0.3
            - Similar to the discrete soil sample evaluation, primary risk drivers include arsenic and benzo(a)pyrene.
- North Percolation Pond Area
    - Stormwater Management Worker – cancer risk of 1×10^{-4}; HI of 0.8
        - Primary risk drivers are benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene in soils and sediment

        - Potential contribution to risk from background PAH concentrations in soil was found to be negligible (less than 1 percent) and the cumulative ELCR was 2 x 10^{-9}.
    - Trespasser- cancer risk of 5 x 10^{-5}; HI of 0.4
        - Primary risk drivers are benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene in soils and sediment
            - Potential contribution to risk from background PAH concentrations in soil was found to be negligible (less than 1 percent) and the cumulative ELCR was 8 x 10^{-10}.
- Western Undeveloped Area
    - Resident (Adult/Child) – timeweighted average cancer risk of 2 x 10^{-5}; the resident (adult) had a HI of 1, while the resident (child) had a HI of 3 (with target organ-specific HIs less than 1)
        - Primary risk contribution from potential exposure to bis(2-ethylhexyl) phthalate through potential future potable use of groundwater within the upper hydrogeologic unit and exposure to arsenic in soils.
        - Arsenic in soil was found to be comparable to background with a contribution to the risk associated with arsenic ranging from 74 percent and an ELCR of 4 x 10^{-6}.

As noted, in **Section 2.5**, CFAC intends to prohibit the use of groundwater beneath the Site for potable use. However, as required by the USEPA, this scenario was evaluated as a conservative evaluation of potential health risk in the absence of any controls. The following presents the potential risks and hazards for future use of groundwater beneath the Site as a potable water source with exposure scenarios having an ELCR exceeding the USEPA upper risk range of 10^{-4} and or an HI exceeding 1 for one or more receptors:

- Upper Hydrogeologic Unit Plume Core Area Groundwater
    - Resident (Adult/Child) – lifetime timeweighted average cancer risk of 2 x 10^{-4}; HI of 80 for the resident (adult) and HI of 100 for resident (child)
- Below Upper Hydrogeologic Unit Site-Wide Groundwater
    - Resident (Adult/Child) – lifetime timeweighted average cancer risk of 4 x 10^{-5}; HI of 3 for the adult and a HI of 4 for the resident child
        - Primary risk driver for the resident (adult) includes arsenic, cyanide, fluoride
        - Primary risk drivers for the resident (child) include arsenic and antimony

The objective of the risk assessment process was to conservatively characterize the potential risks to human receptors posed by exposure to affected environmental media at the Site in the absence of any remedial action. This BHHRA meets this objective and provides the risk manager with the necessary information to support the FS in the evaluation of remedial alternatives to address any unacceptable current or future risk to human receptors from exposure to COPCs.

8 References

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Tables

Table 1-1
Selection of Exposure Pathways - Main Plant Area (Exposure Area 1)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Northern Property – Operational Area (Exposure Area 1)	Current	Soil	Soil (0-2 ft bgs)	Soil	Maintenance Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Main Plant Area that have been be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	All	All	Ig D	None	There are no surface waters within the Main Plant Area
		Sediment	Sediment	Sediment	All	All	Ig D	None	There are no sediments within the Main Plant Area
	Future	Soil	Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	Quantitative	Industrial or commercial worker exosed during to outdoor activity; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	Quantitative	Construction worker exposed during excavations; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities; Site soils redistributed during develoment
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Main Plant Area that will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	All	All	Ig D	None	There are no surface waters within the Main Plant Area
		Sediment	Sediment	Sediment	All	All	Ig D	None	There are no sediments within the Main Plant Area

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles
D = dermal
Ig = ingestion

Table 1-2
Selection of Exposure Pathways - North Percolation Pond Area (Exposure Area 2)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
North Percolation Pond Area (exposure area 2)	Current	Soil	Soil (0-2 ft bgs)	Soil	Stormwater Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during industrial stormwater management activities
			Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the North Percolation Pond Area that have been or will be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Stormwater Management Worker	Adult	Ig D	Quantitative	Workers exposed during industrial stormwater management activities
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Stormwater Management Worker	All	Ig D	Quantitative	Workers exposed during industrial stormwater management activities
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

Table 1-2
Selection of Exposure Pathways - North Percolation Pond Area (Exposure Area 2)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Future	Soil	Soil (0-2 ft bgs)	Soil	Stormwater Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during industrial stormwater management activities
			Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no future industrial or commercial activities
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no future construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the North Percolation Pond Area that have been or will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Stormwater Management Worker	Adult	Ig D	Quantitative	Workers exposed during industrial stormwater management activities
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Stormwater Management Worker	All	Ig D	Quantitative	Workers exposed during industrial stormwater management activities
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-3
Selection of Exposure Pathways - Central Landfill Area (Exposure Area 3)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Central Landfill Area (exposure area 3)	Current	Soil	Soil (0-2 ft bgs)	Soil	Landfill Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during landfill management and maintenance activities
			Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Soil	Recreational Trespasser	Adult	Ig D Ip	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.
			Shallow soil (0-.5 ft bgs)	Biota	Recreational Trespasser	Adult	Ig	None	There are no recreational use areas within the Central Landfill Area that have been be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Landfill Management Worker	Adult	Ig D	Quantitative	Workers exposed during landfill management and maintenance activities
				Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
				Surface water	Recreational Trespasser	Adult	Ig D	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.
		Sediment	Sediment	Sediment	Landfill Management Worker	All	Ig D	Quantitative	Workers exposed during landfill management and maintenance activities
				Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
				Sediment	Recreational Trespasser	Adult	Ig D	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.

Table 1-3
Selection of Exposure Pathways - Central Landfill Area (Exposure Area 3)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Future	Soil	Soil (0-12 ft bgs)	Soil	Landfill Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during landfill management and maintenance activities
			Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no future industrial or commercial activities
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no future construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Soil	Recreational Trespasser	Adult	Ig D Ip	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.
			Shallow soil (0-.5 ft bgs)	Biota	Recreational Trespasser	Adult	Ig	None	There are no recreational use areas within the Central Landfill Area that will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Landfill Management Worker	Adult	Ig D	Quantitative	Workers exposed during landfill management and maintenance activities
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
				Surface water	Recreational Trespasser	Adult	Ig D	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.
		Sediment	Sediment	Sediment	Landfill Management Worker	All	Ig D	Quantitative	Workers exposed during landfill management and maintenance activities
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
				Sediment	Recreational Trespasser	Adult	Ig D	Quantitative	There are recreational uses within the Central Landfill Area (ATV riding). Refer to Section 2.5.3.3 for additional information.

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-4
Selection of Exposure Pathways - Industrial Landfill Area (Exposure Area 4)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Industrial Landfill Area (exposure area 4)	Current	Soil	Soil (0-2 ft bgs)	Soil	Landfill Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during landfill management and maintenance activities
			Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Industrial Landfill Area that have been be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	All	All	Ig D	None	There are no surface waters within the Industrial Landfill Area
		Sediment	Sediment	Sediment	All	All	Ig D	None	There are no sediments in the Industrial Landfill Area
	Future	Soil	Soil (0-2 ft bgs)	Soil	Landfill Management Worker	Adult	Ig D Ip	Quantitative	Workers exposed during landfill management and maintenance activities
			Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no future industrial or commercial activities
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no future construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Industrial Landfill Area that will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	All	All	Ig D	None	There are no surface waters within the Industrial Landfill Area
		Sediment	Sediment	Sediment	All	All	Ig D	None	There are no sediments in the Industrial Landfill Area

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-5
Selection of Exposure Pathways - Eastern Undeveloped Area (Exposure Area 5)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Eastern Undeveloped Area (exposure area 5)	Current	Soil	Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Eastern Undeveloped Area that have been be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
	Future	Soil	Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	Quantitative	Industrial or commercial worker exposed during to outdoor activity; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	Quantitative	Construction worker exposed during excavations; Site soils redistributed during develoment
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the Eastern Undeveloped Area that will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-6
Selection of Exposure Pathways - North-Central Undeveloped Area (Exposure Area 6)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
North-Central Undeveloped Area (exposure area 6)	Current	Soil	Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-2 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Soil	Recreational Trespasser	Adult	Ig D Ip	Quantitative	There are recreational uses within the North-Central Undeveloped Landfill Area (ATV riding and hunting). Refer to Section 2.5.3.6 for additional information.
			Shallow soil (0-.5 ft bgs)	Biota	Recreational Trespasser	Adult	Ig	Quantitative	There are recreational use areas within the North-Central Undeveloped Area that have been be used for hunting
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
	Future	Soil	Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	Quantitative	Industrial or commercial worker exosed during to outdoor activity; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	Quantitative	Construction worker exposed during excavations; Site soils redistributed during develoment
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Soil	Recreational Trespasser	Adult	Ig D Ip	Quantitative	There are recreational uses within the North-Central Undeveloped Landfill Area (ATV riding and hunting). Refer to Section 2.5.3.6 for additional information.
			Shallow soil (0-.5 ft bgs)	Biota	Recreational Trespasser	Adult	Ig	Quantitative	There are recreational use areas within the North-Central Undeveloped Area that will be used for hunting
		Groundwater	Groundwater	Groundwater	Industrial or Commercial Worker	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

Table 1-6
Selection of Exposure Pathways - North-Central Undeveloped Area (Exposure Area 6)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-7
Selection of Exposure Pathways - Western Undeveloped Area (Exposure Area 7)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Western Undeveloped Area (exposure area 7)	Current	Soil	Soil (0-2 ft bgs)	Soil	Resident	Adult	Ig D Ip	None	There are no curent residents
			Soil (0-2 ft bgs)	Soil	Resident	Child	Ig D Ip	None	There are no curent residents
			Soil (0-2 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	None	There are no current industrial or commercial activities
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	Quantitative	There are recreational use areas within the Western Undeveloped Area that have been used for hunting and ATV riding
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Recreationist	Adult	Ig D	Quantitative	There are recreational use areas within the Western Undeveloped Area that have been used for hunting
			Surface water	Surface water	Recreationist	Adult	Ig D	Quantitative	There are recreational use areas within the Western Undeveloped Area that have been used for hunting
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Recreationist	Adult	Ig D	Quantitative	There are recreational use areas within the Western Undeveloped Area that have been used for hunting
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

Table 1-7
Selection of Exposure Pathways - Western Undeveloped Area (Exposure Area 7)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Future	Soil	Soil (0-12 ft bgs)	Soil	Resident	Adult	Ig D Ip	Quantitative	There are potential future residents; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Resident	Child	Ig D Ip	Quantitative	There are potential future residents; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Industrial or Commercial Worker	Adult	Ig D Ip	Quantitative	Industrial or commercial worker exosed during to outdoor activity; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	Quantitative	Construction worker exposed during excavations; Site soils redistributed during develoment
			Soil (0-12 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities; Site soils redistributed during develoment
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	Quantitative	There are recreational use areas within the Western Undeveloped Area that will used for hunting and ATV riding; undeveloped areas not subject to redistribution of soils
		Groundwater	Groundwater	Groundwater	Resident	Adult	Ig D Iv	Quantitative	Groundwater potable water future use will be prohibited; but as a conservative measure, it will be assessed in the BHHRA
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Recreationist	Adult	Ig D	Quantitative	There are recreational use areas within the Western Undeveloped Area that will be used for hunting
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Recreationist	Adult	Ig D	Quantitative	There are recreational use areas within the Western Undeveloped Area that will be used for hunting
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-8
Selection of Exposure Pathways - South Percolation Pond Area (Exposure Area 8)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
South Percolation Pond Area (exposure area 8)	Current	Soil	Soil (0-2 ft bgs)	Soil	Resident	Adult	Ig D Ip	None	There are no curent residents
			Soil (0-2 ft bgs)	Soil	Stormwater Management Worker	Adult	Ig D Ip	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no current construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
		Groundwater	Groundwater	Groundwater	All	All	Ig D Iv	None	There is no current potable use of groundwater.
			Air	Ambient Outdoor	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Stormwater Management Worker	Adult	Ig D	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
				Surface water	Recreationist	Adult	Ig D	None	There are recreational use areas within the South Percolation Pond Area that have been used for fishing
				Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Stormwater Management Worker	Adult	Ig D	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
				Sediment	Recreationist	Adult	Ig D	None	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
				Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

Table 1-8
Selection of Exposure Pathways - South Percolation Pond Area (Exposure Area 8)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Future	Soil	Soil (0-12 ft bgs)	Soil	Resident	Adult	Ig D Ip	None	There are no potential future residents
			Soil (0-2 ft bgs)	Soil	Stormwater Management Worker	Adult	Ig D Ip	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
			Soil (0-12 ft bgs)	Soil	Construction Worker	Adult	Ig D Ip	None	There are no future construction activities
			Shallow soil (0-.5 ft bgs)	Soil	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
			Shallow soil (0-.5 ft bgs)	Biota	Recreationist	Adult	Ig	None	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
		Groundwater	Groundwater	Groundwater	All	Adult	Ig D Iv	None	There is no potential potable use of groundwater
			Air	Indoor/Outdoor Air	All	All	Iv	None	Assessment of groundwater with VISL calculator showed no unacceptable concentrations
		Surface Water	Surface water	Surface water	Stormwater Management Worker	Adult	Ig D	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
			Surface water	Surface water	Recreationist	Adult	Ig D	Quantitative	There are no recreational use areas within the South Percolation Pond Area that will be used for fishing
			Surface water	Biota	Recreationist	Adult	Ig	Quantitative	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
			Surface water	Surface water	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities
		Sediment	Sediment	Sediment	Stormwater Management Worker	Adult	Ig D	Quantitative	The Stormwater Management Worker conducts periodic inspection of the South Percolation Ponds.
			Sediment	Sediment	Recreatist	Adult	Ig D	Quantitative	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
			Sediment	Biota	Recreatist	Adult	Ig	Quantitative	There are no recreational use areas within the South Percolation Pond Area that have been used for fishing
			Sediment	Sediment	Trespasser	Child/ Adolescent	Ig D	Quantitative	Trespasser exposed during unauthorized activities

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-9
Selection of Exposure Pathways - Flathead River Area (Exposure Area 9)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Flathead River Area (exposure area 9)	Current	Surface Water	Surface water	Surface water	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Surface water	Surface water	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Surface water	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing
		Sediment	Sediment	Sediment	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Sediment	Sediment	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Sediment	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing
	Future	Surface Water	Surface water	Surface water	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Surface water	Surface water	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Surface water	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing
		Sediment	Sediment	Sediment	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Sediment	Sediment	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing, and water contact sports (e.g., floating, boating, fishing, and swimming activities). Refer to Section 2.5.3.9 for additional information.
			Sediment	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Flathead River Area that have been used for fishing

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 1-9a
Selection of Exposure Pathways - Backwater Seep Sampling Area (Exposure Area 9a)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route (a)	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Backwater Seep Area (exposure area 9a)	Current	Soil	Surface soil (0 to 0.5 ft-bgs)	Soil	Recreationist (Floater/Fisher)	Adult	Ig D Ip	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating and fishing
			Surface soil (0 to 0.5 ft-bgs)	Soil	Recreationist (Floater)	Child/ Adolescent	Ig D Ip	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
		Surface Water	Surface water	Surface water	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating and fishing
			Surface water	Surface water	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
			Surface water	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Backwater Seep Areathat have been used for fishing
		Sediment	Sediment	Sediment	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Areathat have been used for fishing
			Sediment	Sediment	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
			Sediment	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Backwater Seep Areathat have been used for fishing
	Future	Soil	Surface soil (0 to 0.5 ft-bgs)	Soil	Recreationist (Floater/Fisher)	Adult	Ig D Ip	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating and fishing
			Surface soil (0 to 0.5 ft-bgs)	Soil	Recreationist (Floater)	Child/ Adolescent	Ig D Ip	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
		Surface Water	Surface water	Surface water	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating and fishing
			Surface water	Surface water	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
			Surface water	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Backwater Seep Area that will be used for fishing
		Sediment	Sediment	Sediment	Recreationist (Floater/Fisher)	Adult	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Area that will be used for fishing
			Sediment	Sediment	Recreationist (Floater)	Child/ Adolescent	Ig D	Quantitative	There are recreational use areas within the Backwater Seep Sampling Area that have been used for floating. Refer to Section 2.5.3.10 for additional information.
			Sediment	Biota	Recreationist (Fisher)	Adult	Ig	Quantitative	There are recreational use areas within the Backwater Seep Area that will be used for fishing

a/ Ip = inhalation of particulate
Iv = inhalation of volatiles

D = dermal
Ig = ingestion

Table 2-1
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.018 (J)	0.99 (J+)	mg/kg	CFSB-276	74 / 83	0.015 - 0.069	0.99	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	1.97 (J-)	571 (J)	mg/kg	CFSB-066	82 / 82	NA	571	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7429-90-5	Aluminum	5610	51200	mg/kg	CFMW-037	82 / 82	NA	51200	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.35 (J-)	0.61 (J)	mg/kg	CFMW-070	6 / 82	0.23 - 0.54	0.61	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2.1	7.6	mg/kg	CFSB-099	82 / 82	NA	7.6	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	40.3 (J)	376	mg/kg	CFMW-042	82 / 82	NA	376	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.21 (J)	0.96	mg/kg	CFSB-055	82 / 82	NA	0.96	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.29 (J)	1.7	mg/kg	CFSB-066	14 / 82	0.24 - 0.39	1.7	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1940	65300	mg/kg	CFSB-094	82 / 82	NA	65300	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	0.21 (J-)	0.24 (J-)	mg/kg	CFSB-288	2 / 5	0.17 - 0.55	0.24	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-47-3	Chromium, Total	5.3	80.8	mg/kg	CFMW-070	84 / 84	NA	80.8	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.141849	2.16253	mg/kg	CFMW-070	79 / 79	NA	2.16253	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	5.09	34.66	mg/kg	CFSB-288	5 / 5	NA	34.66	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	5.15815	78.6375	mg/kg	CFMW-070	79 / 79	NA	78.6375	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7440-48-4	Cobalt	2.8	7.8	mg/kg	CFSB-066	82 / 82	NA	7.8	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	5.7 (J)	34.5	mg/kg	CFMW-070	82 / 82	NA	34.5	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	6170	21500	mg/kg	CFMW-070	82 / 82	NA	21500	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	4.1	57.7 (J-)	mg/kg	CFMW-040	82 / 82	NA	57.7	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	3030	27500 (J)	mg/kg	CFSB-071	82 / 82	NA	27500	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	173	1270	mg/kg	CFMW-053A	82 / 82	NA	1270	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J-)	0.069	mg/kg	CFSB-065	74 / 82	0.01 - 0.014	0.069	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	6.3	140 (J)	mg/kg	CFSB-066	82 / 82	NA	140	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	388	1580	mg/kg	CFMW-070	82 / 82	NA	1580	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.42 (J)	0.66 (J)	mg/kg	CFSB-099	4 / 82	0.23 - 0.5	0.66	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.96 (J)	1.5 (J)	mg/kg	CFMW-035	2 / 82	0.48 - 0.99	1.5	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	28.4 (J)	4750	mg/kg	CFMW-070	63 / 82	26.8 - 48.3	4750	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 82	0.098 - 0.2	ND	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	N	BSL-ND
	7440-62-2	Vanadium	4.1	31.6	mg/kg	CFMW-042	82 / 82	NA	31.6	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	22.2	238	mg/kg	CFMW-026	82 / 82	NA	238	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 23	0.00087 - 0.0013	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.00066 - 0.00097	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.0007 - 0.001	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 23	0.0011 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 23	0.0012 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.00078 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 23	0.00094 - 0.0014	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 23	0.00084 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 23	0.00091 - 0.0013	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 23	0.00089 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 23	0.00065 - 0.00095	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 23	0.00092 - 0.0014	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 23	0.0014 - 0.0021	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 23	0.0015 - 0.0023	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 23	0.00095 - 0.0014	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 23	0.00074 - 0.0011	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 23	0.021 - 0.031	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 23	0.0016 - 0.0023	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-1
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 71	0.0093 - 0.014	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 71	0.0093 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 71	0.0093 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 71	0.0093 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 71	0.0093 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	0.056 (J)	0.11	mg/kg	CFSB-231	3 / 71	0.0096 - 0.015	0.11	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	ASL-SSLOnly
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 71	0.0096 - 0.015	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 71	0.0096 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 71	0.0096 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.056 (J)	0.11	mg/kg	CFSB-231	3 / 71	0.0096 - 0.015	0.11	NA	No Screening Level	NULL	NA	NA	N	LDF
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 82	0.0015 - 1.3	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 82	0.011 - 4.7	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 82	0.014 - 1.7	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 82	0.0024 - 1.8	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 82	0.0019 - 0.5	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 82	0.0026 - 0.42	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 82	0.0021 - 3.9	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 82	0.092 - 13	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 82	0.0017 - 0.7	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 82	0.0021 - 0.94	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 82	0.0016 - 0.4	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 82	0.0016 - 0.45	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0017 (J)	1.7 (J)	mg/kg	CFSB-044	44 / 82	0.0016 - 0.017	1.7	0.0083	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 82	0.0098 - 0.77	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 82	0.011 - 0.81	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 82	0.002 - 0.6	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 82	0.032 - 2	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.036 (J)	0.036 (J)	mg/kg	CFMW-050	1 / 62	0.0092 - 0.47	0.036	NA	No Screening Level	NULL	NA	NA	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 82	0.0087 - 0.53	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 82	0.059 - 4.7	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 82	0.0024 - 0.56	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 82	0.0016 - 0.76	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 82	0.0011 - 0.46	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 82	0.0021 - 0.53	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 82	0.0017 - 0.67	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 82	0.024 - 8.5	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0026 (J)	15 (J)	mg/kg	CFSB-040	68 / 82	0.002 - 0.011	15	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0023 (J)	0.055 (J)	mg/kg	CFSB-275	11 / 82	0.0015 - 0.46	0.055	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0026 (J)	0.046 (J)	mg/kg	CFSB-066	3 / 82	0.0019 - 0.39	0.046	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.002 (J)	22	mg/kg	CFSB-040	65 / 82	0.033 - 0.046	22	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 82	0.015 - 0.79	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0049 (J)	0.093 (J)	mg/kg	CFMW-044A	4 / 68	0.0047 - 1.4	0.093	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.019	110	mg/kg	CFSB-040	78 / 82	0.031 - 0.033	110	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.027	130	mg/kg	CFSB-040	80 / 82	0.012 - 0.012	130	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.028 (J)	150	mg/kg	CFSB-040	81 / 82	0.016 - 0.016	150	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.032 (J)	99	mg/kg	CFSB-040	81 / 82	0.023 - 0.023	99	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.016	68	mg/kg	CFSB-040	78 / 82	0.016 - 0.019	68	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.016 (J)	5.6	mg/kg	CFMW-037	19 / 82	0.011 - 1.2	5.6	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.034 (J)	0.14 (J)	mg/kg	CFSB-275	3 / 82	0.0014 - 1.5	0.14	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 82	0.0016 - 0.55	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 82	0.0012 - 0.42	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 82	0.0025 - 0.73	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.016 (J)	5.8	mg/kg	CFMW-050	30 / 82	0.013 - 1.9	5.8	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 82	0.022 - 1.3	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0046 (J)	17 (J)	mg/kg	CFSB-040	74 / 82	0.0088 - 0.0099	17	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.022 (J)	130	mg/kg	CFSB-040	81 / 82	0.011 - 0.011	130	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen

Table 2-1
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	84-74-2	Di-N-Butyl Phthalate	0.013 (J)	0.085 (J)	mg/kg	CFSB-094	12 / 82	0.01 - 0.78	0.085	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 82	0.017 - 1	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0073	28	mg/kg	CFSB-040	72 / 82	0.019 - 0.023	28	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0017 (J)	4.8 (J)	mg/kg	CFSB-040	56 / 82	0.0016 - 0.015	4.8	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 82	0.0098 - 0.53	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 82	0.0012 - 0.52	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.038 (J)	170	mg/kg	CFSB-040	81 / 82	0.012 - 0.012	170	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.002 (J)	10 (J)	mg/kg	CFSB-040	64 / 82	0.0015 - 0.01	10	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 82	0.0025 - 0.72	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 82	0.002 - 0.5	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 82	0.0017 - 1.1	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 82	0.0018 - 0.65	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.028 (J)	100 (J+)	mg/kg	CFSB-040	81 / 82	0.027 - 0.027	100	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.035 (J)	0.076 (J)	mg/kg	CFSB-045	4 / 82	0.0017 - 0.38	0.076	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 82	0.0023 - 0.6	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 82	0.011 - 1.6	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0017 (J)	4 (J)	mg/kg	CFSB-044	56 / 82	0.0013 - 0.013	4	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 82	0.011 - 0.65	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	0.3 (J)	0.53	mg/kg	CFSB-059	3 / 82	0.042 - 2.9	0.53	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	ASL-SSLOnly
	85-01-8	Phenanthrene	0.017	120	mg/kg	CFSB-040	81 / 82	0.011 - 0.011	120	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 82	0.01 - 0.58	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.039	220	mg/kg	CFSB-040	81 / 82	0.018 - 0.018	220	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-2
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Main Plant Area Soil
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	57-12-5	Cyanide	0.017 (J)	15.3	mg/kg	CFMW-028A	192 / 284	0.014 - 0.072	15.3	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.59 (J+)	571 (J)	mg/kg	CFSB-066	279 / 283	0.16 - 0.19	571	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.136496	9.71533	mg/kg	CFSB-158	278 / 278	NA	9.71533	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	5.09	34.66	mg/kg	CFSB-288	9 / 9	NA	34.66	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	4.9635	353.285	mg/kg	CFSB-158	278 / 278	NA	353.285	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	2840	85500	mg/kg	CFMW-028A	283 / 283	NA	85500	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.31 (J-)	0.96 (J)	mg/kg	CFSB-287	12 / 283	0.23 - 0.54	0.96	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	1.6 (J)	34.2	mg/kg	CFMW-028A	283 / 283	NA	34.2	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	28.7 (J)	510 (J)	mg/kg	CFMW-028A	283 / 283	NA	510	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.097 (J)	32.7	mg/kg	CFMW-028A	283 / 283	NA	32.7	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-43-9	Cadmium	0.29 (J)	8	mg/kg	CFMW-028A	23 / 283	0.23 - 0.39	8	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-70-2	Calcium	1100	130000	mg/kg	CFSB-095	283 / 283	NA	130000	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	0.21 (J-)	0.24 (J-)	mg/kg	CFSB-288	2 / 9	0.16 - 0.55	0.24	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-47-3	Chromium, Total	5.1	363	mg/kg	CFSB-158	287 / 287	NA	363	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.9	9.6	mg/kg	CFSB-052	283 / 283	NA	9.6	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	4.1 (J+)	66	mg/kg	CFSB-158	283 / 283	NA	66	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	4860	43800	mg/kg	CFSB-158	283 / 283	NA	43800	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	2.2	104	mg/kg	CFMW-028A	283 / 283	NA	104	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	3030	27500 (J)	mg/kg	CFSB-071	283 / 283	NA	27500	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	73.4	1270	mg/kg	CFMW-053A	283 / 283	NA	1270	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.0094 (J)	0.27	mg/kg	CFSB-065	239 / 283	0.0093 - 0.014	0.27	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.5 (J)	252	mg/kg	CFMW-028A	283 / 283	NA	252	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	324 (J+)	5050 (J+)	mg/kg	CFMW-028A	283 / 283	NA	5050	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.32 (J)	1.4 (J)	mg/kg	CFMW-028A	10 / 283	0.23 - 0.5	1.4	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.92 (J)	1.5 (J)	mg/kg	CFMW-035	4 / 283	0.48 - 1.1	1.5	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	26.5 (J)	4750	mg/kg	CFMW-070	191 / 280	24.4 - 48.3	4750	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.13 (J)	2.2	mg/kg	CFMW-028A	4 / 283	0.098 - 0.2	2.2	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	3.2	166	mg/kg	CFMW-028A	283 / 283	NA	166	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	11.3	403	mg/kg	CFMW-028A	283 / 283	NA	403	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 23	0.00087 - 0.0013	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.00066 - 0.00097	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.0007 - 0.001	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 23	0.0011 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 23	0.0012 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 23	0.00078 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 23	0.00094 - 0.0014	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 23	0.00084 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 23	0.00091 - 0.0013	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 23	0.00089 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 23	0.00065 - 0.00095	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 23	0.00092 - 0.0014	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 23	0.0014 - 0.0021	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 23	0.0015 - 0.0023	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 23	0.00095 - 0.0014	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 23	0.001 - 0.0015	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 23	0.00074 - 0.0011	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 23	0.021 - 0.031	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 23	0.0016 - 0.0023	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 222	0.009 - 0.016	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 222	0.009 - 0.016	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 222	0.009 - 0.016	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 222	0.009 - 0.016	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 222	0.009 - 0.016	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	0.056 (J)	0.11	mg/kg	CFSB-231	4 / 222	0.0093 - 0.017	0.11	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	ASL-SSLOnly
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 222	0.0093 - 0.017	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 222	0.0093 - 0.017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-2
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Main Plant Area Soil
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 222	0.0093 - 0.017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.056 (J)	0.11	mg/kg	CFSB-231	4 / 222	0.0093 - 0.017	0.11	NA	No Screening Level	NULL	NA	NA	N	LDF
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 283	0.0014 - 9	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 281	0.01 - 32	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 281	0.014 - 11	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 281	0.0024 - 12	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 281	0.0018 - 3.4	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 281	0.0025 - 2.9	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 281	0.002 - 27	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 278	0.089 - 91	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 283	0.0016 - 4.8	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 283	0.002 - 6.4	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 283	0.0015 - 2.7	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 281	0.0015 - 3.1	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0017 (J)	4.4 (J)	mg/kg	CFMW-028A	93 / 283	0.0016 - 0.35	4.4	0.0083	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 281	0.0094 - 5.3	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 283	0.011 - 4	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 281	0.0019 - 4.1	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 283	0.031 - 13	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.011 (J)	0.036 (J)	mg/kg	CFMW-050	4 / 203	0.0089 - 3.2	0.036	NA	No Screening Level	NULL	NA	NA	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 283	0.0084 - 3.6	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 281	0.057 - 32	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 283	0.0023 - 3.8	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 281	0.0016 - 5.2	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 283	0.0011 - 3.1	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 283	0.002 - 3.6	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 283	0.0016 - 4.6	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 281	0.023 - 58	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0026 (J)	55 (J)	mg/kg	CFMW-028A	149 / 283	0.0019 - 0.011	55	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0016 (J)	0.059 (J)	mg/kg	CFSB-130	21 / 283	0.0014 - 3.1	0.059	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0021 (J)	0.046 (J)	mg/kg	CFSB-066	8 / 283	0.0018 - 2.6	0.046	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.0019 (J)	100 (J)	mg/kg	CFMW-028A	129 / 283	0.0017 - 0.046	100	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 283	0.014 - 5.4	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	0.0049 (J)	0.093 (J)	mg/kg	CFMW-044A	6 / 218	0.0044 - 9.2	0.093	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0013 (J)	400	mg/kg	CFMW-028A	205 / 283	0.0012 - 0.033	400	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0015 (J)	450	mg/kg	CFMW-028A	222 / 283	0.0014 - 0.012	450	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0017 (J)	570	mg/kg	CFMW-028A	227 / 283	0.0016 - 0.016	570	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0015 (J)	290	mg/kg	CFMW-028A	214 / 283	0.0014 - 0.023	290	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0023 (J)	210	mg/kg	CFMW-028A	197 / 283	0.002 - 0.019	210	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.013 (J+)	6.3	mg/kg	CFSB-050	36 / 283	0.01 - 5	6.3	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0017 (J)	0.27 (J)	mg/kg	CFSB-130	17 / 283	0.0014 - 10	0.27	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 283	0.0016 - 3.8	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 283	0.0012 - 2.9	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 282	0.0024 - 5	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.015 (J)	5.8	mg/kg	CFMW-050	62 / 283	0.013 - 7.8	5.8	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 283	0.021 - 8.7	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0024 (J)	42 (J)	mg/kg	CFMW-028A	171 / 283	0.0015 - 0.0099	42	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0014 (J)	500	mg/kg	CFMW-028A	231 / 283	0.0013 - 0.011	500	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.011 (J)	0.66	mg/kg	CFSB-050	35 / 283	0.01 - 3.6	0.66	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	0.027 (J)	0.027 (J)	mg/kg	CFMW-026	1 / 283	0.017 - 6.1	0.027	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	LDF
	53-70-3	Dibenz(A,H)Anthracene	0.0016 (J)	28	mg/kg	CFSB-040	161 / 283	0.0015 - 6.3	28	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0017 (J)	15 (J)	mg/kg	CFMW-028A	111 / 283	0.0014 - 0.32	15	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 283	0.0095 - 3.4	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 283	0.0012 - 3.5	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0019 (J)	1000	mg/kg	CFMW-028A	235 / 283	0.0017 - 0.012	1000	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	Y	ASL-DC Only
	86-73-7	Fluorene	0.0018 (J)	33 (J)	mg/kg	CFMW-028A	140 / 283	0.0013 - 0.01	33	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	0.091	0.091	mg/kg	CFSB-082	1 / 283	0.0024 - 4.9	0.091	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	ASL-SSLOnly
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 283	0.0019 - 3.4	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND

Table 2-2
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Main Plant Area Soil
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 283	0.0017 - 7.5	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 283	0.0017 - 4.4	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0015 (J)	360	mg/kg	CFMW-028A	210 / 283	0.0013 - 0.027	360	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0099 (J)	3.3	mg/kg	CFSB-052	13 / 283	0.0017 - 2.6	3.3	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 283	0.0022 - 4.1	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 283	0.011 - 11	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0017 (J)	8 (J)	mg/kg	CFMW-028A	115 / 283	0.0013 - 0.013	8	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 283	0.011 - 3.8	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	0.17 (J-)	0.53	mg/kg	CFSB-059	5 / 281	0.04 - 15	0.53	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	ASL-SSLOnly
	85-01-8	Phenanthrene	0.0021 (J)	440	mg/kg	CFMW-028A	228 / 283	0.0018 - 0.011	440	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	0.021 (J)	0.021 (J)	mg/kg	CFSB-010	1 / 281	0.01 - 4	0.021	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	LDF
	129-00-0	Pyrene	0.0017 (J)	730	mg/kg	CFMW-028A	230 / 283	0.0016 - 0.018	730	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only
	71-55-6	1,1,1-Trichloroethane	0.0004 (J)	0.0004 (J)	mg/kg	CFSB-075	1 / 167	0.00012 - 0.001	0.0004	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 167	8.7e-005 - 0.00046	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 167	0.00015 - 0.0012	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 167	9e-005 - 0.00076	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 167	0.0001 - 0.00092	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 167	0.00011 - 0.0011	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 167	5.6e-005 - 0.0003	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 167	4.6e-005 - 0.00087	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 167	0.00023 - 0.0013	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 167	6.1e-005 - 0.00032	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 167	7.2e-005 - 0.00038	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	0.00014 (J)	0.00014 (J)	mg/kg	CFMW-054	1 / 167	5.6e-005 - 0.00032	0.00014	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	ASL-SSLOnly
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 167	8.7e-005 - 0.00046	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 167	6.1e-005 - 0.00032	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 167	5.1e-005 - 0.00035	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	0.0012 (J)	0.0012 (J)	mg/kg	CFSB-066	1 / 167	0.00039 - 0.0025	0.0012	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	ASL-SSLOnly
	67-64-1	Acetone	0.0033 (J)	0.17 (J+)	mg/kg	CFMW-026	156 / 167	0.00091 - 0.0035	0.17	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00018 (J)	0.0027	mg/kg	CFSB-065	128 / 167	0.00015 - 0.00048	0.0027	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 167	8.7e-005 - 0.00046	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 167	0.00013 - 0.001	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 167	6.6e-005 - 0.00047	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	0.00063 (J)	0.0011	mg/kg	CFSB-055	3 / 167	0.00016 - 0.00087	0.0011	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	ASL-SSLOnly
	75-15-0	Carbon Disulfide	0.00024 (J)	0.0047	mg/kg	CFSB-130	89 / 167	0.00013 - 0.001	0.0047	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 167	9.1e-005 - 0.0012	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	0.0012 (J)	0.0012 (J)	mg/kg	CFMW-028A	1 / 167	7.2e-005 - 0.00038	0.0012	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 167	0.00018 - 0.00095	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 167	0.00011 - 0.00057	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	0.0025	0.0025	mg/kg	CFSB-130	1 / 167	0.00019 - 0.001	0.0025	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 167	7.7e-005 - 0.0006	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 167	7.7e-005 - 0.00041	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00035 (J)	0.0062	mg/kg	CFSB-065	79 / 167	0.00018 - 0.0011	0.0062	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 167	7.7e-005 - 0.00041	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 167	0.00016 - 0.00087	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00011 (J)	0.0029	mg/kg	CFSB-065	77 / 167	0.00011 - 0.00043	0.0029	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	ASL-SSLOnly
	98-82-8	Isopropylbenzene (Cumene)	0.00015 (J)	0.00037 (J)	mg/kg	CFSB-065	7 / 167	6.4e-005 - 0.00046	0.00037	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	9.1e-005 (J)	0.0081	mg/kg	CFSB-065	130 / 167	7.9e-005 - 0.00016	0.0081	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0016 (J)	0.32	mg/kg	CFSB-050	19 / 167	0.00046 - 0.0047	0.32	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.00097 (J-)	0.014	mg/kg	CFSB-097	62 / 167	0.00039 - 0.0021	0.014	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	0.0043 (J)	0.0043 (J)	mg/kg	CFSB-066	1 / 167	0.00034 - 0.006	0.0043	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.00039 (J-)	0.012	mg/kg	CFSB-065	113 / 167	0.00036 - 0.0012	0.012	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	0.00018 (J-)	0.0027	mg/kg	CFSB-050	9 / 167	8.2e-005 - 0.00087	0.0027	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	8.5e-005 (J)	0.0051	mg/kg	CFSB-066	93 / 167	8.5e-005 - 0.00039	0.0051	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	0.0003 (J)	0.0003 (J)	mg/kg	CFSB-066	1 / 167	6.2e-005 - 0.00041	0.0003	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL

Table 2-2
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Main Plant Area Soil
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 167	6.3e-005 - 0.00046	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.00029 (J)	0.0011 (J)	mg/kg	CFMW-028A	4 / 167	7.2e-005 - 0.00076	0.0011	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00016 (J)	0.012	mg/kg	CFSB-066	149 / 167	0.00014 - 0.00058	0.012	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 167	0.00012 - 0.0011	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 167	5.1e-005 - 0.00029	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 167	7.3e-005 - 0.0007	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 167	0.00017 - 0.00092	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 167	0.0002 - 0.0011	ND	NA	0.0000065	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-5})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-3
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-0.5 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.19	137 (J)	mg/kg	CFSB-026	20 / 20	NA	137	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	2.42 (J-)	241 (J)	mg/kg	CFSB-016	20 / 20	NA	241	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	TOC	Total Organic Carbon	23500	182000	mg/kg	CFSB-203	11 / 11	NA	182000	122647	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.206083	1.27129	mg/kg	CFSB-026	19 / 19	NA	1.27129	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	6.805	34.12	mg/kg	CFSB-281	3 / 3	NA	34.12	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	7.49392	46.2287	mg/kg	CFSB-026	19 / 19	NA	46.2287	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	7520	106000	mg/kg	CFSB-026	20 / 20	NA	106000	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.43 (J)	2.6 (J-)	mg/kg	CFSB-025	6 / 20	0.25 - 0.7	2.6	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2.5	22.7	mg/kg	CFSB-026	20 / 20	NA	22.7	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	19.6 (J+)	461	mg/kg	CFSB-026	20 / 20	NA	461	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.34 (J)	17.2	mg/kg	CFSB-026	20 / 20	NA	17.2	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-43-9	Cadmium	0.29 (J)	8.3	mg/kg	CFSB-026	19 / 20	0.27 - 0.27	8.3	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-70-2	Calcium	427	68600 (J)	mg/kg	CFSB-026	20 / 20	NA	68600	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	0.68 (J-)	0.68 (J-)	mg/kg	CFSB-281	1 / 3	0.18 - 0.79	0.68	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-47-3	Chromium, Total	7.2	47.5	mg/kg	CFSB-026	22 / 22	NA	47.5	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.2 (J)	27.4	mg/kg	CFSB-025	20 / 20	NA	27.4	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	6.4	71.6	mg/kg	CFSB-202	20 / 20	NA	71.6	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	1330 (J+)	15400	mg/kg	CFSB-016	20 / 20	NA	15400	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	8.3 (J+)	238 (J+)	mg/kg	CFSB-026	20 / 20	NA	238	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	442 (J)	11800	mg/kg	CFSB-028	20 / 20	NA	11800	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	12.8 (J)	479 (J)	mg/kg	CFSB-030	20 / 20	NA	479	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.014 (J)	0.12 (J+)	mg/kg	CFSB-273	16 / 20	0.0099 - 0.028	0.12	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	17.9 (J+)	1250 (J+)	mg/kg	CFSB-025	20 / 20	NA	1250	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	101	1900	mg/kg	CFSB-030	20 / 20	NA	1900	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	3.3 (J)	mg/kg	CFSB-025	14 / 20	0.25 - 0.45	3.3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	1 (J)	1 (J)	mg/kg	CFSB-281	1 / 20	0.53 - 1.4	1	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	28.4 (J)	2140	mg/kg	CFSB-025	19 / 20	33.8 - 33.8	2140	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.14 (J)	4.6	mg/kg	CFSB-026	17 / 20	0.11 - 0.18	4.6	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	13.3 (J-)	348 (J-)	mg/kg	CFSB-025	20 / 20	NA	348	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	42.2 (J-)	694	mg/kg	CFSB-281	20 / 20	NA	694	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 7	0.00092 - 0.0021	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00069 - 0.0016	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 7	0.0011 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00074 - 0.0017	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 7	0.0012 - 0.0027	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 7	0.0012 - 0.0028	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00083 - 0.0019	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 7	0.00099 - 0.0022	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 7	0.00088 - 0.002	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 7	0.00096 - 0.0022	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 7	0.00094 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 7	0.0011 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 7	0.00068 - 0.0015	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 7	0.00098 - 0.0022	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 7	0.0015 - 0.0034	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 7	0.0016 - 0.0036	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 7	0.001 - 0.0023	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 7	0.0011 - 0.0025	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 7	0.00078 - 0.0018	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 7	0.022 - 0.05	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 7	0.0016 - 0.0037	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 9	0.0095 - 0.023	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 9	0.0095 - 0.023	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 9	0.0095 - 0.023	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 9	0.0095 - 0.023	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 9	0.0095 - 0.023	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL

Table 2-3
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-0.5 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 9	0.0099 - 0.024	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 9	0.0099 - 0.024	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 9	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 9	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 9	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 20	0.0031 - 8.6	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 20	0.022 - 62	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 20	0.03 - 83	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 20	0.0051 - 14	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 20	0.0039 - 11	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 20	0.0055 - 15	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 20	0.0044 - 12	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 20	0.19 - 540	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 20	0.0036 - 9.9	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 20	0.0044 - 12	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 20	0.0033 - 9.2	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 20	0.0033 - 9.3	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.017 (J)	6.9 (J)	mg/kg	CFSB-203	16 / 20	0.058 - 9.6	6.9	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 20	0.017 - 57	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 20	0.013 - 91	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 20	0.0041 - 11	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 20	0.043 - 190	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 9	0.01 - 1.3	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 20	0.012 - 51	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 20	0.1 - 340	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 20	0.005 - 14	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 20	0.0034 - 9.4	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 20	0.0024 - 6.7	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 20	0.0043 - 12	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 20	0.0035 - 9.7	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 20	0.05 - 140	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.031 (J)	190	mg/kg	CFSB-203	25 / 25	NA	190	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0096 (J)	1.2 (J)	mg/kg	CFMW-027	7 / 25	0.01 - 26	1.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSB-019	1 / 20	0.0039 - 11	0.011	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.049 (J)	250	mg/kg	CFSB-203	25 / 25	NA	250	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 20	0.017 - 87	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 18	0.0089 - 25	ND	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL
	56-55-3	Benzo(A)Anthracene	1.4	2700	mg/kg	CFSB-203	24 / 25	0.032 - 0.032	2700	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	1.5	3100	mg/kg	CFSB-203	24 / 25	0.012 - 0.012	3100	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	4.1	3000	mg/kg	CFSB-203	24 / 25	0.015 - 0.015	3000	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	1.4	2200	mg/kg	CFSB-203	24 / 25	0.022 - 0.022	2200	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	1.7	2400	mg/kg	CFSB-203	24 / 25	0.017 - 0.017	2400	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	192-97-2	Benzo[E]Pyrene	3.5	2100	mg/kg	CFSB-203	8 / 8	NA	2100	NA	No Screening Level	NULL	NA	NA	N	NSL
	85-68-7	Benzyl Butyl Phthalate	0.55 (J)	0.55 (J)	mg/kg	CFSB-028	1 / 20	0.012 - 140	0.55	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0047 (J)	0.55 (J)	mg/kg	CFSB-273	3 / 20	0.016 - 8.4	0.55	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 20	0.0034 - 9.5	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 20	0.0026 - 7.3	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 20	0.0053 - 15	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.17 (J)	0.17 (J)	mg/kg	CFSB-028	1 / 20	0.015 - 210	0.17	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 20	0.028 - 130	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.11 (J)	190	mg/kg	CFSB-203	19 / 20	0.0096 - 0.0096	190	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	1.8	2800	mg/kg	CFSB-203	24 / 25	0.011 - 0.011	2800	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 20	0.012 - 87	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 20	0.02 - 120	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	53-70-3	Dibenz(A,H)Anthracene	0.4	740	mg/kg	CFSB-203	24 / 25	0.02 - 0.02	740	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.036 (J)	28 (J)	mg/kg	CFSB-203	19 / 20	8.7 - 8.7	28	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.022 (J)	0.022 (J)	mg/kg	CFSB-202	1 / 20	0.011 - 60	0.022	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	ASL-SSLOnly

Table 2-3
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-0.5 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 20	0.0026 - 7.3	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.029 (J)	3700	mg/kg	CFSB-203	25 / 25	NA	3700	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	Y	ASL-DC Only
	86-73-7	Fluorene	0.012 (J)	82 (J)	mg/kg	CFSB-203	22 / 25	0.054 - 0.3	82	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 20	0.0051 - 14	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 20	0.0042 - 12	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 20	0.0037 - 10	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 20	0.0037 - 10	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	2000	mg/kg	CFSB-203	24 / 25	0.026 - 0.026	2000	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 20	0.0037 - 10	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 20	0.0049 - 14	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 20	0.024 - 67	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.038	12	mg/kg	CFSB-272	18 / 25	0.056 - 39	12	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 20	0.012 - 73	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 20	0.047 - 320	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	198-55-0	Perylene	0.87	850	mg/kg	CFSB-203	8 / 8	NA	850	NA	No Screening Level	NULL	NA	NA	N	NSL
	85-01-8	Phenanthrene	0.51	1300	mg/kg	CFSB-203	25 / 25	NA	1300	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 20	0.013 - 61	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.058 (J)	3200	mg/kg	CFSB-203	25 / 25	NA	3200	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-4
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.078 (J)	137 (J)	mg/kg	CFSB-026	42 / 43	0.064 - 0.064	137	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	2.42 (J-)	306 (J)	mg/kg	CFSB-273	43 / 43	NA	306	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.195377	1.37835	mg/kg	CFSB-281	41 / 41	NA	1.37835	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	5.52	40.25	mg/kg	CFSB-273	6 / 6	NA	40.25	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	7.10462	50.1217	mg/kg	CFSB-281	41 / 41	NA	50.1217	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	6290	123000	mg/kg	CFSB-281	43 / 43	NA	123000	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.43 (J)	2.6	mg/kg	CFSB-281	9 / 43	0.23 - 0.8	2.6	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2.4	34.1	mg/kg	CFSB-273	43 / 43	NA	34.1	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	19.6 (J+)	1560	mg/kg	CFSB-273	43 / 43	NA	1560	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-41-7	Beryllium	0.31 (J)	17.2	mg/kg	CFSB-026	43 / 43	NA	17.2	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-43-9	Cadmium	0.29 (J)	9.6	mg/kg	CFSB-281	36 / 43	0.27 - 0.39	9.6	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-70-2	Calcium	427	82700	mg/kg	CFSB-281	43 / 43	NA	82700	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	0.68 (J-)	0.68 (J-)	mg/kg	CFSB-281	1 / 6	0.16 - 0.79	0.68	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-47-3	Chromium, Total	5.6	51.5	mg/kg	CFSB-281	47 / 47	NA	51.5	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.2 (J)	27.4	mg/kg	CFSB-025	43 / 43	NA	27.4	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	6.4	202 (J)	mg/kg	CFSB-019	43 / 43	NA	202	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	1330 (J+)	23600 (J)	mg/kg	CFSB-016	43 / 43	NA	23600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	6.4	238 (J+)	mg/kg	CFSB-026	43 / 43	NA	238	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	442 (J)	21800	mg/kg	CFSB-016	43 / 43	NA	21800	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	12.8 (J)	762	mg/kg	CFSB-028	43 / 43	NA	762	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.012 (J)	0.12 (J+)	mg/kg	CFSB-273	30 / 43	0.0099 - 0.028	0.12	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	10.3	1250 (J+)	mg/kg	CFSB-025	43 / 43	NA	1250	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	101	3200 (J+)	mg/kg	CFSB-199	43 / 43	NA	3200	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	3.3 (J)	mg/kg	CFSB-025	26 / 43	0.23 - 0.52	3.3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.7 (J)	1 (J)	mg/kg	CFSB-281	2 / 43	0.49 - 1.5	1	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	28.3 (J)	2390	mg/kg	CFSB-273	39 / 43	27.7 - 33.8	2390	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.14 (J)	4.6	mg/kg	CFSB-026	35 / 43	0.099 - 0.18	4.6	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	6.1	348 (J-)	mg/kg	CFSB-025	43 / 43	NA	348	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	29.2	694	mg/kg	CFSB-281	43 / 43	NA	694	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 7	0.00092 - 0.0021	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00069 - 0.0016	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 7	0.0011 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00074 - 0.0017	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 7	0.0012 - 0.0027	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 7	0.0012 - 0.0028	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00083 - 0.0019	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 7	0.00099 - 0.0022	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 7	0.00088 - 0.002	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 7	0.00096 - 0.0022	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 7	0.00094 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 7	0.0011 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 7	0.00068 - 0.0015	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 7	0.00098 - 0.0022	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 7	0.0015 - 0.0034	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 7	0.0016 - 0.0036	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 7	0.001 - 0.0023	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 7	0.0011 - 0.0025	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 7	0.00078 - 0.0018	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 7	0.022 - 0.05	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 7	0.0016 - 0.0037	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 19	0.0095 - 0.023	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 19	0.0095 - 0.023	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 19	0.0095 - 0.023	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 19	0.0095 - 0.023	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 19	0.0095 - 0.023	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 19	0.0099 - 0.024	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL

Table 2-4
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 19	0.0099 - 0.024	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 19	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 19	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 19	0.0099 - 0.024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 41	0.0015 - 8.6	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 41	0.011 - 62	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 41	0.015 - 83	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 41	0.0025 - 14	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 41	0.0019 - 11	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 41	0.0027 - 15	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 41	0.0022 - 16	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 41	0.094 - 540	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 41	0.0017 - 9.9	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 41	0.0022 - 12	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 41	0.0016 - 9.2	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 41	0.0016 - 9.3	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0055 (J)	6.9 (J)	mg/kg	CFSB-203	31 / 41	0.0018 - 9.6	6.9	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 41	0.01 - 57	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 41	0.012 - 91	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 41	0.002 - 11	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 41	0.033 - 190	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 19	0.0095 - 1.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 41	0.0089 - 51	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 41	0.061 - 340	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 41	0.0025 - 14	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 41	0.0017 - 9.4	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 41	0.0012 - 6.7	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 41	0.0021 - 12	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 41	0.0017 - 9.7	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 41	0.025 - 140	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0022 (J)	190	mg/kg	CFSB-203	48 / 50	0.0087 - 0.021	190	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0027 (J)	1.2 (J)	mg/kg	CFMW-027	9 / 50	0.0016 - 26	1.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSB-019	1 / 41	0.0019 - 11	0.011	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.0071 (J)	250	mg/kg	CFSB-203	49 / 50	0.034 - 0.034	250	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 41	0.015 - 87	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 37	0.0044 - 25	ND	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL
	56-55-3	Benzo(A)Anthracene	0.062	2700	mg/kg	CFSB-203	48 / 50	0.03 - 0.032	2700	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.078	3100	mg/kg	CFSB-203	48 / 50	0.011 - 0.012	3100	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.18	3000	mg/kg	CFSB-203	48 / 50	0.014 - 0.015	3000	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.12	2200	mg/kg	CFSB-203	48 / 50	0.021 - 0.022	2200	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.057	2400	mg/kg	CFSB-203	48 / 50	0.016 - 0.017	2400	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	192-97-2	Benzo[E]Pyrene	1.1	2100	mg/kg	CFSB-203	18 / 18	NA	2100	NA	No Screening Level	NULL	NA	NA	N	NSL
	85-68-7	Benzyl Butyl Phthalate	0.55 (J)	0.55 (J)	mg/kg	CFSB-028	1 / 41	0.011 - 140	0.55	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0021 (J)	0.55 (J)	mg/kg	CFSB-273	6 / 41	0.0015 - 8.4	0.55	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 41	0.0017 - 9.5	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 41	0.0013 - 7.3	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 41	0.0026 - 15	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.17 (J)	5.9 (J)	mg/kg	CFSB-025	3 / 41	0.014 - 210	5.9	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 41	0.023 - 130	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0043 (J)	190	mg/kg	CFSB-203	39 / 41	0.0089 - 0.0096	190	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.011 (J)	2800	mg/kg	CFSB-203	49 / 50	0.011 - 0.011	2800	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 41	0.011 - 87	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 41	0.018 - 120	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	53-70-3	Dibenz(A,H)Anthracene	0.021	740	mg/kg	CFSB-203	48 / 50	0.019 - 0.02	740	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.019 (J)	28 (J)	mg/kg	CFSB-203	38 / 41	0.0016 - 8.7	28	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.022 (J)	2.3 (J)	mg/kg	CFSB-019	3 / 41	0.01 - 60	2.3	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	ASL-SSLOnly
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 41	0.0013 - 7.3	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-4
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	206-44-0	Fluoranthene	0.029 (J)	3700	mg/kg	CFSB-203	49 / 50	0.011 - 0.011	3700	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	Y	ASL-DC Only
	86-73-7	Fluorene	0.012 (J)	82 (J)	mg/kg	CFSB-203	41 / 50	0.0014 - 0.3	82	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 41	0.0025 - 14	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 41	0.0021 - 12	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 41	0.0018 - 10	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 41	0.0018 - 10	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.095	2000	mg/kg	CFSB-203	48 / 50	0.024 - 0.026	2000	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 41	0.0018 - 10	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 41	0.0024 - 14	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 41	0.012 - 67	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0015 (J)	12	mg/kg	CFSB-272	35 / 50	0.0091 - 39	12	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 41	0.011 - 73	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 41	0.043 - 320	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	198-55-0	Perylene	0.24	850	mg/kg	CFSB-203	18 / 18	NA	850	NA	No Screening Level	NULL	NA	NA	N	NSL
	85-01-8	Phenanthrene	0.025	1300	mg/kg	CFSB-203	49 / 50	0.0095 - 0.0095	1300	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	0.26 (J)	0.26 (J)	mg/kg	CFSB-030	1 / 41	0.011 - 61	0.26	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	LDF
	129-00-0	Pyrene	0.058 (J)	3200	mg/kg	CFSB-203	49 / 50	0.016 - 0.016	3200	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 10	0.00038 - 0.001	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 10	0.00017 - 0.00045	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 10	0.00044 - 0.0012	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 10	0.00028 - 0.00075	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 10	0.00034 - 0.00091	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 10	0.00041 - 0.0011	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 10	0.00011 - 0.00029	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 10	0.00032 - 0.00086	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 10	0.00047 - 0.0013	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 10	0.00012 - 0.00032	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 10	0.00014 - 0.00037	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 10	0.00011 - 0.00029	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 10	0.00017 - 0.00045	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 10	0.00012 - 0.00032	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 10	0.00013 - 0.00035	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	0.0024 (J)	0.0036 (J)	mg/kg	CFMW-027	2 / 10	0.00095 - 0.0025	0.0036	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	ASL-SSLOnly
	67-64-1	Acetone	0.0088 (J)	0.31 (J+)	mg/kg	CFSB-026	10 / 10	NA	0.31	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	ASL-SSLOnly
	71-43-2	Benzene	0.00043 (J)	0.0031	mg/kg	CFSB-027	5 / 10	0.00024 - 0.00054	0.0031	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 10	0.00017 - 0.00045	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 10	0.00038 - 0.001	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 10	0.00013 - 0.00035	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 10	0.00032 - 0.00086	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00092 (J)	0.0059	mg/kg	CFSB-030	6 / 10	0.00043 - 0.00076	0.0059	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 10	0.00043 - 0.0012	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 10	0.00014 - 0.00037	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 10	0.00035 - 0.00094	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 10	0.00021 - 0.00056	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 10	0.00038 - 0.001	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 10	0.00022 - 0.00059	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 10	0.00015 - 0.0004	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.0026	0.0086 (J+)	mg/kg	CFSB-027	4 / 10	0.00054 - 0.0012	0.0086	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 10	0.00015 - 0.0004	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 10	0.00032 - 0.00086	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.0013 (J)	0.0038	mg/kg	CFSB-027	4 / 10	0.00021 - 0.00048	0.0038	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	ASL-SSLOnly
	98-82-8	Isopropylbenzene (Cumene)	0.0002 (J)	0.00052 (J)	mg/kg	CFSB-027	2 / 10	0.0002 - 0.00045	0.00052	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00016 (J)	0.0091	mg/kg	CFSB-027	6 / 10	0.00013 - 0.00028	0.0091	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0022 (J)	0.0065	mg/kg	CFMW-027	5 / 10	0.00091 - 0.0016	0.0065	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.002 (J)	0.041	mg/kg	CFSB-026	7 / 10	0.00077 - 0.0014	0.041	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 10	0.0022 - 0.0059	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.0052	0.015 (J+)	mg/kg	CFSB-027	4 / 10	0.00058 - 0.0013	0.015	NA	No Screening Level	NULL	NA	NA	N	NSL

Table 2-4
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: North Percolation Pond Area
Exposure Medium: Surface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	75-09-2	Methylene Chloride	0.002 (J)	0.004 (J)	mg/kg	CFSB-019	2 / 10	0.00032 - 0.00086	0.004	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00094 (J)	0.0032	mg/kg	CFSB-027	4 / 10	0.00019 - 0.00043	0.0032	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 10	0.00015 - 0.0004	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 10	0.00017 - 0.00045	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 10	0.00028 - 0.00075	ND	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00033 (J)	0.013	mg/kg	CFSB-027	9 / 10	0.00023 - 0.00023	0.013	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 10	0.00039 - 0.001	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 10	0.0001 - 0.00027	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 10	0.00026 - 0.0007	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 10	0.00034 - 0.00091	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 10	0.00039 - 0.001	ND	NA	6.50E-06	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-5
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Water North Percolation Pond Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	T	7.6 (J)	7.6 (J)	µg/l	CFSWP-023	1 / 2	2 - 2	7.6	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	T	2150	22400 (J+)	µg/l	CFSWP-024	2 / 2	NA	22400	130	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	T	109	8630	µg/l	CFSWP-024	2 / 2	NA	8630	33.9	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	T	7.7	7.7	µg/l	CFSWP-024	1 / 2	0.62 - 0.62	7.7	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	T	2.4	2.4	µg/l	CFSWP-024	1 / 2	0.64 - 0.64	2.4	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	T	43.4	234	µg/l	CFSWP-023	2 / 2	NA	234	98.6	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	T	0.71 (J)	0.71 (J)	µg/l	CFSWP-024	1 / 2	0.24 - 0.24	0.71	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	T	3	3	µg/l	CFSWP-024	1 / 2	0.71 - 0.71	3	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-70-2	Calcium	T	7860	63300	µg/l	CFSWP-023	2 / 2	NA	63300	55600	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	T	2.7 (J)	2.7 (J)	µg/l	CFSWP-024	1 / 2	1.3 - 1.3	2.7	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	T	1.6 (J)	1.6 (J)	µg/l	CFSWP-024	1 / 2	1.3 - 1.3	1.6	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	T	3.8 (J)	16.5	µg/l	CFSWP-024	2 / 2	NA	16.5	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	T	817	817	µg/l	CFSWP-024	1 / 2	42.4 - 42.4	817	123	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-92-1	Lead	T	7.6	7.6	µg/l	CFSWP-024	1 / 2	0.38 - 0.38	7.6	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	T	804	13900	µg/l	CFSWP-023	2 / 2	NA	13900	17601	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	T	37.4	37.4	µg/l	CFSWP-024	1 / 2	2.5 - 2.5	37.4	6813	43	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-97-6	Mercury	T	ND	ND	ND	ND	0 / 2	0.17 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	T	1.9 (J)	55.9	µg/l	CFSWP-024	2 / 2	NA	55.9	NA	39	USEPA RSL Tapwater (THQ=0.1), n	Y	Carcinogen
	7440-09-7	Potassium	T	646	814	µg/l	CFSWP-024	2 / 2	NA	814	919	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	T	ND	ND	ND	ND	0 / 2	0.73 - 0.73	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	T	ND	ND	ND	ND	0 / 2	1.3 - 1.3	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	T	5280	6730	µg/l	CFSWP-024	2 / 2	NA	6730	3064	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	T	0.27 (J)	0.27 (J)	µg/l	CFSWP-024	1 / 2	0.26 - 0.26	0.27	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-62-2	Vanadium	T	6.9	18	µg/l	CFSWP-024	2 / 2	NA	18	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-66-6	Zinc	T	537	537	µg/l	CFSWP-024	1 / 2	7 - 7	537	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	NA	ND	ND	ND	ND	0 / 1	0.003 - 0.003	ND	NA	0.00092	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	NA	ND	ND	ND	ND	0 / 1	0.007 - 0.007	ND	NA	0.0072	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	NA	ND	ND	ND	ND	0 / 1	0.002 - 0.002	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	NA	ND	ND	ND	ND	0 / 1	0.004 - 0.004	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	NA	ND	ND	ND	ND	0 / 1	0.004 - 0.004	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	5103-71-9	cis-Chlordane	NA	ND	ND	ND	ND	0 / 1	0.002 - 0.002	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	NA	ND	ND	ND	ND	0 / 1	0.005 - 0.005	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	NA	ND	ND	ND	ND	0 / 1	0.003 - 0.003	ND	NA	0.0018	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	NA	ND	ND	ND	ND	0 / 1	0.006 - 0.006	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	72-20-8	Endrin	NA	ND	ND	ND	ND	0 / 1	0.004 - 0.004	ND	NA	0.23	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	NA	ND	ND	ND	ND	0 / 1	0.008 - 0.008	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	53494-70-5	Endrin Ketone	NA	ND	ND	ND	ND	0 / 1	0.008 - 0.008	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	NA	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	0.042	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	NA	ND	ND	ND	ND	0 / 1	0.003 - 0.003	ND	NA	0.0014	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	NA	ND	ND	ND	ND	0 / 1	0.005 - 0.005	ND	NA	0.0014	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	72-43-5	Methoxychlor	NA	ND	ND	ND	ND	0 / 1	0.004 - 0.004	ND	NA	3.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	NA	ND	ND	ND	ND	0 / 1	0.006 - 0.006	ND	NA	0.0012	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	72-55-9	P,P'-DDE	NA	ND	ND	ND	ND	0 / 1	0.002 - 0.002	ND	NA	0.00018	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	50-29-3	P,P'-DDT	NA	ND	ND	ND	ND	0 / 1	0.004 - 0.004	ND	NA	0.0003	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	8001-35-2	Toxaphene	NA	ND	ND	ND	ND	0 / 1	0.11 - 0.11	ND	NA	0.071	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	5103-74-2	trans-Chlordane	NA	ND	ND	ND	ND	0 / 1	0.003 - 0.003	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11097-69-1	PCB-1254 (Aroclor 1254)	NA	ND	ND	ND	ND	0 / 1	0.099 - 0.099	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	11096-82-5	PCB-1260 (Aroclor 1260)	NA	ND	ND	ND	ND	0 / 1	0.099 - 0.099	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	37324-23-5	PCB-1262 (Aroclor 1262)	NA	ND	ND	ND	ND	0 / 1	0.099 - 0.099	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	NA	ND	ND	ND	ND	0 / 1	0.099 - 0.099	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	NA	ND	ND	ND	ND	0 / 1	0.1 - 0.1	ND	NA	0.5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL

Table 2-5
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Water North Percolation Pond Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	95-94-3	1,2,4,5-Tetrachlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.43 - 0.43	ND	NA	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	NA	ND	ND	ND	ND	0 / 1	3.1 - 3.1	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	NA	ND	ND	ND	ND	0 / 1	0.69 - 0.69	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	NA	ND	ND	ND	ND	0 / 1	0.49 - 0.49	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	NA	ND	ND	ND	ND	0 / 1	0.53 - 0.53	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	NA	ND	ND	ND	ND	0 / 1	0.63 - 0.63	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	NA	ND	ND	ND	ND	0 / 1	0.91 - 0.91	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	NA	ND	ND	ND	ND	0 / 1	2.4 - 2.4	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	NA	ND	ND	ND	ND	0 / 1	1 - 1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	NA	ND	ND	ND	ND	0 / 1	0.88 - 0.88	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	NA	ND	ND	ND	ND	0 / 1	0.61 - 0.61	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	NA	ND	ND	ND	ND	0 / 1	0.74 - 0.74	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	NA	ND	ND	ND	ND	0 / 1	0.88 - 0.88	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	NA	ND	ND	ND	ND	0 / 1	1.3 - 1.3	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	NA	ND	ND	ND	ND	0 / 1	0.65 - 0.65	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	NA	ND	ND	ND	ND	0 / 1	0.59 - 0.59	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	NA	ND	ND	ND	ND	0 / 1	1 - 1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	NA	ND	ND	ND	ND	0 / 1	0.88 - 0.88	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	NA	ND	ND	ND	ND	0 / 1	0.82 - 0.82	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	NA	ND	ND	ND	ND	0 / 1	2 - 2	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	NA	ND	ND	ND	ND	0 / 1	1 - 1	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	NA	ND	ND	ND	ND	0 / 1	0.76 - 0.76	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	NA	ND	ND	ND	ND	0 / 1	0.73 - 0.73	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	NA	ND	ND	ND	ND	0 / 1	0.96 - 0.96	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	NA	ND	ND	ND	ND	0 / 1	0.48 - 0.48	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	NA	ND	ND	ND	ND	0 / 1	4.7 - 4.7	ND	NA	50	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	83-32-9	Acenaphthene	NA	ND	ND	ND	ND	0 / 1	0.88 - 0.88	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	NA	ND	ND	ND	ND	0 / 1	0.65 - 0.65	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	NA	ND	ND	ND	ND	0 / 1	1 - 1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	NA	ND	ND	ND	ND	0 / 1	0.57 - 0.57	ND	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	NA	ND	ND	ND	ND	0 / 1	0.77 - 0.77	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	NA	ND	ND	ND	ND	0 / 1	0.86 - 0.86	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	NA	3	3	µg/l	CFSWP-024	1 / 1	NA	3	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	NA	3.9	3.9	µg/l	CFSWP-024	1 / 1	NA	3.9	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	NA	10	10	µg/l	CFSWP-024	1 / 1	NA	10	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	NA	3.9 (J)	3.9 (J)	µg/l	CFSWP-024	1 / 1	NA	3.9	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	NA	ND	ND	ND	ND	0 / 1	0.18 - 0.18	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	NA	ND	ND	ND	ND	0 / 1	0.6 - 0.6	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	NA	ND	ND	ND	ND	0 / 1	0.63 - 0.63	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	NA	ND	ND	ND	ND	0 / 1	0.69 - 0.69	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NA	ND	ND	ND	ND	0 / 1	0.12 - 0.12	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	NA	ND	ND	ND	ND	0 / 1	0.93 - 0.93	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	ND	ND	ND	ND	0 / 1	0.72 - 0.72	ND	NA	5.6	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	NA	ND	ND	ND	ND	0 / 1	1.1 - 1.1	ND	NA	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	NA	ND	ND	ND	ND	0 / 1	0.85 - 0.85	ND	NA	No Screening Level	NULL	N	BSL-ND
	218-01-9	Chrysene	NA	7.6	7.6	µg/l	CFSWP-024	1 / 1	NA	7.6	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	NA	ND	ND	ND	ND	0 / 1	0.82 - 0.82	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	117-84-0	Di-N-Octylphthalate	NA	ND	ND	ND	ND	0 / 1	0.69 - 0.69	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	NA	ND	ND	ND	ND	0 / 1	0.09 - 0.09	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	132-64-9	Dibenzofuran	NA	ND	ND	ND	ND	0 / 1	0.85 - 0.85	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	NA	ND	ND	ND	ND	0 / 1	1 - 1	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	131-11-3	Dimethyl Phthalate	NA	ND	ND	ND	ND	0 / 1	0.98 - 0.98	ND	NA	2000	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	206-44-0	Fluoranthene	NA	9.3 (J)	9.3 (J)	µg/l	CFSWP-024	1 / 1	NA	9.3	NA	20	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	NA	ND	ND	ND	ND	0 / 1	0.8 - 0.8	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.47 - 0.47	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	NA	ND	ND	ND	ND	0 / 1	0.76 - 0.76	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	NA	ND	ND	ND	ND	0 / 1	0.61 - 0.61	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	NA	ND	ND	ND	ND	0 / 1	0.09 - 0.09	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	3.1	3.1	µg/l	CFSWP-024	1 / 1	NA	3.1	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	NA	ND	ND	ND	ND	0 / 1	0.67 - 0.67	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL

Table 2-5
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Water North Percolation Pond Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	621-64-7	N-Nitrosodi-N-Propylamine	NA	ND	ND	ND	ND	0 / 1	0.83 - 0.83	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	NA	ND	ND	ND	ND	0 / 1	0.74 - 0.74	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	NA	ND	ND	ND	ND	0 / 1	0.8 - 0.8	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	98-95-3	Nitrobenzene	NA	ND	ND	ND	ND	0 / 1	0.49 - 0.49	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	NA	ND	ND	ND	ND	0 / 1	2.2 - 2.2	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	NA	1.5 (J)	1.5 (J)	µg/l	CFSWP-024	1 / 1	NA	1.5	NA	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	NA	ND	ND	ND	ND	0 / 1	0.41 - 0.41	ND	NA	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	NA	7 (J)	7 (J)	µg/l	CFSWP-024	1 / 1	NA	7	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	NA	ND	ND	ND	ND	0 / 1	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	NA	ND	ND	ND	ND	0 / 1	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	NA	ND	ND	ND	ND	0 / 1	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	NA	ND	ND	ND	ND	0 / 1	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	NA	ND	ND	ND	ND	0 / 1	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	NA	ND	ND	ND	ND	0 / 1	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	NA	ND	ND	ND	ND	0 / 1	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	NA	ND	ND	ND	ND	0 / 1	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	NA	ND	ND	ND	ND	0 / 1	0.25 - 0.25	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	NA	ND	ND	ND	ND	0 / 1	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	NA	ND	ND	ND	ND	0 / 1	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	NA	12	12	µg/l	CFSWP-024	1 / 1	NA	12	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	NA	ND	ND	ND	ND	0 / 1	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	NA	ND	ND	ND	ND	0 / 1	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	NA	ND	ND	ND	ND	0 / 1	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	NA	ND	ND	ND	ND	0 / 1	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	NA	ND	ND	ND	ND	0 / 1	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	NA	ND	ND	ND	ND	0 / 1	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	NA	ND	ND	ND	ND	0 / 1	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	NA	ND	ND	ND	ND	0 / 1	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	NA	ND	ND	ND	ND	0 / 1	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	NA	ND	ND	ND	ND	0 / 1	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	110-82-7	Cyclohexane	NA	ND	ND	ND	ND	0 / 1	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	NA	ND	ND	ND	ND	0 / 1	0.14 - 0.14	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	NA	ND	ND	ND	ND	0 / 1	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	NA	ND	ND	ND	ND	0 / 1	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	NA	ND	ND	ND	ND	0 / 1	0.28 - 0.28	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-20-9	Methyl Acetate	NA	ND	ND	ND	ND	0 / 1	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	NA	ND	ND	ND	ND	0 / 1	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NA	ND	ND	ND	ND	0 / 1	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	No Screening Level	NULL	N	BSL-ND
	75-09-2	Methylene Chloride	NA	ND	ND	ND	ND	0 / 1	0.21 - 0.21	ND	NA	5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	NA	ND	ND	ND	ND	0 / 1	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	NA	ND	ND	ND	ND	0 / 1	0.17 - 0.17	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	NA	ND	ND	ND	ND	0 / 1	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	NA	ND	ND	ND	ND	0 / 1	0.12 - 0.12	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	NA	ND	ND	ND	ND	0 / 1	0.25 - 0.25	ND	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-5
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area
Exposure Medium: Surface Water North Percolation Pond Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	156-60-5	Trans-1,2-Dichloroethene	NA	ND	ND	ND	ND	0 / 1	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	NA	ND	ND	ND	ND	0 / 1	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	79-01-6	Trichloroethylene (TCE)	NA	ND	ND	ND	ND	0 / 1	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	NA	ND	ND	ND	ND	0 / 1	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	NA	ND	ND	ND	ND	0 / 1	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-6
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure North Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.096 (J)	7.8 (J-)	mg/kg	CFSDP-024	3 / 3	NA	7.8	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	56.6 (J)	219	mg/kg	CFSDP-024	3 / 3	NA	219	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	20800	112000	mg/kg	CFSDP-024	3 / 3	NA	112000	23478	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	0.53 (J-)	2.6 (J-)	mg/kg	CFSDP-024	2 / 3	0.39 - 0.39	2.6	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	7.6	26.4	mg/kg	CFSDP-024	3 / 3	NA	26.4	9.879	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	317	539	mg/kg	CFSDP-023	3 / 3	NA	539	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	1.5	4.5	mg/kg	CFSDP-024	3 / 3	NA	4.5	1.296	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	2.6	8	mg/kg	CFSDP-024	3 / 3	NA	8	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-70-2	Calcium	33400	106000	mg/kg	CFSDP-023	3 / 3	NA	106000	94895	No Screening Level		N	NSL
	7440-47-3	Chromium, Total	42.3	53	mg/kg	CFSDP-023	3 / 3	NA	53	15	No Screening Level		N	NSL
	7440-48-4	Cobalt	5.3	18.5	mg/kg	CFSDP-024	3 / 3	NA	18.5	9.77	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	56.4	83.6	mg/kg	CFSDP-024	3 / 3	NA	83.6	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	2940	9040	mg/kg	CFSDP-024	3 / 3	NA	9040	26687	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	24.6	109	mg/kg	CFSDP-024	3 / 3	NA	109	30.29	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	2660	4020	mg/kg	CFSDP-024	3 / 3	NA	4020	22708	No Screening Level		N	NSL
	7439-96-5	Manganese	24.8	74.7	mg/kg	CFSDP-024	3 / 3	NA	74.7	770	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-97-6	Mercury	0.028	0.1	mg/kg	CFSDP-024	3 / 3	NA	0.1	0.0762	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	208	771	mg/kg	CFSDP-024	3 / 3	NA	771	17.94	150	USEPA RSL Res Soil (THQ=0.1), n	Y	Carcinogen
	7440-09-7	Potassium	351	1150	mg/kg	CFSDP-024	3 / 3	NA	1150	1742	No Screening Level		N	NSL
	7782-49-2	Selenium	0.89 (J)	3.4 (J)	mg/kg	CFSDP-024	3 / 3	NA	3.4	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	1 (J)	1 (J)	mg/kg	CFSDP-024	1 / 3	0.72 - 0.76	1	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	177	840	mg/kg	CFSDP-024	3 / 3	NA	840	60.66	No Screening Level		N	NSL
	7440-28-0	Thallium	0.26 (J)	1.2 (J)	mg/kg	CFSDP-024	3 / 3	NA	1.2	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-62-2	Vanadium	63.3	233	mg/kg	CFSDP-024	3 / 3	NA	233	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-66-6	Zinc	349	871	mg/kg	CFSDP-024	3 / 3	NA	871	81.94	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.0011 - 0.0012	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00085 - 0.00094	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.0013 - 0.0014	ND	NA	No Screening Level		N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00091 - 0.001	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.0015 - 0.0016	ND	NA	No Screening Level		N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.0015 - 0.0017	ND	NA	No Screening Level		N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.001 - 0.0011	ND	NA	No Screening Level		N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.0012 - 0.0013	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.0011 - 0.0012	ND	NA	No Screening Level		N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.0012 - 0.0013	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.0012 - 0.0013	ND	NA	No Screening Level		N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.0013 - 0.0014	ND	NA	No Screening Level		N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.00084 - 0.00092	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.0012 - 0.0013	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.0018 - 0.002	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.002 - 0.0022	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.0012 - 0.0014	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.0014 - 0.0015	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.00096 - 0.0011	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.002 - 0.0022	ND	NA	No Screening Level		N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.012 - 0.014	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.012 - 0.014	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.012 - 0.014	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.012 - 0.014	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.012 - 0.014	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.013 - 0.014	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.013 - 0.014	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.013 - 0.014	ND	NA	No Screening Level		N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.013 - 0.014	ND	NA	No Screening Level		N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.013 - 0.014	ND	NA	No Screening Level		N	BSL-ND

Table 2-6
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure North Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 3	0.17 - 0.76	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 3	0.62 - 2.7	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 3	0.22 - 0.96	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 3	0.23 - 1	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 3	0.066 - 0.29	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 3	0.054 - 0.24	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 3	0.51 - 2.2	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 3	1.7 - 7.7	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 3	0.091 - 0.4	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 3	0.12 - 0.54	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 3	0.052 - 0.23	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 3	0.059 - 0.26	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	0.13 (J)	0.52 (J)	mg/kg	CFSDP-024	3 / 3	NA	0.52	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 3	0.1 - 0.44	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 3	0.076 - 0.34	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 3	0.078 - 0.34	ND	NA	No Screening Level		N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 3	0.26 - 1.1	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 3	0.061 - 0.27	ND	NA	No Screening Level		N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 3	0.068 - 0.3	ND	NA	No Screening Level		N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 3	0.62 - 2.7	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 3	0.073 - 0.32	ND	NA	No Screening Level		N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 3	0.099 - 0.44	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	0.13 (J)	0.13 (J)	mg/kg	CFSDP-023	1 / 3	0.12 - 0.26	0.13	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 3	0.069 - 0.3	ND	NA	No Screening Level		N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 3	0.087 - 0.38	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 3	1.1 - 4.9	ND	NA	No Screening Level		N	BSL-ND
	83-32-9	Acenaphthene	0.28 (J)	4.1 (J)	mg/kg	CFSDP-024	3 / 3	NA	4.1	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	0.086 (J)	0.086 (J)	mg/kg	CFSDP-023	1 / 3	0.12 - 0.26	0.086	NA	No Screening Level		N	NSL
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 3	0.05 - 0.22	ND	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	1.3 (J)	9.9 (J)	mg/kg	CFSDP-024	3 / 3	NA	9.9	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 3	0.1 - 0.45	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 3	0.18 - 0.77	ND	0.0141	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	14	76	mg/kg	CFSDP-024	3 / 3	NA	76	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	19	100	mg/kg	CFSDP-024	3 / 3	NA	100	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	40	210	mg/kg	CFSDP-024	3 / 3	NA	210	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	13	150	mg/kg	CFSDP-024	3 / 3	NA	150	NA	No Screening Level		N	NSL
	207-08-9	Benzo(K)Fluoranthene	17	64	mg/kg	CFSDP-024	3 / 3	NA	64	NA	1.1E+01	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 3	0.071 - 0.31	ND	NA	2.9E+02	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 3	0.2 - 0.87	ND	NA	4.7E+00	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 3	0.072 - 0.32	ND	NA	1.9E+01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 3	0.054 - 0.24	ND	NA	2.3E-01	USEPA RSL Res Soil (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 3	0.095 - 0.42	ND	NA	3.1E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.18 (J)	0.18 (J)	mg/kg	CFSDP-023	1 / 3	0.18 - 0.4	0.18	NA	3.9E+01	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 3	0.17 - 0.73	ND	NA	3.1E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.97 (J)	9.6 (J)	mg/kg	CFSDP-024	3 / 3	NA	9.6	NA	No Screening Level		N	NSL
	218-01-9	Chrysene	18	150	mg/kg	CFSDP-024	3 / 3	NA	150	0.0038	1.1E+02	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 3	0.069 - 0.3	ND	NA	6.3E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 3	0.12 - 0.52	ND	NA	6.3E+01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	4.8	40	mg/kg	CFSDP-024	3 / 3	NA	40	NA	1.1E-01	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	0.53 (J)	1.4 (J)	mg/kg	CFSDP-024	3 / 3	NA	1.4	NA	7.3E+00	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 3	0.066 - 0.29	ND	NA	5.1E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 3	0.067 - 0.3	ND	NA	No Screening Level		N	BSL-ND
	206-44-0	Fluoranthene	17	120	mg/kg	CFSDP-024	3 / 3	NA	120	NA	2.4E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	0.11 (J)	2.1 (J)	mg/kg	CFSDP-024	3 / 3	NA	2.1	NA	2.4E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 3	0.094 - 0.41	ND	NA	2.1E-01	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 3	0.065 - 0.29	ND	NA	1.2E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL

Table 2-6
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North Percolation Pond Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure North Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 3	0.14 - 0.63	ND	NA	1.8E-01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 3	0.085 - 0.37	ND	NA	1.8E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	15	140	mg/kg	CFSDP-024	3 / 3	NA	140	NA	1.1E+00	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 3	0.05 - 0.22	ND	NA	5.7E+02	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 3	0.078 - 0.34	ND	NA	7.8E-02	USEPA RSL Res Soil (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 3	0.21 - 0.92	ND	NA	1.1E+02	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	0.39 (J)	0.89 (J)	mg/kg	CFSDP-024	3 / 3	NA	0.89	NA	3.8E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 3	0.073 - 0.32	ND	NA	5.1E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 3	0.28 - 1.2	ND	NA	1.0E+00	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	6.2	41	mg/kg	CFSDP-024	3 / 3	NA	41	0.00226	No Screening Level		N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 3	0.075 - 0.33	ND	NA	1.9E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	16	120	mg/kg	CFSDP-024	3 / 3	NA	120	NA	1.8E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-7
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.016 (J)	9.9	mg/kg	CFSB-261	44 / 59	0.016 - 0.084	9.9	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	1.51 (J+)	796 (J-)	mg/kg	CFSB-270	59 / 59	NA	796	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0642336	2.26959	mg/kg	CFSB-036	59 / 59	NA	2.26959	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	8.42	11.02	mg/kg	CFSB-291	2 / 3	0.215 - 0.215	11.02	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.33577	82.5304	mg/kg	CFSB-036	59 / 59	NA	82.5304	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	4710	30800	mg/kg	CFSB-261	59 / 59	NA	30800	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.37 (J)	0.57 (J)	mg/kg	CFSB-036	2 / 59	0.24 - 0.5	0.57	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	3.6	11.8	mg/kg	CFSB-008	59 / 59	NA	11.8	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	55.3	420	mg/kg	CFSB-177	59 / 59	NA	420	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.27 (J)	1.5	mg/kg	CFSB-261	59 / 59	NA	1.5	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.27 (J)	0.27 (J)	mg/kg	CFMW-029	1 / 59	0.24 - 0.57	0.27	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1400	279000	mg/kg	CFSB-180	59 / 59	NA	279000	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	ND	ND	ND	ND	0 / 3	0.15 - 0.16	ND	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	7440-47-3	Chromium, Total	2.4	84.8	mg/kg	CFSB-036	61 / 62	0.58 - 0.58	84.8	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.5 (J)	9.5	mg/kg	CFSB-277	59 / 59	NA	9.5	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	6.7	7260	mg/kg	CFSB-002	59 / 59	NA	7260	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	2940	37100	mg/kg	CFSB-036	59 / 59	NA	37100	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	6.1 (J+)	48	mg/kg	CFMW-029	59 / 59	NA	48	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2890	15600	mg/kg	CFSB-005	59 / 59	NA	15600	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	156	1570 (J)	mg/kg	CFSB-283	59 / 59	NA	1570	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.045	mg/kg	CFSB-009	49 / 59	0.01 - 0.015	0.045	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	8.6	89 (J-)	mg/kg	CFMW-023A	59 / 59	NA	89	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	337	1820	mg/kg	CFLP-010	59 / 59	NA	1820	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	1.2 (J)	mg/kg	CFSB-036	12 / 59	0.24 - 0.5	1.2	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 59	0.51 - 1.1	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	33.9 (J)	4390	mg/kg	CFSB-261	39 / 59	27.6 - 53.5	4390	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	0.14 (J)	mg/kg	CFSB-219	7 / 59	0.1 - 0.21	0.14	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4 (J+)	27.7	mg/kg	CFLP-017	59 / 59	NA	27.7	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	28.9	114	mg/kg	CFMW-029	59 / 59	NA	114	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 10	0.00086 - 0.00095	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00065 - 0.00072	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00069 - 0.00077	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 10	0.0011 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 10	0.0012 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00078 - 0.00086	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 9	0.00093 - 0.00099	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 10	0.00083 - 0.00092	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 10	0.0009 - 0.001	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 10	0.00088 - 0.00098	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 10	0.00064 - 0.00071	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 10	0.00092 - 0.001	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 10	0.0014 - 0.0015	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 10	0.00094 - 0.001	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 10	0.001 - 0.0011	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 10	0.00073 - 0.00081	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 10	0.021 - 0.023	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	CLAY	Clay	3.9	8.8	percent	CFLP-018	12 / 12	NA	8.8	NA	No Screening Level	NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	2.7	18.4	percent	CFLP-014	12 / 12	NA	18.4	NA	No Screening Level	NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	7.6	35.6	percent	CFLP-011	12 / 12	NA	35.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	GRAVEL	Gravel	9.9	52.8	percent	CFLP-015	12 / 12	NA	52.8	NA	No Screening Level	NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	9.5	27.6	percent	CFLP-011	12 / 12	NA	27.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	308075-07-2	Sand	27.4	66.4	percent	CFLP-011	12 / 12	NA	66.4	NA	No Screening Level	NULL	NA	NA	N	NSL
	E52456985	Silt	7.5	32	percent	CFLP-016	12 / 12	NA	32	NA	No Screening Level	NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 37	0.0091 - 0.013	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL

Table 2-7
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 37	0.0091 - 0.013	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 37	0.0091 - 0.013	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 37	0.0091 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 37	0.0091 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	0.062 (J)	1.2	mg/kg	CFSB-227	2 / 37	0.0094 - 0.013	1.2	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	Y	ASL-DC Only
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 37	0.0094 - 0.013	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 37	0.0094 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 37	0.0094 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.062 (J)	1.2	mg/kg	CFSB-227	2 / 37	0.0094 - 0.013	1.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 59	0.0015 - 1.4	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 59	0.011 - 4.9	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 59	0.014 - 1.7	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 59	0.0024 - 1.8	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 59	0.0019 - 0.53	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 59	0.0026 - 0.44	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 59	0.0021 - 4.1	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 58	0.092 - 14	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 59	0.0017 - 0.73	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 59	0.0021 - 0.99	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 59	0.0016 - 0.42	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 59	0.0016 - 0.47	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0016 (J)	2 (J)	mg/kg	CFSB-004	23 / 59	0.0017 - 0.01	2	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 59	0.0098 - 0.81	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 59	0.012 - 0.61	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 59	0.002 - 0.62	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 57	0.032 - 2.1	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.026 (J)	0.048 (J)	mg/kg	CFSB-021	2 / 28	0.0094 - 0.49	0.048	NA	No Screening Level	NULL	NA	NA	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 59	0.0087 - 0.55	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 59	0.059 - 4.9	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 59	0.0024 - 0.58	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 59	0.0016 - 0.79	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 59	0.0011 - 0.48	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 59	0.0021 - 0.55	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 59	0.0017 - 0.7	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 59	0.024 - 8.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0025 (J)	22	mg/kg	CFSB-004	49 / 59	0.0021 - 0.01	22	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0015 (J)	0.54 (J)	mg/kg	CFSB-004	5 / 59	0.0015 - 0.1	0.54	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0026 (J)	0.019 (J)	mg/kg	CFLP-016	4 / 59	0.0019 - 0.4	0.019	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0025 (J)	47	mg/kg	CFSB-004	48 / 59	0.0019 - 0.044	47	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 59	0.015 - 0.82	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0049 (J)	0.082 (J-)	mg/kg	CFLP-016	8 / 48	0.0042 - 1.4	0.082	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.013 (J)	100	mg/kg	CFSB-004	57 / 59	0.03 - 0.034	100	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.019 (J)	100	mg/kg	CFSB-004	57 / 59	0.011 - 0.012	100	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.015 (J)	120	mg/kg	CFSB-004	57 / 59	0.0018 - 0.016	120	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.027 (J)	62	mg/kg	CFSB-004	57 / 59	0.021 - 0.023	62	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.018 (J)	50	mg/kg	CFSB-004	52 / 59	0.016 - 0.018	50	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.013 (J)	0.98	mg/kg	CFSB-036	4 / 59	0.011 - 0.57	0.98	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0055 (J)	0.035 (J)	mg/kg	CFMW-016A	2 / 59	0.0014 - 1.6	0.035	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 59	0.0016 - 0.58	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 59	0.0012 - 0.44	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 59	0.0025 - 0.76	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.045 (J)	2.5	mg/kg	CFSB-264	13 / 59	0.014 - 0.72	2.5	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.066 (J)	0.066 (J)	mg/kg	CFSB-035	1 / 59	0.022 - 1.3	0.066	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0018 (J)	32	mg/kg	CFSB-004	56 / 59	0.0089 - 0.01	32	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.011 (J)	110	mg/kg	CFSB-004	59 / 59	NA	110	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.017 (J)	0.056 (J)	mg/kg	CFSB-033	4 / 59	0.011 - 0.55	0.056	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	0.096 (J)	0.096 (J)	mg/kg	CFMW-002	1 / 59	0.018 - 0.94	0.096	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0054 (J)	21	mg/kg	CFSB-004	54 / 59	0.0016 - 0.021	21	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen

Table 2-7
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	132-64-9	Dibenzofuran	0.0016 (J)	10 (J)	mg/kg	CFSB-004	37 / 59	0.0015 - 0.014	10	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.012 (J)	0.012 (J)	mg/kg	CFSB-177	1 / 59	0.01 - 0.53	0.012	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 59	0.0012 - 0.54	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.014 (J)	240	mg/kg	CFSB-004	58 / 59	0.012 - 0.012	240	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0021 (J)	19	mg/kg	CFSB-004	48 / 59	0.0014 - 0.01	19	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 59	0.0024 - 0.75	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 59	0.002 - 0.52	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 59	0.0017 - 1.2	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 59	0.0018 - 0.68	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.021 (J)	76	mg/kg	CFSB-004	57 / 59	0.024 - 0.027	76	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.011 (J)	0.25	mg/kg	CFSB-007	9 / 59	0.0017 - 0.4	0.25	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 59	0.0023 - 0.62	ND	NA	0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 59	0.011 - 1.7	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0014 (J)	4.6 (J)	mg/kg	CFSB-004	35 / 59	0.0014 - 0.012	4.6	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 59	0.011 - 0.58	ND	NA	0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 59	0.043 - 2.2	ND	NA	0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.01 (J)	180	mg/kg	CFSB-004	58 / 59	0.011 - 0.011	180	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	0.016 (J)	0.14 (J)	mg/kg	CFLP-016	3 / 59	0.01 - 0.6	0.14	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	ASL-SSLOnly
	129-00-0	Pyrene	0.028 (J)	150	mg/kg	CFSB-004	57 / 59	0.016 - 0.018	150	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-8
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)	Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.016 (J)	13	mg/kg	CFSB-261	81 / 118	0.015 - 0.089	13	2.4	0.0015 USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	1.51 (J+)	796 (J-)	mg/kg	CFSB-270	118 / 118	NA	796	4.171	12 USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0642336	2.26959	mg/kg	CFSB-036	118 / 118	NA	2.26959	NA	0.00067 USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	8.42	11.02	mg/kg	CFSB-291	5 / 6	0.215 - 0.215	11.02	NA	12000 USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.33577	82.5304	mg/kg	CFSB-036	118 / 118	NA	82.5304	NA	12000 USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	4500	36800	mg/kg	CFLP-012	118 / 118	NA	36800	15337	3000 USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.37 (J)	1.5	mg/kg	CFLP-009	4 / 118	0.23 - 0.5	1.5	NA	0.035 USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2.8	17.9	mg/kg	CFLP-009	118 / 118	NA	17.9	6.291	0.0015 USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	40.7	436	mg/kg	CFSB-180	118 / 118	NA	436	299.5	16 USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.24 (J)	4.7	mg/kg	CFLP-009	116 / 118	0.16 - 0.17	4.7	1.093	1.9 USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.27 (J)	1.6	mg/kg	CFLP-009	5 / 118	0.24 - 0.57	1.6	0.382	0.069 USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	921	313000	mg/kg	CFSB-180	118 / 118	NA	313000	16691	No Screening Level NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	ND	ND	ND	ND	0 / 6	0.053 - 0.16	ND	NA	0.00067 USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	7440-47-3	Chromium, Total	2.4	84.8	mg/kg	CFSB-036	123 / 124	0.58 - 0.58	84.8	15.94	No Screening Level NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.5 (J)	13	mg/kg	CFLP-009	118 / 118	NA	13	7.576	0.027 USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	5.9	7260	mg/kg	CFSB-002	118 / 118	NA	7260	17.93	2.8 USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	2940	37100	mg/kg	CFSB-036	118 / 118	NA	37100	18549	35 USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	5.9	84.2 (J)	mg/kg	CFSB-008	118 / 118	NA	84.2	28.6	14 USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2890	18800	mg/kg	CFMW-018	118 / 118	NA	18800	11051	No Screening Level NULL	NA	NA	N	NSL
	7439-96-5	Manganese	129	1570 (J)	mg/kg	CFSB-283	118 / 118	NA	1570	1566	2.8 USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.076	mg/kg	CFMW-016A	96 / 118	0.0096 - 0.015	0.076	0.0597	0.0033 USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.9	534	mg/kg	CFLP-009	118 / 118	NA	534	17.32	2.6 USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	332	10900	mg/kg	CFLP-012	118 / 118	NA	10900	2167	No Screening Level NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	3 (J)	mg/kg	CFLP-009	18 / 118	0.23 - 0.5	3	1.376	0.052 USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 118	0.49 - 1.1	ND	NA	0.08 USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	33 (J)	5170	mg/kg	CFLP-012	80 / 118	25.6 - 53.5	5170	69.94	No Screening Level NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	1.1	mg/kg	CFLP-009	16 / 118	0.099 - 0.21	1.1	NA	0.0014 USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	3 (J+)	151	mg/kg	CFLP-009	118 / 118	NA	151	21.54	8.6 USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	27.9	114 (J-)	mg/kg	CFMW-002	118 / 118	NA	114	82.87	37 USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 10	0.00086 - 0.00095	ND	NA	0.00015 USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00065 - 0.00072	ND	NA	4.20E-05 USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00069 - 0.00077	ND	NA	0.00015 USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 10	0.0011 - 0.0012	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 10	0.0012 - 0.0013	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00078 - 0.00086	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 9	0.00093 - 0.00099	ND	NA	7.10E-05 USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 10	0.00083 - 0.00092	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 10	0.0009 - 0.001	ND	NA	0.0092 USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 10	0.00088 - 0.00098	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 10	0.00064 - 0.00071	ND	NA	0.00024 USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 10	0.00092 - 0.001	ND	NA	0.00012 USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 10	0.0014 - 0.0015	ND	NA	2.80E-05 USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	0.2 USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 10	0.00094 - 0.001	ND	NA	0.0015 USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 10	0.001 - 0.0011	ND	NA	0.011 USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 10	0.00073 - 0.00081	ND	NA	0.077 USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 10	0.021 - 0.023	ND	NA	0.011 USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	CLAY	Clay	3.8	30.5	percent	CFLP-009	24 / 24	NA	30.5	NA	No Screening Level NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	2.7	18.4	percent	CFLP-014	24 / 24	NA	18.4	NA	No Screening Level NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	5.1	35.6	percent	CFLP-011	24 / 24	NA	35.6	NA	No Screening Level NULL	NA	NA	N	NSL
	GRAVEL	Gravel	0	63.6	percent	CFLP-017	24 / 24	NA	63.6	NA	No Screening Level NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	7.3	27.6	percent	CFLP-011	24 / 24	NA	27.6	NA	No Screening Level NULL	NA	NA	N	NSL
	308075-07-2	Sand	26.2	66.4	percent	CFLP-011	24 / 24	NA	66.4	NA	No Screening Level NULL	NA	NA	N	NSL
	E52456985	Silt	4.3	41.3	percent	CFLP-009	24 / 24	NA	41.3	NA	No Screening Level NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 76	0.0091 - 0.013	ND	NA	0.013 USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 76	0.0091 - 0.013	ND	NA	8.00E-05 USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 76	0.0091 - 0.013	ND	NA	8.00E-05 USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 76	0.0091 - 0.013	ND	NA	0.0012 USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 76	0.0091 - 0.013	ND	NA	0.0012 USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	0.062 (J)	1.2	mg/kg	CFSB-227	6 / 76	0.0094 - 0.013	1.2	NA	0.002 USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	Y	ASL-DC Only
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 76	0.0094 - 0.013	ND	NA	0.0055 USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL

Table 2-8
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)	Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 76	0.0094 - 0.013	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 76	0.0094 - 0.013	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.062 (J)	1.2	mg/kg	CFSB-227	6 / 76	0.0094 - 0.013	1.2	NA	No Screening Level NULL	NA	NA	N	NSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 118	0.0015 - 1.4	ND	NA	0.00079 USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 118	0.011 - 4.9	ND	NA	9.40E-05 USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 118	0.014 - 1.7	ND	NA	0.018 USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 118	0.0024 - 1.8	ND	NA	0.4 USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 118	0.0019 - 0.53	ND	NA	0.0012 USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 118	0.0026 - 0.44	ND	NA	0.0023 USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 118	0.0021 - 4.1	ND	NA	0.042 USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 117	0.092 - 14	ND	NA	0.0044 USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 118	0.0017 - 0.73	ND	NA	0.00032 USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 118	0.0021 - 0.99	ND	NA	6.70E-05 USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 118	0.0016 - 0.42	ND	NA	0.39 USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 118	0.0016 - 0.47	ND	NA	0.0089 USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0016 (J)	3.9 (J)	mg/kg	CFSB-004	29 / 118	0.0017 - 0.04	3.9	0.0017	0.019 USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 118	0.0098 - 0.81	ND	NA	0.075 USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 118	0.011 - 0.61	ND	NA	0.008 USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 118	0.002 - 0.62	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 116	0.032 - 2.1	ND	NA	0.00082 USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.012 (J)	1 (J)	mg/kg	CFSB-004	4 / 59	0.0093 - 0.49	1	NA	No Screening Level NULL	NA	NA	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 118	0.0087 - 0.55	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 118	0.059 - 4.9	ND	NA	0.00026 USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 118	0.0024 - 0.58	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 118	0.0016 - 0.79	ND	NA	0.17 USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 118	0.0011 - 0.48	ND	NA	0.00016 USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 118	0.0021 - 0.55	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 118	0.0017 - 0.7	ND	NA	0.0016 USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 118	0.024 - 8.9	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0022 (J)	28	mg/kg	CFSB-004	74 / 118	0.002 - 0.047	28	0.00594	0.55 USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0015 (J)	1 (J)	mg/kg	CFSB-004	7 / 118	0.0015 - 0.1	1	NA	No Screening Level NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0022 (J)	0.019 (J)	mg/kg	CFLP-016	7 / 118	0.0019 - 0.4	0.019	0.034	0.058 USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.002 (J)	48	mg/kg	CFSB-004	75 / 118	0.0018 - 0.17	48	0.00326	5.8 USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 118	0.015 - 0.82	ND	NA	0.0002 USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0049 (J-)	0.082 (J-)	mg/kg	CFLP-016	11 / 95	0.0042 - 1.4	0.082	6.02	0.0041 USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.005 (J)	100	mg/kg	CFSB-004	108 / 118	0.029 - 0.034	100	0.016	0.011 USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0057 (J)	100	mg/kg	CFSB-004	111 / 118	0.011 - 0.012	100	0.0317	0.029 USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0093	120	mg/kg	CFSB-004	112 / 118	0.0018 - 0.016	120	0.0589	0.3 USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0051 (J)	62	mg/kg	CFSB-004	108 / 118	0.02 - 0.023	62	0.0406	No Screening Level NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0027 (J)	50	mg/kg	CFSB-004	104 / 118	0.015 - 0.018	50	0.0246	2.9 USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.013 (J)	0.98	mg/kg	CFSB-036	7 / 118	0.011 - 0.57	0.98	NA	0.24 USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0035 (J)	0.035 (J)	mg/kg	CFMW-016A	3 / 118	0.0014 - 1.6	0.035	NA	0.00087 USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 118	0.0016 - 0.58	ND	NA	0.0013 USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 118	0.0012 - 0.44	ND	NA	3.60E-06 USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 118	0.0025 - 0.76	ND	NA	0.026 USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.025 (J)	2.5	mg/kg	CFSB-264	16 / 118	0.014 - 0.87	2.5	NA	1.3 USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.039 (J)	0.066 (J)	mg/kg	CFSB-035	2 / 118	0.022 - 1.3	0.066	NA	0.25 USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0017 (J)	32	mg/kg	CFSB-004	97 / 118	0.0016 - 0.01	32	0.00657	No Screening Level NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.007 (J)	110	mg/kg	CFSB-004	115 / 118	0.0095 - 0.01	110	0.0416	9 USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.013 (J-)	0.056 (J)	mg/kg	CFSB-033	6 / 118	0.01 - 0.55	0.056	NA	0.23 USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	0.096 (J)	0.61	mg/kg	CFSB-009	2 / 118	0.018 - 0.94	0.61	NA	5.7 USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0016 (J)	21	mg/kg	CFSB-004	94 / 118	0.0016 - 0.022	21	0.00619	0.096 USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0016 (J)	15 (J)	mg/kg	CFSB-004	55 / 118	0.0015 - 0.054	15	0.00209	0.015 USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.012 (J)	0.012 (J)	mg/kg	CFSB-177	1 / 118	0.0099 - 0.53	0.012	NA	0.61 USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 118	0.0012 - 0.54	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.01	240	mg/kg	CFSB-004	114 / 118	0.01 - 0.012	240	0.031	8.9 USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0014 (J)	25	mg/kg	CFSB-004	74 / 118	0.0014 - 0.039	25	0.0218	0.54 USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 118	0.0024 - 0.75	ND	NA	0.00012 USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 118	0.002 - 0.52	ND	NA	0.00027 USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 118	0.0017 - 1.2	ND	NA	0.00013 USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 118	0.0018 - 0.68	ND	NA	0.0002 USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0031 (J)	76	mg/kg	CFSB-004	107 / 118	0.023 - 0.027	76	0.0391	0.98 USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.011 (J)	1.4 (J)	mg/kg	CFSB-004	15 / 118	0.0017 - 0.4	1.4	NA	0.026 USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 118	0.0023 - 0.62	ND	NA	8.10E-06 USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND

Table 2-8
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)	Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 118	0.011 - 1.7	ND	NA	0.067 USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0014 (J)	10 (J)	mg/kg	CFSB-004	50 / 118	0.0014 - 0.088	10	0.00337	0.00054 USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 118	0.011 - 0.58	ND	NA	9.20E-05 USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 118	0.042 - 2.2	ND	NA	5.70E-05 USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0052 (J)	240	mg/kg	CFSB-004	112 / 118	0.0093 - 0.011	240	0.0217	No Screening Level NULL	NA	NA	N	NSL
	108-95-2	Phenol	0.016 (J)	1.2 (J)	mg/kg	CFSB-004	4 / 118	0.01 - 0.6	1.2	NA	0.33 USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	ASL-SSLOnly
	129-00-0	Pyrene	0.0083	150	mg/kg	CFSB-004	111 / 118	0.016 - 0.018	150	0.0331	1.3 USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 31	0.00028 - 0.00055	ND	NA	0.28 USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 31	0.00013 - 0.00025	ND	NA	3.00E-05 USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 31	0.00033 - 0.00064	ND	NA	2.6 USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 31	0.00021 - 0.00041	ND	NA	1.30E-05 USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 31	0.00025 - 0.0005	ND	NA	0.00078 USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 31	0.0003 - 0.0006	ND	NA	0.01 USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 31	8.2e-005 - 0.00016	ND	NA	0.0021 USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 31	0.00024 - 0.00047	ND	NA	0.0012 USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 31	0.00035 - 0.00069	ND	NA	1.40E-07 USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 31	8.9e-005 - 0.00018	ND	NA	2.10E-06 USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 31	0.0001 - 0.0002	ND	NA	0.03 USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 31	8.2e-005 - 0.00016	ND	NA	4.80E-05 USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 31	0.00013 - 0.00025	ND	NA	0.00027 USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 31	8.9e-005 - 0.00018	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 31	9.7e-005 - 0.00019	ND	NA	0.00046 USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 31	0.0007 - 0.0014	ND	NA	0.00088 USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0079	0.13 (J+)	mg/kg	CFMW-008A	29 / 31	0.001 - 0.0011	0.13	NA	0.29 USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00017 (J)	0.0097	mg/kg	CFMW-008A	14 / 31	0.00015 - 0.00029	0.0097	NA	0.00023 USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 31	0.00013 - 0.00025	ND	NA	0.0021 USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 31	0.00028 - 0.00055	ND	NA	3.60E-05 USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 31	9.7e-005 - 0.00019	ND	NA	0.00087 USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	0.00045 (J)	0.00045 (J)	mg/kg	CFSB-034	1 / 31	0.00024 - 0.00047	0.00045	NA	0.00019 USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	ASL-SSLOnly
	75-15-0	Carbon Disulfide	0.00039 (J)	0.0041 (J)	mg/kg	CFMW-012A	15 / 31	0.00033 - 0.00047	0.0041	NA	0.024 USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 31	0.00032 - 0.00063	ND	NA	0.00018 USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 31	0.0001 - 0.0002	ND	NA	0.0053 USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 31	0.00026 - 0.00051	ND	NA	0.59 USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 31	0.00016 - 0.00031	ND	NA	6.10E-05 USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 31	0.00028 - 0.00055	ND	NA	0.0049 USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 31	0.00016 - 0.00032	ND	NA	0.0011 USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 31	0.00011 - 0.00022	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00052 (J+)	0.00052 (J+)	mg/kg	CFMW-008A	1 / 31	0.00034 - 0.00067	0.00052	NA	1.3 USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 31	0.00011 - 0.00022	ND	NA	0.00023 USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 31	0.00024 - 0.00047	ND	NA	0.03 USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.0024	0.0024	mg/kg	CFMW-008A	1 / 31	0.00013 - 0.00026	0.0024	NA	0.0017 USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	ASL-SSLOnly
	98-82-8	Isopropylbenzene (Cumene)	0.00034 (J)	0.00034 (J)	mg/kg	CFMW-008A	1 / 31	0.00013 - 0.00025	0.00034	NA	0.074 USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00012 (J)	0.0038	mg/kg	CFMW-008A	12 / 31	8.2e-005 - 0.00016	0.0038	NA	No Screening Level NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0028 (J)	0.017 (J+)	mg/kg	CFMW-008A	8 / 31	0.00067 - 0.0013	0.017	NA	0.41 USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0009 (J)	0.012	mg/kg	CFMW-008A	6 / 31	0.00057 - 0.0011	0.012	NA	0.12 USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 31	0.0017 - 0.0032	ND	NA	0.14 USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.00042 (J)	0.001 (J)	mg/kg	CFSB-004	7 / 31	0.00037 - 0.00073	0.001	NA	No Screening Level NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	0.00056 (J)	0.00056 (J)	mg/kg	CFSB-033	1 / 31	0.00024 - 0.00047	0.0015	NA	0.0027 USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00022 (J)	0.0016	mg/kg	CFMW-008A	2 / 31	0.00012 - 0.00023	0.0016	NA	0.019 USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 31	0.00011 - 0.00022	ND	NA	0.13 USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 31	0.00013 - 0.00025	ND	NA	0.0032 USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.00034 (J)	0.00034 (J)	mg/kg	CFMW-008A	1 / 31	0.00021 - 0.00041	0.00034	NA	0.0018 USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00015 (J)	0.012	mg/kg	CFMW-008A	26 / 31	0.00017 - 0.00021	0.012	NA	0.076 USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 31	0.00029 - 0.00057	ND	NA	0.011 USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 31	7.4e-005 - 0.00015	ND	NA	No Screening Level NULL	NA	NA	N	BSL-ND

Table 2-8
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)	Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 31	0.00019 - 0.00038	ND	NA	0.0001 USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 31	0.00025 - 0.0005	ND	NA	0.33 USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 31	0.00029 - 0.00057	ND	NA	0.0000065 USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-9
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Central Landfills Area
Exposure Medium: Subsurface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	57-12-5	Cyanide	0.016 (J)	13	mg/kg	CFSB-261	102 / 161	0.015 - 0.089	13	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.35 (J)	796 (J-)	mg/kg	CFSB-270	161 / 161	NA	796	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	STL00529	In Place Density	0.869	1.74	g/cc	CFLP-008	24 / 24	NA	1.74	NA	No Screening Level	NULL	NA	NA	N	NSL
	MOIST	Moisture, Percent	3.4	62.5	percent	CFLP-009	24 / 24	NA	62.5	NA	No Screening Level	NULL	NA	NA	N	NSL
	TOC	Total Organic Carbon	1990	137000	mg/kg	CFSB-180	71 / 77	74.7 - 127	137000	122647	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0642336	2.26959	mg/kg	CFSB-036	161 / 161	NA	2.26959	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_CALC	Chromium, Trivalent - Calculated	8.42	11.02	mg/kg	CFSB-291	5 / 6	0.215 - 0.215	11.02	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.33577	82.5304	mg/kg	CFSB-036	161 / 161	NA	82.5304	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	4500	36800	mg/kg	CFLP-012	161 / 161	NA	36800	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.37 (J)	1.5	mg/kg	CFLP-009	5 / 161	0.23 - 0.5	1.5	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2.8	17.9	mg/kg	CFLP-009	161 / 161	NA	17.9	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	29.5	436	mg/kg	CFSB-180	161 / 161	NA	436	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.2 (J)	4.7	mg/kg	CFLP-009	156 / 161	0.16 - 0.18	4.7	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.27 (J)	1.6	mg/kg	CFLP-009	5 / 161	0.24 - 0.57	1.6	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	921	313000	mg/kg	CFSB-180	161 / 161	NA	313000	16691	No Screening Level	NULL	NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent	ND	ND	ND	ND	0 / 6	0.053 - 0.16	ND	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	7440-47-3	Chromium, Total	2.4	84.8	mg/kg	CFSB-036	166 / 167	0.58 - 0.58	84.8	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.5 (J)	13	mg/kg	CFLP-009	161 / 161	NA	13	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	5.9	7260	mg/kg	CFSB-002	161 / 161	NA	7260	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	2940	37100	mg/kg	CFSB-036	161 / 161	NA	37100	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	3.7 (J+)	84.2 (J)	mg/kg	CFSB-008	161 / 161	NA	84.2	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2890	20500	mg/kg	CFSB-271	161 / 161	NA	20500	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	129	1570 (J)	mg/kg	CFSB-283	161 / 161	NA	1570	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.083	mg/kg	CFSB-261	133 / 161	0.0096 - 0.015	0.083	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.9	534	mg/kg	CFLP-009	161 / 161	NA	534	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	332	10900	mg/kg	CFLP-012	161 / 161	NA	10900	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	3 (J)	mg/kg	CFLP-009	18 / 161	0.23 - 0.5	3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 161	0.49 - 1.1	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	31.3 (J)	5170	mg/kg	CFLP-012	101 / 161	25 - 53.5	5170	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	1.1	mg/kg	CFLP-009	16 / 161	0.098 - 0.21	1.1	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	3 (J+)	151	mg/kg	CFLP-009	161 / 161	NA	151	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	25.2	114	mg/kg	CFMW-029	161 / 161	NA	114	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 10	0.00086 - 0.00095	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00065 - 0.00072	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00069 - 0.00077	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 10	0.0011 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 10	0.0012 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 10	0.00078 - 0.00086	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 9	0.00093 - 0.00099	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 10	0.00083 - 0.00092	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 10	0.0009 - 0.001	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 10	0.00088 - 0.00098	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 10	0.00099 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 10	0.00064 - 0.00071	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 10	0.00092 - 0.001	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 10	0.0014 - 0.0015	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 10	0.00094 - 0.001	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 10	0.001 - 0.0011	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 10	0.00073 - 0.00081	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 10	0.021 - 0.023	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 10	0.0015 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	CLAY	Clay	3.8	30.5	percent	CFLP-009	24 / 24	NA	30.5	NA	No Screening Level	NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	2.7	18.4	percent	CFLP-014	24 / 24	NA	18.4	NA	No Screening Level	NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	5.1	35.6	percent	CFLP-011	24 / 24	NA	35.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	GRAVEL	Gravel	0	63.6	percent	CFLP-017	24 / 24	NA	63.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	7.3	27.6	percent	CFLP-011	24 / 24	NA	27.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	308075-07-2	Sand	26.2	66.4	percent	CFLP-011	24 / 24	NA	66.4	NA	No Screening Level	NULL	NA	NA	N	NSL
	E52456985	Silt	4.3	41.3	percent	CFLP-009	24 / 24	NA	41.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 105	0.0091 - 0.013	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 105	0.0091 - 0.013	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 105	0.0091 - 0.013	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 105	0.0091 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL

Table 2-9
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Central Landfills Area
Exposure Medium: Subsurface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 105	0.0091 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	0.062 (J)	1.2	mg/kg	CFSB-227	6 / 105	0.0094 - 0.013	1.2	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	Y	ASL-DC Only
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 105	0.0094 - 0.013	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 105	0.0094 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 105	0.0094 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.062 (J)	1.2	mg/kg	CFSB-227	6 / 105	0.0094 - 0.013	1.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 161	0.0015 - 1.4	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 161	0.011 - 4.9	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 161	0.014 - 1.7	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 161	0.0024 - 1.8	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 161	0.0019 - 0.53	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 161	0.0026 - 0.44	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 161	0.0021 - 4.1	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 158	0.092 - 14	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 161	0.0017 - 0.73	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 161	0.0021 - 0.99	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 161	0.0016 - 0.42	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 161	0.0016 - 0.47	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0016 (J)	3.9 (J)	mg/kg	CFSB-004	33 / 161	0.0016 - 0.04	3.9	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 161	0.0098 - 0.81	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 161	0.011 - 0.61	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 161	0.002 - 0.62	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 159	0.032 - 2.1	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.012 (J)	1 (J)	mg/kg	CFSB-004	6 / 88	0.0092 - 0.49	1	NA	No Screening Level	NULL	NA	NA	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 161	0.0087 - 0.55	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 161	0.059 - 4.9	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 161	0.0024 - 0.58	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 161	0.0016 - 0.79	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 161	0.0011 - 0.48	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 161	0.0021 - 0.55	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 161	0.0017 - 0.7	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 161	0.024 - 8.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0022 (J)	28	mg/kg	CFSB-004	86 / 161	0.002 - 0.047	28	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0015 (J)	1 (J)	mg/kg	CFSB-004	8 / 161	0.0015 - 0.1	1	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0022 (J)	0.019 (J)	mg/kg	CFLP-016	7 / 161	0.0019 - 0.4	0.019	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.002 (J)	48	mg/kg	CFSB-004	83 / 161	0.0018 - 0.17	48	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 161	0.015 - 0.82	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0049 (J)	0.082 (J-)	mg/kg	CFLP-016	11 / 128	0.0042 - 1.4	0.082	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0021 (J)	100	mg/kg	CFSB-004	129 / 161	0.029 - 0.039	100	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0019 (J)	100	mg/kg	CFSB-004	135 / 161	0.01 - 0.014	100	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0033 (J)	120	mg/kg	CFSB-004	137 / 161	0.0018 - 0.018	120	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0029 (J)	62	mg/kg	CFSB-004	130 / 161	0.02 - 0.027	62	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0027 (J)	50	mg/kg	CFSB-004	123 / 161	0.0021 - 0.02	50	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.013 (J)	0.98	mg/kg	CFSB-036	8 / 161	0.011 - 0.57	0.98	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0035 (J)	0.035 (J)	mg/kg	CFMW-016A	3 / 161	0.0014 - 1.6	0.035	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 161	0.0016 - 0.58	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 161	0.0012 - 0.44	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 161	0.0025 - 0.76	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.025 (J)	2.5	mg/kg	CFSB-264	22 / 161	0.013 - 0.87	2.5	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.039 (J)	0.066 (J)	mg/kg	CFSB-035	2 / 161	0.022 - 1.3	0.066	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0017 (J)	32	mg/kg	CFSB-004	110 / 161	0.0016 - 0.012	32	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0028 (J)	110	mg/kg	CFSB-004	141 / 161	0.0094 - 0.013	110	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.013 (J-)	0.056 (J)	mg/kg	CFSB-033	7 / 161	0.01 - 0.55	0.056	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	LDF
	117-84-0	Di-N-Octylphthalate	0.027 (J)	0.61	mg/kg	CFSB-009	3 / 161	0.018 - 0.94	0.61	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0015 (J)	21	mg/kg	CFSB-004	112 / 161	0.0015 - 0.024	21	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0016 (J)	15 (J)	mg/kg	CFSB-004	62 / 161	0.0015 - 0.054	15	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.012 (J)	0.012 (J)	mg/kg	CFSB-177	1 / 161	0.0098 - 0.53	0.012	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 161	0.0012 - 0.54	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0032 (J)	240	mg/kg	CFSB-004	140 / 161	0.01 - 0.014	240	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0014 (J)	25	mg/kg	CFSB-004	86 / 161	0.0013 - 0.039	25	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 161	0.0024 - 0.75	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 161	0.002 - 0.52	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 161	0.0017 - 1.2	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 161	0.0018 - 0.68	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL

Table 2-9
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Central Landfills Area
Exposure Medium: Subsurface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0022 (J)	76	mg/kg	CFSB-004	129 / 161	0.023 - 0.031	76	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.011 (J)	1.4 (J)	mg/kg	CFSB-004	17 / 161	0.0017 - 0.4	1.4	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 161	0.0023 - 0.62	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 161	0.011 - 1.7	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0014 (J)	10 (J)	mg/kg	CFSB-004	54 / 161	0.0013 - 0.088	10	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 161	0.011 - 0.58	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 161	0.042 - 2.2	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0027 (J)	240	mg/kg	CFSB-004	136 / 161	0.0019 - 0.012	240	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	0.016 (J)	1.2 (J)	mg/kg	CFSB-004	4 / 161	0.01 - 0.6	1.2	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	ASL-SSLOnly
	129-00-0	Pyrene	0.0033 (J)	150	mg/kg	CFSB-004	134 / 161	0.016 - 0.021	150	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 61	0.00016 - 0.00055	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 61	7.4e-005 - 0.00025	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 61	0.00019 - 0.00064	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 61	0.00012 - 0.00041	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 61	0.00015 - 0.0005	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 61	0.00018 - 0.0006	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 61	4.8e-005 - 0.00018	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 61	9.2e-005 - 0.00047	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 61	0.0002 - 0.00069	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 61	5.2e-005 - 0.00018	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 61	6.1e-005 - 0.0002	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 61	4.8e-005 - 0.0003	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 61	7.4e-005 - 0.00042	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 61	5.2e-005 - 0.00018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 61	5.6e-005 - 0.00019	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 61	0.00041 - 0.0014	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0026 (J)	0.15	mg/kg	CFSB-221	54 / 61	0.00046 - 0.0015	0.15	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00017 (J)	0.0097	mg/kg	CFMW-008A	20 / 61	8.7e-005 - 0.00029	0.0097	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 61	7.4e-005 - 0.00028	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 61	0.00016 - 0.00055	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 61	5.6e-005 - 0.00043	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	0.00045 (J)	0.00045 (J)	mg/kg	CFSB-034	1 / 61	0.00014 - 0.00047	0.00045	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	ASL-SSLOnly
	75-15-0	Carbon Disulfide	0.0003 (J)	0.0041 (J)	mg/kg	CFMW-012A	22 / 61	0.00019 - 0.00062	0.0041	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 61	0.00018 - 0.00063	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 61	6.1e-005 - 0.0002	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 61	0.00015 - 0.00052	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 61	9.1e-005 - 0.00032	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 61	0.00016 - 0.00055	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 61	9.5e-005 - 0.00032	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 61	6.5e-005 - 0.00027	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00045 (J)	0.00052 (J+)	mg/kg	CFMW-008A	2 / 61	0.0002 - 0.00067	0.00052	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 61	6.5e-005 - 0.00022	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 61	0.00014 - 0.00047	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00042 (J)	0.0024	mg/kg	CFMW-008A	2 / 61	7.8e-005 - 0.00026	0.0024	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	ASL-SSLOnly
	98-82-8	Isopropylbenzene (Cumene)	0.00034 (J)	0.00034 (J)	mg/kg	CFMW-008A	1 / 61	7.4e-005 - 0.00025	0.00034	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00012 (J)	0.0038	mg/kg	CFMW-008A	19 / 61	4.8e-005 - 0.00017	0.0038	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0028 (J)	0.017 (J+)	mg/kg	CFMW-008A	9 / 61	0.00039 - 0.0043	0.017	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0009 (J)	0.012	mg/kg	CFMW-008A	12 / 61	0.00033 - 0.0011	0.012	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 61	0.00066 - 0.0032	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.00042 (J)	0.001 (J)	mg/kg	CFSB-004	9 / 61	0.00016 - 0.00073	0.001	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	0.00054 (J)	0.00061 (J)	mg/kg	CFMW-002	3 / 61	0.00014 - 0.00047	0.0015	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00018 (J)	0.0016	mg/kg	CFMW-008A	5 / 61	6.9e-005 - 0.00023	0.0016	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	0.0002 (J)	0.0002 (J)	mg/kg	CFSB-221	1 / 61	6.5e-005 - 0.00022	0.0002	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 61	7.4e-005 - 0.00025	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.00034 (J)	0.00034 (J)	mg/kg	CFMW-008A	1 / 61	0.00012 - 0.00041	0.00034	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00015 (J)	0.012	mg/kg	CFMW-008A	44 / 61	8.2e-005 - 0.00027	0.012	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 61	0.00017 - 0.00057	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 61	4.3e-005 - 0.00027	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-9
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Central Landfills Area
Exposure Medium: Subsurface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 61	0.00011 - 0.00038	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 61	0.00015 - 0.0005	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 61	0.00017 - 0.00057	ND	NA	0.0000065	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-10
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfills Area
Exposure Medium: Surface Water Central Landfills Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	ND	ND	ND	ND	0 / 15	2 - 4	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 5	1.5 - 1.5	ND	1834	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	16984-48-8	Fluoride	38.7 (J)	2600	µg/l	CFSWP-010	15 / 15	NA	2600	130	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	16.5 (J)	507	µg/l	CFSWP-010	12 / 15	18.2 - 18.2	507	33.9	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-36-0	Antimony	2.2	2.2	µg/l	CFSWP-010	1 / 15	0.62 - 0.76	2.2	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.8 (J)	0.8 (J)	µg/l	CFSWP-012	1 / 15	0.64 - 0.77	0.8	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	63.4	88.8	µg/l	CFSWP-012	15 / 15	NA	88.8	98.6	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 15	0.24 - 0.29	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 15	0.61 - 0.72	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	38300	50700	µg/l	CFSWP-010	15 / 15	NA	50700	55600	No Screening Level		N	NSL
	7440-47-3	Chromium, Total	ND	ND	ND	ND	0 / 15	1.3 - 1.5	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	ND	ND	ND	ND	0 / 15	1.3 - 1.5	ND	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-50-8	Copper	1.5 (J)	4.1	µg/l	CFSWP-012	3 / 15	1.4 - 1.9	4.1	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	49.3 (J)	392	µg/l	CFSWP-010	5 / 15	42.4 - 49.1	392	123	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-92-1	Lead	0.54 (J)	0.54 (J)	µg/l	CFSWP-010	1 / 15	0.37 - 0.44	0.54	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	6510	12100	µg/l	CFSWP-010	15 / 15	NA	12100	17601	No Screening Level		N	NSL
	7439-96-5	Manganese	3.1 (J)	19.6	µg/l	CFSWP-010	15 / 15	NA	19.6	6813	43	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 15	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	ND	ND	ND	ND	0 / 15	1.3 - 1.6	ND	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	363	1100	µg/l	CFSWP-010	15 / 15	NA	1100	919	No Screening Level		N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 15	0.69 - 0.79	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 15	1.3 - 1.5	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	2080	4830	µg/l	CFSWP-010	15 / 15	NA	4830	3064	No Screening Level		N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 15	0.24 - 0.31	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	2.1 (J)	2.1 (J)	µg/l	CFSWP-012	3 / 15	1.2 - 1.9	2.1	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	7.1 (J)	7.1 (J)	µg/l	CFSWP-010	1 / 15	5.4 - 7	7.1	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-11
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure Central Landfills Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.3	0.85	mg/kg	CFSDP-010	4 / 4	NA	0.85	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	1.3	4.27	mg/kg	CFSDP-010	4 / 4	NA	4.27	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	14700	22700	mg/kg	CFSDP-010	4 / 4	NA	22700	23478	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 4	0.32 - 0.37	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	4.3	5.8	mg/kg	CFSDP-012	4 / 4	NA	5.8	9.879	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	180	257	mg/kg	CFSDP-010	4 / 4	NA	257	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.64	0.98	mg/kg	CFSDP-010	4 / 4	NA	0.98	1.296	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 4	0.33 - 0.39	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	20600	30100	mg/kg	CFSDP-010	4 / 4	NA	30100	94895	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	11.8	15.2	mg/kg	CFSDP-012	4 / 4	NA	15.2	15	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	7.5	8.6	mg/kg	CFSDP-012	4 / 4	NA	8.6	9.77	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	20.1	23.3	mg/kg	CFSDP-010	4 / 4	NA	23.3	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	16800	20200	mg/kg	CFSDP-012	4 / 4	NA	20200	26687	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	13	18.5	mg/kg	CFSDP-012	4 / 4	NA	18.5	30.29	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	10400	12200	mg/kg	CFSDP-011	4 / 4	NA	12200	22708	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	640	1280	mg/kg	CFSDP-012	4 / 4	NA	1280	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.029	0.045	mg/kg	CFSDP-012	4 / 4	NA	0.045	0.0762	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	23.7 (J+)	43.8 (J+)	mg/kg	CFSDP-010	4 / 4	NA	43.8	17.94	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	922	1330	mg/kg	CFSDP-010	4 / 4	NA	1330	1742	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	0.34 (J)	0.46 (J)	mg/kg	CFSDP-010	3 / 4	0.29 - 0.29	0.46	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 4	0.62 - 0.73	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	60 (J)	104 (J)	mg/kg	CFSDP-010	4 / 4	NA	104	60.66	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 4	0.13 - 0.15	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	11.5	18	mg/kg	CFSDP-010	4 / 4	NA	18	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	81.1	129	mg/kg	CFSDP-010	4 / 4	NA	129	81.94	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 4	0.00099 - 0.0011	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 4	0.00074 - 0.00084	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 4	0.0011 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 4	0.00079 - 0.0009	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 4	0.0013 - 0.0015	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 4	0.0013 - 0.0015	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 4	0.00089 - 0.001	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 4	0.0011 - 0.0012	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 4	0.00095 - 0.0011	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 4	0.001 - 0.0012	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 4	0.001 - 0.0011	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 4	0.0011 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 4	0.00073 - 0.00083	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 4	0.001 - 0.0012	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 4	0.0016 - 0.0018	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 4	0.0017 - 0.002	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 4	0.0011 - 0.0012	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 4	0.0012 - 0.0013	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 4	0.00084 - 0.00096	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 4	0.024 - 0.027	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 4	0.0018 - 0.002	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 4	0.03 - 0.034	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 4	0.11 - 0.12	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 4	0.038 - 0.043	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 4	0.04 - 0.046	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 4	0.0095 - 0.011	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 4	0.089 - 0.1	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 4	0.31 - 0.35	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-11
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure Central Landfills Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 4	0.016 - 0.018	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 4	0.021 - 0.024	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 4	0.0092 - 0.01	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 4	0.01 - 0.012	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	0.012 (J)	0.012 (J)	mg/kg	CFSDP-011	1 / 4	0.0094 - 0.01	0.012	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 4	0.018 - 0.02	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 4	0.013 - 0.015	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 4	0.014 - 0.015	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 4	0.045 - 0.051	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 4	0.011 - 0.012	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 4	0.012 - 0.014	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 4	0.11 - 0.12	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 4	0.013 - 0.014	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 4	0.017 - 0.02	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 4	0.01 - 0.012	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 4	0.012 - 0.014	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 4	0.015 - 0.017	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 4	0.19 - 0.22	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	0.037 (J)	0.075 (J)	mg/kg	CFSDP-011	4 / 4	NA	0.075	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 4	0.01 - 0.012	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSDP-010	1 / 4	0.0088 - 0.0094	0.011	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.082 (J)	0.14 (J)	mg/kg	CFSDP-011	4 / 4	NA	0.14	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 4	0.018 - 0.02	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.069 (J)	0.069 (J)	mg/kg	CFSDP-010	1 / 4	0.031 - 0.033	0.069	0.0141	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.55	0.82	mg/kg	CFSDP-010	4 / 4	NA	0.82	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-32-8	Benzo(A)Pyrene	0.74	1.1	mg/kg	CFSDP-010	4 / 4	NA	1.1	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	1.1	1.8	mg/kg	CFSDP-010	4 / 4	NA	1.8	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.69	1.3	mg/kg	CFSDP-010	4 / 4	NA	1.3	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.45	0.49	mg/kg	CFSDP-011	4 / 4	NA	0.49	NA	1.1E+01	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.027 (J)	0.031 (J)	mg/kg	CFSDP-012	2 / 4	0.012 - 0.014	0.031	NA	2.9E+02	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 4	0.034 - 0.039	ND	NA	4.7E+00	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 4	0.013 - 0.014	ND	NA	1.9E+01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 4	0.0095 - 0.011	ND	NA	2.3E-01	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 4	0.017 - 0.019	ND	NA	3.1E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.031 (J)	0.045 (J)	mg/kg	CFSDP-012	2 / 4	0.016 - 0.018	0.045	NA	3.9E+01	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 4	0.029 - 0.033	ND	NA	3.1E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.091 (J)	0.1 (J)	mg/kg	CFSDP-012	4 / 4	NA	0.1	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.82	1.1	mg/kg	CFSDP-010	4 / 4	NA	1.1	0.0038	1.1E+02	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.018 (J)	0.039 (J)	mg/kg	CFSDP-012	2 / 4	0.012 - 0.014	0.039	NA	6.3E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 4	0.02 - 0.023	ND	NA	6.3E+01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.15	0.28	mg/kg	CFSDP-010	4 / 4	NA	0.28	NA	1.1E-01	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	0.014 (J)	0.024 (J)	mg/kg	CFSDP-011	3 / 4	0.014 - 0.014	0.024	NA	7.3E+00	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	5.1E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 4	0.012 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.92	1.1	mg/kg	CFSDP-011	4 / 4	NA	1.1	NA	2.4E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	0.024 (J)	0.053 (J)	mg/kg	CFSDP-011	4 / 4	NA	0.053	NA	2.4E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 4	0.016 - 0.019	ND	NA	2.1E-01	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 4	0.011 - 0.013	ND	NA	1.2E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 4	0.025 - 0.029	ND	NA	1.8E-01	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 4	0.015 - 0.017	ND	NA	1.8E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.76	1.3	mg/kg	CFSDP-010	4 / 4	NA	1.3	NA	1.1E+00	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	0.011 (J)	0.014 (J)	mg/kg	CFSDP-010	4 / 4	NA	0.014	NA	5.7E+02	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 4	0.014 - 0.015	ND	NA	7.8E-02	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 4	0.037 - 0.042	ND	NA	1.1E+02	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	0.011 (J)	0.02 (J)	mg/kg	CFSDP-011	4 / 4	NA	0.02	NA	3.8E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 4	0.013 - 0.014	ND	NA	5.1E+00	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 4	0.049 - 0.055	ND	NA	1.0E+00	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL

Table 2-11
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfills Area Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Exposure Central Landfills Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	85-01-8	Phenanthrene	0.49	0.69	mg/kg	CFSDP-011	4 / 4	NA	0.69	0.00226	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 4	0.013 - 0.015	ND	NA	1.9E+03	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	1	1.5	mg/kg	CFSDP-010	4 / 4	NA	1.5	NA	1.8E+02	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-12
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.066 (J-)	0.42 (J+)	mg/kg	CFSB-195	6 / 18	0.061 - 0.075	0.42	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	2.24 (J-)	579 (J+)	mg/kg	CFLP-005	18 / 18	NA	579	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.173966	1.04915	mg/kg	CFLP-005	18 / 18	NA	1.04915	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	6.32603	38.1509	mg/kg	CFLP-005	18 / 18	NA	38.1509	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	6230	38900	mg/kg	CFLP-005	18 / 18	NA	38900	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.32 (J-)	2.8 (J)	mg/kg	CFLP-005	4 / 18	0.26 - 0.5	2.8	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	3.2	23.5	mg/kg	CFLP-005	18 / 18	NA	23.5	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	43.9	436	mg/kg	CFSB-195	18 / 18	NA	436	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.29 (J)	7.2 (J)	mg/kg	CFLP-005	17 / 18	0.15 - 0.15	7.2	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.36 (J)	0.94 (J)	mg/kg	CFLP-005	4 / 18	0.3 - 0.4	0.94	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1120	75000	mg/kg	CFMW-003A	18 / 18	NA	75000	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	6.5	39.2 (J)	mg/kg	CFLP-005	18 / 18	NA	39.2	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3.5	16	mg/kg	CFLP-005	18 / 18	NA	16	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	7.5	54.6 (J)	mg/kg	CFLP-005	18 / 18	NA	54.6	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	9230	20600	mg/kg	CFLP-002	18 / 18	NA	20600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	5.5 (J+)	19.4 (J+)	mg/kg	CFLP-005	18 / 18	NA	19.4	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	6520	15900	mg/kg	CFLP-005	18 / 18	NA	15900	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	188 (J)	2620	mg/kg	CFSB-195	18 / 18	NA	2620	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.055	mg/kg	CFMW-003A	16 / 18	0.011 - 0.011	0.055	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	7.8	463 (J)	mg/kg	CFLP-005	18 / 18	NA	463	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	464	6760	mg/kg	CFLP-005	18 / 18	NA	6760	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.33 (J)	0.75 (J)	mg/kg	CFLP-005	4 / 18	0.26 - 0.47	0.75	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 18	0.55 - 0.91	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	36.8 (J)	49200 (J)	mg/kg	CFLP-005	14 / 18	28 - 37.1	49200	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.14 (J)	0.17 (J)	mg/kg	CFLP-002	4 / 18	0.11 - 0.19	0.17	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.6	169 (J)	mg/kg	CFLP-005	18 / 18	NA	169	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	27.7	89.1	mg/kg	CFSB-195	18 / 18	NA	89.1	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 1	0.00099 - 0.00099	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00074 - 0.00074	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00079 - 0.00079	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00089 - 0.00089	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 1	0.00095 - 0.00095	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 1	0.00073 - 0.00073	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 1	0.0016 - 0.0016	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 1	0.0017 - 0.0017	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 1	0.0012 - 0.0012	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 1	0.00084 - 0.00084	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 1	0.024 - 0.024	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 1	0.0018 - 0.0018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	CLAY	Clay	3.5	8	percent	CFLP-001	6 / 6	NA	8	NA	No Screening Level	NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	10	20	percent	CFLP-003	6 / 6	NA	20	NA	No Screening Level	NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	5.7	14.9	percent	CFLP-002	6 / 6	NA	14.9	NA	No Screening Level	NULL	NA	NA	N	NSL
	GRAVEL	Gravel	17.2	39.2	percent	CFLP-003	6 / 6	NA	39.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	13.3	28.1	percent	CFLP-004	6 / 6	NA	28.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	308075-07-2	Sand	38.2	54.2	percent	CFLP-004	6 / 6	NA	54.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	E52456985	Silt	4	37	percent	CFLP-002	6 / 6	NA	37	NA	No Screening Level	NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL

Table 2-12
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 18	0.0015 - 0.15	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 18	0.011 - 1.1	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 18	0.015 - 1.5	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 18	0.0025 - 0.25	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 18	0.0019 - 0.2	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 18	0.0027 - 0.27	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 18	0.0022 - 0.22	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 18	0.094 - 9.6	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 18	0.0017 - 0.18	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 18	0.0022 - 0.22	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 18	0.0016 - 0.16	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 18	0.0016 - 0.17	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0055 (J)	0.41	mg/kg	CFLP-006	6 / 18	0.0017 - 0.0095	0.41	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 18	0.01 - 1	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 18	0.013 - 1.6	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 18	0.002 - 0.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 18	0.033 - 3.3	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 18	0.0089 - 0.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 18	0.06 - 6.1	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 18	0.0024 - 0.25	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 18	0.0016 - 0.17	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 18	0.0012 - 0.12	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 18	0.0021 - 0.22	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 18	0.0017 - 0.17	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 18	0.024 - 2.5	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0022 (J)	5.5 (J)	mg/kg	CFLP-005	16 / 18	0.0022 - 0.0097	5.5	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0018 (J)	0.0018 (J)	mg/kg	CFLP-003	1 / 18	0.0015 - 0.16	0.0018	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.002 (J)	0.0057 (J)	mg/kg	CFSB-195	3 / 18	0.0019 - 0.19	0.0057	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0041 (J)	6.4	mg/kg	CFLP-006	16 / 18	0.002 - 0.038	6.4	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 18	0.015 - 1.6	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0052 (J-)	0.015 (J-)	mg/kg	CFSB-250	3 / 5	0.0047 - 0.031	0.015	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0069 (J)	43	mg/kg	CFLP-006	17 / 18	0.034 - 0.034	43	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0065 (J)	53	mg/kg	CFLP-006	18 / 18	NA	53	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.014	60	mg/kg	CFLP-006	18 / 18	NA	60	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0091	52 (J)	mg/kg	CFLP-005	18 / 18	NA	52	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.005 (J)	24	mg/kg	CFLP-006	17 / 18	0.018 - 0.018	24	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 18	0.012 - 2.4	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.003 (J)	0.11 (J)	mg/kg	CFLP-006	2 / 18	0.0015 - 0.15	0.11	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 18	0.0017 - 0.17	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 18	0.0013 - 0.13	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 18	0.0026 - 0.26	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.06 (J+)	0.093 (J+)	mg/kg	CFSB-252	3 / 18	0.037 - 3.8	0.093	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 18	0.023 - 2.3	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0044 (J)	7.1	mg/kg	CFLP-006	16 / 18	0.0018 - 0.01	7.1	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.009	51	mg/kg	CFLP-006	18 / 18	NA	51	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 18	0.012 - 1.6	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL

Table 2-12
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 18	0.02 - 2.1	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0078	11	mg/kg	CFLP-006	16 / 18	0.0017 - 0.021	11	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0016 (J)	1.3 (J)	mg/kg	CFLP-006	12 / 18	0.0016 - 0.012	1.3	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 18	0.01 - 1.1	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 18	0.0013 - 0.13	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.012	71	mg/kg	CFLP-006	18 / 18	NA	71	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0018 (J)	2.7	mg/kg	CFLP-006	16 / 18	0.0015 - 0.0088	2.7	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 18	0.0025 - 0.25	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 18	0.002 - 0.21	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 18	0.0018 - 0.18	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 18	0.0018 - 0.18	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.007 (J)	40 (J)	mg/kg	CFLP-005	17 / 18	0.027 - 0.027	40	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0021 (J)	0.0021 (J)	mg/kg	CFLP-003	1 / 18	0.0018 - 0.18	0.0021	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 18	0.0024 - 0.24	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 18	0.012 - 1.2	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0015 (J)	1.8	mg/kg	CFLP-006	13 / 18	0.0014 - 0.01	1.8	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 18	0.013 - 1.3	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 18	0.049 - 5.7	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0056 (J)	40	mg/kg	CFLP-006	18 / 18	NA	40	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 18	0.011 - 1.1	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.011	67	mg/kg	CFLP-006	18 / 18	NA	67	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-13
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 2 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.053 (J-)	0.42 (J+)	mg/kg	CFSB-195	12 / 34	0.059 - 0.075	0.42	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	1.37 (J+)	810 (J+)	mg/kg	CFLP-003	34 / 34	NA	810	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.173966	1.04915	mg/kg	CFLP-005	34 / 34	NA	1.04915	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	6.32603	38.1509	mg/kg	CFLP-005	34 / 34	NA	38.1509	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	6230	117000	mg/kg	CFLP-003	34 / 34	NA	117000	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.32 (J-)	2.9 (J-)	mg/kg	CFLP-005	6 / 34	0.26 - 0.5	2.9	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	3.2	23.5	mg/kg	CFLP-005	34 / 34	NA	23.5	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	43.9	436	mg/kg	CFSB-195	34 / 34	NA	436	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.29 (J)	7.7	mg/kg	CFLP-005	32 / 34	0.15 - 0.15	7.7	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.36 (J)	1.5	mg/kg	CFLP-003	6 / 34	0.25 - 0.4	1.5	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1120	75000	mg/kg	CFMW-003A	34 / 34	NA	75000	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	6.5	39.2 (J)	mg/kg	CFLP-005	34 / 34	NA	39.2	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3.4	16	mg/kg	CFLP-005	34 / 34	NA	16	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	7.5	776 (J)	mg/kg	CFLP-005	34 / 34	NA	776	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	6400	20600	mg/kg	CFLP-002	34 / 34	NA	20600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	5.5 (J+)	19.4 (J+)	mg/kg	CFLP-005	34 / 34	NA	19.4	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	4950	15900	mg/kg	CFLP-005	34 / 34	NA	15900	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	137	2620	mg/kg	CFSB-195	34 / 34	NA	2620	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.055	mg/kg	CFMW-003A	26 / 34	0.01 - 0.012	0.055	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	7.8	513 (J)	mg/kg	CFLP-005	34 / 34	NA	513	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	464	6760	mg/kg	CFLP-005	34 / 34	NA	6760	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.33 (J)	0.75 (J)	mg/kg	CFLP-005	5 / 34	0.26 - 0.47	0.75	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 34	0.55 - 0.91	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	34.3 (J)	61300	mg/kg	CFLP-005	22 / 34	28 - 37.1	61300	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	0.19 (J)	mg/kg	CFLP-002	7 / 34	0.11 - 0.19	0.19	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.6	169 (J)	mg/kg	CFLP-005	34 / 34	NA	169	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	27.7	89.1	mg/kg	CFSB-195	34 / 34	NA	89.1	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 1	0.00099 - 0.00099	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00074 - 0.00074	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00079 - 0.00079	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00089 - 0.00089	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 1	0.00095 - 0.00095	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 1	0.00073 - 0.00073	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 1	0.0016 - 0.0016	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 1	0.0017 - 0.0017	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 1	0.0012 - 0.0012	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 1	0.00084 - 0.00084	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 1	0.024 - 0.024	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 1	0.0018 - 0.0018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	CLAY	Clay	2.6	8.3	percent	CFLP-002	12 / 12	NA	8.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	10	20	percent	CFLP-003	12 / 12	NA	20	NA	No Screening Level	NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	5.7	17.1	percent	CFLP-003	12 / 12	NA	17.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	GRAVEL	Gravel	17.2	45.3	percent	CFLP-001	12 / 12	NA	45.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	13.3	28.6	percent	CFLP-004	12 / 12	NA	28.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	308075-07-2	Sand	34.7	54.2	percent	CFLP-004	12 / 12	NA	54.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	E52456985	Silt	4	37	percent	CFLP-002	12 / 12	NA	37	NA	No Screening Level	NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL

Table 2-13
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 2 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 2	0.01 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 34	0.0015 - 0.15	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 34	0.011 - 1.1	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 34	0.014 - 1.5	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 34	0.0025 - 0.25	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 34	0.0019 - 0.2	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 34	0.0027 - 0.27	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 34	0.0021 - 0.22	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 34	0.093 - 9.6	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 34	0.0017 - 0.18	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 34	0.0021 - 0.22	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 34	0.0016 - 0.16	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 34	0.0016 - 0.17	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0055 (J)	0.41	mg/kg	CFLP-006	10 / 34	0.0017 - 0.0095	0.41	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 34	0.0099 - 1	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 34	0.012 - 1.6	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 34	0.002 - 0.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 34	0.032 - 3.3	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 2	0.0099 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 34	0.0087 - 0.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 34	0.059 - 6.1	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 34	0.0024 - 0.25	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 34	0.0016 - 0.17	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 34	0.0011 - 0.12	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 34	0.0021 - 0.22	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 34	0.0017 - 0.17	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 34	0.024 - 2.5	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0022 (J)	5.5 (J)	mg/kg	CFLP-005	23 / 34	0.0021 - 0.0097	5.5	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0018 (J)	0.0018 (J)	mg/kg	CFLP-003	1 / 34	0.0015 - 0.16	0.0018	NA	No Screening Level	NULL	NA	NA	N	LDF
	98-86-2	Acetophenone	0.0019 (J)	0.0057 (J)	mg/kg	CFSB-195	4 / 34	0.0019 - 0.19	0.0057	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0029 (J)	6.4	mg/kg	CFLP-006	25 / 34	0.0019 - 0.038	6.4	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 34	0.015 - 1.6	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0052 (J-)	0.015 (J-)	mg/kg	CFSB-250	4 / 10	0.0046 - 0.031	0.015	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0016 (J)	43	mg/kg	CFLP-006	29 / 34	0.0014 - 0.034	43	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0056 (J)	53	mg/kg	CFLP-006	29 / 34	0.0016 - 0.011	53	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0018 (J)	60	mg/kg	CFLP-006	31 / 34	0.0018 - 0.002	60	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.005 (J)	52 (J)	mg/kg	CFLP-005	29 / 34	0.0016 - 0.021	52	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0037 (J)	24	mg/kg	CFLP-006	28 / 34	0.0022 - 0.018	24	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.028 (J+)	0.044 (J+)	mg/kg	CFSB-250	2 / 34	0.011 - 2.4	0.044	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.003 (J)	0.11 (J)	mg/kg	CFLP-006	2 / 34	0.0014 - 0.15	0.11	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 34	0.0016 - 0.17	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 34	0.0012 - 0.13	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 34	0.0025 - 0.26	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.043 (J+)	0.093 (J+)	mg/kg	CFSB-252	6 / 34	0.037 - 3.8	0.093	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 34	0.022 - 2.3	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0041 (J)	7.1	mg/kg	CFLP-006	25 / 34	0.0017 - 0.01	7.1	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0017 (J)	51	mg/kg	CFLP-006	30 / 34	0.0015 - 0.01	51	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 34	0.011 - 1.6	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL

Table 2-13
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 2 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 34	0.019 - 2.1	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.003 (J)	11	mg/kg	CFLP-006	26 / 34	0.0016 - 0.021	11	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0016 (J)	1.3 (J)	mg/kg	CFLP-006	19 / 34	0.0015 - 0.012	1.3	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 34	0.01 - 1.1	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 34	0.0012 - 0.13	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0021 (J)	71	mg/kg	CFLP-006	30 / 34	0.002 - 0.011	71	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0018 (J)	2.7	mg/kg	CFLP-006	24 / 34	0.0014 - 0.0088	2.7	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 34	0.0025 - 0.25	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 34	0.002 - 0.21	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 34	0.0018 - 0.18	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 34	0.0018 - 0.18	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0038 (J)	40 (J)	mg/kg	CFLP-005	28 / 34	0.0015 - 0.027	40	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0021 (J)	0.0021 (J)	mg/kg	CFLP-003	1 / 34	0.0018 - 0.18	0.0021	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	LDF
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 34	0.0023 - 0.24	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 34	0.011 - 1.2	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0015 (J)	1.8	mg/kg	CFLP-006	18 / 34	0.0013 - 0.01	1.8	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 34	0.012 - 1.3	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 34	0.045 - 5.7	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0021 (J)	40	mg/kg	CFLP-006	31 / 34	0.002 - 0.0099	40	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 34	0.01 - 1.1	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0017 (J)	67	mg/kg	CFLP-006	30 / 34	0.0018 - 0.017	67	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 1	0.00029 - 0.00029	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 1	0.00013 - 0.00013	ND	NA	0.00003	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 1	0.00034 - 0.00034	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 1	0.00022 - 0.00022	ND	NA	0.000013	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 1	0.00026 - 0.00026	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 1	0.00032 - 0.00032	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 1	8.5e-005 - 8.5e-005	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 1	0.00025 - 0.00025	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 1	0.00036 - 0.00036	ND	NA	0.00000014	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 1	9.3e-005 - 9.3e-005	ND	NA	0.0000021	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 1	0.00011 - 0.00011	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 1	8.5e-005 - 8.5e-005	ND	NA	0.000048	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 1	0.00013 - 0.00013	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 1	9.3e-005 - 9.3e-005	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 1	0.0001 - 0.0001	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 1	0.00073 - 0.00073	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0091	0.0091	mg/kg	CFMW-003A	1 / 1	NA	0.0091	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 1	0.00015 - 0.00015	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 1	0.00013 - 0.00013	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 1	0.00029 - 0.00029	ND	NA	0.000036	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 1	0.0001 - 0.0001	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 1	0.00025 - 0.00025	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00035 (J)	0.00035 (J)	mg/kg	CFMW-003A	1 / 1	NA	0.00035	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 1	0.00033 - 0.00033	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 1	0.00011 - 0.00011	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 1	0.00027 - 0.00027	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 1	0.00016 - 0.00016	ND	NA	0.000061	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 1	0.00029 - 0.00029	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 1	0.00017 - 0.00017	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	0.00012 - 0.00012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 1	0.00035 - 0.00035	ND	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 1	0.00012 - 0.00012	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 1	0.00025 - 0.00025	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 1	0.00014 - 0.00014	ND	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 1	0.00013 - 0.00013	ND	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL

Table 2-13
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Industrial Landfill Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Industrial Landfill Area
Exposure Medium: Surface Soil 0 to 2 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 1	8.5e-005 - 8.5e-005	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 1	0.00069 - 0.00069	ND	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 1	0.00059 - 0.00059	ND	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 1	0.0017 - 0.0017	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 1	0.00039 - 0.00039	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 1	0.00025 - 0.00025	ND	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 1	0.00012 - 0.00012	ND	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 1	0.00012 - 0.00012	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 1	0.00013 - 0.00013	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 1	0.00022 - 0.00022	ND	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 1	0.00015 - 0.00015	ND	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 1	0.0003 - 0.0003	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	7.7e-005 - 7.7e-005	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 1	0.0002 - 0.0002	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 1	0.00026 - 0.00026	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 1	0.0003 - 0.0003	ND	NA	0.0000065	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility

(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1×10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-14
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.067 (J)	0.64	mg/kg	CFSB-211	11 / 16	0.062 - 0.11	0.64	0.793	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.75 (J)	32.9 (J+)	mg/kg	CFSB-211	16 / 16	NA	32.9	11.29	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	TOC	Total Organic Carbon	9450	187000	mg/kg	CFSB-186	16 / 16	NA	187000	122647	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.17129	0.310462	mg/kg	CFSB-282	16 / 16	NA	0.310462	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	6.22871	11.2895	mg/kg	CFSB-282	16 / 16	NA	11.2895	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	5350	30300	mg/kg	CFSB-183	16 / 16	NA	30300	44367	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 16	0.23 - 0.56	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	2.8	12.4	mg/kg	CFSB-267	16 / 16	NA	12.4	112.1	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	45.3	1060	mg/kg	CFSB-186	16 / 16	NA	1060	733.7	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.28 (J)	0.87	mg/kg	CFSB-184	16 / 16	NA	0.87	1.319	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.38 (J)	0.7 (J)	mg/kg	CFSB-211	6 / 16	0.27 - 0.65	0.7	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	4140 (J)	44100 (J)	mg/kg	CFSB-267	16 / 16	NA	44100	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	6.4	11.6	mg/kg	CFSB-282	16 / 16	NA	11.6	21.35	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3.9	7.3	mg/kg	CFSB-185	16 / 16	NA	7.3	6.872	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	5.9	18.6	mg/kg	CFSB-282	16 / 16	NA	18.6	105.5	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	8490	16600	mg/kg	CFSB-282	16 / 16	NA	16600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	4.5	36.2	mg/kg	CFSB-186	16 / 16	NA	36.2	33.2	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2700	15500 (J)	mg/kg	CFSB-267	16 / 16	NA	15500	8275	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	210	3950	mg/kg	CFSB-211	16 / 16	NA	3950	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J)	0.12	mg/kg	CFSB-186	16 / 16	NA	0.12	0.13	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	7.9	68.9	mg/kg	CFSB-181	16 / 16	NA	68.9	21.67	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	327	2070	mg/kg	CFSB-184	16 / 16	NA	2070	1957	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.57 (J)	0.64 (J)	mg/kg	CFSB-212	2 / 16	0.23 - 0.46	0.64	1.967	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 16	0.5 - 1.2	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	40.9 (J)	189	mg/kg	CFSB-212	10 / 16	25.1 - 60.1	189	293..3	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	0.15 (J)	mg/kg	CFSB-184	4 / 16	0.1 - 0.24	0.15	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.9	25.7	mg/kg	CFSB-181	16 / 16	NA	25.7	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	25.3	150	mg/kg	CFSB-211	16 / 16	NA	150	101.5	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 16	0.0015 - 0.077	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 16	0.011 - 0.56	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 16	0.015 - 0.74	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 16	0.0025 - 0.13	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 16	0.0019 - 0.098	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 16	0.0027 - 0.14	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 16	0.0022 - 0.11	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 16	0.094 - 4.8	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 16	0.0017 - 0.089	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 16	0.0022 - 0.11	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 16	0.0016 - 0.082	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 16	0.0016 - 0.083	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0051 (J)	0.012 (J)	mg/kg	CFSB-188	3 / 16	0.0017 - 0.085	0.012	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 16	0.01 - 0.51	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 16	0.016 - 0.81	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 16	0.002 - 0.1	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 16	0.033 - 1.7	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 16	0.0089 - 0.45	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 16	0.06 - 3.1	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 16	0.0024 - 0.12	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 16	0.0016 - 0.084	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 16	0.0012 - 0.059	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 16	0.0021 - 0.11	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 16	0.0017 - 0.086	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 16	0.025 - 1.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0039 (J)	0.11 (J)	mg/kg	CFSB-185	12 / 16	0.002 - 0.093	0.11	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	0.0073 (J)	0.021 (J)	mg/kg	CFSB-267	2 / 16	0.0015 - 0.078	0.021	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0026 (J)	0.0052 (J)	mg/kg	CFSB-188	2 / 16	0.0019 - 0.097	0.0052	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0069 (J)	0.21 (J)	mg/kg	CFSB-185	14 / 16	0.0018 - 0.0018	0.21	0.0225	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 16	0.015 - 0.78	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.007 (J)	0.056 (J)	mg/kg	CFSB-282	5 / 16	0.0043 - 0.22	0.056	0.0237	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0068 (J)	1.5	mg/kg	CFSB-185	16 / 16	NA	1.5	0.185	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0097	1.9	mg/kg	CFSB-185	16 / 16	NA	1.9	0.409	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.015	4.5	mg/kg	CFSB-185	16 / 16	NA	4.5	0.769	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.01	3.1	mg/kg	CFSB-185	16 / 16	NA	3.1	0.528	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.005 (J)	1.6	mg/kg	CFSB-185	16 / 16	NA	1.6	0.143	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL

Table 2-14
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 16	0.024 - 1.2	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.0041 (J)	0.0041 (J)	mg/kg	CFSB-188	1 / 16	0.0015 - 0.075	0.0041	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 16	0.0017 - 0.085	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 16	0.0013 - 0.065	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 16	0.0026 - 0.13	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.12 (J)	0.15 (J)	mg/kg	CFSB-183	2 / 16	0.037 - 1.9	0.15	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 16	0.023 - 1.2	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0095	0.37	mg/kg	CFSB-185	14 / 16	0.0016 - 0.0017	0.37	0.0462	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.011	2.8	mg/kg	CFSB-185	16 / 16	NA	2.8	0.572	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 16	0.015 - 0.78	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	0.027 (J)	0.027 (J)	mg/kg	CFSB-269	1 / 16	0.021 - 1	0.027	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.017	0.62	mg/kg	CFSB-185	14 / 16	0.0016 - 0.0016	0.62	0.748	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0022 (J)	0.028 (J)	mg/kg	CFSB-211	9 / 16	0.0015 - 0.078	0.028	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	0.012 (J)	0.044 (J)	mg/kg	CFSB-181	2 / 16	0.01 - 0.53	0.044	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 16	0.0013 - 0.065	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.014	2.8	mg/kg	CFSB-185	16 / 16	NA	2.8	0.23	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.0031 (J)	0.026 (J)	mg/kg	CFSB-211	10 / 16	0.0014 - 0.07	0.026	0.0185	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 16	0.0025 - 0.13	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 16	0.002 - 0.1	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 16	0.0018 - 0.091	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 16	0.0018 - 0.092	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0077	2.5	mg/kg	CFSB-185	16 / 16	NA	2.5	0.563	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 16	0.0018 - 0.091	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 16	0.0024 - 0.12	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 16	0.012 - 0.59	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0019 (J)	0.021 (J)	mg/kg	CFSB-282	7 / 16	0.0014 - 0.069	0.021	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 16	0.013 - 0.65	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 16	0.056 - 2.9	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0045 (J)	1.1	mg/kg	CFSB-185	16 / 16	NA	1.1	0.145	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 16	0.011 - 0.54	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.012	2.9	mg/kg	CFSB-185	16 / 16	NA	2.9	0.2	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 2	'0.032 - 0.032	ND	NA	0.00087	USEPA RSL RBSSL THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	1.30E-03	USEPA RSL RBSSL THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 2	'0.0088 - 0.0088	ND	NA	0.0000036	USEPA RSL RBSSL THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 2	'0.015 - 0.015	ND	NA	0.026	USEPA RSL RBSSL THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.043	0.064	mg/kg	CFMW-003A	2 / 2	'0.015 - 0.015	0.064	NA	1.3	USEPA RSL RBSSL THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 2	'0.027 - 0.027	ND	NA	0.25	USEPA RSL RBSSL THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 2	'0.0092 - 0.0092	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	218-01-9	Chrysene	0.035	0.035	mg/kg	CFMW-003A	1 / 2	'0.01 - 0.011	0.035	NA	9	USEPA RSL RBSSL THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	0.23	USEPA RSL RBSSL THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 2	'0.019 - 0.019	ND	NA	5.7	USEPA RSL RBSSL THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 2	'0.019 - 0.019	ND	NA	0.096	USEPA RSL RBSSL THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	0.015	USEPA RSL RBSSL THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	0.61	USEPA RSL RBSSL THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.033	0.033	mg/kg	CFMW-003A	1 / 2	'0.011 - 0.012	0.033	NA	8.9	USEPA RSL RBSSL THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 2	'0.0081 - 0.0081	ND	NA	0.54	USEPA RSL RBSSL THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 2	'0.015 - 0.015	ND	NA	0.00012	USEPA RSL RBSSL THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 2	'0.01 - 0.01	ND	NA	0.00027	USEPA RSL RBSSL THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 2	'0.023 - 0.023	ND	NA	0.00013	USEPA RSL RBSSL THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 2	'0.014 - 0.014	ND	NA	0.0002	USEPA RSL RBSSL THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	ND	ND	ND	ND	0 / 2	'0.025 - 0.025	ND	NA	0.98	USEPA RSL RBSSL THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 2	'0.008 - 0.008	ND	NA	2.60E-02	USEPA RSL RBSSL THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	0.0000081	USEPA RSL RBSSL THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 2	'0.034 - 0.034	ND	NA	0.067	USEPA RSL RBSSL THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 2	'0.0095 - 0.0095	ND	NA	5.40E-04	USEPA RSL RBSSL THQ=0.1, c**	3.8	USEPA RSL Res Soil	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	9.20E-05	USEPA RSL RBSSL THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 2	'0.045 - 0.045	ND	NA	0.000057	USEPA RSL RBSSL THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.018	0.018	mg/kg	CFMW-003A	1 / 2	'0.0099 - 0.011	0.018	NA	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	0.33	USEPA RSL RBSSL THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.042	0.042	mg/kg	CFMW-003A	1 / 2	'0.017 - 0.018	0.042	NA	1.3	USEPA RSL RBSSL THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.28	USEPA RSL RBSSL THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.00003	USEPA RSL RBSSL THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 1	'0.00034 - 0.00034	ND	NA	2.6	USEPA RSL RBSSL THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL

Table 2-14
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 1	'0.00022 - 0.00022	ND	NA	0.000013	USEPA RSL RBSSL THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 1	'0.00026 - 0.00026	ND	NA	0.00078	USEPA RSL RBSSL THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 1	'0.00032 - 0.00032	ND	NA	0.01	USEPA RSL RBSSL THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	0.0021	USEPA RSL RBSSL THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.0012	USEPA RSL RBSSL THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 1	'0.00036 - 0.00036	ND	NA	0.00000014	USEPA RSL RBSSL THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 1	'9.3e-005 - 9.3e-005	ND	NA	0.0000021	USEPA RSL RBSSL THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'0.00011 - 0.00011	ND	NA	0.03	USEPA RSL RBSSL THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	0.000048	USEPA RSL RBSSL THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.000047	USEPA RSL RBSSL THQ=0.1, c**	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'9.3e-005 - 9.3e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'0.0001 - 0.0001	ND	NA	0.00046	USEPA RSL RBSSL THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 1	'0.00073 - 0.00073	ND	NA	0.00088	USEPA RSL RBSSL THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0091	0.0091	mg/kg	CFMW-003A	1 / 1	'0.00082 - 0.00082	0.0091	NA	0.29	USEPA RSL RBSSL THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 1	'0.00015 - 0.00015	ND	NA	0.00023	USEPA RSL RBSSL THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.0021	USEPA RSL RBSSL THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.000036	USEPA RSL RBSSL THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 1	'0.0001 - 0.0001	ND	NA	0.00087	USEPA RSL RBSSL THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.00019	USEPA RSL RBSSL THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00035	0.00035	mg/kg	CFMW-003A	1 / 1	'0.00033 - 0.00033	0.00035	NA	0.024	USEPA RSL RBSSL THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 1	'0.00033 - 0.00033	ND	NA	0.00018	USEPA RSL RBSSL THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 1	'0.00011 - 0.00011	ND	NA	0.0053	USEPA RSL RBSSL THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 1	'0.00027 - 0.00027	ND	NA	0.59	USEPA RSL RBSSL THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 1	'0.00016 - 0.00016	ND	NA	0.000061	USEPA RSL RBSSL THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.0049	USEPA RSL RBSSL THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 1	'0.00017 - 0.00017	ND	NA	0.0011	USEPA RSL RBSSL THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 1	'0.00035 - 0.00035	ND	NA	1.3	USEPA RSL RBSSL THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.00023	USEPA RSL RBSSL THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.03	USEPA RSL RBSSL THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 1	'0.00014 - 0.00014	ND	NA	0.0017	USEPA RSL RBSSL THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.074	USEPA RSL RBSSL THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 1	'0.00069 - 0.00069	ND	NA	0.41	USEPA RSL RBSSL THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 1	'0.00059 - 0.00059	ND	NA	0.12	USEPA RSL RBSSL THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 1	'0.0017 - 0.0017	ND	NA	0.14	USEPA RSL RBSSL THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 1	'0.00039 - 0.00039	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.0027	USEPA RSL RBSSL THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.019	USEPA RSL RBSSL THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.13	USEPA RSL RBSSL THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.0032	USEPA RSL RBSSL THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 1	'0.00022 - 0.00022	ND	NA	0.0018	USEPA RSL RBSSL THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 1	'0.00015 - 0.00015	ND	NA	0.076	USEPA RSL RBSSL THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 1	'0.0003 - 0.0003	ND	NA	0.011	USEPA RSL RBSSL THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	'7.7e-005 - 7.7e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND

Table 2-14
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 1	'0.0002 - 0.0002	ND	NA	0.0001	USEPA RSL RBSSL THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 1	'0.00026 - 0.00026	ND	NA	0.33	USEPA RSL RBSSL THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 1	'0.0003 - 0.0003	ND	NA	0.0000065	USEPA RSL RBSSL THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-15
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.067 (J)	1.2 (J)	mg/kg	CFSB-212	20 / 35	0.056 - 0.11	1.2	0.793	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.69 (J)	41.3 (J-)	mg/kg	CFSB-182	35 / 35	NA	41.3	11.29	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.149878	0.310462	mg/kg	CFSB-282	35 / 35	NA	0.310462	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	5.45012	11.2895	mg/kg	CFSB-282	35 / 35	NA	11.2895	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	5350	30300	mg/kg	CFSB-183	35 / 35	NA	30300	44367	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 35	0.23 - 0.56	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	2	12.4	mg/kg	CFSB-267	35 / 35	NA	12.4	112.1	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	45.3	1060	mg/kg	CFSB-186	35 / 35	NA	1060	733.7	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.21 (J)	0.87	mg/kg	CFSB-184	35 / 35	NA	0.87	1.319	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.38 (J)	0.7 (J)	mg/kg	CFSB-211	6 / 35	0.26 - 0.65	0.7	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1620	54100 (J)	mg/kg	CFSB-269	35 / 35	NA	54100	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	5.6	11.6	mg/kg	CFSB-282	35 / 35	NA	11.6	21.35	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3	7.3	mg/kg	CFSB-185	35 / 35	NA	7.3	6.872	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	4.7	18.6	mg/kg	CFSB-282	35 / 35	NA	18.6	105.5	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	8490	16600	mg/kg	CFSB-282	35 / 35	NA	16600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	4.5	36.2	mg/kg	CFSB-186	35 / 35	NA	36.2	33.2	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2700	15500 (J)	mg/kg	CFSB-267	35 / 35	NA	15500	8275	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	169	3950	mg/kg	CFSB-211	35 / 35	NA	3950	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J)	0.12	mg/kg	CFSB-186	33 / 35	0.012 - 0.015	0.12	0.13	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	7.4	68.9	mg/kg	CFSB-181	35 / 35	NA	68.9	21.67	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	327	2070	mg/kg	CFSB-184	35 / 35	NA	2070	1957	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.52 (J)	0.64 (J)	mg/kg	CFSB-212	4 / 35	0.23 - 0.46	0.64	1.967	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 35	0.48 - 1.2	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	38.2 (J)	205	mg/kg	CFSB-212	22 / 35	24.5 - 60.1	205	293..3	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.11 (J)	0.15 (J)	mg/kg	CFSB-184	7 / 35	0.098 - 0.24	0.15	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.9	25.7	mg/kg	CFSB-181	35 / 35	NA	25.7	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	24.2	150	mg/kg	CFSB-211	35 / 35	NA	150	101.5	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 35	0.0015 - 0.077	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 35	0.011 - 0.56	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 35	0.014 - 0.74	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 35	0.0024 - 0.13	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 35	0.0019 - 0.098	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 35	0.0026 - 0.14	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 35	0.0021 - 0.11	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 35	0.091 - 4.8	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 35	0.0017 - 0.089	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 35	0.0021 - 0.11	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 35	0.0016 - 0.082	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 35	0.0016 - 0.083	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0031 (J)	0.012 (J)	mg/kg	CFSB-188	5 / 35	0.0016 - 0.085	0.012	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 35	0.0097 - 0.51	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 35	0.015 - 0.81	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 35	0.0019 - 0.1	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 35	0.032 - 1.7	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 35	0.0086 - 0.45	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 35	0.058 - 3.1	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 35	0.0024 - 0.12	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 35	0.0016 - 0.084	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 35	0.0011 - 0.059	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 35	0.0021 - 0.11	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 35	0.0016 - 0.086	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 35	0.024 - 1.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0024 (J)	0.11 (J)	mg/kg	CFSB-185	22 / 35	0.0019 - 0.093	0.11	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	0.0069 (J)	0.021 (J)	mg/kg	CFSB-267	3 / 35	0.0015 - 0.078	0.021	NA	No Screening Level	NULL	NA	NA	N	NSL
	98-86-2	Acetophenone	0.0022 (J)	0.0052 (J)	mg/kg	CFSB-188	11 / 35	0.0018 - 0.097	0.0052	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0019 (J)	0.21 (J)	mg/kg	CFSB-185	26 / 35	0.0018 - 0.0022	0.21	0.0225	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 35	0.015 - 0.78	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0048 (J)	0.056 (J)	mg/kg	CFSB-282	15 / 35	0.0042 - 0.22	0.056	0.0237	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0023 (J)	1.5	mg/kg	CFSB-185	33 / 35	0.0013 - 0.0013	1.5	0.185	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0026 (J)	1.9	mg/kg	CFSB-185	33 / 35	0.0015 - 0.0015	1.9	0.409	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.002 (J)	4.5	mg/kg	CFSB-185	34 / 35	0.0017 - 0.0017	4.5	0.769	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0018 (J)	3.1	mg/kg	CFSB-185	34 / 35	0.0015 - 0.0015	3.1	0.528	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0026 (J)	1.6	mg/kg	CFSB-185	32 / 35	0.0021 - 0.0021	1.6	0.143	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 35	0.023 - 1.2	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL

Table 2-15
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	92-52-4	Biphenyl (Diphenyl)	0.0036 (J)	0.0041 (J)	mg/kg	CFSB-188	2 / 35	0.0014 - 0.075	0.0041	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 35	0.0016 - 0.085	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 35	0.0012 - 0.065	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 35	0.0025 - 0.13	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.047 (J)	0.15 (J)	mg/kg	CFSB-183	7 / 35	0.036 - 1.9	0.69	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.039 (J)	0.039 (J)	mg/kg	CFSB-212	1 / 35	0.022 - 1.2	0.039	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0027 (J)	0.37	mg/kg	CFSB-185	28 / 35	0.0016 - 0.0017	0.37	0.0462	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0016 (J)	2.8	mg/kg	CFSB-185	34 / 35	0.0014 - 0.0014	2.8	0.572	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 35	0.015 - 0.78	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	0.027 (J)	0.027 (J)	mg/kg	CFSB-269	1 / 35	0.02 - 1	0.027	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0049 (J)	0.62	mg/kg	CFSB-185	27 / 35	0.0015 - 0.0019	0.62	0.748	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.002 (J)	0.028 (J)	mg/kg	CFSB-211	22 / 35	0.0015 - 0.078	0.028	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	0.012 (J)	0.044 (J)	mg/kg	CFSB-181	2 / 35	0.01 - 0.53	0.044	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 35	0.0012 - 0.065	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0018 (J)	2.8	mg/kg	CFSB-185	34 / 35	0.0019 - 0.0019	2.8	0.23	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.0018 (J)	0.026 (J)	mg/kg	CFSB-211	22 / 35	0.0013 - 0.07	0.026	0.0185	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 35	0.0024 - 0.13	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 35	0.002 - 0.1	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 35	0.0017 - 0.091	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 35	0.0017 - 0.092	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0026 (J)	2.5	mg/kg	CFSB-185	33 / 35	0.0014 - 0.0014	2.5	0.563	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 35	0.0017 - 0.091	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 35	0.0023 - 0.12	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 35	0.011 - 0.59	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0016 (J)	0.021 (J)	mg/kg	CFSB-282	16 / 35	0.0013 - 0.069	0.021	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 35	0.012 - 0.65	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 35	0.054 - 2.9	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0023 (J)	1.1	mg/kg	CFSB-185	32 / 35	0.0018 - 0.0019	1.1	0.145	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 35	0.01 - 0.54	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0047 (J)	2.9	mg/kg	CFSB-185	33 / 35	0.0016 - 0.0017	2.9	0.2	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 2	'0.032 - 0.032	ND	NA	0.00087	USEPA RSL RBSSL THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	1.30E-03	USEPA RSL RBSSL THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 2	'0.0088 - 0.0088	ND	NA	0.0000036	USEPA RSL RBSSL THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 2	'0.015 - 0.015	ND	NA	0.026	USEPA RSL RBSSL THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.043	0.064	mg/kg	CFMW-003A	2 / 2	'0.015 - 0.015	0.064	NA	1.3	USEPA RSL RBSSL THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 2	'0.027 - 0.027	ND	NA	0.25	USEPA RSL RBSSL THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 2	'0.0092 - 0.0092	ND	0.0462	No Screening Level		NA	NA	N	BSL-ND
	218-01-9	Chrysene	0.035	0.035	mg/kg	CFMW-003A	1 / 2	'0.01 - 0.011	0.035	0.572	9	USEPA RSL RBSSL THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	0.23	USEPA RSL RBSSL THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 2	'0.019 - 0.019	ND	NA	5.7	USEPA RSL RBSSL THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 2	'0.019 - 0.019	ND	0.748	0.096	USEPA RSL RBSSL THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	0.00209	0.015	USEPA RSL RBSSL THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	0.61	USEPA RSL RBSSL THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 2	'0.011 - 0.011	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.033	0.033	mg/kg	CFMW-003A	1 / 2	'0.011 - 0.012	0.033	0.23	8.9	USEPA RSL RBSSL THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 2	'0.0081 - 0.0081	ND	0.0185	0.54	USEPA RSL RBSSL THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 2	'0.015 - 0.015	ND	NA	0.00012	USEPA RSL RBSSL THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 2	'0.01 - 0.01	ND	NA	0.00027	USEPA RSL RBSSL THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 2	'0.023 - 0.023	ND	NA	0.00013	USEPA RSL RBSSL THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 2	'0.014 - 0.014	ND	NA	0.0002	USEPA RSL RBSSL THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	ND	ND	ND	ND	0 / 2	'0.025 - 0.025	ND	0.563	0.98	USEPA RSL RBSSL THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 2	'0.008 - 0.008	ND	NA	2.60E-02	USEPA RSL RBSSL THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	0.0000081	USEPA RSL RBSSL THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 2	'0.034 - 0.034	ND	NA	0.067	USEPA RSL RBSSL THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 2	'0.0095 - 0.0095	ND	0.00363	5.40E-04	USEPA RSL RBSSL THQ=0.1, c**	3.8	USEPA RSL Res Soil	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	9.20E-05	USEPA RSL RBSSL THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 2	'0.045 - 0.045	ND	NA	0.000057	USEPA RSL RBSSL THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.018	0.018	mg/kg	CFMW-003A	1 / 2	'0.0099 - 0.011	0.018	0.145	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 2	'0.012 - 0.012	ND	NA	0.33	USEPA RSL RBSSL THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.042	0.042	mg/kg	CFMW-003A	1 / 2	'0.017 - 0.018	0.042	0.2	1.3	USEPA RSL RBSSL THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.28	USEPA RSL RBSSL THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.00003	USEPA RSL RBSSL THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 1	'0.00034 - 0.00034	ND	NA	2.6	USEPA RSL RBSSL THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 1	'0.00022 - 0.00022	ND	NA	0.000013	USEPA RSL RBSSL THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL

Table 2-15
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 1	'0.00026 - 0.00026	ND	NA	0.00078	USEPA RSL RBSSL THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 1	'0.00032 - 0.00032	ND	NA	0.01	USEPA RSL RBSSL THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	0.0021	USEPA RSL RBSSL THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.0012	USEPA RSL RBSSL THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 1	'0.00036 - 0.00036	ND	NA	0.00000014	USEPA RSL RBSSL THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 1	'9.3e-005 - 9.3e-005	ND	NA	0.0000021	USEPA RSL RBSSL THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'0.00011 - 0.00011	ND	NA	0.03	USEPA RSL RBSSL THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	0.000048	USEPA RSL RBSSL THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.000047	USEPA RSL RBSSL THQ=0.1, c**	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'9.3e-005 - 9.3e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 1	'0.0001 - 0.0001	ND	NA	0.00046	USEPA RSL RBSSL THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 1	'0.00073 - 0.00073	ND	NA	0.00088	USEPA RSL RBSSL THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0091	0.0091	mg/kg	CFMW-003A	1 / 1	'0.00082 - 0.00082	0.0091	NA	0.29	USEPA RSL RBSSL THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 1	'0.00015 - 0.00015	ND	NA	0.00023	USEPA RSL RBSSL THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.0021	USEPA RSL RBSSL THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.000036	USEPA RSL RBSSL THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 1	'0.0001 - 0.0001	ND	NA	0.00087	USEPA RSL RBSSL THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.00019	USEPA RSL RBSSL THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00035	0.00035	mg/kg	CFMW-003A	1 / 1	'0.00033 - 0.00033	0.00035	NA	0.024	USEPA RSL RBSSL THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 1	'0.00033 - 0.00033	ND	NA	0.00018	USEPA RSL RBSSL THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 1	'0.00011 - 0.00011	ND	NA	0.0053	USEPA RSL RBSSL THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 1	'0.00027 - 0.00027	ND	NA	0.59	USEPA RSL RBSSL THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 1	'0.00016 - 0.00016	ND	NA	0.000061	USEPA RSL RBSSL THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 1	'0.00029 - 0.00029	ND	NA	0.0049	USEPA RSL RBSSL THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 1	'0.00017 - 0.00017	ND	NA	0.0011	USEPA RSL RBSSL THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 1	'0.00035 - 0.00035	ND	NA	1.3	USEPA RSL RBSSL THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.00023	USEPA RSL RBSSL THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.03	USEPA RSL RBSSL THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 1	'0.00014 - 0.00014	ND	NA	0.0017	USEPA RSL RBSSL THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.074	USEPA RSL RBSSL THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 1	'8.5e-005 - 8.5e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 1	'0.00069 - 0.00069	ND	NA	0.41	USEPA RSL RBSSL THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 1	'0.00059 - 0.00059	ND	NA	0.12	USEPA RSL RBSSL THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 1	'0.0017 - 0.0017	ND	NA	0.14	USEPA RSL RBSSL THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 1	'0.00039 - 0.00039	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 1	'0.00025 - 0.00025	ND	NA	0.0027	USEPA RSL RBSSL THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.019	USEPA RSL RBSSL THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 1	'0.00012 - 0.00012	ND	NA	0.13	USEPA RSL RBSSL THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 1	'0.00013 - 0.00013	ND	NA	0.0032	USEPA RSL RBSSL THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 1	'0.00022 - 0.00022	ND	NA	0.0018	USEPA RSL RBSSL THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 1	'0.00015 - 0.00015	ND	NA	0.076	USEPA RSL RBSSL THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 1	'0.0003 - 0.0003	ND	NA	0.011	USEPA RSL RBSSL THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 1	'7.7e-005 - 7.7e-005	ND	NA	No Screening Level		NA	NA	N	BSL-ND

Table 2-15
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 12 ft bgs

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 1	'0.0002 - 0.0002	ND	NA	0.0001	USEPA RSL RBSSL THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 1	'0.00026 - 0.00026	ND	NA	0.33	USEPA RSL RBSSL THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 1	'0.0003 - 0.0003	ND	NA	0.0000065	USEPA RSL RBSSL THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-16
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area
Exposure Medium: Surface Water Eastern Undeveloped Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	ND	ND	ND	ND	0 / 7	2 - 4	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	FREE CN	Cyanide (Free)	2.5 (J)	5.8	µg/l	CFSWP-039	2 / 4	1.5 - 1.5	5.8	1834	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	80.3	322	µg/l	CFSWP-039	7 / 7	NA	322	130	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	16.8 (J)	64.4	µg/l	CFSWP-009	6 / 7	15 - 15	64.4	33.9	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-36-0	Antimony	2	2	µg/l	CFSWP-009	1 / 7	0.62 - 0.76	2	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.79 (J)	0.95 (J)	µg/l	CFSWP-009	2 / 7	0.64 - 0.77	0.95	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	77.1	209	µg/l	CFSWP-039	7 / 7	NA	209	98.6	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 7	0.24 - 0.29	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 7	0.61 - 0.72	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	45100	59000	µg/l	CFSWP-039	7 / 7	NA	59000	55600	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	ND	ND	ND	ND	0 / 7	1.3 - 1.5	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	ND	ND	ND	ND	0 / 7	1.3 - 1.5	ND	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-50-8	Copper	2.8 (J)	7.2	µg/l	CFSWP-039	3 / 7	1.4 - 1.9	7.2	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	ND	ND	ND	ND	0 / 7	42.4 - 49.1	ND	123	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-92-1	Lead	ND	ND	ND	ND	0 / 7	0.37 - 0.44	ND	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	10600	18500	µg/l	CFSWP-039	7 / 7	NA	18500	17601	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	3 (J)	3.8 (J)	µg/l	CFSWP-040	6 / 7	3 - 3	3.8	6813	43	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 7	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	ND	ND	ND	ND	0 / 7	1.3 - 1.6	ND	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	411	655	µg/l	CFSWP-039	7 / 7	NA	655	919	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 7	0.69 - 0.79	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 7	1.3 - 1.5	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	2340	3430	µg/l	CFSWP-039	7 / 7	NA	3430	3064	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 7	0.24 - 0.31	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	2.2 (J)	2.2 (J)	µg/l	CFSWP-009	1 / 7	1.2 - 1.9	2.2	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	ND	ND	ND	ND	0 / 7	5.4 - 7	ND	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-17
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.34	0.34	mg/kg	CFSDP-009	1 / 1	NA	0.34	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	1.62	1.62	mg/kg	CFSDP-009	1 / 1	NA	1.62	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	17400	17400	mg/kg	CFSDP-009	1 / 1	NA	17400	23478	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 1	0.32 - 0.32	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	6.8	6.8	mg/kg	CFSDP-009	1 / 1	NA	6.8	9.879	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	295	295	mg/kg	CFSDP-009	1 / 1	NA	295	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.66	0.66	mg/kg	CFSDP-009	1 / 1	NA	0.66	1.296	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 1	0.34 - 0.34	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	11500	11500	mg/kg	CFSDP-009	1 / 1	NA	11500	94895	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	11.8	11.8	mg/kg	CFSDP-009	1 / 1	NA	11.8	15	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	5.8	5.8	mg/kg	CFSDP-009	1 / 1	NA	5.8	9.77	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	19.8	19.8	mg/kg	CFSDP-009	1 / 1	NA	19.8	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	14100	14100	mg/kg	CFSDP-009	1 / 1	NA	14100	26687	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	13	13	mg/kg	CFSDP-009	1 / 1	NA	13	30.29	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	8750	8750	mg/kg	CFSDP-009	1 / 1	NA	8750	22708	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	517	517	mg/kg	CFSDP-009	1 / 1	NA	517	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.038	0.038	mg/kg	CFSDP-009	1 / 1	NA	0.038	0.0762	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	16 (J+)	16 (J+)	mg/kg	CFSDP-009	1 / 1	NA	16	17.94	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	978	978	mg/kg	CFSDP-009	1 / 1	NA	978	1742	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	0.54 (J)	0.54 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.54	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 1	0.62 - 0.62	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	171	171	mg/kg	CFSDP-009	1 / 1	NA	171	60.66	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 1	0.13 - 0.13	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	12.1	12.1	mg/kg	CFSDP-009	1 / 1	NA	12.1	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	59	59	mg/kg	CFSDP-009	1 / 1	NA	59	81.94	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 1	0.00097 - 0.00097	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00073 - 0.00073	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00078 - 0.00078	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 1	0.0013 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 1	0.00087 - 0.00087	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 1	0.00093 - 0.00093	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 1	0.00099 - 0.00099	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 1	0.00072 - 0.00072	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 1	0.001 - 0.001	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 1	0.0016 - 0.0016	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 1	0.0017 - 0.0017	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 1	0.0011 - 0.0011	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 1	0.0012 - 0.0012	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 1	0.00083 - 0.00083	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 1	0.023 - 0.023	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 1	0.0017 - 0.0017	ND	NA	No Screening Level	NULL	N	BSL-ND
	CLAY	Clay	3.9	3.9	percent	CFSDP-009	1 / 1	NA	3.9	NA	No Screening Level	NULL	N	NSL
	COARSESAND	Coarse Sand	3.1	3.1	percent	CFSDP-009	1 / 1	NA	3.1	NA	No Screening Level	NULL	N	NSL
	FINESAND	Fine Sand	26.6	26.6	percent	CFSDP-009	1 / 1	NA	26.6	NA	No Screening Level	NULL	N	NSL
	GRAVEL	Gravel	0	0	percent	CFSDP-009	1 / 1	NA	0	NA	No Screening Level	NULL	N	NSL
	HYD01	Hydrometer, Reading 1, Percent Passing	13.3	13.3	% passed	CFSDP-009	1 / 1	NA	13.3	NA	No Screening Level	NULL	N	NSL
	HYD02	Hydrometer, Reading 2, Percent Passing	12.5	12.5	% passed	CFSDP-009	1 / 1	NA	12.5	NA	No Screening Level	NULL	N	NSL
	HYD03	Hydrometer, Reading 3, Percent Passing	7.8	7.8	% passed	CFSDP-009	1 / 1	NA	7.8	NA	No Screening Level	NULL	N	NSL
	HYD04	Hydrometer, Reading 4, Percent Passing	6.2	6.2	% passed	CFSDP-009	1 / 1	NA	6.2	NA	No Screening Level	NULL	N	NSL
	HYD05	Hydrometer, Reading 5, Percent Passing	3.9	3.9	% passed	CFSDP-009	1 / 1	NA	3.9	NA	No Screening Level	NULL	N	NSL
	HYD06	Hydrometer, Reading 6, Percent Passing	0.8	0.8	% passed	CFSDP-009	1 / 1	NA	0.8	NA	No Screening Level	NULL	N	NSL

Table 2-17
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	HYD07	Hydrometer, Reading 7, Percent Passing	-0.2	-0.2	% passed	CFSDP-009	1 / 1	NA	-0.2	NA	No Screening Level	NULL	N	NSL
	GSMSAND	Medium Sand	14.2	14.2	percent	CFSDP-009	1 / 1	NA	14.2	NA	No Screening Level	NULL	N	NSL
	SIEVE0.375IN	Percent Passing 0.375 Inch (3/8 Inch Sieve)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	SIEVE0.75IN	Percent Passing 0.75 Inch (3/4 Inch Sieve)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	SIEVE1.0IN	Percent Passing 1 Inch (1 Inch Sieve)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	SIEVE1.5IN	Percent Passing 1.5 Inch (1.5 Inch Sieve)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	SIEVE2.0IN	Percent Passing 2 Inch (2 Inch Sieve)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	308075-07-2	Sand	43.9	43.9	percent	CFSDP-009	1 / 1	NA	43.9	NA	No Screening Level	NULL	N	NSL
	SIEVE10	Sieve No. 10, Percent Passing	96.9	96.9	% passed	CFSDP-009	1 / 1	NA	96.9	NA	No Screening Level	NULL	N	NSL
	SIEVE200	Sieve No. 200, Percent Passing	56.1	56.1	% passed	CFSDP-009	1 / 1	NA	56.1	NA	No Screening Level	NULL	N	NSL
	SIEVE4	Sieve No. 4, Percent Passing	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	SIEVE40	Sieve No. 40, Percent Passing	82.7	82.7	% passed	CFSDP-009	1 / 1	NA	82.7	NA	No Screening Level	NULL	N	NSL
	SIEVE80	Sieve No. 80, Percent Passing	69.5	69.5	% passed	CFSDP-009	1 / 1	NA	69.5	NA	No Screening Level	NULL	N	NSL
	SIEVE100	Sieve, No. 100, Percent Passing	66.8	66.8	% passed	CFSDP-009	1 / 1	NA	66.8	NA	No Screening Level	NULL	N	NSL
	SIEVE20	Sieve, No. 20, Percent Passing	94	94	% passed	CFSDP-009	1 / 1	NA	94	NA	No Screening Level	NULL	N	NSL
	SIEVE60	Sieve, No. 60, Percent Passing	74.1	74.1	% passed	CFSDP-009	1 / 1	NA	74.1	NA	No Screening Level	NULL	N	NSL
	SIEVE3INCH	Sieve-US Std. 3-inch (75 mm)	100	100	% passed	CFSDP-009	1 / 1	NA	100	NA	No Screening Level	NULL	N	NSL
	E52456985	Silt	52.2	52.2	percent	CFSDP-009	1 / 1	NA	52.2	NA	No Screening Level	NULL	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 1	0.029 - 0.029	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 1	0.11 - 0.11	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 1	0.037 - 0.037	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 1	0.039 - 0.039	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 1	0.0093 - 0.0093	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 1	0.087 - 0.087	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 1	0.3 - 0.3	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 1	0.016 - 0.016	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 1	0.021 - 0.021	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 1	0.009 - 0.009	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 1	0.01 - 0.01	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 1	0.0087 - 0.0087	ND	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 1	0.017 - 0.017	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 1	0.013 - 0.013	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 1	0.013 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 1	0.044 - 0.044	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 1	0.11 - 0.11	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 1	0.017 - 0.017	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 1	0.01 - 0.01	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 1	0.015 - 0.015	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 1	0.19 - 0.19	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 1	0.0096 - 0.0096	ND	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 1	0.01 - 0.01	ND	NA	No Screening Level	NULL	N	BSL-ND

Table 2-17
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 1	0.0086 - 0.0086	ND	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 1	0.038 - 0.038	ND	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 1	0.018 - 0.018	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 1	0.03 - 0.03	ND	0.0141	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.1	0.1	mg/kg	CFSDP-009	1 / 1	NA	0.1	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-32-8	Benzo(A)Pyrene	0.12	0.12	mg/kg	CFSDP-009	1 / 1	NA	0.12	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.21	0.21	mg/kg	CFSDP-009	1 / 1	NA	0.21	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	191-24-2	Benzo(G,H,I)Perylene	0.11 (J)	0.11 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.11	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.069	0.069	mg/kg	CFSDP-009	1 / 1	NA	0.069	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 1	0.034 - 0.034	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 1	0.0093 - 0.0093	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 1	0.016 - 0.016	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 1	0.015 - 0.015	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 1	0.028 - 0.028	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.011 (J)	0.011 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.011	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.14 (J)	0.14 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.14	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 1	0.02 - 0.02	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 1	0.021 - 0.021	ND	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.13 (J)	0.13 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.13	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 1	0.0086 - 0.0086	ND	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 1	0.016 - 0.016	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 1	0.011 - 0.011	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 1	0.025 - 0.025	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 1	0.014 - 0.014	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.12	0.12	mg/kg	CFSDP-009	1 / 1	NA	0.12	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 1	0.0085 - 0.0085	ND	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 1	0.013 - 0.013	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 1	0.036 - 0.036	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 1	0.01 - 0.01	ND	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 1	0.012 - 0.012	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 1	0.048 - 0.048	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	85-01-8	Phenanthrene	0.065 (J)	0.065 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.065	0.00226	No Screening Level	NULL	N	NSL

Table 2-17
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Eastern Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	108-95-2	Phenol	ND	ND	ND	ND	0 / 1	0.013 - 0.013	ND	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.19 (J)	0.19 (J)	mg/kg	CFSDP-009	1 / 1	NA	0.19	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-18
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.042 (J)	0.3 (J+)	mg/kg	CFSB-197	13 / 24	0.026 - 0.098	0.3	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	2.22 (J-)	27.6 (J+)	mg/kg	CFMW-011A	24 / 24	NA	27.6	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	TOC	Total Organic Carbon	3920	107000	mg/kg	CFSB-255	21 / 21	NA	107000	122647	No Screening Level		NA	NA	N	NSL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.117762	0.414842	mg/kg	CFSB-248	24 / 24	NA	0.414842	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	4.28224	15.0852	mg/kg	CFSB-248	24 / 24	NA	15.0852	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	7750	27400 (J)	mg/kg	CFSB-259	24 / 24	NA	27400	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 24	0.25 - 0.5	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	2.8 (J)	15.8	mg/kg	CFSB-256	24 / 24	NA	15.8	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	103	486	mg/kg	CFSB-256	24 / 24	NA	486	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.39 (J)	0.91	mg/kg	CFSB-198	24 / 24	NA	0.91	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.3 (J)	0.78 (J)	mg/kg	CFSB-256	2 / 24	0.29 - 0.47	0.78	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	1750	177000	mg/kg	CFSB-255	24 / 24	NA	177000	16691	No Screening Level		NA	NA	N	NSL
	7440-47-3	Chromium, Total	4.4	15.5	mg/kg	CFSB-248	24 / 24	NA	15.5	15.94	No Screening Level		NA	NA	N	NSL
	7440-48-4	Cobalt	2.2 (J)	8.2	mg/kg	CFSB-198	24 / 24	NA	8.2	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	4	26.2	mg/kg	CFSB-256	24 / 24	NA	26.2	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	6490	23400	mg/kg	CFSB-198	24 / 24	NA	23400	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	6.4	16.7	mg/kg	CFSB-176	24 / 24	NA	16.7	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2940	9790	mg/kg	CFSB-248	24 / 24	NA	9790	11051	No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	49.4 (J)	1940 (J)	mg/kg	CFMW-067	24 / 24	NA	1940	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J)	0.053	mg/kg	CFSB-257	21 / 24	0.011 - 0.019	0.053	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.2	35.7	mg/kg	CFSB-176	24 / 24	NA	35.7	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	337	1620	mg/kg	CFSB-198	24 / 24	NA	1620	2167	No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	0.34 (J)	0.5 (J)	mg/kg	CFSB-011	5 / 24	0.25 - 0.46	0.5	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 24	0.53 - 0.94	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	39.5 (J)	552	mg/kg	CFSB-122	22 / 24	38.9 - 39.9	552	69.94	No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.19 (J)	0.19 (J)	mg/kg	CFSB-258	1 / 24	0.11 - 0.19	0.19	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.3	20.4	mg/kg	CFSB-176	24 / 24	NA	20.4	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	13.6	112	mg/kg	CFSB-198	24 / 24	NA	112	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 2	0.001 - 0.0013	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00076 - 0.00097	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00081 - 0.001	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 2	0.0013 - 0.0017	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 2	0.0014 - 0.0017	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00091 - 0.0012	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 2	0.00097 - 0.0012	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 2	0.001 - 0.0013	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 2	0.00075 - 0.00095	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 2	0.0016 - 0.0021	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 2	0.0018 - 0.0023	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 2	0.00086 - 0.0011	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 2	0.024 - 0.031	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 2	0.0018 - 0.0023	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 4	0.011 - 0.015	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 4	0.011 - 0.015	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL

Table 2-18
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 4	0.011 - 0.015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 4	0.011 - 0.015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 4	0.011 - 0.015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 24	0.0015 - 0.039	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 24	0.011 - 0.14	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 24	0.015 - 0.051	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 24	0.0025 - 0.052	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 24	0.002 - 0.015	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 24	0.0027 - 0.012	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 24	0.0022 - 0.12	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 24	0.096 - 0.4	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 24	0.0018 - 0.021	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 24	0.0022 - 0.028	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 24	0.0016 - 0.012	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 24	0.0017 - 0.013	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0018 (J)	0.0064 (J)	mg/kg	CFSB-176	4 / 24	0.0017 - 0.012	0.0064	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 24	0.01 - 0.035	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 24	0.013 - 0.056	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 24	0.002 - 0.018	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 23	0.033 - 0.083	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 4	0.011 - 0.014	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 24	0.0091 - 0.031	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 24	0.061 - 0.21	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 24	0.0025 - 0.017	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 24	0.0017 - 0.023	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 24	0.0012 - 0.014	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 24	0.0022 - 0.016	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 24	0.0017 - 0.02	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 24	0.025 - 0.25	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0029 (J)	0.018	mg/kg	CFSB-176	10 / 24	0.002 - 0.013	0.018	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 24	0.0016 - 0.014	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.0025 (J)	0.0066 (J)	mg/kg	CFSB-173	6 / 24	0.0019 - 0.011	0.0066	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	0.0022 (J)	0.022 (J)	mg/kg	CFSB-200	14 / 24	0.0018 - 0.05	0.022	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 24	0.016 - 0.054	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0056 (J-)	0.018 (J)	mg/kg	CFSB-173	8 / 14	0.0052 - 0.04	0.018	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0034 (J)	0.14	mg/kg	CFSB-013	22 / 24	0.034 - 0.044	0.14	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0042 (J)	0.22	mg/kg	CFSB-176	23 / 24	0.016 - 0.016	0.22	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0048 (J)	0.51	mg/kg	CFSB-176	23 / 24	0.021 - 0.021	0.51	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.004 (J)	0.29	mg/kg	CFSB-176	23 / 24	0.03 - 0.03	0.29	0.0406	No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0029 (J)	0.16	mg/kg	CFSB-176	23 / 24	0.023 - 0.023	0.16	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.047	0.047	mg/kg	CFSB-193	1 / 24	0.012 - 0.084	0.047	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.0034 (J)	0.0037 (J)	mg/kg	CFSB-176	2 / 24	0.0015 - 0.045	0.0037	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 24	0.0017 - 0.016	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 24	0.0013 - 0.012	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 24	0.0026 - 0.022	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.085 (J)	0.51	mg/kg	CFSB-257	10 / 24	0.016 - 0.13	0.51	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 24	0.023 - 0.08	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0018 (J)	0.035	mg/kg	CFSB-176	19 / 24	0.0017 - 0.013	0.035	0.00657	No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.0047 (J)	0.32	mg/kg	CFSB-176	23 / 24	0.014 - 0.014	0.32	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 24	0.012 - 0.054	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 24	0.02 - 0.071	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0023 (J)	0.062	mg/kg	CFSB-176	18 / 24	0.0016 - 0.027	0.062	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.0021 (J)	0.013 (J)	mg/kg	CFSB-176	6 / 24	0.0016 - 0.016	0.013	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 24	0.011 - 0.037	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 24	0.0013 - 0.015	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0059 (J)	0.29	mg/kg	CFSB-176	23 / 24	0.016 - 0.016	0.29	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL

Table 2-18
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	86-73-7	Fluorene	0.0021 (J)	0.012 (J)	mg/kg	CFSB-200	11 / 24	0.0014 - 0.011	0.012	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 24	0.0026 - 0.021	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 24	0.0021 - 0.015	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 24	0.0018 - 0.033	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 24	0.0018 - 0.019	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0031 (J)	0.24	mg/kg	CFSB-176	22 / 24	0.027 - 0.035	0.24	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	0.0089 (J)	0.013 (J)	mg/kg	CFSB-013	2 / 24	0.0018 - 0.011	0.013	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 24	0.0024 - 0.018	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 24	0.012 - 0.048	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0019 (J)	0.049	mg/kg	CFSB-176	10 / 24	0.0014 - 0.013	0.049	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 24	0.012 - 0.045	ND	NA	0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 24	0.048 - 0.2	ND	NA	0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.0035 (J)	0.13	mg/kg	CFSB-176	23 / 24	0.014 - 0.014	0.13	0.0217	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 24	0.011 - 0.037	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0059 (J)	0.27	mg/kg	CFSB-176	23 / 24	0.024 - 0.024	0.27	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-19
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	57-12-5	Cyanide	0.022 (J)	0.3 (J+)	mg/kg	CFSB-197	25 / 65	0.017 - 0.098	0.3	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.54 (J-)	27.6 (J+)	mg/kg	CFMW-011A	64 / 65	0.17 - 0.17	27.6	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.107056	0.414842	mg/kg	CFSB-248	65 / 65	NA	0.414842	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	3.89294	15.0852	mg/kg	CFSB-248	65 / 65	NA	15.0852	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	4740 (J)	29400	mg/kg	CFSB-198	65 / 65	NA	29400	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 65	0.24 - 0.51	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	2	15.8	mg/kg	CFSB-256	65 / 65	NA	15.8	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	43	486	mg/kg	CFSB-256	65 / 65	NA	486	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.21 (J)	0.97	mg/kg	CFSB-176	65 / 65	NA	0.97	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.3 (J)	0.78 (J)	mg/kg	CFSB-256	3 / 65	0.25 - 0.47	0.78	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	826 (J)	177000	mg/kg	CFSB-255	65 / 65	NA	177000	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	4	15.5	mg/kg	CFSB-248	65 / 65	NA	15.5	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	2.2 (J)	8.6	mg/kg	CFSB-198	65 / 65	NA	8.6	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	3.5	26.7 (J)	mg/kg	CFMW-067	65 / 65	NA	26.7	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	5720	23400	mg/kg	CFSB-198	65 / 65	NA	23400	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	4.3 (J)	21.8 (J+)	mg/kg	CFSB-259	65 / 65	NA	21.8	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2110 (J)	28700	mg/kg	CFSB-260	65 / 65	NA	28700	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	36.1 (J)	1940 (J)	mg/kg	CFMW-067	65 / 65	NA	1940	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.0098 (J)	0.053	mg/kg	CFSB-257	52 / 65	0.01 - 0.019	0.053	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.2	35.7	mg/kg	CFSB-176	65 / 65	NA	35.7	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	335	1620	mg/kg	CFSB-198	65 / 65	NA	1620	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.26 (J)	0.5 (J)	mg/kg	CFSB-011	10 / 65	0.24 - 0.48	0.5	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 65	0.51 - 0.94	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	31.3 (J)	555	mg/kg	CFSB-122	45 / 65	30.3 - 44.2	555	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.13 (J)	0.41	mg/kg	CFSB-248	3 / 65	0.1 - 0.19	0.41	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4	20.4	mg/kg	CFSB-176	65 / 65	NA	20.4	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	10.1	116	mg/kg	CFSB-198	65 / 65	NA	116	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 2	0.001 - 0.0013	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00076 - 0.00097	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00081 - 0.001	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 2	0.0013 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 2	0.0014 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 2	0.00091 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 2	0.00097 - 0.0012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 2	0.001 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 2	0.00075 - 0.00095	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 2	0.0016 - 0.0021	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 2	0.0018 - 0.0023	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 2	0.0011 - 0.0014	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 2	0.0012 - 0.0015	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 2	0.00086 - 0.0011	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 2	0.024 - 0.031	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 2	0.0018 - 0.0023	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 13	0.0091 - 0.014	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 13	0.0091 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 13	0.0091 - 0.014	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 13	0.0091 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 13	0.0091 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 13	0.0094 - 0.015	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 13	0.0094 - 0.015	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 13	0.0094 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 13	0.0094 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-19
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 13	0.0094 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 65	0.0015 - 0.039	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 65	0.011 - 0.14	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 65	0.014 - 0.051	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 65	0.0025 - 0.052	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 65	0.0019 - 0.015	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 65	0.0027 - 0.012	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 65	0.0022 - 0.12	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 64	0.093 - 0.4	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 65	0.0017 - 0.021	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 65	0.0021 - 0.028	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 65	0.0016 - 0.012	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 65	0.0016 - 0.013	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0018 (J)	0.0064 (J)	mg/kg	CFSB-176	7 / 65	0.0017 - 0.012	0.0064	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 65	0.0099 - 0.035	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 65	0.011 - 0.056	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 65	0.002 - 0.018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 64	0.032 - 0.083	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 13	0.009 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 65	0.0088 - 0.031	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 65	0.06 - 0.21	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 65	0.0024 - 0.017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 65	0.0016 - 0.023	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 65	0.0012 - 0.014	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 65	0.0021 - 0.016	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 65	0.0017 - 0.02	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 65	0.024 - 0.25	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0029 (J)	0.018	mg/kg	CFSB-176	15 / 65	0.002 - 0.013	0.018	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 65	0.0015 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.0023 (J)	0.0066 (J)	mg/kg	CFSB-173	12 / 65	0.0019 - 0.011	0.0066	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	0.0021 (J)	0.022 (J)	mg/kg	CFSB-200	20 / 65	0.0018 - 0.05	0.022	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 65	0.015 - 0.054	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0051 (J)	0.018 (J)	mg/kg	CFSB-173	14 / 31	0.0044 - 0.04	0.018	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0015 (J)	0.14	mg/kg	CFSB-013	40 / 65	0.0013 - 0.044	0.14	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0021 (J)	0.22	mg/kg	CFSB-176	42 / 65	0.0015 - 0.016	0.22	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0025 (J)	0.51	mg/kg	CFSB-176	43 / 65	0.0017 - 0.021	0.51	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0023 (J)	0.29	mg/kg	CFSB-176	42 / 65	0.0015 - 0.03	0.29	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0023 (J)	0.16	mg/kg	CFSB-176	36 / 65	0.0021 - 0.023	0.16	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.047	0.047	mg/kg	CFSB-193	1 / 65	0.01 - 0.084	0.047	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.0023 (J)	0.046 (J)	mg/kg	CFSB-122	7 / 65	0.0015 - 0.045	0.046	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 65	0.0017 - 0.016	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 65	0.0013 - 0.012	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 65	0.0026 - 0.022	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.044 (J+)	0.66	mg/kg	CFSB-197	23 / 65	0.013 - 0.13	0.66	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 65	0.023 - 0.08	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0018 (J)	0.035	mg/kg	CFSB-176	26 / 65	0.0016 - 0.013	0.035	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0014 (J)	0.32	mg/kg	CFSB-176	43 / 65	0.0014 - 0.014	0.32	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.48 (J)	0.48 (J)	mg/kg	CFSB-122	1 / 65	0.01 - 0.054	0.48	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 65	0.017 - 0.071	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0022 (J)	0.062	mg/kg	CFSB-176	26 / 65	0.0015 - 0.027	0.062	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.0016 (J)	0.013 (J)	mg/kg	CFSB-176	11 / 65	0.0015 - 0.016	0.013	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	0.032 (J)	0.032 (J)	mg/kg	CFSB-122	1 / 65	0.0096 - 0.037	0.032	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 65	0.0013 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0022 (J)	0.29	mg/kg	CFSB-176	43 / 65	0.0018 - 0.016	0.29	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.0018 (J)	0.012 (J)	mg/kg	CFSB-200	17 / 65	0.0014 - 0.011	0.012	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 65	0.0025 - 0.021	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL

Table 2-19
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 65	0.002 - 0.015	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 65	0.0018 - 0.033	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 65	0.0018 - 0.019	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0016 (J)	0.24	mg/kg	CFSB-176	41 / 65	0.0014 - 0.035	0.24	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	0.002 (J)	0.013 (J)	mg/kg	CFSB-013	3 / 65	0.0018 - 0.011	0.013	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 65	0.0024 - 0.018	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 65	0.012 - 0.048	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0016 (J)	0.049	mg/kg	CFSB-176	15 / 65	0.0014 - 0.013	0.049	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 65	0.011 - 0.045	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 65	0.041 - 0.2	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.0025 (J)	0.13	mg/kg	CFSB-176	41 / 65	0.0019 - 0.014	0.13	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 65	0.011 - 0.037	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0022 (J)	0.27	mg/kg	CFSB-176	42 / 65	0.0016 - 0.024	0.27	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 9	0.00032 - 0.00055	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 9	0.00014 - 0.00024	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 9	0.00037 - 0.00063	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 9	0.00024 - 0.0004	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 9	0.00029 - 0.00049	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 9	0.00035 - 0.00059	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 9	9.3e-005 - 0.00016	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 9	0.00027 - 0.00046	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 9	0.0004 - 0.00068	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 9	0.0001 - 0.00017	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.00012 - 0.0002	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 9	9.3e-005 - 0.00016	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 9	0.00014 - 0.00024	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.0001 - 0.00017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.00011 - 0.00019	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 9	0.00079 - 0.0014	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0047 (J-)	0.071	mg/kg	CFSB-013	9 / 9	NA	0.071	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00022 (J)	0.00044 (J)	mg/kg	CFSB-011	5 / 9	0.00017 - 0.00029	0.00044	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 9	0.00014 - 0.00024	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 9	0.00032 - 0.00055	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 9	0.00011 - 0.00019	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 9	0.00027 - 0.00046	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00058 (J)	0.00058 (J)	mg/kg	CFSB-013	1 / 9	0.00036 - 0.00062	0.00058	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 9	0.00036 - 0.00062	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 9	0.00012 - 0.0002	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 9	0.0003 - 0.0005	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 9	0.00018 - 0.0003	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 9	0.00032 - 0.00055	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 9	0.00019 - 0.00032	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 9	0.00013 - 0.00022	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00093	0.00093	mg/kg	CFSB-122	1 / 9	0.00039 - 0.00066	0.00093	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 9	0.00013 - 0.00022	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 9	0.00027 - 0.00046	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00025 (J)	0.00025 (J)	mg/kg	CFSB-122	1 / 9	0.00015 - 0.00026	0.00025	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 9	0.00014 - 0.00024	ND	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00012 (J)	0.0008 (J)	mg/kg	CFSB-122	3 / 9	9.3e-005 - 0.00016	0.0008	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0019 (J)	0.27 (J)	mg/kg	CFSB-011	4 / 9	0.00076 - 0.0013	0.27	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0018 (J)	0.0034 (J)	mg/kg	CFSB-013	3 / 9	0.00067 - 0.0011	0.0034	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 9	0.0019 - 0.0032	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.0007 (J)	0.0011	mg/kg	CFSB-122	2 / 9	0.00042 - 0.00072	0.0011	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 9	0.00027 - 0.00046	ND	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00025 (J)	0.00025 (J)	mg/kg	CFSB-122	1 / 9	0.00014 - 0.00023	0.00025	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 9	0.00013 - 0.00022	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL

Table 2-19
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 9	0.00014 - 0.00024	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 9	0.00024 - 0.0004	ND	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00024 (J)	0.001	mg/kg	CFSB-122	5 / 9	0.00017 - 0.00027	0.001	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 9	0.00033 - 0.00056	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 9	8.4e-005 - 0.00014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 9	0.00022 - 0.00037	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 9	0.00029 - 0.00049	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 9	0.00033 - 0.00056	ND	NA	0.0000065	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-20
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area
Exposure Medium: Surface Water North-Central Undeveloped Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	4.4 (J)	4.4 (J)	µg/l	CFSWP-046	1 / 24	2 - 4	4.4	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.6 (J)	4.1 (J)	µg/l	CFSWP-021	7 / 13	1.5 - 1.5	4.1	1834	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	38.3 (J)	473 (J-)	µg/l	CFSWP-013	24 / 24	NA	473	130	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	16.1 (J)	5750	µg/l	CFSWP-021	20 / 24	15 - 15	5750	33.9	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	2.4	2.9	µg/l	CFSWP-022	3 / 24	0.62 - 0.76	2.9	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.78 (J)	3.7	µg/l	CFSWP-021	12 / 24	0.64 - 0.77	3.7	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	72.9	245	µg/l	CFSWP-049	24 / 24	NA	245	98.6	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 24	0.24 - 0.29	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 24	0.61 - 0.72	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	40000	82100	µg/l	CFSWP-021	24 / 24	NA	82100	55600	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	1.4 (J)	3.4 (J)	µg/l	CFSWP-021	2 / 24	1.3 - 1.5	3.4	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	2 (J)	2.4 (J)	µg/l	CFSWP-013	2 / 24	1.3 - 1.5	2.4	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	2.2 (J)	11.7 (J)	µg/l	CFSWP-013	6 / 24	1.4 - 1.9	11.7	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	50.2 (J)	4760	µg/l	CFSWP-021	9 / 24	42.4 - 49.1	4760	123	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	0.66 (J)	4.5	µg/l	CFSWP-021	3 / 24	0.37 - 0.44	4.5	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	10300	19500	µg/l	CFSWP-021	24 / 24	NA	19500	17601	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	3 (J)	3750	µg/l	CFSWP-013	21 / 24	2.5 - 2.7	3750	6813	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 24	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	2.1 (J)	3.9 (J)	µg/l	CFSWP-021	3 / 24	1.3 - 1.6	3.9	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	368	1250	µg/l	CFSWP-021	24 / 24	NA	1250	919	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	1.5 (J)	1.5 (J)	µg/l	CFSWP-046	1 / 24	0.69 - 0.79	1.5	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 24	1.3 - 1.5	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	1410	108000	µg/l	CFSWP-046	24 / 24	NA	108000	3064	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 24	0.24 - 0.31	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	1.8 (J)	3.9 (J)	µg/l	CFSWP-021	6 / 24	1.2 - 1.9	3.9	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	9.1 (J)	19.2	µg/l	CFSWP-021	4 / 24	5.4 - 7	19.2	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-21
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.11 (J+)	1.5	mg/kg	CFSDP-013	9 / 14	0.07 - 0.11	1.5	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	1.14	9.59	mg/kg	CFSDP-046	14 / 14	NA	9.59	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	12100	35400	mg/kg	CFSDP-053	14 / 14	NA	35400	23478	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 14	0.3 - 1.2	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	3.2	14.5	mg/kg	CFSDP-046	14 / 14	NA	14.5	9.879	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	136	905	mg/kg	CFSDP-022	14 / 14	NA	905	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.32 (J)	1.1	mg/kg	CFSDP-022	12 / 14	0.32 - 0.67	1.1	1.296	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 14	0.33 - 1.4	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	2500	28500	mg/kg	CFSDP-013	14 / 14	NA	28500	94895	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	5	19.5	mg/kg	CFSDP-046	14 / 14	NA	19.5	15	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	1.9 (J)	9.2	mg/kg	CFSDP-050	14 / 14	NA	9.2	9.77	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	8.7	42.5	mg/kg	CFSDP-046	14 / 14	NA	42.5	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	7770	25200	mg/kg	CFSDP-046	14 / 14	NA	25200	26687	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	6.1	17.6	mg/kg	CFSDP-046	14 / 14	NA	17.6	30.29	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	2570	13800	mg/kg	CFSDP-046	14 / 14	NA	13800	22708	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	34.1	1210 (J)	mg/kg	CFSDP-050	14 / 14	NA	1210	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.012 (J)	0.062 (J)	mg/kg	CFSDP-046	8 / 14	0.013 - 0.022	0.062	0.0762	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	6	18.1 (J+)	mg/kg	CFSDP-013	14 / 14	NA	18.1	17.94	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	452	1700	mg/kg	CFSDP-013	14 / 14	NA	1700	1742	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	0.57 (J)	4.4 (J)	mg/kg	CFSDP-046	5 / 14	0.29 - 0.59	4.4	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 14	0.61 - 2.6	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	39.9 (J)	844	mg/kg	CFSDP-046	13 / 14	38 - 38	844	60.66	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 14	0.12 - 0.52	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	7.9	17.2	mg/kg	CFSDP-046	14 / 14	NA	17.2	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	16 (J)	89.8	mg/kg	CFSDP-013	14 / 14	NA	89.8	81.94	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.00093 - 0.0015	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.0007 - 0.0011	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.0011 - 0.0017	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00075 - 0.0012	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.0012 - 0.0019	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.0013 - 0.002	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00084 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.001 - 0.0016	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.0009 - 0.0014	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.00098 - 0.0015	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.00095 - 0.0015	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.0011 - 0.0017	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.00069 - 0.0011	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.00099 - 0.0016	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.0015 - 0.0024	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.0016 - 0.0026	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.001 - 0.0016	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.0011 - 0.0018	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.00079 - 0.0012	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.022 - 0.035	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.0017 - 0.0026	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Table 2-21
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.011 - 0.017	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.011 - 0.017	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.011 - 0.017	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.011 - 0.017	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.011 - 0.017	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 14	0.0018 - 0.044	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 14	0.013 - 0.16	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 14	0.018 - 0.14	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 14	0.003 - 0.059	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 14	0.0023 - 0.018	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 14	0.0033 - 0.025	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 14	0.0026 - 0.13	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 13	0.11 - 0.87	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 14	0.0021 - 0.024	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 14	0.0026 - 0.032	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 14	0.0019 - 0.015	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 14	0.002 - 0.015	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 14	0.002 - 0.016	ND	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 14	0.012 - 0.093	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 14	0.013 - 0.15	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 14	0.0024 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 14	0.04 - 0.3	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 3	0.01 - 0.016	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 14	0.011 - 0.083	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 14	0.073 - 0.56	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 14	0.003 - 0.023	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 14	0.002 - 0.026	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 14	0.0014 - 0.015	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 14	0.0026 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 14	0.0021 - 0.023	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 14	0.03 - 0.29	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 14	0.0024 - 0.019	ND	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 14	0.0019 - 0.015	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	0.0093 (J)	0.0093 (J)	mg/kg	CFSDP-049	1 / 14	0.0023 - 0.018	0.0093	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.0098 (J)	0.013 (J)	mg/kg	CFSDP-049	3 / 14	0.0022 - 0.057	0.013	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 14	0.017 - 0.14	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.039 (J)	0.1 (J)	mg/kg	CFSDP-046	2 / 5	0.029 - 0.046	0.1	0.0141	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.0061 (J)	0.093 (J-)	mg/kg	CFSDP-013	12 / 14	0.0018 - 0.032	0.093	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-32-8	Benzo(A)Pyrene	0.007 (J)	0.11 (J-)	mg/kg	CFSDP-013	13 / 14	0.002 - 0.002	0.11	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	205-99-2	Benzo(B)Fluoranthene	0.015	0.19 (J-)	mg/kg	CFSDP-013	13 / 14	0.0023 - 0.0023	0.19	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	191-24-2	Benzo(G,H,I)Perylene	0.0076 (J)	0.13 (J)	mg/kg	CFSDP-013	13 / 14	0.002 - 0.002	0.13	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0039 (J)	0.057	mg/kg	CFSDP-053	12 / 14	0.0028 - 0.017	0.057	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 14	0.012 - 0.22	ND	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 14	0.0018 - 0.051	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 14	0.002 - 0.019	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-21
Occurrence, Distribution, and Selection of Chemical of Potential Concern (North-Central Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North-Central Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 14	0.0015 - 0.014	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 14	0.0032 - 0.025	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 14	0.015 - 0.35	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 14	0.027 - 0.21	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.0023 (J)	0.023 (J)	mg/kg	CFSDP-047	11 / 14	0.0022 - 0.013	0.023	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.016	0.2	mg/kg	CFSDP-053	13 / 14	0.0018 - 0.0018	0.2	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 14	0.011 - 0.14	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 14	0.019 - 0.19	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0043 (J)	0.021 (J)	mg/kg	CFSDP-046	8 / 14	0.0019 - 0.031	0.021	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 14	0.0019 - 0.018	ND	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 14	0.011 - 0.097	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 14	0.0015 - 0.017	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.013	0.15	mg/kg	CFSDP-053	13 / 14	0.0025 - 0.0025	0.15	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	0.0062 (J)	0.0062 (J)	mg/kg	CFSDP-049	1 / 14	0.0017 - 0.013	0.0062	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 14	0.0031 - 0.024	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 14	0.0025 - 0.019	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 14	0.0022 - 0.037	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 14	0.0022 - 0.022	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0061 (J)	0.11	mg/kg	CFSDP-013	13 / 14	0.0019 - 0.0019	0.11	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	0.015 (J)	0.016 (J-)	mg/kg	CFSDP-013	2 / 14	0.0022 - 0.017	0.016	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 14	0.0029 - 0.022	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 14	0.014 - 0.11	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 14	0.0017 - 0.015	ND	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 14	0.012 - 0.12	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 14	0.046 - 0.52	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	85-01-8	Phenanthrene	0.0058 (J)	0.085	mg/kg	CFSDP-046	13 / 14	0.0025 - 0.0025	0.085	0.00226	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	0.13 (J)	0.13 (J)	mg/kg	CFSDP-046	1 / 14	0.012 - 0.049	0.13	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.011	0.13 (J)	mg/kg	CFSDP-013	13 / 14	0.0022 - 0.0022	0.13	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
c = carcinogenic basis
n = non-carcinogenic basis
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-22
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.024 (J)	2.2 (J+)	mg/kg	CFSB-168	27 / 32	0.056 - 0.072	2.2	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	1.15	15.4	mg/kg	CFMW-057A	32 / 32	NA	15.4	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.176642	0.489781	mg/kg	CFSB-124	32 / 32	NA	0.489781	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	6.42336	17.8102	mg/kg	CFSB-124	32 / 32	NA	17.8102	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	8330	29200	mg/kg	CFSB-126	32 / 32	NA	29200	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 32	0.25 - 0.49	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	2.1	9	mg/kg	CFSB-218	32 / 32	NA	9	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	83.8	499	mg/kg	CFSB-168	32 / 32	NA	499	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.32 (J)	1.2	mg/kg	CFSB-126	31 / 32	0.19 - 0.19	1.2	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 32	0.26 - 0.43	ND	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	BSL
	7440-70-2	Calcium	1630	41600 (J+)	mg/kg	CFSB-249	32 / 32	NA	41600	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	6.6	18.3	mg/kg	CFSB-124	32 / 32	NA	18.3	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3.5	7.2	mg/kg	CFSB-125	32 / 32	NA	7.2	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	7	27 (J)	mg/kg	CFSB-124	32 / 32	NA	27	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	11300	19900	mg/kg	CFSB-124	32 / 32	NA	19900	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	5.8	33.1	mg/kg	CFMW-069	32 / 32	NA	33.1	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	4660	11400	mg/kg	CFSB-124	32 / 32	NA	11400	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	62.7	2210 (J)	mg/kg	CFSB-196	32 / 32	NA	2210	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.012 (J)	0.063	mg/kg	CFSB-218	26 / 32	0.011 - 0.014	0.063	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	8.9 (J)	14.3	mg/kg	CFMW-056A	32 / 32	NA	14.3	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	737	1520	mg/kg	CFSB-216	32 / 32	NA	1520	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.29 (J)	0.93 (J)	mg/kg	CFSB-124	14 / 32	0.25 - 0.44	0.93	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 32	0.54 - 0.9	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	29.8 (J)	235	mg/kg	CFSB-168	27 / 32	27.3 - 34.8	235	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 32	0.11 - 0.18	ND	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	N	BSL-ND
	7440-62-2	Vanadium	6.3	17.3	mg/kg	CFSB-238	32 / 32	NA	17.3	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	34.1	89	mg/kg	CFMW-056A	32 / 32	NA	89	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 9	0.0009 - 0.0011	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00068 - 0.00083	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 9	0.001 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00072 - 0.00088	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 9	0.0012 - 0.0014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 9	0.0012 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00081 - 0.00099	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 9	0.00097 - 0.0012	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 9	0.00087 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 9	0.00095 - 0.0011	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 9	0.00092 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 9	0.001 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 9	0.00067 - 0.00081	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 9	0.00096 - 0.0012	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 9	0.0015 - 0.0018	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 9	0.0016 - 0.0019	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 9	0.00098 - 0.0012	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 9	0.0011 - 0.0013	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 9	0.00077 - 0.00093	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 9	0.022 - 0.026	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 9	0.0016 - 0.002	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 12	0.0096 - 0.012	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 12	0.0096 - 0.012	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 12	0.0096 - 0.012	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 12	0.0096 - 0.012	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 12	0.0096 - 0.012	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 12	0.0099 - 0.012	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 12	0.0099 - 0.012	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 12	0.0099 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-22
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 12	0.0099 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 12	0.0099 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 32	0.0015 - 0.033	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 32	0.011 - 0.12	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 32	0.015 - 0.042	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 32	0.0026 - 0.044	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 32	0.002 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 32	0.0028 - 0.011	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 32	0.0022 - 0.098	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 32	0.096 - 0.34	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 32	0.0018 - 0.018	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 32	0.0022 - 0.024	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 32	0.0016 - 0.01	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 32	0.0017 - 0.011	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0053 (J)	0.023 (J)	mg/kg	CFSB-132	6 / 32	0.0017 - 0.0099	0.023	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 32	0.01 - 0.026	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 32	0.012 - 0.041	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 32	0.002 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 32	0.033 - 0.083	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 12	0.0095 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 32	0.0091 - 0.023	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 32	0.062 - 0.15	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 32	0.0025 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 32	0.0017 - 0.019	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 32	0.0012 - 0.011	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 32	0.0022 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	0.0059 (J)	0.0059 (J)	mg/kg	CFSB-170	1 / 32	0.0017 - 0.017	0.0059	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	ASL-SSLOnly
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 32	0.025 - 0.21	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0024 (J)	0.018	mg/kg	CFMW-071	12 / 32	0.0021 - 0.011	0.018	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 32	0.0016 - 0.011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.025 (J)	0.025 (J)	mg/kg	CFSB-171	1 / 32	0.0019 - 0.0097	0.078	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	0.0022 (J)	0.031	mg/kg	CFMW-071	17 / 32	0.0019 - 0.042	0.031	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 32	0.016 - 0.039	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0056 (J)	0.044 (J)	mg/kg	CFSB-171	4 / 25	0.0046 - 0.034	0.044	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0019 (J)	0.19	mg/kg	CFMW-071	24 / 32	0.03 - 0.037	0.19	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.002 (J)	0.27	mg/kg	CFMW-071	27 / 32	0.011 - 0.013	0.27	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0032 (J)	0.35	mg/kg	CFMW-071	28 / 32	0.014 - 0.017	0.35	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0025 (J)	0.24	mg/kg	CFMW-071	24 / 32	0.02 - 0.025	0.24	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0037 (J)	0.18	mg/kg	CFMW-071	24 / 32	0.0025 - 0.019	0.18	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.034 (J)	0.041 (J)	mg/kg	CFSB-168	2 / 32	0.011 - 0.061	0.041	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.0044 (J)	0.0053 (J)	mg/kg	CFSB-216	4 / 32	0.0015 - 0.038	0.0053	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 32	0.0017 - 0.014	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 32	0.0013 - 0.011	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 32	0.0026 - 0.018	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.016 (J)	0.12 (J)	mg/kg	CFSB-216	3 / 32	0.014 - 0.09	0.12	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 32	0.023 - 0.058	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0024 (J)	0.037	mg/kg	CFMW-071	20 / 32	0.0017 - 0.011	0.037	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0027 (J)	0.31	mg/kg	CFMW-071	28 / 32	0.0097 - 0.012	0.31	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.011 (J)	0.011 (J)	mg/kg	CFMW-057A	1 / 32	0.011 - 0.039	0.011	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 32	0.018 - 0.052	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0023 (J)	0.055	mg/kg	CFMW-071	16 / 32	0.0017 - 0.023	0.055	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.0018 (J)	0.0075 (J)	mg/kg	CFSB-216	10 / 32	0.0016 - 0.014	0.0075	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 32	0.01 - 0.027	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 32	0.0013 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0031 (J)	0.41	mg/kg	CFMW-071	28 / 32	0.011 - 0.013	0.41	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.0015 (J)	0.013 (J)	mg/kg	CFMW-071	16 / 32	0.0014 - 0.0097	0.013	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL

Table 2-22
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 32	0.0026 - 0.018	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 32	0.0021 - 0.013	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 32	0.0018 - 0.028	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 32	0.0018 - 0.016	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0059 (J)	0.2	mg/kg	CFMW-071	23 / 32	0.0017 - 0.029	0.2	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 32	0.0018 - 0.0096	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 32	0.0024 - 0.015	ND	NA	0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 32	0.012 - 0.041	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0015 (J)	0.013 (J)	mg/kg	CFSB-216	13 / 32	0.0014 - 0.011	0.013	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 32	0.011 - 0.033	ND	NA	0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 32	0.043 - 0.14	ND	NA	0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.0083	0.16	mg/kg	CFMW-071	26 / 32	0.0022 - 0.012	0.16	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 32	0.011 - 0.027	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0024 (J)	0.38	mg/kg	CFMW-071	27 / 32	0.016 - 0.02	0.38	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 2	0.00032 - 0.00046	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 2	0.00021 - 0.0003	ND	NA	0.00003	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 2	0.00042 - 0.00053	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 2	0.00025 - 0.00034	ND	NA	0.000013	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 2	0.00029 - 0.00041	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 2	0.00031 - 0.0005	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 2	0.00013 - 0.00025	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 2	0.00013 - 0.00039	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 2	0.00057 - 0.00064	ND	NA	0.00000014	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 2	0.00014 - 0.00025	ND	NA	0.0000021	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00017 - 0.0002	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 2	0.00013 - 0.00041	ND	NA	0.000048	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 2	0.00021 - 0.00059	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00014 - 0.00022	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00014 - 0.00016	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 2	0.0011 - 0.0011	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.17 (J+)	0.17 (J+)	mg/kg	CFSB-238	1 / 2	0.0013 - 0.0013	0.17	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 2	0.00024 - 0.00036	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 2	0.00021 - 0.00039	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 2	0.00036 - 0.00046	ND	NA	0.000036	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 2	0.00016 - 0.00059	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 2	0.00039 - 0.00066	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	ND	ND	ND	ND	0 / 2	0.00037 - 0.00052	ND	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 2	0.00025 - 0.00052	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 2	0.00017 - 0.00025	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 2	0.00042 - 0.00073	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 2	0.00025 - 0.00044	ND	NA	0.000061	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 2	0.00046 - 0.0006	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 2	0.00021 - 0.00027	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 2	0.00018 - 0.00038	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 2	0.00031 - 0.00056	ND	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 2	0.00018 - 0.00027	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 2	0.00039 - 0.00047	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 2	0.00022 - 0.00028	ND	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 2	0.00018 - 0.00021	ND	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 2	0.00013 - 0.00024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-20-9	Methyl Acetate	0.4	0.4	mg/kg	CFSB-238	1 / 2	0.0011 - 0.0011	0.4	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.009	0.009	mg/kg	CFSB-238	1 / 2	0.00093 - 0.00093	0.009	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 2	0.00092 - 0.0027	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 2	0.00022 - 0.0006	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 2	0.00023 - 0.00039	ND	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 2	0.00013 - 0.00019	ND	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL

Table 2-22
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	100-42-5	Styrene	ND	ND	ND	ND	0 / 2	0.00017 - 0.00018	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 2	0.00017 - 0.00021	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 2	0.0002 - 0.00034	ND	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.003	0.003	mg/kg	CFSB-238	1 / 2	0.00023 - 0.00023	0.003	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 2	0.00034 - 0.00047	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 2	0.00012 - 0.00037	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 2	0.0002 - 0.00031	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 2	0.00041 - 0.00056	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 2	0.00047 - 0.00076	ND	NA	0.0000065	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-23
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	57-12-5	Cyanide	0.017 (J)	2.2 (J+)	mg/kg	CFSB-168	56 / 84	0.017 - 0.084	2.2	2.4	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	0.31 (J)	15.4	mg/kg	CFMW-057A	82 / 84	0.21 - 0.24	15.4	4.171	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.176642	0.693187	mg/kg	CFSB-244	84 / 84	NA	0.693187	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	6.42336	25.2068	mg/kg	CFSB-244	84 / 84	NA	25.2068	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	3840 (J)	30900	mg/kg	CFSB-120	84 / 84	NA	30900	15337	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.36 (J-)	0.36 (J-)	mg/kg	CFSB-216	1 / 84	0.23 - 0.54	0.36	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	2	10.8	mg/kg	CFSB-218	84 / 84	NA	10.8	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	30.3	533	mg/kg	CFSB-169	84 / 84	NA	533	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.21 (J)	1.2	mg/kg	CFSB-120	83 / 84	0.19 - 0.19	1.2	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 84	0.25 - 0.43	ND	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	BSL
	7440-70-2	Calcium	988	41600 (J+)	mg/kg	CFSB-249	84 / 84	NA	41600	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	6.6	25.9	mg/kg	CFSB-244	84 / 84	NA	25.9	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	3.2	7.4	mg/kg	CFSB-126	84 / 84	NA	7.4	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	3.7 (J)	27 (J)	mg/kg	CFSB-124	84 / 84	NA	27	17.93	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	7100	21100	mg/kg	CFSB-218	84 / 84	NA	21100	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	3.1	33.1	mg/kg	CFMW-069	84 / 84	NA	33.1	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	4660	13400	mg/kg	CFMW-059A	84 / 84	NA	13400	11051	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	53.7	2210 (J)	mg/kg	CFSB-196	84 / 84	NA	2210	1566	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.01 (J)	0.063	mg/kg	CFSB-218	57 / 84	0.0096 - 0.014	0.063	0.0597	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	5.2	14.3	mg/kg	CFMW-056A	84 / 84	NA	14.3	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	475	1520	mg/kg	CFSB-216	84 / 84	NA	1520	2167	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.29 (J)	1.1 (J)	mg/kg	CFSB-123	23 / 84	0.23 - 0.44	1.1	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 84	0.49 - 0.98	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	27.7 (J)	289	mg/kg	CFSB-168	63 / 84	24.7 - 50	289	69.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.12 (J)	0.14 (J)	mg/kg	CFSB-216	2 / 84	0.099 - 0.2	0.14	NA	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	4.9	21.4	mg/kg	CFMW-069	84 / 84	NA	21.4	21.54	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	16.9	89	mg/kg	CFMW-056A	84 / 84	NA	89	82.87	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 9	0.0009 - 0.0011	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00068 - 0.00083	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 9	0.001 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00072 - 0.00088	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 9	0.0012 - 0.0014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 9	0.0012 - 0.0015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 9	0.00081 - 0.00099	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 9	0.00097 - 0.0012	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 9	0.00087 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 9	0.00095 - 0.0011	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 9	0.00092 - 0.0011	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 9	0.001 - 0.0013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 9	0.00067 - 0.00081	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 9	0.00096 - 0.0012	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 9	0.0015 - 0.0018	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 9	0.0016 - 0.0019	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 9	0.00098 - 0.0012	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 9	0.0011 - 0.0013	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 9	0.00077 - 0.00093	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 9	0.022 - 0.026	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 9	0.0016 - 0.002	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 34	0.0092 - 0.012	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 34	0.0092 - 0.012	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 34	0.0092 - 0.012	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 34	0.0092 - 0.012	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 34	0.0092 - 0.012	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 34	0.0095 - 0.013	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 34	0.0095 - 0.013	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 34	0.0095 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 34	0.0095 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 34	0.0095 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 84	0.0015 - 0.033	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 84	0.011 - 0.12	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 84	0.014 - 0.042	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 84	0.0025 - 0.045	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 84	0.0019 - 0.013	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 84	0.0027 - 0.011	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL

Table 2-23
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 84	0.0022 - 0.099	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 82	0.093 - 0.34	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 84	0.0017 - 0.018	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 84	0.0021 - 0.024	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 84	0.0016 - 0.01	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 84	0.0016 - 0.011	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.0019 (J)	0.023 (J)	mg/kg	CFSB-132	12 / 84	0.0017 - 0.0099	0.023	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 84	0.0099 - 0.026	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 84	0.011 - 0.041	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 84	0.002 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 83	0.032 - 0.083	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 34	0.0091 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 84	0.0088 - 0.023	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 83	0.06 - 0.15	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 84	0.0024 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 84	0.0016 - 0.019	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 84	0.0012 - 0.012	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 84	0.0021 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	0.0059 (J)	0.0059 (J)	mg/kg	CFSB-170	1 / 84	0.0017 - 0.017	0.0059	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	ASL-SSLOnly
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 83	0.024 - 0.22	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0024 (J)	0.018	mg/kg	CFMW-071	17 / 84	0.002 - 0.011	0.018	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 84	0.0015 - 0.012	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.0022 (J)	0.025 (J)	mg/kg	CFSB-171	5 / 84	0.0019 - 0.0098	0.078	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	0.0022 (J)	0.031	mg/kg	CFMW-071	20 / 84	0.0018 - 0.043	0.031	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 84	0.015 - 0.039	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.0056 (J)	0.044 (J)	mg/kg	CFSB-171	8 / 67	0.0043 - 0.034	0.044	6.02	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0017 (J)	0.19	mg/kg	CFMW-071	40 / 84	0.0013 - 0.038	0.19	0.016	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.002 (J)	0.27	mg/kg	CFMW-071	43 / 84	0.0015 - 0.014	0.27	0.0317	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.003 (J)	0.35	mg/kg	CFMW-071	46 / 84	0.0017 - 0.018	0.35	0.0589	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.002 (J)	0.24	mg/kg	CFMW-071	40 / 84	0.0015 - 0.026	0.24	0.0406	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0022 (J)	0.18	mg/kg	CFMW-071	35 / 84	0.0021 - 0.02	0.18	0.0246	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.034 (J)	0.074	mg/kg	CFSB-171	4 / 84	0.011 - 0.061	0.074	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.0024 (J)	0.0055 (J)	mg/kg	CFSB-216	9 / 84	0.0015 - 0.038	0.0055	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 84	0.0017 - 0.014	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 84	0.0013 - 0.011	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 84	0.0026 - 0.019	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.016 (J)	0.31 (J)	mg/kg	CFSB-218	9 / 84	0.013 - 0.09	0.31	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 83	0.023 - 0.058	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0019 (J)	0.037	mg/kg	CFMW-071	28 / 84	0.0016 - 0.011	0.037	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.0021 (J)	0.31	mg/kg	CFMW-071	47 / 84	0.0014 - 0.012	0.31	0.0416	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.011 (J)	0.013 (J)	mg/kg	CFMW-059A	2 / 84	0.01 - 0.039	0.013	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 84	0.017 - 0.052	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0017 (J)	0.055	mg/kg	CFMW-071	21 / 84	0.0015 - 0.023	0.055	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.0018 (J)	0.0087 (J)	mg/kg	CFMW-071	15 / 84	0.0015 - 0.014	0.0087	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 84	0.0097 - 0.027	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 84	0.0013 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0029 (J)	0.41	mg/kg	CFMW-071	45 / 84	0.0018 - 0.013	0.41	0.031	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.0015 (J)	0.014 (J)	mg/kg	CFMW-071	22 / 84	0.0014 - 0.0098	0.014	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 84	0.0025 - 0.018	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 84	0.002 - 0.013	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 84	0.0018 - 0.028	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 84	0.0018 - 0.016	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0015 (J)	0.2	mg/kg	CFMW-071	38 / 84	0.0014 - 0.03	0.2	0.0391	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 84	0.0018 - 0.0097	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 84	0.0023 - 0.015	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 84	0.012 - 0.041	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.0015 (J)	0.013 (J)	mg/kg	CFSB-216	19 / 84	0.0014 - 0.011	0.013	0.00337	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 84	0.011 - 0.033	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 83	0.041 - 0.14	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.002 (J)	0.16	mg/kg	CFMW-071	48 / 84	0.0019 - 0.012	0.16	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 84	0.01 - 0.027	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.0024 (J)	0.38	mg/kg	CFMW-071	43 / 84	0.0016 - 0.02	0.38	0.0331	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 26	0.00028 - 0.0011	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 26	0.00013 - 0.00051	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL

Table 2-23
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 26	0.00033 - 0.0013	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 26	0.00021 - 0.00083	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 26	0.00025 - 0.001	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 26	0.00027 - 0.0012	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 26	8.3e-005 - 0.00033	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 26	0.00011 - 0.00095	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 26	0.00035 - 0.0014	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 26	9e-005 - 0.00036	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 26	0.00011 - 0.00042	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 26	8.3e-005 - 0.00041	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 26	0.00013 - 0.00059	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 26	9e-005 - 0.00036	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 26	9.8e-005 - 0.00039	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 26	0.00071 - 0.0028	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.0069 (J-)	0.17 (J+)	mg/kg	CFSB-238	24 / 26	0.00099 - 0.0013	0.17	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00019 (J)	0.0015 (J)	mg/kg	CFSB-123	15 / 26	0.00015 - 0.00036	0.0015	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 26	0.00013 - 0.00051	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 26	0.00029 - 0.0011	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 26	9.8e-005 - 0.00059	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 26	0.00024 - 0.00095	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00039 (J)	0.00079 (J)	mg/kg	CFSB-127	4 / 26	0.00032 - 0.0013	0.00079	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 26	0.00022 - 0.0013	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 26	0.00011 - 0.00042	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 26	0.00026 - 0.001	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 26	0.00016 - 0.00062	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 26	0.00029 - 0.0011	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 26	0.00017 - 0.00065	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 26	0.00011 - 0.00045	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00044 (J)	0.0019 (J)	mg/kg	CFSB-132	6 / 26	0.00027 - 0.00073	0.0019	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 26	0.00011 - 0.00045	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 26	0.00024 - 0.00095	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00021 (J)	0.00067 (J)	mg/kg	CFSB-120	3 / 26	0.00014 - 0.00054	0.00067	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 26	0.00013 - 0.00051	ND	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.0001 (J)	0.0024 (J)	mg/kg	CFSB-132	7 / 26	9.6e-005 - 0.00024	0.0024	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.002 (J)	0.4	mg/kg	CFSB-238	10 / 26	0.00068 - 0.0027	0.4	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0021 (J)	0.009	mg/kg	CFSB-238	5 / 26	0.00058 - 0.0023	0.009	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 26	0.00081 - 0.0066	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.0005 (J)	0.0041	mg/kg	CFSB-132	8 / 26	0.0002 - 0.00079	0.0041	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 26	0.0002 - 0.00095	ND	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00033 (J)	0.00073 (J)	mg/kg	CFSB-132	3 / 26	0.00012 - 0.00025	0.00073	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 26	0.00011 - 0.00045	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 26	0.00013 - 0.00051	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 26	0.00017 - 0.00083	ND	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00018 (J)	0.0031	mg/kg	CFSB-132	17 / 26	0.00014 - 0.0003	0.0031	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 26	0.00029 - 0.0012	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 26	7.5e-005 - 0.00037	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-23
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 26	0.00018 - 0.00077	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	0.00078 (J)	0.00078 (J)	mg/kg	CFSB-238	1 / 26	0.00026 - 0.001	0.00078	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 26	0.00029 - 0.0012	ND	NA	6.50E-06	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-24
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area
Exposure Medium: Surface Water Western Undeveloped Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)	COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	2 (J)	15.3 (J)	µg/l	CFSWP-014	7 / 38	2 - 2	15.3	NA	0.15 USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.9 (J-)	7.7	µg/l	CFSWP-044	2 / 23	1.5 - 1.5	7.7	1834	0.15 USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	55.8 (J)	137	µg/l	CFSWP-014	27 / 34	12 - 12	137	130	80 USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	17.6 (J)	85.5	µg/l	CFSWP-016	23 / 34	15 - 18.2	85.5	33.9	2000 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-36-0	Antimony	0.62 (J)	0.78 (J)	µg/l	CFSWP-016	5 / 34	0.62 - 0.62	0.78	1	0.78 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	ND	ND	ND	ND	0 / 34	0.64 - 0.77	ND	1.5	0.052 USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7440-39-3	Barium	85.9	130	µg/l	CFSWP-025	34 / 34	NA	130	98.6	380 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 34	0.24 - 0.26	ND	NA	2.5 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 34	0.61 - 0.71	ND	NA	0.92 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	43100	56800	µg/l	CFSWP-015	34 / 34	NA	56800	55600	No Screening Level NULL	N	NSL
	7440-47-3	Chromium, Total	2.4 (J)	37.7 (J)	µg/l	CFSWP-014	3 / 34	1.3 - 1.3	37.7	NA	100 MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	ND	ND	ND	ND	0 / 34	1.3 - 1.3	ND	NA	0.6 USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-50-8	Copper	1.9 (J)	8.5 (J)	µg/l	CFSWP-044	10 / 34	1.4 - 1.9	8.5	5.401	80 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	51.7 (J)	304 (J)	µg/l	CFSWP-014	5 / 34	42.4 - 45.7	304	123	1400 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-92-1	Lead	0.41 (J)	0.41 (J)	µg/l	CFSWP-014	1 / 34	0.37 - 0.38	0.41	NA	15 MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	10700	16800	µg/l	CFSWP-025	34 / 34	NA	16800	17601	No Screening Level NULL	N	NSL
	7439-96-5	Manganese	3.5 (J)	14.7	µg/l	CFSWP-016	34 / 34	NA	14.7	6813	43 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 34	0.12 - 0.17	ND	NA	0.063 USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	ND	ND	ND	ND	0 / 34	1.3 - 1.4	ND	NA	39 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	357	656	µg/l	CFSWP-014	34 / 34	NA	656	919	No Screening Level NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 34	0.69 - 0.73	ND	NA	10 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 34	1.3 - 1.4	ND	NA	9.4 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	2010	5530 (J)	µg/l	CFSWP-014	34 / 34	NA	5530	3064	No Screening Level NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 34	0.24 - 0.26	ND	NA	0.02 USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	ND	ND	ND	ND	0 / 34	1.2 - 1.9	ND	NA	8.6 USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	13.5 (J)	16.4	µg/l	CFSWP-014	2 / 34	5.4 - 7	16.4	7.2	600 USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-25
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.1 (J)	0.24 (J)	mg/kg	CFSDP-014	4 / 11	0.075 - 0.28	0.24	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	1.41 (J+)	1.71 (J+)	mg/kg	CFSDP-016	3 / 11	0.2 - 0.76	1.71	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	6900	12600	mg/kg	CFSDP-025	11 / 11	NA	12600	23478	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 11	0.3 - 1.1	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	1.8	4.2	mg/kg	CFSDP-014	11 / 11	NA	4.2	9.879	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	20.2	249	mg/kg	CFSDP-044	11 / 11	NA	249	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.21 (J)	0.68 (J)	mg/kg	CFSDP-044	10 / 11	0.21 - 0.21	0.68	1.296	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 11	0.34 - 1.3	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	1120	52600 (J)	mg/kg	CFSDP-016	11 / 11	NA	52600	94895	No Screening Level		N	NSL
	7440-47-3	Chromium, Total	6.9	13	mg/kg	CFSDP-025	11 / 11	NA	13	15	No Screening Level		N	NSL
	7440-48-4	Cobalt	3.2 (J)	6.5	mg/kg	CFSDP-015	11 / 11	NA	6.5	9.77	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	3.3	20.8	mg/kg	CFSDP-044	11 / 11	NA	20.8	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	7770	16400	mg/kg	CFSDP-045	11 / 11	NA	16400	26687	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	4.3	10.3	mg/kg	CFSDP-044	11 / 11	NA	10.3	30.29	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	5410	13700	mg/kg	CFSDP-025	11 / 11	NA	13700	22708	No Screening Level		N	NSL
	7439-96-5	Manganese	67.3 (J-)	571 (J-)	mg/kg	CFSDP-014	11 / 11	NA	571	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.032 (J)	0.044 (J)	mg/kg	CFSDP-016	3 / 11	0.013 - 0.045	0.044	0.0762	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	6.9	13.8 (J-)	mg/kg	CFSDP-045	11 / 11	NA	13.8	17.94	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	177 (J+)	1230 (J+)	mg/kg	CFSDP-044	11 / 11	NA	1230	1742	No Screening Level		N	NSL
	7782-49-2	Selenium	1.8 (J)	1.8 (J)	mg/kg	CFSDP-044	1 / 11	0.3 - 0.87	1.8	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 11	0.63 - 2.4	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	40.2 (J)	154 (J)	mg/kg	CFSDP-044	7 / 11	32.1 - 116	154	60.66	No Screening Level		N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 11	0.13 - 0.48	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	4.6	8.8	mg/kg	CFSDP-044	11 / 11	NA	8.8	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	37.3	58.5	mg/kg	CFSDP-044	11 / 11	NA	58.5	81.94	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.0024 - 0.0027	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.0018 - 0.002	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.0028 - 0.0031	ND	NA	No Screening Level		N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.002 - 0.0022	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.0032 - 0.0035	ND	NA	No Screening Level		N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.0033 - 0.0036	ND	NA	No Screening Level		N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.0022 - 0.0024	ND	NA	No Screening Level		N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.0026 - 0.0029	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.0024 - 0.0026	ND	NA	No Screening Level		N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.0026 - 0.0028	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.0025 - 0.0028	ND	NA	No Screening Level		N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.0028 - 0.0031	ND	NA	No Screening Level		N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.0018 - 0.002	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.0026 - 0.0029	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.004 - 0.0044	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.0043 - 0.0048	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.0027 - 0.0029	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.0029 - 0.0032	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.0021 - 0.0023	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.059 - 0.065	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.0044 - 0.0049	ND	NA	No Screening Level		N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.027 - 0.03	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.028 - 0.031	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.028 - 0.031	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.028 - 0.031	ND	NA	No Screening Level		N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.028 - 0.031	ND	NA	No Screening Level		N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.028 - 0.031	ND	NA	No Screening Level		N	BSL-ND

Table 2-25
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 11	0.0017 - 0.082	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 11	0.012 - 0.3	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 11	0.017 - 0.26	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.0028 - 0.11	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.0022 - 0.035	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 11	0.0031 - 0.049	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 11	0.0025 - 0.24	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 11	0.11 - 1.7	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.002 - 0.044	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.0025 - 0.059	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 11	0.0018 - 0.029	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 11	0.0019 - 0.029	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	0.0038 (J)	0.0038 (J)	mg/kg	CFSDP-045	1 / 11	0.0019 - 0.03	0.0038	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 11	0.011 - 0.18	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 11	0.018 - 0.29	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 11	0.0023 - 0.037	ND	NA	No Screening Level		N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 10	0.037 - 0.59	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 3	0.027 - 0.029	ND	NA	No Screening Level		N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 11	0.01 - 0.16	ND	NA	No Screening Level		N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 11	0.069 - 1.1	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.0028 - 0.044	ND	NA	No Screening Level		N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 11	0.0019 - 0.047	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 11	0.0013 - 0.028	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.0024 - 0.038	ND	NA	No Screening Level		N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 11	0.0019 - 0.042	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 11	0.028 - 0.53	ND	NA	No Screening Level		N	BSL-ND
	83-32-9	Acenaphthene	0.0058 (J)	0.011 (J)	mg/kg	CFSDP-045	2 / 11	0.0023 - 0.036	0.011	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	0.011 (J)	0.033 (J)	mg/kg	CFSDP-044	3 / 11	0.0017 - 0.028	0.033	NA	No Screening Level		N	NSL
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 11	0.0022 - 0.034	ND	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.026 (J)	0.051 (J)	mg/kg	CFSDP-044	3 / 11	0.0021 - 0.1	0.051	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 11	0.017 - 0.28	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.017 (J)	0.17 (J)	mg/kg	CFSDP-016	4 / 5	0.079 - 0.079	0.17	0.0141	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.0034 (J)	0.12	mg/kg	CFSDP-016	6 / 11	0.0015 - 0.087	0.12	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-32-8	Benzo(A)Pyrene	0.0032 (J)	0.094 (J)	mg/kg	CFSDP-044	6 / 11	0.0017 - 0.031	0.094	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	205-99-2	Benzo(B)Fluoranthene	0.0035 (J)	0.12	mg/kg	CFSDP-016	5 / 11	0.002 - 0.04	0.12	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	191-24-2	Benzo(G,H,I)Perylene	0.03 (J)	0.081 (J)	mg/kg	CFSDP-016	4 / 11	0.0017 - 0.06	0.081	NA	No Screening Level		N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.014	0.04 (J)	mg/kg	CFSDP-044	3 / 11	0.0024 - 0.048	0.04	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 11	0.027 - 0.44	ND	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 11	0.0017 - 0.094	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 11	0.0019 - 0.034	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 11	0.0014 - 0.026	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 11	0.003 - 0.047	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.04 (J)	0.04 (J)	mg/kg	CFSDP-015	1 / 11	0.04 - 0.67	0.04	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 11	0.026 - 0.41	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.0049 (J)	0.0098 (J)	mg/kg	CFSDP-016	2 / 11	0.0019 - 0.03	0.0098	NA	No Screening Level		N	NSL
	218-01-9	Chrysene	0.0021 (J)	0.13 (J)	mg/kg	CFSDP-016	10 / 11	0.0016 - 0.0016	0.13	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 11	0.017 - 0.28	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 11	0.023 - 0.37	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0066 (J)	0.0075 (J)	mg/kg	CFSDP-045	2 / 11	0.0018 - 0.058	0.0075	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	132-64-9	Dibenzofuran	0.0031 (J)	0.0031 (J)	mg/kg	CFSDP-045	1 / 11	0.0017 - 0.033	0.0031	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 11	0.012 - 0.19	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 11	0.0014 - 0.032	ND	NA	No Screening Level		N	BSL-ND
	206-44-0	Fluoranthene	0.0023 (J)	0.19 (J)	mg/kg	CFSDP-016	11 / 11	NA	0.19	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	0.013 (J)	0.028 (J)	mg/kg	CFSDP-045	2 / 11	0.0016 - 0.025	0.028	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 11	0.0029 - 0.045	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 11	0.0023 - 0.037	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL

Table 2-25
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Western Undeveloped Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 11	0.002 - 0.069	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 11	0.0021 - 0.04	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0064 (J)	0.087 (J+)	mg/kg	CFSDP-016	5 / 11	0.0016 - 0.069	0.087	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	0.06 (J)	0.078 (J)	mg/kg	CFSDP-014	2 / 11	0.002 - 0.032	0.078	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 11	0.0027 - 0.043	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 11	0.013 - 0.21	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 11	0.0016 - 0.028	ND	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 11	0.015 - 0.23	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 11	0.064 - 1	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	85-01-8	Phenanthrene	0.0028 (J)	0.21 (J-)	mg/kg	CFSDP-045	10 / 11	0.006 - 0.006	0.21	0.00226	No Screening Level		N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 11	0.012 - 0.19	ND	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.0031 (J)	0.16 (J)	mg/kg	CFSDP-016	9 / 11	0.0019 - 0.047	0.16	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
c = carcinogenic basis
n = non-carcinogenic basis
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-26
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.03 (J)	16.4	mg/kg	CFSB-153	17 / 24	0.02 - 0.095	16.4	0.178	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 1	0.56 - 0.56	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	BSL
	16984-48-8	Fluoride	1.8 (J+)	44.1 (J+)	mg/kg	CFSB-152	24 / 24	NA	44.1	2.68	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0695864	0.877859	mg/kg	CFSB-153	24 / 24	NA	0.877859	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.53041	31.9221	mg/kg	CFSB-153	24 / 24	NA	31.9221	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	2570	16100	mg/kg	CFSB-153	24 / 24	NA	16100	12712	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.67 (J-)	0.67 (J-)	mg/kg	CFSB-153	1 / 24	0.29 - 0.91	0.67	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	0.46 (J)	5.7	mg/kg	CFSB-142	23 / 24	0.84 - 0.84	5.7	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	52.3	972	mg/kg	CFSB-113	24 / 24	NA	972	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.16 (J)	0.79	mg/kg	CFSB-153	22 / 24	0.11 - 0.21	0.79	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	1.1 (J)	2.5	mg/kg	CFSB-153	2 / 24	0.31 - 0.69	2.5	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	7410	313000	mg/kg	CFSB-113	24 / 24	NA	313000	16691	No Screening Level		NA	NA	N	NSL
	7440-47-3	Chromium, Total	2.6	32.8	mg/kg	CFSB-153	24 / 24	NA	32.8	15.94	No Screening Level		NA	NA	N	NSL
	7440-48-4	Cobalt	1.2 (J)	6.7 (J+)	mg/kg	CFSB-143	23 / 24	1.4 - 1.4	6.7	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	8.9	694 (J)	mg/kg	CFSB-153	24 / 24	NA	694	24.51	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	1760 (J)	15300	mg/kg	CFSB-143	24 / 24	NA	15300	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	3.4	116	mg/kg	CFSB-153	24 / 24	NA	116	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2510	14800	mg/kg	CFSB-151	24 / 24	NA	14800	11719	No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	14.8 (J)	415	mg/kg	CFSB-142	24 / 24	NA	415	672.1	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J+)	1.4	mg/kg	CFSB-153	23 / 24	0.018 - 0.018	1.4	0.0632	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.4	53.9	mg/kg	CFSB-153	24 / 24	NA	53.9	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	238	1270	mg/kg	CFSB-143	24 / 24	NA	1270	1844	No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	0.4 (J)	1.3 (J)	mg/kg	CFSB-153	3 / 24	0.27 - 0.85	1.3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	1.7	23.5	mg/kg	CFSB-153	2 / 24	0.57 - 1.7	23.5	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	42.1 (J)	280	mg/kg	CFSB-152	12 / 24	37.6 - 59.1	280	72.16	No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.2 (J)	0.2 (J)	mg/kg	CFSB-152	1 / 24	0.12 - 0.34	0.2	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	3.2 (J)	26.2	mg/kg	CFSB-153	24 / 24	NA	26.2	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	16.3	351	mg/kg	CFSB-153	24 / 24	NA	351	61.49	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 7	0.001 - 0.0018	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00076 - 0.0014	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 7	0.0012 - 0.0021	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00081 - 0.0015	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 7	0.0013 - 0.0024	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 7	0.0014 - 0.0025	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00091 - 0.0017	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 7	0.00098 - 0.0018	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 7	0.0011 - 0.0019	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 7	0.001 - 0.0019	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 7	0.0012 - 0.0021	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 7	0.00075 - 0.0014	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 7	0.0016 - 0.003	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 7	0.0018 - 0.0032	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 7	0.0012 - 0.0022	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 7	0.00086 - 0.0016	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 7	0.024 - 0.044	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 7	0.0018 - 0.0033	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 13	0.0094 - 0.02	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 13	0.0094 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 13	0.0094 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 13	0.0094 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 13	0.0094 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 13	0.0097 - 0.021	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 13	0.0097 - 0.021	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL

Table 2-26
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 13	0.0097 - 0.021	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 13	0.0097 - 0.021	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 13	0.0097 - 0.021	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 24	0.026 - 0.45	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 24	0.093 - 1.6	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 24	0.033 - 0.56	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 24	0.035 - 0.6	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 24	0.0099 - 0.17	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 24	0.0082 - 0.14	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 24	0.077 - 1.3	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 24	0.26 - 4.5	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 24	0.014 - 0.24	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 24	0.019 - 0.32	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 24	0.0079 - 0.14	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 24	0.0089 - 0.15	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.01 (J)	0.01 (J)	mg/kg	CFSB-101	1 / 24	0.0077 - 0.13	0.01	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	LDF
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 24	0.015 - 0.26	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 24	0.011 - 0.2	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 24	0.012 - 0.2	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 24	0.039 - 0.67	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 24	0.0093 - 0.16	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 24	0.01 - 0.18	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 24	0.093 - 1.6	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 24	0.011 - 0.19	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 24	0.015 - 0.26	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	1.9 (J)	1.9 (J)	mg/kg	CFSB-153	1 / 24	0.009 - 0.019	1.9	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 24	0.01 - 0.18	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 24	0.013 - 0.23	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 24	0.17 - 2.9	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.01 (J)	0.024 (J)	mg/kg	CFMW-064	4 / 24	0.0084 - 0.14	0.024	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 24	0.009 - 0.15	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSB-119	1 / 24	0.0076 - 0.13	0.011	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 24	0.033 - 0.57	ND	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 24	0.015 - 0.27	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.031 (J)	0.088 (J)	mg/kg	CFSB-119	5 / 24	0.027 - 0.46	0.088	0.0185	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.038	0.36	mg/kg	CFSB-109	20 / 24	0.031 - 0.5	0.36	0.0158	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.059	2.8	mg/kg	CFSB-153	19 / 24	0.011 - 0.019	2.8	0.0205	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.084	6.6	mg/kg	CFSB-153	20 / 24	0.015 - 0.024	6.6	0.0411	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.045 (J)	2.7 (J)	mg/kg	CFSB-153	19 / 24	0.021 - 0.035	2.7	0.0305	No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.022 (J)	0.25	mg/kg	CFSB-109	19 / 24	0.016 - 0.26	0.25	0.0125	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 24	0.011 - 0.18	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 24	0.03 - 0.51	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 24	0.011 - 0.19	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.017 (J)	0.017 (J)	mg/kg	CFSB-116	1 / 24	0.0082 - 0.14	0.017	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	ASL-SSLOnly
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 24	0.014 - 0.25	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.074 (J)	0.074 (J)	mg/kg	CFSB-152	1 / 24	0.014 - 0.23	0.074	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 24	0.025 - 0.43	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.0089 (J)	0.97 (J)	mg/kg	CFSB-153	15 / 24	0.009 - 0.014	0.97	0.00657	No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.048 (J)	2.6 (J)	mg/kg	CFSB-153	21 / 24	0.01 - 0.012	2.6	0.0334	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.014 (J)	0.058 (J)	mg/kg	CFSB-110	4 / 24	0.01 - 0.18	0.058	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 24	0.018 - 0.3	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.035 (J)	0.14	mg/kg	CFSB-110	9 / 24	0.018 - 0.31	0.14	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 24	0.011 - 0.18	ND	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 24	0.0099 - 0.17	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 24	0.01 - 0.17	ND	NA	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.052 (J)	1.3 (J)	mg/kg	CFSB-153	21 / 24	0.011 - 0.013	1.3	0.0373	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL

Table 2-26
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	86-73-7	Fluorene	0.015 (J)	0.02 (J)	mg/kg	CFSB-109	2 / 24	0.0076 - 0.13	0.02	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 24	0.014 - 0.24	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 24	0.0098 - 0.17	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 24	0.022 - 0.37	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 24	0.013 - 0.22	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.06	3.1	mg/kg	CFSB-153	20 / 24	0.025 - 0.041	3.1	0.0223	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.02 (J)	0.024 (J)	mg/kg	CFSB-113	2 / 24	0.0075 - 0.13	0.024	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 24	0.012 - 0.2	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 24	0.032 - 0.54	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.015 (J)	0.015 (J)	mg/kg	CFSB-116	1 / 24	0.0089 - 0.15	0.015	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 24	0.011 - 0.19	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 24	0.042 - 0.72	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.025 (J)	0.55 (J)	mg/kg	CFSB-153	21 / 24	0.01 - 0.012	0.55	0.0217	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 24	0.011 - 0.2	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.058 (J)	1.3 (J)	mg/kg	CFSB-153	21 / 24	0.017 - 0.02	1.3	0.0278	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-27
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.03 (J)	16.4	mg/kg	CFSB-153	35 / 48	0.017 - 0.095	16.4	0.178	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 1	0.56 - 0.56	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	BSL
	16984-48-8	Fluoride	1.26 (J+)	44.1 (J+)	mg/kg	CFSB-152	48 / 48	NA	44.1	2.68	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0695864	0.877859	mg/kg	CFSB-153	48 / 48	NA	0.877859	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.53041	31.9221	mg/kg	CFSB-153	48 / 48	NA	31.9221	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	2560	16100	mg/kg	CFSB-153	48 / 48	NA	16100	12712	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.67 (J-)	0.67 (J-)	mg/kg	CFSB-153	1 / 48	0.27 - 0.91	0.67	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	0.46 (J)	8.2	mg/kg	CFSB-142	46 / 48	0.7 - 0.84	8.2	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	43.1	972	mg/kg	CFSB-113	48 / 48	NA	972	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.11 (J)	0.79	mg/kg	CFSB-153	46 / 48	0.11 - 0.21	0.79	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	1.1 (J)	2.5	mg/kg	CFSB-153	3 / 48	0.28 - 0.69	2.5	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	5140 (J)	313000	mg/kg	CFSB-113	48 / 48	NA	313000	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	2.6	32.8	mg/kg	CFSB-153	48 / 48	NA	32.8	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.2 (J)	6.7 (J+)	mg/kg	CFSB-143	47 / 48	1.4 - 1.4	6.7	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	3.3	694 (J)	mg/kg	CFSB-153	48 / 48	NA	694	24.51	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	1580 (J)	16300	mg/kg	CFSB-152	48 / 48	NA	16300	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	2.1	116	mg/kg	CFSB-153	48 / 48	NA	116	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2510	14800	mg/kg	CFSB-151	48 / 48	NA	14800	11719	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	10.7 (J)	415	mg/kg	CFSB-142	48 / 48	NA	415	672.1	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J+)	1.4	mg/kg	CFSB-153	45 / 48	0.012 - 0.018	1.4	0.0632	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	4.3	53.9	mg/kg	CFSB-153	48 / 48	NA	53.9	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	194	1270	mg/kg	CFSB-143	48 / 48	NA	1270	1844	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.4 (J)	1.3 (J)	mg/kg	CFSB-153	4 / 48	0.25 - 0.85	1.3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	1.7	23.5	mg/kg	CFSB-153	3 / 48	0.52 - 1.7	23.5	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	40.3 (J)	280	mg/kg	CFSB-152	25 / 48	37.6 - 59.1	280	72.16	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.2 (J)	0.2 (J)	mg/kg	CFSB-152	1 / 48	0.11 - 0.34	0.2	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	2.6	55.7	mg/kg	CFSB-152	48 / 48	NA	55.7	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	13.1	351	mg/kg	CFSB-153	48 / 48	NA	351	61.49	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 7	0.001 - 0.0018	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00076 - 0.0014	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 7	0.0012 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00081 - 0.0015	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 7	0.0013 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 7	0.0014 - 0.0025	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 7	0.00091 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 7	0.00098 - 0.0018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 7	0.0011 - 0.0019	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 7	0.001 - 0.0019	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 7	0.0012 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 7	0.00075 - 0.0014	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 7	0.0016 - 0.003	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 7	0.0018 - 0.0032	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 7	0.0011 - 0.002	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 7	0.0012 - 0.0022	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 7	0.00086 - 0.0016	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 7	0.024 - 0.044	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 7	0.0018 - 0.0033	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 26	0.0093 - 0.02	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 26	0.0093 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 26	0.0093 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 26	0.0093 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 26	0.0093 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 26	0.0096 - 0.021	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 26	0.0096 - 0.021	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL

Table 2-27
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 26	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 26	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 26	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 48	0.026 - 0.45	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 48	0.092 - 1.6	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 48	0.032 - 0.56	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 48	0.034 - 0.6	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 48	0.0098 - 0.17	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 48	0.0081 - 0.14	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 48	0.076 - 1.3	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 48	0.26 - 4.5	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 48	0.014 - 0.24	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 48	0.018 - 0.32	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 48	0.0078 - 0.14	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 48	0.0088 - 0.15	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.01 (J)	0.013 (J)	mg/kg	CFSB-118	2 / 48	0.0076 - 0.13	0.013	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	LDF
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 48	0.015 - 0.26	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 48	0.011 - 0.2	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 48	0.012 - 0.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 48	0.039 - 0.67	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 48	0.0092 - 0.16	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 48	0.01 - 0.18	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 48	0.092 - 1.6	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 48	0.011 - 0.19	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 48	0.015 - 0.26	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	0.019 (J)	1.9 (J)	mg/kg	CFSB-153	3 / 48	0.0089 - 0.019	1.9	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 48	0.01 - 0.18	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 48	0.013 - 0.23	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 48	0.17 - 2.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.01 (J)	0.024 (J)	mg/kg	CFMW-064	5 / 48	0.0084 - 0.14	0.024	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 48	0.0089 - 0.15	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSB-119	1 / 48	0.0075 - 0.13	0.011	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.05 (J)	0.05 (J)	mg/kg	CFSB-109	1 / 48	0.033 - 0.57	0.05	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 48	0.015 - 0.27	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.031 (J)	0.088 (J)	mg/kg	CFSB-119	5 / 48	0.026 - 0.46	0.088	0.0185	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.038	0.75	mg/kg	CFSB-153	30 / 48	0.029 - 0.5	0.75	0.0158	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.018 (J)	4	mg/kg	CFSB-153	34 / 48	0.01 - 0.019	4	0.0205	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.029 (J)	6.6	mg/kg	CFSB-153	36 / 48	0.014 - 0.024	6.6	0.0411	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.035 (J)	2.7 (J)	mg/kg	CFSB-153	33 / 48	0.02 - 0.035	2.7	0.0305	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.02 (J)	0.25	mg/kg	CFSB-109	33 / 48	0.015 - 0.26	0.25	0.0125	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 48	0.011 - 0.18	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 48	0.029 - 0.51	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 48	0.011 - 0.19	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.017 (J)	0.017 (J)	mg/kg	CFSB-116	1 / 48	0.0081 - 0.14	0.017	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	ASL-SSLOnly
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 48	0.014 - 0.25	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.074 (J)	2.2 (J)	mg/kg	CFSB-153	4 / 48	0.013 - 0.23	2.2	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.042 (J)	0.046 (J)	mg/kg	CFSB-119	2 / 48	0.025 - 0.43	0.046	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0089 (J)	0.97 (J)	mg/kg	CFSB-153	22 / 48	0.0086 - 0.014	0.97	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.012 (J)	2.6 (J)	mg/kg	CFSB-153	39 / 48	0.0094 - 0.012	2.6	0.0334	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.014 (J)	0.058 (J)	mg/kg	CFSB-110	10 / 48	0.01 - 0.18	0.058	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 48	0.018 - 0.3	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.019 (J)	0.44	mg/kg	CFSB-153	15 / 48	0.018 - 0.31	0.44	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 48	0.01 - 0.18	ND	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 48	0.0098 - 0.17	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 48	0.01 - 0.17	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.026 (J)	1.3 (J)	mg/kg	CFSB-153	38 / 48	0.01 - 0.013	1.3	0.0373	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL

Table 2-27
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	86-73-7	Fluorene	0.015 (J)	0.02 (J)	mg/kg	CFSB-109	2 / 48	0.0075 - 0.13	0.02	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 48	0.014 - 0.24	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 48	0.0097 - 0.17	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 48	0.022 - 0.37	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 48	0.013 - 0.22	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.031 (J)	3.1	mg/kg	CFSB-153	35 / 48	0.023 - 0.041	3.1	0.0223	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0095 (J)	0.024 (J)	mg/kg	CFSB-113	3 / 48	0.0074 - 0.13	0.024	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 48	0.012 - 0.2	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 48	0.031 - 0.54	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.015 (J)	0.015 (J)	mg/kg	CFSB-116	1 / 48	0.0088 - 0.15	0.015	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 48	0.011 - 0.19	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 48	0.042 - 0.72	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.013 (J)	0.55 (J)	mg/kg	CFSB-153	38 / 48	0.0092 - 0.012	0.55	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 48	0.011 - 0.2	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.032 (J)	1.3 (J)	mg/kg	CFSB-153	38 / 48	0.016 - 0.02	1.3	0.0278	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 24	0.00021 - 0.00068	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 24	0.0001 - 0.00033	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 24	0.00026 - 0.00079	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 24	0.00016 - 0.0005	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 24	0.00019 - 0.00061	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 24	0.00021 - 0.00073	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 24	6.6e-005 - 0.00028	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 24	8.4e-005 - 0.00057	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 24	0.00028 - 0.00084	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 24	7.2e-005 - 0.00027	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 24	8.4e-005 - 0.00025	ND	NA	3.00E-02	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 24	6.6e-005 - 0.00045	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 24	0.0001 - 0.00064	ND	NA	2.70E-04	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 24	7.2e-005 - 0.00024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	0.00021 (J)	0.00074 (J+)	mg/kg	CFSB-153	2 / 24	9.2e-005 - 0.00023	0.00074	NA	4.60E-04	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	ASL-SSLOnly
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 24	0.00056 - 0.0017	ND	NA	8.80E-04	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL
	67-64-1	Acetone	0.011	0.18	mg/kg	CFMW-064	24 / 24	NA	0.18	NA	2.90E-01	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.0002 (J)	0.0022	mg/kg	CFSB-147	23 / 24	0.00036 - 0.00036	0.0022	NA	2.30E-04	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 24	0.0001 - 0.00043	ND	NA	2.10E-03	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 24	0.00023 - 0.00068	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 24	7.8e-005 - 0.00065	ND	NA	8.70E-04	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 24	0.00019 - 0.00072	ND	NA	1.90E-04	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00032 (J)	0.014	mg/kg	CFSB-151	22 / 24	0.00046 - 0.00052	0.014	NA	2.40E-02	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 24	0.00017 - 0.00077	ND	NA	1.80E-04	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 24	8.4e-005 - 0.00027	ND	NA	5.30E-03	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 24	0.00021 - 0.0008	ND	NA	5.90E-01	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 24	0.00013 - 0.00049	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 24	0.00023 - 0.00068	ND	NA	4.90E-03	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 24	0.00013 - 0.00039	ND	NA	1.10E-03	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 24	9e-005 - 0.00042	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00047 (J)	0.005	mg/kg	CFSB-148	16 / 24	0.00025 - 0.00082	0.005	NA	1.30E+00	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 24	9e-005 - 0.0003	ND	NA	2.30E-04	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 24	0.00019 - 0.00057	ND	NA	3.00E-02	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00012 (J)	0.0012	mg/kg	CFSB-119	15 / 24	0.00014 - 0.00032	0.0012	NA	1.70E-03	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 24	0.0001 - 0.0003	ND	NA	7.40E-02	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00025 (J)	0.0033	mg/kg	CFSB-119	21 / 24	8.8e-005 - 0.0002	0.0033	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0043 (J)	0.36	mg/kg	CFSB-119	4 / 24	0.00072 - 0.0066	0.36	NA	4.10E-01	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0012 (J-)	0.011	mg/kg	CFMW-064	21 / 24	0.0008 - 0.00092	0.011	NA	1.20E-01	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 24	0.00061 - 0.004	ND	NA	1.40E-01	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.00027 (J)	0.011	mg/kg	CFSB-148	19 / 24	0.0003 - 0.0009	0.011	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	NULL	NULL	mg/kg	NULL	0 / 24	0.00015 - 0.00057	0.001	NA	2.70E-03	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00011 (J)	0.0011 (J)	mg/kg	CFSB-119	17 / 24	0.00011 - 0.00029	0.0011	NA	1.90E-02	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 24	9e-005 - 0.00027	ND	NA	1.30E-01	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 24	0.0001 - 0.0003	ND	NA	3.20E-03	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL

Table 2-27
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 24	0.00013 - 0.0005	ND	NA	1.80E-03	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00044 (J)	0.0069	mg/kg	CFSB-119	22 / 24	0.00034 - 0.0007	0.0069	NA	7.60E-02	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 24	0.00023 - 0.0007	ND	NA	1.10E-02	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 24	6e-005 - 0.00041	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 24	0.00013 - 0.00047	ND	NA	1.00E-04	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 24	0.0002 - 0.00062	ND	NA	3.30E-01	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 24	0.00023 - 0.00083	ND	NA	6.50E-06	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-28
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: South Percolation Pond Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	57-12-5	Cyanide	0.022 (J)	16.4	mg/kg	CFSB-153	48 / 68	0.017 - 0.095	16.4	0.178	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 1	0.56 - 0.56	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	BSL
	16984-48-8	Fluoride	0.8 (J+)	44.1 (J+)	mg/kg	CFSB-152	68 / 68	NA	44.1	2.68	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.0695864	0.877859	mg/kg	CFSB-153	68 / 68	NA	0.877859	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	2.53041	31.9221	mg/kg	CFSB-153	68 / 68	NA	31.9221	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	2560	16100	mg/kg	CFSB-153	68 / 68	NA	16100	12712	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.67 (J-)	0.67 (J-)	mg/kg	CFSB-153	1 / 68	0.27 - 0.91	0.67	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	0.46 (J)	8.4	mg/kg	CFSB-104	66 / 68	0.7 - 0.84	8.4	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	34.1	972	mg/kg	CFSB-113	68 / 68	NA	972	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.11 (J)	0.79	mg/kg	CFSB-153	66 / 68	0.11 - 0.21	0.79	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	1.1 (J)	2.5	mg/kg	CFSB-153	3 / 68	0.28 - 0.69	2.5	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	3670	313000	mg/kg	CFSB-113	68 / 68	NA	313000	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	2.6	32.8	mg/kg	CFSB-153	68 / 68	NA	32.8	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	1.2 (J)	6.7 (J+)	mg/kg	CFSB-143	67 / 68	1.4 - 1.4	6.7	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	3.3	694 (J)	mg/kg	CFSB-153	68 / 68	NA	694	24.51	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	1580 (J)	16300	mg/kg	CFSB-152	68 / 68	NA	16300	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	1.8	116	mg/kg	CFSB-153	68 / 68	NA	116	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	ASL-SSLOnly
	7439-95-4	Magnesium	2510	16900	mg/kg	CFMW-064	68 / 68	NA	16900	11719	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	10.7 (J)	415	mg/kg	CFSB-142	68 / 68	NA	415	672.1	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.011 (J+)	1.4	mg/kg	CFSB-153	57 / 68	0.011 - 0.018	1.4	0.0632	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	3.5	53.9	mg/kg	CFSB-153	68 / 68	NA	53.9	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	168	1270	mg/kg	CFSB-143	68 / 68	NA	1270	1844	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.4 (J)	1.3 (J)	mg/kg	CFSB-153	4 / 68	0.25 - 0.85	1.3	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	1.7	23.5	mg/kg	CFSB-153	3 / 68	0.52 - 1.7	23.5	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	38.9 (J)	280	mg/kg	CFSB-152	34 / 68	36.1 - 59.1	280	72.16	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	0.2 (J)	0.2 (J)	mg/kg	CFSB-152	1 / 68	0.11 - 0.34	0.2	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	2.6	55.7	mg/kg	CFSB-152	68 / 68	NA	55.7	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	13.1	351	mg/kg	CFSB-153	68 / 68	NA	351	61.49	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 8	0.00086 - 0.0018	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 8	0.00065 - 0.0014	ND	NA	4.20E-05	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 8	0.00098 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 8	0.00069 - 0.0015	ND	NA	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 8	0.0011 - 0.0024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 8	0.0012 - 0.0025	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 8	0.00077 - 0.0017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 8	0.00092 - 0.002	ND	NA	7.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 8	0.00083 - 0.0018	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 8	0.0009 - 0.0019	ND	NA	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 8	0.00088 - 0.0019	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 8	0.00098 - 0.0021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 8	0.00064 - 0.0014	ND	NA	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 8	0.00091 - 0.002	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 8	0.0014 - 0.003	ND	NA	2.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 8	0.0015 - 0.0032	ND	NA	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 8	0.00093 - 0.002	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 8	0.001 - 0.0022	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 8	0.00073 - 0.0016	ND	NA	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 8	0.021 - 0.044	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 8	0.0015 - 0.0033	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	CLAY	Clay	1	9.3	percent	CFSB-152	9 / 9	NA	9.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	COARSESAND	Coarse Sand	2.1	19	percent	CFSB-153	9 / 9	NA	19	NA	No Screening Level	NULL	NA	NA	N	NSL
	FINESAND	Fine Sand	7.4	21.3	percent	CFSB-153	9 / 9	NA	21.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	GRAVEL	Gravel	5.1	69.8	percent	CFSB-151	9 / 9	NA	69.8	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD01	Hydrometer, Reading 1, Percent Passing	3	31.1	% passed	CFSB-152	9 / 9	NA	31.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD02	Hydrometer, Reading 2, Percent Passing	2.7	24.9	% passed	CFSB-152	9 / 9	NA	24.9	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD03	Hydrometer, Reading 3, Percent Passing	2	15.6	% passed	CFSB-152	9 / 9	NA	15.6	NA	No Screening Level	NULL	NA	NA	N	NSL

Table 2-28
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: South Percolation Pond Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	HYD04	Hydrometer, Reading 4, Percent Passing	1.7	11.4	% passed	CFSB-152	9 / 9	NA	11.4	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD05	Hydrometer, Reading 5, Percent Passing	1	9.3	% passed	CFSB-152	9 / 9	NA	9.3	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD06	Hydrometer, Reading 6, Percent Passing	1	5.2	% passed	CFSB-152	9 / 9	NA	5.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	HYD07	Hydrometer, Reading 7, Percent Passing	0.3	3.1	% passed	CFSB-152	9 / 9	NA	3.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	GSMSAND	Medium Sand	3.1	15.5	percent	CFSB-152	9 / 9	NA	15.5	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE0.375IN	Percent Passing 0.375 Inch (3/8 Inch Sieve)	45.9	100	% passed	CFSB-153	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE0.75IN	Percent Passing 0.75 Inch (3/4 Inch Sieve)	81.2	100	% passed	CFSB-152	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE1.0IN	Percent Passing 1 Inch (1 Inch Sieve)	83.1	100	% passed	CFSB-151	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE1.5IN	Percent Passing 1.5 Inch (1.5 Inch Sieve)	100	100	% passed	CFSB-153	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE2.0IN	Percent Passing 2 Inch (2 Inch Sieve)	100	100	% passed	CFSB-151	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	308075-07-2	Sand	16.5	45.7	percent	CFSB-151	9 / 9	NA	45.7	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE10	Sieve No. 10, Percent Passing	27.6	90.7	% passed	CFSB-153	9 / 9	NA	90.7	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE200	Sieve No. 200, Percent Passing	6.6	59.2	% passed	CFSB-153	9 / 9	NA	59.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE4	Sieve No. 4, Percent Passing	30.2	94.9	% passed	CFSB-153	9 / 9	NA	94.9	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE40	Sieve No. 40, Percent Passing	20.1	80.5	% passed	CFSB-153	9 / 9	NA	80.5	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE80	Sieve No. 80, Percent Passing	8.7	73.2	% passed	CFSB-153	9 / 9	NA	73.2	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE100	Sieve, No. 100, Percent Passing	8.1	70.6	% passed	CFSB-153	9 / 9	NA	70.6	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE20	Sieve, No. 20, Percent Passing	26.2	85.1	% passed	CFSB-153	9 / 9	NA	85.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE60	Sieve, No. 60, Percent Passing	11	76.5	% passed	CFSB-153	9 / 9	NA	76.5	NA	No Screening Level	NULL	NA	NA	N	NSL
	SIEVE3INCH	Sieve-US Std. 3-inch (75 mm)	100	100	% passed	CFSB-151	9 / 9	NA	100	NA	No Screening Level	NULL	NA	NA	N	NSL
	E52456985	Silt	4.3	55.1	percent	CFSB-153	9 / 9	NA	55.1	NA	No Screening Level	NULL	NA	NA	N	NSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 39	0.0093 - 0.02	ND	NA	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 39	0.0093 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 39	0.0093 - 0.02	ND	NA	8.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 39	0.0093 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 39	0.0093 - 0.02	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 39	0.0096 - 0.021	ND	NA	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 39	0.0096 - 0.021	ND	NA	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 39	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 39	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 39	0.0096 - 0.021	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 68	0.026 - 0.45	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 68	0.092 - 1.6	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 68	0.032 - 0.56	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 68	0.034 - 0.6	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 68	0.0098 - 0.17	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 68	0.0081 - 0.14	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 68	0.076 - 1.3	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 68	0.26 - 4.5	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 68	0.014 - 0.24	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 68	0.018 - 0.32	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 68	0.0078 - 0.14	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 68	0.0088 - 0.15	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.01 (J)	0.029 (J)	mg/kg	CFSB-118	3 / 68	0.0076 - 0.13	0.029	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 68	0.015 - 0.26	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 68	0.011 - 0.2	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 68	0.012 - 0.2	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 68	0.039 - 0.67	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 68	0.0092 - 0.16	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 68	0.01 - 0.18	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 68	0.092 - 1.6	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 68	0.011 - 0.19	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 68	0.015 - 0.26	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	0.019 (J)	1.9 (J)	mg/kg	CFSB-153	3 / 68	0.0089 - 0.019	1.9	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 68	0.01 - 0.18	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 68	0.013 - 0.23	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL

Table 2-28
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: South Percolation Pond Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 68	0.17 - 2.9	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.01 (J)	0.024 (J)	mg/kg	CFMW-064	5 / 68	0.0084 - 0.14	0.024	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 68	0.0089 - 0.15	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	98-86-2	Acetophenone	0.011 (J)	0.011 (J)	mg/kg	CFSB-119	1 / 68	0.0075 - 0.13	0.011	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	LDF
	120-12-7	Anthracene	0.05 (J)	0.05 (J)	mg/kg	CFSB-109	1 / 68	0.033 - 0.57	0.05	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 68	0.015 - 0.27	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	0.031 (J)	0.088 (J)	mg/kg	CFSB-119	5 / 68	0.026 - 0.46	0.088	0.0185	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.038	0.75	mg/kg	CFSB-153	32 / 68	0.029 - 0.5	0.75	0.0158	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.014 (J)	4	mg/kg	CFSB-153	44 / 68	0.01 - 0.019	4	0.0205	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.019 (J)	6.6	mg/kg	CFSB-153	48 / 68	0.014 - 0.024	6.6	0.0411	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.02 (J)	2.7 (J)	mg/kg	CFSB-153	40 / 68	0.02 - 0.035	2.7	0.0305	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.016 (J)	0.25	mg/kg	CFSB-109	38 / 68	0.015 - 0.26	0.25	0.0125	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.081 (J)	0.081 (J)	mg/kg	CFMW-061	1 / 68	0.011 - 0.18	0.081	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 68	0.029 - 0.51	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	0.015 (J)	0.015 (J)	mg/kg	CFSB-114	1 / 68	0.011 - 0.19	0.015	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.017 (J)	0.017 (J)	mg/kg	CFSB-116	1 / 68	0.0081 - 0.14	0.017	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	ASL-SSLOnly
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 68	0.014 - 0.25	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.028 (J)	2.2 (J)	mg/kg	CFSB-153	6 / 68	0.013 - 0.23	2.2	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	0.042 (J)	0.046 (J)	mg/kg	CFSB-119	2 / 68	0.025 - 0.43	0.046	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	LDF
	86-74-8	Carbazole	0.0089 (J)	0.97 (J)	mg/kg	CFSB-153	22 / 68	0.0086 - 0.014	0.97	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.012 (J)	2.6 (J)	mg/kg	CFSB-153	50 / 68	0.0094 - 0.012	2.6	0.0334	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.013 (J)	0.058 (J)	mg/kg	CFSB-110	14 / 68	0.01 - 0.18	0.058	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 68	0.018 - 0.3	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.019 (J)	0.44	mg/kg	CFSB-153	17 / 68	0.018 - 0.31	0.44	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 68	0.01 - 0.18	ND	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 68	0.0098 - 0.17	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 68	0.01 - 0.17	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.011 (J)	1.3 (J)	mg/kg	CFSB-153	51 / 68	0.01 - 0.013	1.3	0.0373	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.015 (J)	0.02 (J)	mg/kg	CFSB-109	2 / 68	0.0075 - 0.13	0.02	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 68	0.014 - 0.24	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 68	0.0097 - 0.17	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 68	0.022 - 0.37	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 68	0.013 - 0.22	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.027 (J)	3.1	mg/kg	CFSB-153	43 / 68	0.023 - 0.041	3.1	0.0223	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0095 (J)	0.024 (J)	mg/kg	CFSB-113	3 / 68	0.0074 - 0.13	0.024	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	LDF
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 68	0.012 - 0.2	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 68	0.031 - 0.54	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.015 (J)	0.015 (J)	mg/kg	CFSB-116	1 / 68	0.0088 - 0.15	0.015	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 68	0.011 - 0.19	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 68	0.042 - 0.72	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.0096 (J)	0.55 (J)	mg/kg	CFSB-153	48 / 68	0.0092 - 0.012	0.55	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 68	0.011 - 0.2	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.018 (J)	1.3 (J)	mg/kg	CFSB-153	49 / 68	0.016 - 0.02	1.3	0.0278	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 43	0.00021 - 0.00068	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 43	0.0001 - 0.00033	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 43	0.00026 - 0.00079	ND	NA	2.60E+00	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 43	0.00016 - 0.0005	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 43	0.00018 - 0.00061	ND	NA	7.80E-04	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 43	0.0002 - 0.00073	ND	NA	1.00E-02	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 43	6.6e-005 - 0.00028	ND	NA	2.10E-03	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 43	8.2e-005 - 0.00057	ND	NA	1.20E-03	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 43	0.00028 - 0.00084	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 43	7.2e-005 - 0.00027	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 43	8.4e-005 - 0.00025	ND	NA	3.00E-02	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 43	6.6e-005 - 0.00045	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 43	0.0001 - 0.00064	ND	NA	2.70E-04	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL

Table 2-28
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Subsurface Soil [0 to 12 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: South Percolation Pond Area
Exposure Medium: Subsurface Soil 0-12 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Subsurface Soil	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 43	7.2e-005 - 0.00024	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	0.00021 (J)	0.00074 (J+)	mg/kg	CFSB-153	2 / 43	7.8e-005 - 0.00023	0.00074	NA	4.60E-04	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	ASL-SSLOnly
	591-78-6	2-Hexanone	0.00076 (J)	0.0011 (J)	mg/kg	CFMW-061	2 / 43	0.00056 - 0.0017	0.0011	NA	8.80E-04	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	ASL-SSLOnly
	67-64-1	Acetone	0.0035	0.18	mg/kg	CFMW-064	44 / 44	NA	0.18	NA	2.90E-01	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00018 (J)	0.0038	mg/kg	CFSB-148	40 / 43	0.0002 - 0.00036	0.0038	NA	2.30E-04	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 43	0.0001 - 0.00043	ND	NA	2.10E-03	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 43	0.00023 - 0.00068	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 43	7.8e-005 - 0.00065	ND	NA	8.70E-04	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 43	0.00019 - 0.00072	ND	NA	1.90E-04	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00032 (J)	0.014	mg/kg	CFSB-151	34 / 43	0.00027 - 0.00052	0.014	NA	2.40E-02	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 43	0.00016 - 0.00077	ND	NA	1.80E-04	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 43	8.4e-005 - 0.00027	ND	NA	5.30E-03	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 43	0.00021 - 0.0008	ND	NA	5.90E-01	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 43	0.00013 - 0.00049	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 43	0.00023 - 0.00068	ND	NA	4.90E-03	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 43	0.00013 - 0.00039	ND	NA	1.10E-03	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 43	9e-005 - 0.00042	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00046 (J)	0.0077 (J-)	mg/kg	CFMW-064	30 / 43	0.00025 - 0.00082	0.0077	NA	1.30E+00	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 43	9e-005 - 0.0003	ND	NA	2.30E-04	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 43	0.00019 - 0.00057	ND	NA	3.00E-02	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00012 (J)	0.0032	mg/kg	CFMW-064	29 / 43	0.00014 - 0.00032	0.0032	NA	1.70E-03	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	ASL-SSLOnly
	98-82-8	Isopropylbenzene (Cumene)	0.00016 (J)	0.00039 (J)	mg/kg	CFMW-064	2 / 43	0.0001 - 0.0003	0.00039	NA	7.40E-02	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.00025 (J)	0.008	mg/kg	CFMW-064	39 / 43	8.8e-005 - 0.0002	0.008	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.0043 (J)	0.36	mg/kg	CFSB-119	6 / 43	0.00054 - 0.0066	0.36	NA	4.10E-01	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0012 (J)	0.014	mg/kg	CFMW-064	35 / 43	0.00046 - 0.00092	0.014	NA	1.20E-01	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 43	0.00059 - 0.004	ND	NA	1.40E-01	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.00027 (J)	0.012	mg/kg	CFMW-064	36 / 43	0.0003 - 0.0009	0.012	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	0.003 (J-)	0.003 (J-)	mg/kg	CFSB-102	1 / 44	0.00015 - 0.00057	0.003	NA	2.70E-03	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.0001 (J)	0.0028	mg/kg	CFMW-064	31 / 43	8.8e-005 - 0.00029	0.0028	NA	1.90E-02	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 43	9e-005 - 0.00027	ND	NA	1.30E-01	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 43	0.0001 - 0.0003	ND	NA	3.20E-03	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 43	0.00013 - 0.0005	ND	NA	1.80E-03	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.00044 (J)	0.01	mg/kg	CFMW-064	40 / 43	0.00019 - 0.0007	0.01	NA	7.60E-02	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 43	0.00022 - 0.0007	ND	NA	1.10E-02	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 43	6e-005 - 0.00041	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 43	0.00013 - 0.00047	ND	NA	1.00E-04	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 43	0.0002 - 0.00062	ND	NA	3.30E-01	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 43	0.00023 - 0.00083	ND	NA	6.50E-06	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-29
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Water South Percolation Pond Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	3 (J)	690 (J)	µg/l	CFSWP-059	25 / 36	2 - 4	690	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.8 (J)	26.1	µg/l	CFSWP-030	22 / 26	1.5 - 1.5	26.1	1.834	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	250	9240 (J-)	µg/l	CFSWP-019	36 / 36	NA	9240	29.8	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	15.3 (J)	32000	µg/l	CFSWP-032	32 / 36	13.5 - 18.2	32000	683	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	0.69 (J)	1.1 (J)	µg/l	CFSWP-060	3 / 36	0.62 - 0.76	1.1	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.71 (J)	18.5	µg/l	CFSWP-032	15 / 36	0.64 - 0.77	18.5	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	122	2710	µg/l	CFSWP-020	36 / 36	NA	2710	130	380	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-41-7	Beryllium	0.62 (J)	2	µg/l	CFSWP-032	3 / 36	0.24 - 0.29	2	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	0.66 (J)	1 (J)	µg/l	CFSWP-020	3 / 36	0.61 - 0.72	1	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-70-2	Calcium	25200	506000	µg/l	CFSWP-020	36 / 36	NA	506000	27776	No Screening Level		N	NSL
	7440-47-3	Chromium, Total	1.6 (J)	36.4	µg/l	CFSWP-032	13 / 36	1.3 - 1.5	36.4	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	1.4 (J)	22.7	µg/l	CFSWP-032	10 / 36	1.3 - 1.5	22.7	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	1.6 (J)	183	µg/l	CFSWP-020	28 / 36	1.4 - 1.9	183	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-89-6	Iron	43.1 (J)	52100	µg/l	CFSWP-032	33 / 36	42.4 - 49.1	52100	1055	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	0.4 (J)	38.5	µg/l	CFSWP-032	20 / 36	0.37 - 0.44	38.5	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	Lead
	7439-95-4	Magnesium	12600	63900	µg/l	CFSWP-032	36 / 36	NA	63900	7455	No Screening Level		N	NSL
	7439-96-5	Manganese	3.2 (J)	2570	µg/l	CFSWP-031	33 / 36	2.5 - 3	2570	15.9	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.19 (J)	0.26	µg/l	CFSWP-020	2 / 36	0.12 - 0.17	0.26	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-02-0	Nickel	1.6 (J)	51.7	µg/l	CFSWP-020	14 / 36	1.3 - 1.6	51.7	NA	39	USEPA RSL Tapwater (THQ=0.1), n	Y	Carcinogen
	7440-09-7	Potassium	600	9100 (J+)	µg/l	CFSWP-019	36 / 36	NA	9100	463	No Screening Level		N	NSL
	7782-49-2	Selenium	0.96 (J)	2 (J)	µg/l	CFSWP-020	4 / 36	0.69 - 0.79	2	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 36	1.3 - 1.5	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	4080	55300 (J)	µg/l	CFSWP-059	36 / 36	NA	55300	1232	No Screening Level		N	NSL
	7440-28-0	Thallium	0.32 (J)	0.33 (J)	µg/l	CFSWP-020	2 / 36	0.24 - 0.31	0.33	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-62-2	Vanadium	1.6 (J)	46.8	µg/l	CFSWP-032	12 / 36	1.2 - 1.9	46.8	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-66-6	Zinc	7.8 (J)	192	µg/l	CFSWP-032	16 / 36	5.4 - 7	192	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.00092	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.006 - 0.006	ND	NA	0.0072	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.005 - 0.005	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.005 - 0.005	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.006 - 0.006	ND	NA	No Screening Level		N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.0018	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.005 - 0.005	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.23	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	No Screening Level		N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.042	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.0014	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.0014	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	3.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.005 - 0.005	ND	NA	0.0012	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.00018	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.004 - 0.004	ND	NA	0.0003	MDEQ Circular DEQ-7 Groundwater, c	N	BSL-ND
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.06 - 0.06	ND	NA	0.071	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.005 - 0.005	ND	NA	No Screening Level		N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.084 - 0.084	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.084 - 0.084	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.084 - 0.084	ND	NA	No Screening Level		N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.084 - 0.084	ND	NA	No Screening Level		N	BSL-ND

Table 2-29
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Water South Percolation Pond Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.098 - 0.098	ND	NA	0.5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 8	0.43 - 0.47	ND	NA	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 8	3.1 - 3.4	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 8	0.69 - 0.75	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 8	0.49 - 0.53	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 8	0.53 - 0.58	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 8	0.63 - 0.68	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 8	0.91 - 0.99	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 8	2.4 - 2.6	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 8	1 - 1.1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 8	0.88 - 0.96	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 8	0.61 - 0.66	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 8	0.74 - 0.8	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 8	0.88 - 0.96	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	2.7 (J)	2.7 (J)	µg/l	CFSWP-031	1 / 8	1.3 - 1.4	2.7	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 8	0.65 - 0.71	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 8	0.59 - 0.64	ND	NA	No Screening Level		N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 8	1 - 1.1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	7.5 (J)	7.5 (J)	µg/l	CFSWP-031	1 / 8	0.88 - 0.96	7.5	NA	No Screening Level		N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 8	0.82 - 0.89	ND	NA	No Screening Level		N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 8	2 - 2.2	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 8	1 - 1.1	ND	NA	No Screening Level		N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 8	0.76 - 0.83	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 8	0.73 - 0.79	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 8	0.96 - 1	ND	NA	No Screening Level		N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 8	0.48 - 0.52	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 8	4.7 - 5.1	ND	NA	50	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 8	0.88 - 0.96	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 8	0.65 - 0.71	ND	NA	No Screening Level		N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 8	1 - 1.1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 8	0.57 - 0.62	ND	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 8	0.77 - 0.84	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	2.3 (J)	2.3 (J)	µg/l	CFSWP-031	1 / 8	0.86 - 0.93	2.3	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	ND	ND	ND	ND	0 / 8	0.55 - 0.6	ND	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	50-32-8	Benzo(A)Pyrene	0.36 (J)	0.36 (J)	µg/l	CFSWP-020	1 / 8	0.16 - 0.17	0.36	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.53 (J)	0.53 (J)	µg/l	CFSWP-020	1 / 8	0.44 - 0.48	0.53	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	ND	ND	ND	ND	0 / 8	0.75 - 0.82	ND	NA	No Screening Level		N	BSL-ND
	207-08-9	Benzo(K)Fluoranthene	ND	ND	ND	ND	0 / 8	0.18 - 0.2	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 8	0.6 - 0.65	ND	0.703	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 8	0.63 - 0.68	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 8	0.69 - 0.75	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 8	0.12 - 0.13	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 8	0.93 - 1	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 8	0.72 - 0.78	ND	6.574	5.6	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 8	1.1 - 1.1	ND	3.4	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	1.9 (J)	2.9 (J)	µg/l	CFSWP-031	2 / 8	0.85 - 0.92	2.9	NA	No Screening Level		N	NSL
	218-01-9	Chrysene	ND	ND	ND	ND	0 / 8	0.67 - 0.73	ND	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 8	0.82 - 0.89	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	117-84-0	Di-N-Octylphthalate	1.4 (J)	1.4 (J)	µg/l	CFSWP-020	1 / 8	0.69 - 0.75	1.4	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 8	0.09 - 0.098	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 8	0.85 - 0.92	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 8	1 - 1.1	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 8	0.98 - 1.1	ND	NA	2000	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	206-44-0	Fluoranthene	1 (J)	3.7 (J)	µg/l	CFSWP-030	3 / 8	0.72 - 0.78	3.7	NA	20	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 8	0.8 - 0.87	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 8	0.47 - 0.51	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Table 2-29
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Water South Percolation Pond Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 8	0.76 - 0.83	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 8	0.61 - 0.66	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	0.26 (J)	0.26 (J)	µg/l	CFSWP-019	1 / 8	0.09 - 0.098	0.26	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.28 (J)	0.28 (J)	µg/l	CFSWP-020	1 / 8	0.21 - 0.23	0.28	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 8	0.67 - 0.73	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 8	0.83 - 0.9	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 8	0.74 - 0.8	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 8	0.8 - 0.87	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 8	0.49 - 0.53	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 8	2.2 - 2.4	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	1.8 (J)	1.9 (J)	µg/l	CFSWP-030	2 / 8	0.65 - 0.71	1.9	0.099	No Screening Level		N	NSL
	108-95-2	Phenol	0.8 (J)	5.2 (J)	µg/l	CFSWP-031	2 / 8	0.41 - 0.45	5.2	0.12	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	1.4 (J)	1.8 (J)	µg/l	CFSWP-030	2 / 8	0.83 - 0.9	1.8	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 8	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 8	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 8	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 8	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 8	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 8	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 8	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 8	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 8	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 8	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 8	0.25 - 0.25	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 8	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 8	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	7.1	15	µg/l	CFSWP-031	2 / 8	1.1 - 1.1	15	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 8	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 8	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 8	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 8	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 8	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 8	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 8	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 8	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 8	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 8	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 8	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 8	0.14 - 0.14	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 8	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 8	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 8	0.28 - 0.28	ND	NA	No Screening Level		N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 8	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 8	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 8	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	No Screening Level		N	BSL-ND
	75-09-2	Methylene Chloride	0.47 (J)	0.9 (J)	µg/l	CFSWP-020	2 / 8	0.21 - 0.21	1	NA	5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 8	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	1	1	µg/l	CFSWP-031	1 / 8	0.17 - 0.17	1	NA	100	MDEQ Circular DEQ-7 Groundwater, c	N	BSL

Table 2-29
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area
Exposure Medium: Surface Water South Percolation Pond Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 8	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	0.82 (J)	3	µg/l	CFSWP-031	2 / 8	0.25 - 0.25	3	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 8	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 8	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 8	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 8	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 8	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available
Lead = refer to text for discussion on lead and exclusion as COPC at Site

Table 2-30
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.14 (J)	8.5	mg/kg	CFSDP-018	18 / 20	0.1 - 0.13	8.5	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	0.89 (J)	0.89 (J)	mg/kg	CFSB-150	1 / 2	0.45 - 0.45	0.89	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	1.91	93.7 (J+)	mg/kg	CFSDP-019	16 / 20	0.31 - 0.37	93.7	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	2360	13300	mg/kg	CFSB-149	20 / 20	NA	13300	10210	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 20	0.31 - 1.1	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	0.82 (J)	6.1	mg/kg	CFSDP-030	19 / 20	0.65 - 0.65	6.1	7.277	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	85.7	969	mg/kg	CFSDP-019	20 / 20	NA	969	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.18 (J)	0.74	mg/kg	CFSDP-030	13 / 20	0.2 - 0.43	0.74	0.497	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	0.95 (J)	0.95 (J)	mg/kg	CFSDP-018	1 / 20	0.36 - 1.1	0.95	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	12400	302000	mg/kg	CFSDP-019	20 / 20	NA	302000	33818	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	3.3 (J)	13.9	mg/kg	CFSB-149	20 / 20	NA	13.9	12.85	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	1.4 (J)	7.6	mg/kg	CFSDP-030	19 / 20	1.6 - 1.6	7.6	8.048	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	10.6	143	mg/kg	CFSDP-019	20 / 20	NA	143	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	1490	19100 (J)	mg/kg	CFSDP-030	20 / 20	NA	19100	20227	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	5.8	22.3	mg/kg	CFSDP-018	20 / 20	NA	22.3	13.66	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	3470	16200	mg/kg	CFSB-149	20 / 20	NA	16200	14224	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	18.1	252 (J-)	mg/kg	CFSDP-030	20 / 20	NA	252	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.015 (J+)	0.28	mg/kg	CFSDP-018	13 / 20	0.014 - 0.031	0.28	NA	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	5.4	25	mg/kg	CFSDP-020	20 / 20	NA	25	16.32	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	228 (J)	1790	mg/kg	CFSB-149	20 / 20	NA	1790	672.3	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	0.57 (J)	0.97 (J)	mg/kg	CFSDP-018	3 / 20	0.31 - 0.98	0.97	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 20	0.66 - 2.1	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	55.4 (J)	434	mg/kg	CFSDP-019	19 / 20	54.4 - 54.4	434	60.66	No Screening Level	NULL	N	NSL
	18496-25-8	Sulfide	0.61 (J)	7.1	umol/g	CFSDP-018	4 / 4	NA	7.1	NA	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 20	0.13 - 0.42	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	2.3 (J)	19.4	mg/kg	CFSB-149	20 / 20	NA	19.4	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	37.2 (J+)	174	mg/kg	CFSDP-018	20 / 20	NA	174	54.75	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	F&O15A-AA-A	SEM/AVS	0.341	0.606	none	CFSDP-019	4 / 4	NA	0.606	NA	No Screening Level	NULL	N	NSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.0013 - 0.0019	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00096 - 0.0015	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.0015 - 0.0022	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.001 - 0.0016	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.0016 - 0.0025	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.0017 - 0.0026	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.0011 - 0.0017	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.0014 - 0.0021	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.0012 - 0.0019	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.0013 - 0.002	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.0013 - 0.002	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.0015 - 0.0022	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.00094 - 0.0014	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.0013 - 0.0021	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.0021 - 0.0031	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.0022 - 0.0034	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.0014 - 0.0021	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.0015 - 0.0023	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.0011 - 0.0017	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.031 - 0.047	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.0023 - 0.0035	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.014 - 0.021	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.014 - 0.021	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.014 - 0.021	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.014 - 0.021	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.014 - 0.021	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.014 - 0.022	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.014 - 0.022	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Table 2-30
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.014 - 0.022	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.014 - 0.022	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.014 - 0.022	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 20	0.0043 - 0.12	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 20	0.031 - 0.49	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 20	0.041 - 0.65	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 20	0.007 - 0.16	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 20	0.0054 - 0.086	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 20	0.0076 - 0.12	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 20	0.0061 - 0.35	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 20	0.27 - 4.2	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 20	0.0049 - 0.078	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 20	0.0061 - 0.097	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 20	0.0045 - 0.072	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 20	0.0046 - 0.073	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 20	0.0047 - 0.075	ND	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 20	0.02 - 0.45	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 20	0.015 - 0.71	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 20	0.0056 - 0.09	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 20	0.052 - 1.5	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.13 (J)	0.13 (J)	mg/kg	CFSDP-018	1 / 11	0.012 - 0.042	0.13	NA	No Screening Level	NULL	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 20	0.014 - 0.4	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 20	0.12 - 2.7	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 20	0.0069 - 0.11	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 20	0.0046 - 0.074	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	0.13 (J)	0.13 (J)	mg/kg	CFSDP-018	1 / 20	0.0033 - 0.041	0.13	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 20	0.006 - 0.095	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 20	0.0048 - 0.076	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 20	0.069 - 1.1	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	0.012 (J)	0.012 (J)	mg/kg	CFSDP-059	1 / 20	0.0057 - 0.09	0.012	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 20	0.0043 - 0.069	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	0.0085 (J)	0.0085 (J)	mg/kg	CFSDP-031	1 / 20	0.0053 - 0.085	0.0085	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.0096 (J)	0.096 (J)	mg/kg	CFSDP-018	6 / 20	0.0051 - 0.15	0.096	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 20	0.021 - 0.69	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.019 (J)	0.062 (J)	mg/kg	CFSDP-031	3 / 14	0.036 - 0.12	0.062	NA	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.013 (J)	0.57	mg/kg	CFSDP-018	18 / 20	0.039 - 0.041	0.57	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-32-8	Benzo(A)Pyrene	0.013 (J)	0.86	mg/kg	CFSDP-018	18 / 20	0.014 - 0.015	0.86	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.03	1.9	mg/kg	CFSDP-018	20 / 20	NA	1.9	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.016 (J)	1.2	mg/kg	CFSDP-018	18 / 20	0.027 - 0.028	1.2	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.016 (J)	0.64	mg/kg	CFSDP-018	17 / 20	0.007 - 0.022	0.64	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 20	0.014 - 1.1	ND	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 20	0.0041 - 0.13	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 20	0.0047 - 0.075	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 20	0.0036 - 0.057	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 20	0.0073 - 0.12	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.52 (J)	0.52 (J)	mg/kg	CFSDP-018	1 / 20	0.018 - 1.7	0.52	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 20	0.034 - 1	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.0062 (J)	0.24 (J)	mg/kg	CFSDP-018	13 / 20	0.012 - 0.039	0.24	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.019 (J)	1.4	mg/kg	CFSDP-018	20 / 20	NA	1.4	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	0.024 (J)	0.024 (J)	mg/kg	CFSDP-030	1 / 20	0.014 - 0.69	0.024	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 20	0.024 - 0.91	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0061 (J)	0.28	mg/kg	CFSDP-018	14 / 20	0.0052 - 0.082	0.28	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 20	0.0043 - 0.069	ND	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 20	0.013 - 0.47	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 20	0.0036 - 0.057	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.025 (J)	1.1	mg/kg	CFSDP-018	20 / 20	NA	1.1	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-30
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	86-73-7	Fluorene	0.0087 (J)	0.0087 (J)	mg/kg	CFSDP-059	1 / 20	0.0039 - 0.062	0.0087	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 20	0.0071 - 0.11	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 20	0.0058 - 0.092	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 19	0.005 - 0.098	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 20	0.0051 - 0.081	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.011 (J)	1.2	mg/kg	CFSDP-018	18 / 20	0.031 - 0.033	1.2	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 20	0.005 - 0.08	ND	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 20	0.0067 - 0.11	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 20	0.033 - 0.52	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 20	0.0038 - 0.061	ND	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 20	0.015 - 0.57	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 20	0.056 - 2.5	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	0.011 (J)	0.37	mg/kg	CFSDP-018	19 / 20	0.012 - 0.012	0.37	0.00226	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	0.043 (J)	0.043 (J)	mg/kg	CFSDP-032	1 / 20	0.015 - 0.47	0.043	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.026	0.78	mg/kg	CFSDP-018	19 / 20	0.055 - 0.055	0.78	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 8	0.00027 - 0.0019	ND	NA	810	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 8	0.00025 - 0.0017	ND	NA	0.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 8	0.00035 - 0.0024	ND	NA	670	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 8	0.00021 - 0.0014	ND	NA	0.15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 8	0.00024 - 0.0017	ND	NA	3.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 8	0.00027 - 0.0018	ND	NA	23	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 8	0.00021 - 0.0015	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 8	0.00011 - 0.00074	ND	NA	5.8	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 8	0.00054 - 0.0037	ND	NA	0.0053	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 8	0.00021 - 0.0014	ND	NA	0.036	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.00017 - 0.0012	ND	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 8	0.00035 - 0.0024	ND	NA	0.46	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 8	0.0005 - 0.0034	ND	NA	1.6	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.00019 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 8	0.00012 - 0.0008	ND	NA	2.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 8	0.00092 - 0.0063	ND	NA	20	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-64-1	Acetone	0.027	0.29	mg/kg	CFSDP-018	8 / 8	NA	0.29	NA	6100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-43-2	Benzene	0.0011 (J)	0.0021	mg/kg	CFSB-149	4 / 8	0.00085 - 0.0021	0.0021	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 8	0.00033 - 0.0023	ND	NA	15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 8	0.0003 - 0.0021	ND	NA	0.29	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 8	0.0005 - 0.0034	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 8	0.00056 - 0.0038	ND	NA	0.68	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	0.0013 (J)	0.011	mg/kg	CFSB-149	8 / 8	NA	0.011	NA	77	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 8	0.00021 - 0.0015	ND	NA	0.65	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 8	0.00021 - 0.0014	ND	NA	28	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 8	0.00062 - 0.0042	ND	NA	1400	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 8	0.00038 - 0.0026	ND	NA	0.32	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 8	0.00051 - 0.0035	ND	NA	11	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 8	0.00018 - 0.0012	ND	NA	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 8	0.00032 - 0.0022	ND	NA	No Screening Level	NULL	N	BSL-ND
	110-82-7	Cyclohexane	0.00093 (J)	0.0046	mg/kg	CFSB-149	5 / 8	0.00072 - 0.0018	0.0046	NA	650	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 8	0.00023 - 0.0016	ND	NA	8.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 8	0.0004 - 0.0027	ND	NA	8.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	0.00038 (J)	0.0022	mg/kg	CFSDP-031	4 / 8	0.00065 - 0.0016	0.0022	NA	5.8	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 8	0.00015 - 0.001	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	0.00077 (J)	0.0033	mg/kg	CFSB-149	5 / 8	0.00057 - 0.0014	0.0033	NA	No Screening Level	NULL	N	NSL
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 8	0.0051 - 0.035	ND	NA	7800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0043 (J+)	0.08	mg/kg	CFSDP-018	8 / 8	NA	0.08	NA	2700	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 8	0.00078 - 0.0053	ND	NA	3300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	0.0014 (J)	0.0081	mg/kg	CFSB-149	5 / 8	0.00052 - 0.0013	0.0081	NA	No Screening Level	NULL	N	NSL
	75-09-2	Methylene Chloride	0.001 (J)	0.001 (J)	mg/kg	CFSDP-018	1 / 8	0.00019 - 0.0013	0.001	NA	35	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00026 (J)	0.0011 (J)	mg/kg	CFSB-149	4 / 8	0.00031 - 0.00076	0.0011	NA	65	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 8	0.00015 - 0.00099	ND	NA	600	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 8	0.00015 - 0.001	ND	NA	47	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 8	0.00017 - 0.0012	ND	NA	8.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-88-3	Toluene	0.0027 (J)	0.0062	mg/kg	CFSB-149	5 / 8	0.002 - 0.005	0.0062	NA	490	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 8	0.00029 - 0.002	ND	NA	160	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 8	0.00031 - 0.0021	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 8	0.00017 - 0.0012	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-30
Occurrence, Distribution, and Selection of Chemical of Potential Concern (South Percolation Pond Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 8	0.00048 - 0.0033	ND	NA	2300	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 8	0.00064 - 0.0044	ND	NA	0.059	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-31
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area
Exposure Medium: Surface Water Flathead River Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	T	3.2 (J)	285	µg/l	CFSWP-033	6 / 285	2 - 2	285	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	T	1.5 (J-)	56.4 (J-)	µg/l	CFSWP-033	10 / 32	1.5 - 1.5	56.4	1.834	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	T	28.6 (J)	2160	µg/l	CFSWP-033	42 / 54	12 - 12	2160	29.8	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	T	17.5 (J)	5090	µg/l	CFSWP-033	50 / 54	15 - 18.2	5090	683	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	T	0.64 (J)	0.78 (J)	µg/l	CFSWP-033	5 / 54	0.62 - 0.62	0.78	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	T	0.84 (J)	4.9	µg/l	CFSWP-033	4 / 54	0.64 - 0.77	4.9	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	T	62.8	466	µg/l	CFSWP-033	54 / 54	NA	466	130	380	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-41-7	Beryllium	T	0.27 (J)	0.27 (J)	µg/l	CFSWP-033	1 / 54	0.24 - 0.26	0.27	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	T	ND	ND	ND	ND	0 / 54	0.61 - 0.71	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	T	17600	78300	µg/l	CFSWP-033	54 / 54	NA	78300	27776	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	T	1.5 (J)	5.5	µg/l	CFSWP-033	4 / 54	1.3 - 1.3	5.5	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	T	3.9 (J)	3.9 (J)	µg/l	CFSWP-033	1 / 54	1.3 - 1.3	3.9	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	T	1.4 (J)	13.8	µg/l	CFSWP-033	15 / 54	1.4 - 1.9	13.8	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	T	63.1 (J)	11100	µg/l	CFSWP-033	29 / 54	42.4 - 45.7	11100	1055	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	T	0.37 (J)	5.6	µg/l	CFSWP-033	12 / 54	0.37 - 0.38	5.6	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	T	4670	24200	µg/l	CFSWP-033	54 / 54	NA	24200	7455	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	T	2.6 (J)	1140	µg/l	CFSWP-033	32 / 54	2.5 - 2.7	1140	15.9	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	T	ND	ND	ND	ND	0 / 54	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	T	1.4 (J)	7.6	µg/l	CFSWP-033	3 / 54	1.3 - 1.4	7.6	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	T	242	5270	µg/l	CFSWP-033	54 / 54	NA	5270	463	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	T	ND	ND	ND	ND	0 / 54	0.69 - 0.73	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	T	ND	ND	ND	ND	0 / 54	1.3 - 1.4	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	T	666	37800	µg/l	CFSWP-033	54 / 54	NA	37800	1232	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	T	ND	ND	ND	ND	0 / 54	0.24 - 0.26	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	T	1.2 (J)	7.9	µg/l	CFSWP-033	4 / 54	1.2 - 1.9	7.9	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	T	6.1 (J)	36.2	µg/l	CFSWP-033	4 / 54	5.4 - 7	36.2	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	NA	ND	ND	ND	ND	0 / 4	0.048 - 0.44	ND	NA	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	NA	ND	ND	ND	ND	0 / 4	0.18 - 3.2	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	NA	ND	ND	ND	ND	0 / 4	0.042 - 0.7	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	NA	ND	ND	ND	ND	0 / 4	0.056 - 0.5	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	NA	ND	ND	ND	ND	0 / 4	0.063 - 0.54	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	NA	ND	ND	ND	ND	0 / 4	0.047 - 0.64	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	NA	ND	ND	ND	ND	0 / 4	0.038 - 0.93	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	NA	ND	ND	ND	ND	0 / 4	1.4 - 2.4	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	NA	ND	ND	ND	ND	0 / 4	0.047 - 1.1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	NA	ND	ND	ND	ND	0 / 4	0.056 - 0.9	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	NA	ND	ND	ND	ND	0 / 4	0.055 - 0.62	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	NA	ND	ND	ND	ND	0 / 4	0.059 - 0.76	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	NA	ND	ND	ND	ND	0 / 4	0.057 - 0.9	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	NA	ND	ND	ND	ND	0 / 4	0.1 - 1.3	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	NA	ND	ND	ND	ND	0 / 4	0.19 - 0.66	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	NA	ND	ND	ND	ND	0 / 4	0.056 - 0.6	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	NA	ND	ND	ND	ND	0 / 4	0.54 - 1.1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	NA	ND	ND	ND	ND	0 / 2	0.88 - 0.9	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	NA	ND	ND	ND	ND	0 / 4	0.062 - 0.84	ND	NA	No Screening Level	NULL	N	BSL-ND

Table 2-31
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area
Exposure Medium: Surface Water Flathead River Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	534-52-1	4,6-Dinitro-2-Methylphenol	NA	ND	ND	ND	ND	0 / 4	1.4 - 2.1	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	NA	ND	ND	ND	ND	0 / 4	0.058 - 1	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	NA	ND	ND	ND	ND	0 / 4	0.056 - 0.78	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	NA	ND	ND	ND	ND	0 / 4	0.041 - 0.74	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	NA	ND	ND	ND	ND	0 / 4	0.056 - 0.98	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	NA	ND	ND	ND	ND	0 / 4	0.054 - 0.49	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	NA	ND	ND	ND	ND	0 / 4	0.13 - 4.7	ND	NA	50	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	83-32-9	Acenaphthene	NA	ND	ND	ND	ND	0 / 4	0.0048 - 0.9	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	NA	ND	ND	ND	ND	0 / 4	0.0047 - 0.66	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	NA	ND	ND	ND	ND	0 / 4	0.057 - 1.1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	NA	0.0074 (J)	0.0074 (J)	µg/l	CFSWP-026	1 / 4	0.0045 - 0.58	0.0074	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	NA	ND	ND	ND	ND	0 / 4	0.17 - 0.79	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	NA	ND	ND	ND	ND	0 / 4	0.1 - 0.88	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	NA	0.071	0.63 (J)	µg/l	CFSWP-026	2 / 4	0.0028 - 0.55	0.63	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	NA	0.041	0.25 (J)	µg/l	CFSWP-026	2 / 4	0.0024 - 0.16	0.25	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	NA	0.1	0.7 (J)	µg/l	CFSWP-026	2 / 4	0.0042 - 0.44	0.7	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	NA	0.044	0.044	µg/l	CFSWP-026	1 / 4	0.0039 - 0.77	0.044	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	NA	0.095	0.46 (J)	µg/l	CFSWP-026	2 / 4	0.0075 - 0.18	0.46	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	192-97-2	Benzo[E]Pyrene	NA	0.065	0.065	µg/l	CFSWP-026	1 / 2	0.0025 - 0.0025	0.065	NA	No Screening Level	NULL	N	NSL
	85-68-7	Benzyl Butyl Phthalate	NA	0.56 (J)	0.73 (J)	µg/l	CFSWP-035	2 / 4	0.6 - 0.61	0.73	0.703	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	NA	ND	ND	ND	ND	0 / 4	0.055 - 0.64	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	NA	ND	ND	ND	ND	0 / 4	0.062 - 0.7	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NA	ND	ND	ND	ND	0 / 4	0.037 - 0.12	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	NA	ND	ND	ND	ND	0 / 4	0.054 - 0.95	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	22	22	µg/l	CFSWP-035	1 / 4	0.72 - 4.3	22	6.574	5.6	USEPA RSL Tapwater (THQ=0.1), c**	Y	ASL
	105-60-2	Caprolactam	NA	0.8 (J)	1.1 (J)	µg/l	CFSWP-035	2 / 4	1.1 - 1.1	1.1	3.4	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	NA	ND	ND	ND	ND	0 / 4	0.047 - 0.87	ND	NA	No Screening Level	NULL	N	BSL-ND
	218-01-9	Chrysene	NA	0.18	1.2 (J)	µg/l	CFSWP-026	2 / 4	0.0043 - 0.67	1.2	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	NA	ND	ND	ND	ND	0 / 4	0.69 - 0.84	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	117-84-0	Di-N-Octylphthalate	NA	ND	ND	ND	ND	0 / 4	0.63 - 0.7	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	NA	0.015 (J)	0.015 (J)	µg/l	CFSWP-026	1 / 4	0.005 - 0.092	0.015	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	NA	ND	ND	ND	ND	0 / 4	0.068 - 0.87	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	NA	ND	ND	ND	ND	0 / 4	0.53 - 1	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	131-11-3	Dimethyl Phthalate	NA	ND	ND	ND	ND	0 / 4	0.052 - 1	ND	NA	2000	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	206-44-0	Fluoranthene	NA	0.2 (J+)	2.1 (J)	µg/l	CFSWP-026	3 / 4	0.0074 - 0.0074	2.1	NA	20	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	NA	ND	ND	ND	ND	0 / 4	0.0055 - 0.82	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	NA	ND	ND	ND	ND	0 / 4	0.052 - 0.48	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	NA	ND	ND	ND	ND	0 / 4	0.064 - 0.78	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	NA	ND	ND	ND	ND	0 / 4	0.46 - 0.62	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	NA	ND	ND	ND	ND	0 / 4	0.057 - 0.092	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL

Table 2-31
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area
Exposure Medium: Surface Water Flathead River Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	0.04	0.04	µg/l	CFSWP-026	1 / 4	0.0026 - 0.21	0.04	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	NA	ND	ND	ND	ND	0 / 4	0.05 - 0.68	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	NA	ND	ND	ND	ND	0 / 4	0.066 - 0.85	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	NA	ND	ND	ND	ND	0 / 4	0.11 - 0.76	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	NA	ND	ND	ND	ND	0 / 4	0.0035 - 0.82	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	98-95-3	Nitrobenzene	NA	ND	ND	ND	ND	0 / 4	0.15 - 0.5	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	NA	ND	ND	ND	ND	0 / 4	0.22 - 2.2	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	198-55-0	Perylene	NA	0.011 (J)	0.011 (J)	µg/l	CFSWP-026	1 / 2	0.0018 - 0.0018	0.011	NA	No Screening Level	NULL	N	NSL
	85-01-8	Phenanthrene	NA	0.024 (J-)	1.2 (J)	µg/l	CFSWP-026	2 / 4	0.0068 - 0.65	1.2	0.099	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	NA	ND	ND	ND	ND	0 / 4	0.091 - 0.42	ND	0.12	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	NA	0.18	1.6 (J)	µg/l	CFSWP-026	2 / 4	0.006 - 0.83	1.6	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	NA	ND	ND	ND	ND	0 / 2	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	NA	ND	ND	ND	ND	0 / 2	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	NA	ND	ND	ND	ND	0 / 2	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	NA	ND	ND	ND	ND	0 / 2	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	NA	ND	ND	ND	ND	0 / 2	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	NA	ND	ND	ND	ND	0 / 2	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	NA	ND	ND	ND	ND	0 / 2	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	NA	ND	ND	ND	ND	0 / 2	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	NA	ND	ND	ND	ND	0 / 2	0.25 - 0.25	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	NA	ND	ND	ND	ND	0 / 2	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	NA	ND	ND	ND	ND	0 / 2	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	NA	ND	ND	ND	ND	0 / 2	1.1 - 1.1	ND	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	NA	ND	ND	ND	ND	0 / 2	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	NA	ND	ND	ND	ND	0 / 2	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	NA	ND	ND	ND	ND	0 / 2	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	NA	ND	ND	ND	ND	0 / 2	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	NA	ND	ND	ND	ND	0 / 2	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	NA	ND	ND	ND	ND	0 / 2	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	NA	ND	ND	ND	ND	0 / 2	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	NA	ND	ND	ND	ND	0 / 2	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	NA	ND	ND	ND	ND	0 / 2	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	NA	ND	ND	ND	ND	0 / 2	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	110-82-7	Cyclohexane	NA	ND	ND	ND	ND	0 / 2	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	NA	ND	ND	ND	ND	0 / 2	0.14 - 0.14	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	NA	ND	ND	ND	ND	0 / 2	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	NA	ND	ND	ND	ND	0 / 2	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	NA	ND	ND	ND	ND	0 / 2	0.28 - 0.28	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-20-9	Methyl Acetate	NA	ND	ND	ND	ND	0 / 2	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	NA	ND	ND	ND	ND	0 / 2	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NA	ND	ND	ND	ND	0 / 2	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	No Screening Level	NULL	N	BSL-ND
	75-09-2	Methylene Chloride	NA	ND	ND	ND	ND	0 / 2	0.21 - 0.21	ND	NA	5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	NA	ND	ND	ND	ND	0 / 2	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	NA	ND	ND	ND	ND	0 / 2	0.17 - 0.17	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	NA	ND	ND	ND	ND	0 / 2	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	NA	ND	ND	ND	ND	0 / 2	0.12 - 0.12	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-31
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area
Exposure Medium: Surface Water Flathead River Area

Exposure Point	CAS Number	Chemical	Fraction	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	108-88-3	Toluene	NA	ND	ND	ND	ND	0 / 2	0.25 - 0.25	ND	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	NA	ND	ND	ND	ND	0 / 2	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	NA	ND	ND	ND	ND	0 / 2	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	79-01-6	Trichloroethylene (TCE)	NA	ND	ND	ND	ND	0 / 2	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	NA	ND	ND	ND	ND	0 / 2	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	NA	ND	ND	ND	ND	0 / 2	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-32
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River AreaSediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.067 (J)	2.7	mg/kg	CFSDP-026	6 / 21	0.032 - 0.097	2.7	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	0.36 (J)	69.2 (J+)	mg/kg	CFSDP-026	11 / 21	0.17 - 0.23	69.2	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	5750	12000	mg/kg	CFSDP-026	21 / 21	NA	12000	10210	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 21	0.28 - 0.45	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	2.5	4.4	mg/kg	CFSDP-002	21 / 21	NA	4.4	7.277	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	38	208	mg/kg	CFSDP-033	21 / 21	NA	208	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.22 (J)	0.51	mg/kg	CFSDP-033	20 / 21	0.21 - 0.21	0.51	0.497	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 21	0.32 - 0.51	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	7390 (J)	31400	mg/kg	CFSDP-035	21 / 21	NA	31400	33818	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	6.5	13.3	mg/kg	CFSDP-033	21 / 21	NA	13.3	12.85	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	4.1	7.7	mg/kg	CFSDP-033	21 / 21	NA	7.7	8.048	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	7.2	20.7	mg/kg	CFSDP-033	21 / 21	NA	20.7	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	10000	18300	mg/kg	CFSDP-033	21 / 21	NA	18300	20227	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	4.3	11.7	mg/kg	CFSDP-026	21 / 21	NA	11.7	13.66	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	7010	15000	mg/kg	CFSDP-033	21 / 21	NA	15000	14224	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	129	297	mg/kg	CFSDP-002	21 / 21	NA	297	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.018 (J)	0.023 (J)	mg/kg	CFSDP-002	4 / 21	0.01 - 0.015	0.023	NA	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	8.4	18.5	mg/kg	CFSDP-026	21 / 21	NA	18.5	16.32	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	279	1140	mg/kg	CFSDP-033	21 / 21	NA	1140	672.3	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 21	0.28 - 0.44	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 21	0.59 - 0.94	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	42.9 (J)	100 (J)	mg/kg	CFSDP-033	6 / 21	30.1 - 52.8	100	60.66	No Screening Level	NULL	N	NSL
	18496-25-8	Sulfide	1	1.7	umol/g	CFSDP-026	2 / 3	0.19 - 0.19	1.7	NA	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 21	0.12 - 0.19	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	7.5	25.5	mg/kg	CFSDP-006	21 / 21	NA	25.5	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	28.7	58.4	mg/kg	CFSDP-026	21 / 21	NA	58.4	54.75	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	F&O15A-AA-A	SEM/AVS	0.307	0.474	none	CFSDP-033	2 / 3	NA	0.474	NA	No Screening Level	NULL	N	NSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 6	0.00098 - 0.0012	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 6	0.00074 - 0.00087	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 6	0.0011 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 6	0.00078 - 0.00093	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 6	0.0013 - 0.0015	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 6	0.0013 - 0.0016	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 6	0.00088 - 0.001	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 6	0.0011 - 0.0012	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 6	0.00094 - 0.0011	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 6	0.001 - 0.0012	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 6	0.001 - 0.0012	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 6	0.0011 - 0.0013	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 6	0.00072 - 0.00085	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 6	0.001 - 0.0012	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 6	0.0016 - 0.0019	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 6	0.0017 - 0.002	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 6	0.0011 - 0.0013	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 6	0.0012 - 0.0014	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 6	0.00083 - 0.00098	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 6	0.024 - 0.028	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 6	0.0018 - 0.0021	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND

Table 2-32
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River AreaSediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 6	0.011 - 0.013	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 21	0.00079 - 0.038	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 21	0.0057 - 0.14	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 21	0.0076 - 0.15	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 21	0.0013 - 0.051	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 21	0.001 - 0.019	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 21	0.0014 - 0.027	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 21	0.0011 - 0.11	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 21	0.049 - 0.95	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 21	0.00091 - 0.02	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 21	0.0011 - 0.028	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 21	0.00084 - 0.016	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 21	0.00085 - 0.016	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 21	0.00088 - 0.017	ND	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 21	0.0052 - 0.1	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 21	0.0083 - 0.16	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 21	0.001 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 21	0.017 - 0.33	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.035 (J)	0.035 (J)	mg/kg	CFSDP-008	1 / 8	0.011 - 0.014	0.035	NA	No Screening Level	NULL	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 21	0.0046 - 0.089	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 21	0.032 - 0.61	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 21	0.0013 - 0.025	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 21	0.00086 - 0.022	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 21	0.00061 - 0.013	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 21	0.0011 - 0.021	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 21	0.00089 - 0.02	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 21	0.013 - 0.25	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	0.0014 (J)	0.023 (J)	mg/kg	CFSDP-026	2 / 21	0.0011 - 0.013	0.023	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 21	0.0008 - 0.023	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 21	0.00099 - 0.019	ND	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.0012 (J)	0.11	mg/kg	CFSDP-026	4 / 21	0.001 - 0.049	0.11	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 21	0.008 - 0.15	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.0098 (J)	0.0098 (J)	mg/kg	CFSDP-002	1 / 9	0.03 - 0.039	0.0098	NA	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.00095 (J)	1.4	mg/kg	CFSDP-026	10 / 21	0.0015 - 0.043	1.4	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0014 (J)	0.59	mg/kg	CFSDP-026	8 / 21	0.00092 - 0.014	0.59	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0012 (J)	2.7 (J)	mg/kg	CFSDP-026	12 / 21	0.0019 - 0.018	2.7	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.00098 (J)	0.67 (J)	mg/kg	CFSDP-026	11 / 21	0.0017 - 0.027	0.67	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0015 (J)	1.9 (J)	mg/kg	CFSDP-026	8 / 21	0.0013 - 0.023	1.9	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	192-97-2	Benzo[E]Pyrene	0.1 (J)	1.5 (J)	mg/kg	CFSDP-026	2 / 2	NA	1.5	#N/A	No Screening Level	NULL	N	NSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 21	0.012 - 0.24	ND	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 21	0.00077 - 0.044	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 21	0.00087 - 0.017	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 21	0.00066 - 0.013	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 21	0.0014 - 0.026	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.018 (J)	0.032 (J)	mg/kg	CFSDP-001	2 / 21	0.016 - 0.38	0.032	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 21	0.012 - 0.23	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.0028 (J)	0.68	mg/kg	CFSDP-026	6 / 21	0.00095 - 0.013	0.68	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.0013 (J)	4.3	mg/kg	CFSDP-026	13 / 21	0.0015 - 0.013	4.3	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 21	0.008 - 0.15	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 21	0.011 - 0.2	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0013 (J-)	0.23 (J)	mg/kg	CFSDP-026	5 / 21	0.0009 - 0.027	0.23	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	0.00082 (J)	0.014 (J)	mg/kg	CFSDP-026	2 / 21	0.00088 - 0.016	0.014	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 21	0.0055 - 0.11	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 21	0.00066 - 0.015	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.0011 (J)	4.2	mg/kg	CFSDP-026	13 / 21	0.002 - 0.014	4.2	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-32
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River AreaSediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	86-73-7	Fluorene	ND	ND	ND	ND	0 / 21	0.00072 - 0.034	ND	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 21	0.0013 - 0.025	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 21	0.0011 - 0.021	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 21	0.00093 - 0.032	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 21	0.00094 - 0.019	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.00098 (J)	0.72 (J)	mg/kg	CFSDP-026	9 / 21	0.00086 - 0.032	0.72	#N/A	1.1	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 21	0.00093 - 0.018	ND	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 21	0.0012 - 0.024	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 21	0.0061 - 0.12	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 21	0.00071 - 0.036	ND	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 21	0.0067 - 0.13	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 21	0.029 - 0.56	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	198-55-0	Perylene	0.012	0.17	mg/kg	CFSDP-026	2 / 2	NA	0.17	#N/A	No Screening Level	NULL	N	NSL
	85-01-8	Phenanthrene	0.0019 (J)	0.44	mg/kg	CFSDP-026	12 / 21	0.0021 - 0.014	0.44	0.00226	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 21	0.0055 - 0.11	ND	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.0014 (J)	3.5	mg/kg	CFSDP-026	12 / 21	0.001 - 0.021	3.5	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 2	0.00027 - 0.00027	ND	NA	810	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 2	0.00025 - 0.00025	ND	NA	0.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 2	0.00035 - 0.00036	ND	NA	670	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 2	0.00021 - 0.00021	ND	NA	0.15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 2	0.00024 - 0.00024	ND	NA	3.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 2	0.00026 - 0.00027	ND	NA	23	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 2	0.00021 - 0.00021	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 2	0.00011 - 0.00011	ND	NA	5.8	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 2	0.00054 - 0.00054	ND	NA	0.0053	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 2	0.00021 - 0.00021	ND	NA	0.036	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00017 - 0.00017	ND	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 2	0.00035 - 0.00035	ND	NA	0.46	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 2	0.0005 - 0.0005	ND	NA	1.6	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00019 - 0.00019	ND	NA	No Screening Level	NULL	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 2	0.00012 - 0.00012	ND	NA	2.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 2	0.00091 - 0.00092	ND	NA	20	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-64-1	Acetone	0.018	0.023	mg/kg	CFSDP-033	2 / 2	NA	0.023	NA	6100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-43-2	Benzene	0.0015	0.0015	mg/kg	CFSDP-026	2 / 2	NA	0.0015	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 2	0.00033 - 0.00033	ND	NA	15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 2	0.0003 - 0.0003	ND	NA	0.29	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 2	0.0005 - 0.0005	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 2	0.00056 - 0.00056	ND	NA	0.68	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	0.0011 (J)	0.0015	mg/kg	CFSDP-026	2 / 2	NA	0.0015	NA	77	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 2	0.00021 - 0.00021	ND	NA	0.65	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 2	0.00021 - 0.00021	ND	NA	28	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 2	0.00061 - 0.00062	ND	NA	1400	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 2	0.00037 - 0.00038	ND	NA	0.32	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 2	0.00051 - 0.00051	ND	NA	11	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 2	0.00018 - 0.00018	ND	NA	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 2	0.00032 - 0.00032	ND	NA	No Screening Level	NULL	N	BSL-ND
	110-82-7	Cyclohexane	0.0019	0.0028	mg/kg	CFSDP-033	2 / 2	NA	0.0028	NA	650	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 2	0.00023 - 0.00023	ND	NA	8.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 2	0.0004 - 0.0004	ND	NA	8.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	0.00026 (J)	0.00061 (J)	mg/kg	CFSDP-026	2 / 2	NA	0.00061	NA	5.8	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 2	0.00015 - 0.00015	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	0.00098 (J)	0.0018	mg/kg	CFSDP-026	2 / 2	NA	0.0018	NA	No Screening Level	NULL	N	NSL
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 2	0.005 - 0.0051	ND	NA	7800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0025 (J)	0.0042 (J+)	mg/kg	CFSDP-033	2 / 2	NA	0.0042	NA	2700	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 2	0.00078 - 0.00078	ND	NA	3300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	0.0038	0.0046	mg/kg	CFSDP-033	2 / 2	NA	0.0046	NA	No Screening Level	NULL	N	NSL

Table 2-32
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River AreaSediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 2	0.00019 - 0.00019	ND	NA	35	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.0003 (J)	0.00064 (J)	mg/kg	CFSDP-026	2 / 2	NA	0.00064	NA	65	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 2	0.00014 - 0.00015	ND	NA	600	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 2	0.00015 - 0.00015	ND	NA	47	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 2	0.00017 - 0.00017	ND	NA	8.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-88-3	Toluene	0.0023	0.0036	mg/kg	CFSDP-026	2 / 2	NA	0.0036	NA	490	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 2	0.00029 - 0.00029	ND	NA	160	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 2	0.00031 - 0.00031	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 2	0.00017 - 0.00017	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 2	0.00048 - 0.00048	ND	NA	2300	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 2	0.00064 - 0.00064	ND	NA	0.059	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1×10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-33
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Flathead River Area, Fish)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area
Exposure Medium: Fish Within Flathead River Area

Exposure Point	CAS Number	Chemical	Fraction	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Bioconcentration Factor	Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	T	285	µg/l	CFSWP-033	6 / 285	2 - 2	NA	NA	2.28E-01	USEPA RSL Fish Ingestion, nc	N	No BCF
	FREE CN	Cyanide (Free)	T	56.4	µg/l	CFSWP-033	10 / 32	1.5 - 1.5	NA	NA	0.228	USEPA RSL Fish Ingestion, nc	N	No BCF
	16984-48-8	Fluoride	T	2160	µg/l	CFSWP-033	42 / 54	12 - 12	10	21.6	15.2	USEPA RSL Fish Ingestion, nc	Y	ASL
	7429-90-5	Aluminum	T	5090	µg/l	CFSWP-033	50 / 54	15 - 18.2	500	2545	379	USEPA RSL Fish Ingestion, nc	Y	ASL
	7440-38-2	Arsenic	T	4.9	µg/l	CFSWP-033	4 / 54	0.64 - 0.77	300	1.47	0.00681	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	7440-39-3	Barium	T	466	µg/l	CFSWP-033	54 / 54	NA	4	1.864	75.8	USEPA RSL Fish Ingestion, nc	N	BSL
	7440-48-4	Cobalt	T	3.9	µg/l	CFSWP-033	1 / 54	1.3 - 1.3	300	1.17	0.114	USEPA RSL Fish Ingestion, nc	Y	ASL
	7439-89-6	Iron	T	11100	µg/l	CFSWP-033	29 / 54	42.4 - 45.7	200	2220	265	USEPA RSL Fish Ingestion, nc	Y	ASL
	7439-96-5	Manganese	T	1140	µg/l	CFSWP-033	32 / 54	2.5 - 2.7	400	456	53.1	USEPA RSL Fish Ingestion, nc diet	Y	Carcinogen
	56-55-3	Benzo(A)Anthracene	NA	0.63	µg/l	CFSWP-026	2 / 4	0.0028 - 0.55	260	0.1638	0.102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	NA	0.25	µg/l	CFSWP-026	2 / 4	0.0024 - 0.16	5147	1.28675	0.0102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	NA	0.7	µg/l	CFSWP-026	2 / 4	0.0042 - 0.44	3024	2.1168	0.102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	22	µg/l	CFSWP-035	1 / 4	0.72 - 4.3	588	12.936	0.729	USEPA RSL Fish Ingestion, ca	Y	ASL
	53-70-3	Dibenz(A,H)Anthracene	NA	0.015	µg/l	CFSWP-026	1 / 4	0.005 - 0.092	9596	0.14394	0.0102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-34
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.14 (J)	1.9	mg/kg	CFSB-136	6 / 8	0.071 - 0.077	1.9	0.178	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 5	0.4 - 0.43	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	BSL
	16984-48-8	Fluoride	12.8 (J+)	32.7 (J+)	mg/kg	CFSB-138	8 / 8	NA	32.7	2.68	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.254258	0.331873	mg/kg	CFSB-141	8 / 8	NA	0.331873	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	9.24574	12.0681	mg/kg	CFSB-141	8 / 8	NA	12.0681	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	8270	10800	mg/kg	CFSB-141	8 / 8	NA	10800	12712	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 8	0.34 - 0.47	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	4.4	5.4	mg/kg	CFSB-135	8 / 8	NA	5.4	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	153	236	mg/kg	CFSB-138	8 / 8	NA	236	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.36 (J)	0.63	mg/kg	CFSB-134	8 / 8	NA	0.63	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 8	0.36 - 0.5	ND	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	BSL
	7440-70-2	Calcium	18000	35100	mg/kg	CFSB-134	8 / 8	NA	35100	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	9.5	12.4	mg/kg	CFSB-141	8 / 8	NA	12.4	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	6	7.6	mg/kg	CFSB-141	8 / 8	NA	7.6	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	15.2	22.7	mg/kg	CFSB-138	8 / 8	NA	22.7	24.51	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	13000	17600	mg/kg	CFSB-141	8 / 8	NA	17600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	8.8	11.8	mg/kg	CFSB-138	8 / 8	NA	11.8	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	10400	14800	mg/kg	CFSB-141	8 / 8	NA	14800	11719	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	249	467	mg/kg	CFSB-141	8 / 8	NA	467	672.1	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.015 (J)	0.024	mg/kg	CFSB-141	8 / 8	NA	0.024	0.0632	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	11.5	16.4	mg/kg	CFSB-138	8 / 8	NA	16.4	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	929	1290 (J+)	mg/kg	CFSB-141	8 / 8	NA	1290	1844	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 8	0.32 - 0.44	ND	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 8	0.66 - 0.92	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	61 (J)	249	mg/kg	CFSB-134	8 / 8	NA	249	72.16	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 8	0.13 - 0.19	ND	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	N	BSL-ND
	7440-62-2	Vanadium	11.2	16.6	mg/kg	CFSB-138	8 / 8	NA	16.6	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	42.2	56.3	mg/kg	CFSB-141	8 / 8	NA	56.3	61.49	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 8	0.03 - 0.036	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 8	0.11 - 0.13	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 8	0.038 - 0.046	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 8	0.04 - 0.048	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 8	0.011 - 0.014	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 8	0.0095 - 0.011	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 8	0.088 - 0.11	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 8	0.3 - 0.37	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 8	0.016 - 0.019	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 8	0.021 - 0.026	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 8	0.0091 - 0.011	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 8	0.01 - 0.012	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.039 (J)	0.48	mg/kg	CFSB-138	3 / 8	0.0089 - 0.011	0.48	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 8	0.017 - 0.021	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 8	0.013 - 0.016	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 8	0.013 - 0.016	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 8	0.045 - 0.054	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 8	0.011 - 0.013	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 8	0.012 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 8	0.11 - 0.13	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 8	0.013 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 8	0.017 - 0.021	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 8	0.01 - 0.012	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 8	0.012 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 8	0.015 - 0.018	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 8	0.19 - 0.23	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.021 (J)	0.021 (J)	mg/kg	CFSB-138	1 / 8	0.0097 - 0.012	0.021	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	0.051 (J)	0.1 (J)	mg/kg	CFSB-138	2 / 8	0.01 - 0.012	0.1	NA	No Screening Level	NULL	NA	NA	N	NSL

Table 2-34
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 8	0.0087 - 0.011	ND	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 8	0.038 - 0.046	ND	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 8	0.018 - 0.022	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 8	0.031 - 0.037	ND	0.0185	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL
	56-55-3	Benzo(A)Anthracene	0.049	0.091	mg/kg	CFSB-136	2 / 8	0.034 - 0.04	0.091	0.0158	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.033 (J)	0.036 (J)	mg/kg	CFSB-137	2 / 8	0.012 - 0.015	0.036	0.0205	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.045 (J)	0.4	mg/kg	CFSB-138	6 / 8	0.016 - 0.016	0.4	0.0411	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.051 (J+)	0.21 (J+)	mg/kg	CFSB-138	3 / 8	0.023 - 0.028	0.21	0.0305	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.037 (J)	0.061	mg/kg	CFSB-136	2 / 8	0.017 - 0.021	0.061	0.0125	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 8	0.012 - 0.015	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.05 (J)	0.05 (J)	mg/kg	CFSB-138	1 / 8	0.034 - 0.041	0.05	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 8	0.013 - 0.015	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 8	0.0095 - 0.011	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 8	0.017 - 0.02	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 8	0.016 - 0.019	ND	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 8	0.029 - 0.035	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.023 (J)	0.023 (J)	mg/kg	CFSB-136	1 / 8	0.01 - 0.012	0.023	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.05 (J)	0.34 (J)	mg/kg	CFSB-138	6 / 8	0.011 - 0.011	0.34	0.0334	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 8	0.012 - 0.014	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 8	0.02 - 0.025	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.069 (J+)	0.069 (J+)	mg/kg	CFSB-138	1 / 8	0.021 - 0.025	0.069	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.02 (J)	0.02 (J)	mg/kg	CFSB-138	1 / 8	0.012 - 0.015	0.02	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 8	0.011 - 0.014	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 8	0.012 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.019 (J)	0.3 (J)	mg/kg	CFSB-138	8 / 8	NA	0.3	0.0373	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.04 (J)	0.04 (J)	mg/kg	CFSB-138	1 / 8	0.0087 - 0.011	0.04	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 8	0.016 - 0.02	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 8	0.011 - 0.014	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 8	0.025 - 0.03	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 8	0.015 - 0.018	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.04 (J)	0.31	mg/kg	CFSB-138	5 / 8	0.027 - 0.032	0.31	0.0223	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 8	0.0086 - 0.01	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 8	0.013 - 0.016	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 8	0.036 - 0.044	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.067 (J)	0.81	mg/kg	CFSB-138	3 / 8	0.01 - 0.012	0.81	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 8	0.013 - 0.015	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 8	0.049 - 0.059	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL

Table 2-34
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	85-01-8	Phenanthrene	0.029 (J)	0.16 (J)	mg/kg	CFSB-138	4 / 8	0.011 - 0.013	0.16	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 8	0.013 - 0.016	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.03 (J)	0.26 (J)	mg/kg	CFSB-138	6 / 8	0.018 - 0.019	0.26	0.0278	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-35
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.079 (J)	3.7	mg/kg	CFSB-136	13 / 17	0.069 - 0.077	3.7	0.178	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	FREE CN	Cyanide (Free)	ND	ND	ND	CFSB-138	0 / 5	0.4 - 0.43	ND	NA	0.0015	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	BSL
	16984-48-8	Fluoride	1.58 (J+)	33.5 (J)	mg/kg	CFSB-138	17 / 17	NA	33.5	2.68	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	0.227494	0.33455	mg/kg	CFSB-138	17 / 17	NA	0.33455	NA	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	16065-83-1_EST	Chromium, Trivalent - Estimated	8.27251	12.1655	mg/kg	CFSB-138	17 / 17	NA	12.1655	NA	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7429-90-5	Aluminum	7330	10800	mg/kg	CFSB-141	17 / 17	NA	10800	12712	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 17	0.31 - 0.48	ND	NA	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	N	BSL
	7440-38-2	Arsenic	1.9	5.6	mg/kg	CFSB-139	17 / 17	NA	5.6	6.291	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	98.2	236	mg/kg	CFSB-138	17 / 17	NA	236	299.5	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.36 (J)	0.63	mg/kg	CFSB-134	17 / 17	NA	0.63	1.093	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 17	0.33 - 0.5	ND	0.382	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	BSL
	7440-70-2	Calcium	11800	35100	mg/kg	CFSB-134	17 / 17	NA	35100	16691	No Screening Level	NULL	NA	NA	N	NSL
	7440-47-3	Chromium, Total	8.5	12.5	mg/kg	CFSB-138	17 / 17	NA	12.5	15.94	No Screening Level	NULL	NA	NA	N	NSL
	7440-48-4	Cobalt	4.1	7.6	mg/kg	CFSB-141	17 / 17	NA	7.6	7.576	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	14.3	22.7	mg/kg	CFSB-138	17 / 17	NA	22.7	24.51	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	9160	17600	mg/kg	CFSB-141	17 / 17	NA	17600	18549	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	7.7	11.8	mg/kg	CFSB-138	17 / 17	NA	11.8	28.6	14	USEPA MCL-based SSL	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	8020 (J)	14800	mg/kg	CFSB-141	17 / 17	NA	14800	11719	No Screening Level	NULL	NA	NA	N	NSL
	7439-96-5	Manganese	76.4	467	mg/kg	CFSB-141	17 / 17	NA	467	672.1	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.012 (J)	0.03	mg/kg	CFSB-138	17 / 17	NA	0.03	0.0632	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	9.2	16.4	mg/kg	CFSB-138	17 / 17	NA	16.4	17.32	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	7440-09-7	Potassium	768	1290 (J+)	mg/kg	CFSB-141	17 / 17	NA	1290	1844	No Screening Level	NULL	NA	NA	N	NSL
	7782-49-2	Selenium	0.44 (J)	0.65 (J)	mg/kg	CFSB-138	2 / 17	0.29 - 0.44	0.65	1.376	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	ND	ND	ND	ND	0 / 17	0.61 - 0.93	ND	NA	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	7440-23-5	Sodium	51.2 (J)	249	mg/kg	CFSB-134	17 / 17	NA	249	72.16	No Screening Level	NULL	NA	NA	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 17	0.12 - 0.19	ND	0.45	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	N	BSL-ND
	7440-62-2	Vanadium	11	17.2	mg/kg	CFSB-138	17 / 17	NA	17.2	22.86	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	28.8	56.3	mg/kg	CFSB-141	17 / 17	NA	56.3	61.49	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 17	0.027 - 0.038	ND	NA	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 17	0.097 - 0.14	ND	NA	9.40E-05	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 17	0.034 - 0.048	ND	NA	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 17	0.036 - 0.051	ND	NA	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 17	0.01 - 0.015	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 17	0.0086 - 0.012	ND	NA	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 17	0.08 - 0.11	ND	NA	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 17	0.27 - 0.39	ND	NA	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 17	0.014 - 0.02	ND	NA	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 17	0.019 - 0.027	ND	NA	6.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 17	0.0082 - 0.012	ND	NA	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 17	0.0092 - 0.013	ND	NA	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL
	91-57-6	2-Methylnaphthalene	0.024 (J)	0.48	mg/kg	CFSB-138	7 / 17	0.008 - 0.011	0.48	0.0017	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 17	0.016 - 0.022	ND	NA	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 17	0.012 - 0.017	ND	NA	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 17	0.012 - 0.017	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 17	0.04 - 0.057	ND	NA	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 17	0.0097 - 0.014	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 17	0.011 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 17	0.097 - 0.14	ND	NA	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 17	0.011 - 0.016	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 17	0.016 - 0.022	ND	NA	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 17	0.0093 - 0.013	ND	NA	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 17	0.011 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 17	0.014 - 0.019	ND	NA	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 17	0.17 - 0.25	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.021 (J)	0.021 (J)	mg/kg	CFSB-138	1 / 17	0.0088 - 0.012	0.021	0.00594	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	BSL
	208-96-8	Acenaphthylene	0.024 (J)	0.1 (J)	mg/kg	CFSB-138	3 / 17	0.0093 - 0.013	0.1	NA	No Screening Level	NULL	NA	NA	N	NSL

Table 2-35
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 17	0.0079 - 0.011	ND	0.034	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 17	0.034 - 0.049	ND	0.00326	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 17	0.016 - 0.023	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 17	0.028 - 0.039	ND	0.0185	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL
	56-55-3	Benzo(A)Anthracene	0.049	0.091	mg/kg	CFSB-136	2 / 17	0.03 - 0.043	0.091	0.0158	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.027 (J)	0.036 (J)	mg/kg	CFSB-137	3 / 17	0.011 - 0.015	0.036	0.0205	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.045 (J)	0.4	mg/kg	CFSB-138	9 / 17	0.014 - 0.02	0.4	0.0411	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.051 (J+)	0.21 (J+)	mg/kg	CFSB-138	3 / 17	0.021 - 0.029	0.21	0.0305	No Screening Level	NULL	NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.025 (J)	0.061	mg/kg	CFSB-136	3 / 17	0.016 - 0.022	0.061	0.0125	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 17	0.011 - 0.016	ND	NA	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	BSL
	92-52-4	Biphenyl (Diphenyl)	0.05 (J)	0.05 (J)	mg/kg	CFSB-138	1 / 17	0.031 - 0.044	0.05	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 17	0.011 - 0.016	ND	NA	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 17	0.0086 - 0.012	ND	NA	3.60E-06	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 17	0.015 - 0.021	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 17	0.014 - 0.02	ND	NA	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 17	0.026 - 0.037	ND	NA	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL
	86-74-8	Carbazole	0.023 (J)	0.023 (J)	mg/kg	CFSB-136	1 / 17	0.009 - 0.013	0.023	0.00657	No Screening Level	NULL	NA	NA	N	NSL
	218-01-9	Chrysene	0.023 (J-)	0.34 (J)	mg/kg	CFSB-138	10 / 17	0.0099 - 0.014	0.34	0.0334	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 17	0.011 - 0.015	ND	NA	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 17	0.018 - 0.026	ND	NA	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.069 (J+)	0.069 (J+)	mg/kg	CFSB-138	1 / 17	0.019 - 0.027	0.069	0.00619	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	N	BSL
	132-64-9	Dibenzofuran	0.02 (J)	0.02 (J)	mg/kg	CFSB-138	1 / 17	0.011 - 0.015	0.02	0.00209	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 17	0.01 - 0.015	ND	NA	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 17	0.011 - 0.015	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.019 (J)	0.3 (J)	mg/kg	CFSB-138	12 / 17	0.011 - 0.015	0.3	0.0373	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	86-73-7	Fluorene	0.04 (J)	0.04 (J)	mg/kg	CFSB-138	1 / 17	0.0079 - 0.011	0.04	0.0218	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 17	0.015 - 0.021	ND	NA	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 17	0.01 - 0.014	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 17	0.023 - 0.032	ND	NA	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 17	0.013 - 0.019	ND	NA	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.04 (J)	0.31	mg/kg	CFSB-138	5 / 17	0.024 - 0.034	0.31	0.0223	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 17	0.0078 - 0.011	ND	NA	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 17	0.012 - 0.017	ND	NA	8.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 17	0.033 - 0.046	ND	NA	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL
	91-20-3	Naphthalene	0.037 (J)	0.81	mg/kg	CFSB-138	7 / 17	0.0092 - 0.013	0.81	0.00363	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 17	0.011 - 0.016	ND	NA	9.20E-05	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 17	0.044 - 0.062	ND	NA	5.70E-05	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL
	85-01-8	Phenanthrene	0.022 (J)	0.16 (J)	mg/kg	CFSB-138	6 / 17	0.0097 - 0.014	0.16	0.0217	No Screening Level	NULL	NA	NA	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 17	0.012 - 0.017	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.03 (J)	0.26 (J)	mg/kg	CFSB-138	8 / 17	0.016 - 0.023	0.26	0.0278	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 9	0.00028 - 0.00051	ND	NA	0.28	USEPA RSL RBSSL (THQ=0.1, n	810	USEPA RSL Res Soil	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 9	0.00026 - 0.00047	ND	NA	3.00E-05	USEPA RSL RBSSL (THQ=0.1, c	0.6	USEPA RSL Res Soil	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 9	0.00036 - 0.00066	ND	NA	2.6	USEPA RSL RBSSL (THQ=0.1, n	670	USEPA RSL Res Soil	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 9	0.00021 - 0.00039	ND	NA	1.30E-05	USEPA RSL RBSSL (THQ=0.1, n	0.15	USEPA RSL Res Soil	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 9	0.00025 - 0.00045	ND	NA	0.00078	USEPA RSL RBSSL (THQ=0.1, c	3.6	USEPA RSL Res Soil	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 9	0.00027 - 0.00049	ND	NA	0.01	USEPA RSL RBSSL (THQ=0.1, n	23	USEPA RSL Res Soil	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 9	0.00022 - 0.0004	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 9	0.00011 - 0.0002	ND	NA	0.0012	USEPA RSL RBSSL (THQ=0.1, n	5.8	USEPA RSL Res Soil	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 9	0.00055 - 0.001	ND	NA	1.40E-07	USEPA RSL RBSSL (THQ=0.1, c	0.0053	USEPA RSL Res Soil	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 9	0.00022 - 0.00039	ND	NA	2.10E-06	USEPA RSL RBSSL (THQ=0.1, c	0.036	USEPA RSL Res Soil	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.00017 - 0.00031	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 9	0.00036 - 0.00065	ND	NA	4.80E-05	USEPA RSL RBSSL (THQ=0.1, c**	0.46	USEPA RSL Res Soil	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 9	0.00051 - 0.00093	ND	NA	0.00027	USEPA RSL RBSSL (THQ=0.1), n	1.6	USEPA RSL Res Soil	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.00019 - 0.00035	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 9	0.00012 - 0.00022	ND	NA	0.00046	USEPA RSL RBSSL (THQ=0.1, c	2.6	USEPA RSL Res Soil	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 9	0.00094 - 0.0017	ND	NA	0.00088	USEPA RSL RBSSL (THQ=0.1, n	20	USEPA RSL Res Soil	N	BSL

Table 2-35
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	67-64-1	Acetone	0.03	0.083	mg/kg	CFSB-138	9 / 9	NA	0.083	NA	0.29	USEPA RSL RBSSL (THQ=0.1, n	6100	USEPA RSL Res Soil	N	BSL
	71-43-2	Benzene	0.00076 (J)	0.0019	mg/kg	CFSB-135	9 / 9	NA	0.0019	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	ASL-SSLOnly
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 9	0.00034 - 0.00061	ND	NA	0.0021	USEPA RSL RBSSL (THQ=0.1, n	15	USEPA RSL Res Soil	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 9	0.00031 - 0.00056	ND	NA	3.60E-05	USEPA RSL RBSSL (THQ=0.1, c	0.29	USEPA RSL Res Soil	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 9	0.00051 - 0.00093	ND	NA	0.00087	USEPA RSL RBSSL (THQ=0.1, c*	19	USEPA RSL Res Soil	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 9	0.00057 - 0.001	ND	NA	0.00019	USEPA RSL RBSSL (THQ=0.1, n	0.68	USEPA RSL Res Soil	N	BSL
	75-15-0	Carbon Disulfide	0.00054 (J)	0.0023	mg/kg	CFSB-140	7 / 9	0.00046 - 0.00058	0.0023	NA	0.024	USEPA RSL RBSSL (THQ=0.1, n	77	USEPA RSL Res Soil	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 9	0.00022 - 0.0004	ND	NA	0.00018	USEPA RSL RBSSL (THQ=0.1, c*	0.65	USEPA RSL Res Soil	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 9	0.00021 - 0.00039	ND	NA	0.0053	USEPA RSL RBSSL (THQ=0.1, n	28	USEPA RSL Res Soil	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 9	0.00063 - 0.0011	ND	NA	0.59	USEPA RSL RBSSL (THQ=0.1, n	1400	USEPA RSL Res Soil	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 9	0.00038 - 0.0007	ND	NA	6.10E-05	USEPA RSL RBSSL (THQ=0.1, c*	0.32	USEPA RSL Res Soil	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 9	0.00052 - 0.00095	ND	NA	0.0049	USEPA RSL RBSSL (THQ=0.1, n	11	USEPA RSL Res Soil	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 9	0.00018 - 0.00033	ND	NA	0.0011	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 9	0.00033 - 0.0006	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND
	110-82-7	Cyclohexane	0.00051 (J)	0.0031	mg/kg	CFSB-137	9 / 9	NA	0.0031	NA	1.3	USEPA RSL RBSSL (THQ=0.1, n	650	USEPA RSL Res Soil	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 9	0.00023 - 0.00042	ND	NA	0.00023	USEPA RSL RBSSL (THQ=0.1, c*	8.3	USEPA RSL Res Soil	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 9	0.00041 - 0.00074	ND	NA	0.03	USEPA RSL RBSSL (THQ=0.1, n	8.7	USEPA RSL Res Soil	N	BSL
	100-41-4	Ethylbenzene	0.00038 (J)	0.0006 (J)	mg/kg	CFSB-135	7 / 9	0.00034 - 0.00044	0.0006	NA	0.0017	USEPA RSL RBSSL (THQ=0.1, c*	5.8	USEPA RSL Res Soil	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 9	0.00015 - 0.00028	ND	NA	0.074	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL
	79601-23-1	M,P-Xylene	0.0006 (J)	0.0019	mg/kg	CFSB-135	9 / 9	NA	0.0019	NA	No Screening Level	NULL	NA	NA	N	NSL
	79-20-9	Methyl Acetate	0.011	0.6 (J)	mg/kg	CFSB-138	2 / 9	0.0052 - 0.0094	0.6	NA	0.41	USEPA RSL RBSSL (THQ=0.1, n	7800	USEPA RSL Res Soil	N	ASL-SSLOnly
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0037 (J)	0.013	mg/kg	CFSB-138	9 / 9	NA	0.013	NA	0.12	USEPA RSL RBSSL (THQ=0.1, n	2700	USEPA RSL Res Soil	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 9	0.0008 - 0.0015	ND	NA	0.14	USEPA RSL RBSSL (THQ=0.1, n	3300	USEPA RSL Res Soil	N	BSL
	108-87-2	Methylcyclohexane	0.0012 (J)	0.0054	mg/kg	CFSB-134	9 / 9	NA	0.0054	NA	No Screening Level	NULL	NA	NA	N	NSL
	75-09-2	Methylene Chloride	0.00031 (J)	0.0027	mg/kg	CFSB-136	3 / 9	0.0002 - 0.00036	0.0027	NA	0.0027	USEPA RSL RBSSL (THQ=0.1, n	35	USEPA RSL Res Soil	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00021 (J)	0.00058 (J)	mg/kg	CFSB-135	8 / 9	0.00021 - 0.00021	0.00058	NA	0.019	USEPA RSL RBSSL (THQ=0.1, n	65	USEPA RSL Res Soil	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 9	0.00015 - 0.00027	ND	NA	0.13	USEPA RSL RBSSL (THQ=0.1, n	600	USEPA RSL Res Soil	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 9	0.00015 - 0.00027	ND	NA	0.0032	USEPA RSL RBSSL (THQ=0.1, c*	47	USEPA RSL Res Soil	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.0004 (J)	0.0004 (J)	mg/kg	CFSB-138	1 / 9	0.00017 - 0.00031	0.0004	NA	0.0018	USEPA RSL RBSSL (THQ=0.1, n	8.1	USEPA RSL Res Soil	N	BSL
	108-88-3	Toluene	0.0012 (J)	0.004	mg/kg	CFSB-135	9 / 9	NA	0.004	NA	0.076	USEPA RSL RBSSL (THQ=0.1, n	490	USEPA RSL Res Soil	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 9	0.0003 - 0.00054	ND	NA	0.011	USEPA RSL RBSSL (THQ=0.1, n	160	USEPA RSL Res Soil	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 9	0.00032 - 0.00058	ND	NA	No Screening Level	NULL	NA	NA	N	BSL-ND

Table 2-35
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area
Exposure Medium: Surface Soil 0-2 Feet

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 9	0.00017 - 0.00031	ND	NA	0.0001	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 9	0.00049 - 0.00089	ND	NA	0.33	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 9	0.00066 - 0.0012	ND	NA	6.50E-06	USEPA RSL RBSSL (THQ=0.1, c	0.059	USEPA RSL Res Soil	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-36
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area
Exposure Medium: Surface Water Backwater Seep Sampling Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	7.7 (J)	378	µg/l	CFSWP-029	29 / 31	2 - 2	378	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.5 (J)	140	µg/l	CFSWP-029	23 / 25	1.5 - 1.5	140	1.834	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	40.2 (J)	2640 (J+)	µg/l	CFSWP-005	31 / 31	NA	2640	29.8	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	23.6 (J)	1180	µg/l	CFSWP-004	29 / 31	15 - 15	1180	683	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 31	0.62 - 0.62	ND	1	0.78	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	0.66 (J)	0.99 (J)	µg/l	CFSWP-029	4 / 31	0.64 - 0.77	0.99	1.5	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	79	218	µg/l	CFSWP-029	31 / 31	NA	218	130	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 31	0.24 - 0.26	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 31	0.61 - 0.71	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	20300	64900	µg/l	CFSWP-029	31 / 31	NA	64900	27776	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	1.3 (J)	1.6 (J)	µg/l	CFSWP-004	3 / 31	1.3 - 1.3	1.6	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	1.3 (J)	1.7 (J)	µg/l	CFSWP-004	7 / 31	1.3 - 1.3	1.7	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	1.5 (J)	12.3	µg/l	CFSWP-004	10 / 31	1.4 - 1.9	12.3	5.401	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	62.4 (J)	1620	µg/l	CFSWP-004	30 / 31	45.7 - 45.7	1620	1055	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	0.38 (J)	2.9	µg/l	CFSWP-004	14 / 31	0.37 - 0.38	2.9	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	5600	18500	µg/l	CFSWP-029	31 / 31	NA	18500	7455	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	8.7	405	µg/l	CFSWP-029	29 / 31	2.5 - 2.5	405	15.9	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 31	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	1.6 (J)	2.2 (J)	µg/l	CFSWP-004	2 / 31	1.3 - 1.4	2.2	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	398	1200	µg/l	CFSWP-004	31 / 31	NA	1200	463	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 31	0.69 - 0.73	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 31	1.3 - 1.4	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	1150	44700	µg/l	CFSWP-029	31 / 31	NA	44700	1232	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 31	0.24 - 0.26	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	1.2 (J)	1.2 (J)	µg/l	CFSWP-004	1 / 31	1.2 - 1.9	1.2	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	8.1 (J)	19.9	µg/l	CFSWP-005	6 / 31	5.4 - 7	19.9	7.2	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 11	0.048 - 0.45	ND	NA	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 11	0.18 - 3.2	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 11	0.042 - 0.72	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.056 - 0.51	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.063 - 0.55	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 11	0.047 - 0.66	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 11	0.038 - 0.95	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 11	1.4 - 2.5	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.047 - 1.1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.056 - 0.92	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 11	0.055 - 0.64	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 11	0.059 - 0.77	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 11	0.057 - 0.92	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 11	0.1 - 1.3	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 11	0.19 - 0.68	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 11	0.056 - 0.61	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 11	0.54 - 1.1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 7	0.88 - 0.92	ND	NA	No Screening Level	NULL	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 11	0.062 - 0.85	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 11	1.4 - 2.1	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.058 - 1.1	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 11	0.056 - 0.79	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 11	0.041 - 0.76	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.056 - 1	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 11	0.054 - 0.5	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 11	0.13 - 4.8	ND	NA	50	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 11	0.0048 - 0.92	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-36
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area
Exposure Medium: Surface Water Backwater Seep Sampling Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 11	0.0047 - 0.68	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 11	0.057 - 1.1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.0061 (J-)	0.0061 (J-)	µg/l	CFSWP-029	1 / 11	0.0045 - 0.59	0.0061	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 11	0.17 - 0.8	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 11	0.1 - 0.9	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	0.0048 (J)	0.043 (J-)	µg/l	CFSWP-029	2 / 11	0.0028 - 0.57	0.043	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.022 (J-)	0.022 (J-)	µg/l	CFSWP-029	1 / 11	0.0024 - 0.17	0.022	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.0056 (J)	0.081 (J-)	µg/l	CFSWP-029	2 / 11	0.0042 - 0.46	0.081	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.024 (J-)	0.024 (J-)	µg/l	CFSWP-029	1 / 11	0.0039 - 0.78	0.024	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.061 (J-)	0.061 (J-)	µg/l	CFSWP-029	1 / 11	0.0075 - 0.19	0.061	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	192-97-2	Benzo[E]Pyrene	0.004 (J)	0.047 (J-)	µg/l	CFSWP-029	2 / 4	0.0025 - 0.0025	0.047	NA	No Screening Level	NULL	N	NSL
	85-68-7	Benzyl Butyl Phthalate	0.86 (J)	0.86 (J)	µg/l	CFSWP-027	1 / 11	0.43 - 0.63	0.86	0.703	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 11	0.055 - 0.66	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 11	0.062 - 0.72	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 11	0.037 - 0.13	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 11	0.054 - 0.97	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	1.2 (J)	8.6 (J+)	µg/l	CFSWP-027	3 / 11	0.72 - 4.3	8.6	6.574	5.6	USEPA RSL Tapwater (THQ=0.1), c**	Y	ASL
	105-60-2	Caprolactam	0.6 (J)	0.98 (J)	µg/l	CFSWP-027	3 / 11	0.44 - 1.1	4.6	3.4	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 11	0.047 - 0.89	ND	NA	No Screening Level	NULL	N	BSL-ND
	218-01-9	Chrysene	0.011 (J-)	0.17 (J-)	µg/l	CFSWP-029	3 / 11	0.0043 - 0.7	0.17	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 11	0.69 - 0.85	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 11	0.63 - 0.72	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0066 (J-)	0.0066 (J-)	µg/l	CFSWP-029	1 / 11	0.005 - 0.094	0.0066	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 11	0.068 - 0.89	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 11	0.53 - 1	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 11	0.052 - 1	ND	NA	2000	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	206-44-0	Fluoranthene	0.0077 (J)	1.1 (J)	µg/l	CFSWP-029	4 / 11	0.0074 - 0.75	1.1	NA	20	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 11	0.0055 - 0.83	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 11	0.052 - 0.49	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 11	0.064 - 0.79	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 11	0.46 - 0.64	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 11	0.057 - 0.094	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.022 (J-)	0.022 (J-)	µg/l	CFSWP-029	1 / 11	0.0026 - 0.22	0.022	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 11	0.05 - 0.7	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 11	0.066 - 0.86	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 11	0.11 - 0.77	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	0.004 (J-)	0.004 (J-)	µg/l	CFSWP-028	1 / 11	0.0035 - 0.83	0.004	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 11	0.15 - 0.51	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 11	0.22 - 2.3	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	198-55-0	Perylene	0.006 (J-)	0.006 (J-)	µg/l	CFSWP-029	1 / 4	0.0018 - 0.0018	0.006	NA	No Screening Level	NULL	N	NSL
	85-01-8	Phenanthrene	0.034 (J-)	0.034 (J-)	µg/l	CFSWP-029	1 / 11	0.0068 - 0.68	0.034	0.099	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 11	0.091 - 0.43	ND	0.12	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.0069 (J-)	0.19 (J)	µg/l	CFSWP-029	3 / 11	0.006 - 0.86	0.19	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 7	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 7	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 7	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 7	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 7	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL

Table 2-36
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area
Exposure Medium: Surface Water Backwater Seep Sampling Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 7	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 7	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 7	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 7	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 7	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 7	0.25 - 0.25	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 7	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 7	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	ND	ND	ND	ND	0 / 7	1.1 - 1.1	ND	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 7	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 7	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 7	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 7	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 7	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 7	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 7	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 7	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 7	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 7	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 7	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 7	0.14 - 0.14	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 7	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 7	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 7	0.28 - 0.28	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 7	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 7	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 7	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	No Screening Level	NULL	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 7	0.21 - 0.21	ND	NA	5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 7	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 7	0.17 - 0.17	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 7	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 7	0.12 - 0.12	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 7	0.25 - 0.25	ND	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 7	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 7	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7 Groundwater, c	N	BSL

Table 2-36
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area
Exposure Medium: Surface Water Backwater Seep Sampling Area

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 7	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 7	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 7	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-37
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	57-12-5	Cyanide	0.3	8.3	mg/kg	CFSDP-003	16 / 16	NA	8.3	0.116	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	ND	ND	ND	ND	0 / 5	0.42 - 0.5	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	16984-48-8	Fluoride	2.23 (J-)	24.8 (J+)	mg/kg	CFSDP-003	16 / 16	NA	24.8	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7429-90-5	Aluminum	7410	12200 (J)	mg/kg	CFSDP-029	16 / 16	NA	12200	10210	7700	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	ND	ND	ND	ND	0 / 16	0.32 - 0.57	ND	NA	3.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-38-2	Arsenic	2.8	6.2	mg/kg	CFSDP-004	16 / 16	NA	6.2	7.277	0.68	USEPA RSL Res Soil (THQ=0.1), c**R	Y	Carcinogen
	7440-39-3	Barium	44.6	151	mg/kg	CFSDP-004	16 / 16	NA	151	239	1500	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.29 (J)	0.57 (J)	mg/kg	CFSDP-027	16 / 16	NA	0.57	0.497	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 16	0.34 - 0.64	ND	NA	7.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	9390	24500	mg/kg	CFSDP-003	16 / 16	NA	24500	33818	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	7	13.6	mg/kg	CFSDP-029	16 / 16	NA	13.6	12.85	No Screening Level	NULL	N	NSL
	7440-48-4	Cobalt	4.1	6.9	mg/kg	CFSDP-029	16 / 16	NA	6.9	8.048	2.3	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	6.9	15.4	mg/kg	CFSDP-003	16 / 16	NA	15.4	25.65	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7439-89-6	Iron	10000	18800 (J)	mg/kg	CFSDP-029	16 / 16	NA	18800	20227	5500	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	4.7	9.2	mg/kg	CFSDP-027	16 / 16	NA	9.2	13.66	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	N	BSL
	7439-95-4	Magnesium	8100	14400 (J)	mg/kg	CFSDP-029	16 / 16	NA	14400	14224	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	133	286	mg/kg	CFSDP-003	16 / 16	NA	286	770	180	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.013 (J)	0.08	mg/kg	CFSDP-005	10 / 16	0.013 - 0.018	0.08	NA	1.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-02-0	Nickel	9.4	14.6	mg/kg	CFSDP-029	16 / 16	NA	14.6	16.32	150	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	551	1540	mg/kg	CFSDP-029	16 / 16	NA	1540	672.3	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 16	0.3 - 0.55	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 16	0.62 - 1.2	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	39.9 (J)	198	mg/kg	CFSDP-028	14 / 16	43.9 - 44.7	198	60.66	No Screening Level	NULL	N	NSL
	18496-25-8	Sulfide	0.29 (J)	0.29 (J)	umol/g	CFSDP-005	1 / 4	0.22 - 0.24	0.73	NA	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	0.18 (J)	0.18 (J)	mg/kg	CFSDP-029	1 / 16	0.13 - 0.24	0.18	NA	0.078	USEPA RSL Res Soil (THQ=0.1), n	Y	ASL
	7440-62-2	Vanadium	8.1	21.5	mg/kg	CFSDP-029	16 / 16	NA	21.5	19.27	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	33	50.6	mg/kg	CFSDP-029	16 / 16	NA	50.6	54.75	2300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	F&O15A-AA-A	SEM/AVS	1.27	1.84	none	CFSDP-028	2 / 4	NA	1.84	NA	No Screening Level	NULL	N	NSL
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 3	0.0013 - 0.0017	ND	NA	0.039	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.00095 - 0.0013	ND	NA	0.086	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 3	0.0014 - 0.002	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.001 - 0.0014	ND	NA	0.3	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 3	0.0016 - 0.0022	ND	NA	No Screening Level	NULL	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 3	0.0017 - 0.0023	ND	NA	No Screening Level	NULL	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 3	0.0011 - 0.0016	ND	NA	No Screening Level	NULL	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 3	0.0014 - 0.0019	ND	NA	0.034	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 3	0.0012 - 0.0017	ND	NA	No Screening Level	NULL	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 3	0.0013 - 0.0018	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 3	0.0013 - 0.0018	ND	NA	No Screening Level	NULL	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 3	0.0014 - 0.002	ND	NA	No Screening Level	NULL	N	BSL-ND
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 3	0.00093 - 0.0013	ND	NA	0.57	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 3	0.0013 - 0.0018	ND	NA	0.13	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 3	0.002 - 0.0028	ND	NA	0.07	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 3	0.0022 - 0.003	ND	NA	32	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 3	0.0014 - 0.0019	ND	NA	0.19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 3	0.0015 - 0.0021	ND	NA	2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 3	0.0011 - 0.0015	ND	NA	1.9	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 3	0.03 - 0.042	ND	NA	0.49	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 3	0.0023 - 0.0031	ND	NA	No Screening Level	NULL	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 3	0.014 - 0.019	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 3	0.014 - 0.019	ND	NA	0.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 3	0.014 - 0.019	ND	NA	0.17	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 3	0.014 - 0.019	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 3	0.014 - 0.019	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 3	0.014 - 0.02	ND	NA	0.12	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 3	0.014 - 0.02	ND	NA	0.24	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Table 2-37
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 3	0.014 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 3	0.014 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 3	0.014 - 0.02	ND	NA	No Screening Level	NULL	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 16	0.0018 - 0.1	ND	NA	2.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 16	0.013 - 0.38	ND	NA	5.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 16	0.017 - 0.15	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 16	0.003 - 0.14	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 16	0.0023 - 0.04	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 16	0.0032 - 0.033	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 16	0.0026 - 0.31	ND	NA	130	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 16	0.11 - 1.1	ND	NA	13	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 16	0.0021 - 0.056	ND	NA	1.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 16	0.0026 - 0.075	ND	NA	0.36	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 16	0.0019 - 0.032	ND	NA	480	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 16	0.0019 - 0.036	ND	NA	39	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 16	0.002 - 0.031	ND	NA	24	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 16	0.012 - 0.1	ND	NA	320	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 16	0.014 - 0.17	ND	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 16	0.0024 - 0.047	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 16	0.039 - 0.34	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.024 (J)	0.49 (J)	mg/kg	CFSDP-003	3 / 10	0.011 - 0.027	0.49	NA	No Screening Level	NULL	N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 16	0.011 - 0.092	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 16	0.072 - 0.63	ND	NA	0.51	USEPA RSL Res Soil (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 16	0.0029 - 0.044	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 16	0.002 - 0.06	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 16	0.0014 - 0.036	ND	NA	2.7	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 16	0.0025 - 0.042	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 16	0.002 - 0.053	ND	NA	25	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 16	0.029 - 0.68	ND	NA	No Screening Level	NULL	N	BSL-ND
	83-32-9	Acenaphthene	0.0004 (J)	0.033 (J)	mg/kg	CFSDP-027	4 / 16	0.0024 - 0.034	0.033	NA	360	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 16	0.00051 - 0.036	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	0.0088 (J)	0.0088 (J)	mg/kg	CFSDP-028	1 / 16	0.0023 - 0.031	0.0088	NA	780	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	0.0017 (J)	0.16 (J)	mg/kg	CFSDP-027	6 / 16	0.0022 - 0.13	0.16	NA	1800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 16	0.018 - 0.16	ND	NA	2.4	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	100-52-7	Benzaldehyde	0.02 (J)	0.085 (J)	mg/kg	CFSDP-028	3 / 12	0.032 - 0.11	0.085	NA	170	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	56-55-3	Benzo(A)Anthracene	0.0076 (J)	2.1	mg/kg	CFSDP-027	9 / 16	0.035 - 0.12	2.1	0.00316	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0089	0.87	mg/kg	CFSDP-027	10 / 16	0.0018 - 0.034	0.87	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c*	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.017	4.1	mg/kg	CFSDP-027	13 / 16	0.018 - 0.044	4.1	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0065 (J)	1.2	mg/kg	CFSDP-027	11 / 16	0.026 - 0.065	1.2	NA	No Screening Level	NULL	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0079 (J)	1.3	mg/kg	CFSDP-027	11 / 16	0.018 - 0.049	1.3	NA	11	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	192-97-2	Benzo[E]Pyrene	0.02	0.26 (J)	mg/kg	CFSDP-028	4 / 4	NA	0.26	#N/A	No Screening Level	NULL	N	NSL
	85-68-7	Benzyl Butyl Phthalate	0.044 (J)	0.044 (J)	mg/kg	CFSDP-027	1 / 16	0.013 - 0.25	0.044	NA	290	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 16	0.0018 - 0.12	ND	NA	4.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 16	0.002 - 0.044	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 16	0.0015 - 0.033	ND	NA	0.23	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 16	0.0031 - 0.058	ND	NA	310	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.26 (J)	0.26 (J)	mg/kg	CFSDP-027	1 / 16	0.016 - 0.39	0.26	NA	39	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 16	0.027 - 0.24	ND	NA	3100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	0.0041 (J)	0.36 (J)	mg/kg	CFSDP-027	8 / 16	0.011 - 0.035	0.36	NA	No Screening Level	NULL	N	NSL
	218-01-9	Chrysene	0.025	4.9	mg/kg	CFSDP-027	13 / 16	0.012 - 0.031	4.9	0.0038	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 16	0.012 - 0.16	ND	NA	630	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	117-84-0	Di-N-Octylphthalate	0.084 (J)	0.084 (J)	mg/kg	CFSDP-027	1 / 16	0.021 - 0.21	0.084	NA	63	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0033	0.41	mg/kg	CFSDP-027	7 / 16	0.0019 - 0.073	0.41	NA	0.11	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0046 (J)	0.021 (J)	mg/kg	CFSDP-027	3 / 16	0.0018 - 0.043	0.021	NA	7.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 16	0.012 - 0.11	ND	NA	5100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 16	0.0015 - 0.041	ND	NA	No Screening Level	NULL	N	BSL-ND
	206-44-0	Fluoranthene	0.025	6.5	mg/kg	CFSDP-027	13 / 16	0.013 - 0.033	6.5	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	86-73-7	Fluorene	0.03 (J)	0.03 (J)	mg/kg	CFSDP-027	1 / 16	0.00075 - 0.031	0.03	NA	240	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 16	0.003 - 0.057	ND	NA	0.21	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 16	0.0024 - 0.04	ND	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL

Table 2-37
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 16	0.0021 - 0.088	ND	NA	0.18	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 16	0.0022 - 0.051	ND	NA	1.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0059 (J)	1.5	mg/kg	CFSDP-027	12 / 16	0.03 - 0.075	1.5	NA	1.1	USEPA RSL Res Soil (THQ=0.1), c	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 16	0.0021 - 0.03	ND	NA	570	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 16	0.0028 - 0.047	ND	NA	0.078	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 16	0.014 - 0.13	ND	NA	110	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	0.016 (J)	0.019 (J)	mg/kg	CFSDP-027	2 / 16	0.00078 - 0.036	0.019	NA	3.8	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 16	0.013 - 0.13	ND	NA	5.1	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 16	0.05 - 0.58	ND	NA	1	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	198-55-0	Perylene	0.004	0.035	mg/kg	CFSDP-027	4 / 4	NA	0.035	#N/A	No Screening Level	NULL	N	NSL
	85-01-8	Phenanthrene	0.0048 (J)	1	mg/kg	CFSDP-027	12 / 16	0.012 - 0.037	1	0.00226	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 16	0.013 - 0.11	ND	NA	1900	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	0.018	6.8	mg/kg	CFSDP-027	13 / 16	0.02 - 0.051	6.8	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 7	0.00024 - 0.00071	ND	NA	810	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 7	0.00022 - 0.00065	ND	NA	0.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 7	0.00031 - 0.00092	ND	NA	670	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 7	0.00018 - 0.00054	ND	NA	0.15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 7	0.00021 - 0.00063	ND	NA	3.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 7	0.00023 - 0.00069	ND	NA	23	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 7	0.00018 - 0.00055	ND	NA	6.3	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 7	9.4e-005 - 0.00028	ND	NA	5.8	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 7	0.00047 - 0.0014	ND	NA	0.0053	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 7	0.00018 - 0.00055	ND	NA	0.036	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.00015 - 0.00044	ND	NA	180	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 7	0.0003 - 0.00091	ND	NA	0.46	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 7	0.00043 - 0.0013	ND	NA	1.6	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.00016 - 0.00049	ND	NA	No Screening Level	NULL	N	BSL-ND
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 7	0.0001 - 0.00031	ND	NA	2.6	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 7	0.0008 - 0.0024	ND	NA	20	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-64-1	Acetone	0.02	0.089	mg/kg	CFSDP-004	7 / 7	NA	0.089	NA	6100	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	71-43-2	Benzene	0.00085 (J)	0.0035	mg/kg	CFSDP-004	7 / 7	NA	0.0035	NA	1.2	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 7	0.00029 - 0.00086	ND	NA	15	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 7	0.00026 - 0.00079	ND	NA	0.29	USEPA RSL Res Soil (THQ=0.1), c	N	BSL
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 7	0.00043 - 0.0013	ND	NA	19	USEPA RSL Res Soil (THQ=0.1), c**	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 7	0.00048 - 0.0014	ND	NA	0.68	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	0.00045 (J)	0.014	mg/kg	CFSDP-003	7 / 7	NA	0.014	NA	77	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 7	0.00018 - 0.00055	ND	NA	0.65	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 7	0.00018 - 0.00054	ND	NA	28	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 7	0.00053 - 0.0016	ND	NA	1400	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 7	0.00033 - 0.00098	ND	NA	0.32	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 7	0.00044 - 0.0013	ND	NA	11	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 7	0.00016 - 0.00046	ND	NA	16	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 7	0.00028 - 0.00083	ND	NA	No Screening Level	NULL	N	BSL-ND
	110-82-7	Cyclohexane	0.0011 (J)	0.0039	mg/kg	CFSDP-004	7 / 7	NA	0.0039	NA	650	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 7	0.0002 - 0.00059	ND	NA	8.3	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 7	0.00034 - 0.001	ND	NA	8.7	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	0.00034 (J)	0.0016 (J)	mg/kg	CFSDP-004	7 / 7	NA	0.0016	NA	5.8	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 7	0.00013 - 0.00039	ND	NA	190	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	0.00065 (J)	0.0043	mg/kg	CFSDP-004	7 / 7	NA	0.0043	NA	No Screening Level	NULL	N	NSL
	79-20-9	Methyl Acetate	0.11	0.11	mg/kg	CFSDP-004	1 / 7	0.0044 - 0.006	0.11	NA	7800	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	0.0025 (J+)	0.013	mg/kg	CFSDP-003	7 / 7	NA	0.013	NA	2700	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 7	0.00068 - 0.002	ND	NA	3300	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	0.0021	0.0085	mg/kg	CFSDP-004	7 / 7	NA	0.0085	NA	No Screening Level	NULL	N	NSL
	75-09-2	Methylene Chloride	0.0011 (J)	0.0011 (J)	mg/kg	CFSDP-004	1 / 7	0.00017 - 0.00023	0.0011	NA	35	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	0.00019 (J)	0.0012 (J)	mg/kg	CFSDP-004	7 / 7	NA	0.0012	NA	65	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 7	0.00013 - 0.00038	ND	NA	600	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 7	0.00013 - 0.00038	ND	NA	47	USEPA RSL Res Soil (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.00021 (J)	0.00021 (J)	mg/kg	CFSDP-005	1 / 7	0.00015 - 0.00044	0.00021	NA	8.1	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	108-88-3	Toluene	0.0019	0.011	mg/kg	CFSDP-004	7 / 7	NA	0.011	NA	490	USEPA RSL Res Soil (THQ=0.1), n	N	BSL

Table 2-37
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Sediment	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 7	0.00025 - 0.00075	ND	NA	160	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 7	0.00027 - 0.00081	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 7	0.00015 - 0.00044	ND	NA	0.41	USEPA RSL Res Soil (THQ=0.1), n	N	BSL
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 7	0.00041 - 0.0012	ND	NA	2300	USEPA RSL Res Soil (THQ=0.1), ns	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 7	0.00056 - 0.0017	ND	NA	0.059	USEPA RSL Res Soil (THQ=0.1), c	N	BSL

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-38
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Backwater Seep Sampling Area, Fish)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Sampling Area
Exposure Medium: Fish Within the Backwater Seep Sampling Area

Exposure Point	CAS Number	Chemical	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Bioconcentration Factor	Concentration Used for Screening (1)	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Surface Water	57-12-5	Cyanide	378	µg/l	CFSWP-029	29 / 31	2 - 2	NA	NA	0.228	USEPA RSL Fish Ingestion, nc	NA	No BCF
	FREE CN	Cyanide (Free)	140	µg/l	CFSWP-029	23 / 25	1.5 - 1.5	NA	NA	0.228	USEPA RSL Fish Ingestion, nc	NA	No BCF
	16984-48-8	Fluoride	2640	µg/l	CFSWP-005	31 / 31	NA	10	26.4	15.2	USEPA RSL Fish Ingestion, nc	Y	ASL
	7440-38-2	Arsenic	0.99	µg/l	CFSWP-029	4 / 31	0.64 - 0.77	300	0.297	0.00681	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	7440-48-4	Cobalt	1.7	µg/l	CFSWP-004	7 / 31	1.3 - 1.3	300	0.51	0.114	USEPA RSL Fish Ingestion, nc	Y	ASL
	7439-89-6	Iron	1620	µg/l	CFSWP-004	30 / 31	45.7 - 45.7	200	324	265	USEPA RSL Fish Ingestion, nc	Y	ASL
	7439-96-5	Manganese	405	µg/l	CFSWP-029	29 / 31	2.5 - 2.5	400	162	53.1	USEPA RSL Fish Ingestion, nc diet	Y	ASL
	56-55-3	Benzo(A)Anthracene	0.043	µg/l	CFSWP-029	2 / 11	0.0028 - 0.57	260	0.01118	0.102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.022	µg/l	CFSWP-029	1 / 11	0.0024 - 0.17	5147	0.113234	0.0102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	CFSWP-029	2 / 11	0.0042 - 0.46	3024	0.244944	0.102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen
	117-81-7	Bis(2-Ethylhexyl) Phthalate	8.6	µg/l	CFSWP-027	3 / 11	0.72 - 4.3	588	5.0568	0.729	USEPA RSL Fish Ingestion, nc	Y	ASL
	53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	CFSWP-029	1 / 11	0.005 - 0.094	9596	0.0633336	0.0102	USEPA RSL Fish Ingestion, ca	Y	Carcinogen

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundawter = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-39
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater -Western Undeveloped Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Western Undeveloped Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	57-12-5	Cyanide	2.6 (J)	22.1	µg/l	CFMW-071	3 / 26	2 - 2	22.1	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.7 (J-)	2.2 (J)	µg/l	CFMW-056B	2 / 17	1.5 - 1.5	2.2	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	59.5 (J)	1050	µg/l	CFMW-071	19 / 26	12 - 12	1050	NA	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	15 (J)	619	µg/l	CFMW-059	18 / 19	18.2 - 18.2	619	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-36-0	Antimony	0.64 (J)	1.1 (J)	µg/l	CFMW-065	3 / 19	0.62 - 0.62	1.1	NA	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	ND	ND	ND	ND	0 / 19	0.64 - 0.77	ND	NA	0.052	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7440-39-3	Barium	116	261	µg/l	CFMW-065	19 / 19	NA	261	NA	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	ND	ND	ND	ND	0 / 19	0.24 - 0.26	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 19	0.61 - 0.71	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	60200	81000	µg/l	CFMW-065	19 / 19	NA	81000	NA	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	ND	ND	ND	ND	0 / 19	1.3 - 1.3	ND	NA	100	MDEQ Circular DEQ-7, t	N	BSL
	7440-48-4	Cobalt	ND	ND	ND	ND	0 / 19	1.3 - 1.3	ND	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-50-8	Copper	1.9 (J)	4.7 (J)	µg/l	CFMW-068	4 / 19	1.4 - 1.9	4.7	NA	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	47.1 (J)	940	µg/l	CFMW-059	13 / 19	42.4 - 45.7	940	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-92-1	Lead	0.57 (J)	0.73 (J)	µg/l	CFMW-059	3 / 19	0.37 - 0.38	0.73	NA	15	USEPA RSL Tapwater (THQ=0.1), L	N	BSL
	7439-95-4	Magnesium	13600	19100	µg/l	CFMW-071	19 / 19	NA	19100	NA	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	3 (J)	82.2	µg/l	CFMW-057b	15 / 19	2.5 - 2.7	82.2	NA	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 19	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	ND	ND	ND	ND	0 / 19	1.3 - 1.4	ND	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	602	2650	µg/l	CFMW-071	19 / 19	NA	2650	NA	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	ND	ND	ND	ND	0 / 19	0.69 - 0.73	ND	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 19	1.3 - 1.4	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	2840	21600	µg/l	CFMW-059	19 / 19	NA	21600	NA	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 19	0.24 - 0.26	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	ND	ND	ND	ND	0 / 19	1.2 - 1.9	ND	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-66-6	Zinc	9.1 (J)	145	µg/l	CFMW-071	8 / 19	5.4 - 7	145	NA	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 11	0.048 - 0.054	ND	NA	0.03	USEPA MCLs, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 11	0.18 - 0.2	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 11	0.042 - 0.047	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.056 - 0.064	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.063 - 0.071	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 11	0.047 - 0.053	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 11	0.038 - 0.043	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 11	1.4 - 1.6	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.047 - 0.053	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.056 - 0.063	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 11	0.055 - 0.061	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 11	0.059 - 0.067	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 11	0.057 - 0.065	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 11	0.1 - 0.11	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 11	0.19 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 11	0.056 - 0.064	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 11	0.54 - 0.61	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 11	0.062 - 0.07	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 11	1.4 - 1.5	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.058 - 0.066	ND	NA	No Screening Level	NULL	N	BSL-ND

Table 2-39
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater -Western Undeveloped Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Western Undeveloped Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 11	0.056 - 0.064	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 11	0.041 - 0.046	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.056 - 0.064	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 11	0.054 - 0.06	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 11	0.13 - 0.15	ND	NA	50	MDEQ Circular DEQ-7, t	N	BSL
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 11	0.06 - 0.068	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 11	0.06 - 0.068	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 11	0.057 - 0.065	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 11	0.045 - 0.051	ND	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 11	0.17 - 0.19	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 11	0.1 - 0.12	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	ND	ND	ND	ND	0 / 11	0.069 - 0.078	ND	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	50-32-8	Benzo(A)Pyrene	ND	ND	ND	ND	0 / 11	0.049 - 0.055	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	205-99-2	Benzo(B)Fluoranthene	ND	ND	ND	ND	0 / 11	0.09 - 0.1	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	191-24-2	Benzo(G,H,I)Perylene	ND	ND	ND	ND	0 / 11	0.064 - 0.072	ND	NA	No Screening Level	NULL	N	BSL-ND
	207-08-9	Benzo(K)Fluoranthene	ND	ND	ND	ND	0 / 11	0.081 - 0.092	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	0.44 (J)	1 (U)	µg/l	CFMW-071	6 / 11	0.43 - 0.48	1	NA	1	USEPA MCLs, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 11	0.055 - 0.061	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 11	0.062 - 0.07	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 11	0.037 - 0.042	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 11	0.054 - 0.06	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	73 (D)	73 (D)	µg/l	CFMW-069	1 / 11	4.3 - 4.8	73	NA	5.6	USEPA RSL Tapwater (THQ=0.1), c**	Y	ASL
	105-60-2	Caprolactam	0.52 (J)	0.89 (J)	µg/l	CFMW-071	4 / 11	0.44 - 0.49	0.89	NA	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 11	0.047 - 0.053	ND	NA	No Screening Level	NULL	N	BSL-ND
	218-01-9	Chrysene	ND	ND	ND	ND	0 / 11	0.075 - 0.084	ND	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 11	0.69 - 0.77	ND	NA	20	USEPA MCLs, t	N	BSL
	117-84-0	Di-N-Octylphthalate	1 (U)	1 (U)	µg/l	CFMW-071	1 / 11	0.63 - 0.71	1	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 11	0.067 - 0.075	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 11	0.068 - 0.076	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 11	0.53 - 0.59	ND	NA	600	USEPA MCLs, t	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 11	0.052 - 0.058	ND	NA	2000	MDEQ Circular DEQ-7, t	N	BSL
	206-44-0	Fluoranthene	ND	ND	ND	ND	0 / 11	0.056 - 0.063	ND	NA	20	MDEQ Circular DEQ-7, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 11	0.064 - 0.072	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 11	0.052 - 0.058	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 11	0.064 - 0.072	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 11	0.46 - 0.52	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 11	0.057 - 0.065	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	ND	ND	ND	ND	0 / 11	0.079 - 0.089	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 11	0.05 - 0.056	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 11	0.066 - 0.074	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 11	0.11 - 0.12	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	0.18 (J)	0.18 (J)	µg/l	CFMW-065	1 / 11	0.055 - 0.059	0.18	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	Y	ASL
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 11	0.15 - 0.17	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 11	0.22 - 0.25	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	0.056 (J)	0.19 (U)	µg/l	CFMW-071	3 / 11	0.051 - 0.057	0.19	NA	No Screening Level	NULL	N	NSL
	108-95-2	Phenol	ND	ND	ND	ND	0 / 11	0.091 - 0.1	ND	NA	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	ND	ND	ND	ND	0 / 11	0.05 - 0.056	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 11	0.24 - 0.24	ND	NA	200	MDEQ Circular DEQ-7, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 11	0.37 - 0.37	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 11	0.31 - 0.31	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 11	0.43 - 0.43	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 11	0.26 - 0.26	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 11	0.12 - 0.12	ND	NA	7	MDEQ Circular DEQ-7, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 11	0.36 - 0.36	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 11	0.37 - 0.37	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 11	0.38 - 0.38	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Table 2-39
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater -Western Undeveloped Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Western Undeveloped Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 11	0.5 - 0.5	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 11	0.43 - 0.43	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 11	0.43 - 0.43	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 11	0.35 - 0.35	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 11	0.34 - 0.34	ND	NA	600	MDEQ Circular DEQ-7, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 11	0.76 - 0.76	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 11	2.9 - 2.9	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	6.1	6.1	µg/l	CFMW-071	1 / 11	5 - 5	6.1	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 11	0.43 - 0.43	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 11	0.41 - 0.41	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 11	0.34 - 0.34	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 11	0.54 - 0.54	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 11	1 - 1	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-15-0	Carbon Disulfide	ND	ND	ND	ND	0 / 11	0.16 - 0.16	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 11	0.21 - 0.21	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 11	0.38 - 0.38	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 11	0.32 - 0.32	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 11	0.33 - 0.33	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 11	0.14 - 0.14	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 11	0.22 - 0.22	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 11	0.46 - 0.46	ND	NA	4	MDEQ Circular DEQ-7, c	N	BSL
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 11	0.32 - 0.32	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 11	0.28 - 0.28	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 11	0.12 - 0.12	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 11	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 11	0.34 - 0.34	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 11	0.3 - 0.3	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 11	0.31 - 0.31	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 11	1.9 - 1.9	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 11	2.7 - 2.7	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 11	0.26 - 0.26	ND	NA	No Screening Level	NULL	N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 11	0.32 - 0.32	ND	NA	5	MDEQ Circular DEQ-7, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 11	0.36 - 0.36	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 11	0.42 - 0.42	ND	NA	100	MDEQ Circular DEQ-7, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 11	0.47 - 0.47	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 11	0.25 - 0.25	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 11	0.38 - 0.38	ND	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 11	0.24 - 0.24	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 11	0.49 - 0.49	ND	NA	2	MDEQ Circular DEQ-7, c	N	BSL

Table 2-39
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater -Western Undeveloped Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Western Undeveloped Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 11	0.31 - 0.31	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 11	0.14 - 0.14	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 11	0.17 - 0.17	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c		

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundwater = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-40
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater - Plume Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Plume Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	57-12-5	Cyanide	2 (J)	10800	µg/l	CFMW-010	175 / 183	2 - 2	10800	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	1.6 (J)	306	µg/l	CFMW-002	105 / 123	1.5 - 1.5	306	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	25.5 (J)	52900	µg/l	CFMW-015	182 / 183	60 - 60	52900	NA	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	15.4 (J)	4230 (J)	µg/l	CFMW-028A	61 / 96	15 - 18.2	4230	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	0.66 (J)	4.4	µg/l	CFMW-016A	19 / 96	0.62 - 0.62	4.4	NA	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.66 (J)	82.1	µg/l	CFMW-015	25 / 96	0.64 - 7.7	82.1	NA	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	35.5	331	µg/l	CFMW-010	96 / 96	NA	331	NA	380	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-41-7	Beryllium	0.26 (J)	0.26 (J)	µg/l	CFMW-028A	1 / 96	0.24 - 0.26	0.26	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 96	0.61 - 0.71	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	1990	76000	µg/l	CFMW-021	96 / 96	NA	76000	NA	No Screening Level	NULL	N	NSL
	7440-47-3	Chromium, Total	1.3 (J)	5.7	µg/l	CFMW-028A	26 / 96	1.3 - 1.3	5.7	NA	100	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7440-48-4	Cobalt	1.3 (J)	39.5	µg/l	CFMW-015	42 / 96	1.3 - 1.3	39.5	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	1.5 (J)	977	µg/l	CFMW-042	50 / 96	1.4 - 1.9	977	NA	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-89-6	Iron	46.4 (J)	20400	µg/l	CFMW-044	91 / 96	42.4 - 45.7	20400	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	0.37 (J)	4.3 (J)	µg/l	CFMW-028A	12 / 96	0.37 - 0.38	4.3	NA	15	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	7439-95-4	Magnesium	1790	32200	µg/l	CFMW-010	96 / 96	NA	32200	NA	No Screening Level	NULL	N	NSL
	7439-96-5	Manganese	2.5 (J)	829	µg/l	CFMW-044	49 / 96	2.5 - 2.7	829	NA	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	0.13 (J)	0.13 (J)	µg/l	CFMW-015	1 / 96	0.12 - 0.17	0.13	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-02-0	Nickel	1.3 (J)	10.2	µg/l	CFMW-015	15 / 96	1.3 - 1.4	10.2	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	296	4550	µg/l	CFMW-047	96 / 96	NA	4550	NA	No Screening Level	NULL	N	NSL
	7782-49-2	Selenium	0.74 (J)	13	µg/l	CFMW-015	15 / 96	0.69 - 6.9	13	NA	10	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 96	1.3 - 1.4	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	1880	834000	µg/l	CFMW-012	96 / 96	NA	834000	NA	No Screening Level	NULL	N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 96	0.24 - 0.26	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	1.4 (J)	481	µg/l	CFMW-012	20 / 96	1.2 - 1.9	481	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-66-6	Zinc	6 (J)	56	µg/l	CFMW-045	32 / 96	5.4 - 7	56	NA	600	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.0047	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 8	0.11 - 0.11	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 8	0.11 - 0.11	ND	NA	0.0078	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 8	0.11 - 0.11	ND	NA	No Screening Level	NULL	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 8	0.11 - 0.11	ND	NA	No Screening Level	NULL	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 8	0.12 - 0.12	ND	NA	0.5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 105	0.43 - 0.47	ND	NA	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 105	3.1 - 3.4	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 105	0.69 - 0.75	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 105	0.49 - 0.53	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 105	0.53 - 0.58	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 105	0.63 - 0.68	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 105	0.91 - 0.99	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 105	2.4 - 2.6	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 105	1 - 1.1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 105	0.88 - 0.96	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 105	0.61 - 0.66	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 105	0.74 - 0.8	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 105	0.88 - 0.96	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 105	1.3 - 1.4	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 105	0.65 - 0.71	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 105	0.59 - 0.64	ND	NA	No Screening Level	NULL	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 104	1 - 1.1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	34	42	µg/l	CFMW-044	2 / 105	0.88 - 0.96	42	NA	No Screening Level	NULL	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 104	0.82 - 0.89	ND	NA	No Screening Level	NULL	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 105	2 - 2.2	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND

Table 2-40
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater - Plume Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Plume Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 105	1 - 1.1	ND	NA	No Screening Level	NULL	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 105	0.76 - 0.83	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 105	0.73 - 0.79	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 105	0.96 - 1	ND	NA	No Screening Level	NULL	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 104	0.48 - 0.52	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 105	4.7 - 5.1	ND	NA	50	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 105	0.88 - 0.96	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 105	0.65 - 0.71	ND	NA	No Screening Level	NULL	N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 105	1 - 1.1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 105	0.57 - 0.62	ND	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 105	0.77 - 0.84	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 105	0.86 - 0.93	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	ND	ND	ND	ND	0 / 105	0.55 - 0.6	ND	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	50-32-8	Benzo(A)Pyrene	ND	ND	ND	ND	0 / 105	0.16 - 0.17	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	205-99-2	Benzo(B)Fluoranthene	ND	ND	ND	ND	0 / 105	0.44 - 0.48	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	191-24-2	Benzo(G,H,I)Perylene	ND	ND	ND	ND	0 / 105	0.75 - 0.82	ND	NA	No Screening Level	NULL	N	BSL-ND
	207-08-9	Benzo(K)Fluoranthene	ND	ND	ND	ND	0 / 105	0.18 - 0.2	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 105	0.6 - 0.65	ND	NA	1	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 105	0.63 - 0.68	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 105	0.69 - 0.75	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 105	0.12 - 0.13	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 105	0.93 - 1	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	1.1 (J)	1.2 (J)	µg/l	CFMW-022	2 / 105	0.72 - 0.78	1.2	NA	5.6	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 105	1.1 - 1.1	ND	NA	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 105	0.85 - 0.92	ND	NA	No Screening Level	NULL	N	BSL-ND
	218-01-9	Chrysene	ND	ND	ND	ND	0 / 105	0.67 - 0.73	ND	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	1.2 (J)	1.3 (J)	µg/l	CFMW-031	2 / 105	0.82 - 0.89	1.3	NA	20	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 105	0.69 - 0.75	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 105	0.09 - 0.098	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 105	0.85 - 0.92	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 105	1 - 1.1	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 105	0.98 - 1.1	ND	NA	2000	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	206-44-0	Fluoranthene	ND	ND	ND	ND	0 / 105	0.72 - 0.78	ND	NA	20	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 105	0.8 - 0.87	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 105	0.47 - 0.51	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 105	0.76 - 0.83	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 105	0.61 - 0.66	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 105	0.09 - 0.098	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	ND	ND	ND	ND	0 / 105	0.21 - 0.23	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 105	0.67 - 0.73	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 105	0.83 - 0.9	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 105	0.74 - 0.8	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 105	0.8 - 0.87	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 105	0.49 - 0.53	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 91	2.2 - 2.4	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	ND	ND	ND	ND	0 / 105	0.65 - 0.71	ND	NA	No Screening Level	NULL	N	BSL-ND
	108-95-2	Phenol	1.6 (J)	3.9 (J)	µg/l	CFMW-044	2 / 105	0.41 - 0.45	3.9	NA	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	ND	ND	ND	ND	0 / 105	0.83 - 0.9	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 105	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 105	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 105	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 105	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 105	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 105	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 105	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 105	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-40
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater - Plume Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Plume Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 105	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 105	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	ND	ND	ND	ND	0 / 105	0.25 - 0.25	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 105	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 105	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7 Groundwater, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 105	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 105	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	2.8 (J)	10	µg/l	CFMW-047	5 / 105	1.1 - 1.1	10	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 105	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 105	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 105	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 105	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 105	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	3	3	µg/l	CFMW-047	1 / 105	0.22 - 0.22	3	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 105	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 105	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 105	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 105	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 105	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 105	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	ND	ND	ND	ND	0 / 105	0.14 - 0.14	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 105	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 105	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 105	0.28 - 0.28	ND	NA	No Screening Level	NULL	N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 105	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 105	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 105	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	No Screening Level	NULL	N	BSL-ND
	75-09-2	Methylene Chloride	0.51 (J)	1.8	µg/l	CFMW-015	4 / 105	0.21 - 0.21	1.8	NA	5	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 105	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 105	0.17 - 0.17	ND	NA	100	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 105	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	0.14 (J)	0.69 (J)	µg/l	CFMW-021	10 / 105	0.12 - 0.12	0.69	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	0.66 (J)	2.2	µg/l	CFMW-047	2 / 105	0.25 - 0.25	2.2	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 105	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 105	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7 Groundwater, c	N	BSL
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 105	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-40
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Upper Hydrogeologic Unit Groundwater - Plume Area)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Upper Hydrogeologic Unit Plume Area Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 105	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 105	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundwater = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-41
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Below Upper Hydrogeologic Unit Groundwater)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Below Upper Hydrogeologic Unit Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	57-12-5	Cyanide	2.1 (J)	13.9	µg/l	CFMW-044B	14 / 83	2 - 2	13.9	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	FREE CN	Cyanide (Free)	2 (J-)	3.9 (J)	µg/l	CFMW-025A	6 / 33	1.5 - 1.5	3.9	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	16984-48-8	Fluoride	22.3 (J)	762 (J-)	µg/l	CFMW-053A	76 / 83	12 - 15	762	NA	80	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7429-90-5	Aluminum	16.7 (J)	6370	µg/l	CFMW-025A	32 / 39	15 - 18.2	6370	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-36-0	Antimony	0.64 (J)	70.7	µg/l	CFMW-053A	13 / 39	0.62 - 0.62	70.7	NA	0.78	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-38-2	Arsenic	0.64 (J)	6.2	µg/l	CFMW-003A	22 / 39	0.64 - 0.77	6.2	NA	0.052	USEPA RSL Tapwater (THQ=0.1), c*	Y	Carcinogen
	7440-39-3	Barium	21	2310	µg/l	CFMW-053A	39 / 39	NA	2310	NA	380	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-41-7	Beryllium	0.38 (J)	0.38 (J)	µg/l	CFMW-025A	1 / 39	0.24 - 0.26	0.38	NA	2.5	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-43-9	Cadmium	ND	ND	ND	ND	0 / 39	0.61 - 0.71	ND	NA	0.92	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-70-2	Calcium	8830	602000	µg/l	CFMW-053A	39 / 39	NA	602000	NA	No Screening Level		N	NSL
	7440-47-3	Chromium, Total	1.3 (J)	20.4	µg/l	CFMW-057A	19 / 39	1.3 - 1.3	20.4	NA	100	MDEQ Circular DEQ-7, t	N	BSL
	7440-48-4	Cobalt	1.8 (J)	4.4	µg/l	CFMW-025A	2 / 39	1.3 - 1.3	4.4	NA	0.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-50-8	Copper	1.4 (J)	31	µg/l	CFMW-053A	31 / 39	1.4 - 1.9	31	NA	80	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7439-89-6	Iron	60.5 (J)	17400	µg/l	CFMW-057	37 / 39	45.7 - 45.7	17400	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-92-1	Lead	0.38 (J)	26.8	µg/l	CFMW-053A	26 / 39	0.37 - 0.38	26.8	NA	15	USEPA RSL Tapwater (THQ=0.1), L	N	Lead
	7439-95-4	Magnesium	66.9 (J)	26200	µg/l	CFMW-025A	36 / 39	63.6 - 65.7	26200	NA	No Screening Level		N	NSL
	7439-96-5	Manganese	3.8 (J)	1810	µg/l	CFMW-003A	32 / 39	2.5 - 2.7	1810	NA	43	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7439-97-6	Mercury	ND	ND	ND	ND	0 / 39	0.12 - 0.17	ND	NA	0.063	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-02-0	Nickel	1.5 (J)	23.8	µg/l	CFMW-053A	11 / 39	1.3 - 1.4	23.8	NA	39	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-09-7	Potassium	665	121000	µg/l	CFMW-032A	39 / 39	NA	121000	NA	No Screening Level		N	NSL
	7782-49-2	Selenium	0.98 (J)	0.98 (J)	µg/l	CFMW-057A	1 / 39	0.69 - 0.73	0.98	NA	10	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-22-4	Silver	ND	ND	ND	ND	0 / 39	1.3 - 1.4	ND	NA	9.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	7440-23-5	Sodium	3750	77600	µg/l	CFMW-032A	39 / 39	NA	77600	NA	No Screening Level		N	NSL
	7440-28-0	Thallium	ND	ND	ND	ND	0 / 39	0.24 - 0.26	ND	NA	0.02	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	7440-62-2	Vanadium	1.2 (J)	9.9	µg/l	CFMW-057A	9 / 39	1.2 - 1.9	9.9	NA	8.6	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	7440-66-6	Zinc	5.7 (J)	907	µg/l	CFMW-056	29 / 39	5.4 - 7	907	NA	600	USEPA RSL Tapwater (THQ=0.1), n	Y	ASL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 4	0.43 - 0.45	ND	NA	0.03	USEPA MCLs, t w/BCF>300,	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 4	3.1 - 3.3	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 4	0.69 - 0.73	ND	NA	24	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 4	0.49 - 0.52	ND	NA	120	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 4	0.53 - 0.56	ND	NA	1.2	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 4	0.63 - 0.66	ND	NA	4.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 4	0.91 - 0.96	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 4	2.4 - 2.5	ND	NA	3.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 4	1 - 1.1	ND	NA	0.24	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 4	0.88 - 0.93	ND	NA	0.049	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 4	0.61 - 0.64	ND	NA	75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 4	0.74 - 0.78	ND	NA	9.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	0 / 4	0.88 - 0.93	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 4	1.3 - 1.4	ND	NA	93	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 4	0.65 - 0.69	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 4	0.59 - 0.62	ND	NA	No Screening Level		N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 4	1 - 1.1	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	1.4 (J)	1.4 (J)	µg/l	CFMW-044B	1 / 4	0.88 - 0.88	1.4	NA	No Screening Level		N	NSL
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 4	0.82 - 0.86	ND	NA	No Screening Level		N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 4	2 - 2.1	ND	NA	0.15	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 4	1 - 1.1	ND	NA	No Screening Level		N	BSL-ND

Table 2-41
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Below Upper Hydrogeologic Unit Groundwater)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Below Upper Hydrogeologic Unit Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 4	0.76 - 0.8	ND	NA	140	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 4	0.73 - 0.77	ND	NA	0.37	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 4	0.96 - 1	ND	NA	No Screening Level		N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 4	0.48 - 0.51	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 4	4.7 - 4.9	ND	NA	50	MDEQ Circular DEQ-7, t	N	BSL
	83-32-9	Acenaphthene	ND	ND	ND	ND	0 / 4	0.88 - 0.93	ND	NA	53	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	208-96-8	Acenaphthylene	ND	ND	ND	ND	0 / 4	0.65 - 0.69	ND	NA	No Screening Level		N	BSL-ND
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 4	1 - 1.1	ND	NA	190	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-12-7	Anthracene	ND	ND	ND	ND	0 / 4	0.57 - 0.6	ND	NA	180	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 4	0.77 - 0.81	ND	NA	0.3	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 4	0.86 - 0.91	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	56-55-3	Benzo(A)Anthracene	ND	ND	ND	ND	0 / 4	0.55 - 0.58	ND	NA	0.03	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	50-32-8	Benzo(A)Pyrene	ND	ND	ND	ND	0 / 4	0.16 - 0.17	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	205-99-2	Benzo(B)Fluoranthene	ND	ND	ND	ND	0 / 4	0.44 - 0.46	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	191-24-2	Benzo(G,H,I)Perylene	ND	ND	ND	ND	0 / 4	0.75 - 0.79	ND	NA	No Screening Level		N	BSL-ND
	207-08-9	Benzo(K)Fluoranthene	ND	ND	ND	ND	0 / 4	0.18 - 0.19	ND	NA	2.5	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	85-68-7	Benzyl Butyl Phthalate	ND	ND	ND	ND	0 / 4	0.6 - 0.63	ND	NA	1	USEPA MCLs, c	N	BSL
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 4	0.63 - 0.66	ND	NA	0.083	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 4	0.69 - 0.73	ND	NA	5.9	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 4	0.12 - 0.13	ND	NA	0.014	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 4	0.93 - 0.98	ND	NA	71	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	ND	0 / 4	0.72 - 0.76	ND	NA	5.6	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 4	1.1 - 1.1	ND	NA	990	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	86-74-8	Carbazole	ND	ND	ND	ND	0 / 4	0.85 - 0.9	ND	NA	No Screening Level		N	BSL-ND
	218-01-9	Chrysene	ND	ND	ND	ND	0 / 4	0.67 - 0.71	ND	NA	25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	84-74-2	Di-N-Butyl Phthalate	ND	ND	ND	ND	0 / 4	0.82 - 0.86	ND	NA	20	USEPA MCLs, t	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 4	0.69 - 0.73	ND	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	ND	ND	ND	ND	0 / 4	0.09 - 0.095	ND	NA	0.025	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	132-64-9	Dibenzofuran	ND	ND	ND	ND	0 / 4	0.85 - 0.9	ND	NA	0.79	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 4	1 - 1.1	ND	NA	600	USEPA MCLs, t	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 4	0.98 - 1	ND	NA	2000	MDEQ Circular DEQ-7, t	N	BSL
	206-44-0	Fluoranthene	ND	ND	ND	ND	0 / 4	0.72 - 0.76	ND	NA	20	MDEQ Circular DEQ-7, t w/BCF>300,	N	BSL
	86-73-7	Fluorene	ND	ND	ND	ND	0 / 4	0.8 - 0.84	ND	NA	29	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 4	0.47 - 0.5	ND	NA	0.0098	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 4	0.76 - 0.8	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 4	0.61 - 0.64	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 4	0.09 - 0.095	ND	NA	0.33	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	ND	ND	ND	ND	0 / 4	0.21 - 0.22	ND	NA	0.25	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 4	0.67 - 0.71	ND	NA	78	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 4	0.83 - 0.88	ND	NA	0.011	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 4	0.74 - 0.78	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	91-20-3	Naphthalene	ND	ND	ND	ND	0 / 4	0.8 - 0.84	ND	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 4	0.49 - 0.52	ND	NA	0.14	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 4	2.2 - 2.3	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL-ND
	85-01-8	Phenanthrene	ND	ND	ND	ND	0 / 4	0.65 - 0.69	ND	NA	No Screening Level		N	BSL-ND
	108-95-2	Phenol	ND	ND	ND	ND	0 / 4	0.41 - 0.43	ND	NA	580	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	129-00-0	Pyrene	ND	ND	ND	ND	0 / 4	0.83 - 0.88	ND	NA	12	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-55-6	1,1,1-Trichloroethane	ND	ND	ND	ND	0 / 4	0.28 - 0.28	ND	NA	200	MDEQ Circular DEQ-7, t	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0 / 4	0.19 - 0.19	ND	NA	0.076	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	0 / 4	0.34 - 0.34	ND	NA	1000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	ND	ND	0 / 4	0.08 - 0.08	ND	NA	0.041	USEPA RSL Tapwater (THQ=0.1), n	N	BSL-ND
	75-34-3	1,1-Dichloroethane	ND	ND	ND	ND	0 / 4	0.24 - 0.24	ND	NA	2.8	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	75-35-4	1,1-Dichloroethene	ND	ND	ND	ND	0 / 4	0.34 - 0.34	ND	NA	7	MDEQ Circular DEQ-7, c	N	BSL
	87-61-6	1,2,3-Trichlorobenzene	ND	ND	ND	ND	0 / 4	0.35 - 0.35	ND	NA	0.7	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	ND	ND	0 / 4	0.27 - 0.27	ND	NA	0.4	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	96-12-8	1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	0 / 4	0.23 - 0.23	ND	NA	0.00033	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Table 2-41
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Below Upper Hydrogeologic Unit Groundwater)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Below Upper Hydrogeologic Unit Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	ND	ND	ND	ND	0 / 4	0.19 - 0.19	ND	NA	0.0075	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	95-50-1	1,2-Dichlorobenzene	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	30	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	107-06-2	1,2-Dichloroethane	0.28 (J)	0.28 (J)	µg/l	CFMW-044B	1 / 4	0.25 - 0.25	0.28	NA	0.17	USEPA RSL Tapwater (THQ=0.1), c**	Y	ASL
	78-87-5	1,2-Dichloropropane	ND	ND	ND	ND	0 / 4	0.18 - 0.18	ND	NA	0.82	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	ND	ND	0 / 4	0.33 - 0.33	ND	NA	600	MDEQ Circular DEQ-7, t	N	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	ND	ND	0 / 4	0.33 - 0.33	ND	NA	0.48	USEPA RSL Tapwater (THQ=0.1), c	N	BSL
	591-78-6	2-Hexanone	ND	ND	ND	ND	0 / 4	0.72 - 0.72	ND	NA	3.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-64-1	Acetone	4.9 (J)	4.9 (J)	µg/l	CFMW-044B	1 / 4	1.1 - 1.1	4.9	NA	1400	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	71-43-2	Benzene	ND	ND	ND	ND	0 / 4	0.09 - 0.09	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c**	N	BSL
	74-97-5	Bromochloromethane	ND	ND	ND	ND	0 / 4	0.3 - 0.3	ND	NA	8.3	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-27-4	Bromodichloromethane	ND	ND	ND	ND	0 / 4	0.15 - 0.15	ND	NA	0.13	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND
	75-25-2	Bromoform	ND	ND	ND	ND	0 / 4	0.18 - 0.18	ND	NA	3.3	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-83-9	Bromomethane	ND	ND	ND	ND	0 / 4	0.18 - 0.18	ND	NA	0.75	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-15-0	Carbon Disulfide	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	81	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	0 / 4	0.33 - 0.33	ND	NA	0.46	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	108-90-7	Chlorobenzene	ND	ND	ND	ND	0 / 4	0.24 - 0.24	ND	NA	7.8	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-00-3	Chloroethane	ND	ND	ND	ND	0 / 4	0.37 - 0.37	ND	NA	2100	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	67-66-3	Chloroform	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	0.22	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	74-87-3	Chloromethane	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-59-2	Cis-1,2-Dichloroethylene	ND	ND	ND	ND	0 / 4	0.26 - 0.26	ND	NA	3.6	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-01-5	Cis-1,3-Dichloropropene	ND	ND	ND	ND	0 / 4	0.16 - 0.16	ND	NA	4	MDEQ Circular DEQ-7, c	N	BSL
	110-82-7	Cyclohexane	ND	ND	ND	ND	0 / 4	0.26 - 0.26	ND	NA	1300	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	124-48-1	Dibromochloromethane	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	0.87	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	75-71-8	Dichlorodifluoromethane	0.81 (J)	3.5 (J)	µg/l	CFMW-044B	3 / 4	0.14 - 0.14	3.5	NA	20	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-41-4	Ethylbenzene	ND	ND	ND	ND	0 / 4	0.3 - 0.3	ND	NA	1.5	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	98-82-8	Isopropylbenzene (Cumene)	ND	ND	ND	ND	0 / 4	0.32 - 0.32	ND	NA	45	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	79601-23-1	M,P-Xylene	ND	ND	ND	ND	0 / 4	0.28 - 0.28	ND	NA	No Screening Level		N	BSL-ND
	79-20-9	Methyl Acetate	ND	ND	ND	ND	0 / 4	0.58 - 0.58	ND	NA	2000	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	78-93-3	Methyl Ethyl Ketone (2-Butanone)	ND	ND	ND	ND	0 / 4	2.2 - 2.2	ND	NA	560	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-10-1	Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	ND	ND	ND	ND	0 / 4	0.63 - 0.63	ND	NA	630	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-87-2	Methylcyclohexane	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	No Screening Level		N	BSL-ND
	75-09-2	Methylene Chloride	ND	ND	ND	ND	0 / 4	0.21 - 0.21	ND	NA	5	MDEQ Circular DEQ-7, c	N	BSL
	95-47-6	O-Xylene (1,2-Dimethylbenzene)	ND	ND	ND	ND	0 / 4	0.32 - 0.32	ND	NA	19	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	100-42-5	Styrene	ND	ND	ND	ND	0 / 4	0.17 - 0.17	ND	NA	100	MDEQ Circular DEQ-7, c	N	BSL
	1634-04-4	Tert-Butyl Methyl Ether	ND	ND	ND	ND	0 / 4	0.13 - 0.13	ND	NA	14	USEPA RSL Tapwater (THQ=0.1), c*	N	BSL
	127-18-4	Tetrachloroethylene (PCE)	ND	ND	ND	ND	0 / 4	0.12 - 0.12	ND	NA	4.1	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	108-88-3	Toluene	ND	ND	ND	ND	0 / 4	0.25 - 0.25	ND	NA	110	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	156-60-5	Trans-1,2-Dichloroethene	ND	ND	ND	ND	0 / 4	0.18 - 0.18	ND	NA	36	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	10061-02-6	Trans-1,3-Dichloropropene	ND	ND	ND	ND	0 / 4	0.19 - 0.19	ND	NA	2	MDEQ Circular DEQ-7, c	N	BSL
	79-01-6	Trichloroethylene (TCE)	ND	ND	ND	ND	0 / 4	0.22 - 0.22	ND	NA	0.28	USEPA RSL Tapwater (THQ=0.1), n	N	BSL

Table 2-41
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Below Upper Hydrogeologic Unit Groundwater)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Below Upper Hydrogeologic Unit Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (N/C) (2)		COPC Flag (Y/N) (3)	Rationale for Selection or Deletion (4)
Tapwater	75-69-4	Trichlorofluoromethane	ND	ND	ND	ND	0 / 4	0.15 - 0.15	ND	NA	520	USEPA RSL Tapwater (THQ=0.1), n	N	BSL
	75-01-4	Vinyl Chloride	ND	ND	ND	ND	0 / 4	0.06 - 0.06	ND	NA	0.019	USEPA RSL Tapwater (THQ=0.1), c	N	BSL-ND

Footnotes:

T = total
D = dissolved
NA = not applicable
ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Tapwater = USEPA RSL, Tapwater (June 2017, THQ = 0.1, TR = 1 x 10^{-6})
MDEQ Circular DEQ-7 Groundwater = MDEQ Circular 7 Groundwater Standard
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) COPC Flag
Y = Yes
N = No
(4) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available
Lead = refer to text for discussion on lead and exclusion as COPC at Site

Table 2-42
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	57-12-5	Cyanide	0.0420608 (J)	1.13564	mg/kg	CFISS-033	11 / 11	NA	1.13564		0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	67.8612	761.782	mg/kg	CFISS-042	11 / 11	NA	761.782		12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7429-90-5	Aluminum	15597.7	37895	mg/kg	CFISS-033	11 / 11	NA	37895		3000	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.140875 (J-)	4.61047 (J-)	mg/kg	CFISS-042	11 / 11	NA	4.61047		0.035	USEPA RSL RBSSL (THQ=0.1, n	154	MDEQ RBSL Res SurfSoil (DTW <10 ft)	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	5.12248	16.9611	mg/kg	CFISS-042	11 / 11	NA	16.9611		0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	120.678	297.534 (J+)	mg/kg	CFISS-034	11 / 11	NA	297.534		16	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.510333 (J)	1.59479	mg/kg	CFISS-033	11 / 11	NA	1.59479		1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.0943192 (J)	1.84038	mg/kg	CFISS-033	11 / 11	NA	1.84038		0.069	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	N	ASL-SSLOnly
	7440-70-2	Calcium	10181.3	31872	mg/kg	CFISS-042	11 / 11	NA	31872		No Screening Level		NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent - Estimated	0.381726	1.00018	mg/kg	CFISS-033	11 / 11	NA	1.00018		0.00067	USEPA RSL RBSSL (THQ=0.1, c	NA	NA	Y	ASL-DC Only
	7440-47-3	Chromium, Total	14.2627	37.3704	mg/kg	CFISS-033	11 / 11	NA	37.3704		No Screening Level		NA	NA	N	NSL
	16065-83-1	Chromium, Trivalent - Estimated	13.8809	36.3702	mg/kg	CFISS-033	11 / 11	NA	36.3702		12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7440-48-4	Cobalt	6.00352	8.48774	mg/kg	CFISS-033	11 / 11	NA	8.48774		0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	17.7395	387.349	mg/kg	CFISS-042	11 / 11	NA	387.349		2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	16026.9	31330	mg/kg	CFISS-042	11 / 11	NA	31330		35	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	17.8217	125.643	mg/kg	CFISS-033	11 / 11	NA	125.643		14	USEPA MCL-based SSL	154	USEPA RSL Res Soil	N	ASL-SSLOnly
	7439-95-4	Magnesium	7444.18	11001.8	mg/kg	CFISS-030	11 / 11	NA	11001.8		No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	408.796	589.426	mg/kg	CFISS-036	11 / 11	NA	589.426		2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.020142 (J-)	0.07592 (J)	mg/kg	CFISS-032	5 / 11	0.0116204 - 0.0131698	0.07592		0.0033	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	15.3399	71.8916	mg/kg	CFISS-033	11 / 11	NA	71.8916		2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	9/7/7440	Potassium	927.493	2039.85	mg/kg	CFISS-033	11 / 11	NA	2039.85		No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	1.03165 (J)	3.11893 (J)	mg/kg	CFISS-033	11 / 11	NA	3.11893		0.052	USEPA RSL RBSSL (THQ=0.1, n	NA	NA	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.0392505 (J)	0.7523 (J)	mg/kg	CFISS-042	11 / 11	NA	0.7523		0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	120.543 (J)	3987.58	mg/kg	CFISS-033	11 / 11	NA	3987.58		No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.099492 (J+)	0.251589 (J)	mg/kg	CFISS-034	11 / 11	NA	0.251589		0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	13.4327	48.5982	mg/kg	CFISS-033	11 / 11	NA	48.5982		8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	54.3269 (J)	846.463 (J+)	mg/kg	CFISS-042	11 / 11	NA	846.463		37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 11	0.00039 - 0.00041	ND		0.00015	USEPA RSL RBSSL (THQ=0.1, c*	NA	NA	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 11	0.000295 - 0.00031	ND		0.000042	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL-ND
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 11	0.00045 - 0.000475	ND		No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 11	0.000315 - 0.00033	ND		0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL-ND
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 11	0.0005 - 0.00055	ND		No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 11	0.00055 - 0.00055	ND		No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 11	0.000355 - 0.00037	ND		No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 11	0.00042 - 0.00044	ND		0.000071	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 11	0.000375 - 0.000395	ND		No Screening Level		NA	NA	N	BSL-ND
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 11	0.0004 - 0.00042	ND		No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 11	0.00045 - 0.000475	ND		No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 11	0.00041 - 0.00043	ND		0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 11	0.00029 - 0.000305	ND		0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 11	0.00065 - 0.00065	ND		0.000028	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL-ND
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 11	0.000415 - 0.000435	ND		0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL-ND
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 11	0.0007 - 0.0007	ND		0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 11	0.000425 - 0.000445	ND		0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 11	0.00047 - 0.000495	ND		0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 11	0.000335 - 0.00035	ND		0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 11	0.0095 - 0.01	ND		0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 11	0.0007 - 0.00075	ND		No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 11	0.0043 - 0.0045	ND		0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 11	0.0043 - 0.0045	ND		0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 11	0.0043 - 0.0045	ND		0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 11	0.0043 - 0.0045	ND		0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 11	0.0043 - 0.0045	ND		0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 11	0.0106611 - 0.0112601	ND		0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL-ND
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 11	0.00445 - 0.0047	ND		0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 11	0.00445 - 0.0047	ND		No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 11	0.00445 - 0.0047	ND		No Screening Level		NA	NA	N	BSL-ND

Table 2-42
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 11	0.0106611 - 0.0112601	ND		No Screening Level		NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 11	0.012 - 0.305	ND		0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 11	0.043 - 1.1	ND		0.000094	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 11	0.015 - 0.385	ND		0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL-ND
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.016 - 0.405	ND		0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 11	0.0046 - 0.115	ND		0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 11	0.0038 - 0.095	ND		0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 11	0.0355 - 0.9	ND		0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL-ND
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 11	0.12 - 3.1	ND		0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.0065 - 0.16	ND		0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 11	0.0085 - 0.215	ND		0.000067	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 11	0.00365 - 0.09	ND		0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 11	0.0041 - 0.105	ND		0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL-ND
	91-57-6	2-Methylnaphthalene	0.0135294 (J)	0.67647 (J)	mg/kg	CFISS-040	8 / 11	0.0272059 - 0.132353	0.67647		0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 11	0.007 - 0.18	ND		0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL-ND
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 11	0.0055 - 0.135	ND		0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 11	0.0055 - 0.135	ND		No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 11	0.018 - 0.455	ND		0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	ND	ND	ND	ND	0 / 11	0.0043 - 0.11	ND		No Screening Level		n	NA	N	BSL-ND
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 11	0.0048 - 0.12	ND		No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 11	0.043 - 1.1	ND		0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.005 - 0.13	ND		No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 11	0.007 - 0.175	ND		0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 11	0.00415 - 0.105	ND		0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 11	0.00485 - 0.12	ND		No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 11	0.006 - 0.155	ND		0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL-ND
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 11	0.08 - 1.95	ND		No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0511109 (J)	6.53084 (J)	mg/kg	CFISS-034	11 / 11	NA	6.53084		0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0136149 (J)	0.0136149 (J)	mg/kg	CFISS-036	1 / 11	0.00565018 - 0.142956	0.0136149		No Screening Level		NA	NA	N	NSL
	98-86-2	Acetophenone	ND	ND	ND	ND	0 / 11	0.00505556 - 0.13	ND		0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	BSL-ND
	120-12-7	Anthracene	0.0798399 (J)	20.6482	mg/kg	CFISS-034	11 / 11	NA	20.6482		5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 11	0.007 - 0.18	ND		0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 11	0.0125 - 0.31	ND		0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL-ND
	56-55-3	Benzo(A)Anthracene	0.343314	132.044	mg/kg	CFISS-034	11 / 11	NA	132.044		0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.462897	149.761	mg/kg	CFISS-034	11 / 11	NA	149.761		0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.54534	168.796	mg/kg	CFISS-034	11 / 11	NA	168.796		0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.549262 (J+)	117.699 (J-)	mg/kg	CFISS-034	11 / 11	NA	117.699		No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.21005	61.7022	mg/kg	CFISS-034	11 / 11	NA	61.7022		2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.029 (J)	0.59 (J)	mg/kg	CFISS-033	4 / 11	0.005 - 0.125	0.59		0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	ND	ND	ND	ND	0 / 11	0.0209586 - 0.523966	ND		0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	BSL-ND
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 11	0.005 - 0.125	ND		0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 11	0.0038 - 0.095	ND		0.0000036	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 11	0.0065 - 0.17	ND		0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL-ND
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.058 (J)	0.058 (J)	mg/kg	CFISS-030	1 / 11	0.0065 - 0.16	0.058		1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 11	0.0115 - 0.295	ND		0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL-ND
	86-74-8	Carbazole	0.0482954 (J)	14.3581	mg/kg	CFISS-034	11 / 11	NA	14.3581		No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.489162	135.878	mg/kg	CFISS-034	11 / 11	NA	135.878		9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.018 (J)	0.019 (J)	mg/kg	CFISS-041	2 / 11	0.00485 - 0.12	0.019		0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 11	0.008 - 0.205	ND		5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.132831 (J+)	36.3539 (J-)	mg/kg	CFISS-034	11 / 11	NA	36.3539		0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0173551 (J)	1.73551 (J)	mg/kg	CFISS-040	11 / 11	NA	1.73551		0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 11	0.0046 - 0.115	ND		0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 11	0.0047 - 0.12	ND		No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.631586	164.762	mg/kg	CFISS-034	11 / 11	NA	164.762		8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0323158 (J)	3.36623 (J)	mg/kg	CFISS-040	11 / 11	NA	3.36623		0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 11	0.0065 - 0.165	ND		0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 11	0.00455 - 0.115	ND		0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND

Table 2-42
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Surface Soil	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 11	0.01 - 0.255	ND		0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 11	0.006 - 0.15	ND		0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.498269 (J+)	131.123 (J-)	mg/kg	CFISS-034	11 / 11	NA	131.123		0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 11	0.00345 - 0.09	ND		0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL-ND
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 11	0.0055 - 0.135	ND		0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 11	0.0145 - 0.37	ND		0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL-ND
	91-20-3	Naphthalene	0.0188433 (J)	1.88433 (J)	mg/kg	CFISS-040	8 / 11	0.0304391 - 0.152196	1.88433		0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 11	0.005 - 0.13	ND		0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	0.1 (J)	0.1 (J)	mg/kg	CFISS-036	1 / 11	0.0195 - 0.495	0.1		0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	ASL-SSLOnly
	85-01-8	Phenanthrene	0.393105 (J)	68.1382	mg/kg	CFISS-034	11 / 11	NA	68.1382		No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	0.033 (J)	0.033 (J)	mg/kg	CFISS-042	1 / 11	0.0055 - 0.135	0.033		0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.613084	167.205	mg/kg	CFISS-034	11 / 11	NA	167.205		1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (November 2018, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-43
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	57-12-5	Cyanide	0.0294426 (J)	1.59201	mg/kg	CFISS-032	28 / 28	NA	1.59201	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	67.8612	913.009	mg/kg	CFISS-034	28 / 28	NA	913.009	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7429-90-5	Aluminum	15268	37895	mg/kg	CFISS-033	28 / 28	NA	37895	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.140875 (J-)	11.0139 (J-)	mg/kg	CFISS-038	28 / 28	NA	11.0139	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	MDEQ RBSL Res SurfSoil (DTW <10 ft)	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	4.40573	35.6297	mg/kg	CFISS-038	28 / 28	NA	35.6297	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	120.678	329.916	mg/kg	CFISS-036	28 / 28	NA	329.916	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.510333 (J)	1.59479	mg/kg	CFISS-033	28 / 28	NA	1.59479	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	BSL
	7440-43-9	Cadmium	0.0943192 (J)	1.84038	mg/kg	CFISS-033	28 / 28	NA	1.84038	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	8462.84	50574.6	mg/kg	CFISS-038	28 / 28	NA	50574.6	No Screening Level		NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent - Estimated	0.381726	1.08895	mg/kg	CFISS-038	28 / 28	NA	1.08895	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-47-3	Chromium, Total	14.2627	40.6873	mg/kg	CFISS-038	28 / 28	NA	40.6873	No Screening Level		NA	NA	N	NSL
	16065-83-1	Chromium, Trivalent - Estimated	13.8809	39.5984	mg/kg	CFISS-038	28 / 28	NA	39.5984	12000	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7440-48-4	Cobalt	5.81363	13.9737	mg/kg	CFISS-038	28 / 28	NA	13.9737	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	16.1129	995.881	mg/kg	CFISS-038	28 / 28	NA	995.881	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	15155.3	68967.4	mg/kg	CFISS-038	28 / 28	NA	68967.4	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	10.643	213.861	mg/kg	CFISS-038	28 / 28	NA	213.861	14	USEPA MCL-based SSL	154	USEPA RSL Res Soil	N	ASL-SSLOnly
	7439-95-4	Magnesium	6978.94	11955.1	mg/kg	CFISS-035	28 / 28	NA	11955.1	No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	388.961	772.17	mg/kg	CFISS-038	28 / 28	NA	772.17	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.020142 (J-)	0.07592 (J)	mg/kg	CFISS-032	12 / 28	0.00891533 - 0.0131698	0.07592	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	15.1337	71.8916	mg/kg	CFISS-033	28 / 28	NA	71.8916	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	9/7/7440	Potassium	927.493	2241.71	mg/kg	CFISS-038	28 / 28	NA	2241.71	No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	0.8757 (J)	3.11893 (J)	mg/kg	CFISS-033	28 / 28	NA	3.11893	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.0318508 (J)	1.41738	mg/kg	CFISS-038	28 / 28	NA	1.41738	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	120.543 (J)	4056.11	mg/kg	CFISS-034	28 / 28	NA	4056.11	No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.0841863 (J)	0.251589 (J)	mg/kg	CFISS-034	28 / 28	NA	0.251589	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	13.0173	48.5982	mg/kg	CFISS-033	28 / 28	NA	48.5982	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	47.2275	1938.64 (J)	mg/kg	CFISS-038	28 / 28	NA	1938.64	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 14	0.00039 - 0.00041	ND	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 14	0.000295 - 0.00031	ND	0.000042	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL-ND
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 14	0.00045 - 0.000475	ND	No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 14	0.000315 - 0.00033	ND	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL-ND
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 14	0.0005 - 0.00055	ND	No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 14	0.00055 - 0.00055	ND	No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 14	0.00035 - 0.00037	ND	No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 14	0.00042 - 0.00044	ND	0.000071	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 14	0.000375 - 0.000395	ND	No Screening Level		NA	NA	N	BSL-ND
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 14	0.0004 - 0.00042	ND	No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 14	0.00045 - 0.000475	ND	No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 14	0.00041 - 0.00043	ND	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 14	0.00029 - 0.000305	ND	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 14	0.00065 - 0.00065	ND	0.000028	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL-ND
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 14	0.000415 - 0.000435	ND	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL-ND
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 14	0.0007 - 0.0007	ND	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 14	0.000425 - 0.000445	ND	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 14	0.00047 - 0.000495	ND	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 14	0.000335 - 0.00035	ND	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 14	0.0095 - 0.01	ND	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 14	0.0007 - 0.00075	ND	No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 28	0.0043 - 0.0047	ND	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 28	0.0043 - 0.0047	ND	0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 28	0.0043 - 0.0047	ND	0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 28	0.0043 - 0.0047	ND	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	ND	ND	ND	ND	0 / 28	0.0043 - 0.0047	ND	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	11097-69-1	PCB-1254 (Aroclor 1254)	ND	ND	ND	ND	0 / 28	0.00581351 - 0.0112601	ND	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	N	BSL-ND
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 28	0.00445 - 0.0049	ND	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 28	0.00445 - 0.0049	ND	No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 28	0.00445 - 0.0049	ND	No Screening Level		NA	NA	N	BSL-ND

Table 2-43
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	ND	ND	ND	0 / 28	0.00581351 - 0.0112601	ND	No Screening Level		NA	NA	N	BSL-ND
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 28	0.012 - 0.305	ND	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 28	0.0425 - 1.1	ND	0.000094	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 28	0.015 - 0.385	ND	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL-ND
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 28	0.016 - 0.405	ND	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 28	0.00455 - 0.115	ND	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 28	0.00375 - 0.095	ND	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	105-67-9	2,4-Dimethylphenol	ND	ND	ND	ND	0 / 28	0.035 - 0.9	ND	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	BSL-ND
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 28	0.12 - 3.1	ND	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 28	0.0065 - 0.16	ND	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 28	0.0085 - 0.215	ND	0.000067	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 28	0.0036 - 0.09	ND	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 28	0.00405 - 0.105	ND	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL-ND
	91-57-6	2-Methylnaphthalene	0.0116703 (J)	0.67647 (J)	mg/kg	CFISS-040	21 / 28	0.00531809 - 0.132353	0.67647	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 28	0.007 - 0.18	ND	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL-ND
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 28	0.0055 - 0.135	ND	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 28	0.0055 - 0.135	ND	No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 28	0.018 - 0.455	ND	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.017 (J)	0.017 (J)	mg/kg	CFISS-038	1 / 28	0.00425 - 0.11	0.017	No Screening Level		NA	NA	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 28	0.0047 - 0.12	ND	No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 28	0.0425 - 1.1	ND	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 28	0.005 - 0.13	ND	No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 28	0.007 - 0.175	ND	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 28	0.0041 - 0.105	ND	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 28	0.00475 - 0.12	ND	No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 28	0.006 - 0.155	ND	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL-ND
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 28	0.075 - 1.95	ND	No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0325695 (J)	6.53084 (J)	mg/kg	CFISS-034	28 / 28	NA	6.53084	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0136149 (J)	0.0472139 (J)	mg/kg	CFISS-039	5 / 28	0.00565018 - 0.142956	0.0472139	No Screening Level		NA	NA	N	NSL
	98-86-2	Acetophenone	0.0107259 (J)	0.0169356 (J)	mg/kg	CFISS-042	2 / 28	0.00486899 - 0.13	0.0169356	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0656527 (J)	20.6482	mg/kg	CFISS-034	27 / 28	0.029179 - 0.029179	20.6482	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 28	0.007 - 0.18	ND	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	ND	ND	ND	ND	0 / 28	0.012 - 0.31	ND	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	BSL-ND
	56-55-3	Benzo(A)Anthracene	0.202527	132.044	mg/kg	CFISS-034	28 / 28	NA	132.044	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.200684	149.761	mg/kg	CFISS-034	28 / 28	NA	149.761	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.272101	168.796	mg/kg	CFISS-034	28 / 28	NA	168.796	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.131847 (J)	117.699 (J-)	mg/kg	CFISS-034	28 / 28	NA	117.699	No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0937728	61.7022	mg/kg	CFISS-034	28 / 28	NA	61.7022	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.019 (J)	0.73	mg/kg	CFISS-043	9 / 28	0.005 - 0.125	0.73	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0733341 (J)	0.0733341 (J)	mg/kg	CFISS-040	1 / 28	0.0209586 - 0.523966	0.0733341	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 28	0.00495 - 0.125	ND	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 28	0.00375 - 0.095	ND	0.0000036	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 28	0.0065 - 0.17	ND	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL-ND
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.058 (J)	0.064 (J)	mg/kg	CFISS-038	3 / 28	0.006 - 0.16	0.064	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	N	BSL
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 28	0.0115 - 0.295	ND	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL-ND
	86-74-8	Carbazole	0.028175 (J)	14.3581	mg/kg	CFISS-034	28 / 28	NA	14.3581	No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.211818 (J)	135.878	mg/kg	CFISS-034	28 / 28	NA	135.878	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.011 (J)	0.052 (J)	mg/kg	CFISS-043	12 / 28	0.00475 - 0.12	0.052	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 28	0.008 - 0.205	ND	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0458782 (J)	36.3539 (J-)	mg/kg	CFISS-034	27 / 28	0.0147466 - 0.0147466	36.3539	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0173551 (J)	1.73551 (J)	mg/kg	CFISS-040	25 / 28	0.00850061 - 0.00935067	1.73551	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	N	ASL-SSLOnly
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 28	0.00455 - 0.115	ND	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 28	0.00465 - 0.12	ND	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.359993 (J)	164.762	mg/kg	CFISS-034	28 / 28	NA	164.762	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	86-73-7	Fluorene	0.0165452 (J-)	3.36623 (J)	mg/kg	CFISS-040	28 / 28	NA	3.36623	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 28	0.0065 - 0.165	ND	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 28	0.0045 - 0.115	ND	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND

Table 2-43
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Main Plant Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 28	0.01 - 0.255	ND	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 28	0.006 - 0.15	ND	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.155555	131.123 (J-)	mg/kg	CFISS-034	28 / 28	NA	131.123	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	ND	ND	ND	ND	0 / 28	0.00345 - 0.09	ND	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	BSL-ND
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 28	0.0055 - 0.135	ND	0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 28	0.0145 - 0.37	ND	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL-ND
	91-20-3	Naphthalene	0.0123706 (J)	1.88433 (J)	mg/kg	CFISS-040	23 / 28	0.00534769 - 0.152196	1.88433	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 28	0.005 - 0.13	ND	0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	0.1 (J)	0.1 (J)	mg/kg	CFISS-036	1 / 28	0.0195 - 0.495	0.1	0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	ASL-SSLOnly
	85-01-8	Phenanthrene	0.26716 (J)	68.1382	mg/kg	CFISS-034	28 / 28	NA	68.1382	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	0.016 (J)	0.033 (J)	mg/kg	CFISS-042	3 / 28	0.005 - 0.135	0.033	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	BSL
	129-00-0	Pyrene	0.431779 (J)	167.205	mg/kg	CFISS-034	28 / 28	NA	167.205	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	N	ASL-SSLOnly

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (November 2018, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-44
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	57-12-5	Cyanide	0.134595 (J)	40.6588	mg/kg	CFISS-002	36 / 36	NA	40.6588	0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	22.4195 (J)	1176.42	mg/kg	CFISS-002	36 / 36	NA	1176.42	12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	TOC	Total Organic Carbon	10358.7	38257.9	mg/kg	CFISS-013	12 / 12	NA	38257.9	No Screening Level		NA	NA	N	NSL
	7429-90-5	Aluminum	11933.8	47002.4	mg/kg	CFISS-002	36 / 36	NA	47002.4	3000	USEPA RSL RBSSL (THQ=0.1, n	7700	MDEQ RBSL Res SurfSoil (DTW <10 ft)	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.192103 (J-)	1.53682 (J)	mg/kg	CFISS-005	30 / 36	0.108858 - 0.300961	1.53682	0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	4.78098	14.0015	mg/kg	CFISS-022	36 / 36	NA	14.0015	0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	61.7956	307.938	mg/kg	CFISS-027	36 / 36	NA	307.938	16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.510333	3.93381 (J)	mg/kg	CFISS-002	36 / 36	NA	3.93381	1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.138028 (J)	1.38028 (J)	mg/kg	CFISS-022	32 / 36	0.166784 - 0.207042	1.38028	0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	7813.06	33864	mg/kg	CFISS-020	36 / 36	NA	33864	No Screening Level		NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent - Estimated	0.43192	2.04475	mg/kg	CFISS-027	32 / 32	NA	2.04475	0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-47-3	Chromium, Total	10.5035	88.7824	mg/kg	CFISS-008	36 / 36	NA	88.7824	No Screening Level		NA	NA	N	NSL
	16065-83-1	Chromium, Trivalent - Estimated	15.7062	74.3545	mg/kg	CFISS-027	32 / 32	NA	74.3545	1.20E+04	USEPA RSL Res Soil (THQ=0.1), n	NA	NA	N	BSL
	7440-48-4	Cobalt	4.24387	9.62633	mg/kg	CFISS-022	36 / 36	NA	9.62633	0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	15.7185 (J+)	427.768	mg/kg	CFISS-005	36 / 36	NA	427.768	2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	12201.1	31536.8	mg/kg	CFISS-014	36 / 36	NA	31536.8	35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	17.9702	602.968 (J)	mg/kg	CFISS-006	36 / 36	NA	602.968	14	USEPA MCL-based SSL	154	USEPA RSL Res Soil	N	Lead
	7439-95-4	Magnesium	9109.86	12544.1	mg/kg	CFISS-010	36 / 36	NA	12544.1	No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	360.205	902.494	mg/kg	CFISS-004	36 / 36	NA	902.494	2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.0247902 (J)	0.139538 (J)	mg/kg	CFISS-001	28 / 36	0.010071 - 0.0486908	0.139538	0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	20.0335	162.557	mg/kg	CFISS-022	36 / 36	NA	162.557	2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	9/7/7440	Potassium	876.497	3272.26	mg/kg	CFISS-002	36 / 36	NA	3272.26	No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	0.287526 (J)	15.9545	mg/kg	CFISS-022	32 / 36	0.209928 - 0.26391	15.9545	0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.041431 (J)	0.207155 (J)	mg/kg	CFISS-020	32 / 36	0.37615 - 0.468825	0.207155	0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	79.8824 (J)	13727.7	mg/kg	CFISS-002	34 / 36	45.8245 - 47.1319	13727.7	No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.07092 (J)	0.457434 (J)	mg/kg	CFISS-022	33 / 36	0.0857689 - 0.102923	0.457434	0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	12.3407	59.5191	mg/kg	CFISS-022	36 / 36	NA	59.5191	8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	49.7057	131.872	mg/kg	CFISS-005	36 / 36	NA	131.872	37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 32	0.00039 - 0.00055	ND	0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.000295 - 0.00036	ND	0.000042	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL-ND
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 32	0.000445 - 0.00055	ND	No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.000315 - 0.000395	ND	0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL-ND
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 32	0.0005 - 0.0009	ND	No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 32	0.0005 - 0.00065	ND	No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.00021 - 0.000425	ND	No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 32	0.00042 - 0.0005	ND	0.000071	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 32	0.000375 - 0.00045	ND	No Screening Level		NA	NA	N	BSL-ND
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 32	0.0004 - 0.00085	ND	No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 32	0.000445 - 0.0007	ND	No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 32	0.00041 - 0.0005	ND	0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 32	0.00029 - 0.00035	ND	0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 32	0.0005 - 0.00075	ND	0.000028	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL-ND
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 32	0.0004 - 0.0005	ND	0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL-ND
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 32	0.0007 - 0.0008	ND	0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 32	0.000425 - 0.0006	ND	0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 32	0.0004 - 0.00055	ND	0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 32	0.00033 - 0.00065	ND	0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 32	0.0095 - 0.013	ND	0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL-ND
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 32	0.0006 - 0.00085	ND	No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 32	0.0043 - 0.005	ND	0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 32	0.0043 - 0.005	ND	0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 32	0.0043 - 0.005	ND	0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 32	0.0043 - 0.005	ND	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	0.2	0.2	mg/kg	CFISS-014	1 / 32	0.0043 - 0.005	0.2	0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	ASL-SSLOnly
	11097-69-1	PCB-1254 (Aroclor 1254)	0.110205 (J)	0.646856 (J+)	mg/kg	CFISS-013	8 / 34	0.0106611 - 0.101735	0.646856	0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	Y	ASL-DC Only
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 32	0.00445 - 0.0055	ND	0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL

Table 2-44
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 32	0.00445 - 0.0055	ND	No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 32	0.00445 - 0.0055	ND	No Screening Level		NA	NA	N	BSL-ND
	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.110205 (J)	0.646856 (J+)	mg/kg	CFISS-013	9 / 34	0.0106611 - 0.101735	0.646856	No Screening Level		NA	NA	N	NSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 32	0.00075 - 0.7	ND	0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 32	0.0055 - 2.55	ND	0.000094	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 32	0.007 - 0.9	ND	0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL-ND
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 32	0.0012 - 0.95	ND	0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 32	0.00095 - 0.27	ND	0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 32	0.0013 - 0.225	ND	0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	105-67-9	2,4-Dimethylphenol	0.25 (J)	0.25 (J)	mg/kg	CFISS-013	1 / 32	0.00105 - 2.1	0.25	0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	ASL-SSLOnly
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 32	0.046 - 7	ND	0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 32	0.00085 - 0.38	ND	0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 32	0.00105 - 0.5	ND	0.000067	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 32	0.0008 - 0.215	ND	0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 32	0.0008 - 0.245	ND	0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL-ND
	91-57-6	2-Methylnaphthalene	0.0100512 (J)	13.3823	mg/kg	CFISS-013	34 / 35	0.00544117 - 0.00544117	13.3823	0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	N	ASL-SSLOnly
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 32	0.0049 - 0.475	ND	0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL-ND
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 32	0.005 - 0.75	ND	0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 32	0.001 - 0.32	ND	No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 32	0.016 - 1.55	ND	0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.011 (J)	0.011 (J)	mg/kg	CFISS-022	1 / 24	0.00425 - 0.255	0.011	No Screening Level		NA	NA	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 32	0.00435 - 0.42	ND	No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 32	0.0295 - 2.85	ND	0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 32	0.0012 - 0.3	ND	No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 32	0.0008 - 0.41	ND	0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 32	0.00055 - 0.245	ND	0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 32	0.00105 - 0.285	ND	No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 32	0.00085 - 0.36	ND	0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL-ND
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 32	0.012 - 4.6	ND	No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0198765 (J)	53.9504	mg/kg	CFISS-013	36 / 36	NA	53.9504	0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.00435677 (J)	4.08447	mg/kg	CFISS-013	14 / 35	0.00503751 - 0.066713	4.08447	No Screening Level		NA	NA	N	NSL
	98-86-2	Acetophenone	0.00346667 (J)	0.0433333 (J)	mg/kg	CFISS-028	7 / 33	0.00498333 - 0.303333	0.0433333	0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0674509 (J)	97.735 (J+)	mg/kg	CFISS-013	35 / 36	0.0220248 - 0.0220248	97.735	5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 32	0.007 - 0.7	ND	0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	0.0068 (J)	0.051 (J)	mg/kg	CFISS-025	3 / 25	0.012 - 0.75	0.051	0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.330109	184.861	mg/kg	CFISS-013	36 / 36	NA	184.861	0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.490126	176.99	mg/kg	CFISS-013	36 / 36	NA	176.99	0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.688167	194.764	mg/kg	CFISS-013	36 / 36	NA	194.764	0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.44464 (J-)	130.777	mg/kg	CFISS-013	36 / 36	NA	130.777	No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.21005	66.9535	mg/kg	CFISS-013	36 / 36	NA	66.9535	2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.046 (J)	1.4 (J)	mg/kg	CFISS-003	3 / 32	0.0049 - 1.15	1.4	0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.00583848 (J)	3.14379 (J)	mg/kg	CFISS-013	10 / 33	0.00531451 - 1.19764	3.14379	0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	N	ASL-SSLOnly
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 32	0.0008 - 0.3	ND	0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether	ND	ND	ND	ND	0 / 32	0.0006 - 0.225	ND	0.0000036	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 32	0.00125 - 0.395	ND	0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL-ND
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.033 (J)	0.81 (J)	mg/kg	CFISS-020	9 / 32	0.006 - 1.75	0.81	1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 32	0.011 - 1.1	ND	0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL-ND
	86-74-8	Carbazole	0.041769 (J)	49.6007 (J+)	mg/kg	CFISS-013	36 / 36	NA	49.6007	No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.570689	217.405	mg/kg	CFISS-013	36 / 36	NA	217.405	9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.012 (J)	0.067 (J)	mg/kg	CFISS-029	7 / 32	0.00475 - 0.7	0.067	0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 32	0.008 - 0.95	ND	5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0964776	34.9556	mg/kg	CFISS-013	35 / 36	0.0132831 - 0.0132831	34.9556	0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.0173551 (J)	22.6952	mg/kg	CFISS-013	35 / 36	0.00667506 - 0.00667506	22.6952	0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	ND	ND	ND	ND	0 / 32	0.0045 - 0.495	ND	0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	BSL
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 32	0.0006 - 0.28	ND	No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.562935	411.904	mg/kg	CFISS-013	36 / 36	NA	411.904	8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	Y	ASL-DC Only
	86-73-7	Fluorene	0.0134649 (J)	41.7412	mg/kg	CFISS-013	36 / 36	NA	41.7412	0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly

Table 2-44
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 0.5 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 32	0.0012 - 0.39	ND	0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 32	0.001 - 0.27	ND	0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND
	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 32	0.00085 - 0.6	ND	0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 32	0.0009 - 0.35	ND	0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.498269 (J-)	111.455	mg/kg	CFISS-013	36 / 36	NA	111.455	0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.0072 (J-)	0.099 (J)	mg/kg	CFISS-028	6 / 32	0.00085 - 0.205	0.099	0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 32	0.00115 - 0.32	ND	0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 32	0.0055 - 0.85	ND	0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL-ND
	91-20-3	Naphthalene	0.014423 (J)	24.6412	mg/kg	CFISS-013	35 / 36	0.0061603 - 0.0061603	24.6412	0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 32	0.005 - 0.6	ND	0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 32	0.019 - 2.65	ND	0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.235863 (J)	353.794	mg/kg	CFISS-013	36 / 36	NA	353.794	No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	0.012 (J)	0.018 (J)	mg/kg	CFISS-022	3 / 32	0.005 - 0.5	0.018	0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	ASL-SSLOnly
	129-00-0	Pyrene	0.808156	404.078	mg/kg	CFISS-013	36 / 36	NA	404.078	1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (November 2018, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available
Lead = refer to text for discussion on lead and exclusion as COPC at Site

Table 2-45
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	57-12-5	Cyanide	0.0225535 (J)	40.6588	mg/kg	CFISS-002	66 / 68	0.0444437 - 0.120798	40.6588		0.0015	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	16984-48-8	Fluoride	21.3765 (J-)	1218.2	mg/kg	CFISS-027	68 / 68	NA	1218.2		12	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7429-90-5	Aluminum	9014.4	47002.4	mg/kg	CFISS-002	68 / 68	NA	47002.4		3000	USEPA RSL RBSSL (THQ=0.1, n	7700	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-36-0	Antimony	0.156814 (J-)	3.23854 (J-)	mg/kg	CFISS-006	50 / 66	0.108858 - 0.383511	3.23854		0.035	USEPA RSL RBSSL (THQ=0.1, n	3.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-38-2	Arsenic	4.46859	14.0015	mg/kg	CFISS-022	68 / 68	NA	14.0015		0.0015	USEPA RSL RBSSL (THQ=0.1, c*	0.68	USEPA RSL Res Soil	Y	Carcinogen
	7440-39-3	Barium	61.7956	307.938	mg/kg	CFISS-027	68 / 68	NA	307.938		16	USEPA RSL RBSSL (THQ=0.1, n	1500	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-41-7	Beryllium	0.419616 (J)	3.93381 (J)	mg/kg	CFISS-002	68 / 68	NA	3.93381		1.9	USEPA RSL RBSSL (THQ=0.1, n	16	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-43-9	Cadmium	0.0572559 (J)	1.38028 (J)	mg/kg	CFISS-022	61 / 68	0.153743 - 0.207042	1.38028		0.069	USEPA RSL RBSSL (THQ=0.1, n	7.1	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-70-2	Calcium	2885.52	37305.6	mg/kg	CFISS-018	68 / 68	NA	37305.6		No Screening Level		NA	NA	N	NSL
	18540-29-9	Chromium, Hexavalent - Estimated	0.392196	2.04475	mg/kg	CFISS-027	61 / 61	NA	2.04475		0.00067	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-47-3	Chromium, Total	10.5035	88.7824	mg/kg	CFISS-008	68 / 68	NA	88.7824		No Screening Level		NA	NA	N	NSL
	16065-83-1	Chromium, Trivalent - Estimated	14.2617	74.3545	mg/kg	CFISS-027	61 / 61	NA	74.3545		1.20E+04	USEPA RSL Res Soil (THQ=0.1), n	NSL	NA	N	BSL
	7440-48-4	Cobalt	4.24387	9.62633	mg/kg	CFISS-022	68 / 68	NA	9.62633		0.027	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-50-8	Copper	11.2999 (J+)	754.376	mg/kg	CFISS-006	68 / 68	NA	754.376		2.8	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-89-6	Iron	12201.1	31536.8	mg/kg	CFISS-014	68 / 68	NA	31536.8		35	USEPA RSL RBSSL (THQ=0.1, n	5500	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-92-1	Lead	8.8864	602.968 (J)	mg/kg	CFISS-006	68 / 68	NA	602.968		14	USEPA MCL-based SSL	154	MDEQ Lead Res SurfSoil (DTW <10 ft)	N	Lead
	7439-95-4	Magnesium	9109.86	15633.6	mg/kg	CFISS-002	68 / 68	NA	15633.6		No Screening Level		NA	NA	N	NSL
	7439-96-5	Manganese	360.205	902.494	mg/kg	CFISS-004	68 / 68	NA	902.494		2.8	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7439-97-6	Mercury	0.0191043 (J)	0.139538 (J)	mg/kg	CFISS-001	57 / 68	0.00955214 - 0.0486908	0.139538		0.0033	USEPA RSL RBSSL (THQ=0.1, n	1.1	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-02-0	Nickel	13.0022	162.557	mg/kg	CFISS-022	68 / 68	NA	162.557		2.6	USEPA RSL RBSSL (THQ=0.1, n	150	USEPA RSL Res Soil	Y	Carcinogen
	9/7/7440	Potassium	770.837	3272.26	mg/kg	CFISS-002	68 / 68	NA	3272.26		No Screening Level		NA	NA	N	NSL
	7782-49-2	Selenium	0.214319 (J)	15.9545	mg/kg	CFISS-022	61 / 68	0.208366 - 0.26391	15.9545		0.052	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-22-4	Silver	0.0329491 (J)	0.208678 (J)	mg/kg	CFISS-020	61 / 68	0.37615 - 0.468825	0.208678		0.08	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	ASL-SSLOnly
	7440-23-5	Sodium	50.7317 (J)	13727.7	mg/kg	CFISS-002	64 / 67	42.4378 - 47.1319	13727.7		No Screening Level		NA	NA	N	NSL
	7440-28-0	Thallium	0.0639389 (J)	0.457434 (J)	mg/kg	CFISS-022	63 / 68	0.0799237 - 0.102923	0.457434		0.0014	USEPA RSL RBSSL (THQ=0.1, n	0.078	USEPA RSL Res Soil	Y	ASL-DC Only
	7440-62-2	Vanadium	8.88485	59.5191	mg/kg	CFISS-022	68 / 68	NA	59.5191		8.6	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	7440-66-6	Zinc	41.9566	225.596 (J+)	mg/kg	CFISS-006	68 / 68	NA	225.596		37	USEPA RSL RBSSL (THQ=0.1, n	2300	USEPA RSL Res Soil	N	ASL-SSLOnly
	309-00-2	Aldrin	ND	ND	ND	ND	0 / 32	0.00039 - 0.00055	ND		0.00015	USEPA RSL RBSSL (THQ=0.1, c*	0.039	USEPA RSL Res Soil	N	BSL-ND
	319-84-6	Alpha Bhc (Alpha Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.000295 - 0.00036	ND		0.000042	USEPA RSL RBSSL (THQ=0.1, c	0.086	USEPA RSL Res Soil	N	BSL-ND
	959-98-8	Alpha Endosulfan	ND	ND	ND	ND	0 / 32	0.000445 - 0.00055	ND		No Screening Level		NA	NA	N	BSL-ND
	319-85-7	Beta Bhc (Beta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.000315 - 0.000395	ND		0.00015	USEPA RSL RBSSL (THQ=0.1, c	0.3	USEPA RSL Res Soil	N	BSL-ND
	33213-65-9	Beta Endosulfan	ND	ND	ND	ND	0 / 32	0.0005 - 0.0009	ND		No Screening Level		NA	NA	N	BSL-ND
	5103-71-9	cis-Chlordane	ND	ND	ND	ND	0 / 32	0.0005 - 0.00065	ND		No Screening Level		NA	NA	N	BSL-ND
	319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	ND	ND	ND	0 / 32	0.00021 - 0.000425	ND		No Screening Level		NA	NA	N	BSL-ND
	60-57-1	Dieldrin	ND	ND	ND	ND	0 / 32	0.00042 - 0.0005	ND		0.000071	USEPA RSL RBSSL (THQ=0.1, c*	0.034	USEPA RSL Res Soil	N	BSL-ND
	1031-07-8	Endosulfan Sulfate	ND	ND	ND	ND	0 / 32	0.000375 - 0.00045	ND		No Screening Level		NA	NA	N	BSL-ND
	7421-93-4	Endrin Aldehyde	ND	ND	ND	ND	0 / 32	0.0004 - 0.00085	ND		No Screening Level		NA	NA	N	BSL-ND
	53494-70-5	Endrin Ketone	ND	ND	ND	ND	0 / 32	0.000445 - 0.0007	ND		No Screening Level		NA	NA	N	BSL-ND
	72-20-8	Endrin	ND	ND	ND	ND	0 / 32	0.00041 - 0.0005	ND		0.0092	USEPA RSL RBSSL (THQ=0.1, n	1.9	USEPA RSL Res Soil	N	BSL
	58-89-9	Gamma Bhc (Lindane)	ND	ND	ND	ND	0 / 32	0.00029 - 0.00035	ND		0.00024	USEPA RSL RBSSL (THQ=0.1, c**	0.57	USEPA RSL Res Soil	N	BSL-ND
	1024-57-3	Heptachlor Epoxide	ND	ND	ND	ND	0 / 32	0.0005 - 0.00075	ND		0.000028	USEPA RSL RBSSL (THQ=0.1, c**	0.07	USEPA RSL Res Soil	N	BSL-ND
	76-44-8	Heptachlor	ND	ND	ND	ND	0 / 32	0.0004 - 0.0005	ND		0.00012	USEPA RSL RBSSL (THQ=0.1, c*	0.13	USEPA RSL Res Soil	N	BSL-ND
	72-43-5	Methoxychlor	ND	ND	ND	ND	0 / 32	0.0007 - 0.0008	ND		0.2	USEPA RSL RBSSL (THQ=0.1, n	32	USEPA RSL Res Soil	N	BSL
	72-54-8	P,P'-DDD	ND	ND	ND	ND	0 / 32	0.000425 - 0.0006	ND		0.0015	USEPA RSL RBSSL (THQ=0.1), n	0.19	USEPA RSL Res Soil	N	BSL
	72-55-9	P,P'-DDE	ND	ND	ND	ND	0 / 32	0.0004 - 0.00055	ND		0.011	USEPA RSL RBSSL (THQ=0.1, c	2	USEPA RSL Res Soil	N	BSL
	50-29-3	P,P'-DDT	ND	ND	ND	ND	0 / 32	0.00033 - 0.00065	ND		0.077	USEPA RSL RBSSL (THQ=0.1, c**	1.9	USEPA RSL Res Soil	N	BSL
	8001-35-2	Toxaphene	ND	ND	ND	ND	0 / 32	0.0095 - 0.013	ND		0.011	USEPA RSL RBSSL (THQ=0.1, c	0.49	USEPA RSL Res Soil	N	BSL-ND
	5103-74-2	trans-Chlordane	ND	ND	ND	ND	0 / 32	0.0006 - 0.00085	ND		No Screening Level		NA	NA	N	BSL-ND
	12674-11-2	PCB-1016 (Aroclor 1016)	ND	ND	ND	ND	0 / 60	4.45e-005 - 0.005	ND		0.013	USEPA RSL RBSSL (THQ=0.1, n	0.41	USEPA RSL Res Soil	N	BSL
	11104-28-2	PCB-1221 (Aroclor 1221)	ND	ND	ND	ND	0 / 60	4.45e-005 - 0.005	ND		0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.2	USEPA RSL Res Soil	N	BSL-ND
	11141-16-5	PCB-1232 (Aroclor 1232)	ND	ND	ND	ND	0 / 60	4.45e-005 - 0.005	ND		0.00008	USEPA RSL RBSSL (THQ=0.1, c	0.17	USEPA RSL Res Soil	N	BSL-ND
	53469-21-9	PCB-1242 (Aroclor 1242)	ND	ND	ND	ND	0 / 60	4.45e-005 - 0.005	ND		0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	12672-29-6	PCB-1248 (Aroclor 1248)	0.2	0.2	mg/kg	CFISS-014	1 / 60	4.45e-005 - 0.005	0.2		0.0012	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	ASL-SSLOnly
	11097-69-1	PCB-1254 (Aroclor 1254)	0.110205 (J)	1.72879	mg/kg	CFISS-011	14 / 63	5.9427e-005 - 0.101735	1.72879		0.002	USEPA RSL RBSSL (THQ=0.1, c**	0.12	USEPA RSL Res Soil	Y	ASL-DC Only
	11096-82-5	PCB-1260 (Aroclor 1260)	ND	ND	ND	ND	0 / 60	4.6e-005 - 0.0055	ND		0.0055	USEPA RSL RBSSL (THQ=0.1, c	0.24	USEPA RSL Res Soil	N	BSL
	37324-23-5	PCB-1262 (Aroclor 1262)	ND	ND	ND	ND	0 / 60	4.6e-005 - 0.0055	ND		No Screening Level		NA	NA	N	BSL-ND
	11100-14-4	PCB-1268 (Aroclor 1268)	ND	ND	ND	ND	0 / 60	4.6e-005 - 0.0055	ND		No Screening Level		NA	NA	N	BSL-ND

Table 2-45
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	1336-36-3	Polychlorinated Biphenyl (PCBs)	0.110205 (J)	1.72879	mg/kg	CFISS-011	15 / 63	5.9427e-005 - 0.101735	1.72879		No Screening Level		NA	NA	N	NSL
	95-94-3	1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	0 / 60	0.0006 - 0.7	ND		0.00079	USEPA RSL RBSSL (THQ=0.1, n	2.3	USEPA RSL Res Soil	N	BSL-ND
	123-91-1	1,4-Dioxane (P-Dioxane)	ND	ND	ND	ND	0 / 60	0.0045 - 2.55	ND		0.000094	USEPA RSL RBSSL (THQ=0.1, c*	5.3	USEPA RSL Res Soil	N	BSL-ND
	58-90-2	2,3,4,6-Tetrachlorophenol	ND	ND	ND	ND	0 / 60	0.006 - 1.4	ND		0.018	USEPA RSL RBSSL (THQ=0.1, n	190	USEPA RSL Res Soil	N	BSL-ND
	95-95-4	2,4,5-Trichlorophenol	ND	ND	ND	ND	0 / 60	0.00105 - 0.95	ND		0.4	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	88-06-2	2,4,6-Trichlorophenol	ND	ND	ND	ND	0 / 60	0.0008 - 0.27	ND		0.0012	USEPA RSL RBSSL (THQ=0.1, n	6.3	USEPA RSL Res Soil	N	BSL-ND
	120-83-2	2,4-Dichlorophenol	ND	ND	ND	ND	0 / 60	0.0011 - 0.255	ND		0.0023	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	105-67-9	2,4-Dimethylphenol	0.25 (J)	0.71 (J)	mg/kg	CFISS-013	2 / 60	0.0009 - 2.1	0.71		0.042	USEPA RSL RBSSL (THQ=0.1, n	130	USEPA RSL Res Soil	N	ASL-SSLOnly
	51-28-5	2,4-Dinitrophenol	ND	ND	ND	ND	0 / 59	0.039 - 9	ND		0.0044	USEPA RSL RBSSL (THQ=0.1, n	13	USEPA RSL Res Soil	N	BSL-ND
	121-14-2	2,4-Dinitrotoluene	ND	ND	ND	ND	0 / 60	0.0007 - 0.38	ND		0.00032	USEPA RSL RBSSL (THQ=0.1, c*	1.7	USEPA RSL Res Soil	N	BSL-ND
	606-20-2	2,6-Dinitrotoluene	ND	ND	ND	ND	0 / 60	0.0009 - 0.5	ND		0.000067	USEPA RSL RBSSL (THQ=0.1, c*	0.36	USEPA RSL Res Soil	N	BSL-ND
	91-58-7	2-Chloronaphthalene	ND	ND	ND	ND	0 / 60	0.00065 - 0.215	ND		0.39	USEPA RSL RBSSL (THQ=0.1, n	480	USEPA RSL Res Soil	N	BSL
	95-57-8	2-Chlorophenol	ND	ND	ND	ND	0 / 60	0.00065 - 0.245	ND		0.0089	USEPA RSL RBSSL (THQ=0.1, n	39	USEPA RSL Res Soil	N	BSL-ND
	91-57-6	2-Methylnaphthalene	0.00344293 (J)	39.8857	mg/kg	CFISS-013	59 / 67	0.0050965 - 0.05948	39.8857		0.019	USEPA RSL RBSSL (THQ=0.1, n	24	USEPA RSL Res Soil	Y	ASL-DC Only
	95-48-7	2-Methylphenol (O-Cresol)	ND	ND	ND	ND	0 / 60	0.00415 - 0.95	ND		0.075	USEPA RSL RBSSL (THQ=0.1, n	320	USEPA RSL Res Soil	N	BSL-ND
	88-74-4	2-Nitroaniline	ND	ND	ND	ND	0 / 60	0.005 - 1.5	ND		0.008	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL-ND
	88-75-5	2-Nitrophenol	ND	ND	ND	ND	0 / 60	0.00085 - 0.32	ND		No Screening Level		NA	NA	N	BSL-ND
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	ND	ND	0 / 60	0.0135 - 3.1	ND		0.00082	USEPA RSL RBSSL (THQ=0.1, c	1.2	USEPA RSL Res Soil	N	BSL-ND
	MEPH3MEPH4	3- And 4- Methylphenol (Total)	0.011 (J)	0.011 (J)	mg/kg	CFISS-022	1 / 44	0.0042 - 0.255	0.011		No Screening Level		NA	NA	N	LDF
	99-09-2	3-Nitroaniline	ND	ND	ND	ND	0 / 60	0.0037 - 0.85	ND		No Screening Level		NA	NA	N	BSL-ND
	534-52-1	4,6-Dinitro-2-Methylphenol	ND	ND	ND	ND	0 / 60	0.025 - 5.5	ND		0.00026	USEPA RSL RBSSL (THQ=0.1, n	0.51	USEPA RSL Res Soil	N	BSL-ND
	101-55-3	4-Bromophenyl Phenyl Ether	ND	ND	ND	ND	0 / 60	0.001 - 0.3	ND		No Screening Level		NA	NA	N	BSL-ND
	59-50-7	4-Chloro-3-Methylphenol	ND	ND	ND	ND	0 / 60	0.0007 - 0.41	ND		0.17	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	BSL-ND
	106-47-8	4-Chloroaniline	ND	ND	ND	ND	0 / 60	0.00048 - 0.245	ND		0.00016	USEPA RSL RBSSL (THQ=0.1, c*	2.7	USEPA RSL Res Soil	N	BSL-ND
	7005-72-3	4-Chlorophenyl Phenyl Ether	ND	ND	ND	ND	0 / 60	0.0009 - 0.285	ND		No Screening Level		NA	NA	N	BSL-ND
	100-01-6	4-Nitroaniline	ND	ND	ND	ND	0 / 60	0.0007 - 0.36	ND		0.0016	USEPA RSL RBSSL (THQ=0.1, c**	25	USEPA RSL Res Soil	N	BSL-ND
	100-02-7	4-Nitrophenol	ND	ND	ND	ND	0 / 60	0.01 - 4.6	ND		No Screening Level		NA	NA	N	BSL-ND
	83-32-9	Acenaphthene	0.0144753 (J)	199.036	mg/kg	CFISS-013	65 / 68	0.00687578 - 0.0081423	199.036		0.55	USEPA RSL RBSSL (THQ=0.1, n	360	USEPA RSL Res Soil	N	ASL-SSLOnly
	208-96-8	Acenaphthylene	0.0015 (J)	5.047	mg/kg	CFISS-013	23 / 66	0.00113965 - 0.066713	5.047		No Screening Level		NA	NA	N	NSL
	98-86-2	Acetophenone	0.00346667 (J)	0.0433333 (J)	mg/kg	CFISS-028	19 / 65	0.00268147 - 0.303333	0.0433333		0.058	USEPA RSL RBSSL (THQ=0.1, n	780	USEPA RSL Res Soil	N	ASL-SSLOnly
	120-12-7	Anthracene	0.0271442	273.553 (J+)	mg/kg	CFISS-013	61 / 68	0.0220248 - 0.0319145	273.553		5.8	USEPA RSL RBSSL (THQ=0.1, n	1800	USEPA RSL Res Soil	N	ASL-SSLOnly
	1912-24-9	Atrazine	ND	ND	ND	ND	0 / 60	0.0065 - 1.45	ND		0.0002	USEPA RSL RBSSL (THQ=0.1, c	2.4	USEPA RSL Res Soil	N	BSL-ND
	100-52-7	Benzaldehyde	0.0068 (J)	0.051 (J)	mg/kg	CFISS-025	7 / 47	0.012 - 0.75	0.051		0.0041	USEPA RSL RBSSL (THQ=0.1, c*	170	USEPA RSL Res Soil	N	ASL-SSLOnly
	56-55-3	Benzo(A)Anthracene	0.0962002	405.053	mg/kg	CFISS-013	66 / 68	0.0219404 - 0.0236281	405.053		0.011	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	50-32-8	Benzo(A)Pyrene	0.0301026 (J)	401.367	mg/kg	CFISS-013	67 / 68	0.00836182 - 0.0083618	401.367		0.029	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	205-99-2	Benzo(B)Fluoranthene	0.035213 (J)	432.16	mg/kg	CFISS-013	68 / 68	NA	432.16		0.3	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	191-24-2	Benzo(G,H,I)Perylene	0.0401974 (J)	353.737	mg/kg	CFISS-013	67 / 68	0.015275 - 0.015275	353.737		No Screening Level		NA	NA	N	NSL
	207-08-9	Benzo(K)Fluoranthene	0.0246771 (J)	213.868	mg/kg	CFISS-013	67 / 68	0.0123385 - 0.0123385	213.868		2.9	USEPA RSL RBSSL (THQ=0.1, c	11	USEPA RSL Res Soil	Y	Carcinogen
	85-68-7	Benzyl Butyl Phthalate	0.0131422 (J)	1.4 (J)	mg/kg	CFISS-003	7 / 61	0.0049 - 3.05324	1.4		0.24	USEPA RSL RBSSL (THQ=0.1, c*	290	USEPA RSL Res Soil	N	ASL-SSLOnly
	92-52-4	Biphenyl (Diphenyl)	0.0025766 (J)	14.0722	mg/kg	CFISS-013	19 / 62	0.00531451 - 1.19764	14.0722		0.00087	USEPA RSL RBSSL (THQ=0.1, n	4.7	USEPA RSL Res Soil	Y	ASL-DC Only
	111-91-1	Bis(2-Chloroethoxy) Methane	ND	ND	ND	ND	0 / 60	0.0007 - 0.3	ND		0.0013	USEPA RSL RBSSL (THQ=0.1, n	19	USEPA RSL Res Soil	N	BSL-ND
	111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	ND	ND	ND	ND	0 / 60	0.0005 - 0.225	ND		0.0000036	USEPA RSL RBSSL (THQ=0.1, c	0.23	USEPA RSL Res Soil	N	BSL-ND
	108-60-1	Bis(2-Chloroisopropyl) Ether	ND	ND	ND	ND	0 / 60	0.00105 - 0.395	ND		0.026	USEPA RSL RBSSL (THQ=0.1, n	310	USEPA RSL Res Soil	N	BSL-ND
	117-81-7	Bis(2-Ethylhexyl) Phthalate	0.014 (J)	0.81 (J)	mg/kg	CFISS-020	14 / 60	0.006 - 3.55	0.81		1.3	USEPA RSL RBSSL (THQ=0.1, c**	39	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	105-60-2	Caprolactam	ND	ND	ND	ND	0 / 60	0.0095 - 2.15	ND		0.25	USEPA RSL RBSSL (THQ=0.1, n	3100	USEPA RSL Res Soil	N	BSL-ND
	86-74-8	Carbazole	0.0211313 (J)	137.353 (J+)	mg/kg	CFISS-013	65 / 68	0.00686767 - 0.0081003	137.353		No Screening Level		NA	NA	N	NSL
	218-01-9	Chrysene	0.0358461 (J)	407.342	mg/kg	CFISS-013	68 / 68	NA	407.342		9	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	Y	Carcinogen
	84-74-2	Di-N-Butyl Phthalate	0.011 (J)	0.067 (J)	mg/kg	CFISS-029	11 / 60	0.0047 - 1.45	0.067		0.23	USEPA RSL RBSSL (THQ=0.1, n	630	USEPA RSL Res Soil	N	ASL-SSLOnly
	117-84-0	Di-N-Octylphthalate	ND	ND	ND	ND	0 / 60	0.008 - 1.95	ND		5.7	USEPA RSL RBSSL (THQ=0.1, n	63	USEPA RSL Res Soil	N	BSL
	53-70-3	Dibenz(A,H)Anthracene	0.0344087	83.5639	mg/kg	CFISS-013	63 / 68	0.0131081 - 0.0155658	83.5639		0.096	USEPA RSL RBSSL (THQ=0.1, c	0.11	USEPA RSL Res Soil	Y	Carcinogen
	132-64-9	Dibenzofuran	0.00632426 (J)	93.5067	mg/kg	CFISS-013	61 / 68	0.00667506 - 0.0093506	93.5067		0.015	USEPA RSL RBSSL (THQ=0.1, n	7.3	USEPA RSL Res Soil	Y	ASL-DC Only
	84-66-2	Diethyl Phthalate	0.014 (J)	0.015 (J)	mg/kg	CFISS-009	2 / 60	0.00445 - 1	0.015		0.61	USEPA RSL RBSSL (THQ=0.1, n	5100	USEPA RSL Res Soil	N	LDF
	131-11-3	Dimethyl Phthalate	ND	ND	ND	ND	0 / 60	0.0005 - 0.28	ND		No Screening Level		NA	NA	N	BSL-ND
	206-44-0	Fluoranthene	0.0359993 (J)	754.271	mg/kg	CFISS-013	68 / 68	NA	754.271		8.9	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	Y	ASL-DC Only
	86-73-7	Fluorene	0.0108794	163.711	mg/kg	CFISS-013	64 / 68	0.00600853 - 0.0070535	163.711		0.54	USEPA RSL RBSSL (THQ=0.1, n	240	USEPA RSL Res Soil	N	ASL-SSLOnly
	118-74-1	Hexachlorobenzene	ND	ND	ND	ND	0 / 60	0.00105 - 0.39	ND		0.00012	USEPA RSL RBSSL (THQ=0.1, c	0.21	USEPA RSL Res Soil	N	BSL-ND
	87-68-3	Hexachlorobutadiene	ND	ND	ND	ND	0 / 60	0.00085 - 0.27	ND		0.00027	USEPA RSL RBSSL (THQ=0.1, c**	1.2	USEPA RSL Res Soil	N	BSL-ND

Table 2-45
Occurrence, Distribution, and Selection of Chemical of Potential Concern (Central Landfill Area, ISM Surface Soil [0 to 2 ft-bgs])
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soils
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Initial Screening Toxicity Value (N/C) (2)		Secondary Screening Toxicity Value (3)		COPC Flag (Y/N) (4)	Rationale for Selection or Deletion (5)
Soil	77-47-4	Hexachlorocyclopentadiene	ND	ND	ND	ND	0 / 60	0.00075 - 0.6	ND		0.00013	USEPA RSL RBSSL (THQ=0.1, n	0.18	USEPA RSL Res Soil	N	BSL-ND
	67-72-1	Hexachloroethane	ND	ND	ND	ND	0 / 60	0.00075 - 0.35	ND		0.0002	USEPA RSL RBSSL (THQ=0.1, c**	1.8	USEPA RSL Res Soil	N	BSL-ND
	193-39-5	Indeno(1,2,3-C,D)Pyrene	0.0907405	275.462	mg/kg	CFISS-013	66 / 68	0.0170138 - 0.017824	275.462		0.98	USEPA RSL RBSSL (THQ=0.1, c	1.1	USEPA RSL Res Soil	Y	Carcinogen
	78-59-1	Isophorone	0.00648348 (J)	0.145746 (J)	mg/kg	CFISS-027	13 / 61	0.00085 - 0.225243	0.145746		0.026	USEPA RSL RBSSL (THQ=0.1, c**	570	USEPA RSL Res Soil	N	ASL-SSLOnly
	621-64-7	N-Nitrosodi-N-Propylamine	ND	ND	ND	ND	0 / 60	0.001 - 0.32	ND		0.0000081	USEPA RSL RBSSL (THQ=0.1, c	0.078	USEPA RSL Res Soil	N	BSL-ND
	86-30-6	N-Nitrosodiphenylamine	ND	ND	ND	ND	0 / 60	0.0048 - 1.1	ND		0.067	USEPA RSL RBSSL (THQ=0.1, c	110	USEPA RSL Res Soil	N	BSL-ND
	91-20-3	Naphthalene	0.0050975 (J)	87.6249	mg/kg	CFISS-013	61 / 68	0.0051544 - 0.0061603	87.6249		0.00054	USEPA RSL RBSSL (THQ=0.1, c**	3.8	USEPA RSL Res Soil	Y	ASL-SSL(GW COPC)
	98-95-3	Nitrobenzene	ND	ND	ND	ND	0 / 60	0.00495 - 1.2	ND		0.000092	USEPA RSL RBSSL (THQ=0.1, c**	5.1	USEPA RSL Res Soil	N	BSL-ND
	87-86-5	Pentachlorophenol	ND	ND	ND	ND	0 / 60	0.019 - 5.5	ND		0.000057	USEPA RSL RBSSL (THQ=0.1, c*	1	USEPA RSL Res Soil	N	BSL-ND
	85-01-8	Phenanthrene	0.0195917 (J)	801.48	mg/kg	CFISS-013	68 / 68	NA	801.48		No Screening Level		NA	NA	N	NSL
	108-95-2	Phenol	0.012 (J)	0.018 (J)	mg/kg	CFISS-022	6 / 60	0.0044 - 1	0.018		0.33	USEPA RSL RBSSL (THQ=0.1, n	1900	USEPA RSL Res Soil	N	ASL-SSLOnly
	129-00-0	Pyrene	0.029361 (J)	708.118	mg/kg	CFISS-013	68 / 68	NA	708.118		1.3	USEPA RSL RBSSL (THQ=0.1, n	180	USEPA RSL Res Soil	Y	ASL-DC Only

Footnotes:

ND - Non-detect
THQ = target hazard quotient
TR = target risk
USEPA = US Environmental Protection Agency
RSL = Regional Screening Level
MDEQ = Montana Department of Environmental Quaility
(1) Maximum detection value
(2) Site-specific risk-based screening levels. Refer to text for further discussion.
USEPA RSL Res Soil = USEPA RSL, Residential Soil (November 2018, THQ = 0.1, TR = 1 x 10^{-6})
USEPA RSL RBSSL = USEPA Regional Screening Level Risk-Based Soil Screening Level
MDEQ RBSL Res SurfSoil (DTW <10 ft) = MDEQ Risk-Based Screening Level for Residential Surface Soil, Depth to Water less than 10 ft.
c = carcinogenic basis
n = non-carcinogenic basis
dc - direct contact
(3) In accordance with the heirarchy discussed in the text, if the initial screening level used is the RBSSL and the constituent is not a groundwater COPC, then the direct contact screening level is used to select COPCs for soils. The secondary screening value presented is the direct contact screening level used in COPC selection.
(4) COPC Flag
Y = Yes
N = No
(5) Rationale for Selection or Deletion
BSL - Detections and Detection Limits Below Screening Level
BSL-ND - Detections below screening level, but detection limits either exceed screening level or no screening level available. Refer to text for further discussion of uncertainty.
ASL = Detections Above Screening Level
ASL-SSL(GW COPC) = Detections exceed soil screening level and constituent a groundwater constituent of concern.
ASL-SSLOnly - Detectoin exceed soil screening level, constituent not a groundwater constituent of concern, and direct contact risk based level not exceeded
ASL-DCOnly - Detection exceed soil screening level, constituent not a groundwater constituent of concern, but detection exceeds direct contact risk-based screening level
LDF = Low Detection Frequency - 20 or more samples and detected in less than 5 % of sample set
Carcinogen - constituent identified as either Group A or Carcinogenic To Humans by USEPA
NSL = no screening level available

Table 2-46
Summary of COPCs for Soils
Columbia Falls Aluminium Facility
Columbia Falls, Montana

Constituent	Main Plant Area 0-0.5	Main Plant Area 0-12	North Percolation Pond Area 0-0.5	North Percolation Pond Area 0-2	Central Landfills Area 0-0.5	Central Landfills Area 0-2	Central Landfills Area 0-12	Industrial Landfill Area 0-0.5	Industrial Landfill Area 0-2	Eastern Undeveloped Area 0-0.5	Eastern Undeveloped Area 0-12	North-Central Undeveloped Area 0-0.5	North-Central Undeveloped Area 0-12	Western Undeveloped Area 0-0.5	Western Undeveloped Area 0-12	South Percolation Pond Area 0-0.5	South Percolation Pond Area 0-2	South Percolation Pond Area 0-12	Flathead River Area 0-0.5	Flathead River Area 0-2	Flathead River Area 0-12	Backwater Seep Sampling Area 0-0.5	Backwater Seep Sampling Area 0-2	Main Plant Area ISM 0-0.5	Main Plant Area ISM 0-2	Central Landfill Area ISM 0-0.5	Central Landfill Area ISM 0-2
GENERAL CHEMISTRY																											
Cyanide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Fluoride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
METALS																											
Aluminum	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Antimony	●	●	●	●	●	●	●	●	●						●	●	●	●	NA	NA	NA			●	●	●	●
Arsenic	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Barium				●															NA	NA	NA						
Beryllium		●	●	●															NA	NA	NA						
Cadmium		●	●	●															NA	NA	NA						
Chromium, Hexavalent			●	●															NA	NA	NA						
Chromium, Hexavalent - Estimated	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Cobalt	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Copper	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Manganese	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Mercury	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Nickel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Selenium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA		●	●	●	●	●
Thallium		●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	NA	NA	NA			●	●	●	●
Vanadium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
POLYCHLORINATED BIPHENYLS																											
PCB-1254 (Aroclor 1254)					●	●	●												NA	NA	NA						●

Table 2-46
Summary of COPCs for Soils
Columbia Falls Aluminium Facility
Columbia Falls, Montana

Constituent	Main Plant Area 0-0.5	Main Plant Area 0-12	North Percolation Pond Area 0-0.5	North Percolation Pond Area 0-2	Central Landfills Area 0-0.5	Central Landfills Area 0-2	Central Landfills Area 0-12	Industrial Landfill Area 0-0.5	Industrial Landfill Area 0-2	Eastern Undeveloped Area 0-0.5	Eastern Undeveloped Area 0-12	North-Central Undeveloped Area 0-0.5	North-Central Undeveloped Area 0-12	Western Undeveloped Area 0-0.5	Western Undeveloped Area 0-12	South Percolation Pond Area 0-0.5	South Percolation Pond Area 0-2	South Percolation Pond Area 0-12	Flathead River Area 0-0.5	Flathead River Area 0-2	Flathead River Area 0-12	Backwater Seep Sampling Area 0-0.5	Backwater Seep Sampling Area 0-2	Main Plant Area ISM 0-0.5	Main Plant Area ISM 0-2	Central Landfill Area ISM 0-0.5	Central Landfill Area ISM 0-2
SEMIVOLATILE ORGANIC COMPOUNDS																												
Benzo(A)Anthracene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Benzo(A)Pyrene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Benzo(B)Fluoranthene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Benzo(K)Fluoranthene	●	●	●	●	●	●	●	●	●										NA	NA	NA					●	●
Bis(2-Ethylhexyl) Phthalate	●	●	●	●	●	●	●	●	●	●	●						●	●	NA	NA	NA						
Chrysene	●	●	●	●	●	●	●	●	●										NA	NA	NA			●	●	●	●
Dibenz(A,H)Anthracene	●	●	●	●	●	●	●	●	●	●	●					●	●	●	NA	NA	NA			●	●	●	●
Dibenzofuran		●	●	●	●	●	●												NA	NA	NA						
Fluoranthene		●	●	●															NA	NA	NA						
Indeno(1,2,3-C,D)Pyrene	●	●	●	●	●	●	●	●	●	●	●					●	●	●	NA	NA	NA			●	●	●	●
Naphthalene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	NA	NA	NA	●	●	●	●	●	●
Pyrene	●	●	●	●															NA	NA	NA						

Notes:

NA - Soil samples not collected within this exposure area

● COPC for human health exposure

Table 2-47
Summary of COPCs for Surface Water
Columbia Falls Aluminium Facility
Columbia Falls, Montana

Constituent	Main Plant Area	North Percolation Pond Area	Central Landfills Area	Industrial Landfill Area	Eastern Undeveloped Area	North-Central Undeveloped Area	Western Undeveloped Area	South Percolation Pond Area	Flathead River Area	Backwater Seep Sampling Area
GENERAL CHEMISTRY										
Cyanide	NA	●		NA		●	●	●	●	●
Cyanide (Free)	NA			NA	●	●	●	●	●	
Fluoride	NA	●	●	NA	●	●	●	●	●	
METALS										
Aluminum	NA	●		NA		●		●	●	●
Antimony	NA	●	●	NA	●	●		●		
Arsenic	NA	●	●	NA	●	●		●	●	●
Barium	NA			NA				●	●	
Cadmium	NA	●		NA				●		
Cobalt	NA	●		NA		●		●	●	●
Copper	NA			NA				●		
Iron	NA			NA		●		●	●	●
Manganese	NA			NA		●		●	●	●
Mercury	NA			NA				●		
Nickel	NA	●		NA				●		
Thallium	NA	●		NA				●		●
Vanadium	NA	●		NA				●		
SEMIVOLATILE ORGANIC COMPOUNDS										
Benzo(A)Anthracene	NA	●		NA					●	●
Benzo(A)Pyrene	NA	●		NA				●	●	●
Benzo(B)Fluoranthene	NA	●		NA				●	●	●
Bis(2-Ethylhexyl) Phthalate	NA			NA					●	●
Dibenz(A,H)Anthracene	NA			NA					●	●
Indeno(1,2,3-C,D)Pyrene	NA	●		NA				●		

Notes:

NA - Surface water samples not collected within this exposure area

● COPC for human health exposure

Table 2-48
Summary of COPCs for Sediment
Columbia Falls Aluminium Facility
Columbia Falls, Montana

Constituent	Main Plant Area	North Percolation Pond Area	Central Landfills Area	Industrial Landfill Area	Eastern Undeveloped Area	North-Central Undeveloped Area	Western Undeveloped Area	South Percolation Pond Area	Flathead River Area	Backwater Seep Sampling Area
GENERAL CHEMISTRY										
Cyanide	NA	●		NA				●	●	●
METALS										
Aluminum	NA	●	●	NA	●	●	●	●	●	●
Arsenic	NA	●	●	NA	●	●	●	●	●	●
Cadmium	NA	●		NA						
Cobalt	NA	●	●	NA	●	●	●	●	●	●
Iron	NA	●	●	NA	●	●	●	●	●	●
Manganese	NA		●	NA	●	●	●	●	●	●
Nickel	NA	●		NA						
Thallium	NA	●		NA						●
Vanadium	NA	●		NA						
SEMIVOLATILE ORGANIC COMPOUNDS										
Benzo(A)Anthracene	NA	●		NA					●	●
Benzo(A)Pyrene	NA	●	●	NA	●			●	●	●
Benzo(B)Fluoranthene	NA	●	●	NA				●	●	●
Benzo(K)Fluoranthene	NA	●		NA						
Chrysene	NA	●		NA						
Dibenz(A,H)Anthracene	NA	●	●	NA				●	●	●
Indeno(1,2,3-C,D)Pyrene	NA	●	●	NA				●		●

Notes:

NA - Sediment samples not collected within this exposure area

● COPC for human health exposure

Table 2-49
Summary of COPCs for Groundwater
Columbia Falls Aluminium Facility
Columbia Falls, Montana

Constituent	Western Undeveloped Area - Upper Hydrogeologic Unit Groundwater	Plume Core Area - Upper Hydrogeologic Unit Groundwater	Site-Wide Area - Below Upper Hydrogeologic Unit Groundwater
GENERAL CHEMISTRY			
Cyanide	●	●	●
Cyanide (Free)	●	●	●
Fluoride	●	●	●
METALS			
Aluminum		●	●
Antimony	●	●	●
Arsenic		●	●
Barium			●
Cobalt		●	●
Copper		●	
Iron		●	●
Manganese	●	●	●
Mercury		●	
Selenium		●	
Vanadium			●
Zinc			●
SEMIVOLATILE ORGANIC COMPOUNDS			
Bis(2-Ethylhexyl) Phthalate	●		
Naphthalene	●		
VOLATILE ORGANIC COMPOUNDS (µg/l)			
1,2-Dichloroethane			●

Notes:

● COPC for human health exposure

Table 2-50
Summary of Detected Constituents in Soil Exceeding SSLs and Not Retained as COPC
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Exposure Medium	Cas Number	Chemical Name	COPC Flag	Rationale	COPC Selection Table
Main Plant Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-1
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-1
		18540-29-9	Chromium, Hexavalent	N	ASL-SSLOnly	Table 2-1
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-1
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-1
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-1
		11097-69-1	PCB-1254 (Aroclor 1254)	N	ASL-SSLOnly	Table 2-1
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-1
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-1
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-1
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-1
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-1
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-1
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-1
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-1
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-1
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-1
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-1
		87-86-5	Pentachlorophenol	N	ASL-SSLOnly	Table 2-1
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-2
		18540-29-9	Chromium, Hexavalent	N	ASL-SSLOnly	Table 2-2
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-2
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-2
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-2
		11097-69-1	PCB-1254 (Aroclor 1254)	N	ASL-SSLOnly	Table 2-2
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-2
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-2
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-2
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-2
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-2
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-2
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-2
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-2
		118-74-1	Hexachlorobenzene	N	ASL-SSLOnly	Table 2-2
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-2
		87-86-5	Pentachlorophenol	N	ASL-SSLOnly	Table 2-2
		107-06-2	1,2-Dichloroethane	N	ASL-SSLOnly	Table 2-2
		591-78-6	2-Hexanone	N	ASL-SSLOnly	Table 2-2
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-2
		74-83-9	Bromomethane	N	ASL-SSLOnly	Table 2-2
		100-41-4	Ethylbenzene	N	ASL-SSLOnly	Table 2-2
North Percolation Pond Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-3
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-3
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-3
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-3
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-3
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-3
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-3
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-3
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-3
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-3
		84-66-2	Diethyl Phthalate	N	ASL-SSLOnly	Table 2-3
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-3
	Suburface Soil 0-2	7439-92-1	Lead	N	ASL-SSLOnly	Table 2-4
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-4
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-4
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-4
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-4
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-4
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-4
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-4
		84-66-2	Diethyl Phthalate	N	ASL-SSLOnly	Table 2-4
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-4
		591-78-6	2-Hexanone	N	ASL-SSLOnly	Table 2-4
		67-64-1	Acetone	N	ASL-SSLOnly	Table 2-4
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-4
		100-41-4	Ethylbenzene	N	ASL-SSLOnly	Table 2-4
		75-09-2	Methylene Chloride	N	ASL-SSLOnly	Table 2-4

Table 2-50
Summary of Detected Constituents in Soil Exceeding SSLs and Not Retained as COPC
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Exposure Medium	Cas Number	Chemical Name	COPC Flag	Rationale	COPC Selection Table
Central Landfill Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-7
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-7
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-7
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-7
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-7
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-7
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-7
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-7
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-7
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-7
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-7
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-7
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-7
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-7
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-7
		108-95-2	Phenol	N	ASL-SSLOnly	Table 2-7
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-7
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-8
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-8
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-8
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-8
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-8
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-8
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-8
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-8
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-8
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-8
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-8
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-8
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-8
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-8
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-8
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-8
		108-95-2	Phenol	N	ASL-SSLOnly	Table 2-8
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-8
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-8
		74-83-9	Bromomethane	N	ASL-SSLOnly	Table 2-8
		100-41-4	Ethylbenzene	N	ASL-SSLOnly	Table 2-8
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-9
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-9
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-9
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-9
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-9
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-9
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-9
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-9
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-9
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-9
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-9
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-9
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-9
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-9
		108-95-2	Phenol	N	ASL-SSLOnly	Table 2-9
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-9
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-9
		74-83-9	Bromomethane	N	ASL-SSLOnly	Table 2-9
		100-41-4	Ethylbenzene	N	ASL-SSLOnly	Table 2-9

Table 2-50
Summary of Detected Constituents in Soil Exceeding SSLs and Not Retained as COPC
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Exposure Medium	Cas Number	Chemical Name	COPC Flag	Rationale	COPC Selection Table
Industrial Landfill Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-12
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-12
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-12
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-12
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-12
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-12
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-12
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-12
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-12
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-12
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-12
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-12
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-12
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-12
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-12
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-12
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-13
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-13
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-13
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-13
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-13
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-13
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-13
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-13
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-13
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-13
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-13
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-13
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-13
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-13
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-13
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-13
Eastern Undeveloped Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-14
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-14
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-14
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-14
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-14
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-14
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-14
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-14
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-14
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-14
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-15
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-15
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-15
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-15
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-15
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-15
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-15
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-15
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-15
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-15
North Central Undeveloped Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-18
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-18
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-18
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-18
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-18
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-18
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-18
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-19
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-19
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-19
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-19
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-19
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-19
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-19
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-19
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-19

Table 2-50
Summary of Detected Constituents in Soil Exceeding SSLs and Not Retained as COPC
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Exposure Medium	Cas Number	Chemical Name	COPC Flag	Rationale	COPC Selection Table
Medium: Western Undeveloped Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-22
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-22
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-22
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-22
		100-01-6	4-Nitroaniline	N	ASL-SSLOnly	Table 2-22
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-22
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-22
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-23
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-23
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-23
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-23
		100-01-6	4-Nitroaniline	N	ASL-SSLOnly	Table 2-23
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-23
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-23
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-23
South Percolation Pond Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-26
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-26
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-26
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-26
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-26
		106-47-8	4-Chloroaniline	N	ASL-SSLOnly	Table 2-26
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-26
		111-44-4	2-Chloroethyl) Ether (2-Chloroethyl Et	N	ASL-SSLOnly	Table 2-26
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-26
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-27
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-27
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-27
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-27
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-27
		106-47-8	4-Chloroaniline	N	ASL-SSLOnly	Table 2-27
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-27
		111-44-4	2-Chloroethyl) Ether (2-Chloroethyl Et	N	ASL-SSLOnly	Table 2-27
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-27
		106-46-7	1,4-Dichlorobenzene	N	ASL-SSLOnly	Table 2-27
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-27
	Subsurface Soil 0-12	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-28
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-28
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-28
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-28
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-28
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-28
		106-47-8	4-Chloroaniline	N	ASL-SSLOnly	Table 2-28
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-28
		111-91-1	Bis(2-Chloroethoxy) Methane	N	ASL-SSLOnly	Table 2-28
		111-44-4	2-Chloroethyl) Ether (2-Chloroethyl Et	N	ASL-SSLOnly	Table 2-28
		106-46-7	1,4-Dichlorobenzene	N	ASL-SSLOnly	Table 2-28
		591-78-6	2-Hexanone	N	ASL-SSLOnly	Table 2-28
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-28
		100-41-4	Ethylbenzene	N	ASL-SSLOnly	Table 2-28
		75-09-2	Methylene Chloride	N	ASL-SSLOnly	Table 2-28
Backwater Seep Sampling Area	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-33
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-33
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-33
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-33
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-33
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-34
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-34
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-34
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-34
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-34
		71-43-2	Benzene	N	ASL-SSLOnly	Table 2-34
		79-20-9	Methyl Acetate	N	ASL-SSLOnly	Table 2-34

Table 2-50
Summary of Detected Constituents in Soil Exceeding SSLs and Not Retained as COPC
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Exposure Medium	Cas Number	Chemical Name	COPC Flag	Rationale	COPC Selection Table
Main Plant Area ISM	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-40
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-40
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-40
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-40
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-40
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-40
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-40
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-40
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-40
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-40
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-40
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-40
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-40
		87-86-5	Pentachlorophenol	N	ASL-SSLOnly	Table 2-40
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-40
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-41
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-41
		7439-92-1	Lead	N	ASL-SSLOnly	Table 2-41
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-41
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-41
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-41
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-41
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-41
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-41
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-41
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-41
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-41
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-41
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-41
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-41
		87-86-5	Pentachlorophenol	N	ASL-SSLOnly	Table 2-41
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-41
Central Landfill Area ISM	Surface Soil 0-0.5	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-42
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-42
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-42
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-42
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-42
		11097-69-1	PCB-1254 (Aroclor 1254)	N	ASL-SSLOnly	Table 2-42
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-42
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-42
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-42
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-42
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-42
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-42
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-42
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-42
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-42
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-42
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-42
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-42
		108-95-2	Phenol	N	ASL-SSLOnly	Table 2-42
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-42
	Surface Soil 0-2	7440-39-3	Barium	N	ASL-SSLOnly	Table 2-43
		7440-41-7	Beryllium	N	ASL-SSLOnly	Table 2-43
		7440-43-9	Cadmium	N	ASL-SSLOnly	Table 2-43
		7440-22-4	Silver	N	ASL-SSLOnly	Table 2-43
		7440-66-6	Zinc	N	ASL-SSLOnly	Table 2-43
		91-57-6	2-Methylnaphthalene	N	ASL-SSLOnly	Table 2-43
		83-32-9	Acenaphthene	N	ASL-SSLOnly	Table 2-43
		98-86-2	Acetophenone	N	ASL-SSLOnly	Table 2-43
		120-12-7	Anthracene	N	ASL-SSLOnly	Table 2-43
		100-52-7	Benzaldehyde	N	ASL-SSLOnly	Table 2-43
		85-68-7	Benzyl Butyl Phthalate	N	ASL-SSLOnly	Table 2-43
		92-52-4	Biphenyl (Diphenyl)	N	ASL-SSLOnly	Table 2-43
		84-74-2	Di-N-Butyl Phthalate	N	ASL-SSLOnly	Table 2-43
		132-64-9	Dibenzofuran	N	ASL-SSLOnly	Table 2-43
		206-44-0	Fluoranthene	N	ASL-SSLOnly	Table 2-43
		86-73-7	Fluorene	N	ASL-SSLOnly	Table 2-43
		78-59-1	Isophorone	N	ASL-SSLOnly	Table 2-43
		108-95-2	Phenol	N	ASL-SSLOnly	Table 2-43
		129-00-0	Pyrene	N	ASL-SSLOnly	Table 2-43

N indicates constituent not retained as COPC.
ASL-SSLOnly indicates constituent concentration exceeded soil screening for protection of groundwater only.

Table 3-1
Exposure Point Concentration Summary (Main Plant Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Main Plant Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.151	0.172 NP	0.99	0.172	mg/kg	95% UCL	95% H-UCL (KM-Log)
	16984-48-8	Fluoride	mg/kg	68.39	96.61 L	571	96.61	mg/kg	95% UCL	95% H-UCL
	7429-90-5	Aluminum	mg/kg	14337	15811 N	51200	15811	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-36-0	Antimony	mg/kg	0.253	0.269 NP	0.61	0.269	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	4.605	4.841 N	7.6	4.841	mg/kg	95% UCL	95% Student's t-UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.343	0.409 N	2.163	0.409	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	5.126	5.306 N	7.8	5.306	mg/kg	95% UCL	95% Student's t-UCL
	7440-50-8	Copper	mg/kg	15.4	16.37 N	34.5	16.37	mg/kg	95% UCL	95% Student's t-UCL
	7439-89-6	Iron	mg/kg	13364	13957 N	21500	13957	mg/kg	95% UCL	95% Student's t-UCL
	7439-96-5	Manganese	mg/kg	425.8	456.8 N	1270	456.8	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-97-6	Mercury	mg/kg	0.0201	0.0218 G	0.069	0.0218	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	7440-02-0	Nickel	mg/kg	20.89	30.6 NP	140	30.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.246	0.263 N	0.66	0.263	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	12.7	13.67 G	31.6	13.67	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	56-55-3	Benzo(A)Anthracene	mg/kg	4.906	12.04 NP	110	12.04	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	5.738	13.98 NP	130	13.98	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.275	15.23 L	150	15.23	mg/kg	95% UCL	95% H-UCL (KM-Log)
	207-08-9	Benzo(K)Fluoranthene	mg/kg	2.938	6.33 L	68	6.33	mg/kg	95% UCL	95% H-UCL (KM-Log)
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.151	0.114 L	5.8	0.114	mg/kg	95% UCL	95% H-UCL (KM-Log)
	218-01-9	Chrysene	mg/kg	6.212	12.93 L	130	12.93	mg/kg	95% UCL	95% H-UCL (KM-Log)
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	1.297	3.053 L	28	3.053	mg/kg	95% UCL	95% H-UCL (KM-Log)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	5.002	10.62 L	100	10.62	mg/kg	95% UCL	95% H-UCL (KM-Log)
	91-20-3	Naphthalene	mg/kg	0.193	0.491 NP	4	0.491	mg/kg	95% UCL	95% KM Chebyshev UCL
	129-00-0	Pyrene	mg/kg	9.442	23.56 NP	220	23.56	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
L = lognormal
G = gamma
N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-2
Exposure Point Concentration Summary (Main Plant Area - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Main Plant Area Soil
Exposure Medium: Subsurface Soil (0 to 12 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	mg/kg	0.185	0.411 NP	15.3	0.411	mg/kg	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	mg/kg	59.47	81.71 L	896	81.71	mg/kg	95% UCL	95% H-UCL (KM-Log)
	7429-90-5	Aluminum	mg/kg	13127	16467 NP	102000	16467	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	0.785	0.315 NP	3.3	0.315	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	mg/kg	4.442	4.676 N	34.2	4.676	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-41-7	Beryllium	mg/kg	0.569	0.752 N	32.7	0.752	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-43-9_d	Cadmium	mg/kg	0.31	0.437 NP	8	0.437	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.328	0.385 NP	9.715	0.385	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	5.14	5.261 N	18.1	5.261	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	15.2	15.99 N	74.8	15.99	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-89-6	Iron	mg/kg	13239	13551 NP	43800	13551	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-96-5	Manganese	mg/kg	391.5	403.7 N	1270	403.7	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-97-6	Mercury	mg/kg	0.0198	0.0217 NP	0.27	0.0217	mg/kg	95% UCL	95% KM (BCA) UCL
	7440-02-0	Nickel	mg/kg	19.24	30.59 NP	754	30.59	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.662	0.257 G	1.4	0.257	mg/kg	95% UCL	95% KM Approximate Gamma UCL
	7440-28-0	Thallium	mg/kg	0.105	0.137 NP	2.2	0.137	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	12.15	13.67 NP	221	13.67	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	56-55-3	Benzo(A)Anthracene	mg/kg	3.958	10 NP	400	10	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	4.365	11.11 NP	450	11.11	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	7.226	28.02 L	570	28.02	mg/kg	95% UCL	95% H-UCL (KM-Log)
	207-08-9	Benzo(K)Fluoranthene	mg/kg	2.205	5.391 NP	210	5.391	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.129	0.278 NP	5.8	0.278	mg/kg	95% UCL	95% KM Chebyshev UCL
	218-01-9	Chrysene	mg/kg	5.808	14.43 NP	500	14.43	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.716	1.367 NP	28	1.367	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	0.161	0.424 NP	15	0.424	mg/kg	95% UCL	95% KM Chebyshev UCL
	206-44-0	Fluoranthene	mg/kg	8.709	23.97 NP	1000	23.97	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	5.268	18.83 L	360	18.83	mg/kg	95% UCL	95% H-UCL (KM-Log)
	91-20-3	Naphthalene	mg/kg	0.146	0.3 NP	8	0.3	mg/kg	95% UCL	95% KM Chebyshev UCL
	129-00-0	Pyrene	mg/kg	7.656	19.32 NP	730	19.32	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit
c/ The suffix "_d" is added to the cadmium cas number for dietary exposures for soil, sediment, fish and game tissue, and air.

Table 3-3
Exposure Point Concentration Summary (North Percolation Pond Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	13.38	44.8 NP	137	44.8	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	16984-48-8	Fluoride	mg/kg	91.91	145.6 G	241	145.6	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.613	0.724 N	1.271	0.724	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	34491	46518 G	106000	46518	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-36-0	Antimony	mg/kg	0.557	0.825 NP	2.6	0.825	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	9.94	12.06 N	22.7	12.06	mg/kg	95% UCL	95% Student's-t UCL
	7440-41-7	Beryllium	mg/kg	2.581	4.105 G	17.2	4.105	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-43-9_d	Cadmium	mg/kg	2.155	3.358 G	8.3	3.358	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	18540-29-9	Chromium, Hexavalent	mg/kg	NA	NA	0.68	0.68	mg/kg	Maximum	Not enough data for meaningful statistics
	7440-48-4	Cobalt	mg/kg	6.735	8.925 G	27.4	8.925	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-50-8	Copper	mg/kg	32.89	40.45 N	71.6	40.45	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	8125	9657 N	15400	9657	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	148.4	230.4 G	479	230.4	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7439-97-6	Mercury	mg/kg	0.0314	0.0436 G	0.12	0.0436	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	7440-02-0	Nickel	mg/kg	215	329.5 G	1250	329.5	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7782-49-2	Selenium	mg/kg	0.772	1.517 G	3.3	1.517	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	7440-28-0	Thallium	mg/kg	0.757	2.002 NP	4.6	2.002	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	69.28	101.6 G	348	101.6	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	56-55-3	Benzo(A)Anthracene	mg/kg	238.2	1013 NP	2700	1013	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	260.8	1145 NP	3100	1145	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	302.1	925.9 NP	3000	925.9	mg/kg	95% UCL	95% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	183.1	645.5 NP	2400	645.5	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	NA	NA	0.17	0.17	mg/kg	Maximum	Not enough data for meaningful statistics
	218-01-9	Chrysene	mg/kg	261.5	1055 NP	2800	1055	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	63.45	279.1 NP	740	279.1	mg/kg	95% UCL	97.5% KM (Chebyshev) UCL
	132-64-9	Dibenzofuran	mg/kg	2.767	8.616 G	28	8.616	mg/kg	95% UCL	Gamma Adjusted KM-UCL (n< 50)
	206-44-0	Fluoranthene	mg/kg	359.9	2024 NP	3700	2024	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	179.2	584.3 NP	2000	584.3	mg/kg	95% UCL	95% KM (Chebyshev) UCL
	91-20-3	Naphthalene	mg/kg	1.307	3.215 G	12	3.215	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	129-00-0	Pyrene	mg/kg	320.1	1777 NP	3200	1777	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit
c/ The suffix "_d" is added to the cadmium cas number for dietary exposures for soil, sediment, fish and game tissue, and air.

Table 3-4
Exposure Point Concentration Summary (North Percolation Pond Area - Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area Soil
Exposure Medium: Surface Soil (0 to 2 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	13.76	44.8 NP	137	44.8	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	16984-48-8	Fluoride	mg/kg	84.19	115.1 G	306	115.1	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.561	0.647 G	1.378	0.647	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7429-90-5	Aluminum	mg/kg	33846	55237 NP	123000	55237	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	0.478	0.646 NP	2.6	0.646	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	10.72	12.78 G	34.1	12.78	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-39-3	Barium	mg/kg	201	255.2 G	1560	255.2	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-41-7	Beryllium	mg/kg	2.699	5.388 NP	17.2	5.388	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-43-9_d	Cadmium	mg/kg	1.981	2.916 G	9.6	2.916	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	18540-29-9	Chromium, Hexavalent	mg/kg	NA	NA	0.68	0.68	mg/kg	Maximum	Not enough data for meaningful statistics
	7440-48-4	Cobalt	mg/kg	6.378	7.588 N	27.4	7.588	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	30.42	37.74 G	202	37.74	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7439-89-6	Iron	mg/kg	9876	11001 N	23600	11001	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	182.6	236.4 G	762	236.4	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7439-97-6	Mercury	mg/kg	0.0278	0.0351 G	0.12	0.0351	mg/kg	95% UCL	95% KM Adjusted Gamma UCL
	7440-02-0	Nickel	mg/kg	174.2	232.6 G	1250	232.6	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7782-49-2	Selenium	mg/kg	0.775	1.287 NP	3.3	1.287	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-28-0	Thallium	mg/kg	0.811	1.674 NP	4.6	1.674	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	58.65	75.32 G	348	75.32	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	56-55-3	Benzo(A)Anthracene	mg/kg	195.5	649.5 NP	2700	649.5	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	219.2	747.7 NP	3100	747.7	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	259.9	801.9 NP	3000	801.9	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	149.7	539.4 NP	2400	539.4	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.225	0.599 NP	5.9	0.599	mg/kg	95% UCL	95% KM (t) UCL
	218-01-9	Chrysene	mg/kg	222.3	691.1 NP	2800	691.1	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	52.28	179.9 NP	740	179.9	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	2.645	5.069 G	28	5.069	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	206-44-0	Fluoranthene	mg/kg	332.6	990 NP	3700	990	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	151	497.4 NP	2000	497.4	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	1.235	2.084 G	12	2.084	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	129-00-0	Pyrene	mg/kg	294.5	875.1 NP	3200	875.1	mg/kg	95% UCL	97.5% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit
d/ The suffix "_d" is added to the cadmium cas number for dietary exposures for soil, sediment, fish and game tissue, and air.

Table 3-5
Exposure Point Concentration Summary (North Percolation Pond Area - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	NA	NA	7.6	7.6	µg/l	Maximum	Not enough data to perform statistics
	16984-48-8	Fluoride	µg/l	NA	NA	22400	22400	µg/l	Maximum	Not enough data to perform statistics
	7429-90-5	Aluminum	µg/l	NA	NA	8630	8630	µg/l	Maximum	Not enough data to perform statistics
	7440-36-0	Antimony	µg/l	NA	NA	7.7	7.7	µg/l	Maximum	Not enough data to perform statistics
	7440-38-2	Arsenic	µg/l	NA	NA	2.4	2.4	µg/l	Maximum	Not enough data to perform statistics
	7440-43-9	Cadmium	µg/l	NA	NA	3	3	µg/l	Maximum	Not enough data to perform statistics
	7440-48-4	Cobalt	µg/l	NA	NA	1.6	1.6	µg/l	Maximum	Not enough data to perform statistics
	7440-02-0	Nickel	µg/l	NA	NA	55.9	55.9	µg/l	Maximum	Not enough data to perform statistics
	7440-28-0	Thallium	µg/l	NA	NA	0.27	0.27	µg/l	Maximum	Not enough data to perform statistics
	7440-62-2	Vanadium	µg/l	NA	NA	18	18	µg/l	Maximum	Not enough data to perform statistics
	56-55-3	Benzo(A)Anthracene	µg/l	NA	NA	3	3	µg/l	Maximum	Not enough data to perform statistics
	50-32-8	Benzo(A)Pyrene	µg/l	NA	NA	3.9	3.9	µg/l	Maximum	Not enough data to perform statistics
	205-99-2	Benzo(B)Fluoranthene	µg/l	NA	NA	10	10	µg/l	Maximum	Not enough data to perform statistics
	193-39-5	Indeno(1,2,3-C,D)Pyrene	µg/l	NA	NA	3.1	3.1	µg/l	Maximum	Not enough data to perform statistics

Footnotes:
a/ µg/l = milligrams per liter
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-6
Exposure Point Concentration Summary (North Percolation Pond Area - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Percolation Pond Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	57-12-5	Cyanide	mg/kg	NA	NA	7.8	7.8	mg/kg	Maximum	Not enough data to perform statistics
	7429-90-5	Aluminum	mg/kg	NA	NA	112000	112000	mg/kg	Maximum	Not enough data to perform statistics
	7440-38-2	Arsenic	mg/kg	NA	NA	26.4	26.4	mg/kg	Maximum	Not enough data to perform statistics
	7440-43-9_d	Cadmium	mg/kg	NA	NA	8	8	mg/kg	Maximum	Not enough data to perform statistics
	7440-48-4	Cobalt	mg/kg	NA	NA	18.5	18.5	mg/kg	Maximum	Not enough data to perform statistics
	7439-89-6	Iron	mg/kg	NA	NA	9040	9040	mg/kg	Maximum	Not enough data to perform statistics
	7440-02-0	Nickel	mg/kg	NA	NA	771	771	mg/kg	Maximum	Not enough data to perform statistics
	7440-28-0	Thallium	mg/kg	NA	NA	1.2	1.2	mg/kg	Maximum	Not enough data to perform statistics
	7440-62-2	Vanadium	mg/kg	NA	NA	233	233	mg/kg	Maximum	Not enough data to perform statistics
	56-55-3	Benzo(A)Anthracene	mg/kg	NA	NA	76	76	mg/kg	Maximum	Not enough data to perform statistics
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	100	100	mg/kg	Maximum	Not enough data to perform statistics
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	210	210	mg/kg	Maximum	Not enough data to perform statistics
	207-08-9	Benzo(K)Fluoranthene	mg/kg	NA	NA	64	64	mg/kg	Maximum	Not enough data to perform statistics
	218-01-9	Chrysene	mg/kg	NA	NA	150	150	mg/kg	Maximum	Not enough data to perform statistics
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	NA	NA	40	40	mg/kg	Maximum	Not enough data to perform statistics
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	NA	NA	140	140	mg/kg	Maximum	Not enough data to perform statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-7
Exposure Point Concentration Summary (Central Landfill Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.378	0.433 N	9.9	0.433	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	61.16	82.9 G	796	82.9	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.319	0.385 N	2.27	0.385	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	14658	15808 N	30800	15808	mg/kg	95% UCL	95% Student's-t UCL
	7440-36-0	Antimony	mg/kg	0.249	0.265 N	0.57	0.265	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	6.617	6.583 G	11.8	6.583	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7440-48-4	Cobalt	mg/kg	5.596	5.867 N	9.5	5.867	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	142.5	696.5 NP	7260	696.5	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	15478	16479 N	37100	16479	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-96-5	Manganese	mg/kg	494.2	547.2 N	1570	547.2	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-97-6	Mercury	mg/kg	0.02	0.0217 NP	0.045	0.0217	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)
	7440-02-0	Nickel	mg/kg	20.57	23.98 N	89	23.98	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7782-49-2	Selenium	mg/kg	0.334	0.388 NP	1.2	0.388	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.107	0.111 NP	0.14	0.111	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	13.51	14.67 G	27.7	14.67	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	0.0449	0.341 NP	1.2	0.341	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	2.577	10.32 NP	100	10.32	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	2.751	10.57 NP	100	10.57	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	3.614	12.99 NP	120	12.99	mg/kg	95% UCL	95% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	1.438	5.383 NP	50	5.383	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.283	0.246 G	2.5	0.246	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	218-01-9	Chrysene	mg/kg	3.14	11.7 NP	110	11.7	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.623	2.267 NP	21	2.267	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	0.209	0.977 NP	10	0.977	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	2.38	8.41 NP	76	8.41	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	0.181	0.0686 NP	4.6	0.0686	mg/kg	95% UCL	95% H-UCL (KM -Log)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-8
Exposure Point Concentration Summary (Central Landfill Area - Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Soil
Exposure Medium: Surface Soil (0 to 2 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	0.132	0.163 NP	1.4	0.163	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	45.89	62.24 L	250	62.24	mg/kg	95% UCL	95% H-UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.297	0.338 N	2.27	0.338	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	13802	14690 G	36800	14690	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7440-36-0	Antimony	mg/kg	0.26	0.293 NP	1.5	0.293	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	6.367	6.837 NP	17.9	6.837	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	5.59	5.865 NP	13	5.865	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	92.64	428.6 NP	7260	428.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	14887	15623 NP	37100	15623	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-96-5	Manganese	mg/kg	448.2	479.3 N	1140	479.3	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-97-6	Mercury	mg/kg	0.0213	0.0231 NP	0.076	0.0231	mg/kg	95% UCL	95% KM (t) UCL
	7440-02-0	Nickel	mg/kg	25.56	52.8 NP	534	52.8	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.345	0.522 NP	3	0.522	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-28-0	Thallium	mg/kg	0.125	0.188 NP	1.1	0.188	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	14.76	22.94 NP	151	22.94	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	NA	NA	1.2	1.2	mg/kg	Maximum	Not enough data to perform meaningful statistics
	56-55-3	Benzo(A)Anthracene	mg/kg	2.775	9.039 NP	100	9.039	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	2.679	8.552 NP	100	8.552	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	3.848	11.36 NP	120	11.36	mg/kg	95% UCL	95% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	1.446	4.433 NP	50	4.433	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0276	0.035 G	0.23	0.035	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	218-01-9	Chrysene	mg/kg	3.864	11.6 NP	110	11.6	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.675	2.023 NP	21	2.023	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	0.29	1.126 NP	15	1.126	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	2.319	6.852 NP	76	6.852	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	0.175	0.686 NP	10	0.686	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-9
Exposure Point Concentration Summary (Central Landfill Area - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Central Landfill Area Soil
Exposure Medium: Subsurface Soil (0 to 12 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	mg/kg	0.326	0.811 NP	13	0.811	mg/kg	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	mg/kg	49.98	61.42 L	796	61.42	mg/kg	95% UCL	95% H-UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.287	0.312 N	2.27	0.312	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	12601	13314 N	36800	13314	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-36-0	Antimony	mg/kg	0.25	0.27 NP	1.5	0.27	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	5.844	6.173 N	17.9	6.173	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	5.508	5.717 NP	13	5.717	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	63.71	271.6 NP	7260	271.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	14469	14988 N	37100	14988	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-96-5	Manganese	mg/kg	440.7	466.8 N	1570	466.8	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-97-6	Mercury	mg/kg	0.0209	0.0227 NP	0.083	0.0227	mg/kg	95% UCL	95% KM (BCA) UCL
	7440-02-0	Nickel	mg/kg	20.51	37.53 NP	534	37.53	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.108	0.137 G	3	0.137	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)
	7440-28-0	Thallium	mg/kg	0.115	0.154 NP	1.1	0.154	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	12.61	12.86 L	151	12.86	mg/kg	95% UCL	95% H-UCL
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	0.038	0.0667 NP	1.2	0.0667	mg/kg	95% UCL	95% KM (t) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	1.782	5.677 NP	100	5.677	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	1.732	5.386 NP	100	5.386	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	2.503	7.191 NP	120	7.191	mg/kg	95% UCL	95% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	0.946	2.807 NP	50	2.807	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0406	0.114 NP	2.5	0.114	mg/kg	95% UCL	95% KM Chebyshev UCL
	218-01-9	Chrysene	mg/kg	2.492	7.317 NP	110	7.317	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.44	1.281 NP	21	1.281	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	0.181	0.699 NP	15	0.699	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	1.52	4.35 NP	76	4.35	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	0.111	0.428 NP	10	0.428	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-10
Exposure Point Concentration Summary (Central Landfill Area - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	16984-48-8	Fluoride	µg/l	287.4	1129 NP	2600	1129	µg/l	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	µg/l	NA	NA	2.2	2.2	µg/l	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	µg/l	NA	NA	0.8	0.8	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = milligrams per liter
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-11
Exposure Point Concentration Summary (Central Landfill Area - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Central Landfill Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mg/kg	NA	NA	22700	22700	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	NA	NA	5.8	5.8	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-48-4	Cobalt	mg/kg	NA	NA	8.6	8.6	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-89-6	Iron	mg/kg	NA	NA	20200	20200	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-96-5	Manganese	mg/kg	NA	NA	1280	1280	mg/kg	Maximum	Not enough data to perform meaningful statistics
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	1.1	1.1	mg/kg	Maximum	Not enough data to perform meaningful statistics
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	1.8	1.8	mg/kg	Maximum	Not enough data to perform meaningful statistics
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	NA	NA	0.28	0.28	mg/kg	Maximum	Not enough data to perform meaningful statistics
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	NA	NA	1.3	1.3	mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-12
Exposure Point Concentration Summary (Industrial Landfill Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Industrial Landfill Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.11	0.157 NP	0.42	0.157	mg/kg	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	mg/kg	64.06	471.3 NP	579	471.3	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.33	0.431 N	1.049	0.431	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	16762	21418 G	38900	21418	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-36-0	Antimony	mg/kg	0.442	0.794 NP	2.8	0.794	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	6.98	9.302 N	23.5	9.302	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	6.033	7.454 N	16	7.454	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	16.23	21.84 N	54.6	21.84	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7439-89-6	Iron	mg/kg	15606	16810 N	20600	16810	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	614.5	1280 NP	2620	1280	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0215	0.0295 G	0.055	0.0295	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-02-0	Nickel	mg/kg	47.56	177.6 NP	463	177.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.309	0.379 NP	0.75	0.379	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	NA	NA	0.17	0.17	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	23.22	68.99 NP	169	68.99	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	5.935	44.19 NP	43	43	mg/kg	95% UCL	99% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	7.073	52.45 NP	53	52.45	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	7.962	58.72 NP	60	58.72	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	3.163	23.44 NP	24	23.44	mg/kg	95% UCL	99% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0507	0.0639 NP	0.093	0.0639	mg/kg	95% UCL	95% KM (t) UCL
	218-01-9	Chrysene	mg/kg	6.952	51.37 NP	51	51	mg/kg	95% UCL	99% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	1.478	10.96 NP	11	10.96	mg/kg	95% UCL	99% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	5.316	39.56 NP	40	39.56	mg/kg	95% UCL	99% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	0.145	1.349 NP	1.8	1.349	mg/kg	95% UCL	99% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-13
Exposure Point Concentration Summary (Industrial Landfill Area - Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Industrial Landfill Area Soil
Exposure Medium: Surface Soil (0 to 2 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	0.0897	0.122 NP	0.42	0.122	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	16984-48-8	Fluoride	mg/kg	79.33	232.9 NP	810	232.9	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.299	0.327 N	0.575	0.327	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	20004	36052 NP	117000	36052	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	0.405	0.582 NP	2.9	0.582	mg/kg	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	mg/kg	6.577	7.812 N	23.2	7.812	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	mg/kg	5.813	6.583 N	15.6	6.583	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-50-8	Copper	mg/kg	39.7	150.4 NP	776	150.4	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	15447	16449 NP	20500	16449	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	488.4	839.6 NP	2620	839.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0104	0.0237 NP	0.055	0.0237	mg/kg	95% UCL	95% KM Adjusted Gamma UCL
	7440-02-0	Nickel	mg/kg	41.53	119 NP	513	119	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.276	0.29 NP	0.39	0.29	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.118	0.125 NP	0.19	0.125	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	20.8	45.36 NP	163	45.36	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	3.839	16.2 NP	43	16.2	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	4.646	19.39 NP	53	19.39	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	5.241	21.74 NP	60	21.74	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	2.177	8.821 NP	24	8.821	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0454	0.0516 NP	0.093	0.0516	mg/kg	95% UCL	95% KM (t) UCL
	218-01-9	Chrysene	mg/kg	4.463	18.83 NP	51	18.83	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.99	4.076 NP	11	4.076	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	3.595	14.78 NP	40	14.78	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	0.0847	0.399 G	1.8	0.399	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-14
Exposure Point Concentration Summary (Eastern Undeveloped Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.218	0.304 NP	0.64	0.304	mg/kg	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	mg/kg	11.11	21.05 G	32.9	21.05	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.217	0.238 G	0.31	0.238	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7429-90-5	Aluminum	mg/kg	16317	19578 N	30300	19578	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	6.075	7.18 N	12.4	7.18	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg/kg	5.125	5.594 N	7.3	5.594	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	12.85	14.3 N	18.6	14.3	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	11706	12863 N	16600	12863	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	1242	1701 N	210	210	mg/kg	95% UCL	95% Student's-t UCL
	7439-97-6	Mercury	mg/kg	0.0372	0.0498 G	0.12	0.0498	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-02-0	Nickel	mg/kg	27.83	40.24 G	68.9	40.24	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7782-49-2	Selenium	mg/kg	0.277	0.354 NP	0.64	0.354	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.112	0.123 NP	0.15	0.123	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	14.38	17.48 N	25.7	17.48	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.33	0.618 G	1.5	0.618	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.471	0.891 G	1.9	0.891	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	1.026	2.049 G	4.5	2.049	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0588	0.093 NP	0.15	0.093	mg/kg	95% UCL	95% KM (t) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.134	0.267 G	0.62	0.267	mg/kg	C	95% Gamma Adjusted KM-UCL (n<50)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.539	1.047 G	2.5	1.047	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	91-20-3	Naphthalene	mg/kg	0.00561	0.00835 NP	0.021	0.00835	mg/kg	95% UCL	95% KM (t) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-15
Exposure Point Concentration Summary (Eastern Undeveloped Area - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Soil
Exposure Medium: Surface Soil (0 to 12 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.17	0.229 L	1.2	0.229	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	11.86	20.42 NP	41.3	20.42	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.212	0.224 N	0.31	0.224	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	15282	21075 NP	30300	21075	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	mg/kg	5.579	6.205 N	12.4	6.205	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg/kg	4.759	5.034 N	7.3	5.034	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	11.6	12.6 N	18.6	12.6	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	11656	12420 G	16600	12420	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7439-96-5	Manganese	mg/kg	835.5	1113 L	3950	1113	mg/kg	95% UCL	95% H-UCL
	7439-97-6	Mercury	mg/kg	0.0264	0.0337 G	0.12	0.0337	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-02-0	Nickel	mg/kg	18.41	30.59 NP	68.9	30.59	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	0.261	0.296 NP	0.64	0.296	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.106	0.111 NP	0.15	0.111	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	11.49	13.23 N	25.7	13.23	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.171	0.314 G	1.5	0.314	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.243	0.69 NP	1.9	0.69	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.529	1.016 G	4.5	1.016	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0535	0.0657 NP	0.15	0.0657	mg/kg	95% UCL	95% KM (t) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.07	0.131 G	0.62	0.131	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.28	0.53 G	2.5	0.53	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	91-20-3	Naphthalene	mg/kg	0.00367	0.00491 NP	0.021	0.00491	mg/kg	95% UCL	95% KM (t) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-16
Exposure Point Concentration Summary (Eastern Undeveloped Area - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	FREE CN	Cyanide (Free)	µg/l	NA	NA	5.8	5.8	µg/l	Maximum	Not enough data to perform statistics
	16984-48-8	Fluoride	µg/l	NA	NA	322	322	µg/l	Maximum	Not enough data to perform statistics
	7440-36-0	Antimony	µg/l	NA	NA	2	2	µg/l	Maximum	Not enough data to perform statistics
	7440-38-2	Arsenic	µg/l	NA	NA	0.95	0.95	µg/l	Maximum	Not enough data to perform statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-17
Exposure Point Concentration Summary (Eastern Undeveloped Area - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Eastern Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mg/kg	NA	NA	17400	17400	mg/kg	Maximum	Not enough data to perform statistics
	7440-38-2	Arsenic	mg/kg	NA	NA	6.8	6.8	mg/kg	Maximum	Not enough data to perform statistics
	7440-48-4	Cobalt	mg/kg	NA	NA	5.8	5.8	mg/kg	Maximum	Not enough data to perform statistics
	7439-89-6	Iron	mg/kg	NA	NA	14100	14100	mg/kg	Maximum	Not enough data to perform statistics
	7439-96-5	Manganese	mg/kg	NA	NA	517	517	mg/kg	Maximum	Not enough data to perform statistics
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	0.12	0.12	mg/kg	Maximum	Not enough data to perform statistics

Footnotes:
a/ mg/l = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-18
Exposure Point Concentration Summary (North Central Undeveloped Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Central Undeveloped Area Soil
Exposure Medium: Surface Soil (0 to 0.5 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.107	0.141 NP	0.3	0.141	mg/kg	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	mg/kg	9.136	11.25 N	27.6	11.25	mg/kg	95% UCL	95% Student's-t UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.235	0.261 N	0.415	0.261	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	17334	19264 N	27400	19264	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	6.204	7.345 G	15.8	7.345	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-48-4	Cobalt	mg/kg	5.252	5.759 N	8.2	5.759	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	13.83	15.75 N	26.2	15.75	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	14240	15638 N	23400	15638	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	617.3	959.1 NP	1940	959.1	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0244	0.0284 NP	0.053	0.0284	mg/kg	95% UCL	95% KM (t) UCL
	7440-02-0	Nickel	mg/kg	12.31	14.55 N	35.7	14.55	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7782-49-2	Selenium	mg/kg	0.292	0.325 NP	0.5	0.325	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	NA	NA	0.19	0.19	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	12.01	13.33 N	20.4	13.33	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0034	0.0679 G	0.14	0.0679	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.0042	0.0901 G	0.22	0.0901	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.114	0.183 G	0.51	0.183	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	91-20-3	Naphthalene	mg/kg	0.00493	0.0122 G	0.049	0.0122	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-19
Exposure Point Concentration Summary (North Central Undeveloped Area - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: North Central Undeveloped Area Soil
Exposure Medium: Subsurface Soil (0 to 12 ft-bgs)

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	mg/kg	0.0711	0.0882 NP	0.3	0.0882	mg/kg	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	mg/kg	0.01	7.686 G	27.6	7.686	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.242	0.257	0.415	0.257	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	13882	15137 N	29400	15137	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	6.398	7.126 G	15.8	7.126	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7440-48-4	Cobalt	mg/kg	5.275	5.589 N	8.6	5.589	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	13.2	14.24 N	26.7	14.24	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	13877	14647 N	23400	14647	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	504.6	667.2 NP	1940	667.2	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0098	0.0233 G	0.053	0.0233	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)
	7440-02-0	Nickel	mg/kg	10.9	11.78 N	35.7	11.78	mg/kg	95% UCL	95% Student's-t UCL
	7782-49-2	Selenium	mg/kg	0.269	0.284 NP	0.5	0.284	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.108	0.118 NP	0.41	0.118	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	10.16	10.96 N	20.4	10.96	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0231	0.0322 G	0.14	0.0322	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.03	0.0423 G	0.22	0.0423	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.056	0.0828 G	0.51	0.0828	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	91-20-3	Naphthalene	mg/kg	0.0034	0.00549 G	0.049	0.00549	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-20
Exposure Point Concentration Summary (North Central Undeveloped Area - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Central Undeveloped Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	NA	NA	4.4	4.4	µg/l	Maximum	Not enough data to perform meaningful statistics
	FREE CN	Cyanide (Free)	µg/l	2.123	2.569 NP	4.1	2.569	µg/l	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	µg/l	202.4	282.3 NP	473	282.3	µg/l	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	µg/l	414.5	1530 NP	5750	1530	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-36-0	Antimony	µg/l	0.887	1.191 NP	2.9	1.191	µg/l	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	µg/l	1.025	1.286 NP	3.7	1.286	µg/l	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	µg/l	1.378	1.51 NP	2.4	1.51	µg/l	95% UCL	95% KM (t) UCL
	7439-89-6	Iron	µg/l	397.2	1912 NP	4760	1912	µg/l	95% UCL	97.5% KM Chebyshev UCL
	7439-96-5	Manganese	µg/l	179.5	889.8 NP	3750	889.8	µg/l	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ µg/l = milligrams per liter
b/ NA = not applicable
c/ N = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-21
Exposure Point Concentration Summary (North Central Undeveloped Area - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: North Central Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mgkg	20446	25037 G	35400	25037	mgkg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-38-2	Arsenic	mgkg	7.131	8.968 N	14.5	8.968	mgkg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mgkg	5.2	6.168 N	9.2	6.168	mgkg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mgkg	14400	16676 N	25200	16676	mgkg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mgkg	424.6	846.7 G	1210	846.7	mgkg	95% UCL	95% Adjusted Gamma UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ N = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-22
Exposure Point Concentration Summary (Western Undeveloped Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.226	0.32 L	2.2	0.32	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	5.458	6.88 G	15.4	6.88	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.311	0.338 N	0.49	0.338	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	17662	19193 N	29200	19193	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	5.013	5.526 N	9	5.526	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg/kg	5.742	5.994 N	7.2	5.994	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	16.25	17.9 N	27	17.9	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	15177	15873	19900	15873	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	513.3	643.4 G	2210	643.4	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7439-97-6	Mercury	mg/kg	0.0228	0.0274 G	0.063	0.0274	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-02-0	Nickel	mg/kg	11.6	12.08 N	14.3	12.08	mg/kg	95% UCL	95% Student's-t UCL
	7782-49-2	Selenium	mg/kg	NA	NA	0.93	0.93	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	12.26	13.09 N	17.3	13.09	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0356	0.0528 G	0.19	0.0528	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.0422	0.0672 G	0.27	0.0672	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.0032	0.1 G	0.35	0.1	mg/kg	95% UCL	95% Gamma Adjusted UCL (n<50)
	91-20-3	Naphthalene	mg/kg	0.00341	0.00447 NP	0.013	0.00447	mg/kg	95% UCL	95% KM (t) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ Note, total chromium will be evaluated as chromium III and chromium VI on a 6:1 ratio.
d/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-23
Exposure Point Concentration Summary (Western Undeveloped Area - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Soil
Exposure Medium: Surface Soil 0 to 12

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-12 ft-bgs	57-12-5	Cyanide	mg/kg	0.121	0.188 G	2.2	0.188	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	16984-48-8	Fluoride	mg/kg	0.01	4.869 G	15.4	4.869	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.311	0.329 G	0.693	0.329	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7429-90-5	Aluminum	mg/kg	15546	16697	30900	16697	mg/kg	95% UCL	95% Student's-t UCL
	7440-36-0	Antimony	mg/kg	NA	NA	0.36	0.36	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	4.904	5.257 G	10.8	5.257	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7440-48-4	Cobalt	mg/kg	5.599	5.781 N	7.4	5.781	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	15.01	16.02 G	27	16.02	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7439-89-6	Iron	mg/kg	14685	15191 N	21100	15191	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	410.2	461.9 G	2210	461.9	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	7439-97-6	Mercury	mg/kg	0.0192	0.0212 NP	0.063	0.0212	mg/kg	95% UCL	95% KM (t) UCL
	7440-02-0	Nickel	mg/kg	10.98	11.3 N	14.3	11.3	mg/kg	95% UCL	95% Student's-t UCL
	7782-49-2	Selenium	mg/kg	0.346	0.386 NP	1.1	0.386	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	0.1	0.103 NP	0.14	0.103	mg/kg	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	mg/kg	11.42	12.04 N	21.4	12.04	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0176	0.0251 G	0.19	0.0251	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.0203	0.029 L	0.27	0.029	mg/kg	95% UCL	95% H-UCL (KM -Log)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.0332	0.0481 G	0.35	0.0481	mg/kg	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	91-20-3	Naphthalene	mg/kg	0.00885	0.00959 G	0.013	0.00959	mg/kg	95% UCL	95% Gamma Approximate UCL (n>=50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ Note, total chromium will be evaluated as chromium III and chromium VI on a 6:1 ratio.
d/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-24
Exposure Point Concentration Summary (Western Undeveloped Area - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	2.747	5 NP	15.3	5	µg/l	95% UCL	95% KM Chebyshev UCL
	FREE CN	Cyanide (Free)	µg/l	1.83	3.69 NP	7.7	3.69	µg/l	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	µg/l	4.262	173.2 L	137	137	µg/l	95% UCL	95% H-UCL (KM -Log)

Footnotes:
a/ µg/l = milligrams per liter
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-25
Exposure Point Concentration Summary (Western Undeveloped Area - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Western Undeveloped Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mg/kg	NA	NA	12600	12600	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	NA	NA	4.2	4.2	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-48-4	Cobalt	mg/kg	NA	NA	6.5	6.5	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-89-6	Iron	mg/kg	NA	NA	16400	16400	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-96-5	Manganese	mg/kg	NA	NA	571	571	mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-26
Exposure Point Concentration Summary (South Percolation Pond - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Ponds Area Soil
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	1.03	4.117 NP	16.4	4.117	mg/kg	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	mg/kg	14.19	17.95 N	44.1	17.95	mg/kg	95% UCL	95% Student's-t UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.26	0.317	0.878	0.317	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	8493	9447 N	2570	2570	mg/kg	95% UCL	95% Student's-t UCL
	7440-36-0	Antimony	mg/kg	NA	NA	0.67	0.67	mg/kg	Maximum	Not enough meaningful data to perform statistics
	7440-38-2	Arsenic	mg/kg	2.966	3.53 NP	5.7	3.53	mg/kg	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	mg/kg	4.443	4.98 NP	6.7	4.98	mg/kg	95% UCL	95% KM (t) UCL
	7440-50-8	Copper	mg/kg	70.67	204.4 NP	694	204.4	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	10309	11759 N	15300	11759	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	205.3	385.8 L	415	385.8	mg/kg	95% UCL	95% H-UCL
	7439-97-6	Mercury	mg/kg	0.108	0.369 NP	1.4	0.369	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	15.17	18.75 N	53.9	18.75	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7782-49-2	Selenium	mg/kg	0.361	0.477 NP	1.3	0.477	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	NA	NA	0.2	0.2	mg/kg	Maximum	Not enough meaningful data to perform statistics
	7440-62-2	Vanadium	mg/kg	11.31	13.2 N	26.2	13.2	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.109	0.14 NP	0.36	0.14	mg/kg	95% UCL	95% KM (t) UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	0.248	0.459 L	2.8	0.459	mg/kg	95% UCL	95% H-UCL (KM -Log)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.487	1.711 NP	6.6	1.711	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0337	0.0447 L	0.14	0.0447	mg/kg	95% UCL	95% H-UCL (KM -Log)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.305	0.47 L	3.1	0.47	mg/kg	95% UCL	95% H-UCL (KM -Log)
	91-20-3	Naphthalene	mg/kg	NA	NA	0.015	0.015	mg/kg	Maximum	Not enough meaningful data to perform statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-27
Exposure Point Concentration Summary (South Percolation Pond - Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Ponds Area Soil
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	0.616	0.763 L	16.4	0.763	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	13.57	15.82 N	44.1	15.82	mg/kg	95% UCL	95% Student's-t UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.243	0.274 N	0.878	0.878	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	8036	8623 N	16100	16100	mg/kg	95% UCL	95% Student's-t UCL
	7440-36-0	Antimony	mg/kg	NA	NA	0.67	0.67	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	3.023	3.441 NP	8.2	8.2	mg/kg	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	mg/kg	1.447	5.173 L	6.7	6.7	mg/kg	95% UCL	95% H-UCL (KM -Log)
	7440-50-8	Copper	mg/kg	55.91	131.6 NP	694	694	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	10908	13358 NP	16300	16300	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-96-5	Manganese	mg/kg	193.3	275.9 NP	415	415	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0879	0.242 NP	1.4	1.4	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	13.22	15.14 N	53.9	53.9	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7782-49-2	Selenium	mg/kg	0.305	0.363 NP	1.3	1.3	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	NA	NA	0.2	0.2	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	12.14	17.33 NP	55.7	55.7	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0877	0.108 L	0.75	0.75	mg/kg	95% UCL	95% H-UCL (KM -Log)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.233	0.686 NP	4	4	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.393	1.158 NP	6.6	6.6	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0655	0.302 NP	2.2	2.2	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0409	0.0854 NP	0.44	0.44	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.251	0.607 NP	3.1	3.1	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	NA	NA	0.015	0.015	mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ L = lognormal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-28
Exposure Point Concentration Summary (South Percolation Pond - Soil 0-12 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Ponds Area Soil
Exposure Medium: Subsurface Soil 0 to 12

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	mg/kg	0.466	0.451 L	16.4	0.451	mg/kg	95% UCL	95% H-UCL (KM -Log)
	16984-48-8	Fluoride	mg/kg	12.05	13.87 N	44.1	13.87	mg/kg	95% UCL	95% Student's-t UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.239	0.262 N	0.878	0.262	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7429-90-5	Aluminum	mg/kg	7740	8183 N	16100	8183	mg/kg	95% UCL	95% Student's-t UCL
	7440-36-0	Antimony	mg/kg	NA	NA	0.67	0.67	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	3.169	3.518 NP	8.4	3.518	mg/kg	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	mg/kg	1.454	4.998 L	6.7	4.998	mg/kg	95% UCL	95% H-UCL (KM -Log)
	7440-50-8	Copper	mg/kg	42.64	96.36 NP	694	96.36	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	11107	11806 N	16300	11806	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	200.8	264.9 NP	415	264.9	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0657	0.174 NP	1.4	0.174	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	12.06	13.46 N	53.9	13.46	mg/kg	95% UCL	95% Modified-t UCL (Johnson-1978)
	7782-49-2	Selenium	mg/kg	0.288	0.328 NP	1.3	0.328	mg/kg	95% UCL	95% KM (t) UCL
	7440-28-0	Thallium	mg/kg	NA	NA	0.2	0.2	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	11.43	12.72 G	55.7	12.72	mg/kg	95% UCL	95% Approximate Gamma UCL (n>=50)
	56-55-3	Benzo(A)Anthracene	mg/kg	0.0737	0.131 NP	0.75	0.131	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	0.17	0.159 L	4	0.159	mg/kg	95% UCL	95% H-UCL (KM -Log)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.287	0.28 L	6.6	0.28	mg/kg	95% UCL	95% H-UCL (KM -Log)
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0502	0.207 NP	2.2	0.207	mg/kg	95% UCL	95% KM Chebyshev UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0348	0.0662 NP	0.44	0.0662	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.183	0.192 L	3.1	0.192	mg/kg	95% UCL	95% H-UCL (KM -Log)
	91-20-3	Naphthalene	mg/kg	NA	NA	0.015		mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ L = lognormal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-29
Exposure Point Concentration Summary (South Percolation Pond - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: South Percolation Ponds Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	73.39	245.7 NP	690	245.7	µg/l	95% UCL	97.5% KM Chebyshev UCL
	FREE CN	Cyanide (Free)	µg/l	0.01	11.2 G	26.1	11.2	µg/l	95% UCL	95% Gamma Adjusted UCL (n<50)
	16984-48-8	Fluoride	µg/l	1484	2770 NP	9240	2770	µg/l	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	µg/l	2563	8777 NP	32000	8777	µg/l	95% UCL	97.5% KM Chebyshev UCL
	7440-36-0	Antimony	µg/l	0.644	0.677 NP	1.1	0.677	µg/l	95% UCL	95% KM (t) UCL
	7440-38-2	Arsenic	µg/l	2.033	3.518 G	18.5	3.518	µg/l	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-39-3	Barium	µg/l	370.9	701.6 NP	2710	701.6	µg/l	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-43-9	Cadmium	µg/l	0.632	0.66 NP	1	0.66	µg/l	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	µg/l	0.553	2.844 L	22.7	2.844	µg/l	95% UCL	95% H-UCL (KM -Log)
	7440-50-8	Copper	µg/l	14.58	39.52 NP	183	39.52	µg/l	95% UCL	95% KM Chebyshev UCL
	7439-89-6	Iron	µg/l	3766	14057 NP	52100	14057	µg/l	95% UCL	97.5% KM Chebyshev UCL
	7439-96-5	Manganese	µg/l	234.7	861.5 NP	2570	861.5	µg/l	95% UCL	97.5% KM Chebyshev UCL
	7439-97-6	Mercury	µg/l	0.126	0.136 NP	0.26	0.136	µg/l	95% UCL	95% KM (t) UCL
	7440-02-0	Nickel	µg/l	5.209	13.84 NP	51.7	13.84	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-28-0	Thallium	µg/l	0.245	0.253 NP	0.33	0.253	µg/l	95% UCL	95% KM (t) UCL
	7440-62-2	Vanadium	µg/l	4.036	10.72 NP	46.8	10.72	µg/l	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	µg/l	NA	NA	0.36	0.36	µg/l	Maximum	Not enough data to perform meaningful statistics
	205-99-2	Benzo(B)Fluoranthene	µg/l	NA	NA	0.53	0.53	µg/l	Maximum	Not enough data to perform meaningful statistics
	193-39-5	Indeno(1,2,3-C,D)Pyrene	µg/l	NA	NA	0.28	0.28	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-30
Exposure Point Concentration Summary (South Percolation Pond - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: South Percolation Ponds Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)		Maximum Concentration (Qualifier)	Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Sediment	57-12-5	Cyanide	mg/kg	1.079	1.875	L	8.5	1.875	mg/kg	95% UCL	95% H-UCL (KM -Log)
	7429-90-5	Aluminum	mg/kg	8005	9106	N	1330	1330	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	2.244	2.789	NP	6.1	2.789	mg/kg	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	mg/kg	4.405	5.157	NP	7.6	5.157	mg/kg	95% UCL	95% KM (t) UCL
	7439-89-6	Iron	mg/kg	9025	11110	N	19100	11110	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	116.7	144.8	N	252	144.8	mg/kg	95% UCL	95% Student's-t UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	0.254	0.347	NP	0.86	0.347	mg/kg	95% UCL	95% KM (t) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.445	0.701	G	1.9	0.701	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0704	0.118	G	0.28	0.118	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.331	0.542	G	1.2	0.542	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-31
Exposure Point Concentration Summary (Flat Head River - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	9.917	30.73 G	285	30.73	µg/l	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	FREE CN	Cyanide (Free)	µg/l	3.384	11.13 NP	56.4	11.13	µg/l	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	µg/l	179.2	447.1 NP	2160	447.1	µg/l	95% UCL	95% KM Chebyshev UCL
	7429-90-5	Aluminum	µg/l	346.2	760.3 NP	5090	760.3	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	µg/l	0.786	0.972 NP	4.9	0.972	µg/l	95% UCL	95% KM (t) UCL
	7440-39-3	Barium	µg/l	109.4	123.5 N	466	123.5	µg/l	95% UCL	95% Modified-t UCL (Johnson-1978)
	7440-48-4	Cobalt	µg/l	NA	NA	3.9	3.9	µg/l	Maximum	Not enough data to perform meaningful statistics
	7439-89-6	Iron	µg/l	5.077	834.8 L	11100	834.8	µg/l	95% UCL	95% H-UCL (KM -Log)
	7439-96-5	Manganese	µg/l	46.71	153.2 NP	1140	153.2	µg/l	95% UCL	95% KM Chebyshev UCL
	56-55-3	Benzo(A)Anthracene	µg/l	0.185	1.33 NP	0.63	0.63	µg/l	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	µg/l	0.0788	0.39 NP	0.25	0.25	µg/l	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	µg/l	0.214	1.093 NP	0.7	0.7	µg/l	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	µg/l	NA	NA	22	22	µg/l	Maximum	Not enough data to perform meaningful statistics
	53-70-3	Dibenz(A,H)Anthracene	µg/l	NA	NA	0.015	0.015	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-32
Exposure Point Concentration Summary (Flat Head River - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Sediment	57-12-5	Cyanide	mg//kg	0.27	0.525 NP	2.7	0.525	mg/kg	95% UCL	95% KM (t) UCL
	7429-90-5	Aluminum	mg//kg	7829	8441 N	12000	8441	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg//kg	3.5	3.691 N	4.4	3.691	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg//kg	5.233	5.549 N	7.7	5.549	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg//kg	13176	13961 N	18300	13961	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg//kg	204.7	221.1 N	297	221.1	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg//kg	0.0818	0.511 G	1.4	0.511	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg//kg	0.038	0.202 G	0.59	0.202	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	205-99-2	Benzo(B)Fluoranthene	mg//kg	0.175	0.919 G	2.7	0.919	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	53-70-3	Dibenz(A,H)Anthracene	mg//kg	0.0147	0.0786 G	0.23	0.0786	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-33
Exposure Point Concentration Summary (Backwater Seep Sampling Area - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area Soil
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	NA	NA	1.9	1.9	mg/kg	Maximum	Not enough data to perform meaningful statistics
	16984-48-8	Fluoride	mg/kg	NA	NA	32.7	32.7	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	NA	NA	0.331873	0.331873	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7429-90-5	Aluminum	mg/kg	NA	NA	10800	10800	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-38-2	Arsenic	mg/kg	NA	NA	5.4	5.4	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-48-4	Cobalt	mg/kg	NA	NA	7.6	7.6	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-50-8	Copper	mg/kg	NA	NA	22.7	22.7	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-89-6	Iron	mg/kg	NA	NA	17600	17600	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-96-5	Manganese	mg/kg	NA	NA	467	467	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7439-97-6	Mercury	mg/kg	NA	NA	0.024	0.024	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-02-0	Nickel	mg/kg	NA	NA	16.4	16.4	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	NA	NA	16.6	16.6	mg/kg	Maximum	Not enough data to perform meaningful statistics
	56-55-3	Benzo(A)Anthracene	mg/kg	NA	NA	0.091	0.091	mg/kg	Maximum	Not enough data to perform meaningful statistics
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	0.036	0.036	mg/kg	Maximum	Not enough data to perform meaningful statistics
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	0.4	0.4	mg/kg	Maximum	Not enough data to perform meaningful statistics
	91-20-3	Naphthalene	mg/kg	NA	NA	0.81	0.81	mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-34
Exposure Point Concentration Summary (Backwater Seep Sampling Area - Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area Soil
Exposure Medium: Surface Soil 0 to 2

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Suface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	1.052	1.546 NP	3.7	1.546	mg/kg	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	mg/kg	18.46	21.93 N	33.5	21.93	mg/kg	95% UCL	95% Student's-t UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.29	0.3 N	0.335	0.335	mg/kg	95% UCL	95% Student's-t UCL
	7429-90-5	Aluminum	mg/kg	9403	9731 N	10800	10800	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	4.675	4.988 N	5.6	5.6	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg/kg	6.6	6.797 N	7.6	7.6	mg/kg	95% UCL	95% Student's-t UCL
	7440-50-8	Copper	mg/kg	16.83	17.82 N	22.7	22.7	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	15350	15827 N	17600	17600	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	288.6	331 N	467	467	mg/kg	95% UCL	95% Student's-t UCL
	7439-97-6	Mercury	mg/kg	0.0196	0.0217 N	0.03	0.03	mg/kg	95% UCL	95% Student's-t UCL
	7440-02-0	Nickel	mg/kg	13.57	14.09 N	16.4	16.4	mg/kg	95% UCL	95% Student's-t UCL
	7782-49-2	Selenium	mg/kg	NA	NA	0.65	0.65	mg/kg	Maximum	Not enough data to perform meaningful statistics
	7440-62-2	Vanadium	mg/kg	15.03	15.75 N	17.2	17.2	mg/kg	95% UCL	95% Student's-t UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	0.035	0.0444 NP	0.091	0.091	mg/kg	95% UCL	95% KM (t) UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	0.0149	0.0194 NP	0.036	0.036	mg/kg	95% UCL	95% KM (t) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.0746	0.154 L	0.4	0.4	mg/kg	95% UCL	95% H-UCL (KM -Log)
	91-20-3	Naphthalene	mg/kg	0.111	0.213 NP	0.81	0.81	mg/kg	95% UCL	95% KM (t) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ N = normal
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-35
Exposure Point Concentration Summary (Backwater Seep Sampling Area- Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	122.2	387.2 L	378	378	µg/l	Maximum	Maximum value less than 95% UCL
	FREE CN	Cyanide (Free)	µg/l	30.77	53.38 G	140	53.38	µg/l	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	16984-48-8	Fluoride	µg/l	1080	1880 NP	2640	1880	µg/l	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	µg/l	0.668	0.698 NP	0.99	0.698	µg/l	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	µg/l	1.34	1.377 NP	1.7	1.377	µg/l	95% UCL	95% KM (t) UCL
	7439-89-6	Iron	µg/l	519.9	636.6 NP	1620	636.6	µg/l	95% UCL	95% KM (t) UCL
	7439-96-5	Manganese	µg/l	3.57	104.5 L	405	104.5	µg/l	95% UCL	95% H-UCL (KM -Log)
	56-55-3	Benzo(A)Anthracene	µg/l	0.0134	0.089 NP	0.043	0.043	µg/l	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	µg/l	NA	NA	0.022	0.022	µg/l	Maximum	Not enough data to perform meaningful statistics
	205-99-2	Benzo(B)Fluoranthene	µg/l	0.0238	0.17 NP	0.081	0.081	µg/l	95% UCL	97.5% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	µg/l	1.96	3.73 NP	8.6	3.73	µg/l	95% UCL	95% KM (t) UCL
	53-70-3	Dibenz(A,H)Anthracene	µg/l	NA	NA	0.0066	0.0066	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ micrograms per liter
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-36
Exposure Point Concentration Summary (Backwater Seep Sampling Area- Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)		Maximum Concentration (Qualifier)	Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Sediment	57-12-5	Cyanide	mg/kg	1.687	2.65	L	8.3	2.651	mg/kg	95% UCL	95% H-UCL
	7429-90-5	Aluminum	mg/kg	8448	9016		12200	9016	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-38-2	Arsenic	mg/kg	4.347	4.83	N	6.2	4.83	mg/kg	95% UCL	95% Student's-t UCL
	7440-48-4	Cobalt	mg/kg	5.507	5.836	N	6.9	5.836	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	13800	14760	N	18800	14760	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	194.9	215	N	286	215	mg/kg	95% UCL	95% Student's-t UCL
	7440-28-0	Thallium	mg/kg	NA	NA		0.18	0.18	mg/kg	Maximum	Not enough data to perform meaningful statistics
	56-55-3	Benzo(A)Anthracene	mg/kg	0.402	0.973	G	9.715	0.973	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.122	0.394	G	0.87	0.394	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.547	1.855	G	4.1	1.855	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0562	0.189	G	0.41	0.189	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	0.197	0.663	G	1.5	0.663	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical A CAS = Chemical Abstracts Service
UCL = upper confi UCL = upper confidence limit

Table 3-37
Exposure Point Concentration Summary (Groundwater - Western Undeveloped Area Upper Hydrogeologic Unit)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Groundwater - Western Undeveloped Area Upper Hydrogeologic Unit
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Tapwater	57-12-5	Cyanide	µg/l	3.786	6.285 N	22.1	6.285	µg/l	95% UCL	95% KM (t) UCL
	FREE CN	Cyanide (Free)	µg/l	1.56	1.687 NP	2.2	1.687	µg/l	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	µg/l	189.4	452 NP	1050	452	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-36-0	Antimony	µg/l	0.668	0.737 NP	1.1	0.737	µg/l	95% UCL	95% KM (t) UCL
	7439-96-5	Manganese	µg/l	19.38	49.06 NP	93.8	49.06	µg/l	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	µg/l	NA	NA	73	73	µg/l	Maximum	Not enough data to perform meaningful statistics
	91-20-3	Naphthalene	µg/l	NA	NA	0.18	0.18	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-38
Exposure Point Concentration Summary (Groundwater - Plume Area Upper Hydrogeologic Unit)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium:Groundwater - Plume Area Upper Hydrogeologic Unit
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Tapwater	57-12-5	Cyanide	µg/l	838.9	1355 NP	10800	1355	µg/l	95% UCL	95% KM Chebyshev UCL
	FREE CN	Cyanide (Free)	µg/l	2.533	43.13 L	306	43.13	µg/l	95% UCL	95% H-UCL (KM-Log)
	16984-48-8	Fluoride	µg/l	4744	7287 NP	52900	7287	µg/l	95% UCL	95% KM Chebyshev UCL
	7429-90-5	Aluminum	µg/l	3.84	143.1 L	4230	143.1	µg/l	95% UCL	95% H-UCL (KM -Log)
	7440-36-0	Antimony	µg/l	0.77	0.885 NP	4.4	0.885	µg/l	95% UCL	95% KM (BCA) UCL
	7440-38-2	Arsenic	µg/l	5.304	9.862 G	82.1	9.862	µg/l	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	7440-48-4	Cobalt	µg/l	3.165	5.871 NP	39.5	5.871	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-50-8	Copper	µg/l	16.03	62.52 NP	977	62.52	µg/l	95% UCL	95% KM Chebyshev UCL
	7439-89-6	Iron	µg/l	5.78	954.6 L	20400	954.6	µg/l	95% UCL	95% H-UCL (KM -Log)
	7439-96-5	Manganese	µg/l	26.48	68.58 NP	829	68.58	µg/l	95% UCL	95% KM Chebyshev UCL
	7439-97-6	Mercury	µg/l	NA	NA	0.13	0.13	µg/l	Maximum	Not enough data to perform meaningful statistics
	7782-49-2	Selenium	µg/l	1.118	1.484 G	13	1.484	µg/l	95% UCL	95% Gamma Approximate KM-UCL (n>=50)
	7440-62-2	Vanadium	µg/l	0.759	9.382 L	481	9.382	µg/l	95% UCL	95% H-UCL (KM -Log)

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Al CAS = Chemical Abstracts Service
UCL = upper confid UCL = upper confidence limit

Table 3-39
Exposure Point Concentration Summary (Groundwater -Sitewide Below Upper Hydrogeologic Unit)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium:Groundwater - Sitewide Below Upper Hydrogeologic Unit
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Tapwater	57-12-5	Cyanide	µg/l	2.668	3.094 NP	13.9	3.094	µg/l	95% UCL	95% KM (t) UCL
	FREE CN	Cyanide (Free)	µg/l	1.73	1.912 NP	3.9	1.912	µg/l	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	µg/l	235.8	256.3 G	762	256.3	µg/l	95% UCL	95% Gamma Approximate UCL (n>=50)
	7429-90-5	Aluminum	µg/l	636.7	1014 G	6370	1014	µg/l	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-36-0	Antimony	µg/l	4.445	14.94 NP	70.7	14.94	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	µg/l	1.294	2.156 G	6.2	2.156	µg/l	95% UCL	95% Gamma Adjusted UCL (n<50)
	7440-39-3	Barium	µg/l	262.8	589.5 NP	2310	589.5	µg/l	95% UCL	95% Chebyshev UCL
	7440-48-4	Cobalt	µg/l	1.392	1.88 NP	4.4	1.88	µg/l	95% UCL	95% KM Chebyshev UCL
	7439-89-6	Iron	µg/l	2172	3355 G	17400	3355	µg/l	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7439-96-5	Manganese	µg/l	207	302.1 G	1810	302.1	µg/l	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	7440-62-2	Vanadium	µg/l	1.903	2.603 NP	9.9	2.603	µg/l	95% UCL	95% KM (t) UCL
	7440-66-6	Zinc	µg/l	80.65	216.6 NP	907	216.6	µg/l	95% UCL	95% KM Chebyshev UCL
	107-06-2	1,2-Dichloroethane	µg/l	NA	NA	0.28	0.28	µg/l	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
c/ G = gamma
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-40
Exposure Point Concentration Summary (ATV Exposure Areas - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ATV Exposure Areas Soil
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration						
							Central Landfills Area	North Central Undeveloped Area	Western Undeveloped Area	EPC	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	NA	NA	NA	0.433	0.141	0.32	0.293006419	mg/kg	See Footnote	Refer to text.
	16984-48-8	Fluoride	mg/kg	NA	NA	NA	82.9	11.25	6.88	22.79143006	mg/kg	See Footnote	Refer to text.
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	NA	NA	NA	0.385	0.261	0.338	0.326076728	mg/kg	See Footnote	Refer to text.
	7429-90-5	Aluminum	mg/kg	NA	NA	NA	15808	19264	19193	18557.01164	mg/kg	See Footnote	Refer to text.
	7440-36-0	Antimony	mg/kg	NA	NA	NA	0.265	NA	NA	0.051306911	mg/kg	See Footnote	Refer to text.
	7440-38-2	Arsenic	mg/kg	NA	NA	NA	6.583	7.345	5.526	6.227280788	mg/kg	See Footnote	Refer to text.
	7440-48-4	Cobalt	mg/kg	NA	NA	NA	5.867	5.759	5.994	5.905250336	mg/kg	See Footnote	Refer to text.
	7440-50-8	Copper	mg/kg	NA	NA	NA	696.5	15.75	17.9	148.6974101	mg/kg	See Footnote	Refer to text.
	7439-89-6	Iron	mg/kg	NA	NA	NA	16479	15638	15873	15926.16719	mg/kg	See Footnote	Refer to text.
	7439-96-5	Manganese	mg/kg	NA	NA	NA	547.2	959.1	643.4	710.968876	mg/kg	See Footnote	Refer to text.
	7439-97-6	Mercury	mg/kg	NA	NA	NA	0.0217	0.0284	0.0274	0.026569443	mg/kg	See Footnote	Refer to text.
	7440-02-0	Nickel	mg/kg	NA	NA	NA	23.98	14.55	12.08	15.05834453	mg/kg	See Footnote	Refer to text.
	7782-49-2	Selenium	mg/kg	NA	NA	NA	0.388	0.325	0.93	0.659882221	mg/kg	See Footnote	Refer to text.
	7440-28-0	Thallium	mg/kg	NA	NA	NA	0.111	0.19	NA	0.073365726	mg/kg	See Footnote	Refer to text.
	7440-62-2	Vanadium	mg/kg	NA	NA	NA	14.67	13.33	13.09	13.46143156	mg/kg	See Footnote	Refer to text.
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	NA	NA	NA	0.341	NA	NA	0.066021346	mg/kg	See Footnote	Refer to text.
	56-55-3	Benzo(A)Anthracene	mg/kg	NA	NA	NA	10.32	0.0679	0.0528	2.044765413	mg/kg	See Footnote	Refer to text.
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	NA	10.57	0.0901	0.0672	2.106909763	mg/kg	See Footnote	Refer to text.
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	NA	12.99	0.183	0.1	2.618306762	mg/kg	See Footnote	Refer to text.
	207-08-9	Benzo(K)Fluoranthene	mg/kg	NA	NA	NA	5.383	NA	NA	1.042207941	mg/kg	See Footnote	Refer to text.
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	NA	NA	NA	0.246	NA	NA	0.047628303	mg/kg	See Footnote	Refer to text.
	218-01-9	Chrysene	mg/kg	NA	NA	NA	11.7	NA	NA	2.265248545	mg/kg	See Footnote	Refer to text.
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	NA	NA	NA	2.267	NA	NA	0.438916107	mg/kg	See Footnote	Refer to text.
	132-64-9	Dibenzofuran	mg/kg	NA	NA	NA	0.977	NA	NA	0.189157934	mg/kg	See Footnote	Refer to text.
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	NA	NA	NA	8.41	NA	NA	1.628268398	mg/kg	See Footnote	Refer to text.
	91-20-3	Naphthalene	mg/kg	NA	NA	NA	0.0686	0.0122	0.00447	0.018996762	mg/kg	See Footnote	Refer to text.

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ EPC for ATV areas is the suface soil (0 - 0.5 ft=bgs) EPC from the following areas weighted by the amount shown. Refer to text for additional discussion.

Area	Area (acres)	Area Weight (%)	EPC Table
Central Landfills Area	129.7	19.4%	Table 3-7
North Central Undeveloped Area	182.9	27.3%	Table 3-18
Western Undeveloped Area	357.3	53.3%	Table 3-22

CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-41
Exposure Point Concentration Summary (ATV Exposure Areas - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ATV Exposure Areas Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	0.853	2.462 L	15.3	2.462	µg/l	95% UCL	95% H-UCL (KM-Log)
	FREE CN	Cyanide (Free)	µg/l	1.897	2.229 N	7.7	2.229	µg/l	95% UCL	95% KM(t) UCL
	16984-48-8	Fluoride	µg/l	171.7	345.7 N	2600	345.7	µg/l	95% UCL	95% KM Chebyshev UCL
	7429-90-5	Aluminum	µg/l	174.5	582.3 NP	5750	582.3	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-36-0	Antimony	µg/l	0.3	0.781 L	2.9	0.781	µg/l	95% UCL	95% H-UCL (KM-Log)
	7440-38-2	Arsenic	µg/l	0.781	0.88 NP	3.7	0.88	µg/l	95% UCL	95% KM(t) UCL
	7440-48-4	Cobalt	µg/l	1.328	1.376 NP	2.4	1.376	µg/l	95% UCL	95% KM(t) UCL
	7439-89-6	Iron	µg/l	182.7	564.1 NP	4760	564.1	µg/l	95% UCL	95% KM Chebyshev UCL
	7439-96-5	Manganese	µg/l	69.59	324.5 NP	3750	324.5	µg/l	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-42
Exposure Point Concentration Summary (ATV Exposure Areas - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ATV Exposure Areas Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mg/kg	16656	19203 N	35400	19203	mg/kg	95% UCL	95% Student's-t UCL
	7440-38-2	Arsenic	mg/kg	5.252	6.59 G	14.5	6.59	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	7440-48-4	Cobalt	mg/kg	5.484	6.118 N	9.2	6.118	mg/kg	95% UCL	95% Student's-t UCL
	7439-89-6	Iron	mg/kg	14154	15598 N	25200	15598	mg/kg	95% UCL	95% Student's-t UCL
	7439-96-5	Manganese	mg/kg	434.8	630.7 G	1280	630.7	mg/kg	95% UCL	95% Adjusted Gamma UCL (n<50)
	50-32-8	Benzo(A)Pyrene	mg/kg	0.155	0.694 L	1.1	0.694	mg/kg	95% UCL	95% H-UCL (KM-Log)
	205-99-2	Benzo(B)Fluoranthene	mg/kg	0.284	1.301 L	1.8	1.301	mg/kg	95% UCL	95% H-UCL (KM-Log)
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	0.0322	0.0954 NP	0.28	0.0954	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-43
Exposure Point Concentration Summary (Hunter Exposure Areas - Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Hunter Exposure Areas Soil
Exposure Medium: Surface Soil 0 to 0.5

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration					
							North Central Undeveloped Area	Western Undeveloped Area	EPC	Units	Statistic	Rationale
Suface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	NA	NA	NA	0.141	0.32	0.2593945	mg/kg	See Footnote	Refer to text.
	16984-48-8	Fluoride	mg/kg	NA	NA	NA	11.25	6.88	8.3595872	mg/kg	See Footnote	Refer to text.
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	NA	NA	NA	0.261	0.338	0.3119295	mg/kg	See Footnote	Refer to text.
	7429-90-5	Aluminum	mg/kg	NA	NA	NA	19264	19193	19217.039	mg/kg	See Footnote	Refer to text.
	7440-38-2	Arsenic	mg/kg	NA	NA	NA	7.345	5.526	6.1418739	mg/kg	See Footnote	Refer to text.
	7440-48-4	Cobalt	mg/kg	NA	NA	NA	5.759	5.994	5.9144341	mg/kg	See Footnote	Refer to text.
	7440-50-8	Copper	mg/kg	NA	NA	NA	15.75	17.9	17.172057	mg/kg	See Footnote	Refer to text.
	7439-89-6	Iron	mg/kg	NA	NA	NA	15638	15873	15793.434	mg/kg	See Footnote	Refer to text.
	7439-96-5	Manganese	mg/kg	NA	NA	NA	959.1	643.4	750.28917	mg/kg	See Footnote	Refer to text.
	7439-97-6	Mercury	mg/kg	NA	NA	NA	0.0284	0.0274	0.0277386	mg/kg	See Footnote	Refer to text.
	7440-02-0	Nickel	mg/kg	NA	NA	NA	14.55	12.08	12.916288	mg/kg	See Footnote	Refer to text.
	7782-49-2	Selenium	mg/kg	NA	NA	NA	0.325	0.93	0.7251601	mg/kg	See Footnote	Refer to text.
	7440-28-0	Thallium	mg/kg	NA	NA	NA	0.190	NA	0.0643299	mg/kg	See Footnote	Refer to text.
	7440-62-2	Vanadium	mg/kg	NA	NA	NA	13.33	13.09	13.171259	mg/kg	See Footnote	Refer to text.
	56-55-3	Benzo(A)Anthracene	mg/kg	NA	NA	NA	0.0679	0.0528	0.0579125	mg/kg	See Footnote	Refer to text.
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	NA	0.0901	0.0672	0.0749534	mg/kg	See Footnote	Refer to text.
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	NA	0.183	0.1	0.128102	mg/kg	See Footnote	Refer to text.
	91-20-3	Naphthalene	mg/kg	NA	NA	NA	0.0122	0.00447	0.0070872	mg/kg	See Footnote	Refer to text.

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ EPC for ATV areas is the suface soil (0 - 0.5 ft=bgs) EPC from the following areas weighted by the amount shown. Refer to text for additional discussion.

Area	Area (acres)	Area Weight (%)	EPC Table
North Central Undeveloped Area	182.9	33.9%	Table 3-18
Western Undeveloped Area	357.3	66.1%	Table 3-22

CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-44
Exposure Point Concentration Summary (Hunter Exposure Areas - Surface Water)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Hunter Exposure Areas Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC	Units	Statistic	Rationale
Surface Water	57-12-5	Cyanide	µg/l	1.018	2.579 L	15.3	2.579	µg/l	95% UCL	95% H-UCL (KM-Log)
	FREE CN	Cyanide (Free)	µg/l	1.945	2.315 N	7.7	2.315	µg/l	95% UCL	95% KM (t) UCL
	16984-48-8	Fluoride	µg/l	142.2	162.8 NP	473	162.8	µg/l	95% UCL	95% KM (t) UCL
	7429-90-5	Aluminum	µg/l	202.4	712.5 NP	5750	712.5	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-36-0	Antimony	µg/l	0.748	1.066 NP	2.9	1.066	µg/l	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	µg/l	0.814	0.944 NP	3.7	0.944	µg/l	95% UCL	95% KM (BCA) UCL
	7440-48-4	Cobalt	µg/l	NA	NA	2.4	2.4	µg/l	Maximum	Not enough data to perform meaningful statistics.
	7439-89-6	Iron	µg/l	180.6	132.5 L	4760	132.5	µg/l	95% UCL	95% H-UCL (KM-Log)
	7439-96-5	Manganese	µg/l	85.6	405.5 NP	3750	405.5	µg/l	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-45
Exposure Point Concentration Summary (Hunter Exposure Areas - Sediment)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Hunter Exposure Areas Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC	Units	Statistic	Rationale
Sediment	7429-90-5	Aluminum	mg/kg	16255	19100 N	35400	19100	mg/kg		
	7440-38-2	Arsenic	mg/kg	5.273	6.853 G	14.5	6.853	mg/kg		
	7440-48-4	Cobalt	mg/kg	5.123	5.732 N	9.2	5.732	mg/kg		
	7439-89-6	Iron	mg/kg	13548	15054 N	25200	15054	mg/kg		
	7439-96-5	Manganese	mg/kg	358.1	532 G	1210	532	mg/kg		

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable

CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-46
Exposure Point Concentration Summary (Whitetail Deer)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Vegetated Areas Surface Soil (0-0.5 ft-bgs)
Exposure Medium: Whitetail deer

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Venison			
							Value	Units	Statistic	Rationale
Venison	57-12-5	Cyanide	mg/kg	NA	NA	NA	3.2E-04	mg/kg ww	See Footnote	Refer to text.
	16984-48-8	Fluoride	mg/kg	NA	NA	NA	3.8E-02	mg/kg ww	See Footnote	Refer to text.
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	NA	NA	NA	4.5E-04	mg/kg ww	See Footnote	Refer to text.
	7429-90-5	Aluminum	mg/kg	NA	NA	NA	9.7E+00	mg/kg ww	See Footnote	Refer to text.
	7440-36-0	Antimony	mg/kg	NA	NA	NA	3.2E-03	mg/kg ww	See Footnote	Refer to text.
	7440-38-2	Arsenic	mg/kg	NA	NA	NA	1.0E-02	mg/kg ww	See Footnote	Refer to text.
	7440-48-4	Cobalt	mg/kg	NA	NA	NA	4.2E-03	mg/kg ww	See Footnote	Refer to text.
	7440-50-8	Copper	mg/kg	NA	NA	NA	2.9E-01	mg/kg ww	See Footnote	Refer to text.
	7439-89-6	Iron	mg/kg	NA	NA	NA	8.2E+00	mg/kg ww	See Footnote	Refer to text.
	7439-96-5_d	Manganese	mg/kg	NA	NA	NA	2.3E+00	mg/kg ww	See Footnote	Refer to text.
	7439-97-6	Mercury	mg/kg	NA	NA	NA	1.6E+00	mg/kg ww	See Footnote	Refer to text.
	7440-02-0	Nickel	mg/kg	NA	NA	NA	4.2E-02	mg/kg ww	See Footnote	Refer to text.
	7782-49-2	Selenium	mg/kg	NA	NA	NA	7.3E-03	mg/kg ww	See Footnote	Refer to text.
	7440-28-0	Thallium	mg/kg	NA	NA	NA	5.2E-05	mg/kg ww	See Footnote	Refer to text.
	7440-62-2	Vanadium	mg/kg	NA	NA	NA	9.7E-03	mg/kg ww	See Footnote	Refer to text.
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	NA	NA	NA	3.0E-03	mg/kg ww	See Footnote	Refer to text.
	56-55-3	Benzo(A)Anthracene	mg/kg	NA	NA	NA	6.8E-03	mg/kg ww	See Footnote	Refer to text.
	50-32-8	Benzo(A)Pyrene	mg/kg	NA	NA	NA	2.9E-02	mg/kg ww	See Footnote	Refer to text.
	205-99-2	Benzo(B)Fluoranthene	mg/kg	NA	NA	NA	5.9E-03	mg/kg ww	See Footnote	Refer to text.
	207-08-9	Benzo(K)Fluoranthene	mg/kg	NA	NA	NA	8.7E-03	mg/kg ww	See Footnote	Refer to text.
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	NA	NA	NA	6.5E-03	mg/kg ww	See Footnote	Refer to text.
	218-01-9	Chrysene	mg/kg	NA	NA	NA	6.1E-03	mg/kg ww	See Footnote	Refer to text.
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	NA	NA	NA	1.6E-02	mg/kg ww	See Footnote	Refer to text.
	132-64-9	Dibenzofuran	mg/kg	NA	NA	NA	6.5E-02	mg/kg ww	See Footnote	Refer to text.
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	NA	NA	NA	1.6E-02	mg/kg ww	See Footnote	Refer to text.
	91-20-3	Naphthalene	mg/kg	NA	NA	NA	3.2E+00	mg/kg ww	See Footnote	Refer to text.

Footnotes:
a/ mg/kg = milligrams per kilogram; mg/kg ww = milligrams per kilogram wet weight
b/ NA = not applicable
c/ Refer to text for discussion on calculation of EPC for the venison uptake by a hunter.
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-47
Exposure Point Concentration Summary (Flathead River Area- Fish)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Flathead River Area Surface Water
Exposure Medium: Fish

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration						
							Surface Water			Fish Tissue			
							Value	Units	BCF	Value	Units	Statistic	Rationale
Fish	16984-48-8	Fluoride	µg/l	179.2	447.1 NP	2160	447.1	µg/l	10	4.471	mg/kg ww	95% UCL	95% KM Chebyshev UCL
	7429-90-5	Aluminum	µg/l	346.2	760.3 NP	5090	760.3	µg/l	500	380.15	mg/kg ww	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	µg/l	0.786	0.972 NP	4.9	0.972	µg/l	300	0.2916	mg/kg ww	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	µg/l	NA	NA	3.9	3.9	µg/l	300	1.17	mg/kg ww	Maximum	Not enough data to perform meaningful statistics
	7439-89-6	Iron	µg/l	5.077	834.8 L	11100	834.8	µg/l	200	166.96	mg/kg ww	95% UCL	95% H-UCL (KM -Log)
	7439-96-5_d	Manganese	µg/l	46.71	153.2 NP	1140	153.2	µg/l	400	61.28	mg/kg ww	95% UCL	95% KM Chebyshev UCL
	56-55-3	Benzo(A)Anthracene	µg/l	0.185	1.33 NP	0.63	0.63	µg/l	260	0.1638	mg/kg ww	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	µg/l	0.0788	0.39 NP	0.25	0.25	µg/l	5147	1.2868	mg/kg ww	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	µg/l	0.214	1.093 NP	0.7	0.7	µg/l	3024	2.1168	mg/kg ww	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	µg/l	NA	NA	22	22	µg/l	588	12.937	mg/kg ww	Maximum	Not enough data to perform meaningful statistics
	53-70-3	Dibenz(A,H)Anthracene	µg/l	NA	NA	0.015	0.015	µg/l	9596	0.1439	mg/kg ww	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter, mg/kg ww = milligrams per kilogram wet weight
b/ NA = not applicable
c/ NP = non-parametric
d/ Refer to text for biocentration factor (BCF) reference(s) and equations for calculation of fish tissue EPC.
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-48
Exposure Point Concentration Summary (Backwater Seep Sampling Area- Fish)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: Backwater Seep Area Surface Water
Exposure Medium: Fish

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration						
							Surface Water			Fish Tissue			
							Value	Units	BCF	Value	Units	Statistic	Rationale
Fish	57-12-5	Cyanide	µg/l	122.2	387.2 L	378	378	µg/l	0	0	mg/kg	Maximum	Maximum value less than 95% UCL
	FREE CN	Cyanide (Free)	µg/l	30.77	53.38 G	140	53.38	µg/l	0	0	mg/kg	95% UCL	95% Gamma Adjusted KM-UCL (n<50)
	16984-48-8	Fluoride	µg/l	1080	1880 NP	2640	1880	µg/l	10	18.8	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	µg/l	0.668	0.698 NP	0.99	0.698	µg/l	300	0.2094	mg/kg	95% UCL	95% KM (t) UCL
	7440-48-4	Cobalt	µg/l	1.34	1.377 NP	1.7	1.377	µg/l	300	0.4131	mg/kg	95% UCL	95% KM (t) UCL
	7439-89-6	Iron	µg/l	519.9	636.6 NP	1620	636.6	µg/l	200	127.32	mg/kg	95% UCL	95% KM (t) UCL
	7439-96-5_d	Manganese	µg/l	3.57	104.5 L	405	104.5	µg/l	400	41.8	mg/kg	95% UCL	95% H-UCL (KM -Log)
	56-55-3	Benzo(A)Anthracene	µg/l	0.0134	0.089 NP	0.043	0.043	µg/l	260	0.0112	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	µg/l	NA	NA	0.022	0.022	µg/l	5147	0.1132	mg/kg	Maximum	Not enough data to perform meaningful statistics
	205-99-2	Benzo(B)Fluoranthene	µg/l	0.0238	0.17 NP	0.081	0.081	µg/l	3024	0.2449	mg/kg	95% UCL	97.5% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	µg/l	1.96	3.73 NP	8.6	3.73	µg/l	588	2.1934	mg/kg	95% UCL	95% KM (t) UCL
	53-70-3	Dibenz(A,H)Anthracene	µg/l	NA	NA	0.0066	0.0066	µg/l	9596	0.0633	mg/kg	Maximum	Not enough data to perform meaningful statistics

Footnotes:
a/ µg/l = micrograms per liter
b/ NA = not applicable
c/ G = gamma
d/ Refer to text for biocentration factor (BCF) reference(s) and equations for calculation of fish tissue EPC.
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-49
Exposure Point Concentration Summary (ISM Samples - Main Plant Area - Surface Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ISM Samples - Main Plant Area - Surface Soil
Exposure Medium: Surface Soil 0-0.5 ft-bgs

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							Fish Tissue			
							Value	Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	0.4736592	1.00372	1.59	1.0037	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	16984-48-8	Fluoride	mg/kg	328.38399	638.271	913.01	638.27	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	mg/kg	21872.586	33418.7	37894.992	33419	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	1.3306867	2.86063	11.013896	2.8606	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	mg/kg	8.2101774	12.0091	35.62971	12.009	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.598465	0.88161	1.0889547	0.8816	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-48-4	Cobalt	mg/kg	7.0540435	7.92553	13.973712	7.9255	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-50-8	Copper	mg/kg	101.21597	211.873	995.88057	211.87	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	20965.763	25480.5	68967.362	25481	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-96-5	Manganese	mg/kg	532.36337	568.837	772.16982	568.84	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0226365	0.05577	0.07592	0.0558	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	31.453743	64.3223	71.891589	64.322	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	1.5894327	2.80985	3.118931	2.8099	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-28-0	Thallium	mg/kg	0.133418	0.20546	0.2515889	0.2055	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-62-2	Vanadium	mg/kg	19.839976	34.7272	48.598152	34.727	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	10.833437	74.2919	132.04367	74.292	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	12.810729	85.5994	149.76077	85.599	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	14.705215	96.2283	168.79578	96.228	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	5.5901159	35.879	61.702246	35.879	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	218-01-9	Chrysene	mg/kg	12.353735	78.0307	135.87829	78.031	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	6.4655239	20.5399	36.353875	20.54	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	12.063035	75.7245	131.12331	75.725	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	91-20-3	Naphthalene	mg/kg	0.1694867	1.03336	1.8843262	1.0334	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-50
Exposure Point Concentration Summary (ISS Samples - Main Plant Area - Surface Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ISS Samples - Main Plant Area - Surface Soil
Exposure Medium: Surface Soil 0-2 ft-bgs

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC Value	EPC Units	Statistic	Rationale
Surface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	0.473659	0.79117	1.5920121	0.7912	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	16984-48-8	Fluoride	mg/kg	328.384	534.467	913.00857	534.47	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.598465	0.76861	1.0889547	0.7686	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	mg/kg	21872.59	26835.1	37894.992	26835	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	1.330687	3.23022	11.013896	3.2302	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-38-2	Arsenic	mg/kg	8.210177	13.6323	35.62971	13.632	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-48-4	Cobalt	mg/kg	7.054044	8.4343	13.973712	8.4343	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-50-8	Copper	mg/kg	101.216	274.295	995.88057	274.3	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	20965.76	29941.2	68967.362	29941	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-96-5	Manganese	mg/kg	532.3634	622.536	772.16982	622.54	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.022637	0.03958	0.07592	0.0396	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	31.45374	45.7093	71.891589	45.709	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	1.589433	2.07691	3.118931	2.0769	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-28-0	Thallium	mg/kg	0.133418	0.16985	0.2515889	0.1698	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-62-2	Vanadium	mg/kg	19.83998	26.7556	48.598152	26.756	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	10.83344	32.1926	132.04367	32.193	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	12.81073	37.2934	149.76077	37.293	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	14.70522	42.1498	168.79578	42.15	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	5.590116	15.7803	61.702246	15.78	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	218-01-9	Chrysene	mg/kg	12.35374	34.4949	135.87829	34.495	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	3.160267	9.02863	36.353875	9.0286	mg/kg	95% UCL	95% KM Chebyshev UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	12.06304	33.5672	131.12331	33.567	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	91-20-3	Naphthalene	mg/kg	0.169487	0.46779	1.8843262	0.4678	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-51
Exposure Point Concentration Summary (ISM Samples - Central Landfill Area - Surface Soil 0-0.5 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ISM Samples - Central Landfill Area - Surface Soil
Exposure Medium: Surface Soil 0-0.5 ft-bgs

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC Value	EPC Units	Statistic	Rationale
Surface Soil 0-0.5 ft-bgs	57-12-5	Cyanide	mg/kg	2.8552391	8.53641	40.658798	8.5364	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	16984-48-8	Fluoride	mg/kg	292.07011	521.25	1176.4223	521.25	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.7011709	0.96998	2.0447491	0.97	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	mg/kg	23813.438	29850.7	47002.351	29851	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	0.4156153	0.66913	1.5368228	0.6691	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	mg/kg	6.792347	8.32234	14.001452	8.3223	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-48-4	Cobalt	mg/kg	6.5086551	7.2065	9.6263347	7.2065	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-50-8	Copper	mg/kg	44.341549	93.6607	427.76832	93.661	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	18954.474	22588.7	31536.8	22589	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-96-5	Manganese	mg/kg	496.24723	574.035	902.49418	574.04	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0344942	0.05095	0.1395379	0.051	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	48.811858	71.4352	162.55742	71.435	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	2.1436472	4.28594	15.954532	4.2859	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-28-0	Thallium	mg/kg	0.1484698	0.20711	0.4574344	0.2071	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	23.282372	30.217	59.519085	30.217	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	.0689035	0.18464	.6468562	0.1846	mg/kg	95% UCL	95% KM Chebyshev UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	13.916647	38.8045	184.86113	38.805	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	13.938842	38.0662	176.99	38.066	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	19.705118	47.4756	194.76437	47.476	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	6.8176541	16.5342	66.953501	16.534	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	.0739257	0.21989	.81	0.2199	mg/kg	95% UCL	95% KM Chebyshev UCL
	218-01-9	Chrysene	mg/kg	18.554476	47.7565	217.40526	47.756	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	3.4793225	8.18094	34.955649	8.1809	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	1.2496752	4.06391	22.695194	4.0639	mg/kg	95% UCL	95% KM Chebyshev UCL
	206-44-0	Fluoranthene	mg/kg	26.738721	79.8264	411.90384	79.826	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	11.211899	26.8465	111.45481	26.847	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	91-20-3	Naphthalene	mg/kg	1.2316842	4.22854	24.641189	4.2285	mg/kg	95% UCL	95% KM Chebyshev UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 3-52
Exposure Point Concentration Summary (ISS Samples - Central Landfill Area - Surface Soil 0-2 ft-bgs)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current
Medium: ISS Samples - Central Landfill Area - Surface Soil
Exposure Medium: Surface Soil 0-2 ft-bgs

Exposure Point	CAS Number	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
							EPC Value	EPC Units	Statistic	Rationale
Surface Soil 0-2 ft-bgs	57-12-5	Cyanide	mg/kg	2.1874804	5.39417	40.658798	5.39417	mg/kg	95% UCL	95% KM Chebyshev UCL
	16984-48-8	Fluoride	mg/kg	309.03517	484.682	1218.2033	484.682	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-47-3_EST	Chromium, Hexavalent - Estimated	mg/kg	0.6476716	0.82457	2.0447491	0.82457	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7429-90-5	Aluminum	mg/kg	21234.905	25208.6	47002.351	25208.6	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-36-0	Antimony	mg/kg	0.3917492	0.64047	3.2385397	0.64047	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-38-2	Arsenic	mg/kg	6.425664	7.33984	14.001452	7.33984	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-48-4	Cobalt	mg/kg	6.3410373	6.75921	9.6263347	6.75921	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7440-50-8	Copper	mg/kg	50.067675	108.761	754.37621	108.761	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-89-6	Iron	mg/kg	18373.015	20494.1	31536.8	20494.1	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-96-5	Manganese	mg/kg	509.29325	557.431	902.49418	557.431	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7439-97-6	Mercury	mg/kg	0.0321784	0.04164	0.1395379	0.04164	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-02-0	Nickel	mg/kg	35.107274	49.755	162.55742	49.755	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	7782-49-2	Selenium	mg/kg	1.7061919	2.89605	15.954532	2.89605	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-28-0	Thallium	mg/kg	0.1309809	0.16514	0.4574344	0.16514	mg/kg	95% UCL	95% KM Chebyshev UCL
	7440-62-2	Vanadium	mg/kg	19.975866	25.0785	59.519085	25.0785	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	11097-69-1	PCB-1254 (Aroclor 1254)	mg/kg	0.094724	0.24982	1.7287945	0.24982	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-57-6	2-Methylnaphthalene	mg/kg	1.1385269	3.88875	39.885668	3.88875	mg/kg	95% UCL	95% KM Chebyshev UCL
	56-55-3	Benzo(A)Anthracene	mg/kg	18.204814	48.431	405.05349	48.431	mg/kg	95% UCL	95% KM Chebyshev UCL
	50-32-8	Benzo(A)Pyrene	mg/kg	18.117711	47.9759	401.36736	47.9759	mg/kg	95% UCL	95% KM Chebyshev UCL
	205-99-2	Benzo(B)Fluoranthene	mg/kg	22.487532	54.9079	432.16008	54.9079	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	207-08-9	Benzo(K)Fluoranthene	mg/kg	8.8317902	23.769	213.8678	23.769	mg/kg	95% UCL	95% KM Chebyshev UCL
	92-52-4	Biphenyl (Diphenyl)	mg/kg	0.3828767	1.4273	14.072215	1.4273	mg/kg	95% UCL	95% KM Chebyshev UCL
	117-81-7	Bis(2-Ethylhexyl) Phthalate	mg/kg	0.0464546	0.12644	0.81	0.12644	mg/kg	95% UCL	95% KM Chebyshev UCL
	218-01-9	Chrysene	mg/kg	21.369842	52.8478	407.34231	52.8478	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	53-70-3	Dibenz(A,H)Anthracene	mg/kg	4.0268741	10.0842	83.563935	10.0842	mg/kg	95% UCL	95% KM Chebyshev UCL
	132-64-9	Dibenzofuran	mg/kg	2.7249281	9.0422	93.506748	9.0422	mg/kg	95% UCL	95% KM Chebyshev UCL
	206-44-0	Fluoranthene	mg/kg	34.807703	93.1247	754.27147	93.1247	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL
	193-39-5	Indeno(1,2,3-C,D)Pyrene	mg/kg	13.010807	32.8698	275.46209	32.8698	mg/kg	95% UCL	95% KM Chebyshev UCL
	91-20-3	Naphthalene	mg/kg	2.3476671	8.21784	87.624856	8.21784	mg/kg	95% UCL	95% KM Chebyshev UCL
	129-00-0	Pyrene	mg/kg	33.442993	88.765	708.11757	88.765	mg/kg	95% UCL	95% Chebyshev(Mean, Sd) UCL

Footnotes:
a/ mg/kg = milligrams per kilogram
b/ NA = not applicable
c/ NP = non-parametric
CAS = Chemical Abstracts Service
UCL = upper confidence limit

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	187	day/yr	MDEQ, 2016	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	25	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Construction Worker	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	330	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	124	day/yr	MDEQ, 2016	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	1	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	365	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Stormwater Management Worker	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	38	day/yr	BPJ	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	25	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreational Trespasser (ATV)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	9	day/yr	BPJ	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	BPJ	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreational Trespasser (Hunter)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	14	day/yr	BPJ	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	BPJ	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Resident	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil-a	Soil ingestion	100	mg/d	USEPA, 2018	Non-Carcinogenic Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	270	day/yr	MDEQ, 2016	$\frac{CS \times IR_{soil} \times RBA \times EFres\text{-}a \times EDres\text{-}a \times CF}{BWres\text{-}a \times AT\text{-}NC}$
				EDres	Exposure duration	20	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	Carcinogenic Lifetime Average Daily Intake (mg/kg-day) =
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
				$IR_{soil\text{-}adj}$	Ingestion Rate - adjusted	28350	mg/kg	calculated	$\frac{CS \times IR_{SOIL\text{-}ADJ} \times RBA \times CF}{AT\text{-}C}$
				$EF_{res\text{-}c}$	Exposure frequency (child)	270	day/yr	MDEQ, 2016	
				$ED_{res\text{-}c}$	Exposure duration (child)	6	yr	USEPA, 2018	
				$IR_{soil\text{-}c}$	Ingestion Rate - child	200	mg/d	USEPA, 2018	where $IR_{SOIL\text{-}ADJ}$ =
				$BW_{res\text{-}c}$	Body weight - child	15	kg	USEPA, 2018	
				$IFSM_{res\text{-}adj}$	Soil ingestion (age-adjusted mutagenic factor)	128700	mg/kg	calculated	$\left(\frac{EF_{res-c} \times ED_{res-c} \times IR_{soil-c}}{BW_{res-c}} + \frac{EF_{res-a} \times EDres_{\_a} \times IR_{soil-a}}{BW_{res-a}}\right)$
				$EF_{0\text{-}2}$	Exposure frequency (0 to 2 years)	270	day/yr	MDEQ, 2016	
				$ED_{0\text{-}2}$	Exposure duration (0 to 2 years)	2	yr	USEPA, 2018	
				$IRS_{0\text{-}2}$	Soil ingestion (0 to 2 years)	200	mg/d	USEPA, 2018	
				$BW_{0\text{-}2}$	Body weight (0 to 2 years)	15	kg	USEPA, 2018	
				$EF_{2\text{-}6}$	Exposure frequency (2 to 6 years)	270	day/yr	MDEQ, 2016	
				$ED_{2\text{-}6}$	Exposure duration (2 to 6 years)	4	yr	USEPA, 2018	
				$IRS_{2\text{-}6}$	Soil ingestion (2 to 6 years)	200	mg/d	USEPA, 2018	For mutagenic compounds:
				$BW_{2\text{-}6}$	Body weight (2-6 years)	15	kg	USEPA, 2018	$\frac{CS \times IFSM_{tres\text{-}adj} \times RBA \times CF}{AT\text{-}C}$
				$EF_{6\text{-}16}$	Exposure frequency (6 to 16 years)	270	day/yr	MDEQ, 2016	
				$ED_{6\text{-}16}$	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	
				$IRS_{6\text{-}16}$	Soil ingestion (6 to 16 years)	100	mg/d	USEPA, 2018	where:
				$BW_{6\text{-}16}$	Body weight (6 to 16 years)	80	kg	USEPA, 2018	
				$EF_{16\text{-}26}$	Exposure frequency (16 to 26 years)	270	day/yr	MDEQ, 2016	$IFSM_{res\text{-}adj} = (EF_{0\text{-}2} \times ED_{0\text{-}2} \times IRS_{0\text{-}2} \times 10) / (BW_{0\text{-}2}) +$
				$ED_{16\text{-}26}$	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	$(EF_{2\text{-}6} \times ED_{2\text{-}6} \times IRS_{2\text{-}6} \times 3) / (BW_{2\text{-}6}) +$
				$IRS_{16\text{-}26}$	Soil ingestion (16 to 26 years)	100	mg/d	USEPA, 2018	$(EF_{6\text{-}16} \times ED_{6\text{-}16} \times IRS_{6\text{-}16} \times 3) / (BW_{6\text{-}16}) +$
				$BW_{16\text{-}26}$	Body weight (16 to 26 years)	80	kg	USEPA, 2018	$(EF_{16\text{-}26} \times ED_{16\text{-}26} \times IRS_{16\text{-}26} \times 1) / (BW_{16\text{-}26})$
	Resident	Child	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	200	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	270	day/yr	MDEQ, 2016	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	6	yr	USEPA, 2018	
				BW	Body weight	15	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	2,190	days	USEPA, 2018	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Recreationist (Floater)	Adolescent (6-16 years)	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	Non-carcinogenic Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$ For mutagenic compounds: $\frac{CS \times IFSM_{recc\text{-}adj} \times RBA \times CF}{AT}$ where: $IFSM_{recc\text{-}adj} = (EF \times ED \times IRS \times 3) / (BW)$
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	
				$IFSM_{recc\text{-}adj}$	Soil ingestion (age-adjusted mutagenic factor)	681.818	mg/kg	USEPA, 2018	
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	10	day/yr	BPJ	
				ED	Exposure duration	10	yr	USEPA, 2018	
				BW	Body weight	44	kg	USEPA, 2011	
				AT-NC	Averaging time - noncancer	3,650	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	
	Recreationist (Floater)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	Non-Carcinogenic Chronic Daily Intake (CDI) (mg/kg-day) = $\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT\text{-}NC}$ Carcinogenic Lifetime Average Daily Intake (mg/kg-day) = $\frac{CS \times IR_{Mrec\text{-}adj} \times RBA \times CF}{AT\text{-}C}$ where $IR_{SOIL\text{-}ADJ}$ = $\left(\frac{EF_{6-16} \times ED_{6-16} \times IR_{soil-6-16}}{BW_{6-16}} + \frac{EF_{rec-a} \times EDrec\_a \times IR_{soil-a}}{BW_{rec-a}}\right)$ For mutagenic compounds: $\frac{CS \times IFSM_{rec\text{-}adj} \times RBA \times CF}{AT}$ where: $IFSM_{rec\text{-}adj} = (EF_{6\text{-}16} \times ED_{6\text{-}16} \times IRS_{6\text{-}16} \times 3) / (BW_{6\text{-}16}) + (EF_{16\text{-}26} \times ED_{16\text{-}26} \times IRS_{16\text{-}26} \times 1) / (BW_{16\text{-}26})$
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	10	day/yr	BPJ	
				ED	Exposure duration	20	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
				$IFS_{rec\text{-}adj}$	Soil ingestion (age-adjusted factor)	250	mg/kg	calculated	
				$IFSM_{rec\text{-}adj}$	Soil ingestion (age-adjusted mutagenic factor)	500	mg/kg	calculated	
				$EF_{6\text{-}16}$	Exposure frequency (6 to 16 years)	10	day/yr	BPJ	
				$ED_{6\text{-}16}$	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	
				$IRS_{6\text{-}16}$	Soil ingestion (6 to 16 years)	100	mg/d	USEPA, 2018	
				$BW_{6\text{-}16}$	Body weight (6 to 16 years)	80	kg	USEPA, 2018	
				$EF_{16\text{-}26}$	Exposure frequency (16 to 26 years)	10	day/yr	BPJ	
				$ED_{16\text{-}26}$	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	
				$IRS_{16\text{-}26}$	Soil ingestion (16 to 26 years)	100	mg/d	USEPA, 2018	
				$BW_{16\text{-}26}$	Body weight (16 to 26 years)	80	kg	USEPA, 2018	

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Recreationist (Fisher)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	10	day/yr	BPJ	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Trespasser	Adolescent (6-16 years)	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				IRsoil	Soil ingestion	100	mg/d	USEPA, 2018	Chronic Daily Intake (CDI) (mg/kg-day) =
				$IFSM_{tres-adj}$	Soil ingestion (age-adjusted mutagenic factor)	477.2727	mg/kg	USEPA, 2018	$\frac{CS \times IR_{soil} \times RBA \times EF \times ED \times CF}{BW \times AT}$
				RBA	Relative bioavailability factor	chemical-specific	untiless	USEPA, 2018	
				EF	Exposure frequency	7	day/yr	BPJ	
				ED	Exposure duration	10	yr	USEPA, 2018	
				BW	Body weight	44	kg	USEPA, 2018	For mutagenic compounds:
				AT-NC	Averaging time - noncancer	3,650	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	$\frac{CS \times IFSM_{tres-adj} \times RBA \times CF}{AT}$
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
									where:
									$IFSM_{tres-adj} = (EF \times ED \times IRS \times 3) / (BW)$

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Industrial Worker	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	3,527	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA, 2018	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor, adult	0.12	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	187	day/yr	USEPA, 2011	where
				ED	Exposure duration	25	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Construction Worker	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	3,527	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA, 2018	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor, adult	0.3	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	124	day/yr	USEPA, 2011	where
				ED	Exposure duration	1	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	365	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Stormwater Management Worker	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	3,527	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA, 2018	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor, adult	0.12	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	38	day/yr	USEPA, 2011	where
				ED	Exposure duration	25	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreational Trespasser (ATV)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	3,527	cm2/day	BPJ	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor	0.12	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	9	day/yr	BPJ	where
				ED	Exposure duration	20	yr	BPJ	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Recreational Trespasser (Hunter)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	3,527	cm2/day	BPJ	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor	0.07	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	14	day/yr	BPJ	where
				ED	Exposure duration	20	yr	BPJ	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Resident	Adult	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	6,032	cm2/day	USEPA, 2018	For non-carcinogenic compounds:
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AF	Adherence factor	0.07	mg/cm2	USEPA, 2018	(DA-event x EF x ED x EV x SA) / (AT x BW)
				EF	Exposure frequency	270	day/yr	MDEQ, 2016	
				ED	Exposure duration	20	yr	USEPA, 2011	where
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
				$DFS_{Res-adj}$	Dermal age adjusted factor	79,758	mg/kg	calculated	For carcinognic compounds:
				EF_{res-c}	Exposure frequency (child)	270	day/yr	MDEQ, 2016	
				ED_{res-c}	Exposure duration (child)	6	yr	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AF_{res-c}	Ingestion Rate - child	0.2	mg/d	USEPA, 2018	(DFSres-adj) / (AT)
				SA_{res-c}	Surface area for contact (child)	2373	cm2/day	USEPA, 2018	
				BW_{res-c}	Body weight - child	15	kg	USEPA, 2018	where
				$DFSM_{res-adj}$	Dermal age adjusted mutagenic factor	330,372	mg/kg	calculated	
				EF_{0-2}	Exposure frequency (0 to 2 years)	270	day/yr	MDEQ, 2016	$DFS_{Res-adj} = (EF_{0-2} \times ED_{0-2} \times AF_{0-2} \times SA_{0-2}) / (BW_{0-2}) +$
				ED_{0-2}	Exposure duration (0 to 2 years)	2	yr	USEPA, 2018	$(EF_{2-6} \times ED_{2-6} \times AF_{2-6} \times SA_{2-6}) / (BW_{2-6}) +$
				AF_{0-2}	Adherence factor (0 to 2 years)	0.2	mg/cm2	USEPA, 2018	$(EF_{6-16} \times ED_{6-16} \times AF_{6-16} \times SA_{6-16}) / (BW_{6-16}) +$
				SA_{0-2}	Surface area (0 to 2 years)	2,373	cm2/day	USEPA, 2018	$(EF_{16-26} \times ED_{16-26} \times AF_{16-26} \times SA_{16-26}) / (BW_{16-26})$
				BW_{0-2}	Body weight (0 to 2 years)	15	kg	USEPA, 2018	
				EF_{2-6}	Exposure frequency (2 to 6 years)	270	day/yr	MDEQ, 2016	For mutagenic compounds:
				ED_{2-6}	Exposure duration (2 to 6 years)	4	yr	USEPA, 2018	
				AF_{2-6}	Adherence factor (2 to 6 years)	0.2	mg/cm2	USEPA, 2018	$\underline{CS \times DFSM_{resc-adj} \times ABSd \times CF}$
				SA_{2-6}	Surface area (2 to 6 years)	2,373	cm2/day	USEPA, 2018	
				BW_{2-6}	Body weight (2-6 years)	15	kg	USEPA, 2018	AT
				EF_{6-16}	Exposure frequency (6 to 16 years)	270	day/yr	MDEQ, 2016	
				ED_{6-16}	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	Where:
				AF_{6-16}	Adherence factor (6 to 16 years)	0.07	mg/cm2	USEPA, 2018	
				SA_{6-16}	Surface area (6 to 16 years)	6,032	cm2/day	USEPA, 2018	$DFSMR_{esc-adj} = (EF_{0-2} \times ED_{0-2} \times AF_{0-2} \times SA_{0-2} \times 10) / (BW_{0-2}) +$
				BW_{6-16}	Body weight (6 to 16 years)	80	kg	USEPA, 2018	$(EF_{2-6} \times ED_{2-6} \times AF_{2-6} \times SA_{2-6} \times 3) / (BW_{2-6}) +$
				EF_{16-26}	Exposure frequency (16 to 26 years)	270	day/yr	MDEQ, 2016	$(EF_{6-16} \times ED_{6-16} \times AF_{6-16} \times SA_{6-16} \times 3) / (BW_{6-16}) +$
				ED_{16-26}	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	$(EF_{16-26} \times ED_{16-26} \times AF_{16-26} \times SA_{16-26} \times 1) / (BW_{16-26})$
				AF_{16-26}	Adherence factor (16 to 26 years)	0.07	mg/cm2	USEPA, 2018	
				SA_{16-26}	Surface area (16 to 26 years)	6,032	cm2/day	USEPA, 2018	
				BW_{16-26}	Body weight (16 to 26 years)	80	kg	USEPA, 2018	

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Resident	Child	Soil	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	2,373	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor	0.2	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	270	day/yr	MDEQ, 2016	where
				ED	Exposure duration	6	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	15	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	2190	days	USEPA, 2011	CS x CF x AF x ABS-d
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreationist (Floater)	Adolescent (6-16 years)	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	19,652	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				$DFSM_{trecc-adj}$	Dermal age adjusted mutagenic factor	9,379	mg/kg	USEPA, 2018	
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor	0.07	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	10	day/yr	BPJ	where
				ED	Exposure duration	10	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				BW	Body weight	44	kg	USEPA, 2011	CS x CF x AF x ABS-d
				AT-NC	Averaging time - noncancer	3,650	days	USEPA, 2011	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreationist (Floater)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	19,652	cm2/day	USEPA, 2018	For non-carcinogenic compounds:
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				AF	Adherence factor, adult	0.07	mg/cm2	USEPA, 2018	(DA-event x EF x ED x EV x SA) / (AT x BW)
				EF	Exposure frequency	10	day/yr	BPJ	
				ED	Exposure duration	20	yr	USEPA, 2011	where
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	7300	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
				$DFS_{Rec-adj}$	Dermal age adjusted factor	3,439	mg/kg	calculated	For carcinognic compounds:
				$DFSM_{rec-adj}$	Dermal age adjusted mutagenic factor	6,878	mg/kg	calculated	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				EF_{6-16}	Exposure frequency (6 to 16 years)	10	day/yr	MDEQ, 2016	(DFSrec-adj x ABSd x CF) / (AT)
				ED_{6-16}	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	
				AF_{6-16}	Adherence factor (6 to 16 years)	0.07	mg/cm2	USEPA, 2018	where
				SA_{6-16}	Surface area (6 to 16 years)	19,652	cm2/day	USEPA, 2018	
				BW_{6-16}	Body weight (6 to 16 years)	80	kg	USEPA, 2018	$DFS_{Rec-adj} = (EF_{6-16} \times ED_{6-16} \times AF_{6-16} \times SA_{6-16}) / (BW_{6-16}) +$
				EF_{16-26}	Exposure frequency (16 to 26 years)	10	day/yr	MDEQ, 2016	$(EF_{16-26} \times ED_{16-26} \times AF_{16-26} \times SA_{16-26}) / (BW_{16-26})$
				ED_{16-26}	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	
				AF_{16-26}	Adherence factor (16 to 26 years)	0.07	mg/cm2	USEPA, 2018	
				SA_{16-26}	Surface area (16 to 26 years)	19,652	cm2/day	USEPA, 2018	For mutagenic compounds:
				BW_{16-26}	Body weight (16 to 26 years)	80	kg	USEPA, 2018	$\frac{CS \times DFSM_{rec-adj} \times ABSd \times CF}{AT}$
									Where:
									$DFSM_{Rec-adj} = (EF_{6-16} \times ED_{6-16} \times AF_{6-16} \times SA_{6-16} \times 3) / (BW_{6-16}) +$
									$(EF_{16-26} \times ED_{16-26} \times AF_{16-26} \times SA_{16-26} \times 1) / (BW_{16-26})$

Table 4-1
Exposure Equations and Assumptions - Current/Future Scenario: Soil and Sediment
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil/Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Recreationist (Fisher)	Adult	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	6,032	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor, adult	0.07	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	10	day/yr	BPJ	where
				ED	Exposure duration	20	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	
				BW	Body weight	80	kg	USEPA, 2011	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2011	CS x CF x AF x ABS-d
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2011	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Trespasser	Adolescent (6-16 yers)	Soil/ Sediment	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				SA	Surface area for contact	6,032	cm2/day	USEPA, 2018	Dermal Absorbed Dose (DAD) (mg/kg-day) =
				$DFSM_{tres-adj}$	Dermal age adjusted mutagenic factor	2,015	mg/kg	USEPA, 2018	
				ABS-d	Dermal absorption factor-VOCs	chemical-specific	unitless	USEPA 2004	(DA-event x EF x ED x EV x SA) / (AT x BW)
				AF	Adherence factor	0.07	mg/cm2	USEPA, 2018	
				EF	Exposure frequency	7	day/yr	BPJ	where
				ED	Exposure duration	10	yr	USEPA, 2011	
				EV	Event Frequency	1	events/day	EPA, 2001	Absorbed Dose per Event (DA-event) (mg/cm2-event) =
				BW	Body weight	44	kg	USEPA, 2011	CS x CF x AF x ABS-d
				AT-NC	Averaging time - noncancer	3650	days	USEPA, 2011	
				AT-C	Averaging time - cancer	25550	days	USEPA, 2011	For mutagenic compounds:
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	$\frac{CS \times DFSM_{tres-adj} \times ABSd \times CF}{AT}$ Where: $DFSM_{tres-adj} = (EF \times ED \times AF \times SA \times 3) / BW$

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judegment (BPJ) parameter values.

TABLE 4-2
Exposure Equations and Assumptions - Current/Future Scenario: Soil to Air
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air and Airborne Particulate

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Inhalation	Industrial Worker	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	8	hr/day	USEPA, 2018	
				EF	Exposure frequency	187	day/yr	MDEQ, 2017	Intake (µg/m3) =
				ED	Exposure duration	25	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.36E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Construction Worker	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	8	hr/day	USEPA, 2018	
				EF	Exposure frequency	124	day/yr	MDEQ, 2016	Intake (µg/m3) =
				ED	Exposure duration	1	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	80	days	USEPA, 2018	
				AT-C	Averaging time - cancer	365	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.30E+06	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Stormwater Management Worker	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	
				EF	Exposure frequency	38	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	25	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	9,125	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreational Trespasser (ATV)	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	
				EF	Exposure frequency	9	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	20	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	chemical-specific	m3/kg	CDM SMITH, 2019	
				VF	Volatilization factor	chemical-specific	m3/kg	USEPA, 2018	Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	

TABLE 4-2
Exposure Equations and Assumptions - Current/Future Scenario: Soil to Air
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air and Airborne Particulate

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Inhalation	Recreational Trespasser (Hunter)	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	8	hr/day	BPJ	
				EF	Exposure frequency	14	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	20	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreationist (Floater)	Adolescent (6-16 years)	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	Intake (µg/m3) =
				EF	Exposure frequency	10	day/yr	BPJ	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				ED	Exposure duration	10	yr	USEPA, 2018	
				AT-NC	Averaging time - noncancer	3,650	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	EPA, 2009	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
	Recreationist (Floater)	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	For carcinogens:
				EF	Exposure frequency	10	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	20	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		For non-carcinogens:
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	EPA, 2009	Intake (mg/m3) =
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	
				EF_{6-16}	Exposure frequency (6 to 16 years)	10	day/yr	MDEQ, 2016	
				ED_{6-16}	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	For mutagenic compounds:
				ET_{6-16}	Exposure Time (6 to 16 years)	1	hr/day	USEPA, 2018	
				EF_{16-26}	Exposure frequency (16 to 26 years)	10	day/yr	MDEQ, 2016	$(CS_{soil} \times CF_{air} \times (1/VF + 1/PEF) \times [(ET6\text{-}16 \times EF6\text{-}16 \times ED6\text{-}16 \times CFday \times 3) +$
				ED_{16-26}	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	$\frac{(ET_{16-26} \times EF_{16-26} \times ED_{16-26} \times CF_{day} \times 1)]}{AT}$
				ET_{16-26}	Exposure Time (16 to 26 years)	1	hr/day	USEPA, 2018	
	Recreationist (Fisher)	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	
				EF	Exposure frequency	10	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	20	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	EPA, 2009	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.0E-06	kg/mg	USEPA 1989	

TABLE 4-2
Exposure Equations and Assumptions - Current/Future Scenario: Soil to Air
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air and Airborne Particulate

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Inhalation	Resident	Adult	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	24	hr/day	USEPA, 2018	
				EF	Exposure frequency	270	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	26	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	7,300	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	
				EF_{0-2}	Exposure frequency (0 to 2 years)	270	day/yr	MDEQ, 2016	
				ED_{0-2}	Exposure duration (0 to 2 years)	2	yr	USEPA, 2018	For mutagenic compounds:
				ET_{0-2}	Exposure Time (0 to 2 years)	24	hr/day	USEPA, 2018	
				EF_{2-6}	Exposure frequency (2 to 6 years)	270	day/yr	USEPA, 2018	$(CS_{soil} \times CF_{air} \times (1/VF + 1/PEF) \times [(ET_{0-2} \times EF_{0-2} \times ED_{0-2} \times CFday \times 10) +$
				ED_{2-6}	Exposure duration (2 to 6 years)	4	yr	USEPA, 2018	$(ET_{2-6} \times EF_{2-6} \times ED_{2-6} \times CF_{day} \times 3) +$
				ET_{2-6}	Exposure Time (2 to 6 years)	24	hr/day	USEPA, 2018	$(ET_{6-16} \times EF_{6-16} \times ED_{6-16} \times CF_{day} \times 3) +$
				EF_{6-16}	Exposure frequency (6 to 16 years)	270	day/yr	MDEQ, 2016	$\frac{(ET_{16-26} \times EF_{16-26} \times ED_{16-26} \times CF_{day} \times 1)])}{AT}$
				ED_{6-16}	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	
				ET_{6-16}	Exposure Time (6 to 16 years)	24	hr/day	USEPA, 2018	
				EF_{16-26}	Exposure frequency (16 to 26 years)	270	day/yr	MDEQ, 2016	
				ED_{16-26}	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	
				ET_{16-26}	Exposure Time (16 to 26 years)	24	hr/day	USEPA, 2018	
	Resident	Child	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	24	hr/day	USEPA, 2018	
				EF	Exposure frequency	270	day/yr	BPJ	Intake (µg/m3) =
				ED	Exposure duration	6	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	2,190	days	USEPA, 2018	
				AT-C	Averaging time - cancer	#REF!	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	USEPA, 2018	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	

TABLE 4-2
Exposure Equations and Assumptions - Current/Future Scenario: Soil to Air
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air and Airborne Particulate

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Inhalation	Trespasser	Adolescent (6-16 years)	Airborne Particulate and Vapors	CS	Chemical Concentration in Soil	See Table 3s	mg/kg	See Table 3s	
				ET	Exposure time	1	hr/day	BPJ	
				EF	Exposure frequency	7	day/yr	MDEQ, 2017	Intake (µg/m3) =
				ED	Exposure duration	10	yr	USEPA, 2018	$\frac{CS_{soil} \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday \times CFair}{AT}$
				AT-NC	Averaging time - noncancer	3,650	days	USEPA, 2018	
				AT-C	Averaging time - cancer	25,550	days	USEPA, 2018	
				PEF	Particulate Emissions Factor	1.360E+09	m3/kg	MDEQ, 2017	
				VF	Volatilization factor	chemical-specific	m3/kg		Intake (mg/m3) =
				CFair	Conversion factor for carcinogenic risk calculations	1.00E+03	ug/mg	EPA, 2009	$\frac{CSsoil \times (1/VF + 1/PEF) \times ET \times EF \times ED \times CFday}{AT}$
				CFday	Conversion factor for time	1/24	days/hr	EPA, 2009	
				CFsoil	Conversion factor	1.00E-06	kg/mg	USEPA 1989	
									For mutagenic compounds:
									$\frac{CS_{soil} \times (1/VF + 1/PEF) \times (ET \times EF \times ED \times Cfday \times 3) \times CFair}{AT}$

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judgement (BPJ) parameter values.

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Stormwater Management Woker	Adult	Surface Water	EPCsw	Chemical Concentration in Surface water	See Table 3s	µg/l	See Table 3s	
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} or $LADD_{sw}$ (mg/kg-day) =
				EF	Exposure frequency	38	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	25	yr	USEPA, 2018	
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	USEPA, 2018	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	9125	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
	Recreational Trespasser (ATV)	Adult	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} or $LADD_{sw}$ (mg/kg-day) =
				EF	Exposure frequency	9	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7,300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25,550	days	USEPA, 2018	
	Recreational Trespasser (Hunter)	Adult	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} or $LADD_{sw}$ (mg/kg-day) =
				EF	Exposure frequency	14	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
	Recreationist (Floater)	Adolescent (6-16 years)	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	For non-carcinogens:
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} (mg/kg-day) =
				EF	Exposure frequency	10	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	10	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	44	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	3650	days	USEPA, 2018	

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Recreationist (Floater)	Adult	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	For non-carcinogens:
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw}(mg/kg-day) =
				EF	Exposure frequency	10	day/yr	BPJ	
				ED	Exposure duration	20	yr	USEPA, 2018	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	
				CF	Conversion factor	1.0E+00	mg/µg	USEPA, 2018	For carcinogens
				BW	Body weight	80	kg	USEPA, 2018	$LADD_{sw}$(mg/kg-day) =
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	$\frac{EPC_{sw} \times Irsw\text{-}adj \times CF}{AT}$
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
				$IFSW_{rec\text{-}adj}$	Surface water intake rate (age-adjusted factor)	0.18	mg/kg	calculated	
				$IFSWM_{rec\text{-}adj}$	Surface water intake rate (age-adjusted mutagenic factor)	0.36	mg/kg	calculated	where
				$EF_{6\text{-}16}$	Exposure frequency (6 to 16 years)	10	day/yr	BPJ	Irsw-adj =
				$ED_{6\text{-}16}$	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	$[(EV_{6\text{-}16} \times EF_{6\text{-}16} \times ED_{6\text{-}16} \times ET_{6\text{-}16} \times IRsw_{6\text{-}16}) / BW_{6\text{-}16} +$
				$ET_{6\text{-}16}$	Exposure time per event (6 to 16 years)	1	hr/event	BPJ	$\frac{(EV_{16\text{-}26} \times EF_{16\text{-}26} \times ED_{16\text{-}26} \times ET_{16\text{-}26} \times IRsw_{16\text{-}26}) / BW_{16\text{-}26}]}{AT}$
				$EV_{6\text{-}16}$	Events per day (6 to 16 years)	1	events/day	USEPA, 2018	
				$IRSW_{6\text{-}16}$	Surface water ingestion rate (6 to 16 years)	0.071	l/hr	USEPA, 2018	
				$BW_{6\text{-}16}$	Body weight (6 to 16 years)	80	kg	USEPA, 2018	For mutagens
				$EF_{16\text{-}26}$	Exposure frequency (16 to 26 years)	10	day/yr	BPJ	$LADD_{sw}$(mg/kg-day) =
				$ED_{16\text{-}26}$	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	$\frac{EPC_{sw} \times IRSWM\text{-}adj \times CF}{AT}$
				$EV_{16\text{-}26}$	Events per day (16 to 26 years)	1	events/day	USEPA, 2018	
				$IRSW_{16\text{-}26}$	Surface water ingestion rate (16 to 26 years)	0.071	l/hr	USEPA, 2018	
				$ET_{6\text{-}16}$	Exposure time per event (6 to 16 years)	1	hr/event	BPJ	where
				$BW_{16\text{-}26}$	Body weight (16 to 26 years)	80	kg	USEPA, 2018	IRSWM-adj =
									$[(EV_{6\text{-}16} \times EF_{6\text{-}16} \times ED_{6\text{-}16} \times ET_{6\text{-}16} \times IRsw_{6\text{-}16} \times 3) / BW_{6\text{-}16} +$
									$\frac{(EV_{16\text{-}26} \times EF_{16\text{-}26} \times ED_{16\text{-}26} \times ET_{16\text{-}26} \times IRsw_{16\text{-}26} \times 1) / BW_{16\text{-}26}]}{AT}$
	Recreationist (Fisher)	Adult	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} or $LADD_{sw}$ (mg/kg-day) =
				EF	Exposure frequency	10	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
	Trespasser	Adolescent (6-16 years)	Surface Water	EPCsw	Chemical Concentration in Surface Water	See Table 3s	µg/l	See Table 3s	
				IRsw	Surface water intake rate	0.071	l/hr	USEPA, 2018	ADD_{sw} or $LADD_{sw}$ (mg/kg-day) =
				$IFWM_{tres\text{-}adj}$	Ingestion of surface water mutagenic factor	0.34	L/kg	USEPA, 2018	
				EF	Exposure frequency	7	day/yr	BPJ	$\frac{EPC_{sw} \times IR_{sw} \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	10	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	BPJ	For mutagenic compounds:
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	44	kg	USEPA, 2018	$\frac{EPCsw \times IFWM_{tres\text{-}adj} \times CF}{AT}$
				AT-n	Averaging time (noncancer endpoint)	3650	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	Where:
									$IFWM_{tres\text{-}adj}$ = (ED x EF x IRW x EV x ET x 3) / BW

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Stormwater Management Worker	Adult	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw or LDADsw (mg/kg-day) =
				EF	Exposure frequency	38	days/year	BPJ	For inorganics:
				ED	Exposure duration	25	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times DFW_{rec\text{-}adj} \times CF1 \times CF2}{AT}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	3,527	cm2	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFW-adj	Stormwater Management Worker water dermal contact factor	41883	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	9125	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
	Recreational Trespasser (ATV)	Adult	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw or LDADsw (mg/kg-day) =
				EF	Exposure frequency	9	days/year	BPJ	For inorganics:
				ED	Exposure duration	20	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times DFW_{rec\text{-}adj} \times CF1 \times CF2}{AT}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	3,527	cm2	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Water dermal contact factor	7936	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Recreational Trespasser (Hunter)	Adult	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw or LDADsw (mg/kg-day) =
				EF	Exposure frequency	14	days/year	BPJ	For inorganics:
				ED	Exposure duration	20	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times DFW_{rec\text{-}adj} \times CF1 \times CF2}{AT}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	3,527	cm2	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Water dermal contact factor	12345	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
Dermal	Recreationist (Floater)	Adolescent (6-16 years)	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw (mg/kg-day) =
				EF	Exposure frequency	10	days/year	BPJ	For inorganics:
				ED	Exposure duration	10	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times CF1}{DA_{event}}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	
				ETevent-rec-madj	Exposure time per event for mutagenic compounds	1	hrs/event	USEPA, 2018	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	19652	cm2	USEPA, 2018	
				BW	Body weight	44	kg	USEPA, 2018	$\frac{EPCsw \times 2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_{event-rec-c}}{\pi}} \times CF1}{DA_{event}}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Water dermal contact factor	49130	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPCsw \times FA \times Kp \times \left[\frac{ET_{event-rec-c}}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times CF1}{DA_{event}}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E+00	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	3650	days	USEPA, 2018	

Where

$$DA_{event} = \frac{EV_{rec-c} \times ED_{rec-c} \times EF_{rec-c} \times SA_{rec-c} \times CF2}{AT_n \times BW}$$

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Recreationist (Floater)	Adult	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	LDADsw (mg/kg-day) =
				EF	Exposure frequency	10	days/year	BPJ	For inorganics:
				ED	Exposure duration	20	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times CF1}{DA_{event}}$
				EV	Events per day	1	events/day	BPJ	
				ETrec-adj	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	19652	cm2	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$\frac{EPCsw \times 2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_{event-rec-adj}}{\pi}} \times CF1}{DA_{event}}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Water dermal contact factor	49130	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPCsw \times FA \times Kp \times \left[\frac{ET_{event-rec-adj}}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times CF1}{DA_{event}}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
				EF_{rec-c}	Exposure frequency (6 to 16 years)	10	days/year	BPJ	Where:
				ED_{rec-c}	Exposure duration (6 to 16 years)	10	years	USEPA, 2018	
				EV_{rec-c}	Events per day (6 to 16 years)	1	events/day	BPJ	
				ET_{rec-c}	Exposure Time (6 to 16 years)	1	hr/event	BPJ	$DA_{event} = \frac{DFW_{rec-adj} \times CF2}{AT_c}$
				BW_{rec-c}	Body weight (6 to 16 years)	80	kg	USEPA, 2018	
				SA_{rec-c}	Surface Area (6 to 16 years)	19652	cm2	USEPA, 2018	
				EFrec-a	Exposure frequency (adult)	10	days/year	BPJ	Where:
				EDrec-a	Exposure duration (adult)	10	years	USEPA, 2018	
				EVrec-a	Events per day (adult)	1	events/day	BPJ	$DFW_{rec-adj} = \left(\frac{EF_{rec-c} \times EV_{rec-c} \times ED_{rec-c} \times SA_{rec-c}}{BW_{rec-c}} + \frac{EF_{rec-a} \times EV_{rec-a} \times ED_{rec-a} \times SA_{rec-a}}{BW_{rec-a}}\right)$
				ETrec-a	Exposure Time (adult)	1	hr/event	BPJ	
				BW_{rec-a}	Body weight (adult)	80	kg	USEPA, 2018	and
				SA_{rec-a}	Surface Area (adult)	19652	cm2	USEPA, 2018	$ET_{rec-adj} = \left(\frac{ET_{rec-c} \times ED_{rec-c} + ET_{rec-a} \times ED_{rec-a}}{ED_{rec-c} + ED_{rec-a}}\right)$

TABLE 4-3
Exposure Equations and Assumptions - Current/Future Scenario: Surface Water
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Recreationist (Fisher)	Adult	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw or LDADsw (mg/kg-day) =
				EF	Exposure frequency	10	days/year	BPJ	For inorganics:
				ED	Exposure duration	20	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times DFW_{rec\text{-}adj} \times CF1 \times CF2}{AT}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				SAsw	Skin surface area exposed to surface water	6032	cm2	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Recreator water dermal contact factor	15080	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
	Trespasser	Adolescent (6-16 yers)	Surface Water	EPCsw	Chemical concentration in surface water	See Table 3s	µg/L	See Table 3s	DADsw or LDADsw (mg/kg-day) =
				EF	Exposure frequency	7	days/year	BPJ	For inorganics:
				ED	Exposure duration	10	years	USEPA, 2018	$\frac{EPC_{sw} \times K_p \times ET \times DFW_{rec\text{-}adj} \times CF1 \times CF2}{AT}$
				EV	Events per day	1	events/day	BPJ	
				ET	Exposure time per event	1	hr/event	BPJ	For organics if ET ≤ t*:
				ETevent-tres-madj	Exposure time per event for mutagenic compoounds	1	hrs/event	USEPA, 2018	
				SAsw	Skin surface area exposed to surface water	6032	cm2	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				BW	Body weight	44	kg	USEPA, 2018	
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFWrec-adj	Water dermal contact factor	9596	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				DFMWtres-adj	Water dermal contact factor for mutagenic compounds	28789	cm²-event/kg		
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	3650	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	For mutagenic compounds
									For inorganics:
									DADsw = (EPCsw x Kp x ET x DFMWtres-adj x CF1 x CF2)/(AT)
									For organics if ET ≤ t*:
									$\frac{EPCsw \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_{event-tres-madj}}{\pi}} \times DFMWtres-adj \times CF1 \times CF}{AT}$
									For organics if ET > t*:
									$\frac{EPCsw \times FA \times Kp \times \left[\frac{ET_{event-tres-madj}}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFWMtres-adj \times CF1 \times CF2}{AT}$

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judgement (BPJ) parameter values.

TABLE 4-4
Exposure Equations and Assumptions - Future Scenario: Groundwater
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Tapwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Resident	Adult	Tapwater	EPCgw	Chemical Concentration in Groundwater	See Table 3s	µg/l	See Table 3s	For non-carcinogens:
				IRgw	Groundwater intake rate	2.5	l/day	USEPA, 2018	ADDgw (mg/kg-day) =
				EF	Exposure frequency	350	day/yr	USEPA, 2018	$\frac{EPC_{gw} \times IR_{gw} \times EF \times ED \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	For carcinogens:
				AT-n	Averaging time (noncancer endpoint)	7,300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25,550	days	USEPA, 2018	LADDgw (mg/kg-day) =
				IRgw-adj	Groundwater intake rate (age adjusted)	328	L/kg	calculated	$\frac{EPC_{gw} \times Irgw\text{-}adj \times CF}{AT}$
				IRgwm-adj	Groundwater intake rate (age adjusted mutagenic factor)	787	L/kg	calculated	
				$EF_{res\text{-}c}$	Exposure frequency (child)	350	day/yr	USEPA, 2018	
				$ED_{res\text{-}c}$	Exposure duration (child)	6	yr	USEPA, 2018	where IRgw-adj =
				$IR_{gw\text{-}c}$	Ingestion Rate - child	0.78	l/day	USEPA, 2018	$[(EFres\text{-}_c \times ED_{res\text{-}c} \times IRgw_{res\text{-}c}) / BW_{res\text{-}c} +$
				$BW_{res\text{-}c}$	Body weight - child	15	kg	USEPA, 2018	$\frac{(EF_{res\text{-}a} \times (ED_{res\text{-}a} - ED_{res\text{-}c}) \times IRgw_{res\text{-}a})}{AT} / BW_{res\text{-}a}]$
				$ED_{res\text{-}a}$	Exposure duration (adult)	26	yr	USEPA, 2018	
				$EF_{0\text{-}2}$	Exposure frequency (0 to 2 years)	350	day/yr	USEPA, 2018	
				$ED_{0\text{-}2}$	Exposure duration (0 to 2 years)	2	yr	USEPA, 2018	
				$IRgw_{0\text{-}2}$	Grounwdater ingestion rate (0 to 2 years)	0.78	l/day	USEPA, 2018	
				$BW_{0\text{-}2}$	Body weight (0 to 2 years)	15	kg	USEPA, 2018	For mutagens:
				$EF_{2\text{-}6}$	Exposure frequency (2 to 6 years)	350	day/yr	USEPA, 2018	
				$ED_{2\text{-}6}$	Exposure duration (2 to 6 years)	4	yr	USEPA, 2018	LADDgw (mg/kg-day) =
				$IRgw_{2\text{-}6}$	Grounwdater ingestion rate (2 to 6 years)	0.78	l/day	USEPA, 2018	$\frac{EPC_{gw} \times IRgwm\text{-}adj \times CF}{AT}$
				$BW_{2\text{-}6}$	Body weight (2-6 years)	15	kg	USEPA, 2018	
				$EF_{6\text{-}16}$	Exposure frequency (6 to 16 years)	350	day/yr	USEPA, 2018	
				$ED_{6\text{-}16}$	Exposure duration (6 to 16 years)	10	yr	USEPA, 2018	where IRgw-adj =
				$IRgw_{6\text{-}16}$	Grounwdater ingestion rate (6 to 16 years)	2.5	l/day	USEPA, 2018	$[(EV_{0\text{-}2} \times EF_{\text{-}0\text{-}2} \times ED_{0\text{-}2} \times ET_{0\text{-}2} \times IRgw_{0\text{-}2}) / BW_{0\text{-}2} +$
				$BW_{6\text{-}16}$	Body weight (6 to 16 years)	80	kg	USEPA, 2018	$(EV_{2\text{-}6} \times EF_{2\text{-}6} \times ED_{2\text{-}6} \times ET_{2\text{-}6} \times IRgw_{2\text{-}6}) / BW_{2\text{-}6}]$
				$EF_{16\text{-}26}$	Exposure frequency (16 to 26 years)	350	day/yr	USEPA, 2018	$[(EV_{6\text{-}16} \times EF_{6\text{-}16} \times ED_{6\text{-}16} \times ET_{6\text{-}16} \times IRgw_{6\text{-}16}) / BW_{6\text{-}16} +$
				$ED_{16\text{-}26}$	Exposure duration (16 to 26 years)	10	yr	USEPA, 2018	$(EV_{16\text{-}26} \times EF_{16\text{-}26} \times ED_{16\text{-}26} \times ET_{16\text{-}26} \times IRgw_{16\text{-}26}) / BW_{16\text{-}26}]$
				$IRgw_{16\text{-}26}$	Grounwdater ingestion rate (16 to 26 years)	2.5	l/day	USEPA, 2018	AT
				$BW_{16\text{-}26}$	Body weight (16 to 26 years)	80	kg	USEPA, 2018	
	Resident	Child	Tapwater	EPCgw	Chemical Concentration in Groundwater	See Table 3s	µg/l	See Table 3s	ADDgw or LADDgw (mg/kg-day) =
				IRgw	Groundwater intake rate	0.78	l/day	USEPA, 2018	$\frac{EPC_{gw} \times IR_{gw} \times EF \times ED \times CF}{BW \times AT}$
				EF	Exposure frequency	350	day/yr	USEPA, 2018	
				ED	Exposure duration	6	yr	USEPA, 2018	
				CF	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				BW	Body weight	15	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	2,190	days	USEPA, 2018	

TABLE 4-4
Exposure Equations and Assumptions - Future Scenario: Groundwater
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Tapwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Resident	Adult	Tapwater	EPCgw	Chemical Concentration in Groundwater	See Table 3s	µg/L	See Table 3s	DADgw or LDADgw (mg/kg-day) =
				EF	Exposure frequency	350	days/year	USEPA, 2018	For inorganics:
				ED	Exposure duration	20	years	USEPA, 2018	EPCgw x Kp x ETadj / DAevent x CF2
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	0.71	hr/event	USEPA, 2018	For organics if ET ≤ t*:
				SAgw	Skin surface area exposed to groundwater	19652	cm2	USEPA, 2018	$DADgw = \frac{EPCgw \times 2 \times FA \times K_p \times CF2 \times \sqrt{\frac{6\,x\,\tau_{event} \times ETadj}{\pi}}}{DAevent}$
				BW	Body weight	80	kg	USEPA, 2018	
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFW-adj	Resident water dermal contact factor	2610650	cm²-event/kg	calculated	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$DADgw = \frac{EPCgw \times 2 \times FA \times K_p \times CF2 \times \left[\frac{ETadj}{1+B} + 2\,x\,\tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}{DAevent}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	
				EF_{res-c}	Exposure frequency (child)	350	day/yr	USEPA, 2018	For non-carcinogens
				ED_{res-c}	Exposure duration (child)	6	yr	USEPA, 2018	
				EV_{res-c}	Event frequency (child)	1	events/day	USEPA, 2018	$DAevent = \frac{EV_{resa} \times EDres \times EFresa \times SA_{resa} \times CF1}{AT \times BWres_{\_a}}$
				$SAgw_{res-c}$	Skin surface area exposed to groundwater	6365	cm2	USEPA, 2018	
				BW_{res-c}	Body weight - child	15	kg	USEPA, 2018	
				ETres-c	Exposure time per event (child)	0.54	hr/event	USEPA, 2018	ETadj = Etevent = 0.71 hours/event
				EDres-a	Exposure dureation resident	26	yr	USEPA, 2018	
				ETres-adj	Exposure Time (age adjusted)	0.6708	hours/event	calculated	For carcinogens
									$DAevent = \frac{DFW_{res\_adf} \times CF1}{AT}$
									and
									$DFW_{res-adj} = \left(\frac{EF_{res-c} \times EV_{res-c} \times ED_{res-c} \times SA_{res-c}}{BW_{res-c}} + \frac{EF_{res-a} \times EV_{res-a} \times ED_{res-a} \times SA_{res-a}}{BW_{res-a}}\right)$
									and
									$ET_{res-adj} = \left(\frac{ET_{res-c} \times ED_{res-c} + ET_{res-a} \times (ED_{res-a} - ED_{res-c})}{ED_{res}}\right)$

TABLE 4-4
Exposure Equations and Assumptions - Future Scenario: Groundwater
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Tapwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Dermal	Resident	Child	Tapwater	EPCgw	Chemical Concentration in Groundwater	See Table 3s	µg/L	See Table 3s	DADgw or LDADgw (mg/kg-day) =
				EF	Exposure frequency	350	days/year	USEPA, 2018	For inorganics:
				ED	Exposure duration	6	years	USEPA, 2018	EPCgw x Kp x ET x DFWrec-adj x CF1 x CF2 / AT
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	0.54	hr/event	USEPA, 2018	For organics if ET ≤ t*:
				SAgw	Skin surface area exposed to groundwater	6365	cm2	USEPA, 2018	
				BW	Body weight	15	kg	USEPA, 2018	$\frac{EPC_{sw} \times 2 \times FA \times K_p \times \sqrt{\frac{6 \times \tau_{event} \times ET}{\pi}} \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				FA	Fraction absorbed	chemical-specific	--		
				Kp	Dermal permeability	chemical-specific	cm/hr		
				MW	Molecular weight	chemical-specific	g/mole		
				DFW-adj	Water dermal contact factor	891100	cm²-event/kg	USEPA, 2018	For organics if ET > t*:
				τevent	Lag time per event	chemical-specific	hr/event		
				t*	Time to reach steady-state	chemical-specific	hr		$\frac{EPC_{sw} \times FA \times K_p \times \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right] \times DFW_{rec-adj} \times CF1 \times CF2}{AT}$
				B	Ratio of permeability through stratum corneum to permeability across viable epidermis	chemical-specific	--		
				CF1	Conversion factor	1.0E-03	mg/µg	USEPA, 2018	
				CF2	Conversion factor	1.0E-03	L/cm3	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	2190	days	USEPA, 2018	

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judgement (BPJ) parameter values.

TABLE 4-5
Exposure Equations and Assumptions - Current/Future Scenario: Fish
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Fish

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Recreationist (Fisher)	Adult	Fish	Cfish	Chemical Concentration in Fish	See Table 3s	mg/kg	See Table 3s	
				MR	Migration ratio	0.1	unitless	BPJ	
				IR_{fish}	Fish intake rate	12,971	mg/day	BPJ	ADD_{fish} or $LADD_{fish}$ (mg/kg-day) =
				EF	Exposure frequency	10	day/yr	BPJ	$\frac{Cfish \times MR \times IR_{fsh} \times IA \times EF \times ED \times EV \times ET \times CF}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				EV	Events per day	1	events/day	USEPA, 2018	
				ET	Exposure time per event	1	hr/event	USEPA, 2018	where
				IA	intake rate adjustment factor	61.3%	percent	USEPA, 2011	IA = 1 x (1 – L1) x (1 – L2)
				L1	cooking or preparation loss	31.5%	percent	USEPA, 2011	
				L2	post-cooking loss	10.5%	percent	USEPA, 2011	
				CF	Conversion factor	1.0E-06	kg/mg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judgement (BPJ) parameter values.

TABLE 4-6
Exposure Equations and Assumptions - Current/Future Scenario: Hunter Uptake through Venison
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Medium: Deer
Exposure Medium: Venison

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Parameter Value	Units (a)	Rationale/ Reference (b)	Intake Equation/ Model Name
Ingestion	Hunter	Adult	Deer	Cv	Chemical Concentration in Venison	See Table 3s	mg/kg ww	Refer to text (c)	
				Irvdw	Venison intake rate (dry weight)	0.035	kg dry w/day	USEPA, 2018	$ADD_{vension}$ or $LADD_{venison}$ (mg/kg-day) =
				Irvww	Venison intake rate (wet weight)	0.086	kg wet w/day	USEPA, 2018	
				W	percent water content	59.25		USEPA, 2018	
				EF	Exposure frequency	14	day/yr	BPJ	$\frac{Cv \times Ir_{v\text{-}dw} \times EF \times ED}{BW \times AT}$
				ED	Exposure duration	20	yr	USEPA, 2018	
				CF	Conversion factor	1.0E-06	kg/mg	USEPA, 2018	
				BW	Body weight	80	kg	USEPA, 2018	$Irv\text{-}dw = Ir_{v\text{-}ww} \times ((100- W)/100)$
				AT-n	Averaging time (noncancer endpoint)	7300	days	USEPA, 2018	
				AT-c	Averaging time (cancer endpoint)	25550	days	USEPA, 2018	

Footnotes:
a/ mg/d = milligrams per day; yr = year; kg = kilogram; cm2/day = square centimeter per day; mg/cm2 = milligrams per square centimeter; hr/day = hours per day
b/ Refer to text for complete reference citations and discussion of best professional judegment (BPJ) parameter values.
c/ Refer to text for discussion of calculation of chemical concentration in deer.

Table 4-7
Chemical-Specific Parameters
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Chemical	Cas number	Dermal Absorption Factor For Soil (ABSd) (unitless) (c)	Reference (b)	Relative Bioavailability Factor for Soil (RBA) (unitless) (c)	Reference (b)	Fraction Absorbed (FA) (unitless)	Reference (b)	Volitilzation Factor (VF) (m^3/kg)	Reference (b)	ATV Rider - Activity Based PEF (m^3/kg)	Reference (b)	Dermal Permeability Factor (cm/hr)	Reference (b)	Molecular Weight (MW) (g/mole)	Reference (b)	Lag time per event steady state (τevent) (SW dermal)	Reference (b)
Cyanide	57-12-5	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	5.33E+04	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	26.018	USEPA, 2018	0.147078621	USEPA, 2018
Cyanide (Free)	FREE CN	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	5.33E+04	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	26.018	USEPA, 2018	0.147078621	USEPA, 2018
Fluoride	16984-48-8	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	38	USEPA, 2018	0.171651953	USEPA, 2018
Aluminum	7429-90-5	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	26.982	USEPA, 2018	0.148918259	USEPA, 2018
Antimony	7440-36-0	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	121.76	USEPA, 2018	0.505480899	USEPA, 2018
Arsenic	7440-38-2	0.03	USEPA, 2018	0.6	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.49E+05	TechLaw, 2017	0.001	USEPA, 2018	74.922	USEPA, 2018	0.276319764	USEPA, 2018
Barium	7440-39-3	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	137.33	USEPA, 2018	0.617869489	USEPA, 2018
Beryllium	7440-41-7	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	9.01	USEPA, 2018	0.118114917	USEPA, 2018
Cadmium (diet)	7440-43-9_d	0.001	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	112.4	USEPA, 2018	0.448011075	USEPA, 2018
Cadmium (water)	7440-43-9	0.001	USEPA, 2018	0.001	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	112.4	USEPA, 2018	0.448011075	USEPA, 2018
Chromium, Hexavalent	18540-29-9	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.002	USEPA, 2018	52	USEPA, 2018	0.205612138	USEPA, 2018
Chromium, Hexavalent - Estimated	7440-47-3_EST	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.002	USEPA, 2018	52	USEPA, 2018	0.205612138	USEPA, 2018
Cobalt	7440-48-4	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0004	USEPA, 2018	58.93	USEPA, 2018	0.224831289	USEPA, 2018
Copper	7440-50-8	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	63.546	USEPA, 2018	0.23861973	USEPA, 2018
Iron	7439-89-6	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	55.847	USEPA, 2018	0.216068745	USEPA, 2018
Manganese (diet)	7439-96-5_d	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.92E+05	TechLaw, 2017	0.001	USEPA, 2018	54.938	USEPA, 2018	0.213550971	USEPA, 2018
Manganese (non-diet)	7439-96-5	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.92E+05	TechLaw, 2017	0.001	USEPA, 2018	54.938	USEPA, 2018	0.213550971	USEPA, 2018
Mercury	7439-97-6	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	3.47E+04	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	200.59	USEPA, 2018	1.396859577	USEPA, 2018
Nickel	7440-02-0	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0002	USEPA, 2018	58.71	USEPA, 2018	0.224194394	USEPA, 2018
Selenium	7782-49-2	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	78.96	USEPA, 2018	0.2910883	USEPA, 2018
Thallium	7440-28-0	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	204.38	USEPA, 2018	1.466819752	USEPA, 2018
Vanadium	7440-62-2	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.001	USEPA, 2018	50.94	USEPA, 2018	0.202820921	USEPA, 2018
Zinc	7440-66-6	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0006	USEPA, 2018	65.37	USEPA, 2018	0.244298471	USEPA, 2018
PCB-1254 (Aroclor 1254)	11097-69-1	0.14	USEPA, 2018	1	USEPA, 2018	0.5	USEPA, 2018	8.43E+05	USEPA, 2018	1.18E+05	TechLaw, 2017	0.751	USEPA, 2018	326.44	USEPA, 2018	7.078035713	USEPA, 2018
2-Methylnaphthalene	91-57-6	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0917	USEPA, 2018	142.2	USEPA, 2018	0.657913427	USEPA, 2018
Benzo(A)Anthracene	56-55-3	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	4.41E+06	USEPA, 2018	1.18E+05	TechLaw, 2017	0.552	USEPA, 2018	228.3	USEPA, 2018	1.996773248	USEPA, 2018
Benzo(A)Pyrene	50-32-8	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.713	USEPA, 2018	252.32	USEPA, 2018	2.72170311	USEPA, 2018
Benzo(B)Fluoranthene	205-99-2	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.417	USEPA, 2018	252.32	USEPA, 2018	2.72170311	USEPA, 2018
Benzo(K)Fluoranthene	207-08-9	0.13	USEPA, 2018	1	USEPA, 2018	0.9	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.691	USEPA, 2018	252.32	USEPA, 2018	2.72170311	USEPA, 2018
Biphenyl (Diphenyl)	92-52-4	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0943	USEPA, 2018	154.21	USEPA, 2018	0.768112353	USEPA, 2018
Bis(2-Ethylhexyl) Phthalate	117-81-7	0.1	USEPA, 2018	1	USEPA, 2018	0.8	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	1.13	USEPA, 2018	390.57	USEPA, 2018	16.18231868	USEPA, 2018
Chrysene	218-01-9	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.596	USEPA, 2018	228.3	USEPA, 2018	1.996773248	USEPA, 2018
Dibenz(A,H)Anthracene	53-70-3	0.13	USEPA, 2018	1	USEPA, 2018	0.6	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.953	USEPA, 2018	278.36	USEPA, 2018	3.80771776	USEPA, 2018
Dibenzofuran	132-64-9	0.03	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	1.56E+05	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0975	USEPA, 2018	168.2	USEPA, 2018	0.919959587	USEPA, 2018
Fluoranthene	206-44-0	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	0.308	USEPA, 2018	202.26	USEPA, 2018	1.427265439	USEPA, 2018
Indeno(1,2,3-C,D)Pyrene	193-39-5	0.13	USEPA, 2018	1	USEPA, 2018	0.6	USEPA, 2018	NA	USEPA, 2018	1.18E+05	TechLaw, 2017	1.24	USEPA, 2018	276.34	USEPA, 2018	3.709819243	USEPA, 2018
Naphthalene	91-20-3	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	4.63E+04	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0466	USEPA, 2018	128.18	USEPA, 2018	0.549106709	USEPA, 2018
Pyrene	129-00-0	0.13	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	2.38E+06	USEPA, 2018	1.18E+05	TechLaw, 2017	0.201	USEPA, 2018	202.26	USEPA, 2018	1.427265439	USEPA, 2018
1,2-Dichloroethane	107-06-2	NA	USEPA, 2018	1	USEPA, 2018	1	USEPA, 2018	4.57E+03	USEPA, 2018	1.18E+05	TechLaw, 2017	0.0042	USEPA, 2018	98.96	USEPA, 2018	0.376725267	USEPA, 2018

Footnotes:

USEPA. 2018. Regional Screening Levels, November 2018.

USEPA. 2007. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). OSWER 9285.7-02EP. EPA/540/R/99/005 Final

TechLaw, 2017. Final 2017 Sampling and Analysis Plan/ Quality Assurance Project Plan. Nelson Tunnel Superfund Site, Mineral County, Colorado. April

Table 4-7
Chemical-Specific Parameters
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Chemical	Cas number	Time to reach steady state (t*) (SW dermal) (hr)	Reference (b)	Ratio of permeability through stratum corneum to permeability across viable epidermis (B; SW dermal)	Reference (b)	In Effective Predictive Domain (EPD)?	
Cyanide	57-12-5	0.352988691	USEPA, 2018	0.00196184	USEPA, 2018	Yes	USEPA, 2018
Cyanide (Free)	FREE CN	0.352988691	USEPA, 2018	0.00196184	USEPA, 2018	Yes	USEPA, 2018
Fluoride	16984-48-8	0.411964688	USEPA, 2018	0.002370928	USEPA, 2018	Yes	USEPA, 2018
Aluminum	7429-90-5	0.357403821	USEPA, 2018	0.001997854	USEPA, 2018	Yes	USEPA, 2018
Antimony	7440-36-0	1.213154159	USEPA, 2018	0.004244035	USEPA, 2018	Yes	USEPA, 2018
Arsenic	7440-38-2	0.663167434	USEPA, 2018	0.003329134	USEPA, 2018	Yes	USEPA, 2018
Barium	7440-39-3	1.482886773	USEPA, 2018	0.004507226	USEPA, 2018	Yes	USEPA, 2018
Beryllium	7440-41-7	0.283475801	USEPA, 2018	0.001154487	USEPA, 2018	Yes	USEPA, 2018
Cadmium (diet)	7440-43-9_d	1.075226579	USEPA, 2018	0.004077649	USEPA, 2018		USEPA, 2018
Cadmium (water)	7440-43-9	1.075226579	USEPA, 2018	0.004077649	USEPA, 2018	Yes	USEPA, 2018
Chromium, Hexavalent	18540-29-9	0.493469132	USEPA, 2018	0.005547002	USEPA, 2018	Yes	USEPA, 2018
Chromium, Hexavalent - Estimated	7440-47-3_EST	0.493469132	USEPA, 2018	0.005547002	USEPA, 2018	Yes	USEPA, 2018
Cobalt	7440-48-4	0.539595093	USEPA, 2018	0.001181014	USEPA, 2018	Yes	USEPA, 2018
Copper	7440-50-8	0.572687352	USEPA, 2018	0.00306599	USEPA, 2018	Yes	USEPA, 2018
Iron	7439-89-6	0.518564988	USEPA, 2018	0.002874263	USEPA, 2018	Yes	USEPA, 2018
Manganese (diet)	7439-96-5_d	0.512522329	USEPA, 2018	0.002850776	USEPA, 2018		USEPA, 2018
Manganese (non-diet)	7439-96-5	0.512522329	USEPA, 2018	0.002850776	USEPA, 2018	Yes	USEPA, 2018
Mercury	7439-97-6	3.352462984	USEPA, 2018	0.0054473	USEPA, 2018	Yes	USEPA, 2018
Nickel	7440-02-0	0.538066547	USEPA, 2018	0.000589403	USEPA, 2018	Yes	USEPA, 2018
Selenium	7782-49-2	0.69861192	USEPA, 2018	0.003417671	USEPA, 2018	Yes	USEPA, 2018
Thallium	7440-28-0	3.520367406	USEPA, 2018	0.005498521	USEPA, 2018	Yes	USEPA, 2018
Vanadium	7440-62-2	0.486770209	USEPA, 2018	0.002745087	USEPA, 2018	Yes	USEPA, 2018
Zinc	7440-66-6	0.586316331	USEPA, 2018	0.001865809	USEPA, 2018	Yes	USEPA, 2018
PCB-1254 (Aroclor 1254)	11097-69-1	31.09666261	USEPA, 2018	5.218771399	USEPA, 2018	No	USEPA, 2018
2-Methylnaphthalene	91-57-6	1.578992224	USEPA, 2018	0.420577259	USEPA, 2018	Yes	USEPA, 2018
Benzo(A)Anthracene	56-55-3	8.481823791	USEPA, 2018	3.207884222	USEPA, 2018	No	USEPA, 2018
Benzo(A)Pyrene	50-32-8	11.82210455	USEPA, 2018	4.356041613	USEPA, 2018	No	USEPA, 2018
Benzo(B)Fluoranthene	205-99-2	11.34207409	USEPA, 2018	2.547642851	USEPA, 2018	No	USEPA, 2018
Benzo(K)Fluoranthene	207-08-9	11.79716183	USEPA, 2018	4.221633597	USEPA, 2018	No	USEPA, 2018
Biphenyl (Diphenyl)	92-52-4	1.843469647	USEPA, 2018	0.450396092	USEPA, 2018	Yes	USEPA, 2018
Bis(2-Ethylhexyl) Phthalate	117-81-7	72.88239485	USEPA, 2018	8.589236014	USEPA, 2018	No	USEPA, 2018
Chrysene	218-01-9	8.532400269	USEPA, 2018	3.463585139	USEPA, 2018	No	USEPA, 2018
Dibenz(A,H)Anthracene	53-70-3	16.87856519	USEPA, 2018	6.115373213	USEPA, 2018	No	USEPA, 2018
Dibenzofuran	132-64-9	2.207903009	USEPA, 2018	0.486344785	USEPA, 2018	Yes	USEPA, 2018
Fluoranthene	206-44-0	5.729797915	USEPA, 2018	1.684737993	USEPA, 2018	No	USEPA, 2018
Indeno(1,2,3-C,D)Pyrene	193-39-5	16.6519393	USEPA, 2018	7.928119978	USEPA, 2018	No	USEPA, 2018
Naphthalene	91-20-3	1.317856101	USEPA, 2018	0.202918995	USEPA, 2018	Yes	USEPA, 2018
Pyrene	129-00-0	5.535307139	USEPA, 2018	1.099455639	USEPA, 2018	Yes	USEPA, 2018
1,2-Dichloroethane	107-06-2	0.904140641	USEPA, 2018	0.016069627	USEPA, 2018	Yes	USEPA, 2018

Footnotes:

USEPA. 2018. Regional Screening Levels, November 2018.

USEPA. 2007. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). OSWER 9285.7-02EP. EPA/540/R/99/005 Final

TechLaw, 2017. Final 2017 Sampling and Analysis Plan/ Quality Assurance Project Plan. Nelson Tunnel Superfund Site, Mineral County, Colorado. April

TABLE 5-1
Non-Cancer Toxicity Data (Oral/Dermal)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Chronic Oral RfD Value (a) (mg/kg-day)	Oral to Dermal Adjustment Factor	Chronic Oral to Dermal Adjustment Factor Source (b)	Adjusted Dermal RfD Value (mg/kg-day)	Chronic Primary Target Organ	Source (c)
Cyanide	57-12-5	6.0E-04	1.0E+00	USEPA, 2018	6.0E-04	Testes	USEPA (I)
Cyanide (Free)	FREE CN	6.0E-04	1.0E+00		6.0E-04	Testes	USEPA (I)
Fluoride	16984-48-8	4.0E-02	1.0E+00	USEPA, 2018	4.0E-02	NA	USEPA (C)
Chromium, Hexavalent - Estimated	7440-47-3_EST	3.0E-03	2.5E-02	USEPA, 2018	7.5E-05	NA	USEPA (I)
Aluminum	7429-90-5	1.0E+00	1.0E+00	USEPA, 2018	1.0E+00	Neurological	USEPA (P)
Antimony	7440-36-0	4.0E-04	1.5E-01	USEPA, 2018	6.0E-05	hematologic (longevity, blood glucose, and cholesterol)	USEPA (I)
Arsenic	7440-38-2	3.0E-04	1.0E+00	USEPA, 2018	3.0E-04	Skin and blood	USEPA (I)
Barium	7440-39-3	2.0E-01	7.0E-02	USEPA, 2018	1.4E-02	kidney (nephropathy)	USEPA (I)
Beryllium	7440-41-7	2.0E-03	7.0E-03	USEPA, 2018	1.4E-05	Gastrointestinal	USEPA (I)
Cadmium (diet)	7440-43-9_d	1.0E-03	2.5E-02	USEPA, 2018	2.5E-05	Urinary	USEPA (I)
Cadmium (water)	7440-43-9	5.0E-04	5.0E-02	USEPA, 2018	2.5E-05	Urinary	USEPA (I)
Chromium, Hexavalent	18540-29-9	3.0E-03	2.5E-02	USEPA, 2018	7.5E-05	NA	USEPA (I)
Cobalt	7440-48-4	3.0E-04	1.0E+00	USEPA, 2018	3.0E-04	Thyroid	USEPA (P)
Copper	7440-50-8	4.0E-02	1.0E+00	USEPA, 2018	4.0E-02	Gastrointestinal system	USEPA (H)
Iron	7439-89-6	7.0E-01	1.0E+00	USEPA, 2018	7.0E-01	GI Ttract	USEPA (P)
Manganese (diet)	7439-96-5_d	1.4E-01	1.0E+00	USEPA, 2018	1.4E-01	Nervous	USEPA (I)
Manganese (non-diet)	7439-96-5	2.4E-02	4.0E-02	USEPA, 2018	9.6E-04	Nervous	USEPA (S)
Mercury	7439-97-6	NA	1.0E+00	USEPA, 2018	NA	NA	NA
Nickel	7440-02-0	2.0E-02	4.0E-02	USEPA, 2018	8.0E-04	Body weight	USEPA (I)
Selenium	7782-49-2	5.0E-03	1.0E+00	USEPA, 2018	5.0E-03	nervous, hematologic, dermal	USEPA (I)
Thallium	7440-28-0	1.0E-05	1.0E+00	USEPA, 2018	1.0E-05	Skin	USEPA (X)
Vanadium	7440-62-2	5.0E-03	2.6E-02	USEPA, 2018	1.3E-04	Dermal	USEPA (S)
Zinc	7440-66-6	3.0E-01	1.0E+00	USEPA, 2018	3.0E-01	Blood	USEPA (I)
PCB-1254 (Aroclor 1254)	11097-69-1	2.0E-05	1.0E+00	USEPA, 2018	2.0E-05	Whole body	USEPA (I)
2-Methylnaphthalene	91-57-6	4.0E-03	1.0E+00	USEPA, 2018	4.0E-03	Lungs	NA
Benzo(A)Anthracene	56-55-3	NA	1.0E+00	USEPA, 2018	NA		NA
Benzo(A)Pyrene	50-32-8	3.0E-04	1.0E+00	USEPA, 2018	3.0E-04	Developmental	USEPA (I)
Benzo(B)Fluoranthene	205-99-2	NA	1.0E+00	USEPA, 2018	NA		NA
Benzo(K)Fluoranthene	207-08-9	NA	1.0E+00	USEPA, 2018	NA		NA
Biphenyl (Diphenyl)	92-52-4	5.0E-01	1.0E+00	USEPA, 2018	5.0E-01	Kidney	NA

TABLE 5-1
Non-Cancer Toxicity Data (Oral/Dermal)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Chronic Oral RfD Value (a) (mg/kg-day)	Oral to Dermal Adjustment Factor	Chronic Oral to Dermal Adjustment Factor Source (b)	Adjusted Dermal RfD Value (mg/kg-day)	Chronic Primary Target Organ	Source (c)
Bis(2-Ethylhexyl) Phthalate	117-81-7	2.0E-02	1.0E+00	USEPA, 2018	2.0E-02	Liver	USEPA (I)
Chrysene	218-01-9	NA	1.0E+00	USEPA, 2018	NA		NA
Dibenz(A,H)Anthracene	53-70-3	NA	1.0E+00	USEPA, 2018	NA		NA
Dibenzofuran	132-64-9	1.0E-03	1.0E+00	USEPA, 2018	1.0E-03	NA	USEPA (X)
Fluoranthene	206-44-0	4.0E-02	1.0E+00	USEPA, 2018	4.0E-02	Whole body	USEPA (I)
Indeno(1,2,3-C,D)Pyrene	193-39-5	NA	1.0E+00	USEPA, 2018	NA		NA
Naphthalene	91-20-3	2.0E-02	1.0E+00	USEPA, 2018	2.0E-02	Body weight	USEPA (I)
Pyrene	129-00-0	3.0E-02	1.0E+00	USEPA, 2018	3.0E-02	Kidney	USEPA (I)
Indeno(1,2,3-C,D)Pyrene	193-39-5	NA	1.0E+00	USEPA, 2018	NA		NA
Naphthalene	91-20-3	2.0E-02	1.0E+00	USEPA, 2018	2.0E-02	Body weight	USEPA (I)
Pyrene	129-00-0	3.0E-02	1.0E+00	USEPA, 2018	3.0E-02	Kidney	USEPA (I)
1,2-Dichloroethane	107-06-2	6.0E-03	1.0E+00	USEPA, 2018	6.0E-03	Kidney	USEPA (X)

Footnotes:
a/ mg/kg-day = milligrams per kilogram per day; NA = not available/not applicable
b/ Refer to text for citation
c/ OEHHA = California Office of Environmental Health Hazard Assessment -- Toxicity Criteria Database
DTSC = California Department of Toxic Substances Control -- toxicity criteria for TPH fractions
USEPA = U.S. Environmental Protection Agency
HHRA note 3 = Refer to Text for citation
PA DEP = Pennsylvania Department of Environmental Protection
Reg 9 PRG = US EPA Region 9 Preliminary Remediation Goal
A = Agency for Toxic Substance and Disease Registry
I = Integrated Risk Information System
C = Cal EPA
H = HEAST
P = PPRTV
S = USEPA (2018) for user guide Section 5
X = PPRTV Appendix
Refer to text for references.

Table 5-2
Non-Cancer Toxicity Data (Inhalation)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Chronic Inhalation RfC Value (a) mg/m3	Primary Target Organ	Source (b)
Cyanide	57-12-5	8.0E-04	Thyroid	USEPA (S)
Cyanide (Free)	FREE CN	8.0E-04	Thyroid	USEPA (S)
Fluoride	16984-48-8	1.3E-02	NA	USEPA (C)
Chromium, Hexavalent - Estimated	7440-47-3_EST	1.0E-04	Lungs	USEPA (I)
Aluminum	7429-90-5	5.0E-03	Neurological	USEPA (P)
Antimony	7440-36-0	NA	NA	USEPA ()
Arsenic	7440-38-2	1.5E-05	cardiovascular, nervous, and skin	USEPA (C)
Barium	7440-39-3	5.0E-04	Fetus	USEPA (H)
Beryllium	7440-41-7	2.0E-05	Immune, Respiratory	USEPA (I)
Cadmium (diet)	7440-43-9_d	1.0E-05	Renal	USEPA (A)
Cadmium (water)	7440-43-9	1.0E-05	Renal	USEPA (A)
Chromium, Hexavalent	18540-29-9	1.0E-04	Lungs	USEPA (I)
Cobalt	7440-48-4	6.0E-06	Respiratory Tract; Lung	USEPA (P)
Copper	7440-50-8	NA	NA	USEPA ()
Iron	7439-89-6	NA	NA	USEPA ()
Manganese (diet)	7439-96-5_d	5.0E-05	Nervous	USEPA (I)
Manganese (non-diet)	7439-96-5	5.0E-05	Nervous	USEPA (I)
Mercury	7439-97-6	3.0E-04	Nervous	NA
Nickel	7440-02-0	9.0E-05	Resp.	USEPA (A)
Selenium	7782-49-2	2.0E-02	NA	USEPA (C)
Thallium	7440-28-0	NA	NA	USEPA ()
Vanadium	7440-62-2	1.0E-04	Resp.	USEPA (A)
Zinc	7440-66-6	NA	NA	USEPA ()
PCB-1254 (Aroclor 1254)	11097-69-1	NA	NA	USEPA ()
2-Methylnaphthalene	91-57-6	NA	NA	NA
Benzo(A)Anthracene	56-55-3	NA	NA	NA
Benzo(A)Pyrene	50-32-8	2.0E-06	Developmental	USEPA (I)
Benzo(B)Fluoranthene	205-99-2	NA	NA	NA
Benzo(K)Fluoranthene	207-08-9	NA	NA	NA
Biphenyl (Diphenyl)	92-52-4	4.0E-04	Liver; Kidney	NA
Bis(2-Ethylhexyl) Phthalate	117-81-7	NA	NA	USEPA ()
Chrysene	218-01-9	NA	NA	NA
Dibenz(A,H)Anthracene	53-70-3	NA	NA	NA

Table 5-2
Non-Cancer Toxicity Data (Inhalation)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Chronic Inhalation RfC Value (a) mg/m3	Primary Target Organ	Source (b)
Dibenzofuran	132-64-9	NA	NA	USEPA ()
Fluoranthene	206-44-0	NA	NA	USEPA ()
Indeno(1,2,3-C,D)Pyrene	193-39-5	NA	NA	NA
Naphthalene	91-20-3	3.0E-03	Nervous, Respiratory	USEPA (I)
Pyrene	129-00-0	NA	NA	USEPA ()
1,2-Dichloroethane	107-06-2	NA	NA	NA

Footnotes:
a/ mg/kg-day = milligrams per kilogram per day; NA = not available/not applicable
b/ Refer to text for citation
c/ OEHHA = California Office of Environmental Health Hazard Assessment -- Toxicity Criteria Database
DTSC = California Department of Toxic Substances Control -- toxicity criteria for TPH fractions
USEPA = U.S. Environmental Protection Agency
HHRA note 3 = Refer to Text for citation
PA DEP = Pennsylvania Department of Environmental Protection
Reg 9 PRG = US EPA Region 9 Preliminary Remediation Goal
A = Agency for Toxic Substance and Disease Registry
C = Cal EPA
I = Integrated Risk Information System
H = HEAST
P = PPRTV
S = USEPA (2018) for user guide Section 5
X = PPRTV Appendix
Refer to text for references.

Table 6-1
Cancer Toxicity Data (Oral/Dermal)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Oral Cancer Slope Factor (a) (mg/kg-day)-1	Oral to Dermal Adjustment Factor	Oral to Dermal Adjustment Factor Source (b)	Adjusted Dermal Cancer Slope Factor (mg/kg-day)-1	Weight of Evidence/ Cancer Guideline Description (c)	Source (d)	Mutagenic Mode of Action
Cyanide	57-12-5	NA	1.00E+00	USEPA, 2018	NA		NA	N
Cyanide (Free)	FREE CN	NA	1.00E+00		NA		NA	N
Fluoride	16984-48-8	NA	1.00E+00	USEPA, 2018	NA		NA	N
Chromium, Hexavalent - Estimated	7440-47-3_EST	5.0E-01	2.50E-02	USEPA, 2018	1.3E-02	Known/likely (inhalation) cannot determine (oral)	USEPA (c*)	Y
Aluminum	7429-90-5	NA	1.00E+00	USEPA, 2018	NA		NA	N
Antimony	7440-36-0	NA	1.50E-01	USEPA, 2018	NA		NA	N
Arsenic	7440-38-2	1.5E+00	1.00E+00	USEPA, 2018	1.5E+00	A	USEPA (c**R)	N
Barium	7440-39-3	NA	7.00E-02	USEPA, 2018	NA		NA	N
Beryllium	7440-41-7	NA	7.00E-03	USEPA, 2018	NA		NA	N
Cadmium (diet)	7440-43-9_d	NA	2.50E-02	USEPA, 2018	NA		NA	N
Cadmium (water)	7440-43-9	NA	5.00E-02		NA		NA	N
Chromium, Hexavalent	18540-29-9	5.0E-01	2.50E-02	USEPA, 2018	1.3E-02	Known/likely (inhalation) cannot determine (oral)	USEPA (c*)	Y
Cobalt	7440-48-4	NA	1.00E+00	USEPA, 2018	NA		NA	N
Copper	7440-50-8	NA	1.00E+00	USEPA, 2018	NA		NA	N
Iron	7439-89-6	NA	1.00E+00	USEPA, 2018	NA		NA	N
Manganese (diet)	7439-96-5_d	NA	1.00E+00	USEPA, 2018	NA		NA	N
Manganese (non-diet)	7439-96-5	NA	4.00E-02		NA		NA	N
Mercury	7439-97-6	NA	1.00E+00	USEPA, 2018	NA		NA	N
Nickel	7440-02-0	NA	4.00E-02	USEPA, 2018	NA		NA	N
Selenium	7782-49-2	NA	1.00E+00	USEPA, 2018	NA		NA	N
Thallium	7440-28-0	NA	1.00E+00	USEPA, 2018	NA		NA	N
Vanadium	7440-62-2	NA	2.60E-02	USEPA, 2018	NA		NA	N
Zinc	7440-66-6	NA	1.00E+00	USEPA, 2018	NA		NA	N
PCB-1254 (Aroclor 1254)	11097-69-1	2.0E+00	1.00E+00	USEPA, 2018	2.0E+00	B2	USEPA (n)	N
2-Methylnaphthalene	91-57-6	NA	1.00E+00	USEPA, 2018	NA		NA	N
Benzo(A)Anthracene	56-55-3	1.0E-01	1.00E+00	USEPA, 2018	1.0E-01	Carcinogenic to humans	USEPA (c)	Y
Benzo(A)Pyrene	50-32-8	1.0E+00	1.00E+00	USEPA, 2018	1.0E+00	Carcinogenic to humans	USEPA (c*)	Y
Benzo(B)Fluoranthene	205-99-2	1.0E-01	1.00E+00	USEPA, 2018	1.0E-01	Carcinogenic to humans	USEPA (c)	Y
Benzo(K)Fluoranthene	207-08-9	1.0E-02	1.00E+00	USEPA, 2018	1.0E-02	Carcinogenic to humans	USEPA (c)	Y
Biphenyl (Diphenyl)	92-52-4	8.0E-03	1.00E+00	USEPA, 2018	8.0E-03	Suggestive evidence of carcinogenic potential	USEPA (n)	N
Bis(2-Ethylhexyl) Phthalate	117-81-7	1.4E-02	1.00E+00	USEPA, 2018	1.4E-02	B2	USEPA (c**)	N
Chrysene	218-01-9	1.0E-03	1.00E+00	USEPA, 2018	1.0E-03	Carcinogenic to humans	USEPA (c)	Y
Dibenz(A,H)Anthracene	53-70-3	1.0E+00	1.00E+00	USEPA, 2018	1.0E+00	Carcinogenic to humans	USEPA (c)	Y
Dibenzofuran	132-64-9	NA	1.00E+00	USEPA, 2018	NA		NA	N
Fluoranthene	206-44-0	NA	1.00E+00	USEPA, 2018	NA		NA	N
Indeno(1,2,3-C,D)Pyrene	193-39-5	1.0E-01	1.00E+00	USEPA, 2018	1.0E-01	Carcinogenic to humans	USEPA (c)	Y
Naphthalene	91-20-3	NA	1.00E+00	USEPA, 2018	NA		NA	N

Table 6-1
Cancer Toxicity Data (Oral/Dermal)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Oral Cancer Slope Factor (a) (mg/kg-day)-1	Oral to Dermal Adjustment Factor	Oral to Dermal Adjustment Factor Source (b)	Adjusted Dermal Cancer Slope Factor (mg/kg-day)-1	Weight of Evidence/ Cancer Guideline Description (c)	Source (d)	Mutagenic Mode of Action
Pyrene	129-00-0	NA	1.00E+00	USEPA, 2018	NA		NA	N
1,2-Dichloroethane	107-06-2	1.0E-01	1.00E+00	USEPA, 2018	1.0E-01	B2	USEPA (c**)	N

Footnotes:
a/ mg/kg-day = milligrams per kilogram per day; NA = not available/not applicable
b/ Refer to text for citation
c/ Weight of evidence abbreviations:
USEPA classification
A - human carcinogen
B2 - probable human carcinogen; inadequate evidence that it can cause cancer in humans but at present it is far from conclusive
C - Probable human carcinogen; There is limited evidence that it can cause cancer in animals in the absence of human data, but at present it is not conclusive.
D - Not Classifiable as to Human Carcinogenicity
IARC classification
Group 2A - Limited evidence in humans and sufficient evidence in animals
Group 2B - Limited evidence in humans and less than sufficient evidence in animals
Group 3 - Inadequate in humans and inadequate or limited in animals
d/ OEHHA = California Office of Environmental Health Hazard Assessment -- Toxicity Criteria Database
DTSC = California Department of Toxic Substances Control -- toxicity criteria for TPH fractions
CDWAL - California Drinking Water Action Level
USEPA = U.S. Environmental Protection Agency
HHRA note 3 = Refer to Text for citation
PA DEP = Pennsylvania Department of Environmental Protection
Reg 9 PRG = US EPA Region 9 Preliminary Remediation Goal
A = Agency for Toxic Substance and Disease Registry
C = Cal EPA
E = see USEPA (2018) for user guide Section 2.3.5
I = Integrated Risk Information System
H = HEAST
P = PPRTV
X = PPRTV Appendix
Refer to text for references.

Table 6-2
Cancer Toxicity Data (Inhalation)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Inhalation Unit Risk (µg/m3)-1	Weight of Evidence/ Cancer Guideline Description (b)	Source (c)	Mutagenic Mode of Action
Cyanide	57-12-5	NA		NA	N
Cyanide (Free)	FREE CN	NA		NA	N
Fluoride	16984-48-8	NA		NA	N
Chromium, Hexavalent - Estimated	7440-47-3_EST	8.4E-02	Known/likely (inhalation) cannot determine (oral)	USEPA (IRIS)	Y
Aluminum	7429-90-5	NA		NA	N
Antimony	7440-36-0	NA		NA	N
Arsenic	7440-38-2	4.3E-03	A	USEPA (IRIS)	N
Barium	7440-39-3	NA		NA	N
Beryllium	7440-41-7	2.4E-03	Known/likely human carcinogen	USEPA (IRIS)	N
Cadmium (diet)	7440-43-9_d	1.8E-03	B1	USEPA (IRIS)	N
Cadmium (water)	7440-43-9	1.8E-03	B1	USEPA (IRIS)	N
Chromium, Hexavalent	18540-29-9	8.4E-02	Known/likely (inhalation) cannot determine (oral)	USEPA (IRIS)	Y
Cobalt	7440-48-4	9.0E-03	LI	USEPA (PPRTV)	N
Copper	7440-50-8	NA		NA	N
Iron	7439-89-6	NA		NA	N
Manganese (diet)	7439-96-5_d	NA		NA	N
Manganese (non-diet)	7439-96-5	NA		NA	N
Mercury	7439-97-6	NA		NA	N
Nickel	7440-02-0	2.6E-04	A	USEPA (Cal EPA)	N
Selenium	7782-49-2	NA		NA	N
Thallium	7440-28-0	NA		NA	N
Vanadium	7440-62-2	NA		NA	N
Zinc	7440-66-6	NA		NA	N
PCB-1254 (Aroclor 1254)	11097-69-1	5.7E-04	B2	USEPA (IRIS)	N
2-Methylnaphthalene	91-57-6	NA		NA	N
Benzo(A)Anthracene	56-55-3	6.0E-05	Carcinogenic to humans	USEPA (IRIS)	Y
Benzo(A)Pyrene	50-32-8	6.0E-04	Carcinogenic to humans	USEPA (IRIS)	Y
Benzo(B)Fluoranthene	205-99-2	6.0E-05	Carcinogenic to humans	USEPA (IRIS)	Y
Benzo(K)Fluoranthene	207-08-9	6.0E-06	Carcinogenic to humans	USEPA (IRIS)	Y
Biphenyl (Diphenyl)	92-52-4	NA		NA	N
Bis(2-Ethylhexyl) Phthalate	117-81-7	2.4E-06	B2	USEPA (Cal EPA)	N
Chrysene	218-01-9	6.0E-07	Carcinogenic to humans	USEPA (IRIS)	Y
Dibenz(A,H)Anthracene	53-70-3	6.0E-04	Carcinogenic to humans	USEPA (IRIS)	Y
Dibenzofuran	132-64-9	NA		NA	N
Fluoranthene	206-44-0	NA		NA	N
Indeno(1,2,3-C,D)Pyrene	193-39-5	6.0E-05	Carcinogenic to humans	USEPA (IRIS)	Y

Table 6-2
Cancer Toxicity Data (Inhalation)
Columbia Falls Aluminum Facility
Columbia Falls, Montana

COC	CAS No.	Inhalation Unit Risk (µg/m3)-1	Weight of Evidence/ Cancer Guideline Description (b)	Source (c)	Mutagenic Mode of Action
Naphthalene	91-20-3	3.4E-05	Carcinogenic potential cannot be determined	USEPA (Cal EPA)	N
Pyrene	129-00-0	NA		NA	N
1,2-Dichloroethane	107-06-2	2.6E-05	B2	USEPA (IRIS)	N

Footnotes:
a/ µg/m3 = micrograms per cubic meter. NA = not available/not applicable.
b/ Weight of evidence abbreviations:
USEPA classification
A - human carcinogen
B2 - probable human carcinogen; inadequate evidence that it can cause cancer in humans but at present it is far from conclusive
C - Probable human carcinogen; There is limited evidence that it can cause cancer in animals in the absence of human data, but at present it is not conclusive.
D - Not Classifiable as to Human Carcinogenicity
IARC classification
Group 2A - Limited evidence in humans and sufficient evidence in animals
Group 2B - Limited evidence in humans and less than sufficient evidence in animals
Group 3 - Inadequate in humans and inadequate or limited in animals
c/ CAL EPA = California EPA
USEPA = U.S. Environmental Protection Agency
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer-Reviewed Toxicity Values
Refer to text for references.

Table 7-1
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft bgs	Ingestion	57-12-5	Cyanide	0.172	mg/kg	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-05
				16984-48-8	Fluoride	96.61	mg/kg	6.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	15811	mg/kg	9.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-04
				7440-36-0	Antimony	0.269	mg/kg	1.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-05
				7440-38-2	Arsenic	4.841	mg/kg	1.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.409	mg/kg	7.6E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-09	1.8E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	6E-06
				7440-48-4	Cobalt	5.306	mg/kg	3.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-50-8	Copper	16.37	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	13957	mg/kg	8.7E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	456.8	mg/kg	2.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-04
				7439-97-6	Mercury	0.0218	mg/kg	1.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.6	mg/kg	1.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-05
				7782-49-2	Selenium	0.263	mg/kg	1.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-06
				7440-62-2	Vanadium	13.67	mg/kg	8.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	12.04	mg/kg	2.2E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	5.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	13.98	mg/kg	2.6E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	6.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	15.23	mg/kg	2.8E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	6.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	6.33	mg/kg	1.2E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-09	2.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	7.1E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-11	5.0E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
				218-01-9	Chrysene	12.93	mg/kg	2.4E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-10	5.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	3.053	mg/kg	5.7E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-08	1.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	10.62	mg/kg	2.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.491	mg/kg	3.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
				129-00-0	Pyrene	23.56	mg/kg	1.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	3.0E-02	(mg/kg-day)	3E-05
			Total Ingestion									4E-07					6E-03
			Dermal	57-12-5	Cyanide	0.172	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	96.61	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7429-90-5	Aluminum	15811	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.269	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.841	mg/kg	3.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	2.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.409	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	5.306	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.37	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	13957	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	456.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0218	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.263	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	12.04	mg/kg	1.2E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.9E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	13.98	mg/kg	1.4E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	3.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	15.23	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	3.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	6.33	mg/kg	6.5E-08	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	6E-10	1.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	3.0E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-12	2.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
				218-01-9	Chrysene	12.93	mg/kg	1.3E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-10	3.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	3.053	mg/kg	3.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-08	7.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	10.62	mg/kg	1.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.491	mg/kg	1.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-07
				129-00-0	Pyrene	23.56	mg/kg	8.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-07	(mg/kg-day)	3.0E-02	(mg/kg-day)	2E-05
			Total Dermal									2E-07					1E-03
		Total Soil Direct Contact										6E-07					7E-03

Table 7-1
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.172	mg/kg	3.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-09	mg/m3	8.0E-04	mg/m3	3E-06
				16984-48-8	Fluoride	96.61	mg/kg	8.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	5.7E-11	mg/m3	1.3E-02	mg/m3	4E-09
				7429-90-5	Aluminum	15811	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.3E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-36-0	Antimony	0.269	mg/kg	2.3E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	4.841	mg/kg	4.1E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	2.8E-12	mg/m3	1.5E-05	mg/m3	2E-07
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.409	mg/kg	1.0E-10	(µg/m3)	8.4E-02	1/(µg/m3)	9E-12	2.4E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7440-48-4	Cobalt	5.306	mg/kg	4.5E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.1E-12	mg/m3	6.0E-06	mg/m3	5E-07
				7440-50-8	Copper	16.37	mg/kg	1.4E-09	(µg/m3)	NA	1/(µg/m3)	NA	9.6E-12	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	13957	mg/kg	1.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.2E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	456.8	mg/kg	3.8E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.7E-10	mg/m3	5.0E-05	mg/m3	5E-06
				7439-97-6	Mercury	0.0218	mg/kg	7.2E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.0E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	30.6	mg/kg	2.6E-09	(µg/m3)	2.6E-04	1/(µg/m3)	7E-13	1.8E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.263	mg/kg	2.2E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-13	mg/m3	2.0E-02	mg/m3	8E-12
				7440-62-2	Vanadium	13.67	mg/kg	1.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	8.0E-12	mg/m3	1.0E-04	mg/m3	8E-08
				56-55-3	Benzo(A)Anthracene	12.04	mg/kg	9.4E-07	(µg/m3)	6.0E-05	1/(µg/m3)	6E-11	2.2E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	13.98	mg/kg	3.5E-09	(µg/m3)	6.0E-04	1/(µg/m3)	2E-12	8.2E-12	mg/m3	2.0E-06	mg/m3	4E-06
				205-99-2	Benzo(B)Fluoranthene	15.23	mg/kg	3.8E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	8.9E-12	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	6.33	mg/kg	1.6E-09	(µg/m3)	6.0E-06	1/(µg/m3)	1E-14	3.7E-12	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	9.6E-12	(µg/m3)	2.4E-06	1/(µg/m3)	2E-17	6.7E-14	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	12.93	mg/kg	3.3E-09	(µg/m3)	6.0E-07	1/(µg/m3)	2E-15	7.6E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	3.053	mg/kg	7.7E-10	(µg/m3)	6.0E-04	1/(µg/m3)	5E-13	1.8E-12	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	10.62	mg/kg	2.7E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	6.2E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.491	mg/kg	1.2E-06	(µg/m3)	3.4E-05	1/(µg/m3)	4E-11	8.5E-09	mg/m3	3.0E-03	mg/m3	3E-06
				129-00-0	Pyrene	23.56	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.9E-09	mg/m3	NA	mg/m3	NA
		Total Dust Inhalation										1E-10					2E-05
	Total Soil Direct Contact and Dust Inhalation											6E-07					7E-03
Medium Total												6E-07					7E-03
												Total of Receptor Risks Across All Media					6E-07					Total of Receptor Hazards Across All Media					7E-03

Table 7-2
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft bgs	Ingestion	57-12-5	Cyanide	0.411	mg/kg	9.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-04
				16984-48-8	Fluoride	81.71	mg/kg	1.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.2E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7429-90-5	Aluminum	16467	mg/kg	3.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-36-0	Antimony	0.315	mg/kg	7.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	4.676	mg/kg	6.4E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	1.8E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-03
				7440-41-7	Beryllium	0.752	mg/kg	1.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-07	(mg/kg-day)	2.0E-03	(mg/kg-day)	2E-04
				7440-43-9_d	Cadmium	0.437	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	3E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	8.8E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-08	2.5E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	5.261	mg/kg	1.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	15.99	mg/kg	3.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7439-89-6	Iron	13551	mg/kg	3.1E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	403.7	mg/kg	9.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-02
				7439-97-6	Mercury	0.0217	mg/kg	5.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	7.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-03
				7782-49-2	Selenium	0.257	mg/kg	5.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-05
				7440-28-0	Thallium	0.137	mg/kg	3.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	9E-03
				7440-62-2	Vanadium	13.67	mg/kg	3.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	10	mg/kg	2.3E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	6.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	2.5E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-06	7.1E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	6.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-07	1.8E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	1.2E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-08	3.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	6.4E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	9E-10	1.8E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-06
				218-01-9	Chrysene	14.43	mg/kg	3.3E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-09	9.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	3.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	8.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	9.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	3E-04
				206-44-0	Fluoranthene	23.97	mg/kg	5.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	4.3E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	1.2E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	6.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
				129-00-0	Pyrene	19.32	mg/kg	4.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	4E-04
			Total Ingestion									5E-06					9E-02
			Dermal	57-12-5	Cyanide	0.411	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	81.71	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7429-90-5	Aluminum	16467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.315	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.676	mg/kg	1.4E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	3.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-41-7	Beryllium	0.752	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-05	(mg/kg-day)	NA
				7440-43-9_d	Cadmium	0.437	mg/kg	4.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-09	(mg/kg-day)	2.5E-05	(mg/kg-day)	5E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	5.261	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	15.99	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	13551	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	403.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0217	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.257	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	10	mg/kg	1.3E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	3.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	1.4E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	3.9E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	3.5E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	9.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	6.8E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	7E-09	1.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	2.7E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-10	7.5E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-06
				218-01-9	Chrysene	14.43	mg/kg	1.8E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-09	5.1E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	1.7E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	1.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	3E-05

Table 7-2
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft bgs		206-44-0	Fluoranthene	23.97	mg/kg	3.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	2.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	6.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	3.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
				129-00-0	Pyrene	19.32	mg/kg	2.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-06	(mg/kg-day)	3.0E-02	(mg/kg-day)	2E-04
			Total Dermal									2E-06					1E-02
		Total Soil Direct Contact										8E-06					1E-01
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.411	mg/kg	4.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-06	mg/m3	8.0E-04	mg/m3	2E-03
				16984-48-8	Fluoride	81.71	mg/kg	3.7E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-08	mg/m3	1.3E-02	mg/m3	8E-07
				7429-90-5	Aluminum	16467	mg/kg	7.4E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-06	mg/m3	5.0E-03	mg/m3	4E-04
				7440-36-0	Antimony	0.315	mg/kg	1.4E-08	(µg/m3)	NA	1/(µg/m3)	NA	4.0E-11	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	4.676	mg/kg	2.1E-07	(µg/m3)	4.3E-03	1/(µg/m3)	9E-10	5.9E-10	mg/m3	1.5E-05	mg/m3	4E-05
				7440-41-7	Beryllium	0.752	mg/kg	3.4E-08	(µg/m3)	2.4E-03	1/(µg/m3)	8E-11	9.4E-11	mg/m3	2.0E-05	mg/m3	5E-06
				7440-43-9_d	Cadmium	0.437	mg/kg	2.0E-08	(µg/m3)	1.8E-03	1/(µg/m3)	4E-11	5.5E-11	mg/m3	1.0E-05	mg/m3	5E-06
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	1.7E-08	(µg/m3)	8.4E-02	1/(µg/m3)	1E-09	4.8E-11	mg/m3	1.0E-04	mg/m3	5E-07
				7440-48-4	Cobalt	5.261	mg/kg	2.4E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	6.6E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	15.99	mg/kg	7.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.0E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	13551	mg/kg	6.1E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	403.7	mg/kg	1.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.1E-08	mg/m3	5.0E-05	mg/m3	1E-03
				7439-97-6	Mercury	0.0217	mg/kg	3.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	30.59	mg/kg	1.4E-06	(µg/m3)	2.6E-04	1/(µg/m3)	4E-10	3.8E-09	mg/m3	9.0E-05	mg/m3	4E-05
				7782-49-2	Selenium	0.257	mg/kg	1.2E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.2E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-28-0	Thallium	0.137	mg/kg	6.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.67	mg/kg	6.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-09	mg/m3	1.0E-04	mg/m3	2E-05
				56-55-3	Benzo(A)Anthracene	10	mg/kg	1.4E-04	(µg/m3)	6.0E-05	1/(µg/m3)	8E-09	3.9E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	5.0E-07	(µg/m3)	6.0E-04	1/(µg/m3)	3E-10	1.4E-09	mg/m3	2.0E-06	mg/m3	7E-04
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	1.3E-06	(µg/m3)	6.0E-05	1/(µg/m3)	8E-11	3.5E-09	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	2.4E-07	(µg/m3)	6.0E-06	1/(µg/m3)	1E-12	6.8E-10	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	1.2E-08	(µg/m3)	2.4E-06	1/(µg/m3)	3E-14	3.5E-11	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	14.43	mg/kg	6.5E-07	(µg/m3)	6.0E-07	1/(µg/m3)	4E-13	1.8E-09	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	6.1E-08	(µg/m3)	6.0E-04	1/(µg/m3)	4E-11	1.7E-10	mg/m4	NA	mg/m4	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	1.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	4.6E-07	mg/m5	NA	mg/m5	NA
				206-44-0	Fluoranthene	23.97	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.0E-09	mg/m6	NA	mg/m6	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	8.4E-07	(µg/m3)	6.0E-05	1/(µg/m3)	5E-11	2.4E-09	mg/m7	NA	mg/m7	NA
				91-20-3	Naphthalene	0.3	mg/kg	4.0E-04	(µg/m3)	3.4E-05	1/(µg/m3)	1E-08	1.1E-06	mg/m8	3.0E-03	mg/m8	4E-04
				129-00-0	Pyrene	19.32	mg/kg	5.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-06	mg/m9	NA	mg/m9	NA
		Total Dust Inhalation										3E-08					5E-03
	Total Soil Direct Contact and Dust Inhalation											8E-06					1E-01
Medium Total												8E-06					1E-01
											Total of Receptor Risks Across All Media	8E-06				Total of Receptor Hazards Across All Media	1E-01

Table 7-3
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Subsurface Soil 0-12 ft bgs	Ingestion	57-12-5	Cyanide	0.411	mg/kg	8.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				16984-48-8	Fluoride	81.71	mg/kg	1.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-03
				7429-90-5	Aluminum	16467	mg/kg	3.3E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-02
				7440-36-0	Antimony	0.315	mg/kg	6.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.4E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	4.676	mg/kg	5.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-08	3.9E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-41-7	Beryllium	0.752	mg/kg	1.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-06	(mg/kg-day)	2.0E-03	(mg/kg-day)	5E-04
				7440-43-9_d	Cadmium	0.437	mg/kg	8.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	6E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	7.7E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-09	5.4E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	5.261	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7440-50-8	Copper	15.99	mg/kg	3.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-04
				7439-89-6	Iron	13551	mg/kg	2.7E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-02
				7439-96-5	Manganese	403.7	mg/kg	8.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-02
				7439-97-6	Mercury	0.0217	mg/kg	4.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	6.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-03
				7782-49-2	Selenium	0.257	mg/kg	5.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	7E-05
				7440-28-0	Thallium	0.137	mg/kg	2.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-02
				7440-62-2	Vanadium	13.67	mg/kg	2.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-03
				56-55-3	Benzo(A)Anthracene	10	mg/kg	2.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	1.4E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	2.2E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	1.6E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-02
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	5.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-08	3.9E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	1.1E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-09	7.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	5.6E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	8E-11	3.9E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				218-01-9	Chrysene	14.43	mg/kg	2.9E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-10	2.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	2.7E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-08	1.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	8.5E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	6E-04
				206-44-0	Fluoranthene	23.97	mg/kg	4.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	8E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	3.8E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	2.6E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	6.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				129-00-0	Pyrene	19.32	mg/kg	3.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	9E-04
			Total Ingestion									5E-07					2E-01
			Dermal	57-12-5	Cyanide	0.411	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	81.71	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7429-90-5	Aluminum	16467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.315	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.676	mg/kg	9.0E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	6.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-41-7	Beryllium	0.752	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-05	(mg/kg-day)	NA
				7440-43-9_d	Cadmium	0.437	mg/kg	2.8E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-09	(mg/kg-day)	2.5E-05	(mg/kg-day)	8E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	5.261	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	15.99	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	13551	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	403.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0217	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.257	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	10	mg/kg	8.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-09	5.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	9.3E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-08	6.5E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	2.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	1.6E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	4.5E-08	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	4E-10	3.1E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	1.8E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-11	1.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-06
				218-01-9	Chrysene	14.43	mg/kg	1.2E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-10	8.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	1.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	8.0E-07	(mg/kg-day)	NA	(mg/kg-day)	NA

Table 7-3
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Soil	Soil	Subsurface Soil 0-12 ft bgs		132-64-9	Dibenzofuran	0.424	mg/kg	8.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	6E-05
				206-44-0	Fluoranthene	23.97	mg/kg	2.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	1.1E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	2.5E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-06
				129-00-0	Pyrene	19.32	mg/kg	1.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	4E-04
			Total Dermal									2E-07					2E-02
		Total Soil Direct Contact										6E-07					2E-01
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.411	mg/kg	1.3E-05	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-07	mg/m3	8.0E-04	mg/m3	1E-03
				16984-48-8	Fluoride	81.71	mg/kg	1.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	7.1E-06	mg/m3	1.3E-02	mg/m3	5E-04
				7429-90-5	Aluminum	16467	mg/kg	2.0E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-03	mg/m3	5.0E-03	mg/m3	3E-01
				7440-36-0	Antimony	0.315	mg/kg	3.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.7E-08	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	4.676	mg/kg	5.8E-06	(µg/m3)	4.3E-03	1/(µg/m3)	3E-08	4.1E-07	mg/m3	1.5E-05	mg/m3	3E-02
				7440-41-7	Beryllium	0.752	mg/kg	9.4E-07	(µg/m3)	2.4E-03	1/(µg/m3)	2E-09	6.6E-08	mg/m3	2.0E-05	mg/m3	3E-03
				7440-43-9_d	Cadmium	0.437	mg/kg	5.4E-07	(µg/m3)	1.8E-03	1/(µg/m3)	1E-09	3.8E-08	mg/m3	1.0E-05	mg/m3	4E-03
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	4.8E-07	(µg/m3)	8.4E-02	1/(µg/m3)	4E-08	3.4E-08	mg/m3	1.0E-04	mg/m3	3E-04
				7440-48-4	Cobalt	5.261	mg/kg	6.5E-06	(µg/m3)	9.0E-03	1/(µg/m3)	6E-08	4.6E-07	mg/m3	6.0E-06	mg/m3	8E-02
				7440-50-8	Copper	15.99	mg/kg	2.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-06	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	13551	mg/kg	1.7E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-03	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	403.7	mg/kg	5.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	3.5E-05	mg/m3	5.0E-05	mg/m3	7E-01
				7439-97-6	Mercury	0.0217	mg/kg	1.0E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.3E-08	mg/m3	3.0E-04	mg/m3	2E-04
				7440-02-0	Nickel	30.59	mg/kg	3.8E-05	(µg/m3)	2.6E-04	1/(µg/m3)	1E-08	2.7E-06	mg/m3	9.0E-05	mg/m3	3E-02
				7782-49-2	Selenium	0.257	mg/kg	3.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.2E-08	mg/m3	2.0E-02	mg/m3	1E-06
				7440-28-0	Thallium	0.137	mg/kg	1.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-08	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.67	mg/kg	1.7E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-06	mg/m3	1.0E-04	mg/m3	1E-02
				56-55-3	Benzo(A)Anthracene	10	mg/kg	1.6E-05	(µg/m3)	6.0E-05	1/(µg/m3)	1E-09	1.1E-06	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	1.4E-05	(µg/m3)	6.0E-04	1/(µg/m3)	8E-09	9.7E-07	mg/m3	2.0E-06	mg/m3	5E-01
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	3.5E-05	(µg/m3)	6.0E-05	1/(µg/m3)	2E-09	2.4E-06	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	6.7E-06	(µg/m3)	6.0E-06	1/(µg/m3)	4E-11	4.7E-07	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	3.5E-07	(µg/m3)	2.4E-06	1/(µg/m3)	8E-13	2.4E-08	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	14.43	mg/kg	1.8E-05	(µg/m3)	6.0E-07	1/(µg/m3)	1E-11	1.3E-06	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	1.7E-06	(µg/m3)	6.0E-04	1/(µg/m3)	1E-09	1.2E-07	mg/m4	NA	mg/m4	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	4.9E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.4E-07	mg/m5	NA	mg/m5	NA
				206-44-0	Fluoranthene	23.97	mg/kg	3.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-06	mg/m6	NA	mg/m6	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	2.3E-05	(µg/m3)	6.0E-05	1/(µg/m3)	1E-09	1.6E-06	mg/m7	NA	mg/m7	NA
				91-20-3	Naphthalene	0.3	mg/kg	1.1E-05	(µg/m3)	3.4E-05	1/(µg/m3)	4E-10	7.6E-07	mg/m8	3.0E-03	mg/m8	3E-04
				129-00-0	Pyrene	19.32	mg/kg	3.7E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-06	mg/m9	NA	mg/m9	NA
		Total Dust Inhalation										2E-07					2E+00
	Total Soil Direct Contact and Dust Inhalation											8E-07					2E+00
Medium Total												8E-07					2E+00
												Total of Receptor Risks Across All Media 8E-07					Total of Receptor Hazards Across All Media 2E+00

Table 7-4
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Subsurface Soil 0-12 ft bgs	Ingestion	57-12-5	Cyanide	0.411	mg/kg	2.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				16984-48-8	Fluoride	81.71	mg/kg	5.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-05
				7429-90-5	Aluminum	16467	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-04
				7440-36-0	Antimony	0.315	mg/kg	2.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-05
				7440-38-2	Arsenic	4.676	mg/kg	1.7E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-41-7	Beryllium	0.752	mg/kg	4.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-08	(mg/kg-day)	2.0E-03	(mg/kg-day)	2E-05
				7440-43-9_d	Cadmium	0.437	mg/kg	2.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	7.2E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-09	1.7E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	6E-06
				7440-48-4	Cobalt	5.261	mg/kg	3.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-50-8	Copper	15.99	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	13551	mg/kg	8.4E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	8E-04
				7439-96-5	Manganese	403.7	mg/kg	2.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	7E-04
				7439-97-6	Mercury	0.0217	mg/kg	1.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	1.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-05
				7782-49-2	Selenium	0.257	mg/kg	1.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-06
				7440-28-0	Thallium	0.137	mg/kg	8.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	6E-04
				7440-62-2	Vanadium	13.67	mg/kg	8.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	10	mg/kg	1.9E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	2.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	5.2E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-08	1.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	1.0E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-09	2.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	1.7E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-11	1.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-07
				218-01-9	Chrysene	14.43	mg/kg	2.7E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-10	6.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	2.6E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-08	6.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	2.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	2E-05
				206-44-0	Fluoranthene	23.97	mg/kg	1.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-05
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	3.5E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	8.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	1.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-07
				129-00-0	Pyrene	19.32	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-07	(mg/kg-day)	3.0E-02	(mg/kg-day)	3E-05
			Total Ingestion									4E-07					6E-03
			Dermal	57-12-5	Cyanide	0.411	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	81.71	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7429-90-5	Aluminum	16467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.315	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.676	mg/kg	3.7E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	2.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				7440-41-7	Beryllium	0.752	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-05	(mg/kg-day)	NA
				7440-43-9_d	Cadmium	0.437	mg/kg	1.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-11	(mg/kg-day)	2.5E-05	(mg/kg-day)	3E-06
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	5.261	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	15.99	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	13551	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	403.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0217	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.257	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	10	mg/kg	1.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	1.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	2.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	2.9E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	6.7E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	5.5E-08	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	6E-10	1.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	7.3E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-11	5.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-07
				218-01-9	Chrysene	14.43	mg/kg	1.5E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-10	3.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	1.4E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	3.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA

Table 7-4
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Main Plant Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft bgs	Ingestion	132-64-9	Dibenzofuran	0.424	mg/kg	3.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-09	(mg/kg-day)	1.0E-03	(mg/kg-day)	2E-06
				206-44-0	Fluoranthene	23.97	mg/kg	8.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-05
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	1.9E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.3	mg/kg	1.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-07
				129-00-0	Pyrene	19.32	mg/kg	6.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-07	(mg/kg-day)	3.0E-02	(mg/kg-day)	2E-05
			Total Dermal									2E-07					1E-03
		Total Soil Direct Contact										6E-07					7E-03
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.411	mg/kg	8.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.2E-09	mg/m3	8.0E-04	mg/m3	8E-06
				16984-48-8	Fluoride	81.71	mg/kg	6.9E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.8E-11	mg/m3	1.3E-02	mg/m3	4E-09
				7429-90-5	Aluminum	16467	mg/kg	1.4E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.7E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-36-0	Antimony	0.315	mg/kg	2.6E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	4.676	mg/kg	3.9E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	2.7E-12	mg/m3	1.5E-05	mg/m3	2E-07
				7440-41-7	Beryllium	0.752	mg/kg	6.3E-11	(µg/m3)	2.4E-03	1/(µg/m3)	2E-13	4.4E-13	mg/m3	2.0E-05	mg/m3	2E-08
				7440-43-9_d	Cadmium	0.437	mg/kg	3.7E-11	(µg/m3)	1.8E-03	1/(µg/m3)	7E-14	2.6E-13	mg/m3	1.0E-05	mg/m3	3E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	9.7E-11	(µg/m3)	8.4E-02	1/(µg/m3)	8E-12	2.3E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7440-48-4	Cobalt	5.261	mg/kg	4.4E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.1E-12	mg/m3	6.0E-06	mg/m3	5E-07
				7440-50-8	Copper	15.99	mg/kg	1.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	9.4E-12	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	13551	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.0E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	403.7	mg/kg	3.4E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.4E-10	mg/m3	5.0E-05	mg/m3	5E-06
				7439-97-6	Mercury	0.0217	mg/kg	7.1E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.0E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	30.59	mg/kg	2.6E-09	(µg/m3)	2.6E-04	1/(µg/m3)	7E-13	1.8E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.257	mg/kg	2.2E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-13	mg/m3	2.0E-02	mg/m3	8E-12
				7440-28-0	Thallium	0.137	mg/kg	1.1E-11	(µg/m3)	NA	1/(µg/m3)	NA	8.0E-14	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.67	mg/kg	1.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	8.0E-12	mg/m3	1.0E-04	mg/m3	8E-08
				56-55-3	Benzo(A)Anthracene	10	mg/kg	7.8E-07	(µg/m3)	6.0E-05	1/(µg/m3)	5E-11	1.8E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	11.11	mg/kg	2.8E-09	(µg/m3)	6.0E-04	1/(µg/m3)	2E-12	6.5E-12	mg/m3	2.0E-06	mg/m3	3E-06
				205-99-2	Benzo(B)Fluoranthene	28.02	mg/kg	7.1E-09	(µg/m3)	6.0E-05	1/(µg/m3)	4E-13	1.6E-11	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	5.391	mg/kg	1.4E-09	(µg/m3)	6.0E-06	1/(µg/m3)	8E-15	3.2E-12	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.278	mg/kg	2.3E-11	(µg/m3)	2.4E-06	1/(µg/m3)	6E-17	1.6E-13	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	14.43	mg/kg	3.6E-09	(µg/m3)	6.0E-07	1/(µg/m3)	2E-15	8.5E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	1.367	mg/kg	3.4E-10	(µg/m3)	6.0E-04	1/(µg/m3)	2E-13	8.0E-13	mg/m4	NA	mg/m4	NA
				132-64-9	Dibenzofuran	0.424	mg/kg	3.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.2E-09	mg/m5	NA	mg/m5	NA
				206-44-0	Fluoranthene	23.97	mg/kg	2.0E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-11	mg/m6	NA	mg/m6	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	18.83	mg/kg	4.7E-09	(µg/m3)	6.0E-05	1/(µg/m3)	3E-13	1.1E-11	mg/m7	NA	mg/m7	NA
				91-20-3	Naphthalene	0.3	mg/kg	7.4E-07	(µg/m3)	3.4E-05	1/(µg/m3)	3E-11	5.2E-09	mg/m8	3.0E-03	mg/m8	2E-06
				129-00-0	Pyrene	19.32	mg/kg	9.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-09	mg/m9	NA	mg/m9	NA
			Total Inhalation									9E-11					2E-05
		Total Dust Inhalation										2E-10					4E-05
	Total Soil Direct Contact and Dust Inhalation											6E-07					7E-03
Medium Total												6E-07					7E-03
											Total of Receptor Risks Across All Media	6E-07				Total of Receptor Hazards Across All Media	7E-03

Table 7-5
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	44.8	mg/kg	2.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-02
				16984-48-8	Fluoride	115.1	mg/kg	5.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.647	mg/kg	3.0E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-08	8.4E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	3E-05
				7429-90-5	Aluminum	55237	mg/kg	2.6E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-03
				7440-36-0	Antimony	0.646	mg/kg	3.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	12.78	mg/kg	3.6E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-07	1.0E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-39-3	Barium	255.2	mg/kg	1.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-05	(mg/kg-day)	2.0E-01	(mg/kg-day)	2E-04
				7440-41-7	Beryllium	5.388	mg/kg	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	2.0E-03	(mg/kg-day)	4E-04
				7440-43-9_d	Cadmium	2.916	mg/kg	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	4E-04
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	3.2E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-08	8.8E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	3E-05
				7440-48-4	Cobalt	7.588	mg/kg	3.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-50-8	Copper	37.74	mg/kg	1.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7439-89-6	Iron	11001	mg/kg	5.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-03
				7439-96-5	Manganese	236.4	mg/kg	1.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.0351	mg/kg	1.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	232.6	mg/kg	1.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-03
				7782-49-2	Selenium	1.287	mg/kg	6.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-05
				7440-28-0	Thallium	1.674	mg/kg	7.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-02
				7440-62-2	Vanadium	75.32	mg/kg	3.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.8E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	649.5	mg/kg	3.0E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-06	8.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	747.7	mg/kg	3.5E-05	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-05	9.7E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-01
				205-99-2	Benzo(B)Fluoranthene	801.9	mg/kg	3.7E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-06	1.0E-04	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	539.4	mg/kg	2.5E-05	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	3E-07	7.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.599	mg/kg	2.8E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-10	7.8E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-06
				218-01-9	Chrysene	691.1	mg/kg	3.2E-05	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-08	9.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	179.9	mg/kg	8.4E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-06	2.3E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	5.069	mg/kg	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.6E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	7E-04
				206-44-0	Fluoranthene	990	mg/kg	4.6E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-03
				193-39-5	Indeno(1,2,3-C,D)Pyrene	497.4	mg/kg	2.3E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-06	6.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	2.084	mg/kg	9.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
				129-00-0	Pyrene	875.1	mg/kg	4.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-04	(mg/kg-day)	3.0E-02	(mg/kg-day)	4E-03
			Total Ingestion									5E-05					4E-01
			Dermal	57-12-5	Cyanide	44.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	115.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.647	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	55237	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.646	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	12.78	mg/kg	7.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	2.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-39-3	Barium	255.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-02	(mg/kg-day)	NA
				7440-41-7	Beryllium	5.388	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-05	(mg/kg-day)	NA
				7440-43-9_d	Cadmium	2.916	mg/kg	5.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-09	(mg/kg-day)	2.5E-05	(mg/kg-day)	6E-05
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	7.588	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	37.74	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	11001	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	236.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0351	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	232.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	1.287	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	1.674	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	75.32	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	649.5	mg/kg	1.7E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-06	4.7E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	747.7	mg/kg	1.9E-05	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-05	5.4E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-01
				205-99-2	Benzo(B)Fluoranthene	801.9	mg/kg	2.1E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-06	5.7E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	539.4	mg/kg	1.4E-05	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-07	3.9E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.599	mg/kg	1.2E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-10	3.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
				218-01-9	Chrysene	691.1	mg/kg	1.8E-05	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-08	4.9E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	179.9	mg/kg	4.6E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-06	1.3E-05	(mg/kg-day)	NA	(mg/kg-day)	NA

Table 7-5
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs		132-64-9	Dibenzofuran	5.069	mg/kg	3.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	8E-05
				206-44-0	Fluoranthene	990	mg/kg	2.5E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				193-39-5	Indeno(1,2,3-C,D)Pyrene	497.4	mg/kg	1.3E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-06	3.6E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	2.084	mg/kg	5.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-06
				129-00-0	Pyrene	875.1	mg/kg	2.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	2E-03
			Total Dermal									3E-05					2E-01
		Total Soil Direct Contact										8E-05					6E-01
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	44.8	mg/kg	1.3E-03	(µg/m3)	NA	1/(µg/m3)	NA	3.6E-06	mg/m3	8.0E-04	mg/m3	5E-03
				16984-48-8	Fluoride	115.1	mg/kg	1.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	3.7E-10	mg/m3	1.3E-02	mg/m3	3E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.647	mg/kg	7.4E-10	(µg/m3)	8.4E-02	1/(µg/m3)	6E-11	2.1E-12	mg/m3	1.0E-04	mg/m3	2E-08
				7429-90-5	Aluminum	55237	mg/kg	6.3E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-07	mg/m3	5.0E-03	mg/m3	4E-05
				7440-36-0	Antimony	0.646	mg/kg	7.4E-10	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-12	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	12.78	mg/kg	1.5E-08	(µg/m3)	4.3E-03	1/(µg/m3)	6E-11	4.1E-11	mg/m3	1.5E-05	mg/m3	3E-06
				7440-39-3	Barium	255.2	mg/kg	2.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	8.1E-10	mg/m3	5.0E-04	mg/m3	2E-06
				7440-41-7	Beryllium	5.388	mg/kg	6.1E-09	(µg/m3)	2.4E-03	1/(µg/m3)	1E-11	1.7E-11	mg/m3	2.0E-05	mg/m3	9E-07
				7440-43-9_d	Cadmium	2.916	mg/kg	3.3E-09	(µg/m3)	1.8E-03	1/(µg/m3)	6E-12	9.3E-12	mg/m3	1.0E-05	mg/m3	9E-07
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	7.7E-10	(µg/m3)	8.4E-02	1/(µg/m3)	7E-11	2.2E-12	mg/m3	1.0E-04	mg/m3	2E-08
				7440-48-4	Cobalt	7.588	mg/kg	8.6E-09	(µg/m3)	9.0E-03	1/(µg/m3)	8E-11	2.4E-11	mg/m3	6.0E-06	mg/m3	4E-06
				7440-50-8	Copper	37.74	mg/kg	4.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-10	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	11001	mg/kg	1.3E-05	(µg/m3)	NA	1/(µg/m3)	NA	3.5E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	236.4	mg/kg	2.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	7.5E-10	mg/m3	5.0E-05	mg/m3	2E-05
				7439-97-6	Mercury	0.0351	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	4.4E-09	mg/m3	3.0E-04	mg/m3	1E-05
				7440-02-0	Nickel	232.6	mg/kg	2.6E-07	(µg/m3)	2.6E-04	1/(µg/m3)	7E-11	7.4E-10	mg/m3	9.0E-05	mg/m3	8E-06
				7782-49-2	Selenium	1.287	mg/kg	1.5E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.1E-12	mg/m3	2.0E-02	mg/m3	2E-10
				7440-28-0	Thallium	1.674	mg/kg	1.9E-09	(µg/m3)	NA	1/(µg/m3)	NA	5.3E-12	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	75.32	mg/kg	8.6E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.4E-10	mg/m3	1.0E-04	mg/m3	2E-06
				56-55-3	Benzo(A)Anthracene	649.5	mg/kg	2.3E-04	(µg/m3)	6.0E-05	1/(µg/m3)	1E-08	6.4E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	747.7	mg/kg	8.5E-07	(µg/m3)	6.0E-04	1/(µg/m3)	5E-10	2.4E-09	mg/m3	2.0E-06	mg/m3	1E-03
				205-99-2	Benzo(B)Fluoranthene	801.9	mg/kg	9.1E-07	(µg/m3)	6.0E-05	1/(µg/m3)	5E-11	2.6E-09	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	539.4	mg/kg	6.1E-07	(µg/m3)	6.0E-06	1/(µg/m3)	4E-12	1.7E-09	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.599	mg/kg	6.8E-10	(µg/m3)	2.4E-06	1/(µg/m3)	2E-15	1.9E-12	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	691.1	mg/kg	7.9E-07	(µg/m3)	6.0E-07	1/(µg/m3)	5E-13	2.2E-09	mg/m3	NA	mg/m4	NA
				53-70-3	Dibenz(A,H)Anthracene	179.9	mg/kg	2.0E-07	(µg/m3)	6.0E-04	1/(µg/m3)	1E-10	5.7E-10	mg/m3	NA	mg/m5	NA
				132-64-9	Dibenzofuran	5.069	mg/kg	5.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-07	mg/m3	NA	mg/m6	NA
				206-44-0	Fluoranthene	990	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.2E-09	mg/m3	NA	mg/m7	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	497.4	mg/kg	5.7E-07	(µg/m3)	6.0E-05	1/(µg/m3)	3E-11	1.6E-09	mg/m3	NA	mg/m8	NA
				91-20-3	Naphthalene	2.084	mg/kg	7.0E-05	(µg/m3)	3.4E-05	1/(µg/m3)	2E-09	2.0E-07	mg/m3	3.0E-03	mg/m9	7E-05
				129-00-0	Pyrene	875.1	mg/kg	5.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-06	mg/m3	NA	mg/m9	NA
			Total Inhalation									2E-08					6E-03
		Total Dust Inhalation										2E-08					6E-03
	Total Soil Direct Contact and Dust Inhalation											8E-05					6E-01
Medium Total												8E-05					6E-01
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	7.6	µg/l	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				16984-48-8	Fluoride	22400	µg/l	7.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-03	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-02
				7429-90-5	Aluminum	8630	µg/l	2.8E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	8E-04
				7440-36-0	Antimony	7.7	µg/l	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-03
				7440-38-2	Arsenic	2.4	µg/l	7.9E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	2.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-43-9	Cadmium	3	µg/l	9.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	5.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	1.6	µg/l	5.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-02-0	Nickel	55.9	µg/l	1.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.2E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-04
				7440-28-0	Thallium	0.27	µg/l	8.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-03
				7440-62-2	Vanadium	18	µg/l	5.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-04
				56-55-3	Benzo(A)Anthracene	3	µg/l	9.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	3.9	µg/l	1.3E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	3.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	10	µg/l	3.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	9.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	µg/l	1.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.9E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									3E-07					6E-02

Table 7-5
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe: Current/Future
Receptor Population: Stormwater Management Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Surface Water	Dermal	57-12-5	Cyanide	7.6	µg/l	1.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-05
				16984-48-8	Fluoride	22400	µg/l	3.7E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-03
				7429-90-5	Aluminum	8630	µg/l	1.4E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-05
				7440-36-0	Antimony	7.7	µg/l	1.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-05
				7440-38-2	Arsenic	2.4	µg/l	3.9E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	1.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				7440-43-9	Cadmium	3	µg/l	4.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	5.0E-04	(mg/kg-day)	3E-05
				7440-48-4	Cobalt	1.6	µg/l	1.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7440-02-0	Nickel	55.9	µg/l	1.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-06
				7440-28-0	Thallium	0.27	µg/l	4.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	1E-04
				7440-62-2	Vanadium	18	µg/l	3.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.3E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-05
				56-55-3	Benzo(A)Anthracene	3	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	3.9	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	10	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									6E-09					3E-03
		Total Surface Water										6E-09					3E-03
	Total Surface Water Direct Contact											3E-07					6E-02
Medium Total												3E-07					6E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	7.8	mg/kg	3.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				7429-90-5	Aluminum	112000	mg/kg	5.2E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	26.4	mg/kg	7.4E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.1E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-03
				7440-43-9_d	Cadmium	8	mg/kg	3.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	1.0E-03	(mg/kg-day)	1E-03
				7440-48-4	Cobalt	18.5	mg/kg	8.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-03
				7439-89-6	Iron	9040	mg/kg	4.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-03
				7440-02-0	Nickel	771	mg/kg	3.6E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-04	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-03
				7440-28-0	Thallium	1.2	mg/kg	5.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-02
				7440-62-2	Vanadium	233	mg/kg	1.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	6E-03
				56-55-3	Benzo(A)Anthracene	76	mg/kg	3.5E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	9.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	100	mg/kg	4.6E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-06	1.3E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-02
				205-99-2	Benzo(B)Fluoranthene	210	mg/kg	9.8E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-06	2.7E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	64	mg/kg	3.0E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	3E-08	8.3E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				218-01-9	Chrysene	150	mg/kg	7.0E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	7E-09	2.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	40	mg/kg	1.9E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-06	5.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	140	mg/kg	6.5E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-07	1.8E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									1E-05					1E-01
			Dermal	57-12-5	Cyanide	7.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	112000	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	26.4	mg/kg	1.6E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	4.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-43-9_d	Cadmium	8	mg/kg	1.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.4E-09	(mg/kg-day)	2.5E-05	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	18.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	9040	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7440-02-0	Nickel	771	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	1.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	233	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	76	mg/kg	1.9E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	5.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	100	mg/kg	2.6E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-06	7.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				205-99-2	Benzo(B)Fluoranthene	210	mg/kg	5.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-07	1.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	64	mg/kg	1.6E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	2E-08	4.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				218-01-9	Chrysene	150	mg/kg	3.8E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	4E-09	1.1E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	40	mg/kg	1.0E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	2.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	140	mg/kg	3.6E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	1.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									5E-06	1.0E-05				3E-02
		Total Sediment										1E-05					1E-01
	Total Sediment Direct Contact											1E-05					1E-01
Medium Total												1E-05					1E-01
												Total of Receptor Risks Across All Media					8E-01

Table 7-6
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
								Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	44.8	mg/kg	2.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-03
				16984-48-8	Fluoride	145.6	mg/kg	9.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.724	mg/kg	1.4E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	7E-09	3.2E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-05
				7429-90-5	Aluminum	46518	mg/kg	2.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-03
				7440-36-0	Antimony	0.825	mg/kg	5.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-05
				7440-38-2	Arsenic	12.06	mg/kg	4.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-08	3.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-41-7	Beryllium	4.105	mg/kg	2.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	2.0E-03	(mg/kg-day)	9E-05
				7440-43-9_d	Cadmium	3.358	mg/kg	2.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	1E-04
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	1.3E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	6E-09	3.0E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-05
				7440-48-4	Cobalt	8.925	mg/kg	5.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-50-8	Copper	40.45	mg/kg	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-05
				7439-89-6	Iron	9657	mg/kg	6.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	6E-04
				7439-96-5	Manganese	230.4	mg/kg	1.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-04
				7439-97-6	Mercury	0.0436	mg/kg	2.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	329.5	mg/kg	2.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-04
				7782-49-2	Selenium	1.517	mg/kg	9.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.6E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-05
				7440-28-0	Thallium	2.002	mg/kg	1.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	9E-03
				7440-62-2	Vanadium	101.6	mg/kg	6.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.4E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	9E-04
				56-55-3	Benzo(A)Anthracene	1013	mg/kg	1.9E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-06	4.4E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1145	mg/kg	2.1E-05	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-05	5.0E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-01
				205-99-2	Benzo(B)Fluoranthene	925.9	mg/kg	1.7E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-06	4.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	645.5	mg/kg	1.2E-05	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-07	2.8E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.17	mg/kg	1.1E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-11	7.4E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-07
				218-01-9	Chrysene	1055	mg/kg	2.0E-05	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-08	4.6E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	279.1	mg/kg	5.2E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-06	1.2E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	8.616	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	4E-04
				206-44-0	Fluoranthene	2024	mg/kg	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				193-39-5	Indeno(1,2,3-C,D)Pyrene	584.3	mg/kg	1.1E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-06	2.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	3.215	mg/kg	2.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-06
				129-00-0	Pyrene	1777	mg/kg	1.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	3E-03
			Total Ingestion									3E-05					2E-01
			Dermal	57-12-5	Cyanide	44.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	145.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.724	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	46518	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.825	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	12.06	mg/kg	9.5E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	6.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-41-7	Beryllium	4.105	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.4E-05	(mg/kg-day)	NA
				7440-43-9_d	Cadmium	3.358	mg/kg	8.8E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-10	(mg/kg-day)	2.5E-05	(mg/kg-day)	2E-05
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7440-48-4	Cobalt	8.925	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	40.45	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	9657	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	230.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0436	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	329.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	1.517	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	2.002	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	101.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	1013	mg/kg	1.0E-05	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-06	2.4E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1145	mg/kg	1.2E-05	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-05	2.7E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-02
				205-99-2	Benzo(B)Fluoranthene	925.9	mg/kg	9.5E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-07	2.2E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	645.5	mg/kg	6.6E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	7E-08	1.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.17	mg/kg	4.5E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	6E-12	3.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
				218-01-9	Chrysene	1055	mg/kg	1.1E-05	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-08	2.5E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	279.1	mg/kg	2.9E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-06	6.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	8.616	mg/kg	6.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	5E-05

Table 7-6
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Dermal	206-44-0	Fluoranthene	2024	mg/kg	6.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				193-39-5	Indeno(1,2,3-C,D)Pyrene	584.3	mg/kg	6.0E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-07	1.4E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	3.215	mg/kg	1.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-06
				129-00-0	Pyrene	1777	mg/kg	6.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-05	(mg/kg-day)	3.0E-02	(mg/kg-day)	1E-03
			Total Dermal									2E-05					9E-02
		Total Soil Direct Contact										5E-05					3E-01
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	44.8	mg/kg	9.6E-05	(µg/m3)	NA	1/(µg/m3)	NA	6.7E-07	mg/m3	8.0E-04	mg/m3	8E-04
				16984-48-8	Fluoride	115.1	mg/kg	9.7E-09	(µg/m3)	NA	1/(µg/m3)	NA	6.8E-11	mg/m3	1.3E-02	mg/m3	5E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.647	mg/kg	1.6E-10	(µg/m3)	8.4E-02	1/(µg/m3)	1E-11	3.8E-13	mg/m3	1.0E-04	mg/m3	4E-09
				7429-90-5	Aluminum	55237	mg/kg	4.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.2E-08	mg/m3	5.0E-03	mg/m3	6E-06
				7440-36-0	Antimony	0.646	mg/kg	5.4E-11	(µg/m3)	NA	1/(µg/m3)	NA	3.8E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	12.78	mg/kg	1.1E-09	(µg/m3)	4.3E-03	1/(µg/m3)	5E-12	7.5E-12	mg/m3	1.5E-05	mg/m3	5E-07
				7440-41-7	Beryllium	5.388	mg/kg	4.5E-10	(µg/m3)	2.4E-03	1/(µg/m3)	1E-12	3.2E-12	mg/m3	2.0E-05	mg/m3	2E-07
				7440-43-9_d	Cadmium	2.916	mg/kg	2.4E-10	(µg/m3)	1.8E-03	1/(µg/m3)	4E-13	1.7E-12	mg/m3	1.0E-05	mg/m3	2E-07
				18540-29-9	Chromium, Hexavalent	0.68	mg/kg	1.7E-10	(µg/m3)	8.4E-02	1/(µg/m3)	1E-11	4.0E-13	mg/m3	1.0E-04	mg/m3	4E-09
				7440-48-4	Cobalt	7.588	mg/kg	6.4E-10	(µg/m3)	9.0E-03	1/(µg/m3)	6E-12	4.5E-12	mg/m3	6.0E-06	mg/m3	7E-07
				7440-50-8	Copper	37.74	mg/kg	3.2E-09	(µg/m3)	NA	1/(µg/m3)	NA	2.2E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	11001	mg/kg	9.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	236.4	mg/kg	2.0E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-10	mg/m3	5.0E-05	mg/m3	3E-06
				7439-97-6	Mercury	0.0351	mg/kg	1.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	8.1E-10	mg/m3	3.0E-04	mg/m3	3E-06
				7440-02-0	Nickel	232.6	mg/kg	2.0E-08	(µg/m3)	2.6E-04	1/(µg/m3)	5E-12	1.4E-10	mg/m3	9.0E-05	mg/m3	2E-06
				7782-49-2	Selenium	1.287	mg/kg	1.1E-10	(µg/m3)	NA	1/(µg/m3)	NA	7.6E-13	mg/m3	2.0E-02	mg/m3	4E-11
				7440-28-0	Thallium	1.674	mg/kg	1.4E-10	(µg/m3)	NA	1/(µg/m3)	NA	9.8E-13	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	75.32	mg/kg	6.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.4E-11	mg/m3	1.0E-04	mg/m3	4E-07
				56-55-3	Benzo(A)Anthracene	649.5	mg/kg	5.1E-05	(µg/m3)	6.0E-05	1/(µg/m3)	3E-09	1.2E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	747.7	mg/kg	1.9E-07	(µg/m3)	6.0E-04	1/(µg/m3)	1E-10	4.4E-10	mg/m3	2.0E-06	mg/m3	2E-04
				205-99-2	Benzo(B)Fluoranthene	801.9	mg/kg	2.0E-07	(µg/m3)	6.0E-05	1/(µg/m3)	1E-11	4.7E-10	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	539.4	mg/kg	1.4E-07	(µg/m3)	6.0E-06	1/(µg/m3)	8E-13	3.2E-10	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.599	mg/kg	5.0E-11	(µg/m3)	2.4E-06	1/(µg/m3)	1E-16	3.5E-13	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	691.1	mg/kg	1.7E-07	(µg/m3)	6.0E-07	1/(µg/m3)	1E-13	4.1E-10	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	179.9	mg/kg	4.5E-08	(µg/m3)	6.0E-04	1/(µg/m3)	3E-11	1.1E-10	mg/m3	NA	mg/m4	NA
				132-64-9	Dibenzofuran	5.069	mg/kg	3.7E-06	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-08	mg/m3	NA	mg/m5	NA
				206-44-0	Fluoranthene	990	mg/kg	8.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.8E-10	mg/m3	NA	mg/m6	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	497.4	mg/kg	1.3E-07	(µg/m3)	6.0E-05	1/(µg/m3)	8E-12	2.9E-10	mg/m3	NA	mg/m7	NA
				91-20-3	Naphthalene	2.084	mg/kg	5.1E-06	(µg/m3)	3.4E-05	1/(µg/m3)	2E-10	3.6E-08	mg/m3	3.0E-03	mg/m8	1E-05
				129-00-0	Pyrene	875.1	mg/kg	4.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.9E-07	mg/m3	NA	mg/m9	NA
			Total Inhalation									3E-09					1E-03
		Total Dust Inhalation										3E-09					1E-03
	Total Soil Direct Contact and Dust Inhalation											5E-05					3E-01
Medium Total												5E-05					3E-01
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	7.6	µg/l	3.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-04
				16984-48-8	Fluoride	22400	µg/l	9.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-02
				7429-90-5	Aluminum	8630	µg/l	3.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-36-0	Antimony	7.7	µg/l	3.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	6E-04
				7440-38-2	Arsenic	2.4	µg/l	1.1E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	7.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-43-9	Cadmium	3	µg/l	1.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.3E-08	(mg/kg-day)	5.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	1.6	µg/l	7.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-02-0	Nickel	55.9	µg/l	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-05
				7440-28-0	Thallium	0.27	µg/l	1.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-04
				7440-62-2	Vanadium	18	µg/l	8.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	3	µg/l	4.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-09	9.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	3.9	µg/l	5.2E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				205-99-2	Benzo(B)Fluoranthene	10	µg/l	1.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	3.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	µg/l	4.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-09	9.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									9E-08					2E-02

Table 7-6
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Surface Water	Surface Water	Surface Water	Dermal	57-12-5	Cyanide	7.6	µg/l	2.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				16984-48-8	Fluoride	22400	µg/l	8.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7429-90-5	Aluminum	8630	µg/l	3.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-05
				7440-36-0	Antimony	7.7	µg/l	2.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	5E-05
				7440-38-2	Arsenic	2.4	µg/l	9.0E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-09	6.3E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				7440-43-9	Cadmium	3	µg/l	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.9E-09	(mg/kg-day)	5.0E-04	(mg/kg-day)	2E-05
				7440-48-4	Cobalt	1.6	µg/l	2.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-06
				7440-02-0	Nickel	55.9	µg/l	4.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
				7440-28-0	Thallium	0.27	µg/l	1.0E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-10	(mg/kg-day)	1.0E-05	(mg/kg-day)	7E-05
				7440-62-2	Vanadium	18	µg/l	6.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	9E-06
				56-55-3	Benzo(A)Anthracene	3	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	3.9	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	10	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									1E-09					2E-03
		Total Surface Water										1E-09					2E-03
	Total Surface Water Direct Contact											9E-08					2E-02
Medium Total												9E-08					2E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	7.8	mg/kg	4.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				7429-90-5	Aluminum	112000	mg/kg	7.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-03
				7440-38-2	Arsenic	26.4	mg/kg	9.9E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	6.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-43-9_d	Cadmium	8	mg/kg	5.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	18.5	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7439-89-6	Iron	9040	mg/kg	5.6E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	6E-04
				7440-02-0	Nickel	771	mg/kg	4.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-03
				7440-28-0	Thallium	1.2	mg/kg	7.5E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.2E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	5E-03
				7440-62-2	Vanadium	233	mg/kg	1.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	76	mg/kg	1.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	3.3E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	100	mg/kg	1.9E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-06	4.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				205-99-2	Benzo(B)Fluoranthene	210	mg/kg	3.9E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	9.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	64	mg/kg	1.2E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-08	2.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				218-01-9	Chrysene	150	mg/kg	2.8E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-09	6.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	40	mg/kg	7.5E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-07	1.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	140	mg/kg	2.6E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-07	6.1E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									4E-06					3E-02
			Dermal	57-12-5	Cyanide	7.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	112000	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	26.4	mg/kg	2.1E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-43-9_d	Cadmium	8	mg/kg	2.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-09	(mg/kg-day)	2.5E-05	(mg/kg-day)	6E-05
				7440-48-4	Cobalt	18.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	9040	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7440-02-0	Nickel	771	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	1.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	233	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	76	mg/kg	7.8E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-08	1.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	100	mg/kg	1.0E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	2.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-03
				205-99-2	Benzo(B)Fluoranthene	210	mg/kg	2.2E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	5.0E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	64	mg/kg	6.6E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	7E-09	1.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				218-01-9	Chrysene	150	mg/kg	1.5E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-09	3.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	40	mg/kg	4.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-07	9.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	140	mg/kg	1.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	3.3E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-06	3.3E-06				9E-03
		Total Sediment										5E-06					4E-02
	Total Sediment Direct Contact											5E-06					4E-02
Medium Total												5E-06					4E-02
												Total of Receptor Risks Across All Media	5E-05		Total of Receptor Hazards Across All Media		4E-01

Table 7-7
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.163	mg/kg	3.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	62.24	mg/kg	1.4E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	7.7E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-08	2.2E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	7E-05
				7429-90-5	Aluminum	14690	mg/kg	3.4E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.4E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-03
				7440-36-0	Antimony	0.293	mg/kg	6.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	6.837	mg/kg	9.4E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.6E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-03
				7440-48-4	Cobalt	5.865	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	428.6	mg/kg	9.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-03
				7439-89-6	Iron	15623	mg/kg	3.6E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	479.3	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-02
				7439-97-6	Mercury	0.0231	mg/kg	5.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	52.8	mg/kg	1.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-03
				7782-49-2	Selenium	0.522	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	7E-05
				7440-28-0	Thallium	0.188	mg/kg	4.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	1E-02
				7440-62-2	Vanadium	22.94	mg/kg	5.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-03
				11097-69-1	PCB-1254 (Aroclor 1254)	1.2	mg/kg	2.7E-07	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	5E-07	7.7E-07	(mg/kg-day)	2.0E-05	(mg/kg-day)	4E-02
				56-55-3	Benzo(A)Anthracene	9.039	mg/kg	2.1E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	5.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	8.552	mg/kg	2.0E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-06	5.5E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				205-99-2	Benzo(B)Fluoranthene	11.36	mg/kg	2.6E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-07	7.3E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	4.433	mg/kg	1.0E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-08	2.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.035	mg/kg	8.0E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-10	2.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
				218-01-9	Chrysene	11.6	mg/kg	2.7E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-09	7.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	2.023	mg/kg	4.6E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-07	1.3E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	1.126	mg/kg	2.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	7E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	6.852	mg/kg	1.6E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	4.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.686	mg/kg	1.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.4E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
			Total Ingestion									5E-06					1E-01
			Dermal	57-12-5	Cyanide	0.163	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	62.24	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	14690	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.293	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.837	mg/kg	2.0E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	5.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.865	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	428.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15623	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	479.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0231	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	52.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.522	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	22.94	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				11097-69-1	PCB-1254 (Aroclor 1254)	1.2	mg/kg	1.6E-07	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	3E-07	4.6E-07	(mg/kg-day)	2.0E-05	(mg/kg-day)	2E-02
				56-55-3	Benzo(A)Anthracene	9.039	mg/kg	1.1E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	3.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	8.552	mg/kg	1.1E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	3.0E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				205-99-2	Benzo(B)Fluoranthene	11.36	mg/kg	1.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	4.0E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	4.433	mg/kg	5.6E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	6E-09	1.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.035	mg/kg	3.4E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	5E-11	9.5E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-07

Table 7-7
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Dermal	218-01-9	Chrysene	11.6	mg/kg	1.5E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-09	4.1E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	2.023	mg/kg	2.5E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	7.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	1.126	mg/kg	3.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	9E-05
				193-39-5	Indeno(1,2,3-C,D)Pyrene	6.852	mg/kg	8.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-08	2.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.686	mg/kg	8.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
			Total Dermal									2E-06					3E-02
		Total Soil Direct Contact										7E-06					2E-01
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.163	mg/kg	1.9E-04	(µg/m3)	NA	1/(µg/m3)	NA	5.2E-07	mg/m3	8.0E-04	mg/m3	7E-04
				16984-48-8	Fluoride	62.24	mg/kg	2.8E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.8E-09	mg/m3	1.3E-02	mg/m3	6E-07
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	1.5E-08	(µg/m3)	8.4E-02	1/(µg/m3)	1E-09	4.2E-11	mg/m3	1.0E-04	mg/m3	4E-07
				7429-90-5	Aluminum	14690	mg/kg	6.6E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-06	mg/m3	5.0E-03	mg/m3	4E-04
				7440-36-0	Antimony	0.293	mg/kg	1.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.7E-11	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	6.837	mg/kg	3.1E-07	(µg/m3)	4.3E-03	1/(µg/m3)	1E-09	8.6E-10	mg/m3	1.5E-05	mg/m3	6E-05
				7440-48-4	Cobalt	5.865	mg/kg	2.6E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	7.4E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	428.6	mg/kg	1.9E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.4E-08	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15623	mg/kg	7.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.0E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	479.3	mg/kg	2.1E-05	(µg/m3)	NA	1/(µg/m3)	NA	6.0E-08	mg/m3	5.0E-05	mg/m3	1E-03
				7439-97-6	Mercury	0.0231	mg/kg	4.1E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	52.8	mg/kg	2.4E-06	(µg/m3)	2.6E-04	1/(µg/m3)	6E-10	6.6E-09	mg/m3	9.0E-05	mg/m3	7E-05
				7782-49-2	Selenium	0.522	mg/kg	2.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	6.6E-11	mg/m3	2.0E-02	mg/m3	3E-09
				7440-28-0	Thallium	0.188	mg/kg	8.4E-09	(µg/m3)	NA	1/(µg/m3)	NA	2.4E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	22.94	mg/kg	1.0E-06	(µg/m3)	NA	1/(µg/m3)	NA	2.9E-09	mg/m3	1.0E-04	mg/m3	3E-05
				11097-69-1	PCB-1254 (Aroclor 1254)	1.2	mg/kg	8.7E-05	(µg/m3)	5.7E-04	1/(µg/m3)	5E-08	2.4E-07	mg/m3	NA	mg/m3	NA
				56-55-3	Benzo(A)Anthracene	9.039	mg/kg	1.3E-04	(µg/m3)	6.0E-05	1/(µg/m3)	8E-09	3.5E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	8.552	mg/kg	3.8E-07	(µg/m3)	6.0E-04	1/(µg/m3)	2E-10	1.1E-09	mg/m3	2.0E-06	mg/m3	5E-04
				205-99-2	Benzo(B)Fluoranthene	11.36	mg/kg	5.1E-07	(µg/m3)	6.0E-05	1/(µg/m3)	3E-11	1.4E-09	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	4.433	mg/kg	2.0E-07	(µg/m3)	6.0E-06	1/(µg/m3)	1E-12	5.6E-10	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.035	mg/kg	1.6E-09	(µg/m3)	2.4E-06	1/(µg/m3)	4E-15	4.4E-12	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	11.6	mg/kg	5.2E-07	(µg/m3)	6.0E-07	1/(µg/m3)	3E-13	1.5E-09	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	2.023	mg/kg	9.1E-08	(µg/m3)	6.0E-04	1/(µg/m3)	5E-11	2.5E-10	mg/m3	NA	mg/m4	NA
				132-64-9	Dibenzofuran	1.126	mg/kg	4.4E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-06	mg/m3	NA	mg/m5	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	6.852	mg/kg	3.1E-07	(µg/m3)	6.0E-05	1/(µg/m3)	2E-11	8.6E-10	mg/m3	NA	mg/m6	NA
				91-20-3	Naphthalene	0.686	mg/kg	9.0E-04	(µg/m3)	3.4E-05	1/(µg/m3)	3E-08	2.5E-06	mg/m3	3.0E-03	mg/m7	8E-04
			Total Inhalation									9E-08					4E-03
		Total Dust Inhalation										9E-08					4E-03
	Total Soil Direct Contact and Dust Inhalation											7E-06					2E-01
Medium Total												7E-06					2E-01
Surface Water	Surface Water	Surface Water	Ingestion	16984-48-8	Fluoride	1129	µg/l	1.8E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-02
				7440-36-0	Antimony	2.2	µg/l	3.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-03
				7440-38-2	Arsenic	0.8	µg/l	1.3E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	3.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
			Total Ingestion									2E-07					2E-02
			Dermal	16984-48-8	Fluoride	1129	µg/l	7.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-03
				7440-36-0	Antimony	2.2	µg/l	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	0.8	µg/l	5.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
			Total Dermal									8E-08					7E-03
		Total Surface Water										8E-08					7E-03
	Total Surface Water Direct Contact											3E-07					2E-02
Medium Total												3E-07					2E-02

Table 7-7
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	22700	mg/kg	5.2E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	5.8	mg/kg	8.0E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-03
				7440-48-4	Cobalt	8.6	mg/kg	2.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7439-89-6	Iron	20200	mg/kg	4.6E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-02
				7439-96-5	Manganese	1280	mg/kg	2.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-02
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	2.5E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	7.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	4.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	1.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	6.4E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-08	1.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	3.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	8.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-06					1E-01
			Dermal	7429-90-5	Aluminum	22700	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.8	mg/kg	1.7E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	4.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	8.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	20200	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1280	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	1.4E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	3.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	2.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	6.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	3.5E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-08	9.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									5E-07					3E-03
		Total Sediment										2E-06					1E-01
	Total Sediment Direct Contact											2E-06					1E-01
Medium Total												2E-06					1E-01
												Total of Receptor Risks Across All Media 1E-05					Total of Receptor Hazards Across All Media 3E-01

Table 7-8
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.433	mg/kg	2.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				16984-48-8	Fluoride	82.9	mg/kg	5.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	7.2E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-09	1.7E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	6E-06
				7429-90-5	Aluminum	15808	mg/kg	9.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-04
				7440-36-0	Antimony	0.265	mg/kg	1.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-05
				7440-38-2	Arsenic	6.583	mg/kg	2.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	1.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.867	mg/kg	3.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	696.5	mg/kg	4.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	8E-04
				7439-89-6	Iron	16479	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	547.2	mg/kg	3.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.0217	mg/kg	1.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	23.98	mg/kg	1.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-05
				7782-49-2	Selenium	0.388	mg/kg	2.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-06
				7440-28-0	Thallium	0.111	mg/kg	6.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	5E-04
				7440-62-2	Vanadium	14.67	mg/kg	9.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.4E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				11097-69-1	PCB-1254 (Aroclor 1254)	0.341	mg/kg	2.1E-09	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	4E-09	1.5E-08	(mg/kg-day)	2.0E-05	(mg/kg-day)	7E-04
				56-55-3	Benzo(A)Anthracene	10.32	mg/kg	1.9E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	10.57	mg/kg	2.0E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	12.99	mg/kg	2.4E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	5.7E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.383	mg/kg	1.0E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-09	2.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.246	mg/kg	1.5E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-11	1.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-07
				218-01-9	Chrysene	11.7	mg/kg	2.2E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-10	5.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	2.267	mg/kg	4.2E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-08	9.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.977	mg/kg	6.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	4E-05
				193-39-5	Indeno(1,2,3-C,D)Pyrene	8.41	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	3.7E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.0686	mg/kg	4.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
			Total Ingestion									3E-07					8E-03
			Dermal	57-12-5	Cyanide	0.433	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	82.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	15808	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.265	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.583	mg/kg	5.2E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-09	3.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.867	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	696.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	16479	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	547.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0217	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	23.98	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.388	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.111	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	14.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				11097-69-1	PCB-1254 (Aroclor 1254)	0.341	mg/kg	1.3E-09	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	3E-09	8.8E-09	(mg/kg-day)	2.0E-05	(mg/kg-day)	4E-04
				56-55-3	Benzo(A)Anthracene	10.32	mg/kg	1.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	10.57	mg/kg	1.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	2.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				205-99-2	Benzo(B)Fluoranthene	12.99	mg/kg	1.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	3.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	5.383	mg/kg	5.5E-08	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	6E-10	1.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.246	mg/kg	6.5E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	9E-12	4.5E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07

Table 7-8
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Dermal	218-01-9	Chrysene	11.7	mg/kg	1.2E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-10	2.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	2.267	mg/kg	2.3E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	5.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.977	mg/kg	7.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-09	(mg/kg-day)	1.0E-03	(mg/kg-day)	5E-06
				193-39-5	Indeno(1,2,3-C,D)Pyrene	8.41	mg/kg	8.6E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-09	2.0E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.0686	mg/kg	2.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-08
			Total Dermal									2E-07					1E-03
		Total Soil Direct Contact										5E-07					9E-03
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.433	mg/kg	9.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-09	mg/m3	8.0E-04	mg/m3	8E-06
				16984-48-8	Fluoride	82.9	mg/kg	7.0E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.9E-11	mg/m3	1.3E-02	mg/m3	4E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.385	mg/kg	9.7E-11	(µg/m3)	8.4E-02	1/(µg/m3)	8E-12	2.3E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	15808	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.3E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-36-0	Antimony	0.265	mg/kg	2.2E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	6.583	mg/kg	5.5E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	3.9E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	5.867	mg/kg	4.9E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.4E-12	mg/m3	6.0E-06	mg/m3	6E-07
				7440-50-8	Copper	696.5	mg/kg	5.8E-08	(µg/m3)	NA	1/(µg/m3)	NA	4.1E-10	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	16479	mg/kg	1.4E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.7E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	547.2	mg/kg	4.6E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.2E-10	mg/m3	5.0E-05	mg/m3	6E-06
				7439-97-6	Mercury	0.0217	mg/kg	7.1E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.0E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	23.98	mg/kg	2.0E-09	(µg/m3)	2.6E-04	1/(µg/m3)	5E-13	1.4E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.388	mg/kg	3.3E-11	(µg/m3)	NA	1/(µg/m3)	NA	2.3E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-28-0	Thallium	0.111	mg/kg	9.3E-12	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-14	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	14.67	mg/kg	1.2E-09	(µg/m3)	NA	1/(µg/m3)	NA	8.6E-12	mg/m3	1.0E-04	mg/m3	9E-08
				11097-69-1	PCB-1254 (Aroclor 1254)	0.341	mg/kg	4.6E-08	(µg/m3)	5.7E-04	1/(µg/m3)	3E-11	3.2E-10	mg/m3	NA	mg/m3	NA
				56-55-3	Benzo(A)Anthracene	10.32	mg/kg	8.0E-07	(µg/m3)	6.0E-05	1/(µg/m3)	5E-11	1.9E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	10.57	mg/kg	2.7E-09	(µg/m3)	6.0E-04	1/(µg/m3)	2E-12	6.2E-12	mg/m3	2.0E-06	mg/m3	3E-06
				205-99-2	Benzo(B)Fluoranthene	12.99	mg/kg	3.3E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	7.6E-12	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	5.383	mg/kg	1.4E-09	(µg/m3)	6.0E-06	1/(µg/m3)	8E-15	3.2E-12	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.246	mg/kg	2.1E-11	(µg/m3)	2.4E-06	1/(µg/m3)	5E-17	1.4E-13	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	11.7	mg/kg	2.9E-09	(µg/m3)	6.0E-07	1/(µg/m3)	2E-15	6.9E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	2.267	mg/kg	5.7E-10	(µg/m3)	6.0E-04	1/(µg/m3)	3E-13	1.3E-12	mg/m3	NA	mg/m4	NA
				132-64-9	Dibenzofuran	0.977	mg/kg	7.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	5.0E-09	mg/m3	NA	mg/m5	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	8.41	mg/kg	2.1E-09	(µg/m3)	6.0E-05	1/(µg/m3)	1E-13	4.9E-12	mg/m3	NA	mg/m6	NA
				91-20-3	Naphthalene	0.0686	mg/kg	1.7E-07	(µg/m3)	3.4E-05	1/(µg/m3)	6E-12	1.2E-09	mg/m3	3.0E-03	mg/m7	4E-07
			Total Inhalation									1E-10					2E-05
		Total Dust Inhalation										1E-10					2E-05
	Total Soil Direct Contact and Dust Inhalation											5E-07					9E-03
Medium Total												5E-07					9E-03
Surface Water	Surface Water	Surface Water	Ingestion	16984-48-8	Fluoride	1129	µg/l	5.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-04
				7440-36-0	Antimony	2.2	µg/l	9.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	0.8	µg/l	3.5E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-09	2.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
			Total Ingestion									5E-09					1E-03
			Dermal	16984-48-8	Fluoride	1129	µg/l	4.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-05
				7440-36-0	Antimony	2.2	µg/l	8.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-05
				7440-38-2	Arsenic	0.8	µg/l	3.0E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-10	2.1E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
			Total Dermal									5E-10					1E-04
		Total Surface Water										5E-10					1E-04
	Total Surface Water Direct Contact											6E-09					1E-03
Medium Total												6E-09					1E-03

Table 7-8
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	22700	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	5.8	mg/kg	2.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	8.6	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7439-89-6	Iron	20200	mg/kg	1.3E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	1280	mg/kg	8.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-03
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	2.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	4.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	3.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	7.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	5.2E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	2.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	5.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									6E-08					6E-03
			Dermal	7429-90-5	Aluminum	22700	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.8	mg/kg	4.6E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-09	3.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	8.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	20200	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1280	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	1.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	2.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	2.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	6.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	1.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-08	0.0E+00				2E-04
		Total Sediment										9E-08					7E-03
	Total Sediment Direct Contact											9E-08					7E-03
Medium Total												9E-08					7E-03
											Total of Receptor Risks Across All Media	6E-07				Total of Receptor Hazards Across All Media	2E-02

											Total of Receptor Risks Across All Media	6E-07				Total of Receptor Hazards Across All Media	2E-02

Table 7-9
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Subsurface Soil 0-12 ft-bgs	Ingestion	7429-90-5	Aluminum	13314	mg/kg	3.0E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-03
				7440-36-0	Antimony	0.27	mg/kg	6.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-04
				7440-38-2	Arsenic	6.173	mg/kg	8.5E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-03
				7440-48-4	Cobalt	5.717	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	271.6	mg/kg	6.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-03
				7439-89-6	Iron	14988	mg/kg	3.4E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.6E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	466.8	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-02
				7439-97-6	Mercury	0.0227	mg/kg	5.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	37.53	mg/kg	8.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-03
				7782-49-2	Selenium	0.137	mg/kg	3.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-05
				7440-28-0	Thallium	0.154	mg/kg	3.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	1E-02
				7440-62-2	Vanadium	12.86	mg/kg	2.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				11097-69-1	PCB-1254 (Aroclor 1254)	0.0667	mg/kg	1.5E-08	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	3E-08	4.3E-08	(mg/kg-day)	2.0E-05	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	5.677	mg/kg	1.3E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	3.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	5.386	mg/kg	1.2E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	3.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				205-99-2	Benzo(B)Fluoranthene	7.191	mg/kg	1.6E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	4.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	2.807	mg/kg	6.4E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	6E-09	1.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	2.6E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-10	7.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-06
				218-01-9	Chrysene	7.317	mg/kg	1.7E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-09	4.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.281	mg/kg	2.9E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	8.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.699	mg/kg	1.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.5E-07	(mg/kg-day)	1.0E-03	(mg/kg-day)	4E-04
				193-39-5	Indeno(1,2,3-C,D)Pyrene	4.35	mg/kg	9.9E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	2.8E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.428	mg/kg	9.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
			Total Ingestion									3E-06					9E-02
			Dermal	7429-90-5	Aluminum	13314	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.27	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.173	mg/kg	1.8E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	5.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.717	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	271.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	14988	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	466.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0227	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	37.53	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.154	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.86	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				11097-69-1	PCB-1254 (Aroclor 1254)	0.0667	mg/kg	9.0E-09	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	2E-08	2.5E-08	(mg/kg-day)	2.0E-05	(mg/kg-day)	1E-03
				56-55-3	Benzo(A)Anthracene	5.677	mg/kg	7.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-08	2.0E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	5.386	mg/kg	6.8E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-07	1.9E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-03
				205-99-2	Benzo(B)Fluoranthene	7.191	mg/kg	9.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-08	2.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	2.807	mg/kg	3.5E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	4E-09	9.9E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	1.1E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-10	3.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
				218-01-9	Chrysene	7.317	mg/kg	9.2E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	9E-10	2.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	1.281	mg/kg	1.6E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.699	mg/kg	2.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-08	(mg/kg-day)	1.0E-03	(mg/kg-day)	6E-05
				193-39-5	Indeno(1,2,3-C,D)Pyrene	4.35	mg/kg	5.5E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-08	1.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.428	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-06
			Total Dermal									1E-06					9E-03
		Total Soil Direct Contact										5E-06					1E-01

Table 7-9
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
	Air	Airborne vapors /dust	Inhalation	7429-90-5	Aluminum	13314	mg/kg	6.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-06	mg/m3	5.0E-03	mg/m3	3E-04
				7440-36-0	Antimony	0.27	mg/kg	1.2E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.4E-11	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	6.173	mg/kg	2.8E-07	(µg/m3)	4.3E-03	1/(µg/m3)	1E-09	7.8E-10	mg/m3	1.5E-05	mg/m3	5E-05
				7440-48-4	Cobalt	5.717	mg/kg	2.6E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	7.2E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	271.6	mg/kg	1.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	3.4E-08	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	14988	mg/kg	6.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	466.8	mg/kg	2.1E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.9E-08	mg/m3	5.0E-05	mg/m3	1E-03
				7439-97-6	Mercury	0.0227	mg/kg	4.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	37.53	mg/kg	1.7E-06	(µg/m3)	2.6E-04	1/(µg/m3)	4E-10	4.7E-09	mg/m3	9.0E-05	mg/m3	5E-05
				7782-49-2	Selenium	0.137	mg/kg	6.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-11	mg/m3	2.0E-02	mg/m3	9E-10
				7440-28-0	Thallium	0.154	mg/kg	6.9E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	12.86	mg/kg	5.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-09	mg/m3	1.0E-04	mg/m3	2E-05
				11097-69-1	PCB-1254 (Aroclor 1254)	0.0667	mg/kg	4.8E-06	(µg/m3)	5.7E-04	1/(µg/m3)	3E-09	1.4E-08	mg/m3	NA	mg/m3	NA
				56-55-3	Benzo(A)Anthracene	5.677	mg/kg	7.9E-05	(µg/m3)	6.0E-05	1/(µg/m3)	5E-09	2.2E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	5.386	mg/kg	2.4E-07	(µg/m3)	6.0E-04	1/(µg/m3)	1E-10	6.8E-10	mg/m3	2.0E-06	mg/m3	3E-04
				205-99-2	Benzo(B)Fluoranthene	7.191	mg/kg	3.2E-07	(µg/m3)	6.0E-05	1/(µg/m3)	2E-11	9.0E-10	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	2.807	mg/kg	1.3E-07	(µg/m3)	6.0E-06	1/(µg/m3)	8E-13	3.5E-10	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.114	mg/kg	5.1E-09	(µg/m3)	2.4E-06	1/(µg/m3)	1E-14	1.4E-11	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	7.317	mg/kg	3.3E-07	(µg/m3)	6.0E-07	1/(µg/m3)	2E-13	9.2E-10	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	1.281	mg/kg	5.7E-08	(µg/m3)	6.0E-04	1/(µg/m3)	3E-11	1.6E-10	mg/m3	NA	mg/m3	NA
				132-64-9	Dibenzofuran	0.699	mg/kg	2.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	7.7E-07	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	4.35	mg/kg	2.0E-07	(µg/m3)	6.0E-05	1/(µg/m3)	1E-11	5.5E-10	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.428	mg/kg	5.6E-04	(µg/m3)	3.4E-05	1/(µg/m3)	2E-08	1.6E-06	mg/m3	3.0E-03	mg/m4	5E-04
			Total Inhalation									3E-08					3E-03
		Total Dust Inhalation										3E-08					3E-03
	Total Soil Direct Contact and Dust Inhalation											5E-06					1E-01
Medium Total												5E-06					1E-01
Surface Water	Surface Water	Surface Water	Ingestion	16984-48-8	Fluoride	1129	µg/l	1.8E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-02
				7440-36-0	Antimony	2.2	µg/l	3.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-03
				7440-38-2	Arsenic	0.8	µg/l	1.3E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	3.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
			Total Ingestion									2E-07					2E-02
			Dermal	16984-48-8	Fluoride	1129	µg/l	7.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-03
				7440-36-0	Antimony	2.2	µg/l	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	0.8	µg/l	5.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
			Total Dermal									8E-08					7E-03
		Total Surface Water										8E-08					7E-03
	Total Surface Water Direct Contact											3E-07					2E-02
Medium Total												3E-07					2E-02
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	22700	mg/kg	5.2E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	5.8	mg/kg	8.0E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-03
				7440-48-4	Cobalt	8.6	mg/kg	2.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7439-89-6	Iron	20200	mg/kg	4.6E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-02
				7439-96-5	Manganese	1280	mg/kg	2.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-02
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	2.5E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-07	7.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	4.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	1.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	6.4E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-08	1.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	3.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	8.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-06					1E-01

Table 7-9
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Central Landfills Area - Landfill Management Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Sediment	Sediment	Sediment	Dermal	7429-90-5	Aluminum	22700	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.8	mg/kg	1.7E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	4.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	8.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	20200	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1280	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1.1	mg/kg	1.4E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	3.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	1.8	mg/kg	2.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	6.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.28	mg/kg	3.5E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-08	9.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.3	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									5E-07	0.0E+00				3E-03
		Total Sediment										2E-06					1E-01
	Total Sediment Direct Contact											2E-06					1E-01
Medium Total												2E-06					1E-01
											Total of Receptor Risks Across All Media	7E-06				Total of Receptor Hazards Across All Media	2E-01

Table 7-10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Industrial Landfills Area - Landfill Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.122	mg/kg	2.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				16984-48-8	Fluoride	232.9	mg/kg	5.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-03
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.327	mg/kg	7.5E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-08	2.1E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	7E-05
				7429-90-5	Aluminum	36052	mg/kg	8.2E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-02
				7440-36-0	Antimony	0.582	mg/kg	1.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-04
				7440-38-2	Arsenic	7.812	mg/kg	1.1E-06	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-06	3.0E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-48-4	Cobalt	6.583	mg/kg	1.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	150.4	mg/kg	3.4E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.6E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7439-89-6	Iron	16449	mg/kg	3.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-02
				7439-96-5	Manganese	839.6	mg/kg	1.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-02
				7439-97-6	Mercury	0.0237	mg/kg	5.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	119	mg/kg	2.7E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-03
				7782-49-2	Selenium	0.29	mg/kg	6.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-05
				7440-28-0	Thallium	0.125	mg/kg	2.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-03
				7440-62-2	Vanadium	45.36	mg/kg	1.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	6E-03
				56-55-3	Benzo(A)Anthracene	16.2	mg/kg	3.7E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-07	1.0E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	19.39	mg/kg	4.4E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-06	1.2E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-02
				205-99-2	Benzo(B)Fluoranthene	21.74	mg/kg	5.0E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-07	1.4E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	8.821	mg/kg	2.0E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	2E-08	5.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0516	mg/kg	1.2E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-10	3.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
				218-01-9	Chrysene	18.83	mg/kg	4.3E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	4E-09	1.2E-05	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	4.076	mg/kg	9.3E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-07	2.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	14.78	mg/kg	3.4E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-07	9.5E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.399	mg/kg	9.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
			Total Ingestion									8E-06					2E-01
			Dermal	57-12-5	Cyanide	0.122	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	232.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.327	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	36052	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.582	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	7.812	mg/kg	2.3E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	6.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	6.583	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	150.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	16449	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	839.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0237	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	119	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.29	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.125	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	45.36	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	16.2	mg/kg	2.0E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	5.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	19.39	mg/kg	2.4E-06	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-06	6.8E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				205-99-2	Benzo(B)Fluoranthene	21.74	mg/kg	2.7E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-07	7.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	8.821	mg/kg	1.1E-06	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	1E-08	3.1E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0516	mg/kg	5.0E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	7E-11	1.4E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-07
				218-01-9	Chrysene	18.83	mg/kg	2.4E-06	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-09	6.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	4.076	mg/kg	5.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-07	1.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	14.78	mg/kg	1.9E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-07	5.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.399	mg/kg	5.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-06
			Total Dermal									4E-06					2E-02
		Total Soil Direct Contact										1E-05					2E-01

Table 7-10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Industrial Landfills Area - Landfill Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.122	mg/kg	1.4E-04	(µg/m3)	NA	1/(µg/m3)	NA	3.9E-07	mg/m3	8.0E-04	mg/m3	5E-04
				16984-48-8	Fluoride	232.9	mg/kg	1.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.9E-08	mg/m3	1.3E-02	mg/m3	2E-06
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.327	mg/kg	1.5E-08	(µg/m3)	8.4E-02	1/(µg/m3)	1E-09	4.1E-11	mg/m3	1.0E-04	mg/m3	4E-07
				7429-90-5	Aluminum	36052	mg/kg	1.6E-03	(µg/m3)	NA	1/(µg/m3)	NA	4.5E-06	mg/m3	5.0E-03	mg/m3	9E-04
				7440-36-0	Antimony	0.582	mg/kg	2.6E-08	(µg/m3)	NA	1/(µg/m3)	NA	7.3E-11	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	7.812	mg/kg	3.5E-07	(µg/m3)	4.3E-03	1/(µg/m3)	2E-09	9.8E-10	mg/m3	1.5E-05	mg/m3	7E-05
				7440-48-4	Cobalt	6.583	mg/kg	3.0E-07	(µg/m3)	9.0E-03	1/(µg/m3)	3E-09	8.3E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	150.4	mg/kg	6.7E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-08	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	16449	mg/kg	7.4E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	839.6	mg/kg	3.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	5.0E-05	mg/m3	2E-03
				7439-97-6	Mercury	0.0237	mg/kg	4.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	119	mg/kg	5.3E-06	(µg/m3)	2.6E-04	1/(µg/m3)	1E-09	1.5E-08	mg/m3	9.0E-05	mg/m3	2E-04
				7782-49-2	Selenium	0.29	mg/kg	1.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.6E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-28-0	Thallium	0.125	mg/kg	5.6E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	45.36	mg/kg	2.0E-06	(µg/m3)	NA	1/(µg/m3)	NA	5.7E-09	mg/m3	1.0E-04	mg/m3	6E-05
				56-55-3	Benzo(A)Anthracene	16.2	mg/kg	2.2E-04	(µg/m3)	6.0E-05	1/(µg/m3)	1E-08	6.3E-07	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	19.39	mg/kg	8.7E-07	(µg/m3)	6.0E-04	1/(µg/m3)	5E-10	2.4E-09	mg/m3	2.0E-06	mg/m3	1E-03
				205-99-2	Benzo(B)Fluoranthene	21.74	mg/kg	9.7E-07	(µg/m3)	6.0E-05	1/(µg/m3)	6E-11	2.7E-09	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	8.821	mg/kg	4.0E-07	(µg/m3)	6.0E-06	1/(µg/m3)	2E-12	1.1E-09	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0516	mg/kg	2.3E-09	(µg/m3)	2.4E-06	1/(µg/m3)	6E-15	6.5E-12	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	18.83	mg/kg	8.4E-07	(µg/m3)	6.0E-07	1/(µg/m3)	5E-13	2.4E-09	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	4.076	mg/kg	1.8E-07	(µg/m3)	6.0E-04	1/(µg/m3)	1E-10	5.1E-10	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	14.78	mg/kg	6.6E-07	(µg/m3)	6.0E-05	1/(µg/m3)	4E-11	1.9E-09	mg/m3	NA	mg/m4	NA
				91-20-3	Naphthalene	0.399	mg/kg	5.3E-04	(µg/m3)	3.4E-05	1/(µg/m3)	2E-08	1.5E-06	mg/m3	3.0E-03	mg/m5	5E-04
			Total Inhalation									4E-08					6E-03
		Total Dust Inhalation										4E-08					6E-03
	Total Soil Direct Contact and Dust Inhalation											1E-05					2E-01
Medium Total												1E-05					2E-01
												Total of Receptor Risks Across All Media 1E-05					Total of Receptor Hazards Across All Media 2E-01

Table 7-11
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Industrial Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.157	mg/kg	9.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-05
				16984-48-8	Fluoride	471.3	mg/kg	2.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.431	mg/kg	8.1E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-09	1.9E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	6E-06
				7429-90-5	Aluminum	21418	mg/kg	1.3E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.3E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-04
				7440-36-0	Antimony	0.794	mg/kg	4.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-05
				7440-38-2	Arsenic	9.302	mg/kg	3.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	2.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-48-4	Cobalt	7.454	mg/kg	4.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-50-8	Copper	21.84	mg/kg	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	16810	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.3E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	1280	mg/kg	8.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-03
				7439-97-6	Mercury	0.0295	mg/kg	1.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	177.6	mg/kg	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-04
				7782-49-2	Selenium	0.379	mg/kg	2.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-06
				7440-28-0	Thallium	0.17	mg/kg	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	7E-04
				7440-62-2	Vanadium	68.99	mg/kg	4.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	6E-04
				56-55-3	Benzo(A)Anthracene	43	mg/kg	8.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-08	1.9E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	52.45	mg/kg	9.8E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-06	2.3E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-03
				205-99-2	Benzo(B)Fluoranthene	58.72	mg/kg	1.1E-06	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-07	2.6E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	23.44	mg/kg	4.4E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	4E-09	1.0E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0639	mg/kg	4.0E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	6E-12	2.8E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
				218-01-9	Chrysene	51	mg/kg	9.5E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-09	2.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	10.96	mg/kg	2.0E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	39.56	mg/kg	7.4E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-08	1.7E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	1.349	mg/kg	8.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-06
			Total Ingestion									2E-06					2E-02
			Dermal	57-12-5	Cyanide	0.157	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	471.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.431	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	21418	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.794	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	9.302	mg/kg	7.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	5.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	7.454	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	21.84	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	16810	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1280	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0295	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	177.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.379	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.17	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	68.99	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	43	mg/kg	4.4E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	1.0E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	52.45	mg/kg	5.4E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-07	1.3E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-03
				205-99-2	Benzo(B)Fluoranthene	58.72	mg/kg	6.0E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-08	1.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	23.44	mg/kg	2.4E-07	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	2E-09	5.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0639	mg/kg	1.7E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-12	1.2E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-08
				218-01-9	Chrysene	51	mg/kg	5.2E-07	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	5E-10	1.2E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	10.96	mg/kg	1.1E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	2.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	39.56	mg/kg	4.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-08	9.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	1.349	mg/kg	4.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
			Total Dermal									8E-07					4E-03
		Total Soil Direct Contact										2E-06					2E-02

Table 7-11
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Industrial Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.157	mg/kg	3.4E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.4E-09	mg/m3	8.0E-04	mg/m3	3E-06
				16984-48-8	Fluoride	471.3	mg/kg	4.0E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.8E-10	mg/m3	1.3E-02	mg/m3	2E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.431	mg/kg	1.1E-10	(µg/m3)	8.4E-02	1/(µg/m3)	9E-12	2.5E-13	mg/m3	1.0E-04	mg/m3	3E-09
				7429-90-5	Aluminum	21418	mg/kg	1.8E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-08	mg/m3	5.0E-03	mg/m3	3E-06
				7440-36-0	Antimony	0.794	mg/kg	6.7E-11	(µg/m3)	NA	1/(µg/m3)	NA	4.7E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	9.302	mg/kg	7.8E-10	(µg/m3)	4.3E-03	1/(µg/m3)	3E-12	5.5E-12	mg/m3	1.5E-05	mg/m3	4E-07
				7440-48-4	Cobalt	7.454	mg/kg	6.3E-10	(µg/m3)	9.0E-03	1/(µg/m3)	6E-12	4.4E-12	mg/m3	6.0E-06	mg/m3	7E-07
				7440-50-8	Copper	21.84	mg/kg	1.8E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	16810	mg/kg	1.4E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.9E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	1280	mg/kg	1.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	7.5E-10	mg/m3	5.0E-05	mg/m3	2E-05
				7439-97-6	Mercury	0.0295	mg/kg	9.7E-08	(µg/m3)	NA	1/(µg/m3)	NA	6.8E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	177.6	mg/kg	1.5E-08	(µg/m3)	2.6E-04	1/(µg/m3)	4E-12	1.0E-10	mg/m3	9.0E-05	mg/m3	1E-06
				7782-49-2	Selenium	0.379	mg/kg	3.2E-11	(µg/m3)	NA	1/(µg/m3)	NA	2.2E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-28-0	Thallium	0.17	mg/kg	1.4E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-13	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	68.99	mg/kg	5.8E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.1E-11	mg/m3	1.0E-04	mg/m3	4E-07
				56-55-3	Benzo(A)Anthracene	43	mg/kg	3.4E-06	(µg/m3)	6.0E-05	1/(µg/m3)	2E-10	7.8E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	52.45	mg/kg	1.3E-08	(µg/m3)	6.0E-04	1/(µg/m3)	8E-12	3.1E-11	mg/m3	2.0E-06	mg/m3	2E-05
				205-99-2	Benzo(B)Fluoranthene	58.72	mg/kg	1.5E-08	(µg/m3)	6.0E-05	1/(µg/m3)	9E-13	3.5E-11	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	23.44	mg/kg	5.9E-09	(µg/m3)	6.0E-06	1/(µg/m3)	4E-14	1.4E-11	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0639	mg/kg	5.4E-12	(µg/m3)	2.4E-06	1/(µg/m3)	1E-17	3.8E-14	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	51	mg/kg	1.3E-08	(µg/m3)	6.0E-07	1/(µg/m3)	8E-15	3.0E-11	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	10.96	mg/kg	2.8E-09	(µg/m3)	6.0E-04	1/(µg/m3)	2E-12	6.4E-12	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	39.56	mg/kg	1.0E-08	(µg/m3)	6.0E-05	1/(µg/m3)	6E-13	2.3E-11	mg/m3	NA	mg/m4	NA
				91-20-3	Naphthalene	1.349	mg/kg	3.3E-06	(µg/m3)	3.4E-05	1/(µg/m3)	1E-10	2.3E-08	mg/m3	3.0E-03	mg/m5	8E-06
			Total Inhalation									3E-10					5E-05
		Total Dust Inhalation										3E-10					5E-05
	Total Soil Direct Contact and Dust Inhalation											2E-06					2E-02
Medium Total												2E-06					2E-02
												Total of Receptor Risks Across All Media 2E-06					Total of Receptor Hazards Across All Media 2E-02

Table 7-12
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	7429-90-5	Aluminum	19578	mg/kg	1.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-04
				7440-38-2	Arsenic	7.18	mg/kg	2.7E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	1.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.594	mg/kg	3.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-50-8	Copper	14.3	mg/kg	8.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	12863	mg/kg	8.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	8E-04
				7439-96-5	Manganese	210	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-04
				7439-97-6	Mercury	0.0498	mg/kg	3.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	40.24	mg/kg	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-05
				7782-49-2	Selenium	0.354	mg/kg	2.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-06
				7440-28-0	Thallium	0.123	mg/kg	7.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	5E-04
				7440-62-2	Vanadium	17.48	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-04
				56-55-3	Benzo(A)Anthracene	0.618	mg/kg	1.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.891	mg/kg	1.7E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	3.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				205-99-2	Benzo(B)Fluoranthene	2.049	mg/kg	3.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-09	8.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.093	mg/kg	5.8E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	8E-12	4.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
				53-70-3	Dibenz(A,H)Anthracene	0.267	mg/kg	5.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.047	mg/kg	2.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00835	mg/kg	5.2E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-08
			Total Ingestion									7E-08					4E-03
			Dermal	7429-90-5	Aluminum	19578	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	7.18	mg/kg	5.7E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-09	4.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.594	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	14.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	12863	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	210	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0498	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	40.24	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.354	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.123	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	17.48	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.618	mg/kg	6.3E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.891	mg/kg	9.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-09	2.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				205-99-2	Benzo(B)Fluoranthene	2.049	mg/kg	2.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.093	mg/kg	2.4E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	3E-12	1.7E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-08
				53-70-3	Dibenz(A,H)Anthracene	0.267	mg/kg	2.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	6.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.047	mg/kg	1.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00835	mg/kg	2.9E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-08
			Total Dermal									2E-08					2E-04
		Total Soil Direct Contact										9E-08					5E-03

Table 7-12
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	7429-90-5	Aluminum	19578	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-08	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	7.18	mg/kg	6.0E-10	(µg/m3)	4.3E-03	1/(µg/m3)	3E-12	4.2E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	5.594	mg/kg	4.7E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.3E-12	mg/m3	6.0E-06	mg/m3	5E-07
				7440-50-8	Copper	14.3	mg/kg	1.2E-09	(µg/m3)	NA	1/(µg/m3)	NA	8.4E-12	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	12863	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.6E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	210	mg/kg	1.8E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-10	mg/m3	5.0E-05	mg/m3	2E-06
				7439-97-6	Mercury	0.0498	mg/kg	1.6E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-09	mg/m3	3.0E-04	mg/m3	4E-06
				7440-02-0	Nickel	40.24	mg/kg	3.4E-09	(µg/m3)	2.6E-04	1/(µg/m3)	9E-13	2.4E-11	mg/m3	9.0E-05	mg/m3	3E-07
				7782-49-2	Selenium	0.354	mg/kg	3.0E-11	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-28-0	Thallium	0.123	mg/kg	1.0E-11	(µg/m3)	NA	1/(µg/m3)	NA	7.2E-14	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	17.48	mg/kg	1.5E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-11	mg/m3	1.0E-04	mg/m3	1E-07
				56-55-3	Benzo(A)Anthracene	0.618	mg/kg	4.8E-08	(µg/m3)	6.0E-05	1/(µg/m3)	3E-12	1.1E-10	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.891	mg/kg	2.2E-10	(µg/m3)	6.0E-04	1/(µg/m3)	1E-13	5.2E-13	mg/m3	2.0E-06	mg/m3	3E-07
				205-99-2	Benzo(B)Fluoranthene	2.049	mg/kg	5.2E-10	(µg/m3)	6.0E-05	1/(µg/m3)	3E-14	1.2E-12	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.093	mg/kg	7.8E-12	(µg/m3)	2.4E-06	1/(µg/m3)	2E-17	5.5E-14	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.267	mg/kg	6.7E-11	(µg/m3)	6.0E-04	1/(µg/m3)	4E-14	1.6E-13	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.047	mg/kg	2.6E-10	(µg/m3)	6.0E-05	1/(µg/m3)	2E-14	6.2E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00835	mg/kg	2.1E-08	(µg/m3)	3.4E-05	1/(µg/m3)	7E-13	1.4E-10	mg/m3	3.0E-03	mg/m3	5E-08
			Total Inhalation									1E-11					1E-05
		Total Dust Inhalation										1E-11					1E-05
	Total Soil Direct Contact and Dust Inhalation											9E-08					5E-03
Medium Total												9E-08					5E-03
Surface Water	Surface Water	Surface Water	Ingestion	FREE CN	Cyanide (Free)	5.8	µg/l	2.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				16984-48-8	Fluoride	322	µg/l	1.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7440-36-0	Antimony	2	µg/l	8.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	0.95	µg/l	4.2E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	2.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
			Total Ingestion									6E-09					8E-04
			Dermal	FREE CN	Cyanide (Free)	5.8	µg/l	2.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				16984-48-8	Fluoride	322	µg/l	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7440-36-0	Antimony	2	µg/l	7.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-05
				7440-38-2	Arsenic	0.95	µg/l	3.6E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-10	2.5E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-06
			Total Dermal									5E-10					7E-05
		Total Surface Water										5E-10					7E-05
	Total Surface Water Direct Contact											7E-09					9E-04
Medium Total												7E-09					9E-04
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	17400	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	8E-04
				7440-38-2	Arsenic	6.8	mg/kg	2.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	1.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.8	mg/kg	3.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7439-89-6	Iron	14100	mg/kg	8.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	517	mg/kg	3.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	9E-04
				50-32-8	Benzo(A)Pyrene	0.12	mg/kg	2.2E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	5.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
			Total Ingestion									4E-08					4E-03
			Dermal	7429-90-5	Aluminum	17400	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.8	mg/kg	5.4E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-09	3.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14100	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	517	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.12	mg/kg	1.2E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	2.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
			Total Dermal									9E-09	0.0E+00				1E-04
		Total Sediment										5E-08					4E-03
	Total Sediment Direct Contact											5E-08					4E-03

Table 7-12
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Medium Total												5E-08					4E-03
	Total of Receptor Risks Across All Media											1E-07	Total of Receptor Hazards Across All Media				1E-02

Table 7-13
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft-bgs	Ingestion	57-12-5	Cyanide	0.229	mg/kg	5.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	20.42	mg/kg	4.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	5.1E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-08	1.4E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-05
				7429-90-5	Aluminum	21075	mg/kg	4.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	6.205	mg/kg	8.5E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-03
				7440-48-4	Cobalt	5.034	mg/kg	1.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	12.6	mg/kg	2.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.1E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7439-89-6	Iron	12420	mg/kg	2.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	1113	mg/kg	2.5E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-02
				7439-97-6	Mercury	0.0337	mg/kg	7.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	7.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-03
				7782-49-2	Selenium	0.296	mg/kg	6.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-05
				7440-28-0	Thallium	0.111	mg/kg	2.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	7E-03
				7440-62-2	Vanadium	13.23	mg/kg	3.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	7.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-09	2.0E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	1.6E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	4.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	2.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	6.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	1.5E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-10	4.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	3.0E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-08	8.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	1.2E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	3.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00491	mg/kg	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
			Total Ingestion									2E-06					9E-02
			Dermal	57-12-5	Cyanide	0.229	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	20.42	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	21075	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.205	mg/kg	1.8E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	5.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.034	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	12.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	12420	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1113	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0337	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.296	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.111	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.23	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	4.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-09	1.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	8.7E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-08	2.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	1.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	3.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	6.4E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	9E-11	1.8E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-07
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	1.6E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	4.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	6.7E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-09	1.9E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00491	mg/kg	6.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	9E-08
			Total Dermal									4E-07					2E-03
		Total Soil Direct Contact										2E-06					9E-02

Table 7-13
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.229	mg/kg	2.6E-04	(µg/m3)	NA	1/(µg/m3)	NA	7.3E-07	mg/m3	8.0E-04	mg/m3	9E-04
				16984-48-8	Fluoride	20.42	mg/kg	9.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-09	mg/m3	1.3E-02	mg/m3	2E-07
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	1.0E-08	(µg/m3)	8.4E-02	1/(µg/m3)	8E-10	2.8E-11	mg/m3	1.0E-04	mg/m3	3E-07
				7429-90-5	Aluminum	21075	mg/kg	9.5E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-06	mg/m3	5.0E-03	mg/m3	5E-04
				7440-38-2	Arsenic	6.205	mg/kg	2.8E-07	(µg/m3)	4.3E-03	1/(µg/m3)	1E-09	7.8E-10	mg/m3	1.5E-05	mg/m3	5E-05
				7440-48-4	Cobalt	5.034	mg/kg	2.3E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	6.3E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	12.6	mg/kg	5.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	12420	mg/kg	5.6E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	1113	mg/kg	5.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-07	mg/m3	5.0E-05	mg/m3	3E-03
				7439-97-6	Mercury	0.0337	mg/kg	5.9E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-07	mg/m3	3.0E-04	mg/m3	6E-04
				7440-02-0	Nickel	30.59	mg/kg	1.4E-06	(µg/m3)	2.6E-04	1/(µg/m3)	4E-10	3.8E-09	mg/m3	9.0E-05	mg/m3	4E-05
				7782-49-2	Selenium	0.296	mg/kg	1.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.7E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-28-0	Thallium	0.111	mg/kg	5.0E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.23	mg/kg	5.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.7E-09	mg/m3	1.0E-04	mg/m3	2E-05
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	4.4E-06	(µg/m3)	6.0E-05	1/(µg/m3)	3E-10	1.2E-08	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	3.1E-08	(µg/m3)	6.0E-04	1/(µg/m3)	2E-11	8.7E-11	mg/m3	2.0E-06	mg/m3	4E-05
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	4.6E-08	(µg/m3)	6.0E-05	1/(µg/m3)	3E-12	1.3E-10	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	2.9E-09	(µg/m3)	2.4E-06	1/(µg/m3)	7E-15	8.3E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	5.9E-09	(µg/m3)	6.0E-04	1/(µg/m3)	4E-12	1.6E-11	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	2.4E-08	(µg/m3)	6.0E-05	1/(µg/m3)	1E-12	6.7E-11	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00491	mg/kg	6.5E-06	(µg/m3)	3.4E-05	1/(µg/m3)	2E-10	1.8E-08	mg/m3	3.0E-03	mg/m3	6E-06
			Total Inhalation									5E-09					5E-03
		Total Dust Inhalation										5E-09					5E-03
	Total Soil Direct Contact and Dust Inhalation											2E-06					9E-02
Medium Total												2E-06					9E-02
												Total of Receptor Risks Across All Media	2E-06		Total of Receptor Hazards Across All Media		9E-02

Table 7-14
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft-bgs	Ingestion	57-12-5	Cyanide	0.229	mg/kg	4.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-04
				16984-48-8	Fluoride	20.42	mg/kg	4.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	4.5E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-09	3.1E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	21075	mg/kg	4.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-02
				7440-38-2	Arsenic	6.205	mg/kg	7.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	5.2E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7440-48-4	Cobalt	5.034	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7440-50-8	Copper	12.6	mg/kg	2.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-04
				7439-89-6	Iron	12420	mg/kg	2.5E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-02
				7439-96-5	Manganese	1113	mg/kg	2.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-03	(mg/kg-day)	2.4E-02	(mg/kg-day)	6E-02
				7439-97-6	Mercury	0.0337	mg/kg	6.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	6.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-03
				7782-49-2	Selenium	0.296	mg/kg	5.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.1E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-05
				7440-28-0	Thallium	0.111	mg/kg	2.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-02
				7440-62-2	Vanadium	13.23	mg/kg	2.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-03
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	6.3E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	4.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	1.4E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	9.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	2.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	1.4E-06	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	1.3E-09	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-11	9.2E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	2.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	1.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	1.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	7.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00491	mg/kg	9.8E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-07
			Total Ingestion									1E-07					2E-01
			Dermal	57-12-5	Cyanide	0.229	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	20.42	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	21075	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.205	mg/kg	1.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	8.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-48-4	Cobalt	5.034	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	12.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	12420	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	1113	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0337	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	30.59	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.296	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.111	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.23	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	2.6E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	1.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	5.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-09	4.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	8.5E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-10	5.9E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	4.2E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	6E-12	3.0E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	1.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	7.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	4.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	3.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00491	mg/kg	4.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
			Total Dermal									3E-08					4E-03
		Total Soil Direct Contact										2E-07					2E-01

Table 7-14
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Eastern Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.229	mg/kg	7.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	5.1E-07	mg/m3	8.0E-04	mg/m3	6E-04
				16984-48-8	Fluoride	20.42	mg/kg	2.5E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-06	mg/m3	1.3E-02	mg/m3	1E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.224	mg/kg	2.8E-07	(µg/m3)	8.4E-02	1/(µg/m3)	2E-08	2.0E-08	mg/m3	1.0E-04	mg/m3	2E-04
				7429-90-5	Aluminum	21075	mg/kg	2.6E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-03	mg/m3	5.0E-03	mg/m3	4E-01
				7440-38-2	Arsenic	6.205	mg/kg	7.7E-06	(µg/m3)	4.3E-03	1/(µg/m3)	3E-08	5.4E-07	mg/m3	1.5E-05	mg/m3	4E-02
				7440-48-4	Cobalt	5.034	mg/kg	6.3E-06	(µg/m3)	9.0E-03	1/(µg/m3)	6E-08	4.4E-07	mg/m3	6.0E-06	mg/m3	7E-02
				7440-50-8	Copper	12.6	mg/kg	1.6E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-06	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	12420	mg/kg	1.5E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-03	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	1113	mg/kg	1.4E-03	(µg/m3)	NA	1/(µg/m3)	NA	9.7E-05	mg/m3	5.0E-05	mg/m3	2E+00
				7439-97-6	Mercury	0.0337	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	30.59	mg/kg	3.8E-05	(µg/m3)	2.6E-04	1/(µg/m3)	1E-08	2.7E-06	mg/m3	9.0E-05	mg/m3	3E-02
				7782-49-2	Selenium	0.296	mg/kg	3.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-08	mg/m3	2.0E-02	mg/m3	1E-06
				7440-28-0	Thallium	0.111	mg/kg	1.4E-07	(µg/m3)	NA	1/(µg/m3)	NA	9.7E-09	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.23	mg/kg	1.6E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-06	mg/m3	1.0E-04	mg/m3	1E-02
				56-55-3	Benzo(A)Anthracene	0.314	mg/kg	5.1E-07	(µg/m3)	6.0E-05	1/(µg/m3)	3E-11	3.5E-08	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.69	mg/kg	8.6E-07	(µg/m3)	6.0E-04	1/(µg/m3)	5E-10	6.0E-08	mg/m3	2.0E-06	mg/m3	3E-02
				205-99-2	Benzo(B)Fluoranthene	1.016	mg/kg	1.3E-06	(µg/m3)	6.0E-05	1/(µg/m3)	8E-11	8.9E-08	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0657	mg/kg	8.2E-08	(µg/m3)	2.4E-06	1/(µg/m3)	2E-13	5.7E-09	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.131	mg/kg	1.6E-07	(µg/m3)	6.0E-04	1/(µg/m3)	1E-10	1.1E-08	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.53	mg/kg	6.6E-07	(µg/m3)	6.0E-05	1/(µg/m3)	4E-11	4.6E-08	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00491	mg/kg	1.8E-07	(µg/m3)	3.4E-05	1/(µg/m3)	6E-12	1.2E-08	mg/m3	3.0E-03	mg/m3	4E-06
			Total Inhalation									1E-07					2E+00
		Total Dust Inhalation										1E-07					2E+00
	Total Soil Direct Contact and Dust Inhalation											3E-07					3E+00
Medium Total												3E-07					3E+00
					Total of Receptor Risks Across All Media							3E-07		Total of Receptor Hazards Across All Media			3E+00

Table 7-15
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-0.5 ft-bgs	Ingestion	57-12-5	Cyanide	0.141	mg/kg	8.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-05
				16984-48-8	Fluoride	11.25	mg/kg	7.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.261	mg/kg	4.9E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-09	1.1E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	4E-06
				7429-90-5	Aluminum	19264	mg/kg	1.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	8E-04
				7440-38-2	Arsenic	7.345	mg/kg	2.7E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	1.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.759	mg/kg	3.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-50-8	Copper	15.75	mg/kg	9.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	15638	mg/kg	9.7E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	959.1	mg/kg	6.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-03
				7439-97-6	Mercury	0.0284	mg/kg	1.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	14.55	mg/kg	9.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				7782-49-2	Selenium	0.325	mg/kg	2.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-06
				7440-28-0	Thallium	0.19	mg/kg	1.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.3E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-04
				7440-62-2	Vanadium	13.33	mg/kg	8.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.0679	mg/kg	1.3E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	3.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0901	mg/kg	1.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	3.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				205-99-2	Benzo(B)Fluoranthene	0.183	mg/kg	3.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	8.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.0122	mg/kg	7.6E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-08
			Total Ingestion									5E-08					6E-03
			Dermal	57-12-5	Cyanide	0.141	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	11.25	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.261	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	19264	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	7.345	mg/kg	5.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-09	4.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.759	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	15.75	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15638	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	959.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0284	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	14.55	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.325	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.19	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.33	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0679	mg/kg	7.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-11	1.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0901	mg/kg	9.2E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-10	2.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
				205-99-2	Benzo(B)Fluoranthene	0.183	mg/kg	1.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	4.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.0122	mg/kg	4.2E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-08
			Total Dermal									1E-08					1E-04
		Total Soil Direct Contact										6E-08					6E-03

Table 7-15
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.141	mg/kg	3.0E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-09	mg/m3	8.0E-04	mg/m3	3E-06
				16984-48-8	Fluoride	11.25	mg/kg	9.4E-10	(µg/m3)	NA	1/(µg/m3)	NA	6.6E-12	mg/m3	1.3E-02	mg/m3	5E-10
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.261	mg/kg	6.6E-11	(µg/m3)	8.4E-02	1/(µg/m3)	6E-12	1.5E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	19264	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-08	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	7.345	mg/kg	6.2E-10	(µg/m3)	4.3E-03	1/(µg/m3)	3E-12	4.3E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	5.759	mg/kg	4.8E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.4E-12	mg/m3	6.0E-06	mg/m3	6E-07
				7440-50-8	Copper	15.75	mg/kg	1.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	9.3E-12	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15638	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.2E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	959.1	mg/kg	8.1E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.6E-10	mg/m3	5.0E-05	mg/m3	1E-05
				7439-97-6	Mercury	0.0284	mg/kg	9.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	14.55	mg/kg	1.2E-09	(µg/m3)	2.6E-04	1/(µg/m3)	3E-13	8.5E-12	mg/m3	9.0E-05	mg/m3	9E-08
				7782-49-2	Selenium	0.325	mg/kg	2.7E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-28-0	Thallium	0.19	mg/kg	1.6E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-13	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.33	mg/kg	1.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	7.8E-12	mg/m3	1.0E-04	mg/m3	8E-08
				56-55-3	Benzo(A)Anthracene	0.0679	mg/kg	5.3E-09	(µg/m3)	6.0E-05	1/(µg/m3)	3E-13	1.2E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.0901	mg/kg	2.3E-11	(µg/m3)	6.0E-04	1/(µg/m3)	1E-14	5.3E-14	mg/m3	2.0E-06	mg/m3	3E-08
				205-99-2	Benzo(B)Fluoranthene	0.183	mg/kg	4.6E-11	(µg/m3)	6.0E-05	1/(µg/m3)	3E-15	1.1E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.0122	mg/kg	3.0E-08	(µg/m3)	3.4E-05	1/(µg/m3)	1E-12	2.1E-10	mg/m3	3.0E-03	mg/m3	7E-08
			Total Inhalation									1E-11					2E-05
		Total Dust Inhalation										1E-11					2E-05
	Total Soil Direct Contact and Dust Inhalation											6E-08					6E-03
Medium Total												6E-08					6E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	4.4	µg/l	1.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				FREE CN	Cyanide (Free)	2.569	µg/l	1.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				16984-48-8	Fluoride	282.3	µg/l	1.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	1530	µg/l	6.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-05
				7440-36-0	Antimony	1.191	µg/l	5.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-05
				7440-38-2	Arsenic	1.286	µg/l	5.7E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-09	4.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	1.51	µg/l	6.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7439-89-6	Iron	1912	µg/l	8.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	8E-05
				7439-96-5	Manganese	889.8	µg/l	3.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
			Total Ingestion									9E-09					2E-03
			Dermal	57-12-5	Cyanide	4.4	µg/l	1.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				FREE CN	Cyanide (Free)	2.569	µg/l	9.6E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-05
				16984-48-8	Fluoride	282.3	µg/l	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7429-90-5	Aluminum	1530	µg/l	5.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-06	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-06
				7440-36-0	Antimony	1.191	µg/l	4.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	8E-06
				7440-38-2	Arsenic	1.286	µg/l	4.8E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-10	3.4E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7440-48-4	Cobalt	1.51	µg/l	2.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-06
				7439-89-6	Iron	1912	µg/l	7.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.0E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-06
				7439-96-5	Manganese	889.8	µg/l	3.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-04
			Total Dermal									7E-10					2E-04
		Total Surface Water										7E-10					2E-04
	Total Surface Water Direct Contact											9E-09					2E-03
Medium Total												9E-09					2E-03

Table 7-15
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	25037	mgkg	1.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	8.968	mgkg	3.4E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	2.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-48-4	Cobalt	6.168	mgkg	3.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7439-89-6	Iron	16676	mgkg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.3E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	846.7	mgkg	5.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-03
			Total Ingestion									5E-08					5E-03
			Dermal	7429-90-5	Aluminum	25037	mgkg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	8.968	mgkg	7.1E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	5.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	6.168	mgkg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	16676	mgkg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	846.7	mgkg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
			Total Dermal									1E-08	0.0E+00				2E-04
		Total Sediment										6E-08					6E-03
	Total Sediment Direct Contact											6E-08					6E-03
Medium Total												6E-08					6E-03
											Total of Receptor Risks Across All Media	1E-07				Total of Receptor Hazards Across All Media	1E-02

Table 7-16
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft-bgs	Ingestion	57-12-5	Cyanide	0.0882	mg/kg	2.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-05
				16984-48-8	Fluoride	7.686	mg/kg	1.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	5.9E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-08	1.6E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-05
				7429-90-5	Aluminum	15137	mg/kg	3.5E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.7E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	7.126	mg/kg	9.8E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.7E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-03
				7440-48-4	Cobalt	5.589	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	14.24	mg/kg	3.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.1E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7439-89-6	Iron	14647	mg/kg	3.4E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.4E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	667.2	mg/kg	1.5E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-02
				7439-97-6	Mercury	0.0233	mg/kg	5.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.78	mg/kg	2.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-04
				7782-49-2	Selenium	0.284	mg/kg	6.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-05
				7440-28-0	Thallium	0.118	mg/kg	2.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-03
				7440-62-2	Vanadium	10.96	mg/kg	2.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-03
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	7.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-10	2.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	9.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	2.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	5.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00549	mg/kg	1.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
			Total Ingestion									2E-06					7E-02
			Dermal	57-12-5	Cyanide	0.0882	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	7.686	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	15137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	7.126	mg/kg	2.1E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	5.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.589	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	14.24	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	14647	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	667.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0233	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.78	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.284	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.118	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	10.96	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	4.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	1.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	5.3E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00549	mg/kg	6.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
			Total Dermal									3E-07					2E-03
		Total Soil Direct Contact										2E-06					7E-02

Table 7-16
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.0882	mg/kg	1.0E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.8E-07	mg/m3	8.0E-04	mg/m3	4E-04
				16984-48-8	Fluoride	7.686	mg/kg	3.4E-07	(µg/m3)	NA	1/(µg/m3)	NA	9.7E-10	mg/m3	1.3E-02	mg/m3	7E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	1.2E-08	(µg/m3)	8.4E-02	1/(µg/m3)	1E-09	3.2E-11	mg/m3	1.0E-04	mg/m3	3E-07
				7429-90-5	Aluminum	15137	mg/kg	6.8E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-06	mg/m3	5.0E-03	mg/m3	4E-04
				7440-38-2	Arsenic	7.126	mg/kg	3.2E-07	(µg/m3)	4.3E-03	1/(µg/m3)	1E-09	8.9E-10	mg/m3	1.5E-05	mg/m3	6E-05
				7440-48-4	Cobalt	5.589	mg/kg	2.5E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	7.0E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	14.24	mg/kg	6.4E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	14647	mg/kg	6.6E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	667.2	mg/kg	3.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	8.4E-08	mg/m3	5.0E-05	mg/m3	2E-03
				7439-97-6	Mercury	0.0233	mg/kg	4.1E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-07	mg/m3	3.0E-04	mg/m3	4E-04
				7440-02-0	Nickel	11.78	mg/kg	5.3E-07	(µg/m3)	2.6E-04	1/(µg/m3)	1E-10	1.5E-09	mg/m3	9.0E-05	mg/m3	2E-05
				7782-49-2	Selenium	0.284	mg/kg	1.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.6E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-28-0	Thallium	0.118	mg/kg	5.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-11	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	10.96	mg/kg	4.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-09	mg/m3	1.0E-04	mg/m3	1E-05
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	4.5E-07	(µg/m3)	6.0E-05	1/(µg/m3)	3E-11	1.3E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	1.9E-09	(µg/m3)	6.0E-04	1/(µg/m3)	1E-12	5.3E-12	mg/m3	2.0E-06	mg/m3	3E-06
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	3.7E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	1.0E-11	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00549	mg/kg	7.2E-06	(µg/m3)	3.4E-05	1/(µg/m3)	2E-10	2.0E-08	mg/m3	3.0E-03	mg/m3	7E-06
			Total Inhalation									5E-09					3E-03
		Total Dust Inhalation										5E-09					3E-03
	Total Soil Direct Contact and Dust Inhalation											2E-06					8E-02
Medium Total												2E-06					8E-02
											Total of Receptor Risks Across All Media	2E-06				Total of Receptor Hazards Across All Media	8E-02

Table 7-17
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12 ft-bgs	Ingestion	57-12-5	Cyanide	0.0882	mg/kg	1.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	7.686	mg/kg	1.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	5.1E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	3.6E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	15137	mg/kg	3.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-02
				7440-38-2	Arsenic	7.126	mg/kg	8.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	6.0E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7440-48-4	Cobalt	5.589	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-02
				7440-50-8	Copper	14.24	mg/kg	2.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-04
				7439-89-6	Iron	14647	mg/kg	2.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-02
				7439-96-5	Manganese	667.2	mg/kg	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.3E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-02
				7439-97-6	Mercury	0.0233	mg/kg	4.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.78	mg/kg	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-04
				7782-49-2	Selenium	0.284	mg/kg	5.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-05
				7440-28-0	Thallium	0.118	mg/kg	2.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-02
				7440-62-2	Vanadium	10.96	mg/kg	2.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-03
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	6.4E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-11	4.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	8.5E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-10	5.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	1.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	1.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00549	mg/kg	1.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-07
			Total Ingestion									1E-07					2E-01
			Dermal	57-12-5	Cyanide	0.0882	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	7.686	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	15137	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	7.126	mg/kg	1.4E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	9.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-48-4	Cobalt	5.589	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	14.24	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	14647	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	667.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0233	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.78	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.284	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.118	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	10.96	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	2.7E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-11	1.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	3.5E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-10	2.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	6.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-11	4.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00549	mg/kg	4.6E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
			Total Dermal									2E-08					3E-03
		Total Soil Direct Contact										2E-07					2E-01

Table 7-17
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(North Central Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.0882	mg/kg	2.8E-06	(µg/m3)	NA	1/(µg/m3)	NA	2.0E-07	mg/m3	8.0E-04	mg/m3	2E-04
				16984-48-8	Fluoride	7.686	mg/kg	9.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	6.7E-07	mg/m3	1.3E-02	mg/m3	5E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.257	mg/kg	3.2E-07	(µg/m3)	8.4E-02	1/(µg/m3)	3E-08	2.2E-08	mg/m3	1.0E-04	mg/m3	2E-04
				7429-90-5	Aluminum	15137	mg/kg	1.9E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-03	mg/m3	5.0E-03	mg/m3	3E-01
				7440-38-2	Arsenic	7.126	mg/kg	8.9E-06	(µg/m3)	4.3E-03	1/(µg/m3)	4E-08	6.2E-07	mg/m3	1.5E-05	mg/m3	4E-02
				7440-48-4	Cobalt	5.589	mg/kg	7.0E-06	(µg/m3)	9.0E-03	1/(µg/m3)	6E-08	4.9E-07	mg/m3	6.0E-06	mg/m3	8E-02
				7440-50-8	Copper	14.24	mg/kg	1.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-06	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	14647	mg/kg	1.8E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-03	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	667.2	mg/kg	8.3E-04	(µg/m3)	NA	1/(µg/m3)	NA	5.8E-05	mg/m3	5.0E-05	mg/m3	1E+00
				7439-97-6	Mercury	0.0233	mg/kg	1.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.8E-08	mg/m3	3.0E-04	mg/m3	3E-04
				7440-02-0	Nickel	11.78	mg/kg	1.5E-05	(µg/m3)	2.6E-04	1/(µg/m3)	4E-09	1.0E-06	mg/m3	9.0E-05	mg/m3	1E-02
				7782-49-2	Selenium	0.284	mg/kg	3.5E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.5E-08	mg/m3	2.0E-02	mg/m3	1E-06
				7440-28-0	Thallium	0.118	mg/kg	1.5E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-08	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	10.96	mg/kg	1.4E-05	(µg/m3)	NA	1/(µg/m3)	NA	9.5E-07	mg/m3	1.0E-04	mg/m3	1E-02
				56-55-3	Benzo(A)Anthracene	0.0322	mg/kg	5.2E-08	(µg/m3)	6.0E-05	1/(µg/m3)	3E-12	3.6E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.0423	mg/kg	5.3E-08	(µg/m3)	6.0E-04	1/(µg/m3)	3E-11	3.7E-09	mg/m3	2.0E-06	mg/m3	2E-03
				205-99-2	Benzo(B)Fluoranthene	0.0828	mg/kg	1.0E-07	(µg/m3)	6.0E-05	1/(µg/m3)	6E-12	7.2E-09	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00549	mg/kg	2.0E-07	(µg/m3)	3.4E-05	1/(µg/m3)	7E-12	1.4E-08	mg/m3	3.0E-03	mg/m3	5E-06
			Total Inhalation									1E-07					2E+00
		Total Dust Inhalation										1E-07					2E+00
	Total Soil Direct Contact and Dust Inhalation											3E-07					2E+00
Medium Total												3E-07					2E+00
											Total of Receptor Risks Across All Media	3E-07				Total of Receptor Hazards Across All Media	2E+00

Table 7-18
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-0.5 ft-bgs	Ingestion	57-12-5	Cyanide	0.32	mg/kg	2.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				16984-48-8	Fluoride	6.88	mg/kg	4.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-06
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	6.3E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	1.5E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-06
				7429-90-5	Aluminum	19193	mg/kg	1.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	8E-04
				7440-38-2	Arsenic	5.526	mg/kg	2.1E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	5.994	mg/kg	3.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	17.9	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	15873	mg/kg	9.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.9E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	643.4	mg/kg	4.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.0274	mg/kg	1.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	12.08	mg/kg	7.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				7782-49-2	Selenium	0.93	mg/kg	5.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.1E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-06
				7440-62-2	Vanadium	13.09	mg/kg	8.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.0528	mg/kg	9.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	2.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0672	mg/kg	1.3E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	2.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				205-99-2	Benzo(B)Fluoranthene	0.1	mg/kg	1.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	4.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00447	mg/kg	2.8E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-08
			Total Ingestion									4E-08					5E-03
			Dermal	57-12-5	Cyanide	0.32	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	6.88	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	19193	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.526	mg/kg	4.4E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-09	3.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.994	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	17.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15873	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	643.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0274	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	12.08	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.09	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0528	mg/kg	5.4E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-11	1.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.0672	mg/kg	6.9E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-10	1.6E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-06
				205-99-2	Benzo(B)Fluoranthene	0.1	mg/kg	1.0E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	2.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00447	mg/kg	1.5E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-09
			Total Dermal									7E-09					1E-04
		Total Soil Direct Contact										4E-08					5E-03

Table 7-18
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.32	mg/kg	6.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	4.8E-09	mg/m3	8.0E-04	mg/m3	6E-06
				16984-48-8	Fluoride	6.88	mg/kg	5.8E-10	(µg/m3)	NA	1/(µg/m3)	NA	4.0E-12	mg/m3	1.3E-02	mg/m3	3E-10
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.338	mg/kg	8.5E-11	(µg/m3)	8.4E-02	1/(µg/m3)	7E-12	2.0E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	19193	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-08	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	5.526	mg/kg	4.6E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	3.2E-12	mg/m3	1.5E-05	mg/m3	2E-07
				7440-48-4	Cobalt	5.994	mg/kg	5.0E-10	(µg/m3)	9.0E-03	1/(µg/m3)	5E-12	3.5E-12	mg/m3	6.0E-06	mg/m3	6E-07
				7440-50-8	Copper	17.9	mg/kg	1.5E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15873	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.3E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	643.4	mg/kg	5.4E-08	(µg/m3)	NA	1/(µg/m3)	NA	3.8E-10	mg/m3	5.0E-05	mg/m3	8E-06
				7439-97-6	Mercury	0.0274	mg/kg	9.0E-08	(µg/m3)	NA	1/(µg/m3)	NA	6.3E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	12.08	mg/kg	1.0E-09	(µg/m3)	2.6E-04	1/(µg/m3)	3E-13	7.1E-12	mg/m3	9.0E-05	mg/m3	8E-08
				7782-49-2	Selenium	0.93	mg/kg	7.8E-11	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-13	mg/m3	2.0E-02	mg/m3	3E-11
				7440-62-2	Vanadium	13.09	mg/kg	1.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	7.7E-12	mg/m3	1.0E-04	mg/m3	8E-08
				56-55-3	Benzo(A)Anthracene	0.0528	mg/kg	4.1E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	9.6E-12	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.0672	mg/kg	1.7E-11	(µg/m3)	6.0E-04	1/(µg/m3)	1E-14	3.9E-14	mg/m3	2.0E-06	mg/m3	2E-08
				205-99-2	Benzo(B)Fluoranthene	0.1	mg/kg	2.5E-11	(µg/m3)	6.0E-05	1/(µg/m3)	2E-15	5.9E-14	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00447	mg/kg	1.1E-08	(µg/m3)	3.4E-05	1/(µg/m3)	4E-13	7.7E-11	mg/m3	3.0E-03	mg/m3	3E-08
			Total Inhalation									1E-11					2E-05
		Total Dust Inhalation										1E-11					2E-05
	Total Soil Direct Contact and Dust Inhalation											4E-08					5E-03
Medium Total												4E-08					5E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	5	µg/l	2.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				FREE CN	Cyanide (Free)	3.69	µg/l	1.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	137	µg/l	6.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
			Total Ingestion									NA					6E-04
			Dermal	57-12-5	Cyanide	5	µg/l	1.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				FREE CN	Cyanide (Free)	3.69	µg/l	1.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.7E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				16984-48-8	Fluoride	137	µg/l	5.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-06
			Total Dermal									NA					5E-05
		Total Surface Water										NA					5E-05
	Total Surface Water Direct Contact											NA					6E-04
Medium Total												NA					6E-04
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	12600	mg/kg	7.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	4.2	mg/kg	1.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	1.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	6.5	mg/kg	4.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7439-89-6	Iron	16400	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	571	mg/kg	3.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
			Total Ingestion									2E-08					4E-03
			Dermal	7429-90-5	Aluminum	12600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.2	mg/kg	3.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-09	2.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	6.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	16400	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	571	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
			Total Dermal									5E-09					8E-05
		Total Sediment										3E-08					4E-03
	Total Sediment Direct Contact											3E-08					4E-03
Medium Total												3E-08					4E-03
												Total of Receptor Risks Across All Media	7E-08		Total of Receptor Hazards Across All Media		9E-03

Table 7-19
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Resident [Adult] - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
								Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Subsurface Soil 0-12	Ingestion	57-12-5	Cyanide	0.188	mg/kg	2.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				16984-48-8	Fluoride	4.869	mg/kg	5.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.5E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	1.7E-06	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	8E-07	3.0E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	16697	mg/kg	1.9E-02	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-02
				7440-38-2	Arsenic	5.257	mg/kg	3.5E-06	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-06	2.9E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-48-4	Cobalt	5.781	mg/kg	6.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-02
				7440-50-8	Copper	16.02	mg/kg	1.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-04
				7439-89-6	Iron	15191	mg/kg	1.7E-02	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-02
				7439-96-5	Manganese	461.9	mg/kg	5.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-02
				7439-97-6	Mercury	0.0212	mg/kg	2.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-04
				7782-49-2	Selenium	0.386	mg/kg	4.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	7E-05
				7440-62-2	Vanadium	12.04	mg/kg	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	1.3E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	2.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	1.5E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	2.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	2.4E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	1.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.9E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-07
			Total Ingestion									6E-06					8E-02
			Dermal	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.257	mg/kg	4.9E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7.4E-07	6.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	4.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4.2E-09	1.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	4.9E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4.9E-08	1.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	8.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8.1E-09	2.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	3.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
			Total Dermal									8E-07					2E-03
		Total Soil Direct Contact										7E-06					9E-02

Table 7-19
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Resident [Adult] - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
								Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.188	mg/kg	9.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-06	mg/m3	8.0E-04	mg/m3	3E-03
				16984-48-8	Fluoride	4.869	mg/kg	9.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-09	mg/m3	1.3E-02	mg/m3	2E-07
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	1.8E-07	(µg/m3)	8.4E-02	1/(µg/m3)	1.5E-08	1.8E-10	mg/m3	1.0E-04	mg/m3	2E-06
				7429-90-5	Aluminum	16697	mg/kg	3.4E-03	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-06	mg/m3	5.0E-03	mg/m3	2E-03
				7440-38-2	Arsenic	5.257	mg/kg	1.1E-06	(µg/m3)	4.3E-03	1/(µg/m3)	4.6E-09	2.9E-09	mg/m3	1.5E-05	mg/m3	2E-04
				7440-48-4	Cobalt	5.781	mg/kg	1.2E-06	(µg/m3)	9.0E-03	1/(µg/m3)	1.1E-08	3.1E-09	mg/m3	6.0E-06	mg/m3	5E-04
				7440-50-8	Copper	16.02	mg/kg	3.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.7E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15191	mg/kg	3.1E-03	(µg/m3)	NA	1/(µg/m3)	NA	8.3E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	461.9	mg/kg	9.3E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.5E-07	mg/m3	5.0E-05	mg/m3	5E-03
				7439-97-6	Mercury	0.0212	mg/kg	1.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	4.5E-07	mg/m3	3.0E-04	mg/m3	2E-03
				7440-02-0	Nickel	11.3	mg/kg	2.3E-06	(µg/m3)	2.6E-04	1/(µg/m3)	5.9E-10	6.1E-09	mg/m3	9.0E-05	mg/m3	7E-05
				7782-49-2	Selenium	0.386	mg/kg	7.8E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-10	mg/m3	2.0E-02	mg/m3	1E-08
				7440-62-2	Vanadium	12.04	mg/kg	2.4E-06	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-09	mg/m3	1.0E-04	mg/m3	7E-05
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	4.3E-06	(µg/m3)	6.0E-05	1/(µg/m3)	2.6E-10	4.2E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	1.6E-08	(µg/m3)	6.0E-04	1/(µg/m3)	9.7E-12	1.6E-11	mg/m3	2.0E-06	mg/m3	8E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	2.7E-08	(µg/m3)	6.0E-05	1/(µg/m3)	1.6E-12	2.6E-11	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00959	mg/kg	5.7E-05	(µg/m3)	3.4E-05	1/(µg/m3)	1.9E-09	1.5E-07	mg/m3	3.0E-03	mg/m3	5E-05
			Total Inhalation									3E-08					1E-02
		Total Dust Inhalation										3E-08					1E-02
	Total Soil Direct Contact and Dust Inhalation											7E-06					1E-01
Medium Total												7E-06					1E-01
Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Tapwater	Ingestion	57-12-5	Cyanide	6.285	µg/l	8.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-04	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-01
				FREE CN	Cyanide (Free)	1.687	µg/l	2.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	8E-02
				16984-48-8	Fluoride	452	µg/l	5.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-02	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-01
				7440-36-0	Antimony	0.737	µg/l	9.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-05	(mg/kg-day)	4.0E-04	(mg/kg-day)	6E-02
				7439-96-5	Manganese	49.06	µg/l	6.3E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-03	(mg/kg-day)	2.4E-02	(mg/kg-day)	6E-02
				117-81-7	Bis(2-Ethylhexyl) Phthalate	73	µg/l	9.4E-04	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-05	2.2E-03	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-01
				91-20-3	Naphthalene	0.18	µg/l	2.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-04
			Total Ingestion									1E-05					1E+00
			Dermal	57-12-5	Cyanide	6.285	µg/l	4.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				FREE CN	Cyanide (Free)	1.687	µg/l	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-04
				16984-48-8	Fluoride	452	µg/l	3.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7440-36-0	Antimony	0.737	µg/l	5.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	3E-04
				7439-96-5	Manganese	49.06	µg/l	3.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				117-81-7	Bis(2-Ethylhexyl) Phthalate	73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.18	µg/l	1.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-04
			Total Dermal									NA					3E-03
		Total tapwater										NA					3E-03
	Total Groundwater Direct Contact											1E-05					1E+00
Medium Total												1E-05					1E+00
												Total of Receptor Risks Across All Media 2E-05					Total of Receptor Hazards Across All Media 1E+00

Table 7-20
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Resident [Child] - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration [1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12	Ingestion	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-03
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	NA	3.2E-06	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-03
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-01	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-01
				7440-38-2	Arsenic	5.257	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	3.1E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-01
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-05	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-01
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-03
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-01	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-01
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-03	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-01
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-04	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-03
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-04
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-04	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-02
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	4.7E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
			Total Ingestion									NA					9E-01
			Dermal	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.257	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	7.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	8.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
			Total Dermal									NA					1E-02
		Total Soil Direct Contact										NA					9E-01

Table 7-20
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Resident [Child] - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration [1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.188	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-06	mg/m3	8.0E-04	mg/m3	3E-03
				16984-48-8	Fluoride	4.869	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	2.6E-09	mg/m3	1.3E-02	mg/m3	2E-07
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(µg/m3)	8.4E-02	1/(µg/m3)	NA	1.8E-10	mg/m3	1.0E-04	mg/m3	2E-06
				7429-90-5	Aluminum	16697	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-06	mg/m3	5.0E-03	mg/m3	2E-03
				7440-38-2	Arsenic	5.257	mg/kg	NA	(µg/m3)	4.3E-03	1/(µg/m3)	NA	2.9E-09	mg/m3	1.5E-05	mg/m3	2E-04
				7440-48-4	Cobalt	5.781	mg/kg	NA	(µg/m3)	9.0E-03	1/(µg/m3)	NA	3.1E-09	mg/m3	6.0E-06	mg/m3	5E-04
				7440-50-8	Copper	16.02	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	8.7E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15191	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	8.3E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	2.5E-07	mg/m3	5.0E-05	mg/m3	5E-03
				7439-97-6	Mercury	0.0212	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	4.5E-07	mg/m3	3.0E-04	mg/m3	2E-03
				7440-02-0	Nickel	11.3	mg/kg	NA	(µg/m3)	2.6E-04	1/(µg/m3)	NA	6.1E-09	mg/m3	9.0E-05	mg/m3	7E-05
				7782-49-2	Selenium	0.386	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-10	mg/m3	2.0E-02	mg/m3	1E-08
				7440-62-2	Vanadium	12.04	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	6.5E-09	mg/m3	1.0E-04	mg/m3	7E-05
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	NA	(µg/m3)	6.0E-05	1/(µg/m3)	NA	4.2E-09	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	NA	(µg/m3)	6.0E-04	1/(µg/m3)	NA	1.6E-11	mg/m3	2.0E-06	mg/m3	8E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	NA	(µg/m3)	6.0E-05	1/(µg/m3)	NA	2.6E-11	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00959	mg/kg	NA	(µg/m3)	3.4E-05	1/(µg/m3)	NA	1.5E-07	mg/m3	3.0E-03	mg/m3	5E-05
			Total Inhalation									NA					1E-02
		Total Dust Inhalation										NA					1E-02
	Total Soil Direct Contact and Dust Inhalation											NA					9E-01
Medium Total												NA					9E-01
Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Tapwater	Ingestion	57-12-5	Cyanide	6.285	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-04	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-01
				FREE CN	Cyanide (Free)	1.687	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.4E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-01
				16984-48-8	Fluoride	452	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-02	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-01
				7440-36-0	Antimony	0.737	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-05	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-02
				7439-96-5	Manganese	49.06	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-03	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-01
				117-81-7	Bis(2-Ethylhexyl) Phthalate	73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	3.6E-03	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-01
				91-20-3	Naphthalene	0.18	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.0E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-04
			Total Ingestion									NA					2E+00
			Dermal	57-12-5	Cyanide	6.285	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				FREE CN	Cyanide (Free)	1.687	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				16984-48-8	Fluoride	452	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7440-36-0	Antimony	0.737	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-07	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-04
				7439-96-5	Manganese	49.06	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-04
				117-81-7	Bis(2-Ethylhexyl) Phthalate	73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.18	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-04
			Total Dermal									NA					7E-03
		Total tapwater										NA					7E-03
	Total Groundwater Direct Contact											NA					2E+00
Medium Total												NA					2E+00
											Total of Receptor Risks Across All Media	NA				Total of Receptor Hazards Across All Media	3E+00

Table 7-21
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Subsurface Soil 0-12	Ingestion	57-12-5	Cyanide	0.188	mg/kg	4.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	4.869	mg/kg	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	8E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	7.5E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	4E-08	2.1E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	7E-05
				7429-90-5	Aluminum	16697	mg/kg	3.8E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-02
				7440-38-2	Arsenic	5.257	mg/kg	7.2E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-06	2.0E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-03
				7440-48-4	Cobalt	5.781	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-50-8	Copper	16.02	mg/kg	3.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7439-89-6	Iron	15191	mg/kg	3.5E-03	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.7E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-02
				7439-96-5	Manganese	461.9	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-02
				7439-97-6	Mercury	0.0212	mg/kg	4.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	2.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-04
				7782-49-2	Selenium	0.386	mg/kg	8.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	5E-05
				7440-62-2	Vanadium	12.04	mg/kg	2.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	5.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	1.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	6.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-09	1.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	1.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	2.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-07
			Total Ingestion									1E-06					6E-02
			Dermal	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.257	mg/kg	1.5E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	4.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	3.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	8.8E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	3.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	1.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	6.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	1.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-07
			Total Dermal									2E-07					1E-03
		Total Soil Direct Contact										1E-06					6E-02

Table 7-21
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.188	mg/kg	2.2E-04	(µg/m3)	NA	1/(µg/m3)	NA	6.0E-07	mg/m3	8.0E-04	mg/m3	8E-04
				16984-48-8	Fluoride	4.869	mg/kg	2.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.1E-10	mg/m3	1.3E-02	mg/m3	5E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	1.5E-08	(µg/m3)	8.4E-02	1/(µg/m3)	1E-09	4.1E-11	mg/m3	1.0E-04	mg/m3	4E-07
				7429-90-5	Aluminum	16697	mg/kg	7.5E-04	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-06	mg/m3	5.0E-03	mg/m3	4E-04
				7440-38-2	Arsenic	5.257	mg/kg	2.4E-07	(µg/m3)	4.3E-03	1/(µg/m3)	1E-09	6.6E-10	mg/m3	1.5E-05	mg/m3	4E-05
				7440-48-4	Cobalt	5.781	mg/kg	2.6E-07	(µg/m3)	9.0E-03	1/(µg/m3)	2E-09	7.3E-10	mg/m3	6.0E-06	mg/m3	1E-04
				7440-50-8	Copper	16.02	mg/kg	7.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.0E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15191	mg/kg	6.8E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	461.9	mg/kg	2.1E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.8E-08	mg/m3	5.0E-05	mg/m3	1E-03
				7439-97-6	Mercury	0.0212	mg/kg	3.7E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-07	mg/m3	3.0E-04	mg/m3	3E-04
				7440-02-0	Nickel	11.3	mg/kg	5.1E-07	(µg/m3)	2.6E-04	1/(µg/m3)	1E-10	1.4E-09	mg/m3	9.0E-05	mg/m3	2E-05
				7782-49-2	Selenium	0.386	mg/kg	1.7E-08	(µg/m3)	NA	1/(µg/m3)	NA	4.8E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-62-2	Vanadium	12.04	mg/kg	5.4E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-09	mg/m3	1.0E-04	mg/m3	2E-05
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	3.5E-07	(µg/m3)	6.0E-05	1/(µg/m3)	2E-11	9.8E-10	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	1.3E-09	(µg/m3)	6.0E-04	1/(µg/m3)	8E-13	3.6E-12	mg/m3	2.0E-06	mg/m3	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	2.2E-09	(µg/m3)	6.0E-05	1/(µg/m3)	1E-13	6.0E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00959	mg/kg	1.3E-05	(µg/m3)	3.4E-05	1/(µg/m3)	4E-10	3.5E-08	mg/m3	3.0E-03	mg/m3	1E-05
			Total Inhalation									5E-09					3E-03
		Total Dust Inhalation										5E-09					3E-03
	Total Soil Direct Contact and Dust Inhalation											1E-06					6E-02
Medium Total												1E-06					6E-02
												Total of Receptor Risks Across All Media	1E-06		Total of Receptor Hazards Across All Media		6E-02

Table 7-22
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12	Ingestion	57-12-5	Cyanide	0.188	mg/kg	3.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-04
				16984-48-8	Fluoride	4.869	mg/kg	9.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	6.6E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	4.6E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	16697	mg/kg	3.3E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-02	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-02
				7440-38-2	Arsenic	5.257	mg/kg	6.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-08	4.4E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-02
				7440-48-4	Cobalt	5.781	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.1E-06	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-02
				7440-50-8	Copper	16.02	mg/kg	3.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-04
				7439-89-6	Iron	15191	mg/kg	3.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-02	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-02
				7439-96-5	Manganese	461.9	mg/kg	9.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-04	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-02
				7439-97-6	Mercury	0.0212	mg/kg	4.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	2.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-05	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-04
				7782-49-2	Selenium	0.386	mg/kg	7.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				7440-62-2	Vanadium	12.04	mg/kg	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-05	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-03
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	5.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-11	3.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	5.8E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-10	4.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	9.6E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	6.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	1.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-07
			Total Ingestion									1E-07					1E-01
			Dermal	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.257	mg/kg	1.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	7.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	2.1E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-11	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	2.4E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-10	1.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	4.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-11	2.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	8.0E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-07
			Total Dermal									2E-08					2E-03
		Total Soil Direct Contact										1E-07					1E-01

Table 7-22
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.188	mg/kg	5.7E-06	(µg/m3)	NA	1/(µg/m3)	NA	4.0E-07	mg/m3	8.0E-04	mg/m3	5E-04
				16984-48-8	Fluoride	4.869	mg/kg	5.8E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.1E-10	mg/m3	1.3E-02	mg/m3	3E-08
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	3.9E-10	(µg/m3)	8.4E-02	1/(µg/m3)	3E-11	2.7E-11	mg/m3	1.0E-04	mg/m3	3E-07
				7429-90-5	Aluminum	16697	mg/kg	2.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-06	mg/m3	5.0E-03	mg/m3	3E-04
				7440-38-2	Arsenic	5.257	mg/kg	6.3E-09	(µg/m3)	4.3E-03	1/(µg/m3)	3E-11	4.4E-10	mg/m3	1.5E-05	mg/m3	3E-05
				7440-48-4	Cobalt	5.781	mg/kg	6.9E-09	(µg/m3)	9.0E-03	1/(µg/m3)	6E-11	4.8E-10	mg/m3	6.0E-06	mg/m3	8E-05
				7440-50-8	Copper	16.02	mg/kg	1.9E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15191	mg/kg	1.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-06	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	461.9	mg/kg	5.5E-07	(µg/m3)	NA	1/(µg/m3)	NA	3.8E-08	mg/m3	5.0E-05	mg/m3	8E-04
				7439-97-6	Mercury	0.0212	mg/kg	9.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.9E-08	mg/m3	3.0E-04	mg/m3	2E-04
				7440-02-0	Nickel	11.3	mg/kg	1.3E-08	(µg/m3)	2.6E-04	1/(µg/m3)	3E-12	9.4E-10	mg/m3	9.0E-05	mg/m3	1E-05
				7782-49-2	Selenium	0.386	mg/kg	4.6E-10	(µg/m3)	NA	1/(µg/m3)	NA	3.2E-11	mg/m3	2.0E-02	mg/m3	2E-09
				7440-62-2	Vanadium	12.04	mg/kg	1.4E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-09	mg/m3	1.0E-04	mg/m3	1E-05
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	9.2E-09	(µg/m3)	6.0E-05	1/(µg/m3)	6E-13	6.5E-10	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	3.4E-11	(µg/m3)	6.0E-04	1/(µg/m3)	2E-14	2.4E-12	mg/m3	2.0E-06	mg/m3	1E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	5.7E-11	(µg/m3)	6.0E-05	1/(µg/m3)	3E-15	4.0E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00959	mg/kg	3.4E-07	(µg/m3)	3.4E-05	1/(µg/m3)	1E-11	2.3E-08	mg/m3	3.0E-03	mg/m3	8E-06
			Total Inhalation									1E-10					2E-03
		Total Dust Inhalation										1E-10					2E-03
	Total Soil Direct Contact and Dust Inhalation											1E-07					1E-01
Medium Total												1E-07					1E-01
											Total of Receptor Risks Across All Media	1E-07				Total of Receptor Hazards Across All Media	1E-01

Table 7-23
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Subsurface Soil 0-12	Ingestion	57-12-5	Cyanide	0.188	mg/kg	1.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-05
				16984-48-8	Fluoride	4.869	mg/kg	3.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-06
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	6.1E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	1.4E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-06
				7429-90-5	Aluminum	16697	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.3E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-04
				7440-38-2	Arsenic	5.257	mg/kg	2.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	5.781	mg/kg	3.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7440-50-8	Copper	16.02	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	15191	mg/kg	9.5E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.6E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	461.9	mg/kg	2.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-04
				7439-97-6	Mercury	0.0212	mg/kg	1.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	7.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				7782-49-2	Selenium	0.386	mg/kg	2.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-06
				7440-62-2	Vanadium	12.04	mg/kg	7.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.2E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	4.7E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-11	1.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	5.4E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-10	1.3E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	9.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-11	2.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	6.0E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-08
			Total Ingestion									3E-08					4E-03
			Dermal	57-12-5	Cyanide	0.188	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	4.869	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16697	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.257	mg/kg	4.1E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	2.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	5.781	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	16.02	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15191	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	461.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.0212	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	11.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.386	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	12.04	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	2.6E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-11	6.0E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	3.0E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-10	6.9E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	4.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-11	1.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00959	mg/kg	3.3E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-08
			Total Dermal									7E-09					1E-04
		Total Soil Direct Contact										4E-08					4E-03

Table 7-23
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Western Undeveloped Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.188	mg/kg	4.0E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.8E-09	mg/m3	8.0E-04	mg/m3	4E-06
				16984-48-8	Fluoride	4.869	mg/kg	4.1E-10	(µg/m3)	NA	1/(µg/m3)	NA	2.9E-12	mg/m3	1.3E-02	mg/m3	2E-10
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.329	mg/kg	8.3E-11	(µg/m3)	8.4E-02	1/(µg/m3)	7E-12	1.9E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	16697	mg/kg	1.4E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.8E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	5.257	mg/kg	4.4E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	3.1E-12	mg/m3	1.5E-05	mg/m3	2E-07
				7440-48-4	Cobalt	5.781	mg/kg	4.9E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	3.4E-12	mg/m3	6.0E-06	mg/m3	6E-07
				7440-50-8	Copper	16.02	mg/kg	1.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	9.4E-12	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	15191	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.9E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	461.9	mg/kg	3.9E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.7E-10	mg/m3	5.0E-05	mg/m3	5E-06
				7439-97-6	Mercury	0.0212	mg/kg	7.0E-08	(µg/m3)	NA	1/(µg/m3)	NA	4.9E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	11.3	mg/kg	9.5E-10	(µg/m3)	2.6E-04	1/(µg/m3)	2E-13	6.6E-12	mg/m3	9.0E-05	mg/m3	7E-08
				7782-49-2	Selenium	0.386	mg/kg	3.2E-11	(µg/m3)	NA	1/(µg/m3)	NA	2.3E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-62-2	Vanadium	12.04	mg/kg	1.0E-09	(µg/m3)	NA	1/(µg/m3)	NA	7.1E-12	mg/m3	1.0E-04	mg/m3	7E-08
				56-55-3	Benzo(A)Anthracene	0.0251	mg/kg	2.0E-09	(µg/m3)	6.0E-05	1/(µg/m3)	1E-13	4.6E-12	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.029	mg/kg	7.3E-12	(µg/m3)	6.0E-04	1/(µg/m3)	4E-15	1.7E-14	mg/m3	2.0E-06	mg/m3	9E-09
				205-99-2	Benzo(B)Fluoranthene	0.0481	mg/kg	1.2E-11	(µg/m3)	6.0E-05	1/(µg/m3)	7E-16	2.8E-14	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00959	mg/kg	2.4E-08	(µg/m3)	3.4E-05	1/(µg/m3)	8E-13	1.7E-10	mg/m3	3.0E-03	mg/m3	6E-08
			Total Inhalation									1E-11					1E-05
		Total Dust Inhalation										1E-11					1E-05
	Total Soil Direct Contact and Dust Inhalation											4E-08					4E-03
Medium Total												4E-08					4E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	5	µg/l	2.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				FREE CN	Cyanide (Free)	3.69	µg/l	1.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	137	µg/l	6.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
			Total Ingestion									NA					6E-04
			Dermal	57-12-5	Cyanide	5	µg/l	1.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				FREE CN	Cyanide (Free)	3.69	µg/l	1.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.7E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				16984-48-8	Fluoride	137	µg/l	5.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-06
			Total Dermal									NA					5E-05
		Total Surface Water										NA					5E-05
	Total Surface Water Direct Contact											NA					6E-04
Medium Total												NA					6E-04
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	12600	mg/kg	7.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	4.2	mg/kg	1.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	1.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	6.5	mg/kg	4.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7439-89-6	Iron	16400	mg/kg	1.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	571	mg/kg	3.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
			Total Ingestion									2E-08					4E-03
			Dermal	7429-90-5	Aluminum	12600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.2	mg/kg	3.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-09	2.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	6.5	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	16400	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	571	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
			Total Dermal									5E-09					8E-05
		Total Sediment										3E-08					4E-03
	Total Sediment Direct Contact											3E-08					4E-03
Medium Total												3E-08					4E-03
												Total of Receptor Risks Across All Media	7E-08		Total of Receptor Hazards Across All Media		9E-03

Table 7-24
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.763	mg/kg	3.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	15.82	mg/kg	7.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.878	mg/kg	4.1E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-08	1.1E-07	(mg/kg-day)	3.0E-03	(mg/kg-day)	4E-05
				7429-90-5	Aluminum	16100	mg/kg	7.5E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-03
				7440-36-0	Antimony	0.67	mg/kg	3.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	8.2	mg/kg	2.3E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-07	6.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-48-4	Cobalt	6.7	mg/kg	3.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-50-8	Copper	694	mg/kg	3.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7439-89-6	Iron	16300	mg/kg	7.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-03
				7439-96-5	Manganese	415	mg/kg	1.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-03
				7439-97-6	Mercury	1.4	mg/kg	6.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	53.9	mg/kg	2.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-04
				7782-49-2	Selenium	1.3	mg/kg	6.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-05
				7440-28-0	Thallium	0.2	mg/kg	9.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	3E-03
				7440-62-2	Vanadium	55.7	mg/kg	2.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-03
				56-55-3	Benzo(A)Anthracene	0.75	mg/kg	3.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	9.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	4	mg/kg	1.9E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-07	5.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				205-99-2	Benzo(B)Fluoranthene	6.6	mg/kg	3.1E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-08	8.6E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	2.2	mg/kg	1.0E-07	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-09	2.9E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-05
				53-70-3	Dibenz(A,H)Anthracene	0.44	mg/kg	2.0E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	5.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	mg/kg	1.4E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-08	4.0E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.015	mg/kg	7.0E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-07
			Total Ingestion									6E-07					2E-02
			Dermal	57-12-5	Cyanide	0.763	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	15.82	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.878	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	16100	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	8.2	mg/kg	4.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	6.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	694	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	16300	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	415	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	1.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	53.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	1.3	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	55.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.75	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	5.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	4	mg/kg	1.0E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	2.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				205-99-2	Benzo(B)Fluoranthene	6.6	mg/kg	1.7E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	4.7E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	2.2	mg/kg	4.3E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	6E-10	1.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-06
				53-70-3	Dibenz(A,H)Anthracene	0.44	mg/kg	1.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	3.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	mg/kg	7.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-09	2.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.015	mg/kg	3.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-08
			Total Dermal									2E-07					1E-03
		Total Soil Direct Contact										8E-07					2E-02

Table 7-24
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.763	mg/kg	2.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	6.2E-08	mg/m3	8.0E-04	mg/m3	8E-05
				16984-48-8	Fluoride	15.82	mg/kg	1.8E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.0E-11	mg/m3	1.3E-02	mg/m3	4E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.878	mg/kg	1.0E-09	(µg/m3)	8.4E-02	1/(µg/m3)	8E-11	2.8E-12	mg/m3	1.0E-04	mg/m3	3E-08
				7429-90-5	Aluminum	16100	mg/kg	1.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.1E-08	mg/m3	5.0E-03	mg/m3	1E-05
				7440-36-0	Antimony	0.67	mg/kg	7.6E-10	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-12	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	8.2	mg/kg	9.3E-09	(µg/m3)	4.3E-03	1/(µg/m3)	4E-11	2.6E-11	mg/m3	1.5E-05	mg/m3	2E-06
				7440-48-4	Cobalt	6.7	mg/kg	7.6E-09	(µg/m3)	9.0E-03	1/(µg/m3)	7E-11	2.1E-11	mg/m3	6.0E-06	mg/m3	4E-06
				7440-50-8	Copper	694	mg/kg	7.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.2E-09	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	16300	mg/kg	1.9E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.2E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	415	mg/kg	4.7E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-09	mg/m3	5.0E-05	mg/m3	3E-05
				7439-97-6	Mercury	1.4	mg/kg	6.3E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-07	mg/m3	3.0E-04	mg/m3	6E-04
				7440-02-0	Nickel	53.9	mg/kg	6.1E-08	(µg/m3)	2.6E-04	1/(µg/m3)	2E-11	1.7E-10	mg/m3	9.0E-05	mg/m3	2E-06
				7782-49-2	Selenium	1.3	mg/kg	1.5E-09	(µg/m3)	NA	1/(µg/m3)	NA	4.1E-12	mg/m3	2.0E-02	mg/m3	2E-10
				7440-28-0	Thallium	0.2	mg/kg	2.3E-10	(µg/m3)	NA	1/(µg/m3)	NA	6.4E-13	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	55.7	mg/kg	6.3E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-10	mg/m3	1.0E-04	mg/m3	2E-06
				56-55-3	Benzo(A)Anthracene	0.75	mg/kg	2.6E-07	(µg/m3)	6.0E-05	1/(µg/m3)	2E-11	7.4E-10	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	4	mg/kg	4.6E-09	(µg/m3)	6.0E-04	1/(µg/m3)	3E-12	1.3E-11	mg/m3	2.0E-06	mg/m3	6E-06
				205-99-2	Benzo(B)Fluoranthene	6.6	mg/kg	7.5E-09	(µg/m3)	6.0E-05	1/(µg/m3)	5E-13	2.1E-11	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	2.2	mg/kg	2.5E-09	(µg/m3)	2.4E-06	1/(µg/m3)	6E-15	7.0E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.44	mg/kg	5.0E-10	(µg/m3)	6.0E-04	1/(µg/m3)	3E-13	1.4E-12	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	3.1	mg/kg	3.5E-09	(µg/m3)	6.0E-05	1/(µg/m3)	2E-13	9.9E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.015	mg/kg	5.0E-07	(µg/m3)	3.4E-05	1/(µg/m3)	2E-11	1.4E-09	mg/m3	3.0E-03	mg/m3	5E-07
			Total Inhalation									2E-10					7E-04
		Total Dust Inhalation										2E-10					7E-04
	Total Soil Direct Contact and Dust Inhalation											8E-07					2E-02
Medium Total												8E-07					2E-02
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	245.7	µg/l	8.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-02
				FREE CN	Cyanide (Free)	11.2	µg/l	3.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				16984-48-8	Fluoride	2770	µg/l	9.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-03
				7429-90-5	Aluminum	8777	µg/l	2.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.1E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	8E-04
				7440-36-0	Antimony	0.677	µg/l	2.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	3.518	µg/l	1.2E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	3.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-39-3	Barium	701.6	µg/l	2.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-05	(mg/kg-day)	2.0E-01	(mg/kg-day)	3E-04
				7440-43-9	Cadmium	0.66	µg/l	2.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-08	(mg/kg-day)	5.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	2.844	µg/l	9.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	39.52	µg/l	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-05
				7439-89-6	Iron	14057	µg/l	4.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-03
				7439-96-5	Manganese	861.5	µg/l	2.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.0E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-03
				7439-97-6	Mercury	0.136	µg/l	4.5E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	13.84	µg/l	4.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-05
				7440-28-0	Thallium	0.253	µg/l	8.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-03
				7440-62-2	Vanadium	10.72	µg/l	3.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-04
				50-32-8	Benzo(A)Pyrene	0.36	µg/l	1.2E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	3.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				205-99-2	Benzo(B)Fluoranthene	0.53	µg/l	1.7E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.28	µg/l	9.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-10	2.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-07					6E-02

Table 7-24
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk	Non-Cancer Hazard Calculations: Intake/Exposure Concentration Value	Intake/Exposure Concentration Units	RfD/RfC Value	RfD/RfC Units	Hazard Quotient
Surface Water	Surface Water	Surface Water	Dermal	57-12-5	Cyanide	245.7	µg/l	4.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				FREE CN	Cyanide (Free)	11.2	µg/l	1.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-05
				16984-48-8	Fluoride	2770	µg/l	4.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7429-90-5	Aluminum	8777	µg/l	1.4E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-05
				7440-36-0	Antimony	0.677	µg/l	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	8E-06
				7440-38-2	Arsenic	3.518	µg/l	5.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-09	1.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				7440-39-3	Barium	701.6	µg/l	1.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	2E-05
				7440-43-9	Cadmium	0.66	µg/l	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-09	(mg/kg-day)	5.0E-04	(mg/kg-day)	6E-06
				7440-48-4	Cobalt	2.844	µg/l	1.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				7440-50-8	Copper	39.52	µg/l	6.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-06
				7439-89-6	Iron	14057	µg/l	2.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-05
				7439-96-5	Manganese	861.5	µg/l	1.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-04
				7439-97-6	Mercury	0.136	µg/l	2.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	13.84	µg/l	4.5E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-07
				7440-28-0	Thallium	0.253	µg/l	4.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	1E-04
				7440-62-2	Vanadium	10.72	µg/l	1.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-05
				50-32-8	Benzo(A)Pyrene	0.36	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.53	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.28	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									9E-09					3E-03
		Total Surface Water										9E-09					3E-03
	Total Surface Water Direct Contact											2E-07					6E-02
Medium Total												2E-07					6E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	1.875	mg/kg	8.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-04
				7429-90-5	Aluminum	1330	mg/kg	6.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	2.789	mg/kg	7.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-07	2.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-48-4	Cobalt	5.157	mg/kg	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7439-89-6	Iron	11110	mg/kg	5.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-03
				7439-96-5	Manganese	144.8	mg/kg	6.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-04
				50-32-8	Benzo(A)Pyrene	0.347	mg/kg	1.6E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	4.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				205-99-2	Benzo(B)Fluoranthene	0.701	mg/kg	3.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	9.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.118	mg/kg	5.5E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.542	mg/kg	2.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	7.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									1E-07					7E-03
			Dermal	57-12-5	Cyanide	1.875	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	1330	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	2.789	mg/kg	1.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	4.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	5.157	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	11110	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	144.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.347	mg/kg	8.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-09	2.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				205-99-2	Benzo(B)Fluoranthene	0.701	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	5.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.118	mg/kg	3.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	8.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.542	mg/kg	1.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									4E-08	0.0E+00				2E-04
		Total Sediment										2E-07					7E-03
	Total Sediment Direct Contact											2E-07					7E-03
Medium Total												2E-07					7E-03
												Total of Receptor Risks Across All Media	1E-06				Total of Receptor Hazards Across All Media	9E-02

Table 7-25
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-0.5 ft-bgs	Ingestion	57-12-5	Cyanide	4.117	mg/kg	2.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				16984-48-8	Fluoride	17.95	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.317	mg/kg	5.9E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	1.4E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-06
				7429-90-5	Aluminum	2570	mg/kg	1.6E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-04
				7440-36-0	Antimony	0.67	mg/kg	4.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	7E-05
				7440-38-2	Arsenic	3.53	mg/kg	1.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	9.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	4.98	mg/kg	3.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-50-8	Copper	204.4	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7439-89-6	Iron	11759	mg/kg	7.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	385.8	mg/kg	2.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	7E-04
				7439-97-6	Mercury	0.369	mg/kg	2.3E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	18.75	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-05
				7782-49-2	Selenium	0.477	mg/kg	3.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-06
				7440-28-0	Thallium	0.2	mg/kg	1.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	9E-04
				7440-62-2	Vanadium	13.2	mg/kg	8.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.14	mg/kg	2.6E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	6.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.459	mg/kg	8.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-09	2.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				205-99-2	Benzo(B)Fluoranthene	1.711	mg/kg	3.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	7.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0447	mg/kg	8.3E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-10	1.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.47	mg/kg	8.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-10	2.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.015	mg/kg	9.3E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-08
			Total Ingestion									4E-08					4E-03
			Dermal	57-12-5	Cyanide	4.117	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	17.95	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.317	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	2570	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.67	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	3.53	mg/kg	2.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-09	1.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				7440-48-4	Cobalt	4.98	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	204.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	11759	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	385.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.369	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	18.75	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.477	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.14	mg/kg	1.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	3.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.459	mg/kg	4.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	1.711	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0447	mg/kg	4.6E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-10	1.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.47	mg/kg	4.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-10	1.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.015	mg/kg	5.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-08
			Total Dermal									1E-08					1E-04
		Total Soil Direct Contact										5E-08					4E-03

Table 7-25
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	4.117	mg/kg	8.8E-06	(µg/m3)	NA	1/(µg/m3)	NA	6.2E-08	mg/m3	8.0E-04	mg/m3	8E-05
				16984-48-8	Fluoride	17.95	mg/kg	1.5E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.1E-11	mg/m3	1.3E-02	mg/m3	8E-10
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.317	mg/kg	8.0E-11	(µg/m3)	8.4E-02	1/(µg/m3)	7E-12	1.9E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	2570	mg/kg	2.2E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-09	mg/m3	5.0E-03	mg/m3	3E-07
				7440-36-0	Antimony	0.67	mg/kg	5.6E-11	(µg/m3)	NA	1/(µg/m3)	NA	3.9E-13	mg/m3	NA	mg/m3	NA
				7440-38-2	Arsenic	3.53	mg/kg	3.0E-10	(µg/m3)	4.3E-03	1/(µg/m3)	1E-12	2.1E-12	mg/m3	1.5E-05	mg/m3	1E-07
				7440-48-4	Cobalt	4.98	mg/kg	4.2E-10	(µg/m3)	9.0E-03	1/(µg/m3)	4E-12	2.9E-12	mg/m3	6.0E-06	mg/m3	5E-07
				7440-50-8	Copper	204.4	mg/kg	1.7E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-10	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	11759	mg/kg	9.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.9E-09	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	385.8	mg/kg	3.2E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.3E-10	mg/m3	5.0E-05	mg/m3	5E-06
				7439-97-6	Mercury	0.369	mg/kg	1.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.5E-09	mg/m3	3.0E-04	mg/m3	3E-05
				7440-02-0	Nickel	18.75	mg/kg	1.6E-09	(µg/m3)	2.6E-04	1/(µg/m3)	4E-13	1.1E-11	mg/m3	9.0E-05	mg/m3	1E-07
				7782-49-2	Selenium	0.477	mg/kg	4.0E-11	(µg/m3)	NA	1/(µg/m3)	NA	2.8E-13	mg/m3	2.0E-02	mg/m3	1E-11
				7440-28-0	Thallium	0.2	mg/kg	1.7E-11	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-13	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.2	mg/kg	1.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	7.8E-12	mg/m3	1.0E-04	mg/m3	8E-08
				56-55-3	Benzo(A)Anthracene	0.14	mg/kg	1.1E-08	(µg/m3)	6.0E-05	1/(µg/m3)	7E-13	2.5E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.459	mg/kg	1.2E-10	(µg/m3)	6.0E-04	1/(µg/m3)	7E-14	2.7E-13	mg/m3	2.0E-06	mg/m3	1E-07
				205-99-2	Benzo(B)Fluoranthene	1.711	mg/kg	4.3E-10	(µg/m3)	6.0E-05	1/(µg/m3)	3E-14	1.0E-12	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0447	mg/kg	1.1E-11	(µg/m3)	6.0E-04	1/(µg/m3)	7E-15	2.6E-14	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.47	mg/kg	1.2E-10	(µg/m3)	6.0E-05	1/(µg/m3)	7E-15	2.8E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.015	mg/kg	3.7E-08	(µg/m3)	3.4E-05	1/(µg/m3)	1E-12	2.6E-10	mg/m3	3.0E-03	mg/m3	9E-08
			Total Inhalation									1E-11					1E-04
		Total Dust Inhalation										1E-11					1E-04
	Total Soil Direct Contact and Dust Inhalation											5E-08					5E-03
Medium Total												5E-08					5E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	245.7	µg/l	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-02
				FREE CN	Cyanide (Free)	11.2	µg/l	5.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				16984-48-8	Fluoride	2770	µg/l	1.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.6E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7429-90-5	Aluminum	8777	µg/l	3.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-36-0	Antimony	0.677	µg/l	3.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	5E-05
				7440-38-2	Arsenic	3.518	µg/l	1.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	1.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-39-3	Barium	701.6	µg/l	3.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-05	(mg/kg-day)	2.0E-01	(mg/kg-day)	1E-04
				7440-43-9	Cadmium	0.66	µg/l	2.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-08	(mg/kg-day)	5.0E-04	(mg/kg-day)	4E-05
				7440-48-4	Cobalt	2.844	µg/l	1.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-50-8	Copper	39.52	µg/l	1.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-05
				7439-89-6	Iron	14057	µg/l	6.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.4E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	6E-04
				7439-96-5	Manganese	861.5	µg/l	3.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.136	µg/l	6.0E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	13.84	µg/l	6.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				7440-28-0	Thallium	0.253	µg/l	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-04
				7440-62-2	Vanadium	10.72	µg/l	4.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	7E-05
				50-32-8	Benzo(A)Pyrene	0.36	µg/l	4.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	0.53	µg/l	7.0E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-10	1.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.28	µg/l	3.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	8.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									3E-08					2E-02

Table 7-25
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(South Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Surface Water	Dermal	57-12-5	Cyanide	245.7	µg/l	9.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				FREE CN	Cyanide (Free)	11.2	µg/l	4.2E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-05
				16984-48-8	Fluoride	2770	µg/l	1.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.3E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	8777	µg/l	3.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-05
				7440-36-0	Antimony	0.677	µg/l	2.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-06
				7440-38-2	Arsenic	3.518	µg/l	1.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-09	9.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				7440-39-3	Barium	701.6	µg/l	2.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	9E-06
				7440-43-9	Cadmium	0.66	µg/l	2.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-09	(mg/kg-day)	5.0E-04	(mg/kg-day)	3E-06
				7440-48-4	Cobalt	2.844	µg/l	4.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7440-50-8	Copper	39.52	µg/l	1.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-06
				7439-89-6	Iron	14057	µg/l	5.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	5E-05
				7439-96-5	Manganese	861.5	µg/l	3.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	9E-05
				7439-97-6	Mercury	0.136	µg/l	5.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	13.84	µg/l	1.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.3E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-07
				7440-28-0	Thallium	0.253	µg/l	9.5E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.7E-10	(mg/kg-day)	1.0E-05	(mg/kg-day)	7E-05
				7440-62-2	Vanadium	10.72	µg/l	4.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	6E-06
				50-32-8	Benzo(A)Pyrene	0.36	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.53	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.28	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-09					2E-03
		Total Surface Water										2E-09					2E-03
	Total Surface Water Direct Contact											3E-08					2E-02
Medium Total												3E-08					2E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	1.875	mg/kg	1.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	1330	mg/kg	8.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-05
				7440-38-2	Arsenic	2.789	mg/kg	1.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	7.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	5.157	mg/kg	3.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7439-89-6	Iron	11110	mg/kg	6.9E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	144.8	mg/kg	9.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				50-32-8	Benzo(A)Pyrene	0.347	mg/kg	6.5E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-09	1.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				205-99-2	Benzo(B)Fluoranthene	0.701	mg/kg	1.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.118	mg/kg	2.2E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	5.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.542	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									3E-08					2E-03
			Dermal	57-12-5	Cyanide	1.875	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	1330	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	2.789	mg/kg	2.2E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-09	1.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				7440-48-4	Cobalt	5.157	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	11110	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	144.8	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.347	mg/kg	3.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	8.3E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				205-99-2	Benzo(B)Fluoranthene	0.701	mg/kg	7.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-10	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.118	mg/kg	1.2E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	2.8E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.542	mg/kg	5.6E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	1.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									9E-09					8E-05
		Total Sediment										4E-08					2E-03
	Total Sediment Direct Contact											4E-08					2E-03
Medium Total												4E-08					2E-03
												Total of Receptor Risks Across All Media					3E-02

Table 7-26
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
								Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	30.73	µg/l	2.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				FREE CN	Cyanide (Free)	11.13	µg/l	7.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-04
				16984-48-8	Fluoride	447.1	µg/l	3.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7429-90-5	Aluminum	760.3	µg/l	5.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-05
				7440-38-2	Arsenic	0.972	µg/l	6.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-39-3	Barium	123.5	µg/l	8.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	2E-05
				7440-48-4	Cobalt	3.9	µg/l	2.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7439-89-6	Iron	834.8	µg/l	5.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-05
				7439-96-5	Manganese	153.2	µg/l	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-04
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	8.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-10	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	3.5E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	6.1E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	9.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	1.5E-07	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-09	5.3E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	2.1E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-10	3.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-08					3E-03
			Dermal	57-12-5	Cyanide	30.73	µg/l	5.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				FREE CN	Cyanide (Free)	11.13	µg/l	2.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				16984-48-8	Fluoride	447.1	µg/l	8.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	8E-05
				7429-90-5	Aluminum	760.3	µg/l	1.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-06	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-06
				7440-38-2	Arsenic	0.972	µg/l	1.9E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-09	6.5E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				7440-39-3	Barium	123.5	µg/l	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.3E-07	(mg/kg-day)	2.0E-01	(mg/kg-day)	4E-06
				7440-48-4	Cobalt	3.9	µg/l	3.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				7439-89-6	Iron	834.8	µg/l	1.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	8E-06
				7439-96-5	Manganese	153.2	µg/l	2.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-05
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									3E-09					7E-04
		Total Surface Water										3E-09					7E-04
	Total Surface Water Direct Contact											2E-08					3E-03
Medium Total												2E-08					3E-03
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	0.525	mg/kg	5.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				7429-90-5	Aluminum	8441	mg/kg	8.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-38-2	Arsenic	3.691	mg/kg	2.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	7.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.549	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7439-89-6	Iron	13961	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	221.1	mg/kg	2.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	1.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	4.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	6.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	1.5E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	2.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									4E-08					2E-03

Table 7-26
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Dermal	57-12-5	Cyanide	0.525	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	8441	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	3.691	mg/kg	1.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	5.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	5.549	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	13961	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	221.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	7.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-09	1.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	3.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	5.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	2.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	4.8E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									4E-08	0.0E+00				2E-04
		Total Sediment										8E-08					2E-03
	Total Sediment Direct Contact											8E-08					2E-03
Medium Total												8E-08					2E-03
												Total of Receptor Risks Across All Media	1E-07		Total of Receptor Hazards Across All Media		6E-03

Table 7-27
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	30.73	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				FREE CN	Cyanide (Free)	11.13	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	8E-04
				16984-48-8	Fluoride	447.1	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	5E-04
				7429-90-5	Aluminum	760.3	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-05
				7440-38-2	Arsenic	0.972	µg/l	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	4.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-39-3	Barium	123.5	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	3E-05
				7440-48-4	Cobalt	3.9	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7439-89-6	Iron	834.8	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	5E-05
				7439-96-5	Manganese	153.2	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.8E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	2.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	1.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	9.7E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-05
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	6.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									NA					5E-03
			Dermal	57-12-5	Cyanide	30.73	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				FREE CN	Cyanide (Free)	11.13	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	447.1	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	760.3	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.3E-06	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-06
				7440-38-2	Arsenic	0.972	µg/l	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				7440-39-3	Barium	123.5	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	8E-06
				7440-48-4	Cobalt	3.9	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				7439-89-6	Iron	834.8	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-05
				7439-96-5	Manganese	153.2	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-05
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									NA					1E-03
		Total Surface Water										NA					1E-03
	Total Surface Water Direct Contact											NA					6E-03
Medium Total												NA					6E-03
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	0.525	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-05
				7429-90-5	Aluminum	8441	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	3.691	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	5.549	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7439-89-6	Iron	13961	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	221.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	6E-04
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	3.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	5.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	4.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									NA					4E-03

Table 7-27
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Dermal	57-12-5	Cyanide	0.525	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	8441	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	3.691	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	9.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.549	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	13961	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	221.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	5.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.0E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	8.8E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									NA	0.0E+00				4E-04
		Total Sediment										NA					4E-03
	Total Sediment Direct Contact											NA					4E-03
Medium Total												NA					4E-03
												Total of Receptor Risks Across All Media					NA	Total of Receptor Hazards Across All Media				1E-02

Note:
1/ Carcinogenic risks for this receptor are calculated based on a time-weighted average approach and are presented on Table 7-26.

Table 7-28
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Fisher] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	30.73	µg/l	2.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				FREE CN	Cyanide (Free)	11.13	µg/l	7.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-04
				16984-48-8	Fluoride	447.1	µg/l	3.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7429-90-5	Aluminum	760.3	µg/l	5.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-05
				7440-38-2	Arsenic	0.972	µg/l	6.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-39-3	Barium	123.5	µg/l	8.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	2.0E-01	(mg/kg-day)	2E-05
				7440-48-4	Cobalt	3.9	µg/l	2.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7439-89-6	Iron	834.8	µg/l	5.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-05
				7439-96-5	Manganese	153.2	µg/l	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-04
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	4.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	1.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	1.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	6.1E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	4.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-10	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	1.5E-07	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-09	5.3E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	1.0E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-10	3.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-08					3E-03
			Dermal	57-12-5	Cyanide	30.73	µg/l	1.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				FREE CN	Cyanide (Free)	11.13	µg/l	6.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-05
				16984-48-8	Fluoride	447.1	µg/l	2.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7429-90-5	Aluminum	760.3	µg/l	4.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-06	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-06
				7440-38-2	Arsenic	0.972	µg/l	5.7E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-10	2.0E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
				7440-39-3	Barium	123.5	µg/l	7.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	2.0E-01	(mg/kg-day)	1E-06
				7440-48-4	Cobalt	3.9	µg/l	9.2E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7439-89-6	Iron	834.8	µg/l	4.9E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-06
				7439-96-5	Manganese	153.2	µg/l	9.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-05
				56-55-3	Benzo(A)Anthracene	0.63	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.25	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.7	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	22	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.015	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									9E-10					2E-04
		Total Surface Water										9E-10					2E-04
		Fish	Fish	16984-48-8	Fluoride	4.471	mg/kg	3.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.7E-12	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-10
				7429-90-5	Aluminum	380.15	mg/kg	3.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-10	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-10
				7440-38-2	Arsenic	0.2916	mg/kg	2.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	4.3E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-09
				7440-48-4	Cobalt	1.17	mg/kg	9.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-12	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-09
				7439-89-6	Iron	166.96	mg/kg	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-10	(mg/kg-day)	7.0E-01	(mg/kg-day)	4E-10
				7439-96-5_d	Manganese	61.28	mg/kg	4.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.1E-11	(mg/kg-day)	1.4E-01	(mg/kg-day)	7E-10
				56-55-3	Benzo(A)Anthracene	0.16381005	mg/kg	1.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.4E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	1.28675	mg/kg	1.0E-07	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-07	1.9E-12	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-09
				205-99-2	Benzo(B)Fluoranthene	2.1168	mg/kg	1.6E-07	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-08	3.2E-12	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	12.9366754	mg/kg	1.0E-06	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	1E-08	1.9E-11	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-09
				53-70-3	Dibenz(A,H)Anthracene	0.14394	mg/kg	1.1E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	2.1E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Fish									2E-07					2E-08
		Total Fish										2E-07					2E-08
	Total Surface Water Direct Contact and Ingestion of Fish											2E-07					3E-03
Medium Total												2E-07					3E-03

Table 7-28
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Flathead River Area - Recreationist [Fisher] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	0.525	mg/kg	5.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-05
				7429-90-5	Aluminum	8441	mg/kg	8.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-38-2	Arsenic	3.691	mg/kg	2.2E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	7.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.549	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7439-89-6	Iron	13961	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	221.1	mg/kg	2.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	5.0E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-10	1.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	2.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	6.9E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	9.0E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-10	3.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	7.7E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-10	2.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									4E-08					2E-03
			Dermal	57-12-5	Cyanide	0.525	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	8441	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	3.691	mg/kg	4.6E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-09	1.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-05
				7440-48-4	Cobalt	5.549	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	13961	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	221.1	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.511	mg/kg	2.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	9.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.202	mg/kg	1.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	3.8E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				205-99-2	Benzo(B)Fluoranthene	0.919	mg/kg	4.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-10	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0786	mg/kg	4.2E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-10	1.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									9E-09	0.0E+00				7E-05
		Total Sediment										5E-08					2E-03
	Total Sediment Direct Contact											5E-08					2E-03
Medium Total												5E-08					2E-03
												Total of Receptor Risks Across All Media	2E-07		Total of Receptor Hazards Across All Media		5E-03

Table 7-29
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	1.546	mg/kg	7.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				16984-48-8	Fluoride	21.93	mg/kg	1.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	1.6E-08	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	8E-09	4.4E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	1E-05
				7429-90-5	Aluminum	10800	mg/kg	5.0E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	5.6	mg/kg	1.6E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	4.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-48-4	Cobalt	7.6	mg/kg	3.5E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7440-50-8	Copper	22.7	mg/kg	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-05
				7439-89-6	Iron	17600	mg/kg	8.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-03
				7439-96-5	Manganese	467	mg/kg	2.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-03
				7439-97-6	Mercury	0.03	mg/kg	1.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	7.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.1E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-04
				7782-49-2	Selenium	0.65	mg/kg	3.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-05
				7440-62-2	Vanadium	17.2	mg/kg	8.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-04
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	4.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	1.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	4.7E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	5.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	3.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
			Total Ingestion									2E-07					1E-02
			Dermal	57-12-5	Cyanide	1.546	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	21.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.6	mg/kg	3.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	9.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.03	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.65	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	17.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	2.3E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	6.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	9.2E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-10	2.6E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	2.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-06
			Total Dermal									5E-08					3E-04
		Total Soil Direct Contact										3E-07					1E-02

Table 7-29
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	1.546	mg/kg	4.5E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-07	mg/m3	8.0E-04	mg/m3	2E-04
				16984-48-8	Fluoride	21.93	mg/kg	2.5E-08	(µg/m3)	NA	1/(µg/m3)	NA	7.0E-11	mg/m3	1.3E-02	mg/m3	5E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	3.8E-10	(µg/m3)	8.4E-02	1/(µg/m3)	3E-11	1.1E-12	mg/m3	1.0E-04	mg/m3	1E-08
				7429-90-5	Aluminum	10800	mg/kg	1.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	3.4E-08	mg/m3	5.0E-03	mg/m3	7E-06
				7440-38-2	Arsenic	5.6	mg/kg	6.4E-09	(µg/m3)	4.3E-03	1/(µg/m3)	3E-11	1.8E-11	mg/m3	1.5E-05	mg/m3	1E-06
				7440-48-4	Cobalt	7.6	mg/kg	8.7E-09	(µg/m3)	9.0E-03	1/(µg/m3)	8E-11	2.4E-11	mg/m3	6.0E-06	mg/m3	4E-06
				7440-50-8	Copper	22.7	mg/kg	2.6E-08	(µg/m3)	NA	1/(µg/m3)	NA	7.2E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	17600	mg/kg	2.0E-05	(µg/m3)	NA	1/(µg/m3)	NA	5.6E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	467	mg/kg	5.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-09	mg/m3	5.0E-05	mg/m3	3E-05
				7439-97-6	Mercury	0.03	mg/kg	1.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.8E-09	mg/m3	3.0E-04	mg/m3	1E-05
				7440-02-0	Nickel	16.4	mg/kg	1.9E-08	(µg/m3)	2.6E-04	1/(µg/m3)	5E-12	5.2E-11	mg/m3	9.0E-05	mg/m3	6E-07
				7782-49-2	Selenium	0.65	mg/kg	7.4E-10	(µg/m3)	NA	1/(µg/m3)	NA	2.1E-12	mg/m3	2.0E-02	mg/m3	1E-10
				7440-62-2	Vanadium	17.2	mg/kg	2.0E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-11	mg/m3	1.0E-04	mg/m3	5E-07
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	3.2E-08	(µg/m3)	6.0E-05	1/(µg/m3)	2E-12	9.0E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	4.1E-11	(µg/m3)	6.0E-04	1/(µg/m3)	2E-14	1.1E-13	mg/m3	2.0E-06	mg/m3	6E-08
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	4.6E-10	(µg/m3)	6.0E-05	1/(µg/m3)	3E-14	1.3E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.81	mg/kg	2.7E-05	(µg/m3)	3.4E-05	1/(µg/m3)	9E-10	7.6E-08	mg/m3	3.0E-03	mg/m3	3E-05
			Total Inhalation									1E-09					2E-04
		Total Dust Inhalation										1E-09					2E-04
	Total Soil Direct Contact and Dust Inhalation											3E-07					1E-02
Medium Total												3E-07					1E-02
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	378	µg/l	1.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-02
				FREE CN	Cyanide (Free)	53.38	µg/l	1.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	8E-03
				16984-48-8	Fluoride	1880	µg/l	6.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-04	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-03
				7440-38-2	Arsenic	0.698	µg/l	2.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	6.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	1.377	µg/l	4.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7439-89-6	Iron	636.6	µg/l	2.1E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	8E-05
				7439-96-5	Manganese	104.5	µg/l	3.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.7E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-04
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	1.4E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	4.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	7.3E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-10	2.0E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	2.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	7.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	1.2E-07	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-09	3.4E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	2.2E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-10	6.1E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									4E-08					7E-02
			Dermal	57-12-5	Cyanide	378	µg/l	6.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-03
				FREE CN	Cyanide (Free)	53.38	µg/l	8.8E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-04
				16984-48-8	Fluoride	1880	µg/l	3.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.6E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7440-38-2	Arsenic	0.698	µg/l	1.1E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-09	3.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7440-48-4	Cobalt	1.377	µg/l	9.0E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-06
				7439-89-6	Iron	636.6	µg/l	1.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	4E-06
				7439-96-5	Manganese	104.5	µg/l	1.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-05
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-09					4E-03
		Total Surface Water										2E-09					4E-03
	Total Surface Water Direct Contact											4E-08					8E-02
Medium Total												4E-08					8E-02

Table 7-29
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	2.651	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				7429-90-5	Aluminum	9016	mg/kg	4.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-03	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	4.83	mg/kg	1.3E-07	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-07	3.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-48-4	Cobalt	5.836	mg/kg	2.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-03
				7439-89-6	Iron	14760	mg/kg	6.9E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-03
				7439-96-5	Manganese	215	mg/kg	1.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7440-28-0	Thallium	0.18	mg/kg	8.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-03
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	4.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-09	1.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	1.8E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	5.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	8.6E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-09	2.4E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	8.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-09	2.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	3.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	8.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									2E-07					1E-02
			Dermal	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.83	mg/kg	2.9E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	8.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	2.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	7.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	1.0E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	2.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	4.7E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-09	1.3E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	4.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	1.7E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									7E-08	0.0E+00				4E-04
		Total Sediment										3E-07					1E-02
	Total Sediment Direct Contact											3E-07					1E-02
Medium Total												3E-07					1E-02
												7E-07					1E-01

Table 7-30
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-0.5 ft-bgs	Ingestion	57-12-5	Cyanide	1.9	mg/kg	1.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				16984-48-8	Fluoride	32.7	mg/kg	2.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.331873	mg/kg	6.2E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	1.4E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-06
				7429-90-5	Aluminum	10800	mg/kg	6.7E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	5E-04
				7440-38-2	Arsenic	5.4	mg/kg	2.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	7.6	mg/kg	4.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7440-50-8	Copper	22.7	mg/kg	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	17600	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.7E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	467	mg/kg	2.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-04
				7439-97-6	Mercury	0.024	mg/kg	1.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	4E-05
				7440-62-2	Vanadium	16.6	mg/kg	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	1.7E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	4.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	6.7E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-10	1.6E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	7.5E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-10	1.7E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	5.0E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
			Total Ingestion									3E-08					4E-03
			Dermal	57-12-5	Cyanide	1.9	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	32.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.331873	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.4	mg/kg	4.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	3.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.024	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7440-62-2	Vanadium	16.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	9.3E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-11	2.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	3.7E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-10	8.6E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	4.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	9.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	2.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
			Total Dermal									7E-09					1E-04
		Total Soil Direct Contact										4E-08					4E-03
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	1.9	mg/kg	4.1E-06	(µg/m3)	NA	1/(µg/m3)	NA	2.8E-08	mg/m3	8.0E-04	mg/m3	4E-05
				16984-48-8	Fluoride	32.7	mg/kg	2.7E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-11	mg/m3	1.3E-02	mg/m3	1E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.331873	mg/kg	8.4E-11	(µg/m3)	8.4E-02	1/(µg/m3)	7E-12	1.9E-13	mg/m3	1.0E-04	mg/m3	2E-09
				7429-90-5	Aluminum	10800	mg/kg	9.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.3E-09	mg/m3	5.0E-03	mg/m3	1E-06
				7440-38-2	Arsenic	5.4	mg/kg	4.5E-10	(µg/m3)	4.3E-03	1/(µg/m3)	2E-12	3.2E-12	mg/m3	1.5E-05	mg/m3	2E-07
				7440-48-4	Cobalt	7.6	mg/kg	6.4E-10	(µg/m3)	9.0E-03	1/(µg/m3)	6E-12	4.5E-12	mg/m3	6.0E-06	mg/m3	7E-07
				7440-50-8	Copper	22.7	mg/kg	1.9E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	17600	mg/kg	1.5E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	467	mg/kg	3.9E-08	(µg/m3)	NA	1/(µg/m3)	NA	2.7E-10	mg/m3	5.0E-05	mg/m3	5E-06
				7439-97-6	Mercury	0.024	mg/kg	7.9E-08	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-10	mg/m3	3.0E-04	mg/m3	2E-06
				7440-02-0	Nickel	16.4	mg/kg	1.4E-09	(µg/m3)	2.6E-04	1/(µg/m3)	4E-13	9.6E-12	mg/m3	9.0E-05	mg/m3	1E-07
				7440-62-2	Vanadium	16.6	mg/kg	1.4E-09	(µg/m3)	NA	1/(µg/m3)	NA	9.8E-12	mg/m3	1.0E-04	mg/m3	1E-07
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	7.1E-09	(µg/m3)	6.0E-05	1/(µg/m3)	4E-13	1.7E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	9.1E-12	(µg/m3)	6.0E-04	1/(µg/m3)	5E-15	2.1E-14	mg/m3	2.0E-06	mg/m3	1E-08
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	1.0E-10	(µg/m3)	6.0E-05	1/(µg/m3)	6E-15	2.4E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.81	mg/kg	2.0E-06	(µg/m3)	3.4E-05	1/(µg/m3)	7E-11	1.4E-08	mg/m3	3.0E-03	mg/m3	5E-06
			Total Inhalation									8E-11					5E-05
		Total Dust Inhalation										8E-11					5E-05
	Total Soil Direct Contact and Dust Inhalation											4E-08					5E-03

Table 7-30
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Medium Total												4E-08					5E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	378	µg/l	1.7E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-02
				FREE CN	Cyanide (Free)	53.38	µg/l	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-03
				16984-48-8	Fluoride	1880	µg/l	8.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	0.698	µg/l	3.1E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-09	2.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				7440-48-4	Cobalt	1.377	µg/l	6.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7439-89-6	Iron	636.6	µg/l	2.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-05
				7439-96-5	Manganese	104.5	µg/l	4.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	5.7E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-11	1.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	2.9E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-10	6.8E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	1.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	2.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	1.6E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-10	1.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	6E-06
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	8.8E-11	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-11	2.0E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									5E-09					2E-02
			Dermal	57-12-5	Cyanide	378	µg/l	1.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.9E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				FREE CN	Cyanide (Free)	53.38	µg/l	2.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	1880	µg/l	7.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7440-38-2	Arsenic	0.698	µg/l	2.6E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-10	1.8E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-06
				7440-48-4	Cobalt	1.377	µg/l	2.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-06
				7439-89-6	Iron	636.6	µg/l	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-06
				7439-96-5	Manganese	104.5	µg/l	3.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-05
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									4E-10					2E-03
		Total Surface Water										4E-10					2E-03
	Total Surface Water Direct Contact											6E-09					3E-02
Medium Total												6E-09					3E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	2.651	mg/kg	1.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	9016	mg/kg	5.6E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-04
				7440-38-2	Arsenic	4.83	mg/kg	1.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	1.3E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	5.836	mg/kg	3.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-04
				7439-89-6	Iron	14760	mg/kg	9.2E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.4E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	215	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.4E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	4E-04
				7440-28-0	Thallium	0.18	mg/kg	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	8E-04
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	7.4E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-09	1.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	3.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	8.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	3.5E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	8.2E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	1.2E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.9E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									4E-08					4E-03

Table 7-30
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Dermal	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.83	mg/kg	3.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-09	2.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	4.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	9.4E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	1.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	4.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	6.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	7E-10	1.6E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-08	0.0E+00				1E-04
		Total Sediment										6E-08					4E-03
	Total Sediment Direct Contact											6E-08					4E-03
Medium Total												6E-08					4E-03
												Total of Receptor Risks Across All Media 1E-07					Total of Receptor Hazards Across All Media 3E-02

Table 7-31
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Backwater Seep Sampling Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	1.546	mg/kg	1.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-05
				16984-48-8	Fluoride	21.93	mg/kg	2.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	6.6E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	3E-09	1.1E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	4E-06
				7429-90-5	Aluminum	10800	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-04
				7440-38-2	Arsenic	5.6	mg/kg	3.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	7.6	mg/kg	7.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	22.7	mg/kg	2.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	17600	mg/kg	1.7E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	467	mg/kg	4.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	7E-04
				7439-97-6	Mercury	0.03	mg/kg	2.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	1.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				7782-49-2	Selenium	0.65	mg/kg	6.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-06
				7440-62-2	Vanadium	17.2	mg/kg	1.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	1.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	3.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	7.0E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-10	1.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	7.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-10	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	7.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
			Total Ingestion									5E-08					3E-03
			Dermal	57-12-5	Cyanide	1.546	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	21.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.6	mg/kg	2.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	7.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.03	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.65	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	17.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	3.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-10	5.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	1.3E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	2.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	1.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	1.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.0E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-06
			Total Dermal									4E-08					3E-04
		Total Soil Direct Contact										9E-08					4E-03

Table 7-31
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Backwater Seep Sampling Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	1.546	mg/kg	9.5E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.3E-08	mg/m3	8.0E-04	mg/m3	4E-05
				16984-48-8	Fluoride	21.93	mg/kg	5.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-11	mg/m3	1.3E-02	mg/m3	1E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	1.6E-10	(µg/m3)	8.4E-02	1/(µg/m3)	1.3E-11	2.8E-13	mg/m3	1.0E-04	mg/m3	3E-09
				7429-90-5	Aluminum	10800	mg/kg	2.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	5.6	mg/kg	1.3E-09	(µg/m3)	4.3E-03	1/(µg/m3)	5.8E-12	4.7E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	7.6	mg/kg	1.8E-09	(µg/m3)	9.0E-03	1/(µg/m3)	1.6E-11	6.4E-12	mg/m3	6.0E-06	mg/m3	1E-06
				7440-50-8	Copper	22.7	mg/kg	5.4E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	17600	mg/kg	4.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	467	mg/kg	1.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	3.9E-10	mg/m3	5.0E-05	mg/m3	8E-06
				7439-97-6	Mercury	0.03	mg/kg	2.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	9.9E-10	mg/m3	3.0E-04	mg/m3	3E-06
				7440-02-0	Nickel	16.4	mg/kg	3.9E-09	(µg/m3)	2.6E-04	1/(µg/m3)	1.0E-12	1.4E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.65	mg/kg	1.6E-10	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-13	mg/m3	2.0E-02	mg/m3	3E-11
				7440-62-2	Vanadium	17.2	mg/kg	4.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-11	mg/m3	1.0E-04	mg/m3	1E-07
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	1.4E-08	(µg/m3)	6.0E-05	1/(µg/m3)	8.1E-13	2.4E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	1.7E-11	(µg/m3)	6.0E-04	1/(µg/m3)	1.0E-14	3.0E-14	mg/m3	2.0E-06	mg/m3	2E-08
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	1.9E-10	(µg/m3)	6.0E-05	1/(µg/m3)	1.2E-14	3.4E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.81	mg/kg	5.7E-06	(µg/m3)	3.4E-05	1/(µg/m3)	1.9E-10	2.0E-08	mg/m3	3.0E-03	mg/m3	7E-06
			Total Inhalation									2E-10					6E-05
		Total Dust Inhalation										2E-10					6E-05
	Total Soil Direct Contact and Dust Inhalation											9E-08					4E-03
Medium Total												9E-08					4E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	378	µg/l	2.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-02
				FREE CN	Cyanide (Free)	53.38	µg/l	3.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				16984-48-8	Fluoride	1880	µg/l	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	0.698	µg/l	4.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-09	1.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				7440-48-4	Cobalt	1.377	µg/l	9.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7439-89-6	Iron	636.6	µg/l	4.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-05
				7439-96-5	Manganese	104.5	µg/l	7.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	6.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-11	1.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	3.1E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-10	5.3E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	1.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-10	2.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	2.6E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-10	9.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	9.2E-11	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-11	1.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									8E-09					2E-02
			Dermal	57-12-5	Cyanide	378	µg/l	7.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-03
				FREE CN	Cyanide (Free)	53.38	µg/l	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-04
				16984-48-8	Fluoride	1880	µg/l	3.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-04
				7440-38-2	Arsenic	0.698	µg/l	1.3E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-09	4.7E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				7440-48-4	Cobalt	1.377	µg/l	1.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				7439-89-6	Iron	636.6	µg/l	1.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.3E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	6E-06
				7439-96-5	Manganese	104.5	µg/l	2.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-05
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-09					5E-03
		Total Surface Water										2E-09					5E-03
	Total Surface Water Direct Contact											1E-08					2E-02
Medium Total												1E-08					2E-02

Table 7-31
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Backwater Seep Sampling Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	2.651	mg/kg	2.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.1E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	9016	mg/kg	8.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-38-2	Arsenic	4.83	mg/kg	2.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	9.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.836	mg/kg	5.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7439-89-6	Iron	14760	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	215	mg/kg	2.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				7440-28-0	Thallium	0.18	mg/kg	1.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	6E-04
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	3.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	7.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-09	1.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	3.6E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-09	6.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	3.7E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	6.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	1.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	2.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									6E-08					3E-03
			Dermal	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.83	mg/kg	2.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	3E-08	6.8E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	3.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-09	6.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	1.4E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	6.5E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-09	1.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	6.6E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	7E-09	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	2.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	4.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									6E-08					3E-04
		Total Sediment										1E-07					3E-03
	Total Sediment Direct Contact											1E-07					3E-03
Medium Total												1E-07					3E-03
												Total of Receptor Risks Across All Media					2E-07	Total of Receptor Hazards Across All Media					3E-02

Table 7-32
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	1.546	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.6E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	21.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	3E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	NA	2.1E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	7E-06
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	7E-04
				7440-38-2	Arsenic	5.6	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	2.1E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-03
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	4E-05
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-03	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-03
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.9E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.03	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-06	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-05
				7782-49-2	Selenium	0.65	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-06
				7440-62-2	Vanadium	17.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-06	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-04
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	5.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	2.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.0E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-06
			Total Ingestion									NA					6E-03
			Dermal	57-12-5	Cyanide	1.546	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	21.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.6	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	1.4E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-04
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.03	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.65	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	17.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	4.0E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	4.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.0E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
			Total Dermal									NA					5E-04
		Total Soil Direct Contact										NA					7E-03

Table 7-32
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	1.546	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	3.3E-08	mg/m3	8.0E-04	mg/m3	4E-05
				16984-48-8	Fluoride	21.93	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-11	mg/m3	1.3E-02	mg/m3	1E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(µg/m3)	8.4E-02	1/(µg/m3)	NA	2.8E-13	mg/m3	1.0E-04	mg/m3	3E-09
				7429-90-5	Aluminum	10800	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	5.6	mg/kg	NA	(µg/m3)	4.3E-03	1/(µg/m3)	NA	4.7E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	7.6	mg/kg	NA	(µg/m3)	9.0E-03	1/(µg/m3)	NA	6.4E-12	mg/m3	6.0E-06	mg/m3	1E-06
				7440-50-8	Copper	22.7	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	17600	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	467	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	3.9E-10	mg/m3	5.0E-05	mg/m3	8E-06
				7439-97-6	Mercury	0.03	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	9.9E-10	mg/m3	3.0E-04	mg/m3	3E-06
				7440-02-0	Nickel	16.4	mg/kg	NA	(µg/m3)	2.6E-04	1/(µg/m3)	NA	1.4E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.65	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-13	mg/m3	2.0E-02	mg/m3	3E-11
				7440-62-2	Vanadium	17.2	mg/kg	NA	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-11	mg/m3	1.0E-04	mg/m3	1E-07
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	NA	(µg/m3)	6.0E-05	1/(µg/m3)	NA	2.4E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	NA	(µg/m3)	6.0E-04	1/(µg/m3)	NA	3.0E-14	mg/m3	2.0E-06	mg/m3	2E-08
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	NA	(µg/m3)	6.0E-05	1/(µg/m3)	NA	3.4E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.81	mg/kg	NA	(µg/m3)	3.4E-05	1/(µg/m3)	NA	2.0E-08	mg/m3	3.0E-03	mg/m3	7E-06
			Total Inhalation									NA					6E-05
		Total Dust Inhalation										NA					6E-05
	Total Soil Direct Contact and Dust Inhalation											NA					7E-03
Medium Total												NA					7E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	378	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-05	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-02
				FREE CN	Cyanide (Free)	53.38	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-03
				16984-48-8	Fluoride	1880	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.3E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-03
				7440-38-2	Arsenic	0.698	µg/l	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	3.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	1.377	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				7439-89-6	Iron	636.6	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	4E-05
				7439-96-5	Manganese	104.5	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-04
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	9.7E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-06
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	3.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	1.6E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-06
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.9E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									NA					3E-02
			Dermal	57-12-5	Cyanide	378	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	8E-03
				FREE CN	Cyanide (Free)	53.38	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.5E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				16984-48-8	Fluoride	1880	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-04
				7440-38-2	Arsenic	0.698	µg/l	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	8.5E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-05
				7440-48-4	Cobalt	1.377	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.7E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				7439-89-6	Iron	636.6	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-05
				7439-96-5	Manganese	104.5	µg/l	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	5E-05
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									NA					9E-03
		Total Surface Water										NA					9E-03
	Total Surface Water Direct Contact											NA					4E-02
Medium Total												NA					4E-02

Table 7-32
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration[1]		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	3E-04
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-04
				7440-38-2	Arsenic	4.83	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-03
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	6E-04
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-08	(mg/kg-day)	1.0E-05	(mg/kg-day)	1E-03
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	6.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	4.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									NA					6E-03
			Dermal	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.83	mg/kg	NA	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	NA	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	4.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	2.1E-07	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	2.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	7.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									NA	0.0E+00				6E-04
		Total Sediment										NA					6E-03
	Total Sediment Direct Contact											NA					6E-03
Medium Total												NA					6E-03
												Total of Receptor Risks Across All Media					NA	Total of Receptor Hazards Across All Media			6E-02

Note:
1/ Carcinogenic risks for this receptor are calculated based on a time-weighted average approach and are presented on Table 7-32.

Table 7-33
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	1.546	mg/kg	1.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.3E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-05
				16984-48-8	Fluoride	21.93	mg/kg	2.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.5E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	3.3E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-09	1.1E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	4E-06
				7429-90-5	Aluminum	10800	mg/kg	1.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	4E-04
				7440-38-2	Arsenic	5.6	mg/kg	3.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	7.6	mg/kg	7.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	22.7	mg/kg	2.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	17600	mg/kg	1.7E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-04
				7439-96-5	Manganese	467	mg/kg	4.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	7E-04
				7439-97-6	Mercury	0.03	mg/kg	2.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	1.6E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.6E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				7782-49-2	Selenium	0.65	mg/kg	6.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-06
				7440-62-2	Vanadium	17.2	mg/kg	1.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	8.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-11	3.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	3.5E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-10	1.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	3.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	7.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	1E-06
			Total Ingestion									5E-08					3E-03
			Dermal	57-12-5	Cyanide	1.546	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	21.93	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	10800	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	5.6	mg/kg	6.9E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	7.6	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	22.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	17600	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	467	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.03	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	16.4	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.65	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-62-2	Vanadium	17.2	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	4.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-11	1.7E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	1.9E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-10	6.8E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	2.1E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	7.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.81	mg/kg	4.4E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	8E-07
			Total Dermal									1E-08					8E-05
		Total Soil Direct Contact										6E-08					4E-03

Table 7-33
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	1.546	mg/kg	9.5E-06	(µg/m3)	NA	1/(µg/m3)	NA	3.3E-08	mg/m3	8.0E-04	mg/m3	4E-05
				16984-48-8	Fluoride	21.93	mg/kg	5.3E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-11	mg/m3	1.3E-02	mg/m3	1E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.335	mg/kg	8.0E-11	(µg/m3)	8.4E-02	1/(µg/m3)	7E-12	2.8E-13	mg/m3	1.0E-04	mg/m3	3E-09
				7429-90-5	Aluminum	10800	mg/kg	2.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	9.1E-09	mg/m3	5.0E-03	mg/m3	2E-06
				7440-38-2	Arsenic	5.6	mg/kg	1.3E-09	(µg/m3)	4.3E-03	1/(µg/m3)	6E-12	4.7E-12	mg/m3	1.5E-05	mg/m3	3E-07
				7440-48-4	Cobalt	7.6	mg/kg	1.8E-09	(µg/m3)	9.0E-03	1/(µg/m3)	2E-11	6.4E-12	mg/m3	6.0E-06	mg/m3	1E-06
				7440-50-8	Copper	22.7	mg/kg	5.4E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.9E-11	mg/m3	NA	mg/m3	NA
				7439-89-6	Iron	17600	mg/kg	4.2E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-08	mg/m3	NA	mg/m3	NA
				7439-96-5	Manganese	467	mg/kg	1.1E-07	(µg/m3)	NA	1/(µg/m3)	NA	3.9E-10	mg/m3	5.0E-05	mg/m3	8E-06
				7439-97-6	Mercury	0.03	mg/kg	2.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	9.9E-10	mg/m3	3.0E-04	mg/m3	3E-06
				7440-02-0	Nickel	16.4	mg/kg	3.9E-09	(µg/m3)	2.6E-04	1/(µg/m3)	1E-12	1.4E-11	mg/m3	9.0E-05	mg/m3	2E-07
				7782-49-2	Selenium	0.65	mg/kg	1.6E-10	(µg/m3)	NA	1/(µg/m3)	NA	5.5E-13	mg/m3	2.0E-02	mg/m3	3E-11
				7440-62-2	Vanadium	17.2	mg/kg	4.1E-09	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-11	mg/m3	1.0E-04	mg/m3	1E-07
				56-55-3	Benzo(A)Anthracene	0.091	mg/kg	6.8E-09	(µg/m3)	6.0E-05	1/(µg/m3)	4E-13	2.4E-11	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.036	mg/kg	8.6E-12	(µg/m3)	6.0E-04	1/(µg/m3)	5E-15	3.0E-14	mg/m3	2.0E-06	mg/m3	2E-08
				205-99-2	Benzo(B)Fluoranthene	0.4	mg/kg	9.6E-11	(µg/m3)	6.0E-05	1/(µg/m3)	6E-15	3.4E-13	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.81	mg/kg	5.7E-06	(µg/m3)	3.4E-05	1/(µg/m3)	2E-10	2.0E-08	mg/m3	3.0E-03	mg/m3	7E-06
			Total Inhalation									2E-10					6E-05
		Total Dust Inhalation										2E-10					6E-05
	Total Soil Direct Contact and Dust Inhalation											6E-08					4E-03
Medium Total												6E-08					4E-03
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	378	µg/l	2.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-02
				FREE CN	Cyanide (Free)	53.38	µg/l	3.7E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-03
				16984-48-8	Fluoride	1880	µg/l	1.3E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-05	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-03
				7440-38-2	Arsenic	0.698	µg/l	4.8E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	7E-09	1.7E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				7440-48-4	Cobalt	1.377	µg/l	9.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7439-89-6	Iron	636.6	µg/l	4.4E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.5E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-05
				7439-96-5	Manganese	104.5	µg/l	7.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.5E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	3.0E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-11	1.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	1.5E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-10	5.3E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	5.6E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-11	2.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	2.6E-08	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-10	9.1E-08	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-06
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	4.6E-11	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-11	1.6E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									8E-09					2E-02
			Dermal	57-12-5	Cyanide	378	µg/l	2.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.8E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-03
				FREE CN	Cyanide (Free)	53.38	µg/l	3.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-07	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				16984-48-8	Fluoride	1880	µg/l	1.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7440-38-2	Arsenic	0.698	µg/l	4.1E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	6E-10	1.4E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	5E-06
				7440-48-4	Cobalt	1.377	µg/l	3.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-06
				7439-89-6	Iron	636.6	µg/l	3.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-06
				7439-96-5	Manganese	104.5	µg/l	6.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	9E-06
				56-55-3	Benzo(A)Anthracene	0.043	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.022	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				205-99-2	Benzo(B)Fluoranthene	0.081	µg/l	NA	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	3.73	µg/l	NA	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	2.0E-02	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0066	µg/l	NA	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									6E-10					2E-03
		Total Surface Water										6E-10					2E-03

Table 7-33
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Backwater Seep Sampling Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Fish	Fish	57-12-5	Cyanide	0.0	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				FREE CN	Cyanide (Free)	0.0	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	18.8	mg/kg	1.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-11	(mg/kg-day)	4.0E-02	(mg/kg-day)	7E-10
				7440-38-2	Arsenic	0.2094	mg/kg	1.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	2E-08	3.1E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-09
				7440-48-4	Cobalt	0.4131	mg/kg	3.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-09
				7439-89-6	Iron	127.32	mg/kg	9.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-10	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-10
				7439-96-5_d	Manganese	41.8	mg/kg	3.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-11	(mg/kg-day)	1.4E-01	(mg/kg-day)	4E-10
				56-55-3	Benzo(A)Anthracene	0.01118069	mg/kg	8.7E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	9E-11	1.7E-14	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.113234	mg/kg	8.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	9E-09	1.7E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-10
				205-99-2	Benzo(B)Fluoranthene	0.244944	mg/kg	1.9E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	3.7E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	2.19335451	mg/kg	1.7E-07	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-09	3.3E-12	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-10
				53-70-3	Dibenz(A,H)Anthracene	0.0633336	mg/kg	4.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-09	9.4E-14	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Fish									4E-08					5E-09
		Total Fish										4E-08					5E-09
	Total Surface Water Direct Contact and Fish Ingestion											5E-08					2E-02
Medium Total												5E-08					2E-02
Sediment	Sediment	Sediment	Ingestion	57-12-5	Cyanide	2.651	mg/kg	2.6E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.1E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	9016	mg/kg	8.8E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	3E-04
				7440-38-2	Arsenic	4.83	mg/kg	2.8E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-08	9.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7440-48-4	Cobalt	5.836	mg/kg	5.7E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7439-89-6	Iron	14760	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.1E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	215	mg/kg	2.1E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
				7440-28-0	Thallium	0.18	mg/kg	1.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	6E-04
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	9.5E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	3.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	1.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	6.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	1.8E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	6.5E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	6.5E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	2.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									5E-08					3E-03
			Dermal	57-12-5	Cyanide	2.651	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				7429-90-5	Aluminum	9016	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	4.83	mg/kg	6.0E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-09	2.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				7440-48-4	Cobalt	5.836	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	14760	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	215	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7440-28-0	Thallium	0.18	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.973	mg/kg	5.2E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	5E-10	1.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.394	mg/kg	2.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	7.4E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-05
				205-99-2	Benzo(B)Fluoranthene	1.855	mg/kg	1.0E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.189	mg/kg	1.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	3.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.663	mg/kg	3.6E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	4E-10	1.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									1E-08	0.0E+00				9E-05
		Total Sediment										7E-08					3E-03
	Total Sediment Direct Contact											7E-08					3E-03
Medium Total												7E-08					3E-03
												Total of Receptor Risks Across All Media	2E-07		Total of Receptor Hazards Across All Media		3E-02

Table 7-34
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [ATV] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (ATV)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil From ATV Exposure Areas	Soil	Surface Soil 0-2 ft-bgs	Ingestion	57-12-5	Cyanide	0.29300642	mg/kg	2.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.0E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				16984-48-8	Fluoride	22.7914301	mg/kg	2.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.32607673	mg/kg	2.9E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	1E-09	1.0E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	3E-06
				7429-90-5	Aluminum	18557.0116	mg/kg	1.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.7E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-04
				7440-36-0	Antimony	0.05130691	mg/kg	4.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-09	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-06
				7440-38-2	Arsenic	6.22728079	mg/kg	3.3E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	5.90525034	mg/kg	5.2E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-50-8	Copper	148.69741	mg/kg	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7439-89-6	Iron	15926.1672	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	710.968876	mg/kg	6.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	9E-04
				7439-97-6	Mercury	0.02656944	mg/kg	2.3E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	15.0583445	mg/kg	1.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.6E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-05
				7782-49-2	Selenium	0.65988222	mg/kg	5.8E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.0E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	4E-06
				7440-28-0	Thallium	0.07336573	mg/kg	6.5E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.3E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	2E-04
				7440-62-2	Vanadium	13.4614316	mg/kg	1.2E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.1E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	8E-05
				11097-69-1	PCB-1254 (Aroclor 1254)	0.06602135	mg/kg	5.8E-10	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	1E-09	2.0E-09	(mg/kg-day)	2.0E-05	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	2.04476541	mg/kg	1.8E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	6.3E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	2.10690976	mg/kg	1.9E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-08	6.5E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-04
				205-99-2	Benzo(B)Fluoranthene	2.61830676	mg/kg	2.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-09	8.1E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	1.04220794	mg/kg	9.2E-09	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	9E-11	3.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0476283	mg/kg	4.2E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	6E-12	1.5E-09	(mg/kg-day)	2.0E-02	(mg/kg-day)	7E-08
				218-01-9	Chrysene	2.26524854	mg/kg	2.0E-08	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	2E-11	7.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.43891611	mg/kg	3.9E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	4E-09	1.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.18915793	mg/kg	1.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.8E-09	(mg/kg-day)	1.0E-03	(mg/kg-day)	6E-06
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.6282684	mg/kg	1.4E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	5.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.01899676	mg/kg	1.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-08
			Total Ingestion									8E-08					4E-03
			Dermal	57-12-5	Cyanide	0.29300642	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	22.7914301	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.32607673	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	18557.0116	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-36-0	Antimony	0.05130691	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-05	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.22728079	mg/kg	7.0E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	5.90525034	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	148.69741	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15926.1672	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	710.968876	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.02656944	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	15.0583445	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.65988222	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.07336573	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.4614316	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				11097-69-1	PCB-1254 (Aroclor 1254)	0.06602135	mg/kg	3.4E-10	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	7E-10	1.2E-09	(mg/kg-day)	2.0E-05	(mg/kg-day)	6E-05
				56-55-3	Benzo(A)Anthracene	2.04476541	mg/kg	9.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	3.5E-08	(mg/kg-day)	NA	(mg/kg-day)	NA

Table 7-34
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [ATV] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (ATV)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil From ATV Exposure Areas	Soil	Surface Soil 0-2 ft-bgs	Dermal	50-32-8	Benzo(A)Pyrene	2.10690976	mg/kg	1.0E-08	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-08	3.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				205-99-2	Benzo(B)Fluoranthene	2.61830676	mg/kg	1.3E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	4.4E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	1.04220794	mg/kg	5.0E-09	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	5E-11	1.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0476283	mg/kg	1.8E-10	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	2E-12	6.2E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-08
				218-01-9	Chrysene	2.26524854	mg/kg	1.1E-08	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	1E-11	3.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.43891611	mg/kg	2.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	2E-09	7.4E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.18915793	mg/kg	2.1E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.4E-10	(mg/kg-day)	1.0E-03	(mg/kg-day)	7E-07
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.6282684	mg/kg	7.9E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-10	2.8E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.01899676	mg/kg	9.2E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.2E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-08
			Total Dermal									3E-08					3E-04
		Total Soil Direct Contact										1E-07					4E-03
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.29300642	mg/kg	2.3E-06	(µg/m3)	NA	1/(µg/m3)	NA	8.2E-09	mg/m3	8.0E-04	mg/m3	1E-05
				16984-48-8	Fluoride	22.7914301	mg/kg	5.7E-05	(µg/m3)	NA	1/(µg/m3)	NA	2.0E-07	mg/m3	1.3E-02	mg/m3	2E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.32607673	mg/kg	8.1E-07	(µg/m3)	8.4E-02	1/(µg/m3)	7E-08	2.8E-09	mg/m3	1.0E-04	mg/m3	3E-05
				7429-90-5	Aluminum	18557.0116	mg/kg	4.6E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-04	mg/m3	5.0E-03	mg/m3	3E-02
				7440-36-0	Antimony	0.05130691	mg/kg	1.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	4.5E-10	mg/m4	NA	mg/m4	NA
				7440-38-2	Arsenic	6.22728079	mg/kg	1.2E-05	(µg/m3)	4.3E-03	1/(µg/m3)	5E-08	4.3E-08	mg/m5	1.5E-05	mg/m5	3E-03
				7440-48-4	Cobalt	5.90525034	mg/kg	1.5E-05	(µg/m3)	9.0E-03	1/(µg/m3)	1E-07	5.2E-08	mg/m7	6.0E-06	mg/m7	9E-03
				7440-50-8	Copper	148.69741	mg/kg	3.7E-04	(µg/m3)	NA	1/(µg/m3)	NA	1.3E-06	mg/m8	NA	mg/m8	NA
				7439-89-6	Iron	15926.1672	mg/kg	4.0E-02	(µg/m3)	NA	1/(µg/m3)	NA	1.4E-04	mg/m9	NA	mg/m9	NA
				7439-96-5	Manganese	710.968876	mg/kg	1.1E-03	(µg/m3)	NA	1/(µg/m3)	NA	3.8E-06	mg/m10	5.0E-05	mg/m10	8E-02
				7439-97-6	Mercury	0.02656944	mg/kg	2.9E-07	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-09	mg/m11	3.0E-04	mg/m11	3E-06
				7440-02-0	Nickel	15.0583445	mg/kg	3.8E-05	(µg/m3)	2.6E-04	1/(µg/m3)	1E-08	1.3E-07	mg/m12	9.0E-05	mg/m12	1E-03
				7782-49-2	Selenium	0.65988222	mg/kg	1.6E-06	(µg/m3)	NA	1/(µg/m3)	NA	5.8E-09	mg/m13	2.0E-02	mg/m13	3E-07
				7440-28-0	Thallium	0.07336573	mg/kg	1.8E-07	(µg/m3)	NA	1/(µg/m3)	NA	6.4E-10	mg/m3	NA	mg/m3	NA
				7440-62-2	Vanadium	13.4614316	mg/kg	3.4E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-07	mg/m3	1.0E-04	mg/m3	1E-03
				11097-69-1	PCB-1254 (Aroclor 1254)	0.06602135	mg/kg	1.9E-07	(µg/m3)	5.7E-04	1/(µg/m3)	1E-10	6.6E-10	mg/m3	NA	mg/m3	NA
				56-55-3	Benzo(A)Anthracene	2.04476541	mg/kg	5.2E-06	(µg/m3)	6.0E-05	1/(µg/m3)	3E-10	1.8E-08	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	2.10690976	mg/kg	5.3E-06	(µg/m3)	6.0E-04	1/(µg/m3)	3E-09	1.8E-08	mg/m3	2.0E-06	mg/m3	9E-03
				205-99-2	Benzo(B)Fluoranthene	2.61830676	mg/kg	6.5E-06	(µg/m3)	6.0E-05	1/(µg/m3)	4E-10	2.3E-08	mg/m3	NA	mg/m3	NA
				207-08-9	Benzo(K)Fluoranthene	1.04220794	mg/kg	2.6E-06	(µg/m3)	6.0E-06	1/(µg/m3)	2E-11	9.1E-09	mg/m3	NA	mg/m3	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.0476283	mg/kg	1.2E-07	(µg/m3)	2.4E-06	1/(µg/m3)	3E-13	4.2E-10	mg/m3	NA	mg/m3	NA
				218-01-9	Chrysene	2.26524854	mg/kg	5.7E-06	(µg/m3)	6.0E-07	1/(µg/m3)	3E-12	2.0E-08	mg/m3	NA	mg/m3	NA
				53-70-3	Dibenz(A,H)Anthracene	0.43891611	mg/kg	1.1E-06	(µg/m3)	6.0E-04	1/(µg/m3)	7E-10	3.8E-09	mg/m3	NA	mg/m3	NA
				132-64-9	Dibenzofuran	0.18915793	mg/kg	8.3E-07	(µg/m3)	NA	1/(µg/m3)	NA	2.9E-09	mg/m3	NA	mg/m3	NA
				193-39-5	Indeno(1,2,3-C,D)Pyrene	1.6282684	mg/kg	4.1E-06	(µg/m3)	6.0E-05	1/(µg/m3)	2E-10	1.4E-08	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.01899676	mg/kg	1.7E-07	(µg/m3)	3.4E-05	1/(µg/m3)	6E-12	5.9E-10	mg/m3	3.0E-03	mg/m3	2E-07
			Total Inhalation									3E-07					1E-01
		Total Dust Inhalation										3E-07					1E-01
	Total Soil Vapor and Dust Inhalation											3E-07					1E-01
Medium Total												4E-07					1E-01
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	2.462	µg/l	1.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-05
				FREE CN	Cyanide (Free)	2.229	µg/l	1.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	8E-05
				16984-48-8	Fluoride	345.7	µg/l	2.2E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-04
				7429-90-5	Aluminum	582.3	µg/l	3.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-05
				7440-36-0	Antimony	0.781	µg/l	4.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.7E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-05
				7440-38-2	Arsenic	0.88	µg/l	5.5E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-09	1.9E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-05
				7440-48-4	Cobalt	1.376	µg/l	8.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.0E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7439-89-6	Iron	564.1	µg/l	3.5E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-05	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-05
				7439-96-5	Manganese	324.5	µg/l	2.0E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.1E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	3E-04
			Total Ingestion									8E-09					9E-04

Table 7-34
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [ATV] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (ATV)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
						Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
								Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Surface Water	Dermal	57-12-5	Cyanide	2.462	µg/l	7.6E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-06
				FREE CN	Cyanide (Free)	2.229	µg/l	6.9E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-09	(mg/kg-day)	6.0E-04	(mg/kg-day)	4E-06
				16984-48-8	Fluoride	345.7	µg/l	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.8E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	9E-06
				7429-90-5	Aluminum	582.3	µg/l	1.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-07	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-07
				7440-36-0	Antimony	0.781	µg/l	2.4E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.5E-10	(mg/kg-day)	4.0E-04	(mg/kg-day)	2E-06
				7440-38-2	Arsenic	0.88	µg/l	2.7E-10	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-10	9.6E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-06
				7440-48-4	Cobalt	1.376	µg/l	1.7E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.0E-10	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-06
				7439-89-6	Iron	564.1	µg/l	1.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.1E-07	(mg/kg-day)	7.0E-01	(mg/kg-day)	9E-07
				7439-96-5	Manganese	324.5	µg/l	1.0E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-07	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-05
			Total Dermal									4E-10					4E-05
		Total Surface Water										9E-09					9E-04
	Total Surface Water Direct Contact											9E-09					9E-04
Medium Total												9E-09					9E-04
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	19203	mg/kg	1.7E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.9E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	6E-04
				7440-38-2	Arsenic	6.59	mg/kg	3.5E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-08	1.2E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-04
				7440-48-4	Cobalt	6.118	mg/kg	5.4E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7439-89-6	Iron	15598	mg/kg	1.4E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.8E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	7E-04
				7439-96-5	Manganese	630.7	mg/kg	5.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.9E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	8E-04
				50-32-8	Benzo(A)Pyrene	0.694	mg/kg	6.1E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	6E-09	2.1E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				205-99-2	Benzo(B)Fluoranthene	1.301	mg/kg	1.1E-08	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	1E-09	4.0E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0954	mg/kg	8.4E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-10	2.9E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Ingestion									6E-08					3E-03
			Dermal	7429-90-5	Aluminum	19203	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.59	mg/kg	7.4E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.6E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-05
				7440-48-4	Cobalt	6.118	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	15598	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	630.7	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.694	mg/kg	3.4E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-09	1.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				205-99-2	Benzo(B)Fluoranthene	1.301	mg/kg	6.3E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-10	2.2E-08	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.0954	mg/kg	4.6E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	5E-10	1.6E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
			Total Dermal									2E-08					1E-04
		Total Sediment										8E-08					3E-03
	Total Sediment Direct Contact											8E-08					3E-03
Medium Total												8E-08					3E-03
												Total of Receptor Risks Across All Media 5E-07					Total of Receptor Hazards Across All Media 1E-01

Table 7-35
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [Hunter] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil From Hunter Exposure Areas	Soil	Surface Soil 0-0.5 ft-bgs	Ingestion	57-12-5	Cyanide	0.25939448	mg/kg	3.6E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	2E-05
				16984-48-8	Fluoride	8.35958719	mg/kg	1.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.0E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-05
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.31192947	mg/kg	4.3E-09	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	2E-09	1.5E-08	(mg/kg-day)	3.0E-03	(mg/kg-day)	5E-06
				7429-90-5	Aluminum	19217.0391	mg/kg	2.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-04
				7440-38-2	Arsenic	6.14187394	mg/kg	5.0E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-08	1.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	6E-04
				7440-48-4	Cobalt	5.9144341	mg/kg	8.1E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.8E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7440-50-8	Copper	17.1720566	mg/kg	2.4E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-07	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-05
				7439-89-6	Iron	15793.4341	mg/kg	2.2E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.6E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	750.289171	mg/kg	1.0E-05	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
				7439-97-6	Mercury	0.02773858	mg/kg	3.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	12.9162884	mg/kg	1.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.2E-07	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-05
				7782-49-2	Selenium	0.72516013	mg/kg	9.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	5.0E-03	(mg/kg-day)	7E-06
				7440-28-0	Thallium	0.06432988	mg/kg	8.8E-10	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-09	(mg/kg-day)	1.0E-05	(mg/kg-day)	3E-04
				7440-62-2	Vanadium	13.1712588	mg/kg	1.8E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.3E-07	(mg/kg-day)	5.0E-03	(mg/kg-day)	1E-04
				56-55-3	Benzo(A)Anthracene	0.05791253	mg/kg	7.9E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-11	2.8E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.07495344	mg/kg	1.0E-09	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-09	3.6E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-05
				205-99-2	Benzo(B)Fluoranthene	0.128102	mg/kg	1.8E-09	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	2E-10	6.1E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00708721	mg/kg	9.7E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.4E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	2E-08
			Total Ingestion									8E-08					6E-03
			Dermal	57-12-5	Cyanide	0.25939448	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	6.0E-04	(mg/kg-day)	NA
				16984-48-8	Fluoride	8.35958719	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.31192947	mg/kg	NA	(mg/kg-day)	1.3E-02	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.5E-05	(mg/kg-day)	NA
				7429-90-5	Aluminum	19217.0391	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.14187394	mg/kg	6.2E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	9E-09	2.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-05
				7440-48-4	Cobalt	5.9144341	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7440-50-8	Copper	17.1720566	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	4.0E-02	(mg/kg-day)	NA
				7439-89-6	Iron	15793.4341	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	750.289171	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
				7439-97-6	Mercury	0.02773858	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	12.9162884	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	8.0E-04	(mg/kg-day)	NA
				7782-49-2	Selenium	0.72516013	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	5.0E-03	(mg/kg-day)	NA
				7440-28-0	Thallium	0.06432988	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E-05	(mg/kg-day)	NA
				7440-62-2	Vanadium	13.1712588	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.3E-04	(mg/kg-day)	NA
				56-55-3	Benzo(A)Anthracene	0.05791253	mg/kg	2.5E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-11	8.9E-10	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.07495344	mg/kg	3.3E-10	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	3E-10	1.2E-09	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-06
				205-99-2	Benzo(B)Fluoranthene	0.128102	mg/kg	5.6E-10	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	6E-11	2.0E-09	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	0.00708721	mg/kg	3.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-10	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-09
			Total Dermal									1E-08					8E-05
		Total Soil Direct Contact										9E-08					6E-03

Table 7-35
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [Hunter] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
	Air	Airborne vapors /dust	Inhalation	57-12-5	Cyanide	0.25939448	mg/kg	1.8E-05	(µg/m3)	NA	1/(µg/m3)	NA	6.2E-08	mg/m3	8.0E-04	mg/m3	8E-05
				16984-48-8	Fluoride	8.35958719	mg/kg	2.2E-08	(µg/m3)	NA	1/(µg/m3)	NA	7.9E-11	mg/m3	1.3E-02	mg/m3	6E-09
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.31192947	mg/kg	8.4E-10	(µg/m3)	8.4E-02	1/(µg/m3)	7E-11	2.9E-12	mg/m3	1.0E-04	mg/m3	3E-08
				7429-90-5	Aluminum	19217.0391	mg/kg	5.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.8E-07	mg/m3	5.0E-03	mg/m3	4E-05
				7440-38-2	Arsenic	6.14187394	mg/kg	1.6E-08	(µg/m3)	4.3E-03	1/(µg/m3)	7E-11	5.8E-11	mg/m4	1.5E-05	mg/m4	4E-06
				7440-48-4	Cobalt	5.9144341	mg/kg	1.6E-08	(µg/m3)	9.0E-03	1/(µg/m3)	1E-10	5.6E-11	mg/m6	6.0E-06	mg/m6	9E-06
				7440-50-8	Copper	17.1720566	mg/kg	4.6E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.6E-10	mg/m7	NA	mg/m7	NA
				7439-89-6	Iron	15793.4341	mg/kg	4.2E-05	(µg/m3)	NA	1/(µg/m3)	NA	1.5E-07	mg/m8	NA	mg/m8	NA
				7439-96-5	Manganese	750.289171	mg/kg	2.0E-06	(µg/m3)	NA	1/(µg/m3)	NA	7.1E-09	mg/m9	5.0E-05	mg/m9	1E-04
				7439-97-6	Mercury	0.02773858	mg/kg	2.9E-06	(µg/m3)	NA	1/(µg/m3)	NA	1.0E-08	mg/m10	3.0E-04	mg/m10	3E-05
				7440-02-0	Nickel	12.9162884	mg/kg	3.5E-08	(µg/m3)	2.6E-04	1/(µg/m3)	9E-12	1.2E-10	mg/m11	9.0E-05	mg/m11	1E-06
				7782-49-2	Selenium	0.72516013	mg/kg	1.9E-09	(µg/m3)	NA	1/(µg/m3)	NA	6.8E-12	mg/m12	2.0E-02	mg/m12	3E-10
				7440-28-0	Thallium	0.06432988	mg/kg	1.7E-10	(µg/m3)	NA	1/(µg/m3)	NA	6.0E-13	mg/m13	NA	mg/m13	NA
				7440-62-2	Vanadium	13.1712588	mg/kg	3.5E-08	(µg/m3)	NA	1/(µg/m3)	NA	1.2E-10	mg/m3	1.0E-04	mg/m3	1E-06
				56-55-3	Benzo(A)Anthracene	0.05791253	mg/kg	4.8E-08	(µg/m3)	6.0E-05	1/(µg/m3)	3E-12	1.7E-10	mg/m3	NA	mg/m3	NA
				50-32-8	Benzo(A)Pyrene	0.07495344	mg/kg	2.0E-10	(µg/m3)	6.0E-04	1/(µg/m3)	1E-13	7.0E-13	mg/m3	2.0E-06	mg/m3	4E-07
				205-99-2	Benzo(B)Fluoranthene	0.128102	mg/kg	3.4E-10	(µg/m3)	6.0E-05	1/(µg/m3)	2E-14	1.2E-12	mg/m3	NA	mg/m3	NA
				91-20-3	Naphthalene	0.00708721	mg/kg	5.6E-07	(µg/m3)	3.4E-05	1/(µg/m3)	2E-11	2.0E-09	mg/m3	3.0E-03	mg/m3	7E-07
			Total Inhalation									3E-10					3E-04
		Total Dust Inhalation										3E-10					3E-04
	Total Soil Vapor and Dust Inhalation											3E-10					3E-04
Medium Total												9E-08					6E-03
Soil From Venison Exposure Areas	Surface Soil 0-0.5 ft bgs	Venison	Venison	57-12-5	Cyanide	0.00032353	mg/kg ww	1.6E-15	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-15	(mg/kg-day)	6.0E-04	(mg/kg-day)	9E-12
				16984-48-8	Fluoride	0.03780213	mg/kg ww	1.8E-13	(mg/kg-day)	NA	1/(mg/kg-day)	NA	6.4E-13	(mg/kg-day)	4.0E-02	(mg/kg-day)	2E-11
				7440-47-3_EST	Chromium, Hexavalent - Estimated	0.00045282	mg/kg ww	2.2E-15	(mg/kg-day)	5.0E-01	1/(mg/kg-day)	1E-15	7.6E-15	(mg/kg-day)	3.0E-03	(mg/kg-day)	3E-12
				7429-90-5	Aluminum	9.69689832	mg/kg ww	4.7E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-10	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-10
				7440-36-0	Antimony	0.00318422	mg/kg ww	1.5E-14	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-14	(mg/kg-day)	4.0E-04	(mg/kg-day)	1E-10
				7440-38-2	Arsenic	0.01035373	mg/kg ww	3.0E-14	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	4E-14	1.0E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-10
				7440-48-4	Cobalt	0.0041521	mg/kg ww	2.0E-14	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-14	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-10
				7440-50-8	Copper	0.29447277	mg/kg ww	1.4E-12	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.9E-12	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-10
				7439-89-6	Iron	8.22680073	mg/kg ww	3.9E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-10	(mg/kg-day)	7.0E-01	(mg/kg-day)	2E-10
				7439-96-5_d	Manganese	2.29832022	mg/kg ww	1.1E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.9E-11	(mg/kg-day)	1.4E-01	(mg/kg-day)	3E-10
				7439-97-6	Mercury	1.57501819	mg/kg ww	7.6E-12	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-11	(mg/kg-day)	NA	(mg/kg-day)	NA
				7440-02-0	Nickel	0.04162004	mg/kg ww	2.0E-13	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.0E-13	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-11
				7782-49-2	Selenium	0.00729635	mg/kg ww	3.5E-14	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.2E-13	(mg/kg-day)	5.0E-03	(mg/kg-day)	2E-11
				7440-28-0	Thallium	5.1979E-05	mg/kg ww	2.5E-16	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.7E-16	(mg/kg-day)	1.0E-05	(mg/kg-day)	9E-11
				7440-62-2	Vanadium	0.00965543	mg/kg ww	4.6E-14	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.6E-13	(mg/kg-day)	5.0E-03	(mg/kg-day)	3E-11
				11097-69-1	PCB-1254 (Aroclor 1254)	0.00303812	mg/kg ww	1.5E-14	(mg/kg-day)	2.0E+00	1/(mg/kg-day)	3E-14	5.1E-14	(mg/kg-day)	2.0E-05	(mg/kg-day)	3E-09
				56-55-3	Benzo(A)Anthracene	0.00684831	mg/kg ww	3.3E-14	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-15	1.2E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				50-32-8	Benzo(A)Pyrene	0.02891857	mg/kg ww	1.4E-13	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	1E-13	4.9E-13	(mg/kg-day)	3.0E-04	(mg/kg-day)	2E-09
				205-99-2	Benzo(B)Fluoranthene	0.00587755	mg/kg ww	2.8E-14	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	3E-15	9.9E-14	(mg/kg-day)	NA	(mg/kg-day)	NA
				207-08-9	Benzo(K)Fluoranthene	0.00873105	mg/kg ww	4.2E-14	(mg/kg-day)	1.0E-02	1/(mg/kg-day)	4E-16	1.5E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				117-81-7	Bis(2-Ethylhexyl) Phthalate	0.00646071	mg/kg ww	3.1E-14	(mg/kg-day)	1.4E-02	1/(mg/kg-day)	4E-16	1.1E-13	(mg/kg-day)	2.0E-02	(mg/kg-day)	5E-12
				218-01-9	Chrysene	0.00613648	mg/kg ww	2.9E-14	(mg/kg-day)	1.0E-03	1/(mg/kg-day)	3E-17	1.0E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				53-70-3	Dibenz(A,H)Anthracene	0.01624109	mg/kg ww	7.8E-14	(mg/kg-day)	1.0E+00	1/(mg/kg-day)	8E-14	2.7E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				132-64-9	Dibenzofuran	0.06534674	mg/kg ww	3.1E-13	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.1E-12	(mg/kg-day)	1.0E-03	(mg/kg-day)	1E-09
				193-39-5	Indeno(1,2,3-C,D)Pyrene	0.01574852	mg/kg ww	7.6E-14	(mg/kg-day)	1.0E-01	1/(mg/kg-day)	8E-15	2.6E-13	(mg/kg-day)	NA	(mg/kg-day)	NA
				91-20-3	Naphthalene	3.18426814	mg/kg ww	1.5E-11	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.4E-11	(mg/kg-day)	2.0E-02	(mg/kg-day)	3E-09
			Total Venison Ingestion									3E-13					1E-08
		Total Venison										3E-13					1E-08
	Total Venison Ingestion											3E-13					1E-08
Medium Total												3E-13					1E-08

Table 7-35
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
(Recreational Trespasser [Hunter] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure point	Exposure route	Cas Number	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
								Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
						Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Surface Water	Surface Water	Surface Water	Ingestion	57-12-5	Cyanide	2.579	µg/l	2.5E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.8E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				FREE CN	Cyanide (Free)	2.315	µg/l	2.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.9E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	1E-04
				16984-48-8	Fluoride	162.8	µg/l	1.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	1E-04
				7429-90-5	Aluminum	712.5	µg/l	6.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.4E-05	(mg/kg-day)	1.0E+00	(mg/kg-day)	2E-05
				7440-36-0	Antimony	1.066	µg/l	1.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.6E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	9E-05
				7440-38-2	Arsenic	0.944	µg/l	9.2E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	3.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	1E-04
				7440-48-4	Cobalt	2.4	µg/l	2.3E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	8.2E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	3E-04
				7439-89-6	Iron	132.5	µg/l	1.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	4.5E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	6E-06
				7439-96-5	Manganese	405.5	µg/l	3.9E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	6E-04
			Total Ingestion									1E-08					1E-03
			Dermal	57-12-5	Cyanide	2.579	µg/l	1.0E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.5E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	6E-05
				FREE CN	Cyanide (Free)	2.315	µg/l	8.9E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	3.1E-08	(mg/kg-day)	6.0E-04	(mg/kg-day)	5E-05
				16984-48-8	Fluoride	162.8	µg/l	6.3E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.2E-06	(mg/kg-day)	4.0E-02	(mg/kg-day)	6E-05
				7429-90-5	Aluminum	712.5	µg/l	2.8E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.6E-06	(mg/kg-day)	1.0E+00	(mg/kg-day)	1E-05
				7440-36-0	Antimony	1.066	µg/l	4.1E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.4E-08	(mg/kg-day)	4.0E-04	(mg/kg-day)	4E-05
				7440-38-2	Arsenic	0.944	µg/l	3.6E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	5E-09	1.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				7440-48-4	Cobalt	2.4	µg/l	3.7E-09	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.3E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	4E-05
				7439-89-6	Iron	132.5	µg/l	5.1E-07	(mg/kg-day)	NA	1/(mg/kg-day)	NA	1.8E-06	(mg/kg-day)	7.0E-01	(mg/kg-day)	3E-06
				7439-96-5	Manganese	405.5	µg/l	1.6E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	5.5E-06	(mg/kg-day)	2.4E-02	(mg/kg-day)	2E-04
			Total Dermal									5E-09					5E-04
		Total Surface Water										2E-08					2E-03
	Total Surface Water Direct Contact											2E-08					2E-03
Medium Total												2E-08					2E-03
Sediment	Sediment	Sediment	Ingestion	7429-90-5	Aluminum	19100	mg/kg	2.6E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	9.2E-04	(mg/kg-day)	1.0E+00	(mg/kg-day)	9E-04
				7440-38-2	Arsenic	6.853	mg/kg	5.6E-08	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	8E-08	2.0E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	7E-04
				7440-48-4	Cobalt	5.732	mg/kg	7.9E-08	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.7E-07	(mg/kg-day)	3.0E-04	(mg/kg-day)	9E-04
				7439-89-6	Iron	15054	mg/kg	2.1E-04	(mg/kg-day)	NA	1/(mg/kg-day)	NA	7.2E-04	(mg/kg-day)	7.0E-01	(mg/kg-day)	1E-03
				7439-96-5	Manganese	532	mg/kg	7.3E-06	(mg/kg-day)	NA	1/(mg/kg-day)	NA	2.6E-05	(mg/kg-day)	2.4E-02	(mg/kg-day)	1E-03
			Total Ingestion									8E-08					5E-03
			Dermal	7429-90-5	Aluminum	19100	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	1.0E+00	(mg/kg-day)	NA
				7440-38-2	Arsenic	6.853	mg/kg	7.0E-09	(mg/kg-day)	1.5E+00	1/(mg/kg-day)	1E-08	2.4E-08	(mg/kg-day)	3.0E-04	(mg/kg-day)	8E-05
				7440-48-4	Cobalt	5.732	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	3.0E-04	(mg/kg-day)	NA
				7439-89-6	Iron	15054	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	7.0E-01	(mg/kg-day)	NA
				7439-96-5	Manganese	532	mg/kg	NA	(mg/kg-day)	NA	1/(mg/kg-day)	NA	NA	(mg/kg-day)	9.6E-04	(mg/kg-day)	NA
			Total Dermal									1E-08	0.0E+00				8E-05
		Total Sediment										9E-08					5E-03
	Total Sediment Direct Contact											9E-08					5E-03
Medium Total												9E-08					5E-03
											Total of Receptor Risks Across All Media	2E-07				Total of Receptor Hazards Across All Media	1E-02

Table 9-1
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-0.5 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-05	NA	NA	1E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	NA	1E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-04	NA	NA	7E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	3E-05	NA	NA	3E-05
			7440-38-2	Arsenic	3E-08	NA	6E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	9E-05	5E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-09	NA	NA	4E-09	NA (RfDo)	6E-06	NA	NA	6E-06
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	8E-04	NA	NA	8E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	7E-05	NA	NA	7E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	2E-06	NA	NA	2E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	3E-07	NA	1E-07	4E-07	Developmental (RfDo)	2E-03	NA	1E-03	3E-03
			205-99-2	Benzo(B)Fluoranthene	3E-08	NA	2E-08	4E-08	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	1E-11	NA	4E-12	1E-11	Liver (RfDo)	2E-07	NA	1E-07	4E-07
			218-01-9	Chrysene	2E-10	NA	1E-10	4E-10	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	6E-08	NA	3E-08	9E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-06	NA	6E-07	2E-06
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	3E-05	NA	2E-05	5E-05
				Chemical Total	4E-07	NA	2E-07	6E-07		6E-03	NA	1E-03	7E-03
		Exposure Point Total						6E-07					7E-03
	Exposure Medium Total							6E-07					7E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	3E-06	NA	3E-06
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	4E-09	NA	4E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	2E-07	NA	2E-07
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	9E-12	NA	9E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	5E-07	NA	5E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-06	NA	5E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	7E-13	NA	7E-13	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	8E-12	NA	8E-12
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	8E-08	NA	8E-08
			56-55-3	Benzo(A)Anthracene	NA	6E-11	NA	6E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-12	NA	2E-12	Developmental (RfC)	NA	4E-06	NA	4E-06
			205-99-2	Benzo(B)Fluoranthene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	1E-14	NA	1E-14	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	2E-17	NA	2E-17	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	2E-15	NA	2E-15	NA (RfC)	NA	NA	NA	NA

Table 9-1
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	53-70-3	Dibenz(A,H)Anthracene	NA	5E-13	NA	5E-13	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	4E-11	NA	4E-11	Nervous, Respiratory (RfC)	NA	3E-06	NA	3E-06
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total	NA	1E-10	NA	1E-10		NA	2E-05	NA	2E-05
		Exposure Point Total						1E-10					2E-05
	Exposure Medium Total							1E-10					2E-05
Medium Total								6E-07					7E-03
Receptor Total							Receptor Risk Total	6E-07				Receptor HI Total	7E-03

Table 9-2
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	4E-04	NA	NA	4E-04
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	NA	1E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	1E-06	NA	2E-07	1E-06	Skin and blood (RfDo)	6E-03	NA	1E-03	7E-03
			7440-41-7	Beryllium	NA	NA	NA	NA	Gastrointestinal (RfDo)	2E-04	NA	NA	2E-04
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	3E-04	NA	5E-05	3E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-08	NA	NA	4E-08	NA (RfDo)	8E-05	NA	NA	8E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	3E-04	NA	NA	3E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-02	NA	NA	1E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	1E-03	NA	NA	1E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-05	NA	NA	3E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	9E-03	NA	NA	9E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	2E-07	NA	1E-07	4E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***3E-06***	NA	1E-06	***4E-06***	Developmental (RfDo)	2E-02	NA	1E-02	4E-02
			205-99-2	Benzo(B)Fluoranthene	6E-07	NA	4E-07	1E-06	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-08	NA	7E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	9E-10	NA	4E-10	1E-09	Liver (RfDo)	9E-06	NA	4E-06	1E-05
			218-01-9	Chrysene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	3E-07	NA	2E-07	5E-07	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	3E-04	NA	3E-05	3E-04
			206-44-0	Fluoranthene	NA	NA	NA	NA	Whole body (RfDo)	4E-04	NA	2E-04	6E-04
			193-39-5	Indeno(1,2,3-C,D)Pyrene	4E-07	NA	2E-07	7E-07	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-05	NA	5E-06	1E-05
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	4E-04	NA	2E-04	6E-04
				Chemical Total	***5E-06***	NA	***2E-06***	***8E-06***		9E-02	NA	1E-02	1E-01
		Exposure Point Total						***8E-06***					1E-01
	Exposure Medium Total							***8E-06***					1E-01
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	2E-03	NA	2E-03
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	8E-07	NA	8E-07
		/dust	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-04	NA	4E-04
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	9E-10	NA	9E-10	cardiovascular, nervous, and skin (RfC)	NA	4E-05	NA	4E-05
			7440-41-7	Beryllium	NA	8E-11	NA	8E-11	Immune, Respiratory (RfC)	NA	5E-06	NA	5E-06
			7440-43-9_d	Cadmium	NA	4E-11	NA	4E-11	Renal (RfC)	NA	5E-06	NA	5E-06
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-09	NA	1E-09	Lungs (RfC)	NA	5E-07	NA	5E-07
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-03	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	4E-10	NA	4E-10	Resp. (RfC)	NA	4E-05	NA	4E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-05	NA	2E-05

Table 9-2
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	56-55-3	Benzo(A)Anthracene	NA	8E-09	NA	8E-09	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	3E-10	NA	3E-10	Developmental (RfC)	NA	7E-04	NA	7E-04
			205-99-2	Benzo(B)Fluoranthene	NA	8E-11	NA	8E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	1E-12	NA	1E-12	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	3E-14	NA	3E-14	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	4E-13	NA	4E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	4E-11	NA	4E-11	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			206-44-0	Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	5E-11	NA	5E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	1E-08	NA	1E-08	Nervous, Respiratory (RfC)	NA	4E-04	NA	4E-04
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total				3E-08					5E-03
		Exposure Point Total						3E-08					5E-03
	Exposure Medium Total							3E-08					5E-03
Medium Total								***8E-06***					1E-01
Receptor Total								***8E-06***					1E-01

Table 9-3
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-0.5 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-03	NA	NA	1E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-03	NA	NA	3E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-02	NA	NA	2E-02
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	1E-03	NA	NA	1E-03
			7440-38-2	Arsenic	8E-08	NA	1E-08	1E-07	Skin and blood (RfDo)	1E-02	NA	2E-03	2E-02
			7440-41-7	Beryllium	NA	NA	NA	NA	Gastrointestinal (RfDo)	5E-04	NA	NA	5E-04
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	6E-04	NA	8E-05	7E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-09	NA	NA	4E-09	NA (RfDo)	2E-04	NA	NA	2E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-02	NA	NA	2E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	6E-04	NA	NA	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-02	NA	NA	3E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-02	NA	NA	2E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-03	NA	NA	2E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	7E-05	NA	NA	7E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-02	NA	NA	2E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	4E-03	NA	NA	4E-03
			56-55-3	Benzo(A)Anthracene	2E-08	NA	8E-09	3E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-07	NA	9E-08	3E-07	Developmental (RfDo)	5E-02	NA	2E-02	7E-02
			205-99-2	Benzo(B)Fluoranthene	6E-08	NA	2E-08	8E-08	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-09	NA	4E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	8E-11	NA	2E-11	1E-10	Liver (RfDo)	2E-05	NA	6E-06	3E-05
			218-01-9	Chrysene	3E-10	NA	1E-10	4E-10	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	3E-08	NA	1E-08	4E-08	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	6E-04	NA	6E-05	7E-04
			206-44-0	Fluoranthene	NA	NA	NA	NA	Whole body (RfDo)	8E-04	NA	4E-04	1E-03
			193-39-5	Indeno(1,2,3-C,D)Pyrene	4E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-05	NA	9E-06	3E-05
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	9E-04	NA	4E-04	1E-03
				Chemical Total	5E-07	NA	2E-07	6E-07		2E-01	NA	2E-02	2E-01
		Exposure Point Total						6E-07					2E-01
	Exposure Medium Total							6E-07					2E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	1E-03	NA	1E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	5E-04	NA	5E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-01	NA	3E-01
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	3E-08	NA	3E-08	cardiovascular, nervous, and skin (RfC)	NA	3E-02	NA	3E-02
			7440-41-7	Beryllium	NA	2E-09	NA	2E-09	Immune, Respiratory (RfC)	NA	3E-03	NA	3E-03
			7440-43-9_d	Cadmium	NA	1E-09	NA	1E-09	Renal (RfC)	NA	4E-03	NA	4E-03
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	4E-08	NA	4E-08	Lungs (RfC)	NA	3E-04	NA	3E-04
			7440-48-4	Cobalt	NA	6E-08	NA	6E-08	Respiratory Tract; Lung (RfC)	NA	8E-02	NA	8E-02
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	7E-01	NA	7E-01
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-04	NA	2E-04
			7440-02-0	Nickel	NA	1E-08	NA	1E-08	Resp. (RfC)	NA	3E-02	NA	3E-02
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-06	NA	1E-06
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-02	NA	1E-02

Table 9-3
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	56-55-3	Benzo(A)Anthracene	NA	1E-09	NA	1E-09	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	8E-09	NA	8E-09	Developmental (RfC)	NA	5E-01	NA	5E-01
			205-99-2	Benzo(B)Fluoranthene	NA	2E-09	NA	2E-09	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	4E-11	NA	4E-11	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	8E-13	NA	8E-13	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	1E-11	NA	1E-11	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	1E-09	NA	1E-09	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			206-44-0	Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	1E-09	NA	1E-09	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	4E-10	NA	4E-10	Nervous, Respiratory (RfC)	NA	3E-04	NA	3E-04
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total				2E-07					***2E+00***
		Exposure Point Total						2E-07					***2E+00***
	Exposure Medium Total							2E-07					***2E+00***
Medium Total								8E-07					***2E+00***
Receptor Total							Receptor Risk Total	8E-07					***2E+00***

Body Weight	2E-03
Dermal/Skin	7E-02
Developmental	6E-01
Gastrointestinal	3E-02
Blood/Cardiovascular/Hematologic	4E-02
Immune	3E-03
Kidney/Renal/Urinary	6E-03
Liver	3E-05
Lung/Respiratory	2E-01
Nervous	8E-01
Neurological	3E-01
Testes	1E-03
Thyroid	3E-02
Whole Body	1E-03

Table 9-4
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-05	NA	NA	3E-05
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	9E-05	NA	NA	9E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-04	NA	NA	7E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	3E-05	NA	NA	3E-05
			7440-38-2	Arsenic	3E-08	NA	6E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	9E-05	5E-04
			7440-41-7	Beryllium	NA	NA	NA	NA	Gastrointestinal (RfDo)	2E-05	NA	NA	2E-05
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	2E-05	NA	3E-06	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-09	NA	NA	4E-09	NA (RfDo)	6E-06	NA	NA	6E-06
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	8E-04	NA	NA	8E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	7E-04	NA	NA	7E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	7E-05	NA	NA	7E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	2E-06	NA	NA	2E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	6E-04	NA	NA	6E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-07	NA	1E-07	3E-07	Developmental (RfDo)	2E-03	NA	9E-04	3E-03
			205-99-2	Benzo(B)Fluoranthene	5E-08	NA	3E-08	8E-08	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-11	NA	1E-11	3E-11	Liver (RfDo)	6E-07	NA	3E-07	9E-07
			218-01-9	Chrysene	3E-10	NA	1E-10	4E-10	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	3E-08	NA	1E-08	4E-08	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	2E-05	NA	2E-06	2E-05
			206-44-0	Fluoranthene	NA	NA	NA	NA	Whole body (RfDo)	3E-05	NA	1E-05	4E-05
			193-39-5	Indeno(1,2,3-C,D)Pyrene	4E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	7E-07	NA	4E-07	1E-06
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	3E-05	NA	2E-05	4E-05
				Chemical Total	4E-07	NA	2E-07	6E-07		6E-03	NA	1E-03	7E-03
		Exposure Point Total						6E-07					7E-03
	Exposure Medium Total							6E-07					7E-03
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-06	NA	8E-06
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	4E-09	NA	4E-09
		/dust	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	2E-07	NA	2E-07
			7440-41-7	Beryllium	NA	2E-13	NA	2E-13	Immune, Respiratory (RfC)	NA	2E-08	NA	2E-08
			7440-43-9_d	Cadmium	NA	7E-14	NA	7E-14	Renal (RfC)	NA	3E-08	NA	3E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	8E-12	NA	8E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	5E-07	NA	5E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-06	NA	5E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	7E-13	NA	7E-13	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	8E-12	NA	8E-12
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	8E-08	NA	8E-08

Table 9-4
Summary of Receptor Risks and Hazards for COPCs
(Main Plant Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	56-55-3	Benzo(A)Anthracene	NA	5E-11	NA	5E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-12	NA	2E-12	Developmental (RfC)	NA	3E-06	NA	3E-06
			205-99-2	Benzo(B)Fluoranthene	NA	4E-13	NA	4E-13	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	8E-15	NA	8E-15	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	6E-17	NA	6E-17	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	2E-15	NA	2E-15	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			206-44-0	Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	3E-11	NA	3E-11	Nervous, Respiratory (RfC)	NA	2E-06	NA	2E-06
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total				9E-11		NA	2E-05	NA	2E-05
		Exposure Point Total						9E-11					2E-05
	Exposure Medium Total							9E-11					2E-05
Medium Total								6E-07					7E-03
Receptor Total								6E-07				Receptor HI Total	7E-03

Table 9-5
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-02	NA	NA	1E-02
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	4E-04	NA	NA	4E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-08	NA	NA	2E-08	NA (RfDo)	3E-05	NA	NA	3E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-03	NA	NA	7E-03
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-04	NA	NA	2E-04
			7440-38-2	Arsenic	5E-07	NA	1E-07	6E-07	Skin and blood (RfDo)	3E-03	NA	7E-04	4E-03
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	2E-04	NA	NA	2E-04
			7440-41-7	Beryllium	NA	NA	NA	NA	Gastrointestinal (RfDo)	4E-04	NA	NA	4E-04
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	4E-04	NA	6E-05	4E-04
			18540-29-9	Chromium, Hexavalent	2E-08	NA	NA	2E-08	NA (RfDo)	3E-05	NA	NA	3E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-03	NA	NA	3E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	1E-04	NA	NA	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-03	NA	NA	2E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-03	NA	NA	2E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-05	NA	NA	3E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-02	NA	NA	2E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	***3E-06***	NA	***2E-06***	***5E-06***	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***3E-05***	NA	***2E-05***	***5E-05***	Developmental (RfDo)	3E-01	NA	2E-01	5E-01
			205-99-2	Benzo(B)Fluoranthene	***4E-06***	NA	***2E-06***	***6E-06***	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	3E-07	NA	1E-07	4E-07	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	4E-10	NA	2E-10	6E-10	Liver (RfDo)	4E-06	NA	2E-06	6E-06
			218-01-9	Chrysene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	***8E-06***	NA	***5E-06***	***1E-05***	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	7E-04	NA	8E-05	7E-04
			206-44-0	Fluoranthene	NA	NA	NA	NA	Whole body (RfDo)	3E-03	NA	2E-03	5E-03
			193-39-5	Indeno(1,2,3-C,D)Pyrene	***2E-06***	NA	***1E-06***	***4E-06***	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-05	NA	7E-06	2E-05
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	4E-03	NA	2E-03	6E-03
				Chemical Total	***5E-05***	NA	***3E-05***	***8E-05***		4E-01	NA	2E-01	6E-01
		Exposure Point Total						***8E-05***					6E-01
Exposure Medium Total								***8E-05***					6E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	5E-03	NA	5E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	3E-08	NA	3E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	6E-11	NA	6E-11	Lungs (RfC)	NA	2E-08	NA	2E-08
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-05	NA	4E-05
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	6E-11	NA	6E-11	cardiovascular, nervous, and skin (RfC)	NA	3E-06	NA	3E-06
			7440-39-3	Barium	NA	NA	NA	NA	Fetus (RfC)	NA	2E-06	NA	2E-06
			7440-41-7	Beryllium	NA	1E-11	NA	1E-11	Immune, Respiratory (RfC)	NA	9E-07	NA	9E-07
			7440-43-9_d	Cadmium	NA	6E-12	NA	6E-12	Renal (RfC)	NA	9E-07	NA	9E-07
			18540-29-9	Chromium, Hexavalent	NA	7E-11	NA	7E-11	Lungs (RfC)	NA	2E-08	NA	2E-08
			7440-48-4	Cobalt	NA	8E-11	NA	8E-11	Respiratory Tract; Lung (RfC)	NA	4E-06	NA	4E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	2E-05	NA	2E-05
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	1E-05	NA	1E-05
			7440-02-0	Nickel	NA	7E-11	NA	7E-11	Resp. (RfC)	NA	8E-06	NA	8E-06
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-10	NA	2E-10
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA

Table 9-5
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-06	NA	2E-06
			56-55-3	Benzo(A)Anthracene	NA	1E-08	NA	1E-08	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	5E-10	NA	5E-10	Developmental (RfC)	NA	1E-03	NA	1E-03
			205-99-2	Benzo(B)Fluoranthene	NA	5E-11	NA	5E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	4E-12	NA	4E-12	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	2E-15	NA	2E-15	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	5E-13	NA	5E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	1E-10	NA	1E-10	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			206-44-0	Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-09	NA	2E-09	Nervous, Respiratory (RfC)	NA	7E-05	NA	7E-05
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total	NA	2E-08	NA	2E-08		NA	6E-03	NA	6E-03
		Exposure Point Total						2E-08					6E-03
	Exposure Medium Total							2E-08					6E-03
Medium Total								***8E-05***					6E-01
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-03	NA	6E-05	1E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	5E-02	NA	3E-03	5E-02
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	8E-04	NA	4E-05	8E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-03	NA	9E-05	2E-03
			7440-38-2	Arsenic	1E-07	NA	6E-09	1E-07	Skin and blood (RfDo)	7E-04	NA	4E-05	8E-04
			7440-43-9	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	6E-04	NA	3E-05	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	5E-04	NA	1E-05	5E-04
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-04	NA	3E-06	3E-04
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-03	NA	1E-04	3E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	3E-04	NA	2E-05	3E-04
			56-55-3	Benzo(A)Anthracene	1E-08	NA	NA	1E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-07	NA	NA	1E-07	Developmental (RfDo)	1E-03	NA	NA	1E-03
			205-99-2	Benzo(B)Fluoranthene	3E-08	NA	NA	3E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-08	NA	NA	1E-08	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	3E-07	NA	6E-09	3E-07		6E-02	NA	3E-03	6E-02
		Exposure Point Total						3E-07					6E-02
	Exposure Medium Total							3E-07					6E-02
Medium Total								3E-07					6E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-03	NA	NA	2E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	2E-07	***1E-06***	Skin and blood (RfDo)	7E-03	NA	1E-03	8E-03
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	1E-03	NA	2E-04	1E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-03	NA	NA	8E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-03	NA	NA	2E-03
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	5E-03	NA	NA	5E-03
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-02	NA	NA	2E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	6E-03	NA	NA	6E-03
			56-55-3	Benzo(A)Anthracene	4E-07	NA	2E-07	5E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***5E-06***	NA	***3E-06***	***7E-06***	Developmental (RfDo)	4E-02	NA	2E-02	7E-02
			205-99-2	Benzo(B)Fluoranthene	1E-06	NA	5E-07	***2E-06***	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA

Table 9-5
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	218-01-9	Chrysene	7E-09	NA	4E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	***2E-06***	NA	***1E-06***	***3E-06***	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	7E-07	NA	4E-07	***1E-06***	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	***1E-05***	NA	***5E-06***	***1E-05***		1E-01	NA	3E-02	1E-01
		Exposure Point Total						***1E-05***					1E-01
	Exposure Medium Total							***1E-05***					1E-01
Medium Total								***1E-05***					1E-01
Receptor Total							Receptor Risk Total	***1E-04***				Receptor HI Total	8E-01

Table 9-6
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-03	NA	NA	3E-03
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-04	NA	NA	2E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	7E-09	NA	NA	7E-09	NA (RfDo)	1E-05	NA	NA	1E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-03	NA	NA	2E-03
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-05	NA	NA	9E-05
			7440-38-2	Arsenic	7E-08	NA	1E-08	8E-08	Skin and blood (RfDo)	1E-03	NA	2E-04	1E-03
			7440-41-7	Beryllium	NA	NA	NA	NA	Gastrointestinal (RfDo)	9E-05	NA	NA	9E-05
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	1E-04	NA	2E-05	2E-04
			18540-29-9	Chromium, Hexavalent	6E-09	NA	NA	6E-09	NA (RfDo)	1E-05	NA	NA	1E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-05	NA	NA	4E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	6E-04	NA	NA	6E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-04	NA	NA	4E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	7E-04	NA	NA	7E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	1E-05	NA	NA	1E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	9E-03	NA	NA	9E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	9E-04	NA	NA	9E-04
			56-55-3	Benzo(A)Anthracene	***2E-06***	NA	***1E-06***	***3E-06***	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***2E-05***	NA	***1E-05***	***3E-05***	Developmental (RfDo)	2E-01	NA	9E-02	3E-01
			205-99-2	Benzo(B)Fluoranthene	***2E-06***	NA	9E-07	***3E-06***	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-07	NA	7E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	1E-11	NA	6E-12	2E-11	Liver (RfDo)	4E-07	NA	2E-07	5E-07
			218-01-9	Chrysene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	***5E-06***	NA	***3E-06***	***8E-06***	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	4E-04	NA	5E-05	4E-04
			206-44-0	Fluoranthene	NA	NA	NA	NA	Whole body (RfDo)	2E-03	NA	1E-03	3E-03
			193-39-5	Indeno(1,2,3-C,D)Pyrene	***1E-06***	NA	6E-07	***2E-06***	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	7E-06	NA	4E-06	1E-05
			129-00-0	Pyrene	NA	NA	NA	NA	Kidney (RfDo)	3E-03	NA	1E-03	4E-03
				Chemical Total	***3E-05***	NA	***2E-05***	***5E-05***		2E-01	NA	9E-02	3E-01
		Exposure Point Total						***5E-05***					3E-01
Exposure Medium Total								***5E-05***					3E-01
Air	Airborne		16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	8E-04	NA	8E-04
	vapors		7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	NA	NA	NA	Lungs (RfC)	NA	5E-09	NA	5E-09
	/dust		7429-90-5	Aluminum	NA	1E-11	NA	1E-11	Neurological (RfC)	NA	4E-09	NA	4E-09
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	6E-06	NA	6E-06
			7440-38-2	Arsenic	NA	NA	NA	NA	cardiovascular, nervous, and skin (RfC)	NA	NA	NA	NA
			7440-39-3	Barium	NA	5E-12	NA	5E-12	Fetus (RfC)	NA	5E-07	NA	5E-07
			7440-41-7	Beryllium	NA	1E-12	NA	1E-12	Immune, Respiratory (RfC)	NA	2E-07	NA	2E-07
			7440-43-9_d	Cadmium	NA	4E-13	NA	4E-13	Renal (RfC)	NA	2E-07	NA	2E-07
			18540-29-9	Chromium, Hexavalent	NA	1E-11	NA	1E-11	Lungs (RfC)	NA	4E-09	NA	4E-09
			7440-48-4	Cobalt	NA	6E-12	NA	6E-12	Respiratory Tract; Lung (RfC)	NA	7E-07	NA	7E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7440-02-0	Nickel	NA	5E-12	NA	5E-12	Resp. (RfC)	NA	2E-06	NA	2E-06
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	4E-11	NA	4E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	4E-07	NA	4E-07

Table 9-6
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	56-55-3	Benzo(A)Anthracene	NA	3E-09	NA	3E-09	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-10	NA	1E-10	Developmental (RfC)	NA	2E-04	NA	2E-04
			205-99-2	Benzo(B)Fluoranthene	NA	1E-11	NA	1E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	8E-13	NA	8E-13	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	1E-16	NA	1E-16	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	1E-13	NA	1E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			206-44-0	Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	8E-12	NA	8E-12	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-10	NA	2E-10	Nervous, Respiratory (RfC)	NA	1E-05	NA	1E-05
			129-00-0	Pyrene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
				Chemical Total	NA	3E-09	NA	3E-09		NA	1E-03	NA	1E-03
		Exposure Point Total						3E-09					1E-03
	Exposure Medium Total							3E-09					1E-03
Medium Total								***5E-05***					3E-01
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	4E-04	NA	3E-05	4E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-02	NA	1E-03	2E-02
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	2E-05	3E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	6E-04	NA	5E-05	6E-04
			7440-38-2	Arsenic	2E-08	NA	1E-09	2E-08	Skin and blood (RfDo)	2E-04	NA	2E-05	3E-04
			7440-43-9	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	2E-04	NA	2E-05	2E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-04	NA	6E-06	2E-04
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	9E-05	NA	1E-06	9E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-04	NA	7E-05	9E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	9E-06	1E-04
			56-55-3	Benzo(A)Anthracene	4E-09	NA	NA	4E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	5E-08	NA	NA	5E-08	Developmental (RfDo)	4E-04	NA	NA	4E-04
			205-99-2	Benzo(B)Fluoranthene	1E-08	NA	NA	1E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	4E-09	NA	NA	4E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	9E-08	NA	1E-09	9E-08		2E-02	NA	2E-03	2E-02
		Exposure Point Total						9E-08					2E-02
	Exposure Medium Total							9E-08					2E-02
Medium Total								9E-08					2E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	6E-04	NA	NA	6E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-03	NA	NA	5E-03
			7440-38-2	Arsenic	1E-07	NA	3E-08	2E-07	Skin and blood (RfDo)	2E-03	NA	5E-04	3E-03
			7440-43-9_d	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	3E-04	NA	6E-05	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-03	NA	NA	3E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	6E-04	NA	NA	6E-04
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-03	NA	NA	2E-03
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	5E-03	NA	NA	5E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	1E-07	NA	8E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***2E-06***	NA	***1E-06***	***3E-06***	Developmental (RfDo)	1E-02	NA	8E-03	2E-02
			205-99-2	Benzo(B)Fluoranthene	4E-07	NA	2E-07	6E-07	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-08	NA	7E-09	2E-08	NA (RfDo)	NA	NA	NA	NA

Table 9-6
Summary of Receptor Risks and Hazards for COPCs
(North Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	218-01-9	Chrysene	3E-09	NA	2E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	7E-07	NA	4E-07	***1E-06***	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-07	NA	1E-07	4E-07	NA (RfDo)	NA	NA	NA	NA
			Chemical Total		***4E-06***	NA	***2E-06***	***5E-06***		3E-02	NA	9E-03	4E-02
		Exposure Point Total						***5E-06***					4E-02
	Exposure Medium Total							***5E-06***					4E-02
Medium Total								***5E-06***					4E-02
Receptor Total							Receptor Risk Total	***5E-05***				Receptor HI Total	4E-01

Table 9-7
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Landfill Management Worker - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	NA	1E-03
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-08	NA	NA	4E-08	NA (RfDo)	7E-05	NA	NA	7E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-03	NA	NA	9E-03
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***2E-06***	Skin and blood (RfDo)	9E-03	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	7E-03	NA	NA	7E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-02	NA	NA	1E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-03	NA	NA	2E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	7E-05	NA	NA	7E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	1E-02	NA	NA	1E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	3E-03	NA	NA	3E-03
			11097-69-1	PCB-1254 (Aroclor 1254)	5E-07	NA	3E-07	9E-07	Whole body (RfDo)	4E-02	NA	2E-02	6E-02
			56-55-3	Benzo(A)Anthracene	2E-07	NA	1E-07	3E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***2E-06***	NA	***1E-06***	***3E-06***	Developmental (RfDo)	2E-02	NA	1E-02	3E-02
			205-99-2	Benzo(B)Fluoranthene	3E-07	NA	1E-07	4E-07	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-08	NA	6E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	1E-10	NA	5E-11	2E-10	Liver (RfDo)	1E-06	NA	5E-07	2E-06
			218-01-9	Chrysene	3E-09	NA	1E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	5E-07	NA	3E-07	7E-07	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	7E-04	NA	9E-05	8E-04
			193-39-5	Indeno(1,2,3-C,D)Pyrene	2E-07	NA	9E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-05	NA	1E-05	3E-05
				Chemical Total	***5E-06***	NA	***2E-06***	***7E-06***		1E-01	NA	3E-02	2E-01
		Exposure Point Total						***7E-06***					2E-01
Exposure Medium Total								***7E-06***					2E-01
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	7E-04	NA	7E-04
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	6E-07	NA	6E-07
		/dust	7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-09	NA	1E-09	Lungs (RfC)	NA	4E-07	NA	4E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-04	NA	4E-04
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	1E-09	NA	1E-09	cardiovascular, nervous, and skin (RfC)	NA	6E-05	NA	6E-05
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-03	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	6E-10	NA	6E-10	Resp. (RfC)	NA	7E-05	NA	7E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-09	NA	3E-09
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	3E-05	NA	3E-05
			11097-69-1	PCB-1254 (Aroclor 1254)	NA	5E-08	NA	5E-08	NA (RfC)	NA	NA	NA	NA
			56-55-3	Benzo(A)Anthracene	NA	8E-09	NA	8E-09	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-10	NA	2E-10	Developmental (RfC)	NA	5E-04	NA	5E-04

Table 9-7
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Landfill Management Worker - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	205-99-2	Benzo(B)Fluoranthene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	1E-12	NA	1E-12	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	4E-15	NA	4E-15	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	5E-11	NA	5E-11	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	2E-11	NA	2E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	3E-08	NA	3E-08	Nervous, Respiratory (RfC)	NA	8E-04	NA	8E-04
				Chemical Total	NA	9E-08	NA	9E-08		NA	4E-03	NA	4E-03
		Exposure Point Total						9E-08					4E-03
	Exposure Medium Total							9E-08					4E-03
Medium Total								***7E-06***					2E-01
Surface Water	Surface Water	Surface Water	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-02	NA	5E-03	2E-02
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	3E-03	NA	1E-03	3E-03
			7440-38-2	Arsenic	2E-07	NA	8E-08	3E-07	Skin and blood (RfDo)	1E-03	NA	5E-04	2E-03
				Chemical Total	2E-07	NA	8E-08	3E-07		2E-02	NA	7E-03	2E-02
		Exposure Point Total						3E-07					2E-02
	Exposure Medium Total							3E-07					2E-02
Medium Total								3E-07					2E-02
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***1E-06***	Skin and blood (RfDo)	7E-03	NA	2E-03	9E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-02	NA	NA	2E-02
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-02	NA	NA	2E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-02	NA	NA	3E-02
			50-32-8	Benzo(A)Pyrene	3E-07	NA	1E-07	4E-07	Developmental (RfDo)	2E-03	NA	1E-03	4E-03
			205-99-2	Benzo(B)Fluoranthene	4E-08	NA	2E-08	6E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	6E-08	NA	4E-08	1E-07	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	***2E-06***	NA	5E-07	***2E-06***		1E-01	NA	3E-03	1E-01
		Exposure Point Total						***2E-06***					1E-01
	Exposure Medium Total							***2E-06***					1E-01
Medium Total								***2E-06***					1E-01
Receptor Total							Receptor Risk Total	***1E-05***				Receptor HI Total	3E-01

Table 9-8
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-05	NA	NA	3E-05
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	9E-05	NA	NA	9E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-09	NA	NA	4E-09	NA (RfDo)	6E-06	NA	NA	6E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-04	NA	NA	7E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	3E-05	NA	NA	3E-05
			7440-38-2	Arsenic	4E-08	NA	8E-09	4E-08	Skin and blood (RfDo)	6E-04	NA	1E-04	7E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	8E-04	NA	NA	8E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	5E-05	NA	NA	5E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-06	NA	NA	3E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	5E-04	NA	NA	5E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			11097-69-1	PCB-1254 (Aroclor 1254)	4E-09	NA	3E-09	7E-09	Whole body (RfDo)	7E-04	NA	4E-04	1E-03
			56-55-3	Benzo(A)Anthracene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-07	NA	1E-07	3E-07	Developmental (RfDo)	2E-03	NA	8E-04	2E-03
			205-99-2	Benzo(B)Fluoranthene	2E-08	NA	1E-08	4E-08	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-11	NA	9E-12	3E-11	Liver (RfDo)	5E-07	NA	2E-07	8E-07
			218-01-9	Chrysene	2E-10	NA	1E-10	3E-10	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	4E-08	NA	2E-08	7E-08	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	4E-05	NA	5E-06	5E-05
			193-39-5	Indeno(1,2,3-C,D)Pyrene	2E-08	NA	9E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-07	NA	8E-08	2E-07
				Chemical Total	3E-07	NA	2E-07	5E-07		8E-03	NA	1E-03	9E-03
		Exposure Point Total						5E-07					9E-03
Exposure Medium Total								5E-07					9E-03
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-06	NA	8E-06
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	4E-09	NA	4E-09
		/dust	7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	8E-12	NA	8E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	6E-07	NA	6E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	6E-06	NA	6E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	5E-13	NA	5E-13	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	9E-08	NA	9E-08
			11097-69-1	PCB-1254 (Aroclor 1254)	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			56-55-3	Benzo(A)Anthracene	NA	5E-11	NA	5E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-12	NA	2E-12	Developmental (RfC)	NA	3E-06	NA	3E-06

Table 9-8
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	205-99-2	Benzo(B)Fluoranthene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	8E-15	NA	8E-15	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	5E-17	NA	5E-17	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	2E-15	NA	2E-15	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	1E-13	NA	1E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	6E-12	NA	6E-12	Nervous, Respiratory (RfC)	NA	4E-07	NA	4E-07
				Chemical Total	NA	1E-10	NA	1E-10		NA	2E-05	NA	2E-05
		Exposure Point Total						1E-10					2E-05
	Exposure Medium Total							1E-10					2E-05
Medium Total								5E-07					9E-03
Surface Water	Surface Water	Surface Water	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	9E-04	NA	7E-05	9E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-04	NA	1E-05	2E-04
			7440-38-2	Arsenic	5E-09	NA	5E-10	6E-09	Skin and blood (RfDo)	8E-05	NA	7E-06	9E-05
				Chemical Total	5E-09	NA	5E-10	6E-09		1E-03	NA	1E-04	1E-03
		Exposure Point Total						6E-09					1E-03
	Exposure Medium Total							6E-09					1E-03
Medium Total								6E-09					1E-03
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-03	NA	NA	1E-03
			7440-38-2	Arsenic	3E-08	NA	7E-09	4E-08	Skin and blood (RfDo)	5E-04	NA	1E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-03	NA	NA	2E-03
			50-32-8	Benzo(A)Pyrene	2E-08	NA	1E-08	3E-08	Developmental (RfDo)	2E-04	NA	9E-05	2E-04
			205-99-2	Benzo(B)Fluoranthene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	5E-09	NA	3E-09	8E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	2E-09	NA	1E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	6E-08	NA	2E-08	9E-08		6E-03	NA	2E-04	7E-03
		Exposure Point Total						9E-08					7E-03
	Exposure Medium Total							9E-08					7E-03
Medium Total								9E-08					7E-03
Receptor Total							Receptor Risk Total	6E-07				Receptor HI Total	2E-02

Table 9-9
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Landfill Management Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-03	NA	NA	9E-03
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	4E-04	NA	NA	4E-04
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***2E-06***	Skin and blood (RfDo)	8E-03	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-03	NA	NA	4E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-02	NA	NA	1E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	1E-03	NA	NA	1E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	2E-05	NA	NA	2E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	1E-02	NA	NA	1E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			11097-69-1	PCB-1254 (Aroclor 1254)	3E-08	NA	2E-08	5E-08	Whole body (RfDo)	2E-03	NA	1E-03	3E-03
			56-55-3	Benzo(A)Anthracene	1E-07	NA	7E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***1E-06***	NA	7E-07	***2E-06***	Developmental (RfDo)	1E-02	NA	6E-03	2E-02
			205-99-2	Benzo(B)Fluoranthene	2E-07	NA	9E-08	3E-07	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	6E-09	NA	4E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	4E-10	NA	2E-10	5E-10	Liver (RfDo)	4E-06	NA	2E-06	5E-06
			218-01-9	Chrysene	2E-09	NA	9E-10	3E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	3E-07	NA	2E-07	5E-07	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	4E-04	NA	6E-05	5E-04
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-07	NA	5E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-05	NA	8E-06	2E-05
				Chemical Total	***3E-06***	NA	***1E-06***	***5E-06***		9E-02	NA	9E-03	1E-01
		Exposure Point Total						***5E-06***					1E-01
	Exposure Medium Total							***5E-06***					1E-01
	Air	Airborne vapors /dust	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-04	NA	3E-04
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	1E-09	NA	1E-09	cardiovascular, nervous, and skin (RfC)	NA	5E-05	NA	5E-05
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-03	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	4E-10	NA	4E-10	Resp. (RfC)	NA	5E-05	NA	5E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	9E-10	NA	9E-10
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-05	NA	2E-05
			11097-69-1	PCB-1254 (Aroclor 1254)	NA	3E-09	NA	3E-09	NA (RfC)	NA	NA	NA	NA
			56-55-3	Benzo(A)Anthracene	NA	5E-09	NA	5E-09	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-10	NA	1E-10	Developmental (RfC)	NA	3E-04	NA	3E-04
			205-99-2	Benzo(B)Fluoranthene	NA	2E-11	NA	2E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	8E-13	NA	8E-13	NA (RfC)	NA	NA	NA	NA

Table 9-9
Summary of Receptor Risks and Hazards for COPCs
(Central Landfills Area - Landfill Management Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	1E-14	NA	1E-14	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	1E-11	NA	1E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-08	NA	2E-08	Nervous, Respiratory (RfC)	NA	5E-04	NA	5E-04
				Chemical Total	NA	3E-08	NA	3E-08		NA	3E-03	NA	3E-03
		Exposure Point Total						3E-08					3E-03
	Exposure Medium Total							3E-08					3E-03
Medium Total								***5E-06***					1E-01
Surface Water	Surface Water	Surface Water	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-02	NA	5E-03	2E-02
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	3E-03	NA	1E-03	3E-03
			7440-38-2	Arsenic	2E-07	NA	8E-08	3E-07	Skin and blood (RfDo)	1E-03	NA	5E-04	2E-03
				Chemical Total	2E-07	NA	8E-08	3E-07		2E-02	NA	7E-03	2E-02
		Exposure Point Total						3E-07					2E-02
	Exposure Medium Total							3E-07					2E-02
Medium Total								3E-07					2E-02
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***1E-06***	Skin and blood (RfDo)	7E-03	NA	2E-03	9E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-02	NA	NA	2E-02
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-02	NA	NA	2E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-02	NA	NA	3E-02
			50-32-8	Benzo(A)Pyrene	3E-07	NA	1E-07	4E-07	Developmental (RfDo)	2E-03	NA	1E-03	4E-03
			205-99-2	Benzo(B)Fluoranthene	4E-08	NA	2E-08	6E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	6E-08	NA	4E-08	1E-07	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	***2E-06***	NA	5E-07	***2E-06***		1E-01	NA	3E-03	1E-01
		Exposure Point Total						***2E-06***					1E-01
	Exposure Medium Total							***2E-06***					1E-01
Medium Total								***2E-06***					1E-01
Receptor Total							Receptor Risk Total	***7E-06***				Receptor HI Total	2E-01

Table 9-10
Summary of Receptor Risks and Hazards for COPCs
(Industrial Landfills Area - Landfill Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	NA	1E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	4E-03	NA	NA	4E-03
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-08	NA	NA	4E-08	NA (RfDo)	7E-05	NA	NA	7E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-02	NA	NA	2E-02
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-04	NA	NA	9E-04
			7440-38-2	Arsenic	***2E-06***	NA	3E-07	***2E-06***	Skin and blood (RfDo)	1E-02	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-03	NA	NA	2E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-02	NA	NA	2E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-02	NA	NA	2E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-03	NA	NA	4E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-05	NA	NA	4E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-03	NA	NA	8E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	6E-03	NA	NA	6E-03
			56-55-3	Benzo(A)Anthracene	4E-07	NA	2E-07	6E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	***4E-06***	NA	***2E-06***	***7E-06***	Developmental (RfDo)	4E-02	NA	2E-02	6E-02
			205-99-2	Benzo(B)Fluoranthene	5E-07	NA	3E-07	8E-07	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-10	NA	7E-11	2E-10	Liver (RfDo)	2E-06	NA	7E-07	2E-06
			218-01-9	Chrysene	4E-09	NA	2E-09	7E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	9E-07	NA	5E-07	***1E-06***	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-07	NA	2E-07	5E-07	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-05	NA	7E-06	2E-05
				Chemical Total	***8E-06***	NA	***4E-06***	***1E-05***		2E-01	NA	2E-02	2E-01
		Exposure Point Total						***1E-05***					2E-01
	Exposure Medium Total							***1E-05***					2E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	5E-04	NA	5E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-06	NA	2E-06
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-09	NA	1E-09	Lungs (RfC)	NA	4E-07	NA	4E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	9E-04	NA	9E-04
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	2E-09	NA	2E-09	cardiovascular, nervous, and skin (RfC)	NA	7E-05	NA	7E-05
			7440-48-4	Cobalt	NA	3E-09	NA	3E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	2E-03	NA	2E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	1E-09	NA	1E-09	Resp. (RfC)	NA	2E-04	NA	2E-04
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	6E-05	NA	6E-05
			56-55-3	Benzo(A)Anthracene	NA	1E-08	NA	1E-08	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	5E-10	NA	5E-10	Developmental (RfC)	NA	1E-03	NA	1E-03
			205-99-2	Benzo(B)Fluoranthene	NA	6E-11	NA	6E-11	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	2E-12	NA	2E-12	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	6E-15	NA	6E-15	NA (RfC)	NA	NA	NA	NA

Table 9-10
Summary of Receptor Risks and Hazards for COPCs
(Industrial Landfills Area - Landfill Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Landfill Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	218-01-9	Chrysene	NA	5E-13	NA	5E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	1E-10	NA	1E-10	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	4E-11	NA	4E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-08	NA	2E-08	Nervous, Respiratory (RfC)	NA	5E-04	NA	5E-04
				Chemical Total	NA	4E-08	NA	4E-08		NA	6E-03	NA	6E-03
		Exposure Point Total						4E-08					6E-03
	Exposure Medium Total							4E-08					6E-03
Medium Total								***1E-05***					2E-01
Receptor Total							Receptor Risk Total	***1E-05***				Receptor HI Total	2E-01

Table 9-11
Summary of Receptor Risks and Hazards for COPCs
(Industrial Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-05	NA	NA	1E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	5E-04	NA	NA	5E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-09	NA	NA	4E-09	NA (RfDo)	6E-06	NA	NA	6E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-04	NA	NA	9E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-05	NA	NA	9E-05
			7440-38-2	Arsenic	5E-08	NA	1E-08	6E-08	Skin and blood (RfDo)	8E-04	NA	2E-04	1E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-03	NA	NA	2E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-04	NA	NA	4E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-06	NA	NA	3E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	7E-04	NA	NA	7E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	6E-04	NA	NA	6E-04
			56-55-3	Benzo(A)Anthracene	8E-08	NA	4E-08	1E-07	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-06	NA	5E-07	***2E-06***	Developmental (RfDo)	8E-03	NA	4E-03	1E-02
			205-99-2	Benzo(B)Fluoranthene	1E-07	NA	6E-08	2E-07	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	4E-09	NA	2E-09	7E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	6E-12	NA	2E-12	8E-12	Liver (RfDo)	1E-07	NA	6E-08	2E-07
			218-01-9	Chrysene	1E-09	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	2E-07	NA	1E-07	3E-07	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	7E-08	NA	4E-08	1E-07	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-06	NA	2E-06	5E-06
				Chemical Total	***2E-06***	NA	8E-07	***2E-06***		2E-02	NA	4E-03	2E-02
		Exposure Point Total						***2E-06***					2E-02
	Exposure Medium Total							***2E-06***					2E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	3E-06	NA	3E-06
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-08	NA	2E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	9E-12	NA	9E-12	Lungs (RfC)	NA	3E-09	NA	3E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-06	NA	3E-06
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	3E-12	NA	3E-12	cardiovascular, nervous, and skin (RfC)	NA	4E-07	NA	4E-07
			7440-48-4	Cobalt	NA	6E-12	NA	6E-12	Respiratory Tract; Lung (RfC)	NA	7E-07	NA	7E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	2E-05	NA	2E-05
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	4E-12	NA	4E-12	Resp. (RfC)	NA	1E-06	NA	1E-06
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	4E-07	NA	4E-07
			56-55-3	Benzo(A)Anthracene	NA	2E-10	NA	2E-10	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	8E-12	NA	8E-12	Developmental (RfC)	NA	2E-05	NA	2E-05
			205-99-2	Benzo(B)Fluoranthene	NA	9E-13	NA	9E-13	NA (RfC)	NA	NA	NA	NA

Table 9-11
Summary of Receptor Risks and Hazards for COPCs
(Industrial Landfills Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	207-08-9	Benzo(K)Fluoranthene	NA	4E-14	NA	4E-14	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	1E-17	NA	1E-17	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	8E-15	NA	8E-15	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	2E-12	NA	2E-12	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	6E-13	NA	6E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	1E-10	NA	1E-10	Nervous, Respiratory (RfC)	NA	8E-06	NA	8E-06
				Chemical Total	NA	3E-10	NA	3E-10		NA	5E-05	NA	5E-05
		Exposure Point Total						3E-10					5E-05
	Exposure Medium Total							3E-10					5E-05
Medium Total								***2E-06***					2E-02
Receptor Total							Receptor Risk Total	***2E-06***				Receptor HI Total	2E-02

Table 9-12
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-0.5 ft bgs	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-04	NA	NA	9E-04
			7440-38-2	Arsenic	4E-08	NA	8E-09	5E-08	Skin and blood (RfDo)	6E-04	NA	1E-04	8E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	8E-04	NA	NA	8E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-04	NA	NA	4E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	9E-05	NA	NA	9E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-06	NA	NA	3E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	5E-04	NA	NA	5E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-04	NA	NA	2E-04
			56-55-3	Benzo(A)Anthracene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-08	NA	9E-09	3E-08	Developmental (RfDo)	1E-04	NA	7E-05	2E-04
			205-99-2	Benzo(B)Fluoranthene	4E-09	NA	2E-09	6E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	8E-12	NA	3E-12	1E-11	Liver (RfDo)	2E-07	NA	9E-08	3E-07
			53-70-3	Dibenz(A,H)Anthracene	5E-09	NA	3E-09	8E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-08	NA	1E-08	3E-08
				Chemical Total	7E-08	NA	2E-08	9E-08		4E-03	NA	2E-04	5E-03
		Exposure Point Total						9E-08					5E-03
	Exposure Medium Total							9E-08					5E-03
	Air	Airborne vapors /dust	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	3E-12	NA	3E-12	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	5E-07	NA	5E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-06	NA	4E-06
			7440-02-0	Nickel	NA	9E-13	NA	9E-13	Resp. (RfC)	NA	3E-07	NA	3E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-07	NA	1E-07
			56-55-3	Benzo(A)Anthracene	NA	3E-12	NA	3E-12	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-13	NA	1E-13	Developmental (RfC)	NA	3E-07	NA	3E-07
			205-99-2	Benzo(B)Fluoranthene	NA	3E-14	NA	3E-14	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	2E-17	NA	2E-17	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	4E-14	NA	4E-14	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	2E-14	NA	2E-14	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	7E-13	NA	7E-13	Nervous, Respiratory (RfC)	NA	5E-08	NA	5E-08
				Chemical Total	NA	1E-11	NA	1E-11		NA	1E-05	NA	1E-05
		Exposure Point Total						1E-11					1E-05
	Exposure Medium Total							1E-11					1E-05
Medium Total								9E-08					5E-03

Table 9-12
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	3E-05	3E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-04	NA	2E-05	3E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-04	NA	1E-05	2E-04
			7440-38-2	Arsenic	6E-09	NA	5E-10	7E-09	Skin and blood (RfDo)	1E-04	NA	8E-06	1E-04
				Chemical Total	6E-09	NA	5E-10	7E-09		8E-04	NA	7E-05	9E-04
		Exposure Point Total						7E-09					9E-04
	Exposure Medium Total							7E-09					9E-04
Medium Total								7E-09					9E-04
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	8E-04	NA	NA	8E-04
			7440-38-2	Arsenic	4E-08	NA	8E-09	5E-08	Skin and blood (RfDo)	6E-04	NA	1E-04	7E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	9E-04	NA	NA	9E-04
			50-32-8	Benzo(A)Pyrene	2E-09	NA	1E-09	3E-09	Developmental (RfDo)	2E-05	NA	1E-05	3E-05
				Chemical Total	4E-08	NA	9E-09	5E-08		4E-03	NA	1E-04	4E-03
		Exposure Point Total						5E-08					4E-03
	Exposure Medium Total							5E-08					4E-03
Medium Total								5E-08					4E-03
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	1E-02

Table 9-13
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-04	NA	NA	3E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-08	NA	NA	3E-08	NA (RfDo)	5E-05	NA	NA	5E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***2E-06***	Skin and blood (RfDo)	8E-03	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-04	NA	NA	2E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-02	NA	NA	3E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	1E-03	NA	NA	1E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-05	NA	NA	4E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	7E-03	NA	NA	7E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	7E-09	NA	4E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-07	NA	9E-08	2E-07	Developmental (RfDo)	1E-03	NA	8E-04	2E-03
			205-99-2	Benzo(B)Fluoranthene	2E-08	NA	1E-08	4E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-10	NA	9E-11	3E-10	Liver (RfDo)	2E-06	NA	9E-07	3E-06
			53-70-3	Dibenz(A,H)Anthracene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-08	NA	7E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-07	NA	9E-08	2E-07
				Chemical Total	***2E-06***	NA	4E-07	***2E-06***		9E-02	NA	2E-03	9E-02
		Exposure Point Total						***2E-06***					9E-02
	Exposure Medium Total							***2E-06***					9E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	9E-04	NA	9E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-07	NA	2E-07
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	8E-10	NA	8E-10	Lungs (RfC)	NA	3E-07	NA	3E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	5E-04	NA	5E-04
			7440-38-2	Arsenic	NA	1E-09	NA	1E-09	cardiovascular, nervous, and skin (RfC)	NA	5E-05	NA	5E-05
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	3E-03	NA	3E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	6E-04	NA	6E-04
			7440-02-0	Nickel	NA	4E-10	NA	4E-10	Resp. (RfC)	NA	4E-05	NA	4E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-05	NA	2E-05
			56-55-3	Benzo(A)Anthracene	NA	3E-10	NA	3E-10	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-11	NA	2E-11	Developmental (RfC)	NA	4E-05	NA	4E-05
			205-99-2	Benzo(B)Fluoranthene	NA	3E-12	NA	3E-12	NA (RfC)	NA	NA	NA	NA

Table 9-13
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	7E-15	NA	7E-15	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	4E-12	NA	4E-12	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	1E-12	NA	1E-12	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-10	NA	2E-10	Nervous, Respiratory (RfC)	NA	6E-06	NA	6E-06
				Chemical Total	NA	5E-09	NA	5E-09		NA	5E-03	NA	5E-03
		Exposure Point Total						5E-09					5E-03
	Exposure Medium Total							5E-09					5E-03
Medium Total								***2E-06***					9E-02
Receptor Total							Receptor Risk Total	***2E-06***				Receptor HI Total	9E-02

Table 9-14
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	5E-04	NA	NA	5E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	7E-04	NA	NA	7E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-09	NA	NA	2E-09	NA (RfDo)	1E-04	NA	NA	1E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-02	NA	NA	3E-02
			7440-38-2	Arsenic	1E-07	NA	2E-08	1E-07	Skin and blood (RfDo)	2E-02	NA	3E-03	2E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-02	NA	NA	2E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-04	NA	NA	4E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-02	NA	NA	2E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	6E-02	NA	NA	6E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-03	NA	NA	2E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	8E-05	NA	NA	8E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-02	NA	NA	2E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	4E-03	NA	NA	4E-03
			56-55-3	Benzo(A)Anthracene	6E-10	NA	3E-10	9E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-08	NA	6E-09	2E-08	Developmental (RfDo)	3E-03	NA	1E-03	5E-03
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	8E-10	3E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-11	NA	6E-12	2E-11	Liver (RfDo)	5E-06	NA	1E-06	6E-06
			53-70-3	Dibenz(A,H)Anthracene	3E-09	NA	1E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-09	NA	4E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-07	NA	1E-07	5E-07
				Chemical Total	1E-07	NA	3E-08	2E-07		2E-01	NA	4E-03	2E-01
		Exposure Point Total						2E-07					2E-01
	Exposure Medium Total							2E-07					2E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	6E-04	NA	6E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	1E-04	NA	1E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	2E-08	NA	2E-08	Lungs (RfC)	NA	2E-04	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-01	NA	4E-01
			7440-38-2	Arsenic	NA	3E-08	NA	3E-08	cardiovascular, nervous, and skin (RfC)	NA	4E-02	NA	4E-02
			7440-48-4	Cobalt	NA	6E-08	NA	6E-08	Respiratory Tract; Lung (RfC)	NA	7E-02	NA	7E-02
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	***2E+00***	NA	***2E+00***
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	1E-08	NA	1E-08	Resp. (RfC)	NA	3E-02	NA	3E-02
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-06	NA	1E-06
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-02	NA	1E-02
			56-55-3	Benzo(A)Anthracene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	5E-10	NA	5E-10	Developmental (RfC)	NA	3E-02	NA	3E-02

Table 9-14
Summary of Receptor Risks and Hazards for COPCs
(East Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	205-99-2	Benzo(B)Fluoranthene	NA	8E-11	NA	8E-11	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	1E-10	NA	1E-10	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	4E-11	NA	4E-11	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	6E-12	NA	6E-12	Nervous, Respiratory (RfC)	NA	4E-06	NA	4E-06
				Chemical Total	NA	1E-07	NA	1E-07		NA	***2E+00***	NA	***2E+00***
		Exposure Point Total						1E-07					***2E+00***
	Exposure Medium Total							1E-07					***2E+00***
Medium Total								3E-07					***3E+00***
Receptor Total							Receptor Risk Total	3E-07				Receptor HI Total	***3E+00***

Table 9-15
Summary of Receptor Risks and Hazards for COPCs
(North Central Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-0.5 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-05	NA	NA	1E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-05	NA	NA	1E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-09	NA	NA	2E-09	NA (RfDo)	4E-06	NA	NA	4E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	8E-04	NA	NA	8E-04
			7440-38-2	Arsenic	4E-08	NA	9E-09	5E-08	Skin and blood (RfDo)	6E-04	NA	1E-04	8E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-03	NA	NA	2E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-05	NA	NA	3E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-06	NA	NA	3E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-04	NA	NA	8E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	1E-10	NA	7E-11	2E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-09	NA	9E-10	3E-09	Developmental (RfDo)	1E-05	NA	7E-06	2E-05
			205-99-2	Benzo(B)Fluoranthene	3E-10	NA	2E-10	5E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-08	NA	1E-08	4E-08
				Chemical Total	5E-08	NA	1E-08	6E-08		6E-03	NA	1E-04	6E-03
		Exposure Point Total						6E-08					6E-03
	Exposure Medium Total							6E-08					6E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	3E-06	NA	3E-06
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	5E-10	NA	5E-10
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	6E-12	NA	6E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	3E-12	NA	3E-12	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	6E-07	NA	6E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-05	NA	1E-05
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	3E-13	NA	3E-13	Resp. (RfC)	NA	9E-08	NA	9E-08
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	8E-08	NA	8E-08
			56-55-3	Benzo(A)Anthracene	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-14	NA	1E-14	Developmental (RfC)	NA	3E-08	NA	3E-08
			205-99-2	Benzo(B)Fluoranthene	NA	3E-15	NA	3E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	1E-12	NA	1E-12	Nervous, Respiratory (RfC)	NA	7E-08	NA	7E-08
				Chemical Total	NA	1E-11	NA	1E-11		NA	2E-05	NA	2E-05
		Exposure Point Total						1E-11					2E-05
	Exposure Medium Total							1E-11					2E-05
Medium Total								6E-08					6E-03

Table 9-15
Summary of Receptor Risks and Hazards for COPCs
(North Central Undeveloped Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	2E-05	2E-04
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	1E-05	1E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-04	NA	2E-05	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-05	NA	4E-06	5E-05
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-05	NA	8E-06	1E-04
			7440-38-2	Arsenic	9E-09	NA	7E-10	9E-09	Skin and blood (RfDo)	1E-04	NA	1E-05	1E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-04	NA	5E-06	2E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	8E-05	NA	7E-06	9E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	1E-04	1E-03
				Chemical Total	9E-09	NA	7E-10	9E-09		2E-03	NA	2E-04	2E-03
		Exposure Point Total						9E-09					2E-03
	Exposure Medium Total							9E-09					2E-03
Medium Total								9E-09					2E-03
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-03	NA	NA	1E-03
			7440-38-2	Arsenic	5E-08	NA	1E-08	6E-08	Skin and blood (RfDo)	8E-04	NA	2E-04	9E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-03	NA	NA	2E-03
				Chemical Total	5E-08	NA	1E-08	6E-08		5E-03	NA	2E-04	6E-03
		Exposure Point Total						6E-08					6E-03
	Exposure Medium Total							6E-08					6E-03
Medium Total								6E-08					6E-03
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	1E-02

Table 9-16
Summary of Receptor Risks and Hazards for COPCs
(North Central Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	9E-05	NA	NA	9E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	NA	1E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-08	NA	NA	3E-08	NA (RfDo)	5E-05	NA	NA	5E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	3E-07	***2E-06***	Skin and blood (RfDo)	9E-03	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-04	NA	NA	2E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-02	NA	NA	2E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-04	NA	NA	4E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-05	NA	NA	4E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-03	NA	NA	8E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-03	NA	NA	1E-03
			56-55-3	Benzo(A)Anthracene	7E-10	NA	4E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-08	NA	5E-09	1E-08	Developmental (RfDo)	9E-05	NA	5E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-07	NA	1E-07	3E-07
				Chemical Total	***2E-06***	NA	3E-07	***2E-06***		7E-02	NA	2E-03	7E-02
		Exposure Point Total						***2E-06***					7E-02
	Exposure Medium Total							***2E-06***					7E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-04	NA	4E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	7E-08	NA	7E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-09	NA	1E-09	Lungs (RfC)	NA	3E-07	NA	3E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-04	NA	4E-04
			7440-38-2	Arsenic	NA	1E-09	NA	1E-09	cardiovascular, nervous, and skin (RfC)	NA	6E-05	NA	6E-05
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	2E-03	NA	2E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	4E-04	NA	4E-04
			7440-02-0	Nickel	NA	1E-10	NA	1E-10	Resp. (RfC)	NA	2E-05	NA	2E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-05	NA	1E-05
			56-55-3	Benzo(A)Anthracene	NA	3E-11	NA	3E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-12	NA	1E-12	Developmental (RfC)	NA	3E-06	NA	3E-06
			205-99-2	Benzo(B)Fluoranthene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-10	NA	2E-10	Nervous, Respiratory (RfC)	NA	7E-06	NA	7E-06
				Chemical Total	NA	5E-09	NA	5E-09		NA	3E-03	NA	3E-03
		Exposure Point Total						5E-09					3E-03
	Exposure Medium Total							5E-09					3E-03
Medium Total								***2E-06***					8E-02
Receptor Total							Receptor Risk Total	***2E-06***				Receptor HI Total	8E-02

Table 9-17
Summary of Receptor Risks and Hazards for COPCs
(North Central Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft-bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-04	NA	NA	3E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	1E-04	NA	NA	1E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-02	NA	NA	2E-02
			7440-38-2	Arsenic	1E-07	NA	2E-08	1E-07	Skin and blood (RfDo)	2E-02	NA	3E-03	2E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-02	NA	NA	3E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	5E-04	NA	NA	5E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-02	NA	NA	3E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-02	NA	NA	4E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	8E-04	NA	NA	8E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	8E-05	NA	NA	8E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-02	NA	NA	2E-02
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	3E-03	NA	NA	3E-03
			56-55-3	Benzo(A)Anthracene	6E-11	NA	3E-11	9E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	8E-10	NA	4E-10	1E-09	Developmental (RfDo)	2E-04	NA	8E-05	3E-04
			205-99-2	Benzo(B)Fluoranthene	2E-10	NA	7E-11	2E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	4E-07	NA	2E-07	5E-07
				Chemical Total	1E-07	NA	2E-08	2E-07		2E-01	NA	3E-03	2E-01
		Exposure Point Total						2E-07					2E-01
	Exposure Medium Total							2E-07					2E-01

Table 9-17
Summary of Receptor Risks and Hazards for COPCs
(North Central Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	2E-04	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	5E-05	NA	5E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	3E-08	NA	3E-08	Lungs (RfC)	NA	2E-04	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-01	NA	3E-01
			7440-38-2	Arsenic	NA	4E-08	NA	4E-08	cardiovascular, nervous, and skin (RfC)	NA	4E-02	NA	4E-02
			7440-48-4	Cobalt	NA	6E-08	NA	6E-08	Respiratory Tract; Lung (RfC)	NA	8E-02	NA	8E-02
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E+00	NA	1E+00
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-04	NA	3E-04
			7440-02-0	Nickel	NA	4E-09	NA	4E-09	Resp. (RfC)	NA	1E-02	NA	1E-02
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-06	NA	1E-06
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-02	NA	1E-02
			56-55-3	Benzo(A)Anthracene	NA	3E-12	NA	3E-12	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	3E-11	NA	3E-11	Developmental (RfC)	NA	2E-03	NA	2E-03
			205-99-2	Benzo(B)Fluoranthene	NA	6E-12	NA	6E-12	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	7E-12	NA	7E-12	Nervous, Respiratory (RfC)	NA	5E-06	NA	5E-06
				Chemical Total	NA	1E-07	NA	1E-07		NA	***2E+00***	NA	***2E+00***
		Exposure Point Total						1E-07					***2E+00***
	Exposure Medium Total							1E-07					***2E+00***
Medium Total								3E-07					***2E+00***
Receptor Total							Receptor Risk Total	3E-07				Receptor HI Total	***2E+00***

Body Weight	8E-04
Dermal/Skin	8E-02
Developmental	2E-03
Gastrointestinal	3E-02
Blood/Cardiovascular/Hematologic	6E-02
Lung/Respiratory	1E-01
Nervous	1E+00
Neurological	3E-01
Testes	2E-04
Thyroid	3E-02

Table 9-18
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-05	NA	NA	2E-05
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	7E-06	NA	NA	7E-06
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	5E-06	NA	NA	5E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	8E-04	NA	NA	8E-04
			7440-38-2	Arsenic	3E-08	NA	7E-09	4E-08	Skin and blood (RfDo)	5E-04	NA	1E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-05	NA	NA	3E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	8E-06	NA	NA	8E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	1E-10	NA	5E-11	2E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-09	NA	7E-10	2E-09	Developmental (RfDo)	1E-05	NA	5E-06	2E-05
			205-99-2	Benzo(B)Fluoranthene	2E-10	NA	1E-10	3E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-08	NA	5E-09	2E-08
				Chemical Total	4E-08	NA	7E-09	4E-08		5E-03	NA	1E-04	5E-03
		Exposure Point Total						4E-08					5E-03
	Exposure Medium Total							4E-08					5E-03
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	6E-06	NA	6E-06
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	3E-10	NA	3E-10
		/dust	7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-12	NA	7E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	2E-07	NA	2E-07
			7440-48-4	Cobalt	NA	5E-12	NA	5E-12	Respiratory Tract; Lung (RfC)	NA	6E-07	NA	6E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-06	NA	8E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	3E-13	NA	3E-13	Resp. (RfC)	NA	8E-08	NA	8E-08
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-11	NA	3E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	8E-08	NA	8E-08
			56-55-3	Benzo(A)Anthracene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-14	NA	1E-14	Developmental (RfC)	NA	2E-08	NA	2E-08
			205-99-2	Benzo(B)Fluoranthene	NA	2E-15	NA	2E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	4E-13	NA	4E-13	Nervous, Respiratory (RfC)	NA	3E-08	NA	3E-08
				Chemical Total	NA	1E-11	NA	1E-11		NA	2E-05	NA	2E-05
		Exposure Point Total						1E-11					2E-05
	Exposure Medium Total							1E-11					2E-05
Medium Total								4E-08					5E-03

Table 9-18
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Trespasser - Current)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	2E-05	3E-04
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	2E-05	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	9E-06	1E-04
				Chemical Total	NA	NA	NA	NA		6E-04	NA	5E-05	6E-04
		Exposure Point Total						NA					6E-04
	Exposure Medium Total							NA					6E-04
Medium Total								NA					6E-04
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	2E-08	NA	5E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	8E-05	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
				Chemical Total	2E-08	NA	5E-09	3E-08		4E-03	NA	8E-05	4E-03
		Exposure Point Total						3E-08					4E-03
	Exposure Medium Total							3E-08					4E-03
Medium Total								3E-08					4E-03
Receptor Total							Receptor Risk Total	7E-08				Receptor HI Total	9E-03

Table 9-19
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Resident Adult - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	NA	3E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	NA	1E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	8E-07	NA	NA	8E-07	NA (RfDo)	1E-04	NA	NA	1E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-02	NA	NA	2E-02
			7440-38-2	Arsenic	***5E-06***	NA	7E-07	***6E-06***	Skin and blood (RfDo)	1E-02	NA	2E-03	1E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-02	NA	NA	2E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-04	NA	NA	4E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-02	NA	NA	2E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-02	NA	NA	2E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	5E-04	NA	NA	5E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	7E-05	NA	NA	7E-05
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	1E-08	NA	4E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-07	NA	5E-08	2E-07	Developmental (RfDo)	9E-05	NA	5E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	2E-08	NA	8E-09	3E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	4E-07	NA	2E-07	7E-07
				Chemical Total	***6E-06***	NA	8E-07	***7E-06***		8E-02	NA	2E-03	9E-02
		Exposure Point Total						***7E-06***					9E-02
	Exposure Medium Total							***7E-06***					9E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	3E-03	NA	3E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-07	NA	2E-07
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	2E-08	NA	2E-08	Lungs (RfC)	NA	2E-06	NA	2E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-03	NA	2E-03
			7440-38-2	Arsenic	NA	5E-09	NA	5E-09	cardiovascular, nervous, and skin (RfC)	NA	2E-04	NA	2E-04
			7440-48-4	Cobalt	NA	1E-08	NA	1E-08	Respiratory Tract; Lung (RfC)	NA	5E-04	NA	5E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-03	NA	5E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-03	NA	2E-03
			7440-02-0	Nickel	NA	6E-10	NA	6E-10	Resp. (RfC)	NA	7E-05	NA	7E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-08	NA	1E-08
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	7E-05	NA	7E-05
			56-55-3	Benzo(A)Anthracene	NA	3E-10	NA	3E-10	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-11	NA	1E-11	Developmental (RfC)	NA	8E-06	NA	8E-06
			205-99-2	Benzo(B)Fluoranthene	NA	2E-12	NA	2E-12	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-09	NA	2E-09	Nervous, Respiratory (RfC)	NA	5E-05	NA	5E-05
				Chemical Total	NA	3E-08	NA	3E-08		NA	1E-02	NA	1E-02
		Exposure Point Total						3E-08					1E-02
		Exposure Medium Total						3E-08					1E-02
Medium Total								***7E-06***					1E-01

Table 9-19
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Resident Adult - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Tapwater	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-01	NA	5E-04	3E-01
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	8E-02	NA	2E-03	9E-02
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-01	NA	3E-04	3E-01
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	6E-02	NA	3E-04	6E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	6E-02	NA	NA	6E-02
			117-81-7	Bis(2-Ethylhexyl) Phthalate	***1E-05***	NA	NA	***1E-05***	Liver (RfDo)	1E-01	NA	2E-04	1E-01
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-04	NA	0E+00	3E-04
				Chemical Total	***1E-05***	NA	NA	***1E-05***		1E+00	NA	3E-03	1E+00
		Exposure Point Total						***1E-05***					1E+00
	Exposure Medium Total							***1E-05***					1E+00
Medium Total								***1E-05***					1E+00
Receptor Total							Receptor Risk Total	***2E-05***				Receptor HI Total	1E+00

Table 9-20
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Resident Child - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-03	NA	NA	3E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	NA	1E-03
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	NA	1E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-01	NA	NA	2E-01
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	1E-01	NA	1E-02	1E-01
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-01	NA	NA	2E-01
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-03	NA	NA	4E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-01	NA	NA	2E-01
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-01	NA	NA	2E-01
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	6E-03	NA	NA	6E-03
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	8E-04	NA	NA	8E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-02	NA	NA	2E-02
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	1E-03	NA	3E-04	1E-03
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	5E-06	NA	1E-06	6E-06
				Chemical Total	NA	NA	NA	NA		9E-01	NA	1E-02	9E-01
		Exposure Point Total						NA					9E-01
	Exposure Medium Total							NA					9E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	3E-03	NA	3E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-07	NA	2E-07
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	NA	NA	NA	Lungs (RfC)	NA	2E-06	NA	2E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-03	NA	2E-03
			7440-38-2	Arsenic	NA	NA	NA	NA	cardiovascular, nervous, and skin (RfC)	NA	2E-04	NA	2E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Respiratory Tract; Lung (RfC)	NA	5E-04	NA	5E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-03	NA	5E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-03	NA	2E-03
			7440-02-0	Nickel	NA	NA	NA	NA	Resp. (RfC)	NA	7E-05	NA	7E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-08	NA	1E-08
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	7E-05	NA	7E-05
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfC)	NA	8E-06	NA	8E-06
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory (RfC)	NA	5E-05	NA	5E-05
				Chemical Total	NA	NA	NA	NA		NA	1E-02	NA	1E-02
		Exposure Point Total						NA					1E-02
	Exposure Medium Total							NA					1E-02
Medium Total								#VALUE!					9E-01

Table 9-20
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Resident Child - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Western Undeveloped Area Upper Hydrogeologic Unit Groundwater	Tapwater	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	5E-01	NA	2E-03	5E-01
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	1E-01	NA	6E-04	1E-01
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	6E-01	NA	2E-03	6E-01
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-02	NA	4E-04	9E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-01	NA	4E-04	1E-01
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	NA	NA	NA	Liver (RfDo)	2E-01	NA	NA	2E-01
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	4E-04	NA	3E-04	7E-04
				Chemical Total	NA	NA	NA	NA		***2E+00***	NA	7E-03	***2E+00***
		Exposure Point Total						NA					***2E+00***
	Exposure Medium Total							NA					***2E+00***
Medium Total								NA					***2E+00***
Receptor Total							Receptor Risk Total	#VALUE!				Receptor HI Total	***3E+00***

Blood/Cardiovascular/Hematologic	9E-02
Body Weight	6E-03
Dermal/Skin	2E-02
Developmental	1E-03
Gastrointestinal	2E-01
Liver	2E-01
Lungs/Respiratory	7E-04
Nervous	3E-01
Neurological	2E-03
Testes	7E-01
Thyroid	2E-01

Table 9-21
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Industrial Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	8E-05	NA	NA	8E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	4E-08	NA	NA	4E-08	NA (RfDo)	7E-05	NA	NA	7E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-02	NA	NA	1E-02
			7440-38-2	Arsenic	***1E-06***	NA	2E-07	***1E-06***	Skin and blood (RfDo)	7E-03	NA	1E-03	8E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-02	NA	NA	1E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	3E-04	NA	NA	3E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-02	NA	NA	1E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-02	NA	NA	1E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-04	NA	NA	4E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	5E-05	NA	NA	5E-05
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	6E-10	NA	3E-10	9E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	7E-09	NA	4E-09	1E-08	Developmental (RfDo)	6E-05	NA	3E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-07	NA	2E-07	5E-07
				Chemical Total	***1E-06***	NA	2E-07	***1E-06***		6E-02	NA	1E-03	6E-02
		Exposure Point Total						***1E-06***					6E-02
	Exposure Medium Total							***1E-06***					6E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-04	NA	8E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	5E-08	NA	5E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-09	NA	1E-09	Lungs (RfC)	NA	4E-07	NA	4E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-04	NA	4E-04
			7440-38-2	Arsenic	NA	1E-09	NA	1E-09	cardiovascular, nervous, and skin (RfC)	NA	4E-05	NA	4E-05
			7440-48-4	Cobalt	NA	2E-09	NA	2E-09	Respiratory Tract; Lung (RfC)	NA	1E-04	NA	1E-04
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-03	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-04	NA	3E-04
			7440-02-0	Nickel	NA	1E-10	NA	1E-10	Resp. (RfC)	NA	2E-05	NA	2E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-05	NA	2E-05
			56-55-3	Benzo(A)Anthracene	NA	2E-11	NA	2E-11	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	8E-13	NA	8E-13	Developmental (RfC)	NA	2E-06	NA	2E-06
			205-99-2	Benzo(B)Fluoranthene	NA	1E-13	NA	1E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	4E-10	NA	4E-10	Nervous, Respiratory (RfC)	NA	1E-05	NA	1E-05
				Chemical Total	NA	5E-09	NA	5E-09		NA	3E-03	NA	3E-03
		Exposure Point Total						5E-09					3E-03
		Exposure Medium Total						5E-09					3E-03
Medium Total								***1E-06***					6E-02
Receptor Total							Receptor Risk Total	***1E-06***			Receptor HI Total		6E-02

Table 9-22
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Construction Worker - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	4E-04	NA	NA	4E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-04	NA	NA	2E-04
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	2E-04	NA	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-02	NA	NA	2E-02
			7440-38-2	Arsenic	9E-08	NA	2E-08	1E-07	Skin and blood (RfDo)	1E-02	NA	2E-03	2E-02
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-02	NA	NA	3E-02
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	6E-04	NA	NA	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-02	NA	NA	3E-02
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-02	NA	NA	3E-02
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	8E-04	NA	NA	8E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	1E-04	NA	NA	1E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	3E-03	NA	NA	3E-03
			56-55-3	Benzo(A)Anthracene	5E-11	NA	2E-11	7E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	6E-10	NA	2E-10	8E-10	Developmental (RfDo)	1E-04	NA	6E-05	2E-04
			205-99-2	Benzo(B)Fluoranthene	1E-10	NA	4E-11	1E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	7E-07	NA	3E-07	1E-06
				Chemical Total	1E-07	NA	2E-08	1E-07		1E-01	NA	2E-03	1E-01
		Exposure Point Total						1E-07					1E-01
	Exposure Medium Total							1E-07					1E-01
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	5E-04	NA	5E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	3E-08	NA	3E-08
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	3E-11	NA	3E-11	Lungs (RfC)	NA	3E-07	NA	3E-07
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-04	NA	3E-04
			7440-38-2	Arsenic	NA	3E-11	NA	3E-11	cardiovascular, nervous, and skin (RfC)	NA	3E-05	NA	3E-05
			7440-48-4	Cobalt	NA	6E-11	NA	6E-11	Respiratory Tract; Lung (RfC)	NA	8E-05	NA	8E-05
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-04	NA	8E-04
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-04	NA	2E-04
			7440-02-0	Nickel	NA	3E-12	NA	3E-12	Resp. (RfC)	NA	1E-05	NA	1E-05
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-09	NA	2E-09
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-05	NA	1E-05
			56-55-3	Benzo(A)Anthracene	NA	6E-13	NA	6E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-14	NA	2E-14	Developmental (RfC)	NA	1E-06	NA	1E-06
			205-99-2	Benzo(B)Fluoranthene	NA	3E-15	NA	3E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	1E-11	NA	1E-11	Nervous, Respiratory (RfC)	NA	8E-06	NA	8E-06
				Chemical Total	NA	1E-10	NA	1E-10		NA	2E-03	NA	2E-03
		Exposure Point Total						1E-10					2E-03
		Exposure Medium Total						1E-10					2E-03
Medium Total								1E-07					1E-01
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	1E-01

Table 9-23
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Subsurface Soil 0-12 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-05	NA	NA	1E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	5E-06	NA	NA	5E-06
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	5E-06	NA	NA	5E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-04	NA	NA	7E-04
			7440-38-2	Arsenic	3E-08	NA	6E-09	4E-08	Skin and blood (RfDo)	5E-04	NA	1E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	8E-04	NA	NA	8E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-05	NA	NA	2E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-06	NA	NA	3E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	5E-11	NA	3E-11	7E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	5E-10	NA	3E-10	8E-10	Developmental (RfDo)	4E-06	NA	2E-06	7E-06
			205-99-2	Benzo(B)Fluoranthene	9E-11	NA	5E-11	1E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-08	NA	1E-08	3E-08
				Chemical Total	3E-08	NA	7E-09	4E-08		4E-03	NA	1E-04	4E-03
		Exposure Point Total						4E-08					4E-03
	Exposure Medium Total							4E-08					4E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-06	NA	4E-06
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-10	NA	2E-10
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-12	NA	7E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	2E-07	NA	2E-07
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	6E-07	NA	6E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-06	NA	5E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	2E-13	NA	2E-13	Resp. (RfC)	NA	7E-08	NA	7E-08
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	7E-08	NA	7E-08
			56-55-3	Benzo(A)Anthracene	NA	1E-13	NA	1E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	4E-15	NA	4E-15	Developmental (RfC)	NA	9E-09	NA	9E-09
			205-99-2	Benzo(B)Fluoranthene	NA	7E-16	NA	7E-16	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	8E-13	NA	8E-13	Nervous, Respiratory (RfC)	NA	6E-08	NA	6E-08
				Chemical Total	NA	1E-11	NA	1E-11		NA	1E-05	NA	1E-05
		Exposure Point Total						1E-11					1E-05
	Exposure Medium Total							1E-11					1E-05
Medium Total								4E-08					4E-03

Table 9-23
Summary of Receptor Risks and Hazards for COPCs
(Western Undeveloped Area - Trespasser - Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	2E-05	3E-04
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	2E-05	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	9E-06	1E-04
				Chemical Total	NA	NA	NA	NA		6E-04	NA	5E-05	6E-04
		Exposure Point Total						NA					6E-04
	Exposure Medium Total							NA					6E-04
Medium Total								NA					6E-04
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	2E-08	NA	5E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	8E-05	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
				Chemical Total	2E-08	NA	5E-09	3E-08		4E-03	NA	8E-05	4E-03
		Exposure Point Total						3E-08					4E-03
	Exposure Medium Total							3E-08					4E-03
Medium Total								3E-08					4E-03
Receptor Total							Receptor Risk Total	7E-08				Receptor HI Total	9E-03

Table 9-24
Summary of Receptor Risks and Hazards for COPCs
(South Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	5E-05	NA	NA	5E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-08	NA	NA	2E-08	NA (RfDo)	4E-05	NA	NA	4E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-03	NA	NA	2E-03
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-04	NA	NA	2E-04
			7440-38-2	Arsenic	3E-07	NA	7E-08	4E-07	Skin and blood (RfDo)	2E-03	NA	5E-04	3E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-03	NA	NA	3E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-03	NA	NA	2E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-03	NA	NA	3E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-03	NA	NA	2E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-04	NA	NA	4E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	3E-05	NA	NA	3E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	3E-03	NA	NA	3E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-03	NA	NA	1E-03
			56-55-3	Benzo(A)Anthracene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-07	NA	1E-07	3E-07	Developmental (RfDo)	2E-03	NA	1E-03	3E-03
			205-99-2	Benzo(B)Fluoranthene	3E-08	NA	2E-08	5E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	1E-09	NA	6E-10	2E-09	Liver (RfDo)	1E-05	NA	6E-06	2E-05
			53-70-3	Dibenz(A,H)Anthracene	2E-08	NA	1E-08	3E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-08	NA	8E-09	2E-08	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-07	NA	5E-08	2E-07
				Chemical Total	6E-07	NA	2E-07	8E-07		2E-02	NA	1E-03	2E-02
		Exposure Point Total						8E-07					2E-02
	Exposure Medium Total							8E-07					2E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-05	NA	8E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	4E-09	NA	4E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	8E-11	NA	8E-11	Lungs (RfC)	NA	3E-08	NA	3E-08
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	1E-05	NA	1E-05
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	4E-11	NA	4E-11	cardiovascular, nervous, and skin (RfC)	NA	2E-06	NA	2E-06
			7440-48-4	Cobalt	NA	7E-11	NA	7E-11	Respiratory Tract; Lung (RfC)	NA	4E-06	NA	4E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	3E-05	NA	3E-05
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	6E-04	NA	6E-04
			7440-02-0	Nickel	NA	2E-11	NA	2E-11	Resp. (RfC)	NA	2E-06	NA	2E-06
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	2E-10	NA	2E-10
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	2E-06	NA	2E-06
			56-55-3	Benzo(A)Anthracene	NA	2E-11	NA	2E-11	NA (RfC)	NA	NA	NA	NA

Table 9-24
Summary of Receptor Risks and Hazards for COPCs
(South Percolation Pond Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	50-32-8	Benzo(A)Pyrene	NA	3E-12	NA	3E-12	Developmental (RfC)	NA	6E-06	NA	6E-06
			205-99-2	Benzo(B)Fluoranthene	NA	5E-13	NA	5E-13	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	6E-15	NA	6E-15	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	2E-13	NA	2E-13	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-11	NA	2E-11	Nervous, Respiratory (RfC)	NA	5E-07	NA	5E-07
				Chemical Total	NA	2E-10	NA	2E-10		NA	7E-04	NA	7E-04
		Exposure Point Total						2E-10					7E-04
	Exposure Medium Total							2E-10					7E-04
Medium Total								8E-07					2E-02
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	4E-02	NA	2E-03	4E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	2E-03	NA	9E-05	2E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	6E-03	NA	3E-04	7E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	8E-04	NA	4E-05	9E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	2E-04	NA	8E-06	2E-04
			7440-38-2	Arsenic	2E-07	NA	9E-09	2E-07	Skin and blood (RfDo)	1E-03	NA	5E-05	1E-03
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	3E-04	NA	2E-05	3E-04
			7440-43-9	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	1E-04	NA	6E-06	1E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	2E-05	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	9E-05	NA	5E-06	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-03	NA	9E-05	2E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-03	NA	2E-04	3E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	6E-05	NA	6E-07	6E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-03	NA	1E-04	2E-03
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-04	NA	1E-05	2E-04
			50-32-8	Benzo(A)Pyrene	1E-08	NA	NA	1E-08	Developmental (RfDo)	1E-04	NA	NA	1E-04
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	NA	2E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	9E-10	NA	NA	9E-10	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	2E-07	NA	9E-09	2E-07		6E-02	NA	3E-03	6E-02
		Exposure Point Total						2E-07					6E-02
	Exposure Medium Total							2E-07					6E-02
Medium Total								2E-07					6E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	4E-04	NA	NA	4E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-04	NA	NA	2E-04
			7440-38-2	Arsenic	1E-07	NA	2E-08	1E-07	Skin and blood (RfDo)	7E-04	NA	2E-04	9E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-03	NA	NA	2E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-03	NA	NA	2E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	8E-04	NA	NA	8E-04
			50-32-8	Benzo(A)Pyrene	2E-08	NA	9E-09	3E-08	Developmental (RfDo)	2E-04	NA	8E-05	2E-04
			205-99-2	Benzo(B)Fluoranthene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	5E-09	NA	3E-09	9E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-09	NA	1E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	1E-07	NA	4E-08	2E-07		7E-03	NA	2E-04	7E-03
		Exposure Point Total						2E-07					7E-03
	Exposure Medium Total							2E-07					7E-03
Medium Total								2E-07					7E-03
Receptor Total							Receptor Risk Total	***1E-06***				Receptor HI Total	9E-02

Table 9-25
Summary of Receptor Risks and Hazards for COPCs
(South Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	NA	3E-04
		0-0.5 ft bgs	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-05	NA	NA	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	5E-06	NA	NA	5E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-04	NA	NA	1E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	7E-05	NA	NA	7E-05
			7440-38-2	Arsenic	2E-08	NA	4E-09	2E-08	Skin and blood (RfDo)	3E-04	NA	6E-05	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	7E-04	NA	NA	7E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-04	NA	NA	2E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	7E-04	NA	NA	7E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-05	NA	NA	4E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-06	NA	NA	4E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	9E-04	NA	NA	9E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	3E-10	NA	1E-10	4E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	9E-09	NA	5E-09	1E-08	Developmental (RfDo)	7E-05	NA	4E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	8E-10	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	9E-10	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-08	NA	2E-08	5E-08
				Chemical Total	4E-08	NA	1E-08	5E-08		4E-03	NA	1E-04	4E-03
		Exposure Point Total						5E-08					4E-03
	Exposure Medium Total							5E-08					4E-03
	Air	Airborne	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-05	NA	8E-05
		vapors	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	8E-10	NA	8E-10
		/dust	7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-12	NA	7E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-07	NA	3E-07
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	1E-12	NA	1E-12	cardiovascular, nervous, and skin (RfC)	NA	1E-07	NA	1E-07
			7440-48-4	Cobalt	NA	4E-12	NA	4E-12	Respiratory Tract; Lung (RfC)	NA	5E-07	NA	5E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-06	NA	5E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-05	NA	3E-05
			7440-02-0	Nickel	NA	4E-13	NA	4E-13	Resp. (RfC)	NA	1E-07	NA	1E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-11	NA	1E-11
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	8E-08	NA	8E-08
			56-55-3	Benzo(A)Anthracene	NA	7E-13	NA	7E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	7E-14	NA	7E-14	Developmental (RfC)	NA	1E-07	NA	1E-07
			205-99-2	Benzo(B)Fluoranthene	NA	3E-14	NA	3E-14	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	7E-15	NA	7E-15	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	7E-15	NA	7E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	1E-12	NA	1E-12	Nervous, Respiratory (RfC)	NA	9E-08	NA	9E-08
				Chemical Total	NA	1E-11	NA	1E-11		NA	1E-04	NA	1E-04
		Exposure Point Total						1E-11					1E-04
	Exposure Medium Total							1E-11					1E-04
Medium Total								5E-08					5E-03

Table 9-25
Summary of Receptor Risks and Hazards for COPCs
(South Percolation Pond Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-02	NA	1E-03	1E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	6E-04	NA	5E-05	6E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-03	NA	2E-04	2E-03
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	2E-05	3E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	5E-05	NA	4E-06	6E-05
			7440-38-2	Arsenic	2E-08	NA	2E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	3E-05	4E-04
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	1E-04	NA	9E-06	1E-04
			7440-43-9	Cadmium	NA	NA	NA	NA	Urinary (RfDo)	4E-05	NA	3E-06	4E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-04	NA	1E-05	3E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	3E-05	NA	3E-06	3E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	6E-04	NA	5E-05	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	9E-05	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-05	NA	4E-07	2E-05
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-04	NA	7E-05	8E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	7E-05	NA	6E-06	7E-05
			50-32-8	Benzo(A)Pyrene	5E-09	NA	NA	5E-09	Developmental (RfDo)	4E-05	NA	NA	4E-05
			205-99-2	Benzo(B)Fluoranthene	7E-10	NA	NA	7E-10	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	4E-10	NA	NA	4E-10	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	3E-08	NA	2E-09	3E-08		2E-02	NA	2E-03	2E-02
		Exposure Point Total						3E-08					2E-02
	Exposure Medium Total							3E-08					2E-02
Medium Total								3E-08					2E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	NA	1E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	6E-05	NA	NA	6E-05
			7440-38-2	Arsenic	2E-08	NA	3E-09	2E-08	Skin and blood (RfDo)	2E-04	NA	5E-05	3E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	7E-04	NA	NA	7E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	NA	3E-04
			50-32-8	Benzo(A)Pyrene	6E-09	NA	4E-09	1E-08	Developmental (RfDo)	5E-05	NA	3E-05	8E-05
			205-99-2	Benzo(B)Fluoranthene	1E-09	NA	7E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	3E-08	NA	9E-09	4E-08		2E-03	NA	8E-05	2E-03
		Exposure Point Total						4E-08					2E-03
	Exposure Medium Total							4E-08					2E-03
Medium Total								4E-08					2E-03
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	3E-02

Table 9-26
Summary of Receptor Risks and Hazards for COPCs
(Flathead River Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-03	NA	3E-04	2E-03
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	5E-04	NA	1E-04	6E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-04	NA	8E-05	3E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-05	NA	5E-06	2E-05
			7440-38-2	Arsenic	1E-08	NA	3E-09	1E-08	Skin and blood (RfDo)	8E-05	NA	2E-05	1E-04
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	2E-05	NA	4E-06	2E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-04	NA	3E-05	4E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-05	NA	8E-06	4E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-04	NA	4E-05	2E-04
			56-55-3	Benzo(A)Anthracene	9E-10	NA	NA	9E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	3E-09	NA	NA	3E-09	Developmental (RfDo)	2E-05	NA	NA	2E-05
			205-99-2	Benzo(B)Fluoranthene	1E-09	NA	NA	1E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-09	NA	NA	2E-09	Liver (RfDo)	3E-05	NA	NA	3E-05
			53-70-3	Dibenz(A,H)Anthracene	2E-10	NA	NA	2E-10	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	2E-08	NA	3E-09	2E-08		3E-03	NA	7E-04	3E-03
		Exposure Point Total						2E-08					3E-03
	Exposure Medium Total							2E-08					3E-03
Medium Total								2E-08					3E-03
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-05	NA	NA	3E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	NA	3E-04
			7440-38-2	Arsenic	3E-08	NA	2E-08	5E-08	Skin and blood (RfDo)	3E-04	NA	2E-04	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-04	NA	NA	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	NA	3E-04
			56-55-3	Benzo(A)Anthracene	1E-09	NA	2E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	4E-09	NA	7E-09	1E-08	Developmental (RfDo)	2E-05	NA	4E-05	6E-05
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	3E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	2E-09	NA	3E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	4E-08	NA	4E-08	8E-08		2E-03	NA	2E-04	2E-03
		Exposure Point Total						8E-08					2E-03
	Exposure Medium Total							8E-08					2E-03
Medium Total								8E-08					2E-03
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	6E-03

Table 9-27
Summary of Receptor Risks and Hazards for COPCs
(Flathead River Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-03	NA	6E-04	3E-03
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	8E-04	NA	2E-04	1E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	5E-04	NA	1E-04	6E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-05	NA	9E-06	4E-05
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	1E-04	NA	4E-05	2E-04
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	3E-05	NA	8E-06	3E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-04	NA	6E-05	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	5E-05	NA	1E-05	7E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	8E-05	4E-04
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	4E-05	NA	NA	4E-05
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	NA	NA	NA	Liver (RfDo)	5E-05	NA	NA	5E-05
			53-70-3	Dibenz(A,H)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	NA	NA	NA	NA		5E-03	NA	1E-03	6E-03
		Exposure Point Total						NA					6E-03
	Exposure Medium Total							NA					6E-03
Medium Total								NA					6E-03
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	5E-05	NA	NA	5E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	5E-04	NA	3E-04	8E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	6E-04	NA	NA	6E-04
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	4E-05	NA	7E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	NA	NA	NA	NA		4E-03	NA	4E-04	4E-03
		Exposure Point Total						NA					4E-03
	Exposure Medium Total							NA					4E-03
Medium Total								NA					4E-03
Receptor Total							Receptor Risk Total	0E+00				Receptor HI Total	1E-02

Table 9-28
Summary of Receptor Risks and Hazards for COPCs
(Flathead River Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-03	NA	1E-04	1E-03
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	5E-04	NA	4E-05	5E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-04	NA	2E-05	3E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-05	NA	2E-06	2E-05
			7440-38-2	Arsenic	1E-08	NA	9E-10	1E-08	Skin and blood (RfDo)	8E-05	NA	7E-06	9E-05
			7440-39-3	Barium	NA	NA	NA	NA	kidney (nephropathy) (RfDo)	2E-05	NA	1E-06	2E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-04	NA	1E-05	3E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-05	NA	2E-06	3E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-04	NA	1E-05	2E-04
			56-55-3	Benzo(A)Anthracene	4E-10	NA	NA	4E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-09	NA	NA	2E-09	Developmental (RfDo)	2E-05	NA	NA	2E-05
			205-99-2	Benzo(B)Fluoranthene	5E-10	NA	NA	5E-10	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-09	NA	NA	2E-09	Liver (RfDo)	3E-05	NA	NA	3E-05
			53-70-3	Dibenz(A,H)Anthracene	1E-10	NA	NA	1E-10	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	2E-08	NA	9E-10	2E-08		3E-03	NA	2E-04	3E-03
		Exposure Point Total						2E-08					3E-03
	Exposure Medium Total							2E-08					3E-03
	Fish	Fish	16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-10	NA	NA	2E-10
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	6E-10	NA	NA	6E-10
			7440-38-2	Arsenic	3E-08	NA	NA	3E-08	Skin and blood (RfDo)	1E-09	NA	NA	1E-09
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-09	NA	NA	6E-09
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	4E-10	NA	NA	4E-10
			7439-96-5_d	Manganese	NA	NA	NA	NA	Nervous (RfDo)	7E-10	NA	NA	7E-10
			56-55-3	Benzo(A)Anthracene	1E-09	NA	NA	1E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-07	NA	NA	1E-07	Developmental (RfDo)	6E-09	NA	NA	6E-09
			205-99-2	Benzo(B)Fluoranthene	2E-08	NA	NA	2E-08	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	1E-08	NA	NA	1E-08	Liver (RfDo)	1E-09	NA	NA	1E-09
			53-70-3	Dibenz(A,H)Anthracene	1E-08	NA	NA	1E-08	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	2E-07	NA	NA	2E-07		2E-08	NA	NA	2E-08
		Exposure Point Total						2E-07					2E-08
	Exposure Medium Total							2E-07					2E-08
Medium Total								2E-07					3E-03
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-05	NA	NA	3E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	NA	3E-04
			7440-38-2	Arsenic	3E-08	NA	7E-09	4E-08	Skin and blood (RfDo)	3E-04	NA	5E-05	3E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-04	NA	NA	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	NA	3E-04
			56-55-3	Benzo(A)Anthracene	5E-10	NA	3E-10	8E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-09	NA	1E-09	3E-09	Developmental (RfDo)	2E-05	NA	1E-05	4E-05
			205-99-2	Benzo(B)Fluoranthene	9E-10	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	8E-10	NA	4E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	4E-08	NA	9E-09	5E-08		2E-03	NA	7E-05	2E-03
		Exposure Point Total						5E-08					2E-03
	Exposure Medium Total							5E-08					2E-03
Medium Total								5E-08					2E-03
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	5E-03

Table 9-29
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	NA	3E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	7E-05	NA	NA	7E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	8E-09	NA	NA	8E-09	NA (RfDo)	1E-05	NA	NA	1E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-03	NA	NA	1E-03
			7440-38-2	Arsenic	2E-07	NA	5E-08	3E-07	Skin and blood (RfDo)	1E-03	NA	3E-04	2E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-03	NA	NA	3E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	7E-05	NA	NA	7E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-03	NA	NA	3E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-03	NA	NA	3E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	1E-04	NA	NA	1E-04
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	2E-05	NA	NA	2E-05
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	4E-04	NA	NA	4E-04
			56-55-3	Benzo(A)Anthracene	4E-10	NA	2E-10	7E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-09	NA	9E-10	3E-09	Developmental (RfDo)	2E-05	NA	9E-06	2E-05
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	5E-06	NA	3E-06	8E-06
				Chemical Total	2E-07	NA	5E-08	3E-07		1E-02	NA	3E-04	1E-02
		Exposure Point Total						3E-07					1E-02
	Exposure Medium Total							3E-07					1E-02
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	2E-04	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	5E-09	NA	5E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	3E-11	NA	3E-11	Lungs (RfC)	NA	1E-08	NA	1E-08
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	7E-06	NA	7E-06
			7440-38-2	Arsenic	NA	3E-11	NA	3E-11	cardiovascular, nervous, and skin (RfC)	NA	1E-06	NA	1E-06
			7440-48-4	Cobalt	NA	8E-11	NA	8E-11	Respiratory Tract; Lung (RfC)	NA	4E-06	NA	4E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	3E-05	NA	3E-05
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	1E-05	NA	1E-05
			7440-02-0	Nickel	NA	5E-12	NA	5E-12	Resp. (RfC)	NA	6E-07	NA	6E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	1E-10	NA	1E-10
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	5E-07	NA	5E-07
			56-55-3	Benzo(A)Anthracene	NA	2E-12	NA	2E-12	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	2E-14	NA	2E-14	Developmental (RfC)	NA	6E-08	NA	6E-08
			205-99-2	Benzo(B)Fluoranthene	NA	3E-14	NA	3E-14	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	9E-10	NA	9E-10	Nervous, Respiratory (RfC)	NA	3E-05	NA	3E-05
				Chemical Total	NA	1E-09	NA	1E-09		NA	2E-04	NA	2E-04
		Exposure Point Total						1E-09					2E-04
	Exposure Medium Total							1E-09					2E-04
Medium Total								3E-07					1E-02

Table 9-29
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Stormwater Management Worker - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Stormwater Management Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	6E-02	NA	3E-03	6E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	8E-03	NA	4E-04	9E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	4E-03	NA	2E-04	5E-03
			7440-38-2	Arsenic	3E-08	NA	2E-09	4E-08	Skin and blood (RfDo)	2E-04	NA	1E-05	2E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	4E-04	NA	8E-06	4E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	8E-05	NA	4E-06	9E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-04	NA	2E-05	4E-04
			56-55-3	Benzo(A)Anthracene	1E-10	NA	NA	1E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	7E-10	NA	NA	7E-10	Developmental (RfDo)	7E-06	NA	NA	7E-06
			205-99-2	Benzo(B)Fluoranthene	3E-10	NA	NA	3E-10	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-09	NA	NA	2E-09	Liver (RfDo)	2E-05	NA	NA	2E-05
			53-70-3	Dibenz(A,H)Anthracene	2E-10	NA	NA	2E-10	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	4E-08	NA	2E-09	4E-08		7E-02	NA	4E-03	8E-02
		Exposure Point Total						4E-08					8E-02
	Exposure Medium Total							4E-08					8E-02
Medium Total								4E-08					8E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	6E-04	NA	NA	6E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-03	NA	NA	1E-03
			7440-38-2	Arsenic	2E-07	NA	4E-08	2E-07	Skin and blood (RfDo)	1E-03	NA	3E-04	2E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-03	NA	NA	3E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-03	NA	NA	3E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-03	NA	NA	2E-03
			56-55-3	Benzo(A)Anthracene	5E-09	NA	2E-09	7E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-08	NA	1E-08	3E-08	Developmental (RfDo)	2E-04	NA	9E-05	3E-04
			205-99-2	Benzo(B)Fluoranthene	9E-09	NA	5E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	9E-09	NA	5E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	2E-07	NA	7E-08	3E-07		1E-02	NA	4E-04	1E-02
		Exposure Point Total						3E-07					1E-02
	Exposure Medium Total							3E-07					1E-02
Medium Total								3E-07					1E-02
Receptor Total							Receptor Risk Total	7E-07				Receptor HI Total	1E-01

Table 9-30
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-0.5 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	NA	1E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	4E-05	NA	NA	4E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	5E-06	NA	NA	5E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	5E-04	NA	NA	5E-04
			7440-38-2	Arsenic	3E-08	NA	6E-09	4E-08	Skin and blood (RfDo)	5E-04	NA	1E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	8E-04	NA	NA	8E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	4E-05	NA	NA	4E-05
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	2E-10	NA	9E-11	3E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	7E-10	NA	4E-10	1E-09	Developmental (RfDo)	5E-06	NA	3E-06	8E-06
			205-99-2	Benzo(B)Fluoranthene	7E-10	NA	4E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-06	NA	1E-06	3E-06
				Chemical Total	3E-08	NA	7E-09	4E-08		4E-03	NA	1E-04	4E-03
		Exposure Point Total						4E-08					4E-03
	Exposure Medium Total							4E-08					4E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-05	NA	4E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	1E-09	NA	1E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-12	NA	7E-12	Lungs (RfC)	NA	2E-09	NA	2E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	1E-06	NA	1E-06
			7440-38-2	Arsenic	NA	2E-12	NA	2E-12	cardiovascular, nervous, and skin (RfC)	NA	2E-07	NA	2E-07
			7440-48-4	Cobalt	NA	6E-12	NA	6E-12	Respiratory Tract; Lung (RfC)	NA	7E-07	NA	7E-07
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	5E-06	NA	5E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	2E-06	NA	2E-06
			7440-02-0	Nickel	NA	4E-13	NA	4E-13	Resp. (RfC)	NA	1E-07	NA	1E-07
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-07	NA	1E-07
			56-55-3	Benzo(A)Anthracene	NA	4E-13	NA	4E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	5E-15	NA	5E-15	Developmental (RfC)	NA	1E-08	NA	1E-08
			205-99-2	Benzo(B)Fluoranthene	NA	6E-15	NA	6E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	7E-11	NA	7E-11	Nervous, Respiratory (RfC)	NA	5E-06	NA	5E-06
				Chemical Total	NA	8E-11	NA	8E-11		NA	5E-05	NA	5E-05
		Exposure Point Total						8E-11					5E-05
	Exposure Medium Total							8E-11					5E-05
Medium Total								4E-08					5E-03

Table 9-30
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Trespasser - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-02	NA	2E-03	2E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	3E-03	NA	2E-04	3E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	1E-04	2E-03
			7440-38-2	Arsenic	5E-09	NA	4E-10	5E-09	Skin and blood (RfDo)	7E-05	NA	6E-06	8E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-04	NA	5E-06	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-05	NA	2E-06	3E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-04	NA	1E-05	1E-04
			56-55-3	Benzo(A)Anthracene	6E-11	NA	NA	6E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	3E-10	NA	NA	3E-10	Developmental (RfDo)	2E-06	NA	NA	2E-06
			205-99-2	Benzo(B)Fluoranthene	1E-10	NA	NA	1E-10	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-10	NA	NA	2E-10	Liver (RfDo)	6E-06	NA	NA	6E-06
			53-70-3	Dibenz(A,H)Anthracene	9E-11	NA	NA	9E-11	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	5E-09	NA	4E-10	6E-09		2E-02	NA	2E-03	3E-02
		Exposure Point Total						6E-09					3E-02
	Exposure Medium Total							6E-09					3E-02
Medium Total								6E-09					3E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	4E-04	NA	NA	4E-04
			7440-38-2	Arsenic	3E-08	NA	6E-09	3E-08	Skin and blood (RfDo)	4E-04	NA	9E-05	5E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	8E-04	NA	NA	8E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-04	NA	NA	4E-04
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	8E-04	NA	NA	8E-04
			56-55-3	Benzo(A)Anthracene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	7E-09	NA	4E-09	1E-08	Developmental (RfDo)	6E-05	NA	3E-05	9E-05
			205-99-2	Benzo(B)Fluoranthene	3E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	4E-09	NA	2E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-09	NA	7E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	4E-08	NA	2E-08	6E-08		4E-03	NA	1E-04	4E-03
		Exposure Point Total						6E-08					4E-03
	Exposure Medium Total							6E-08					4E-03
Medium Total								6E-08					4E-03
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	3E-02

Table 9-31
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	9E-05	NA	NA	9E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-05	NA	NA	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	3E-09	NA	NA	3E-09	NA (RfDo)	4E-06	NA	NA	4E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	4E-04	NA	NA	4E-04
			7440-38-2	Arsenic	5E-08	NA	3E-08	8E-08	Skin and blood (RfDo)	4E-04	NA	3E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	7E-04	NA	NA	7E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-05	NA	NA	3E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-06	NA	NA	4E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	2E-10	NA	3E-10	5E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	7E-10	NA	1E-09	2E-09	Developmental (RfDo)	4E-06	NA	7E-06	1E-05
			205-99-2	Benzo(B)Fluoranthene	8E-10	NA	1E-09	2E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-06	NA	2E-06	4E-06
				Chemical Total	5E-08	NA	4E-08	9E-08		3E-03	NA	3E-04	4E-03
		Exposure Point Total						9E-08					4E-03
	Exposure Medium Total							9E-08					4E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-05	NA	4E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	1E-09	NA	1E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	1E-11	NA	1E-11	Lungs (RfC)	NA	3E-09	NA	3E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	6E-12	NA	6E-12	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	2E-11	NA	2E-11	Respiratory Tract; Lung (RfC)	NA	1E-06	NA	1E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-06	NA	8E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7440-02-0	Nickel	NA	1E-12	NA	1E-12	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-11	NA	3E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-07	NA	1E-07
			56-55-3	Benzo(A)Anthracene	NA	8E-13	NA	8E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-14	NA	1E-14	Developmental (RfC)	NA	2E-08	NA	2E-08
			205-99-2	Benzo(B)Fluoranthene	NA	1E-14	NA	1E-14	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-10	NA	2E-10	Nervous, Respiratory (RfC)	NA	7E-06	NA	7E-06
				Chemical Total	NA	2E-10	NA	2E-10		NA	6E-05	NA	6E-05
		Exposure Point Total						2E-10					6E-05
	Exposure Medium Total							2E-10					6E-05
Medium Total								9E-08					4E-03

Table 9-31
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Floater, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-02	NA	4E-03	2E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	2E-03	NA	6E-04	3E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	3E-04	1E-03
			7440-38-2	Arsenic	7E-09	NA	2E-09	9E-09	Skin and blood (RfDo)	6E-05	NA	2E-05	7E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-04	NA	1E-05	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-05	NA	6E-06	3E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-04	NA	3E-05	1E-04
			56-55-3	Benzo(A)Anthracene	6E-11	NA	NA	6E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	3E-10	NA	NA	3E-10	Developmental (RfDo)	2E-06	NA	NA	2E-06
			205-99-2	Benzo(B)Fluoranthene	1E-10	NA	NA	1E-10	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	4E-10	NA	NA	4E-10	Liver (RfDo)	5E-06	NA	NA	5E-06
			53-70-3	Dibenz(A,H)Anthracene	9E-11	NA	NA	9E-11	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	8E-09	NA	2E-09	1E-08		2E-02	NA	5E-03	2E-02
		Exposure Point Total						1E-08					2E-02
	Exposure Medium Total							1E-08					2E-02
Medium Total								1E-08					2E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	NA	3E-04
			7440-38-2	Arsenic	4E-08	NA	3E-08	7E-08	Skin and blood (RfDo)	3E-04	NA	2E-04	6E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	7E-04	NA	NA	7E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	NA	3E-04
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	6E-04	NA	NA	6E-04
			56-55-3	Benzo(A)Anthracene	2E-09	NA	3E-09	5E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	8E-09	NA	1E-08	2E-08	Developmental (RfDo)	4E-05	NA	8E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	4E-09	NA	6E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	4E-09	NA	7E-09	1E-08	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-09	NA	2E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	6E-08	NA	6E-08	1E-07		3E-03	NA	3E-04	3E-03
		Exposure Point Total						1E-07					3E-03
	Exposure Medium Total							1E-07					3E-03
Medium Total								1E-07					3E-03
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	3E-02

Table 9-32
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	3E-05	NA	NA	3E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	NA	NA	NA	NA (RfDo)	7E-06	NA	NA	7E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	7E-04	NA	NA	7E-04
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	7E-04	NA	5E-04	1E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-03	NA	NA	2E-03
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	4E-05	NA	NA	4E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-03	NA	NA	2E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	5E-05	NA	NA	5E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	8E-06	NA	NA	8E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	2E-04	NA	NA	2E-04
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	7E-06	NA	1E-05	2E-05
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-06	NA	5E-06	7E-06
				Chemical Total	NA	NA	NA	NA		6E-03	NA	5E-04	7E-03
		Exposure Point Total						NA					7E-03
	Exposure Medium Total							NA					7E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-05	NA	4E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	1E-09	NA	1E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	NA	NA	NA	Lungs (RfC)	NA	3E-09	NA	3E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	NA	NA	NA	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	NA	NA	NA	Respiratory Tract; Lung (RfC)	NA	1E-06	NA	1E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-06	NA	8E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7440-02-0	Nickel	NA	NA	NA	NA	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-11	NA	3E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-07	NA	1E-07
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfC)	NA	2E-08	NA	2E-08
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Nervous, Respiratory (RfC)	NA	7E-06	NA	7E-06
				Chemical Total	NA	NA	NA	NA		NA	6E-05	NA	6E-05
		Exposure Point Total						NA					6E-05
		Exposure Medium Total						NA					6E-05
Medium Total								#VALUE!					7E-03

Table 9-32
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Floater, Adolescent] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Floater)
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-02	NA	8E-03	4E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	4E-03	NA	1E-03	5E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-03	NA	6E-04	3E-03
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	1E-04	NA	3E-05	1E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-04	NA	2E-05	2E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	4E-05	NA	1E-05	5E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	2E-04	NA	5E-05	2E-04
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	3E-06	NA	NA	3E-06
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	NA	NA	NA	Liver (RfDo)	8E-06	NA	NA	8E-06
			53-70-3	Dibenz(A,H)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	NA	NA	NA	NA		3E-02	NA	9E-03	4E-02
		Exposure Point Total						NA					4E-02
	Exposure Medium Total							NA					4E-02
Medium Total								NA					4E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	3E-04	NA	NA	3E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	6E-04	NA	NA	6E-04
			7440-38-2	Arsenic	NA	NA	NA	NA	Skin and blood (RfDo)	6E-04	NA	4E-04	1E-03
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-03	NA	NA	1E-03
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	6E-04	NA	NA	6E-04
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	1E-03	NA	NA	1E-03
			56-55-3	Benzo(A)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	NA	NA	NA	Developmental (RfDo)	8E-05	NA	1E-04	2E-04
			205-99-2	Benzo(B)Fluoranthene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	NA	NA	NA	NA		6E-03	NA	6E-04	6E-03
		Exposure Point Total						NA					6E-03
	Exposure Medium Total							NA					6E-03
Medium Total								NA					6E-03
Receptor Total							Receptor Risk Total	#VALUE!				Receptor HI Total	6E-02

Table 9-33
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	9E-05	NA	NA	9E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-05	NA	NA	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-09	NA	NA	2E-09	NA (RfDo)	4E-06	NA	NA	4E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	4E-04	NA	NA	4E-04
			7440-38-2	Arsenic	5E-08	NA	1E-08	6E-08	Skin and blood (RfDo)	4E-04	NA	8E-05	5E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	9E-04	NA	NA	9E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	7E-04	NA	NA	7E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-05	NA	NA	3E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-06	NA	NA	4E-06
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	9E-11	NA	5E-11	1E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	4E-10	NA	2E-10	5E-10	Developmental (RfDo)	4E-06	NA	2E-06	6E-06
			205-99-2	Benzo(B)Fluoranthene	4E-10	NA	2E-10	6E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	1E-06	NA	8E-07	2E-06
				Chemical Total	5E-08	NA	1E-08	6E-08		3E-03	NA	8E-05	4E-03
		Exposure Point Total						6E-08					4E-03
	Exposure Medium Total							6E-08					4E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	4E-05	NA	4E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	1E-09	NA	1E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-12	NA	7E-12	Lungs (RfC)	NA	3E-09	NA	3E-09
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	2E-06	NA	2E-06
			7440-38-2	Arsenic	NA	6E-12	NA	6E-12	cardiovascular, nervous, and skin (RfC)	NA	3E-07	NA	3E-07
			7440-48-4	Cobalt	NA	2E-11	NA	2E-11	Respiratory Tract; Lung (RfC)	NA	1E-06	NA	1E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-06	NA	8E-06
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7440-02-0	Nickel	NA	1E-12	NA	1E-12	Resp. (RfC)	NA	2E-07	NA	2E-07
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-11	NA	3E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-07	NA	1E-07
			56-55-3	Benzo(A)Anthracene	NA	4E-13	NA	4E-13	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	5E-15	NA	5E-15	Developmental (RfC)	NA	2E-08	NA	2E-08
			205-99-2	Benzo(B)Fluoranthene	NA	6E-15	NA	6E-15	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-10	NA	2E-10	Nervous, Respiratory (RfC)	NA	7E-06	NA	7E-06
				Chemical Total	NA	2E-10	NA	2E-10		NA	6E-05	NA	6E-05
		Exposure Point Total						2E-10					6E-05
	Exposure Medium Total							2E-10					6E-05
Medium Total								6E-08					4E-03

Table 9-33
Summary of Receptor Risks and Hazards for COPCs
(Backwater Seep Sampling Area - Recreationist [Fisher, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreationist (Fisher)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-02	NA	1E-03	2E-02
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	2E-03	NA	2E-04	2E-03
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-03	NA	1E-04	1E-03
			7440-38-2	Arsenic	7E-09	NA	6E-10	8E-09	Skin and blood (RfDo)	6E-05	NA	5E-06	6E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-04	NA	4E-06	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-05	NA	2E-06	2E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-04	NA	9E-06	1E-04
			56-55-3	Benzo(A)Anthracene	3E-11	NA	NA	3E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-10	NA	NA	2E-10	Developmental (RfDo)	2E-06	NA	NA	2E-06
			205-99-2	Benzo(B)Fluoranthene	6E-11	NA	NA	6E-11	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	4E-10	NA	NA	4E-10	Liver (RfDo)	5E-06	NA	NA	5E-06
			53-70-3	Dibenz(A,H)Anthracene	5E-11	NA	NA	5E-11	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	8E-09	NA	6E-10	9E-09		2E-02	NA	2E-03	2E-02
		Exposure Point Total						9E-09					2E-02
	Exposure Medium Total							9E-09					2E-02
	Fish	Fish	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	NA	NA	NA	NA
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	NA	NA	NA	NA
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	7E-10	NA	NA	7E-10
			7440-38-2	Arsenic	2E-08	NA	NA	2E-08	Skin and blood (RfDo)	1E-09	NA	NA	1E-09
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-09	NA	NA	2E-09
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	3E-10	NA	NA	3E-10
			7439-96-5_d	Manganese	NA	NA	NA	NA	Nervous (RfDo)	4E-10	NA	NA	4E-10
			56-55-3	Benzo(A)Anthracene	9E-11	NA	NA	9E-11	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	9E-09	NA	NA	9E-09	Developmental (RfDo)	6E-10	NA	NA	6E-10
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	NA	2E-09	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	2E-09	NA	NA	2E-09	Liver (RfDo)	2E-10	NA	NA	2E-10
			53-70-3	Dibenz(A,H)Anthracene	5E-09	NA	NA	5E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	4E-08	NA	NA	4E-08		5E-09	NA	NA	5E-09
		Exposure Point Total						4E-08					5E-09
	Exposure Medium Total							4E-08					5E-09
Medium Total								5E-08					2E-02
Sediment	Sediment	Sediment	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-04	NA	NA	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	3E-04	NA	NA	3E-04
			7440-38-2	Arsenic	4E-08	NA	9E-09	5E-08	Skin and blood (RfDo)	3E-04	NA	7E-05	4E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	7E-04	NA	NA	7E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	NA	3E-04
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	6E-04	NA	NA	6E-04
			56-55-3	Benzo(A)Anthracene	1E-09	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	4E-09	NA	2E-09	6E-09	Developmental (RfDo)	4E-05	NA	2E-05	7E-05
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	6E-10	NA	4E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	5E-08	NA	1E-08	7E-08		3E-03	NA	9E-05	3E-03
		Exposure Point Total						7E-08					3E-03
	Exposure Medium Total							7E-08					3E-03
Medium Total								7E-08					3E-03
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	3E-02

Table 9-34
Summary of Receptor Risks and Hazards for COPCs
(Recreationist [ATV, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (ATV)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil From ATV Exposure Areas	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-05	NA	NA	2E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-05	NA	NA	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	1E-09	NA	NA	1E-09	NA (RfDo)	3E-06	NA	NA	3E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	6E-04	NA	NA	6E-04
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	4E-06	NA	NA	4E-06
			7440-38-2	Arsenic	5E-08	NA	1E-08	6E-08	Skin and blood (RfDo)	4E-04	NA	8E-05	5E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-04	NA	NA	6E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	1E-04	NA	NA	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	9E-04	NA	NA	9E-04
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	2E-05	NA	NA	2E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	4E-06	NA	NA	4E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	2E-04	NA	NA	2E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	8E-05	NA	NA	8E-05
			11097-69-1	PCB-1254 (Aroclor 1254)	1E-09	NA	7E-10	2E-09	Whole body (RfDo)	1E-04	NA	6E-05	2E-04
			56-55-3	Benzo(A)Anthracene	2E-09	NA	1E-09	3E-09	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	2E-08	NA	1E-08	3E-08	Developmental (RfDo)	2E-04	NA	1E-04	3E-04
			205-99-2	Benzo(B)Fluoranthene	2E-09	NA	1E-09	4E-09	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	9E-11	NA	5E-11	1E-10	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	6E-12	NA	2E-12	8E-12	Liver (RfDo)	7E-08	NA	3E-08	1E-07
			218-01-9	Chrysene	2E-11	NA	1E-11	3E-11	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	4E-09	NA	2E-09	6E-09	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	6E-06	NA	7E-07	7E-06
			193-39-5	Indeno(1,2,3-C,D)Pyrene	1E-09	NA	8E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-08	NA	2E-08	5E-08
				Chemical Total	8E-08	NA	3E-08	1E-07		4E-03	NA	3E-04	4E-03
	Exposure Point Total							1E-07					4E-03
Exposure Medium Total								1E-07					4E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	1E-05	NA	1E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	2E-05	NA	2E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-08	NA	7E-08	Lungs (RfC)	NA	3E-05	NA	3E-05
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	3E-02	NA	3E-02
			7440-36-0	Antimony	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-38-2	Arsenic	NA	5E-08	NA	5E-08	cardiovascular, nervous, and skin (RfC)	NA	3E-03	NA	3E-03
			7440-48-4	Cobalt	NA	1E-07	NA	1E-07	Respiratory Tract; Lung (RfC)	NA	9E-03	NA	9E-03
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	8E-02	NA	8E-02
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-06	NA	3E-06
			7440-02-0	Nickel	NA	1E-08	NA	1E-08	Resp. (RfC)	NA	1E-03	NA	1E-03
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-07	NA	3E-07
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-03	NA	1E-03
			11097-69-1	PCB-1254 (Aroclor 1254)	NA	1E-10	NA	1E-10	NA (RfC)	NA	NA	NA	NA
			56-55-3	Benzo(A)Anthracene	NA	3E-10	NA	3E-10	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	3E-09	NA	3E-09	Developmental (RfC)	NA	9E-03	NA	9E-03

Table 9-34
Summary of Receptor Risks and Hazards for COPCs
(Recreationist [ATV, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (ATV)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Air	Airborne vapors /dust	205-99-2	Benzo(B)Fluoranthene	NA	4E-10	NA	4E-10	NA (RfC)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	NA	2E-11	NA	2E-11	NA (RfC)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	NA	3E-13	NA	3E-13	NA (RfC)	NA	NA	NA	NA
			218-01-9	Chrysene	NA	3E-12	NA	3E-12	NA (RfC)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	NA	7E-10	NA	7E-10	NA (RfC)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			193-39-5	Indeno(1,2,3-C,D)Pyrene	NA	2E-10	NA	2E-10	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	6E-12	NA	6E-12	Nervous, Respiratory (RfC)	NA	2E-07	NA	2E-07
				Chemical Total	NA	3E-07	NA	3E-07		NA	1E-01	NA	1E-01
		Exposure Point Total						3E-07					1E-01
	Exposure Medium Total							3E-07					1E-01
Medium Total								4E-07					1E-01
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	9E-05	NA	4E-06	9E-05
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	8E-05	NA	4E-06	9E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-04	NA	9E-06	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	1E-05	NA	6E-07	1E-05
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	4E-05	NA	2E-06	4E-05
			7440-38-2	Arsenic	8E-09	NA	4E-10	9E-09	Skin and blood (RfDo)	6E-05	NA	3E-06	7E-05
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	1E-04	NA	2E-06	1E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-05	NA	9E-07	2E-05
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-04	NA	1E-05	3E-04
				Chemical Total	8E-09	NA	4E-10	9E-09		9E-04	NA	4E-05	9E-04
		Exposure Point Total						9E-09					9E-04
	Exposure Medium Total							9E-09					9E-04
Medium Total								9E-09					9E-04
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	6E-04	NA	NA	6E-04
			7440-38-2	Arsenic	5E-08	NA	1E-08	6E-08	Skin and blood (RfDo)	4E-04	NA	9E-05	5E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	6E-04	NA	NA	6E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	7E-04	NA	NA	7E-04
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	8E-04	NA	NA	8E-04
			50-32-8	Benzo(A)Pyrene	6E-09	NA	3E-09	9E-09	Developmental (RfDo)	7E-05	NA	4E-05	1E-04
			205-99-2	Benzo(B)Fluoranthene	1E-09	NA	6E-10	2E-09	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	8E-10	NA	5E-10	1E-09	NA (RfDo)	NA	NA	NA	NA
				Chemical Total	6E-08	NA	2E-08	8E-08		3E-03	NA	1E-04	3E-03
		Exposure Point Total						8E-08					3E-03
	Exposure Medium Total							8E-08					3E-03
Medium Total								8E-08					3E-03
Receptor Total							Receptor Risk Total	5E-07				Receptor HI Total	1E-01

Table 9-35
Summary of Receptor Risks and Hazards for COPCs
(Recreationist [Hunter, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil From Hunter Exposure Areas	Soil	Surface Soil 0-2 ft bgs	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	2E-05	NA	NA	2E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-05	NA	NA	1E-05
			7440-47-3_EST	Chromium, Hexavalent - Estimated	2E-09	NA	NA	2E-09	NA (RfDo)	5E-06	NA	NA	5E-06
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-04	NA	NA	9E-04
			7440-38-2	Arsenic	8E-08	NA	9E-09	9E-08	Skin and blood (RfDo)	6E-04	NA	7E-05	7E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	2E-05	NA	NA	2E-05
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-05	NA	NA	3E-05
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	7E-06	NA	NA	7E-06
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	3E-04	NA	NA	3E-04
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	1E-04	NA	NA	1E-04
			56-55-3	Benzo(A)Anthracene	8E-11	NA	3E-11	1E-10	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-09	NA	3E-10	1E-09	Developmental (RfDo)	1E-05	NA	4E-06	2E-05
			205-99-2	Benzo(B)Fluoranthene	2E-10	NA	6E-11	2E-10	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	2E-08	NA	5E-09	2E-08
				Chemical Total	8E-08	NA	1E-08	9E-08		6E-03	NA	8E-05	6E-03
		Exposure Point Total						9E-08					6E-03
	Exposure Medium Total							9E-08					6E-03
	Air	Airborne vapors /dust	57-12-5	Cyanide	NA	NA	NA	NA	Thyroid (RfC)	NA	8E-05	NA	8E-05
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfC)	NA	6E-09	NA	6E-09
			7440-47-3_EST	Chromium, Hexavalent - Estimated	NA	7E-11	NA	7E-11	Lungs (RfC)	NA	3E-08	NA	3E-08
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfC)	NA	4E-05	NA	4E-05
			7440-38-2	Arsenic	NA	7E-11	NA	7E-11	cardiovascular, nervous, and skin (RfC)	NA	4E-06	NA	4E-06
			7440-48-4	Cobalt	NA	1E-10	NA	1E-10	Respiratory Tract; Lung (RfC)	NA	9E-06	NA	9E-06
			7440-50-8	Copper	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-89-6	Iron	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfC)	NA	1E-04	NA	1E-04
			7439-97-6	Mercury	NA	NA	NA	NA	Nervous (RfC)	NA	3E-05	NA	3E-05
			7440-02-0	Nickel	NA	9E-12	NA	9E-12	Resp. (RfC)	NA	1E-06	NA	1E-06
			7782-49-2	Selenium	NA	NA	NA	NA	NA (RfC)	NA	3E-10	NA	3E-10
			7440-28-0	Thallium	NA	NA	NA	NA	NA (RfC)	NA	NA	NA	NA
			7440-62-2	Vanadium	NA	NA	NA	NA	Resp. (RfC)	NA	1E-06	NA	1E-06
			56-55-3	Benzo(A)Anthracene	NA	3E-12	NA	3E-12	NA (RfC)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	NA	1E-13	NA	1E-13	Developmental (RfC)	NA	4E-07	NA	4E-07
			205-99-2	Benzo(B)Fluoranthene	NA	2E-14	NA	2E-14	NA (RfC)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	2E-11	NA	2E-11	Nervous, Respiratory (RfC)	NA	7E-07	NA	7E-07
				Chemical Total	NA	3E-10	NA	3E-10		NA	3E-04	NA	3E-04
		Exposure Point Total						3E-10					3E-04
	Exposure Medium Total							3E-10					3E-04
Medium Total								9E-08					6E-03

Table 9-35
Summary of Receptor Risks and Hazards for COPCs
(Recreationist [Hunter, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil From Venison Exposure Areas	Surface Soil 0-0.5 ft bgs	Venison	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	9E-12	NA	NA	9E-12
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	2E-11	NA	NA	2E-11
			7440-47-3_EST	Chromium, Hexavalent - Estimated	1E-15	NA	NA	1E-15	NA (RfDo)	3E-12	NA	NA	3E-12
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-10	NA	NA	2E-10
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	1E-10	NA	NA	1E-10
			7440-38-2	Arsenic	4E-14	NA	NA	4E-14	Skin and blood (RfDo)	3E-10	NA	NA	3E-10
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	2E-10	NA	NA	2E-10
			7440-50-8	Copper	NA	NA	NA	NA	Gastrointestinal system (RfDo)	1E-10	NA	NA	1E-10
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	2E-10	NA	NA	2E-10
			7439-96-5_d	Manganese	NA	NA	NA	NA	Nervous (RfDo)	3E-10	NA	NA	3E-10
			7439-97-6	Mercury	NA	NA	NA	NA	NA (RfDo)	NA	NA	NA	NA
			7440-02-0	Nickel	NA	NA	NA	NA	Body weight (RfDo)	3E-11	NA	NA	3E-11
			7782-49-2	Selenium	NA	NA	NA	NA	nervous, hematologic, dermal (RfDo)	2E-11	NA	NA	2E-11
			7440-28-0	Thallium	NA	NA	NA	NA	Skin (RfDo)	9E-11	NA	NA	9E-11
			7440-62-2	Vanadium	NA	NA	NA	NA	Dermal (RfDo)	3E-11	NA	NA	3E-11
			11097-69-1	PCB-1254 (Aroclor 1254)	3E-14	NA	NA	3E-14	Whole body (RfDo)	3E-09	NA	NA	3E-09
			56-55-3	Benzo(A)Anthracene	3E-15	NA	NA	3E-15	NA (RfDo)	NA	NA	NA	NA
			50-32-8	Benzo(A)Pyrene	1E-13	NA	NA	1E-13	Developmental (RfDo)	2E-09	NA	NA	2E-09
			205-99-2	Benzo(B)Fluoranthene	3E-15	NA	NA	3E-15	NA (RfDo)	NA	NA	NA	NA
			207-08-9	Benzo(K)Fluoranthene	4E-16	NA	NA	4E-16	NA (RfDo)	NA	NA	NA	NA
			117-81-7	Bis(2-Ethylhexyl) Phthalate	4E-16	NA	NA	4E-16	Liver (RfDo)	5E-12	NA	NA	5E-12
			218-01-9	Chrysene	3E-17	NA	NA	3E-17	NA (RfDo)	NA	NA	NA	NA
			53-70-3	Dibenz(A,H)Anthracene	8E-14	NA	NA	8E-14	NA (RfDo)	NA	NA	NA	NA
			132-64-9	Dibenzofuran	NA	NA	NA	NA	NA (RfDo)	1E-09	NA	NA	1E-09
			193-39-5	Indeno(1,2,3-C,D)Pyrene	8E-15	NA	NA	8E-15	NA (RfDo)	NA	NA	NA	NA
			91-20-3	Naphthalene	NA	NA	NA	NA	Body weight (RfDo)	3E-09	NA	NA	3E-09
				Chemical Total	3E-13	NA	NA	3E-13		1E-08	NA	NA	1E-08
		Exposure Point Total						3E-13					1E-08
	Exposure Medium Total							3E-13					1E-08
Surface Water	Surface Water	Surface Water	57-12-5	Cyanide	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	6E-05	2E-04
			FREE CN	Cyanide (Free)	NA	NA	NA	NA	Testes (RfDo)	1E-04	NA	5E-05	2E-04
			16984-48-8	Fluoride	NA	NA	NA	NA	NA (RfDo)	1E-04	NA	6E-05	2E-04
			7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	2E-05	NA	1E-05	3E-05
			7440-36-0	Antimony	NA	NA	NA	NA	hematologic (longevity, blood glucose, and cholesterol) (RfDo)	9E-05	NA	4E-05	1E-04
			7440-38-2	Arsenic	1E-08	NA	5E-09	2E-08	Skin and blood (RfDo)	1E-04	NA	4E-05	1E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	3E-04	NA	4E-05	3E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	6E-06	NA	3E-06	9E-06
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	6E-04	NA	2E-04	8E-04
				Chemical Total	1E-08	NA	5E-09	2E-08		1E-03	NA	5E-04	2E-03
		Exposure Point Total						2E-08					2E-03
	Exposure Medium Total							2E-08					2E-03
Medium Total								2E-08					2E-03

Table 9-35
Summary of Receptor Risks and Hazards for COPCs
(Recreationist [Hunter, Adult] - Current/Future)
Reasonable Maximum Exposure
Columbia Falls Aluminum Facility

Scenario Timeframe:	Current/Future
Receptor Population:	Recreational Trespasser (Hunter)
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Cas Number	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Sediment	7429-90-5	Aluminum	NA	NA	NA	NA	Neurological (RfDo)	9E-04	NA	NA	9E-04
			7440-38-2	Arsenic	8E-08	NA	1E-08	9E-08	Skin and blood (RfDo)	7E-04	NA	8E-05	7E-04
			7440-48-4	Cobalt	NA	NA	NA	NA	Thyroid (RfDo)	9E-04	NA	NA	9E-04
			7439-89-6	Iron	NA	NA	NA	NA	GI Ttract (RfDo)	1E-03	NA	NA	1E-03
			7439-96-5	Manganese	NA	NA	NA	NA	Nervous (RfDo)	1E-03	NA	NA	1E-03
			Chemical Total		8E-08	NA	1E-08	9E-08		5E-03	NA	8E-05	5E-03
		Exposure Point Total						9E-08					5E-03
	Exposure Medium Total							9E-08					5E-03
Medium Total								9E-08					5E-03
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	1E-02

Table 9-36
Summary of ELCR and HI for Receptors by Exposure Scenario
Columbia Falls Aluminum Facility
Columbia Falls, Montana

For Carcinogenic Risk:

1E-07	ELCR<= 10-6
5E-06	10-6 (de minimis) < ELCR <= 10-5 (MDEQ)
8E-05	10-5 (MDEQ) < ELCR <= 10-4 (upper USEPA)
2E-04	10-4 (upper USEPA) < ELCR

For Non-Carcinogenic Hazard:

6E-01	HI <= 1.0
3E+00	1.0 < HI <= 10, target-organ-specific HI < 1.0
3E+00	1.0 < HI <= 10, target-organ-specific HI > 1.0
6E+01	10 < HI <= 100
3E+02	100 < HI

					Tables	
Exposure Area	**Timeframe**	**Receptor**	**ELCR**	**HI**	**Risk Calcs**	**Summaries**
Main Plant Area	Current	Trespasser	6E-07	7E-03	7-1	9-1
	Future	Industrial Worker	***8E-06***	1E-01	7-2	9-2
		Construction Worker	8E-07	2E+00	7-3	9-3
		Trespasser	6E-07	7E-03	7-4	9-4
Main Plant Area ISM	Current	Trespasser	***4E-06***	3E-02	App I, Table I-1	App I, Table I-2
	Future	Industrial Worker	***2E-05***	4E+00	App I, Table I-3	App I, Table I-4
		Construction Worker	***2E-06***	***4E+00***	App I, Table I-5	App I, Table I-6
		Trespasser	***2E-06***	2E-02	App I, Table I-7	App I, Table I-8
North Percolation Pond Area	Current	Stormwater Management Worker	***1E-04***	8E-01	7-5	9-5
		Trespasser	***5E-05***	4E-01	7-6	9-6
	Future	Stormwater Management Worker	***1E-04***	8E-01	7-5	9-5
		Trespasser	***5E-05***	4E-01	7-6	9-6
Central Landfill Area	Current	Landfill Management Worker	***1E-05***	3E-01	7-7	9-7
		Trespasser	6E-07	2E-02	7-8	9-8
	Future	Landfill Management Worker	***7E-06***	2E-01	7-9	9-9
		Trespasser	6E-07	2E-02	7-8	9-8
Central Landfill Area ISM	Current	Landfill Management Worker	***3E-05***	3E-01	App I, Table I-9	App I, Table I-10
		Trespasser	***2E-06***	2E-02	App I, Table I-11	App I, Table I-12
	Future	Landfill Management Worker	***3E-05***	3E-01	App I, Table I-9	App I, Table I-10
		Trespasser	***2E-06***	2E-02	App I, Table I-13	App I, Table I-14
Industrial Landfill Area	Current	Landfill Management Worker	***1E-05***	2E-01	7-10	9-10
		Trespasser	***2E-06***	2E-02	7-11	9-11
	Future	Landfill Management Worker	***1E-05***	2E-01	7-10	9-10
		Trespasser	***2E-06***	2E-02	7-11	9-11
Eastern Undeveloped Area	Current	Trespasser	1E-07	1E-02	7-12	9-12
	Future	Industrial Worker	***2E-06***	9E-02	7-13	9-13
		Construction Worker	3E-07	***3E+00***	7-14	9-14
		Trespasser	1E-07	1E-02	7-12	9-12
North-Central Undeveloped Area	Current	Trespasser	1E-07	1E-02	7-15	9-15
	Future	Industrial Worker	***2E-06***	8E-02	7-16	9-16
		Construction Worker	3E-07	2E+00	7-17	9-17
		Trespasser	1E-07	1E-02	7-15	9-15
Western Undeveloped Area	Current	Trespasser	7E-08	9E-03	7-18	9-18
	Future	Resident (Adult)	***2E-05***	1E+00	7-19	9-19
		Resident (Child)	NA	3E+00	7-20	9-20
		Industrial Worker	1E-06	6E-02	7-21	9-21
		Construction Worker	1E-07	1E-01	7-22	9-22
		Trespasser	7E-08	9E-03	7-23	9-23
South Percolation Pond Area	Current	Stormwater Management Worker	1E-06	9E-02	7-24	9-24
		Trespasser	1E-07	3E-02	7-25	9-25
	Future	Stormwater Management Worker	1E-06	9E-02	7-24	9-24
		Trespasser	1E-07	3E-02	7-25	9-25
Flathead River Area	Current	Recreational Trespasser (Floater, adult)	1E-07	6E-03	7-26	9-26
		Recreational Trespasser (Floater, adolescent)	NA	1E-02	7-27	9-27
		Recreational Trespasser (Fisher, adult)	2E-07	5E-03	7-28	9-28
	Future	Recreational Trespasser (Floater, adult)	1E-07	6E-03	7-26	9-26
		Recreational Trespasser (Floater, adolescent)	NA	1E-02	7-27	9-27
		Recreational Trespasser (Fisher, adult)	2E-07	5E-03	7-28	9-28
Backwater Seep Sampling Area	Current	Stormwater Management Worker	7E-07	1E-01	7-29	9-29
		Trespasser	1E-07	3E-02	7-30	9-30
		Recreational Trespasser (Floater, adult)	2E-07	3E-02	7-31	9-31
		Recreational Trespasser (Floater, adolescent)	NA	6E-02	7-32	9-32
		Recreational Trespasser (Fisher, adult)	2E-07	3E-02	7-33	9-33
	Future	Stormwater Management Worker	7E-07	1E-01	7-29	9-29
		Trespasser	1E-07	3E-02	7-30	9-30
		Recreational Trespasser (Floater, adult)	2E-07	3E-02	7-31	9-31
		Recreational Trespasser (Floater, adolescent)	NA	6E-02	7-32	9-32
		Recreational Trespasser (Fisher, adult)	2E-07	3E-02	7-33	9-33

Table 9-36
Summary of ELCR and HI for Receptors by Exposure Scenario
Columbia Falls Aluminum Facility
Columbia Falls, Montana

For Carcinogenic Risk:

1E-07	ELCR<= 10-6
5E-06	10-6 (de minimis) < ELCR <= 10-5 (MDEQ)
8E-05	10-5 (MDEQ) < ELCR <= 10-4 (upper USEPA)
2E-04	10-4 (upper USEPA) < ELCR

For Non-Carcinogenic Hazard:

6E-01	HI <= 1.0
3E+00	1.0 < HI <= 10, target-organ-specific HI < 1.0
3E+00	1.0 < HI <= 10, target-organ-specific HI > 1.0
6E+01	10 < HI <= 100
3E+02	100 < HI

					Tables	
Exposure Area	**Timeframe**	**Receptor**	**ELCR**	**HI**	**Risk Calcs**	**Summaries**
Western Undeveloped, Central Landfill, North-Central Undeveloped Areas	Current	Recreational Trespasser (ATV)	5E-07	1E-01	7-34	9-34
	Future	Recreational Trespasser (ATV)	5E-07	1E-01	7-34	9-34
Western Undeveloped, North Central Undeveloped Areas	Current	Recreational Trespasser (Hunter)	2E-07	1E-02	7-35	9-35
	Future	Recreational Trespasser (Hunter)	2E-07	1E-02	7-35	9-35
Upper Hydrogeologic Plume Area	Future	Resident (Adult)	***2E-04***	***8E+01***	App J, Table J-1	App J, Table J-2
		Resident (Child)	NA	***1E+02***	App J, Table J-3	App J, Table J-4
Below Upper Hydrogeologic Area	Future	Resident (Adult)	***4E-05***	***3E+00***	App J, Table J-5	App J, Table J-6
		Resident (Child)	NA	***4E+00***	App J, Table J-7	App J, Table J-8

ELCR = excess lifetime cancer risk
HI = hazard index
MDEQ = Montanta Department of Environmental Quality
USEPA = US Environmental Protection Agency

Table 9-37
Relative Contribution of Background to Estimated Risk
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Exposure Area	Risk Tables		Scenario	Exposure Point	COPCs	COPC Risk/HI			Background Evaluation				COPC Risk/HI	
						ELCR	HI	EPC	Mean Background Concentration	Contribution to Estimated Risk	Background Reference Area	Hypothesis Test Result	ELCR	HI
Main Plant	Table 7-2	Table 9-2	Future / Industrial Worker / Adult	Surface Soil: 0-0.5	Arsenic	1E-06	7E-03	4.676	3.9	83%	SO#1	Comparable	1E-06	6E-03
					Benzo(A)Pyrene	4E-06	4E-02	11.11	0.01809	0.16%	SO#1	Potentially Site-Related	6E-09	6E-05
North Percolation Ponds	Table 7-5	Table 9-5	Current/Future Stormwater Worker / Adult	Surface Soil: 0-0.5	Benzo(A)Anthracene	5E-06	NA	650	0.01108	0.0017%	SO#1	Potentially Site-Related	8E-11	NA
					Benzo(A)Pyrene	5E-05	5E-01	748	0.01809	0.0024%	SO#1	Potentially Site-Related	1E-09	1E-05
					Benzo(B)Fluoranthene	6E-06	NA	802	0.0321	0.0040%	SO#1	Potentially Site-Related	2E-10	NA
					Dibenz(A,H)Anthracene	1E-05	NA	180	0.00334	0.0019%	SO#1	Potentially Site-Related	2E-10	NA
					Indeno(1,2,3-C,D)Pyrene	4E-06	NA	497	0.01832	0.0037%	SO#1	Potentially Site-Related	1E-10	NA
	Table 7-6	Table 9-6	Current/Future / Trespasser / Adolescent	Surface Soil: 0-0.5	Benzo(A)Anthracene	3E-06	NA	1013	0.01108	0.0011%	SO#1	Potentially Site-Related	3E-11	NA
					Benzo(A)Pyrene	3E-05	3E-01	1145	0.01809	0.0016%	SO#1	Potentially Site-Related	5E-10	4E-06
					Benzo(B)Fluoranthene	3E-06	NA	926	0.0321	0.0035%	SO#1	Potentially Site-Related	9E-11	NA
					Dibenz(A,H)Anthracene	8E-06	NA	279	0.00334	0.0012%	SO#1	Potentially Site-Related	1E-10	NA
					Indeno(1,2,3-C,D)Pyrene	2E-06	NA	584	0.01832	0.0031%	SO#1	Potentially Site-Related	5E-11	NA
Central Landfills Area	Table 7-7	Table 9-7	Current / Landfill Management Worker / Adult	Surface Soil: 0-0.5	Arsenic	2E-06	1E-02	7	3.9	57%	SO#1	Potentially Site-Related	1E-06	6E-03
					Benzo(A)Pyrene	3E-06	3E-02	9	0.01809	0.21%	SO#1	Potentially Site-Related	6E-09	6E-05
				Sediment*	Arsenic	1E-06	9E-03	6	5.02	87%	SD#2	Comparable	1E-06	8E-03
	Table 7-9	Table 9-9	Future / Landfill Management Worker / Adult	Subsurface Soil 0 -12	Arsenic	2E-06	1E-02	6	3.9	63%	SO#1	Potentially Site-Related	9E-07	6E-03
					Benzo(A)Pyrene	2E-06	2E-02	5	0.01809	0.34%	SO#1	Potentially Site-Related	6E-09	6E-05
				Sediment*	Arsenic	1E-06	9E-03	6	5.02	87%	SD#2	Comparable	1E-06	8E-03
Industrial Landfill Area	Table 7-10	Table 9-10	Current/Future / Landfill Management / Adult	Subsurface Soil: 0-12	Arsenic	2E-06	1E-02	8	3.9	50%	SO#1	Potentially Site-Related	9E-07	6E-03
					Benzo(A)Pyrene	7E-06	6E-02	19	0.01809	0.09%	SO#1	Potentially Site-Related	6E-09	6E-05
					Dibenz(A,H)Anthracene	1E-06	NA	4	0.00334	0.08%	SO#1	Potentially Site-Related	1E-09	NA
	Table 7-11	Table 9-11	Current/Future / Trespasser / Adolescent	Subsurface Soil: 0-12	Benzo(A)Pyrene	2E-06	1E-02	52	0.01809	0.034%	SO#1	Potentially Site-Related	5E-10	4E-06
Eastern Undeveloped Area	Table 7-13	Table 9-13	Future / Industrial Worker / Adult	Subsurface Soil: 0-12	Arsenic	2E-06	1E-02	6	3.9	63%	SO#4	Comparable	9E-07	6E-03
	Table 7-14	Table 9-14	Future / Construction Worker / Adult	Air**	Manganese	NA	2E+00	1113	837.5	75%	SO#4	Comparable	NA	1E+00
North-Central Undeveloped Area	Table 7-16	Table 9-16	Future / Industrial Workers / Adult	Subsurface Soil: 0-12	Arsenic	2E-06	1E-02	5	3.9	74%	SO#1	Potentially Site-Related	1E-06	8E-03
	Table 7-17	Table 9-17	Future / Construction Worker / Adult	Air**	Manganese	NA	2E+00	667	480.5	72%	SO#1	Comparable	NA	1E+00
Western Undeveloped Area	Table 7-19	Table 9-19	Future / Residential / Adult	Subsurface Soil: 0-12	Arsenic	6E-06	1E-02	5	3.9	74%	SO#1	Comparable	4E-06	9E-03

Notes:
* Sediment in Central Landfills Area compared to Background Cedar Creek (SD#2).
** Air EPCs utilized for contribution to estimated risk are based on soil EPCs, since the relationship between soil risk and air risk is linear.
Refer to text for discussion on Background Evaluation.

Table 10-1a
Summary of Constituents in Soil Samples with MDL Exceeding Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Cas Number	Chemical Name	Screening Level			MDL Range	Units	Number of MDL Above Screening Level	Sample Count	Frequency of MDL Exceeding Screening Level
95-94-3	1,2,4,5-Tetrachlorobenzene	2.3	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0014 - 9	mg/kg	8	900	0.9%
123-91-1	1,4-Dioxane (P-Dioxane)	5.3	c*	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.01 - 62	mg/kg	10	898	1.1%
88-06-2	2,4,6-Trichlorophenol	6.3	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0018 - 11	mg/kg	1	898	0.1%
51-28-5	2,4-Dinitrophenol	13	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.089 - 540	mg/kg	17	887	1.9%
121-14-2	2,4-Dinitrotoluene	1.7	c**	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0016 - 9.9	mg/kg	8	900	0.9%
606-20-2	2,6-Dinitrotoluene	0.36	c**	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.002 - 12	mg/kg	22	900	2.4%
88-74-4	2-Nitroaniline	63	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.011 - 91	mg/kg	1	900	0.1%
91-94-1	3,3'-Dichlorobenzidine	1.2	c	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.031 - 190	mg/kg	31	895	3.5%
534-52-1	4,6-Dinitro-2-Methylphenol	0.51	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.057 - 340	mg/kg	67	896	7.5%
1912-24-9	Atrazine	2.4	c*	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.014 - 87	mg/kg	10	900	1.1%
87-68-3	Hexachlorobutadiene	1.2	c**	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0019 - 12	mg/kg	8	900	0.9%
77-47-4	Hexachlorocyclopentadiene	0.18	n	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0017 - 10	mg/kg	33	900	3.7%
67-72-1	Hexachloroethane	1.8	c**	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0017 - 10	mg/kg	7	900	0.8%
621-64-7	N-Nitrosodi-N-Propylamine	0.078	c	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.0022 - 14	mg/kg	47	900	5.2%
98-95-3	Nitrobenzene	5.1	c**	USEPA RSLs (THQ=0.1) for Residential Soil (mg/kg) Nov. 2018	0.011 - 73	mg/kg	5	900	0.6%

Notes:
MDL - method detection limit
mg/kg = milligrams per kilogram
Refer to text for discussion on screening levels.

Table 10-1b
Summary of Constituents in Sediment Samples with MDL Exceeding Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Chemical Name	Range of MDL	Screening Level		Number of MDL Above Screening Level	Sample Count	Frequency of MDL Exceeding Screening Level
606-20-2	2,6-Dinitrotoluene	0.0011 - 0.54	0.36	USEPA RSL Res Soil (THQ=0.1), c**	1	90	1.1%
91-94-1	3,3'-Dichlorobenzidine	0.017 - 1.5	1.2	USEPA RSL Res Soil (THQ=0.1), c	1	89	1.1%
534-52-1	4,6-Dinitro-2-Methylphenol	0.032 - 2.7	0.51	USEPA RSL Res Soil (THQ=0.1), n	12	90	13.3%
111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.00066 - 0.24	0.23	USEPA RSL Res Soil (THQ=0.1), c	1	90	1.1%
118-74-1	Hexachlorobenzene	0.0013 - 0.41	0.21	USEPA RSL Res Soil (THQ=0.1), c*	1	90	1.1%
77-47-4	Hexachlorocyclopentadiene	0.00093 - 0.63	0.18	USEPA RSL Res Soil (THQ=0.1), n	2	89	2.2%
621-64-7	N-Nitrosodi-N-Propylamine	0.0012 - 0.34	0.078	USEPA RSL Res Soil (THQ=0.1), c	3	90	3.3%
87-86-5	Pentachlorophenol	0.029 - 2.5	1	USEPA RSL Res Soil (THQ=0.1), c*	2	90	2.2%

Notes:
MDL - method detection limit
mg/kg = milligrams per kilogram
Refer to text for discussion on screening levels.

Table 10-1c
Summary of Constituents in Surface Water Samples with MDL Exceeding Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

Cas Number	Chemical Name	Range of MDL	Screening Level		Number of MDL Above Screening Level	Sample Count	Frequency of MDL Exceeding Screening Level
309-00-2	Aldrin	0.003 - 0.004	9.20E-04	USEPA RSL Tapwater (THQ=0.1), c*	4	4	100.0%
60-57-1	Dieldrin	0.003 - 0.004	1.80E-03	USEPA RSL Tapwater (THQ=0.1), c*	4	4	100.0%
76-44-8	Heptachlor	0.003 - 0.004	1.40E-03	USEPA RSL Tapwater (THQ=0.1), c*	4	4	100.0%
1024-57-3	Heptachlor Epoxide	0.004 - 0.005	0.0014	USEPA RSL Tapwater (THQ=0.1), c**	4	4	100.0%
72-54-8	P,P'-DDD	0.005 - 0.006	0.0012	MDEQ Circular DEQ-7 Groundwater, c	4	4	100.0%
72-55-9	P,P'-DDE	0.002 - 0.004	0.00018	MDEQ Circular DEQ-7 Groundwater, c	4	4	100.0%
50-29-3	P,P'-DDT	0.004 - 0.004	0.0003	MDEQ Circular DEQ-7 Groundwater, c	4	4	100.0%
8001-35-2	Toxaphene	0.06 - 0.11	0.071	USEPA RSL Tapwater (THQ=0.1), c	1	4	25.0%
11104-28-2	PCB-1221 (Aroclor 1221)	0.098 - 0.1	0.0047	USEPA RSL Tapwater (THQ=0.1), c	4	4	100.0%
11141-16-5	PCB-1232 (Aroclor 1232)	0.098 - 0.1	0.0047	USEPA RSL Tapwater (THQ=0.1), c	4	4	100.0%
53469-21-9	PCB-1242 (Aroclor 1242)	0.098 - 0.1	0.0078	USEPA RSL Tapwater (THQ=0.1), c	4	4	100.0%
12672-29-6	PCB-1248 (Aroclor 1248)	0.098 - 0.1	0.0078	USEPA RSL Tapwater (THQ=0.1), c	4	4	100.0%
11097-69-1	PCB-1254 (Aroclor 1254)	0.084 - 0.099	0.0078	USEPA RSL Tapwater (THQ=0.1), c**	4	4	100.0%
11096-82-5	PCB-1260 (Aroclor 1260)	0.084 - 0.099	0.0078	USEPA RSL Tapwater (THQ=0.1), c	4	4	100.0%
95-94-3	1,2,4,5-Tetrachlorobenzene	0.048 - 0.47	0.03	MDEQ Circular DEQ-7 Groundwater, t w/BCF>300,	24	24	100.0%
123-91-1	1,4-Dioxane (P-Dioxane)	0.18 - 3.4	0.46	USEPA RSL Tapwater (THQ=0.1), c*	18	24	75.0%
121-14-2	2,4-Dinitrotoluene	0.047 - 1.1	0.24	USEPA RSL Tapwater (THQ=0.1), c*	18	24	75.0%
606-20-2	2,6-Dinitrotoluene	0.056 - 0.96	0.049	USEPA RSL Tapwater (THQ=0.1), c*	24	24	100.0%
91-94-1	3,3'-Dichlorobenzidine	0.54 - 1.1	0.13	USEPA RSL Tapwater (THQ=0.1), c	24	24	100.0%
534-52-1	4,6-Dinitro-2-Methylphenol	1.4 - 2.2	0.15	USEPA RSL Tapwater (THQ=0.1), n	24	24	100.0%
106-47-8	4-Chloroaniline	0.041 - 0.79	0.37	USEPA RSL Tapwater (THQ=0.1), c*	18	24	75.0%
1912-24-9	Atrazine	0.17 - 0.84	0.3	USEPA RSL Tapwater (THQ=0.1), c	18	24	75.0%
92-52-4	Biphenyl (Diphenyl)	0.055 - 0.68	0.083	USEPA RSL Tapwater (THQ=0.1), n	18	24	75.0%
111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.037 - 0.13	0.014	USEPA RSL Tapwater (THQ=0.1), c	24	24	100.0%
132-64-9	Dibenzofuran	0.068 - 0.92	0.79	USEPA RSL Tapwater (THQ=0.1), n	18	24	75.0%
118-74-1	Hexachlorobenzene	0.052 - 0.51	0.0098	USEPA RSL Tapwater (THQ=0.1), c	24	24	100.0%
87-68-3	Hexachlorobutadiene	0.064 - 0.83	0.14	USEPA RSL Tapwater (THQ=0.1), c**	18	24	75.0%
77-47-4	Hexachlorocyclopentadiene	0.46 - 0.66	0.041	USEPA RSL Tapwater (THQ=0.1), n	24	24	100.0%
621-64-7	N-Nitrosodi-N-Propylamine	0.066 - 0.9	0.011	USEPA RSL Tapwater (THQ=0.1), c	24	24	100.0%
98-95-3	Nitrobenzene	0.15 - 0.53	0.14	USEPA RSL Tapwater (THQ=0.1), c**	24	24	100.0%
87-86-5	Pentachlorophenol	0.22 - 2.4	0.041	USEPA RSL Tapwater (THQ=0.1), c*	24	24	100.0%
79-34-5	1,1,2,2-Tetrachloroethane	0.19 - 0.19	0.076	USEPA RSL Tapwater (THQ=0.1), c	18	18	100.0%
79-00-5	1,1,2-Trichloroethane	0.08 - 0.08	0.041	USEPA RSL Tapwater (THQ=0.1), n	18	18	100.0%
96-12-8	1,2-Dibromo-3-Chloropropane	0.23 - 0.23	0.00033	USEPA RSL Tapwater (THQ=0.1), c	18	18	100.0%
106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	0.19 - 0.19	0.0075	USEPA RSL Tapwater (THQ=0.1), c	18	18	100.0%
107-06-2	1,2-Dichloroethane	0.25 - 0.25	0.17	USEPA RSL Tapwater (THQ=0.1), c**	18	18	100.0%
75-27-4	Bromodichloromethane	0.15 - 0.15	0.13	USEPA RSL Tapwater (THQ=0.1), c	18	18	100.0%
75-01-4	Vinyl Chloride	0.06 - 0.06	0.019	USEPA RSL Tapwater (THQ=0.1), c	18	18	100.0%

Notes:
µg/L = micrograms per liter
Refer to text for discussion on screening levels.

Table 10-1d
Summary of Constituents in Groundwater Samples with MDL Exceeding Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Chemical Name	RangeOfDL	Screening Level	Units	Number of MDL Above Screening Level	Sample Count	Frequency of MDL Exceeding Screening Level
7440-28-0	Thallium	0.24 - 0.26	0.02 USEPA RSL Tapwater (THQ=0.1), n	µg/l	156	156	100.0%
95-94-3	1,2,4,5-Tetrachlorobenzene	0.048 - 0.47	0.03 USEPA MCLs, t w/BCF>300,	µg/l	122	122	100.0%
123-91-1	1,4-Dioxane (P-Dioxane)	0.18 - 3.4	0.46 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	109	122	89.3%
121-14-2	2,4-Dinitrotoluene	0.047 - 1.1	0.24 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	109	122	89.3%
606-20-2	2,6-Dinitrotoluene	0.056 - 0.96	0.049 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	122	122	100.0%
91-94-1	3,3'-Dichlorobenzidine	0.54 - 1.1	0.13 USEPA RSL Tapwater (THQ=0.1), c	µg/l	121	121	100.0%
534-52-1	4,6-Dinitro-2-Methylphenol	1.4 - 2.2	0.15 USEPA RSL Tapwater (THQ=0.1), n	µg/l	111	122	91.0%
106-47-8	4-Chloroaniline	0.041 - 0.79	0.37 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	109	122	89.3%
1912-24-9	Atrazine	0.17 - 0.84	0.3 USEPA RSL Tapwater (THQ=0.1), c	µg/l	109	122	89.3%
100-52-7	Benzaldehyde	0.1 - 0.93	19 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	11	122	9.0%
56-55-3	Benzo(A)Anthracene	0.069 - 0.6	0.03 USEPA RSL Tapwater (THQ=0.1), c	µg/l	122	122	100.0%
50-32-8	Benzo(A)Pyrene	0.049 - 0.17	0.025 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	111	122	91.0%
205-99-2	Benzo(B)Fluoranthene	0.09 - 0.48	0.25 USEPA RSL Tapwater (THQ=0.1), c	µg/l	109	122	89.3%
92-52-4	Biphenyl (Diphenyl)	0.055 - 0.68	0.083 USEPA RSL Tapwater (THQ=0.1), n	µg/l	109	122	89.3%
111-91-1	Bis(2-Chloroethoxy) Methane	0.062 - 0.75	5.9 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
111-44-4	Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	0.037 - 0.13	0.014 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
117-84-0	Di-N-Octylphthalate	0.63 - 0.75	20 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
53-70-3	Dibenz(A,H)Anthracene	0.067 - 0.098	0.025 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
132-64-9	Dibenzofuran	0.068 - 0.92	0.79 USEPA RSL Tapwater (THQ=0.1), n	µg/l	109	122	89.3%
86-73-7	Fluorene	0.064 - 0.87	29 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
118-74-1	Hexachlorobenzene	0.052 - 0.51	0.0098 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
87-68-3	Hexachlorobutadiene	0.064 - 0.83	0.14 USEPA RSL Tapwater (THQ=0.1), c**	µg/l	120	122	98.4%
77-47-4	Hexachlorocyclopentadiene	0.46 - 0.66	0.041 USEPA RSL Tapwater (THQ=0.1), n	µg/l	111	122	91.0%
78-59-1	Isophorone	0.05 - 0.73	78 USEPA RSL Tapwater (THQ=0.1), c**	µg/l	11	122	9.0%
621-64-7	N-Nitrosodi-N-Propylamine	0.066 - 0.9	0.011 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
91-20-3	Naphthalene	0.055 - 0.87	0.17 USEPA RSL Tapwater (THQ=0.1), c**	µg/l	120	122	98.4%
98-95-3	Nitrobenzene	0.15 - 0.53	0.14 USEPA RSL Tapwater (THQ=0.1), c**	µg/l	122	122	100.0%
71-55-6	1,1,1-Trichloroethane	0.24 - 0.28	200 MDEQ Circular DEQ-7, t	µg/l	11	122	9.0%
79-34-5	1,1,2,2-Tetrachloroethane	0.19 - 0.37	0.076 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	0.31 - 0.34	1000 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
79-00-5	1,1,2-Trichloroethane	0.08 - 0.43	0.041 USEPA RSL Tapwater (THQ=0.1), n	µg/l	111	122	91.0%
120-82-1	1,2,4-Trichlorobenzene	0.27 - 0.37	0.4 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
96-12-8	1,2-Dibromo-3-Chloropropane	0.23 - 0.38	0.00033 USEPA RSL Tapwater (THQ=0.1), c	µg/l	122	122	100.0%
106-93-4	1,2-Dibromoethane (Ethylene Dibromide)	0.19 - 0.5	0.0075 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
95-50-1	1,2-Dichlorobenzene	0.22 - 0.43	30 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
541-73-1	1,3-Dichlorobenzene	0.33 - 0.34	600 MDEQ Circular DEQ-7, t	µg/l	11	122	9.0%
106-46-7	1,4-Dichlorobenzene	0.33 - 0.76	0.48 USEPA RSL Tapwater (THQ=0.1), c	µg/l	2	122	1.6%
74-97-5	Bromochloromethane	0.3 - 0.41	8.3 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
75-27-4	Bromodichloromethane	0.15 - 0.34	0.13 USEPA RSL Tapwater (THQ=0.1), c	µg/l	111	122	91.0%
75-25-2	Bromoform	0.18 - 0.54	3.3 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	11	122	9.0%
74-83-9	Bromomethane	0.18 - 1	0.75 USEPA RSL Tapwater (THQ=0.1), n	µg/l	2	122	1.6%
75-00-3	Chloroethane	0.32 - 0.37	2100 USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%
67-66-3	Chloroform	0.22 - 0.33	0.22 USEPA RSL Tapwater (THQ=0.1), c*	µg/l	2	122	1.6%
10061-02-6	Trans-1,3-Dichloropropene	0.19 - 0.49	2 MDEQ Circular DEQ-7, c	µg/l	11	122	9.0%

Table 10-1d
Summary of Constituents in Groundwater Samples with MDL Exceeding Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Chemical Name	RangeOfDL	Screening Level		Units	Number of MDL Above Screening Level	Sample Count	Frequency of MDL Exceeding Screening Level
79-01-6	Trichloroethylene (TCE)	0.22 - 0.31	0.28	USEPA RSL Tapwater (THQ=0.1), n	µg/l	2	122	1.6%
75-69-4	Trichlorofluoromethane	0.14 - 0.15	520	USEPA RSL Tapwater (THQ=0.1), n	µg/l	11	122	9.0%

Notes:
µg/L = micrograms per liter
Refer to text for discussion on screening levels.

Table 10-2a
Summary of Constituents in Soil Samples Without Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Constituent	Number of Detections	Number of Samples	Detection Frequency	Minimum Concentration	Maximum Concentration	Units	Min_BTV	Max_BTV	BTV Range	Maximum Exceed BTV?
7440-70-2	Calcium	790	790	100%	427	313000	mg/kg	16691	16691	16691 - 16691	YES
7440-47-3	Chromium, Total	803	804	100%	2.4	363	mg/kg	15.94	15.94	15.94 - 15.94	YES
7439-95-4	Magnesium	790	790	100%	442	28700	mg/kg	8275	8275	8275 - 8275	YES
7440-09-7	Potassium	790	790	100%	101	10900	mg/kg	1844	1844	1844 - 1844	YES
7440-23-5	Sodium	534	787	68%	26.5	61300	mg/kg	69.94	69.94	69.94 - 69.94	YES
959-98-8	Alpha Endosulfan	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
33213-65-9	Beta Endosulfan	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
5103-71-9	cis-Chlordane	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
1031-07-8	Endosulfan Sulfate	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
7421-93-4	Endrin Aldehyde	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
53494-70-5	Endrin Ketone	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
5103-74-2	trans-Chlordane	ND	60	0%	ND	ND	mg/kg	NA	NA	NA	NO
37324-23-5	PCB-1262 (Aroclor 1262)	ND	434	0%	ND	ND	mg/kg	NA	NA	NA	NO
11100-14-4	PCB-1268 (Aroclor 1268)	ND	434	0%	ND	ND	mg/kg	NA	NA	NA	NO
1336-36-3	Polychlorinated Biphenyl (PCBs)	10	434	2%	0.056	1.2	mg/kg	NA	NA	NA	NO
88-75-5	2-Nitrophenol	ND	786	0%	ND	ND	mg/kg	0.0099	0.0099	0.0099 - 0.0099	NO
MEPH3MEPH4	3- And 4- Methylphenol (Total)	10	444	2%	0.011	1	mg/kg	NA	NA	NA	NO
99-09-2	3-Nitroaniline	ND	788	0%	ND	ND	mg/kg	0.044	0.044	0.044 - 0.044	NO
101-55-3	4-Bromophenyl Phenyl Ether	ND	788	0%	ND	ND	mg/kg	0.012	0.012	0.012 - 0.012	NO
7005-72-3	4-Chlorophenyl Phenyl Ether	ND	788	0%	ND	ND	mg/kg	0.01	0.01	0.01 - 0.01	NO
100-02-7	4-Nitrophenol	ND	785	0%	ND	ND	mg/kg	0.12	0.12	0.12 - 0.12	NO
208-96-8	Acenaphthylene	45	797	6%	0.0	1.2	mg/kg	0.0075	0.0075	0.0075 - 0.0075	YES
191-24-2	Benzo(G,H,I)Perylene	580	797	73%	0.0015	2200	mg/kg	0.0305	0.0305	0.0305 - 0.0305	YES
192-97-2	Benzo[E]Pyrene	18	18	100%	1.1	2100	mg/kg	NA	NA	NA	NO
86-74-8	Carbazole	450	788	57%	0.0017	190	mg/kg	0.00657	0.00657	0.00657 - 0.00657	YES
131-11-3	Dimethyl Phthalate	ND	788	0%	ND	ND	mg/kg	0.0063	0.0063	0.0063 - 0.0063	NO
198-55-0	Perylene	18	18	100%	0.24	850	mg/kg	NA	NA	NA	NO
85-01-8	Phenanthrene	619	797	78%	0.002	1300	mg/kg	0.0217	0.0217	0.0217 - 0.0217	YES
541-73-1	1,3-Dichlorobenzene	ND	327	0%	ND	ND	mg/kg	NA	NA	NA	NO
10061-01-5	Cis-1,3-Dichloropropene	ND	327	0%	ND	ND	mg/kg	NA	NA	NA	NO
79601-23-1	M,P-Xylene	213	327	65%	0.000091	0.0091	mg/kg	NA	NA	NA	NO
108-87-2	Methylcyclohexane	181	327	55%	0.00027	0.015	mg/kg	NA	NA	NA	NO
10061-02-6	Trans-1,3-Dichloropropene	ND	327	0%	ND	ND	mg/kg	NA	NA	NA	NO

Notes:
mg/kg = milligrams per kilogram
ND = not detected
BTV = background threshold value
NA = not applicable

Table 10-2b
Summary of Constituents in Surface Water Samples Without Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Constituent	Number of Detections	Number of Samples	Detection Frequency	Minimum Concentration	Maximum Concentration	Units	BTV Range	Maximum Exceed BTV?
7440-70-2	Calcium	203	203	100%	7860	506000	µg/L	23800 - 61264	YES
7439-95-4	Magnesium	203	203	100%	804	63900	µg/L	5990 - 15852	YES
7440-09-7	Potassium	203	203	100%	242	9100	µg/L	354 - 751.1	YES
7440-23-5	Sodium	203	203	100%	666	108000	µg/L	809 - 2801	YES
319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	4	ND	ND	ND	µg/L	NA	NO
53494-70-5	Endrin Ketone	ND	4	ND	ND	ND	µg/L	NA	NO
5103-74-2	trans-Chlordane	ND	4	ND	ND	ND	µg/L	NA	NO
37324-23-5	PCB-1262 (Aroclor 1262)	ND	4	ND	ND	ND	µg/L	NA	NO
11100-14-4	PCB-1268 (Aroclor 1268)	ND	4	ND	ND	ND	µg/L	NA	NO
88-75-5	2-Nitrophenol	ND	24	ND	ND	ND	µg/L	0.069 - 0.069	NO
MEPH3MEPH4	3- And 4- Methylphenol (Total)	1	18	6%	7.5	7.5	µg/L	NA	NO
99-09-2	3-Nitroaniline	ND	24	ND	ND	ND	µg/L	0.076 - 0.076	NO
101-55-3	4-Bromophenyl Phenyl Ether	ND	24	ND	ND	ND	µg/L	0.072 - 0.072	NO
7005-72-3	4-Chlorophenyl Phenyl Ether	ND	24	ND	ND	ND	µg/L	0.069 - 0.069	NO
208-96-8	Acenaphthylene	ND	24	ND	ND	ND	µg/L	0.074 - 0.074	NO
191-24-2	Benzo(G,H,I)Perylene	3	24	13%	0.024	3.9	µg/L	NA	NO
192-97-2	Benzo[E]Pyrene	3	6	50%	0.004	0.065	µg/L	NA	NO
86-74-8	Carbazole	2	24	8%	1.9	2.9	µg/L	0.058 - 0.058	YES
198-55-0	Perylene	2	6	33%	0.006	0.011	µg/L	NA	NO
85-01-8	Phenanthrene	6	24	25%	0.024	1.9	µg/L	0.099 - 0.099	YES
79601-23-1	M,P-Xylene	ND	18	ND	ND	ND	µg/L	NA	NO
108-87-2	Methylcyclohexane	ND	18	ND	ND	ND	µg/L	NA	NO

Notes:
µg/l = micrograms per liter
ND = not detected
BTV = background threshold value
NA = not applicable

Table 10-2c
Summary of Constituents in Sediment Samples Without Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Constituent	Number of Detections	Number of Samples	Detection Frequency	Minimum Concentration	Maximum Concentration	Units	BTV Range	Maximum Exceed BTV?
7440-70-2	Calcium	90	90	100%	1120	11500	mg/kg	33818 - 94895	NO
7440-47-3	Chromium, Total	90	90	100%	5	11.8	mg/kg	12.85 - 15	NO
7439-95-4	Magnesium	90	90	100%	2570	4020	mg/kg	14224 - 22708	NO
7440-09-7	Potassium	90	90	100%	279	978	mg/kg	672.3 - 1742	NO
7440-23-5	Sodium	67	90	74%	171	171	mg/kg	60.66 - 60.66	YES
959-98-8	Alpha Endosulfan	ND	26	ND	ND	ND	mg/kg	NA	NO
33213-65-9	Beta Endosulfan	ND	26	ND	ND	ND	mg/kg	NA	NO
5103-71-9	cis-Chlordane	ND	26	ND	ND	ND	mg/kg	NA	NO
319-86-8	Delta BHC (Delta Hexachlorocyclohexane)	ND	26	ND	ND	ND	mg/kg	NA	NO
1031-07-8	Endosulfan Sulfate	ND	26	ND	ND	ND	mg/kg	NA	NO
7421-93-4	Endrin Aldehyde	ND	26	ND	ND	ND	mg/kg	NA	NO
53494-70-5	Endrin Ketone	ND	26	ND	ND	ND	mg/kg	NA	NO
5103-74-2	trans-Chlordane	ND	26	ND	ND	ND	mg/kg	NA	NO
37324-23-5	PCB-1262 (Aroclor 1262)	ND	26	ND	ND	ND	mg/kg	NA	NO
11100-14-4	PCB-1268 (Aroclor 1268)	ND	26	ND	ND	ND	mg/kg	NA	NO
1336-36-3	Polychlorinated Biphenyl (PCBs)	ND	26	ND	ND	ND	mg/kg	NA	NO
88-75-5	2-Nitrophenol	ND	90	ND	ND	ND	mg/kg	0.033 - 0.033	NO
MEPH3MEPH4	3- And 4- Methylphenol (Total)	5	43	12%	0	0	mg/kg	NA	NO
99-09-2	3-Nitroaniline	ND	90	ND	ND	ND	mg/kg	0.14 - 0.14	NO
101-55-3	4-Bromophenyl Phenyl Ether	ND	90	ND	ND	ND	mg/kg	0.04 - 0.04	NO
7005-72-3	4-Chlorophenyl Phenyl Ether	ND	90	ND	ND	ND	mg/kg	0.034 - 0.034	NO
100-02-7	4-Nitrophenol	ND	90	ND	ND	ND	mg/kg	0.4 - 0.4	NO
208-96-8	Acenaphthylene	4	90	4%	0	0	mg/kg	0.025 - 0.025	NO
191-24-2	Benzo(G,H,I)Perylene	65	90	72%	0.69	1.2	mg/kg	NA	NO
192-97-2	Benzo[E]Pyrene	4	4	100%	0.02	0	mg/kg	NA	NO
86-74-8	Carbazole	48	90	53%	0	0.68	mg/kg	0.027 - 0.027	YES
131-11-3	Dimethyl Phthalate	ND	90	ND	ND	ND	mg/kg	0.021 - 0.021	NO
198-55-0	Perylene	6	6	100%	0.004	0.035	mg/kg	NA	NO
85-01-8	Phenanthrene	74	90	82%	0.49	0.085	mg/kg	0.00226 - 0.00226	YES
541-73-1	1,3-Dichlorobenzene	ND	17	ND	ND	ND	mg/kg	NA	NO
10061-01-5	Cis-1,3-Dichloropropene	ND	17	ND	ND	ND	mg/kg	NA	NO
79601-23-1	M,P-Xylene	14	17	82%	0	0.0018	mg/kg	NA	NO
108-87-2	Methylcyclohexane	14	17	82%	0.0021	0.0046	mg/kg	NA	NO
10061-02-6	Trans-1,3-Dichloropropene	ND	17	ND	ND	ND	mg/kg	NA	NO

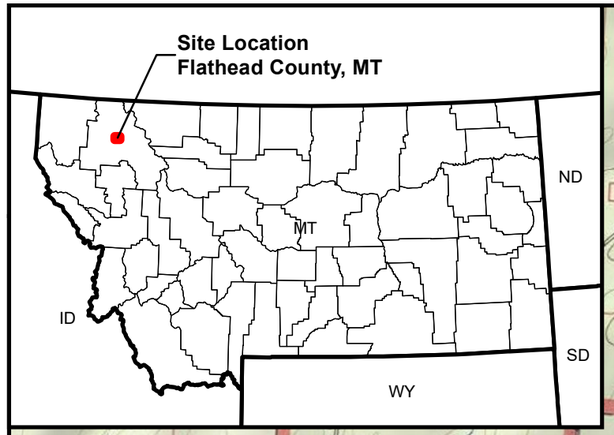
Notes:
mg/kg = milligrams per kilogram
ND = not detected
BTV = background threshold value
NA = not applicable

Table 10-2d
Summary of Constituent sin Groundwater Samples Without Screening Levels
Columbia Falls Aluminum Facility
Columbia Falls, Montana

CAS Number	Constituent	Number of Detections	Number of Samples	Detection Frequency	Minimum Concentration	Maximum Concentration	Units
7440-70-2	Calcium	154	154	100%	1990	76000	µg/L
7439-95-4	Magnesium	151	154	98%	66.9	32200	µg/L
7440-09-7	Potassium	154	154	100%	296	4550	µg/L
7440-23-5	Sodium	154	154	100%	1880	834000	µg/L
37324-23-5	PCB-1262 (Aroclor 1262)	ND	8	ND	ND	ND	µg/L
11100-14-4	PCB-1268 (Aroclor 1268)	ND	8	ND	ND	ND	µg/L
88-75-5	2-Nitrophenol	ND	120	ND	ND	ND	µg/L
MEPH3MEPH4	3- And 4- Methylphenol (Total)	3	109	3%	1.4	1.4	µg/L
99-09-2	3-Nitroaniline	ND	119	ND	ND	ND	µg/L
101-55-3	4-Bromophenyl Phenyl Ether	ND	120	ND	ND	ND	µg/L
7005-72-3	4-Chlorophenyl Phenyl Ether	ND	120	ND	ND	ND	µg/L
208-96-8	Acenaphthylene	ND	120	ND	ND	ND	µg/L
191-24-2	Benzo(G,H,I)Perylene	ND	120	ND	ND	ND	µg/L
86-74-8	Carbazole	ND	120	ND	ND	ND	µg/L
85-01-8	Phenanthrene	3	120	3%	0.056	0.19	µg/L
79601-23-1	M,P-Xylene	ND	120	ND	ND	ND	µg/L
108-87-2	Methylcyclohexane	ND	120	ND	ND	ND	µg/L

Notes:
µg/l = micrograms per liter
ND = not detected
NA = not applicable

Figures



Legend

- Site Boundary
- Flathead National Forest

Scale In Feet: 2,000 1,000 0 2,000

Site Location Map

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 1

Reviewed By: T. Biksey

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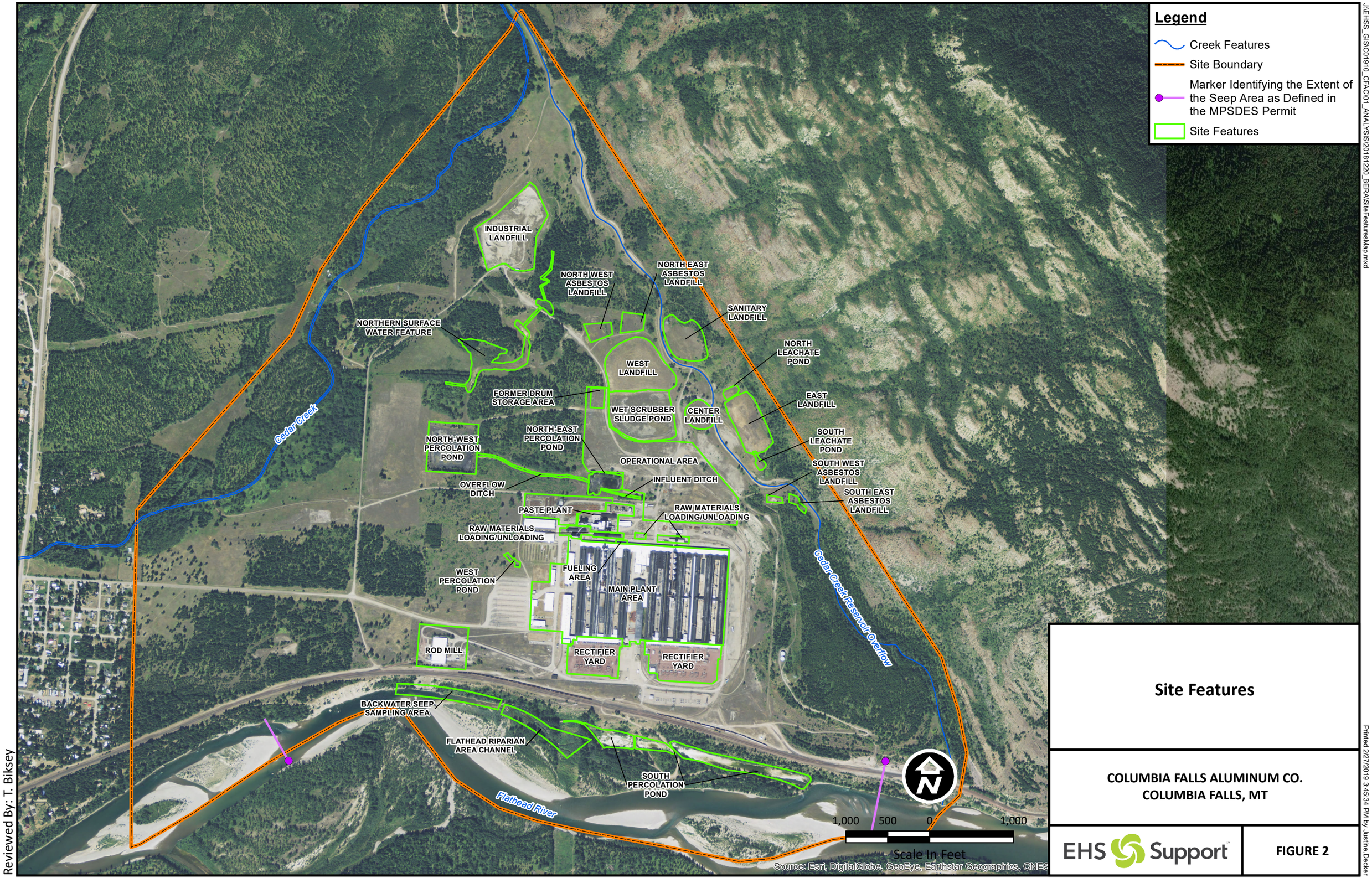

Site Features

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 2

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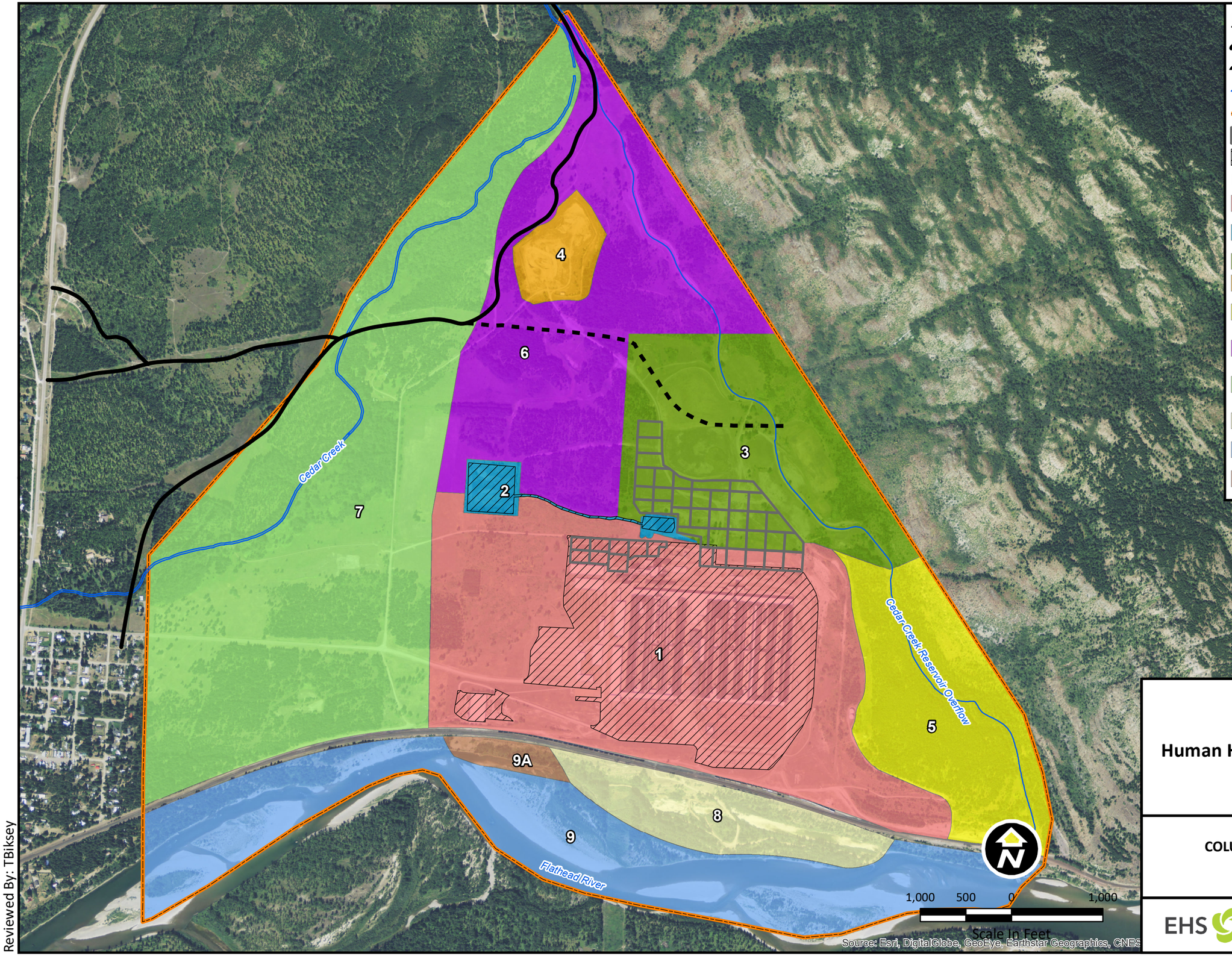

Legend

- ATV Trail
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid
- Unvegetated Area

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

Human Health Exposure Areas Map

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 3

Reviewed By: TBiksey

J:\EHSS_GIS\CO1910_CFAC\01_ANALYSIS\20171030_HumanHealth\Human Health Risk Assess Figure 2 - Human Health Exposure Areas Map.mxd

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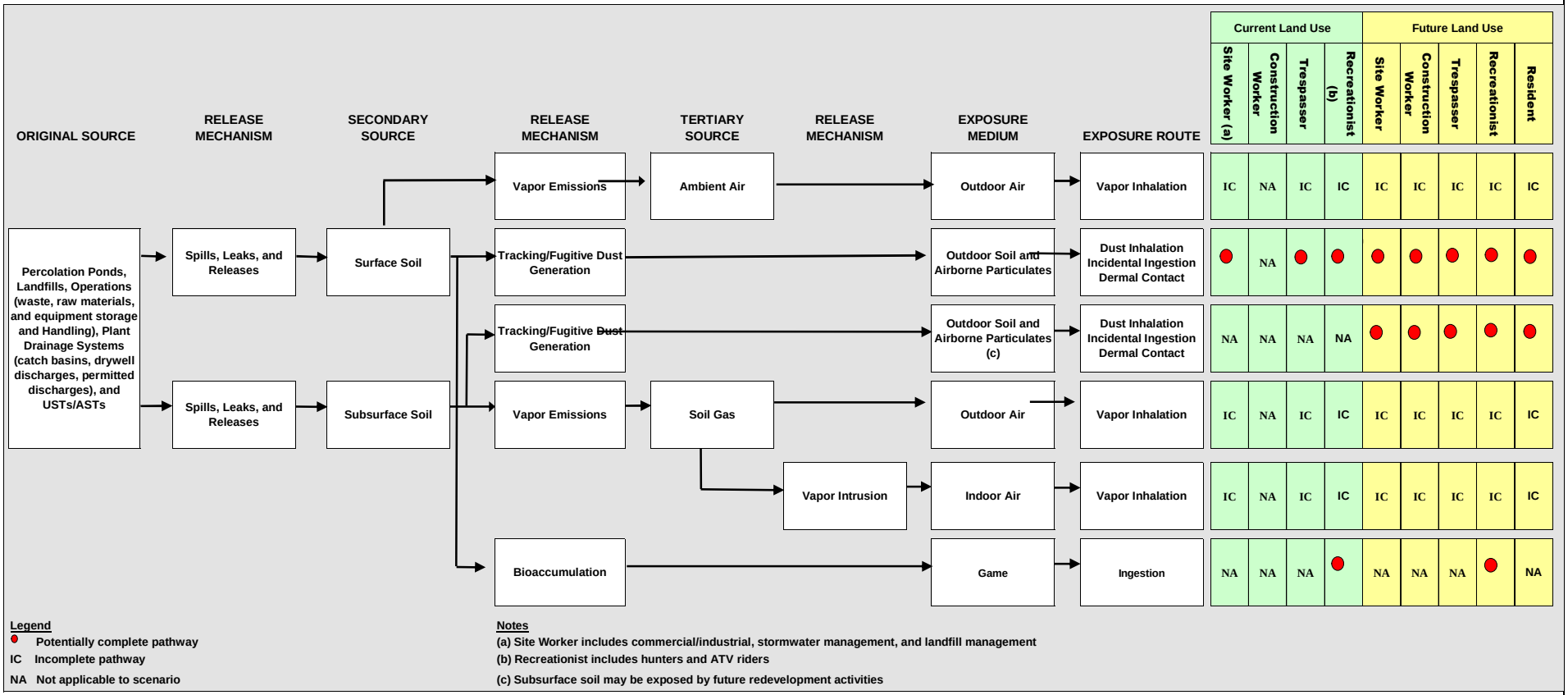

Figure 4 presents a summary of the potential exposure pathways to human receptors throughout the site, and provides an overall perspective of the sources identified at the Site, the affected environmental media and fate and transport through the environment, and the Site-specific human receptors that may be exposed. Not all exposure pathways presented as complete in this figure are applicable to each of the exposure areas. The reader should refer to the exposure area-specific complete exposure pathways in Table 1s.

EHS Support consider it done

Figure 4 Human Health Exposure Pathways – Soil and Biota

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

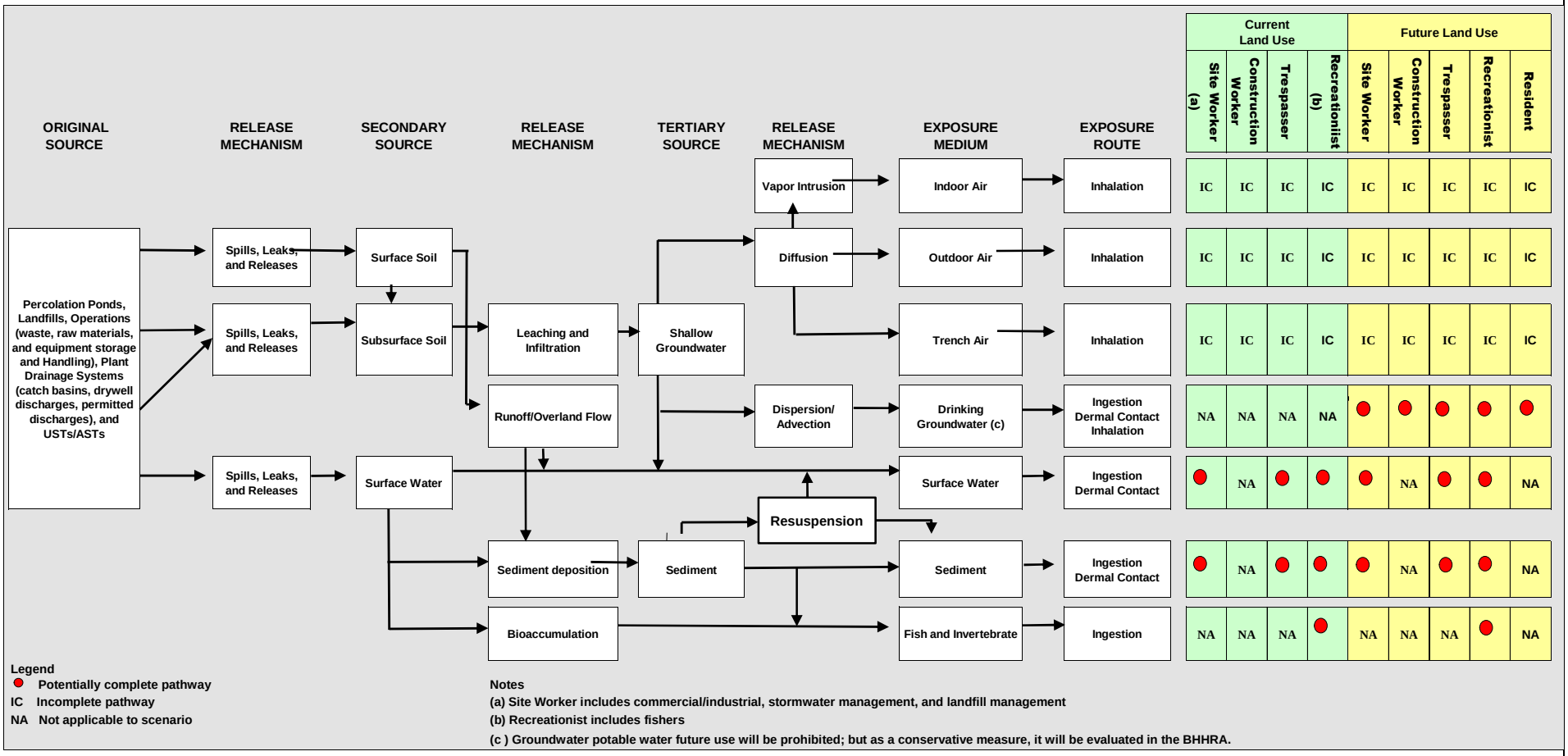

Figure 5 presents a summary of the potential exposure pathways to human receptors throughout the site, and provides an overall perspective of the sources identified at the Site, the affected environmental media and fate and transport through the environment, and the Site-specific human receptors that may be exposed. Not all exposure pathways presented as complete in this figure are applicable to each of the exposure areas. The reader should refer to the exposure area-specific complete exposure pathways in Table 1s.

EHS Support consider it done

Figure 5 Human Health Exposure Pathways – Groundwater, Surface Water, Sediments, and Biota

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

Legend

- Soil Sample Location
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

Cedar Creek Reservoir Overflow

Flathead River

CFMW-025A, CFMW-026, CFMW-028A, CFMW-033, CFMW-034, CFMW-035, CFMW-042, CFMW-043, CFMW-044A, CFMW-045A, CFMW-047, CFMW-049, CFMW-049A, CFMW-050, CFMW-053A, CFMW-053A, CFMW-054, CFMW-070, CFMW-032A, CFMW-037, CFMW-038, CFMW-040, CFMW-040

CFISS-036, CFISS-037, CFISS-038, CFISS-040, CFISS-039, CFISS-042, CFISS-041, CFISS-043, CFISS-030, CFISS-031, CFISS-032, CFISS-033, CFISS-034, CFISS-035

CFSB-121, CFSB-246, CFSB-062, CFSB-064, CFSB-065, CFSB-206, CFSB-247, CFSB-099, CFSB-097, CFSB-095, CFSB-098, CFSB-100, CFSB-205, CFSB-231, CFSB-094, CFSB-088, CFSB-092, CFSB-232, CFSB-087, CFSB-086, CFSB-084, CFSB-082, CFSB-079, CFSB-080, CFSB-075, CFSB-073, CFSB-074, CFSB-071, CFSB-069, CFSB-240, CFSB-236, CFSB-294, CFSB-066, CFSB-266, CFSB-189, CFSB-060, CFSB-059, CFSB-057, CFSB-055, CFSB-054, CFSB-278, CFSB-274, CFSB-051, CFSB-050, CFSB-275, CFSB-045, CFSB-046, CFSB-044, CFSB-276, CFSB-288, CFSB-213, CFSB-048, CFSB-128, CFSB-233, CFSB-207, CFSB-129, CFSB-235, CFSB-190, CFSB-208, CFSB-234, CFSB-293, CFSB-243, CFSB-242

1, 2, 3, 5, 6, 7, 8, 9, 9A

540 270 0 540

Scale In Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES

Main Plant Area
Soil Sample Locations
(0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 6

Reviewed By: T. Biksey

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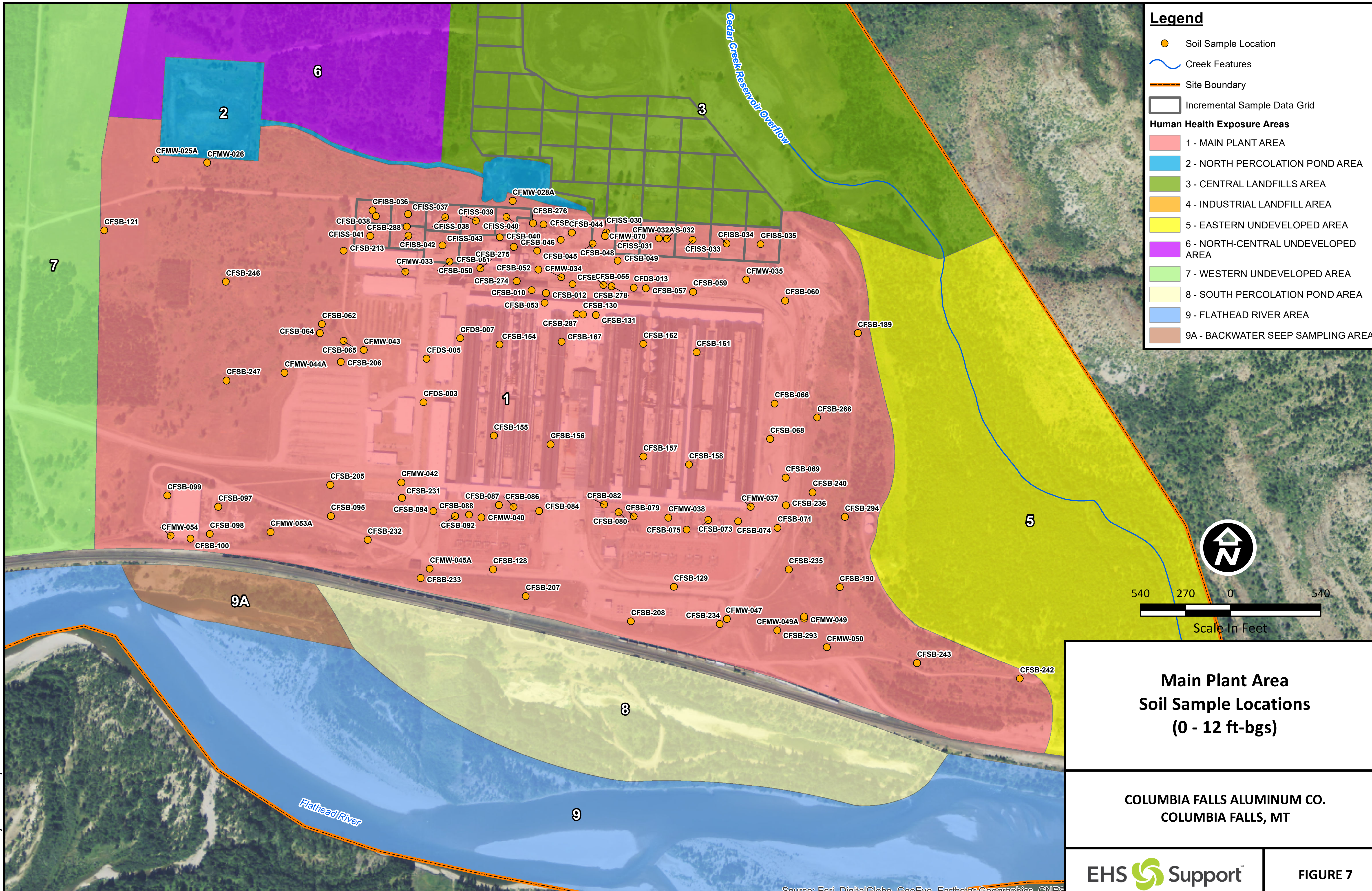

Main Plant Area
Soil Sample Locations
(0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 7

Reviewed By: T. Biksey

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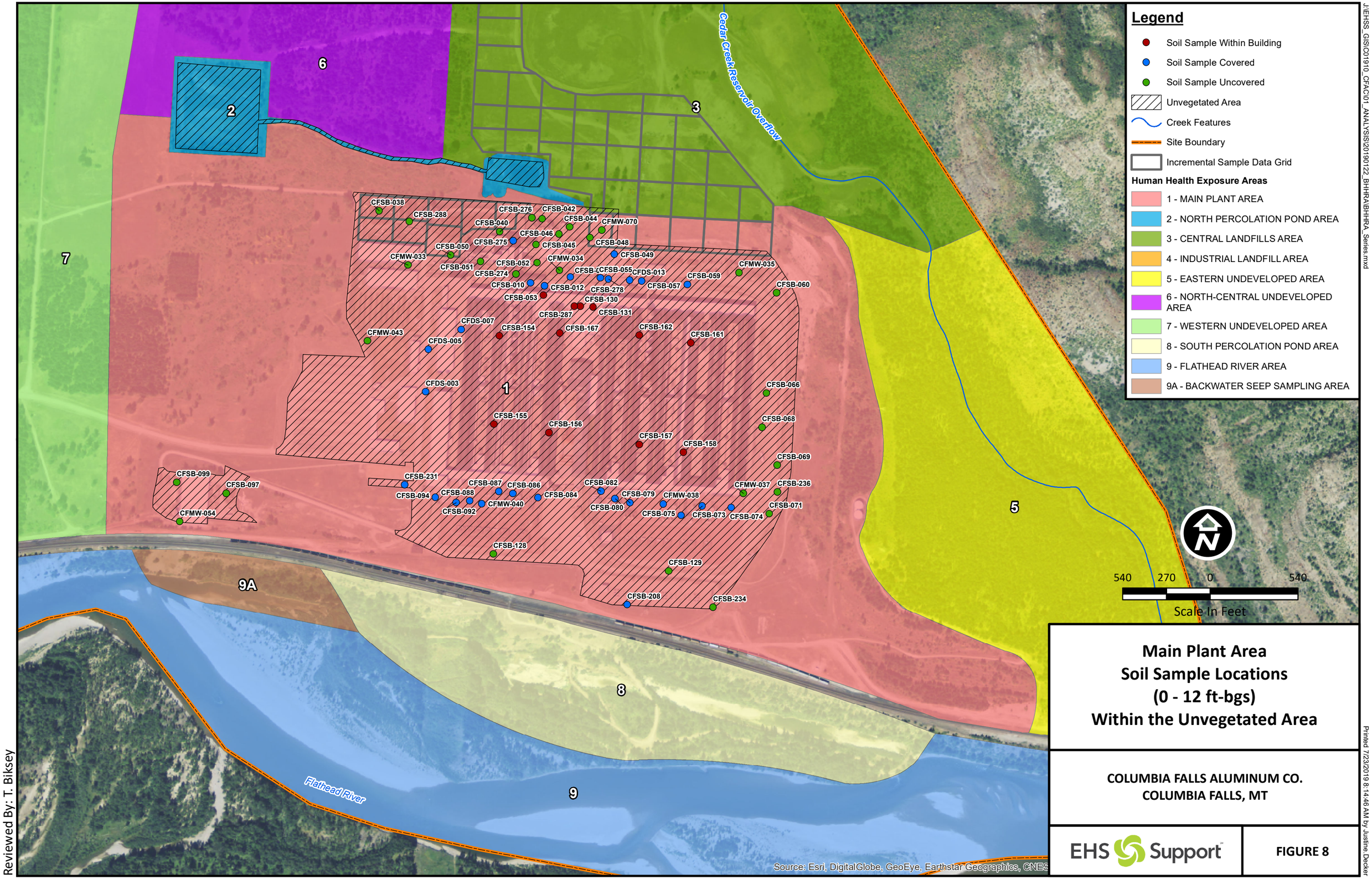

Main Plant Area
Soil Sample Locations
(0 - 12 ft-bgs)
Within the Unvegetated Area

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 8

Reviewed By: T. Biksey

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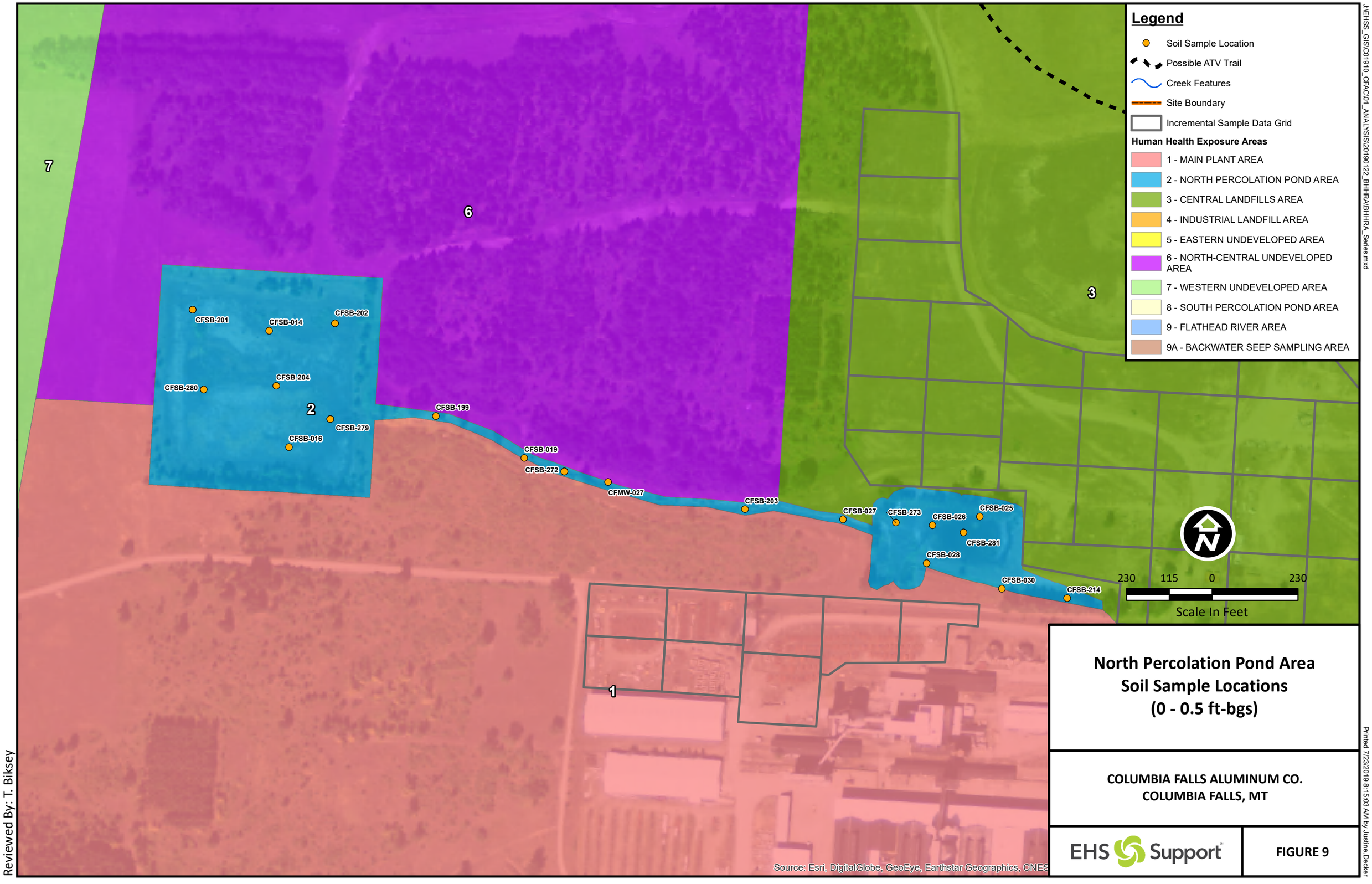

North Percolation Pond Area
Soil Sample Locations
(0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 9

Reviewed By: T. Biksey

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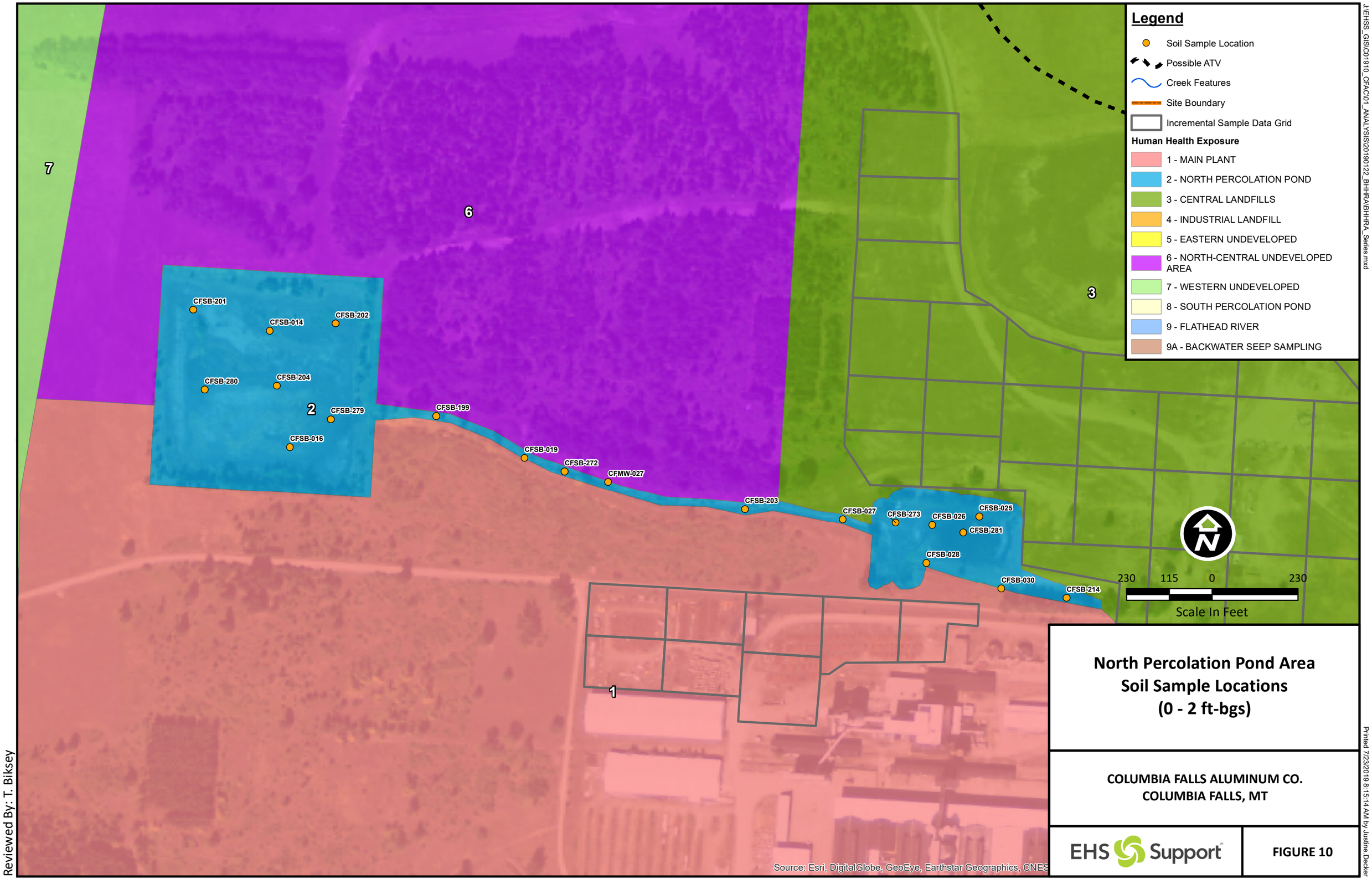

North Percolation Pond Area
Soil Sample Locations
(0 - 2 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 10

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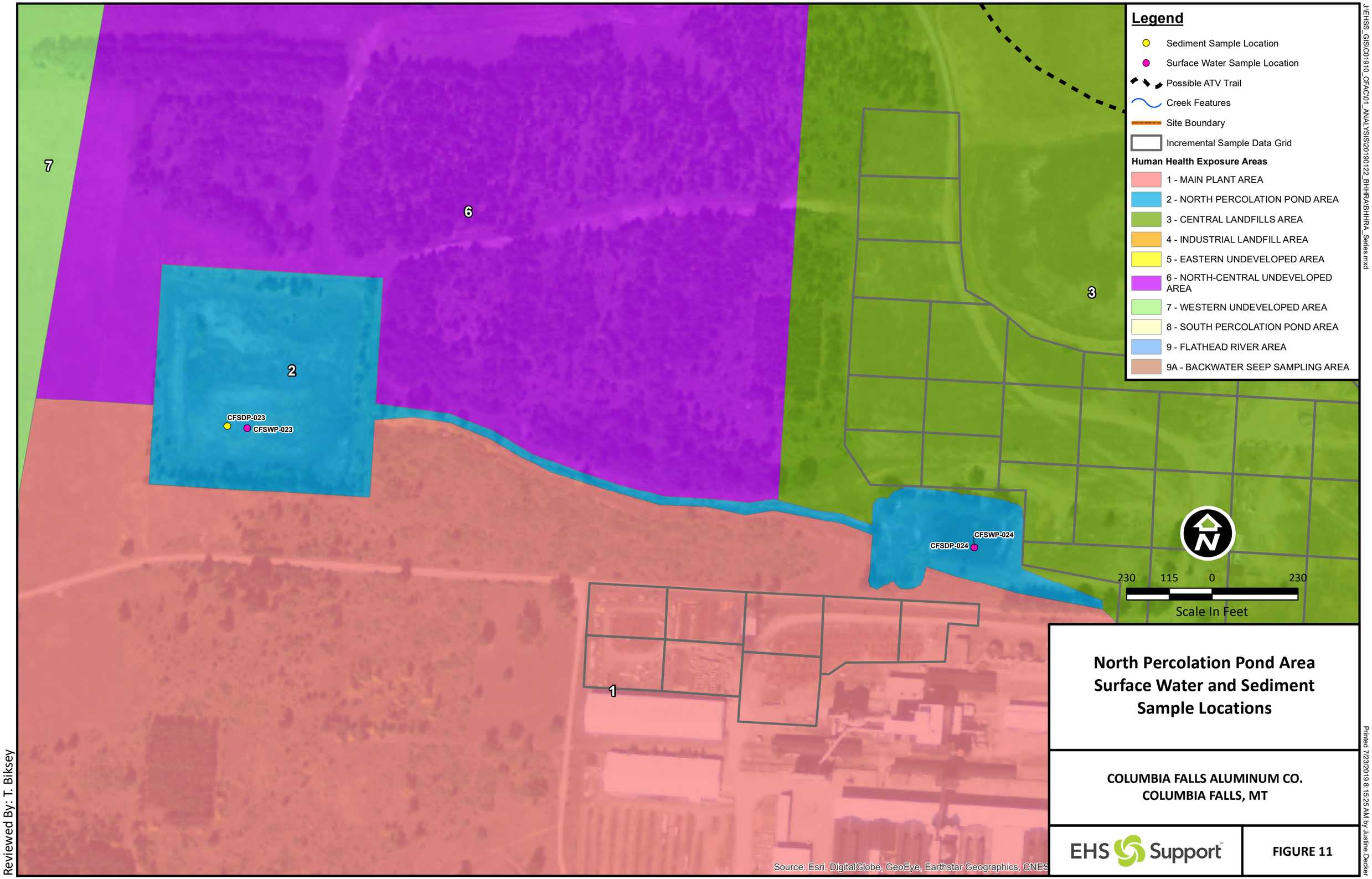

North Percolation Pond Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 11

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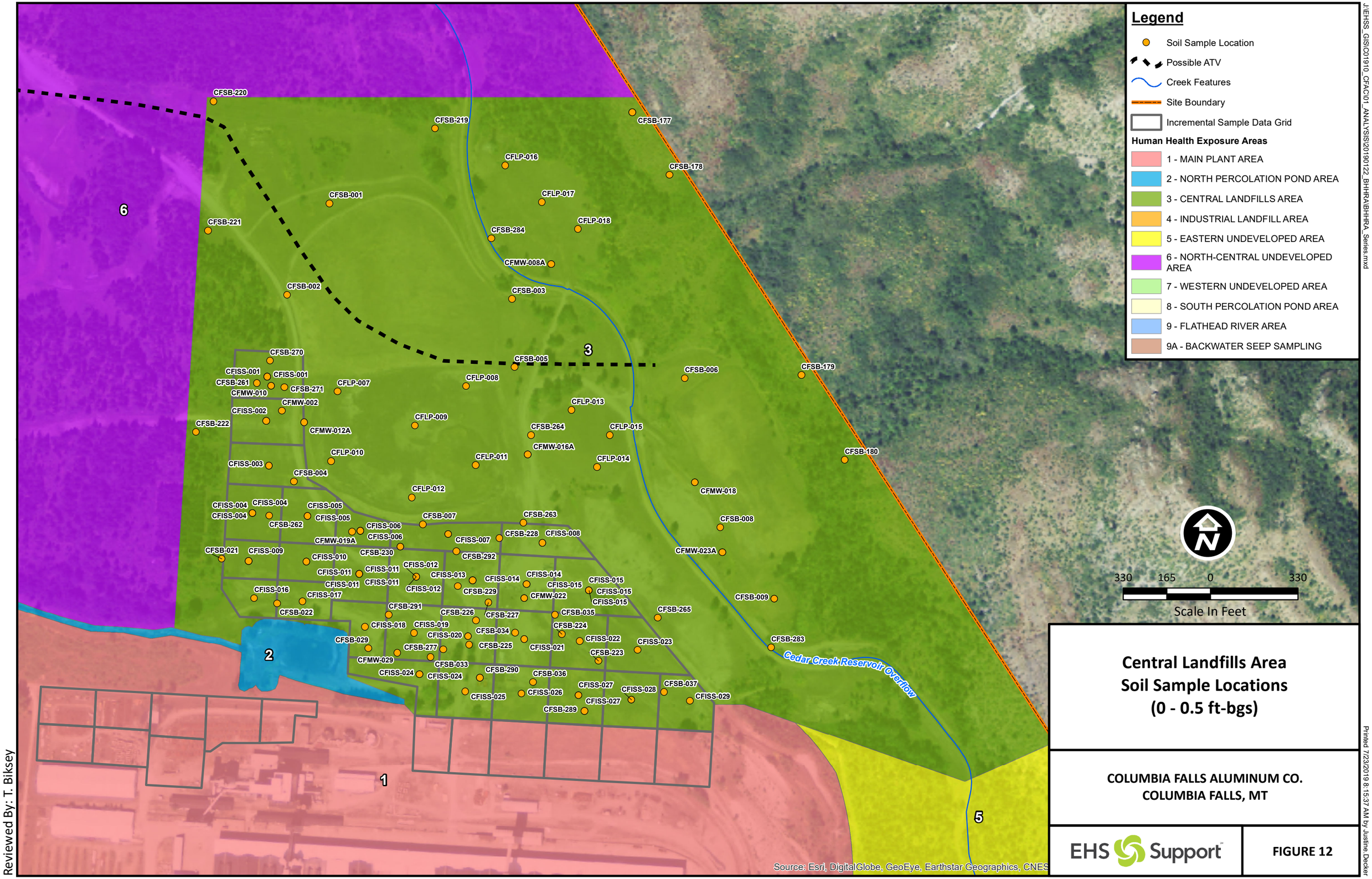

Central Landfills Area Soil Sample Locations (0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 12

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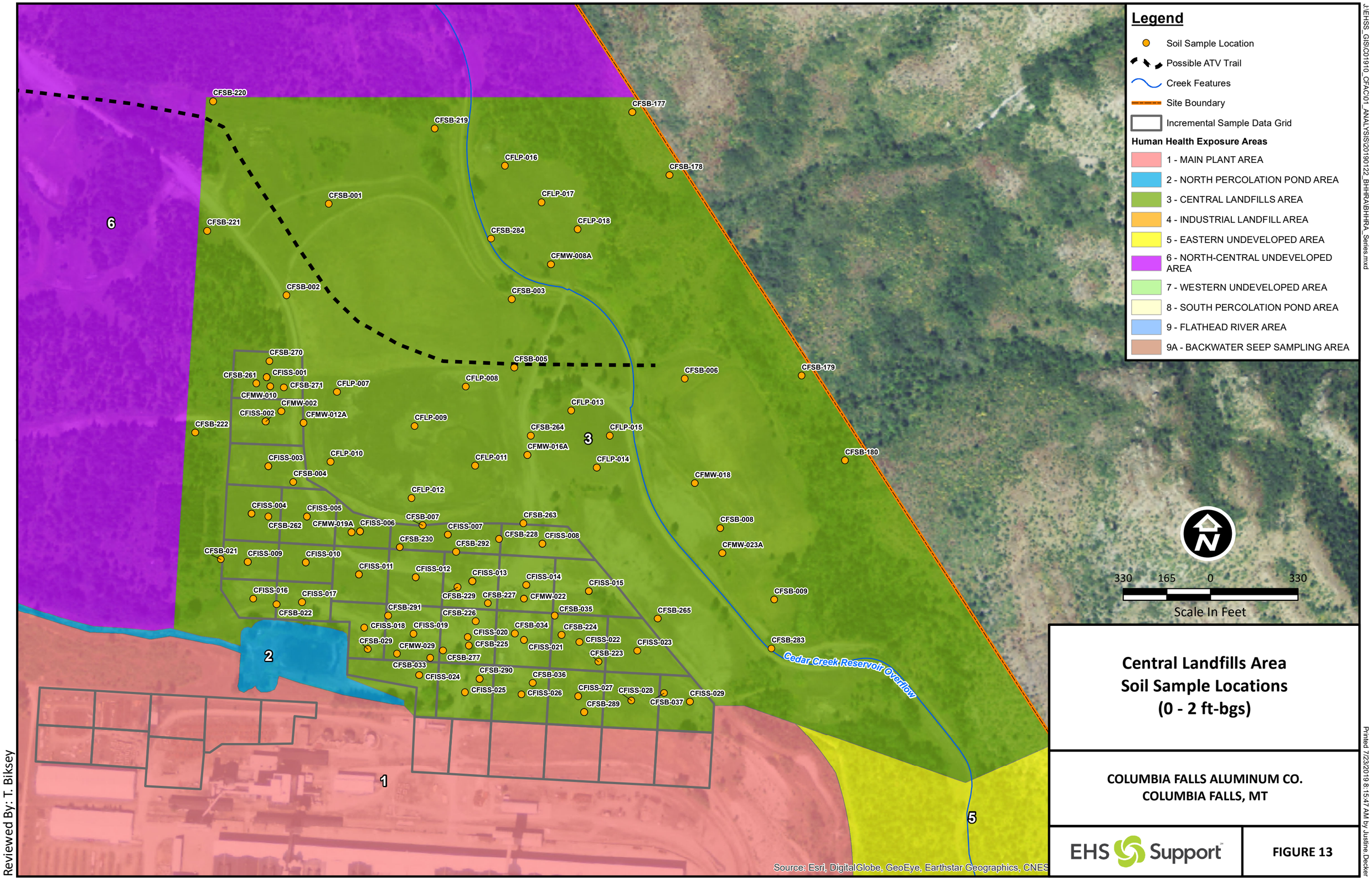

Legend

- Soil Sample Location
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

Central Landfills Area Soil Sample Locations (0 - 2 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 13

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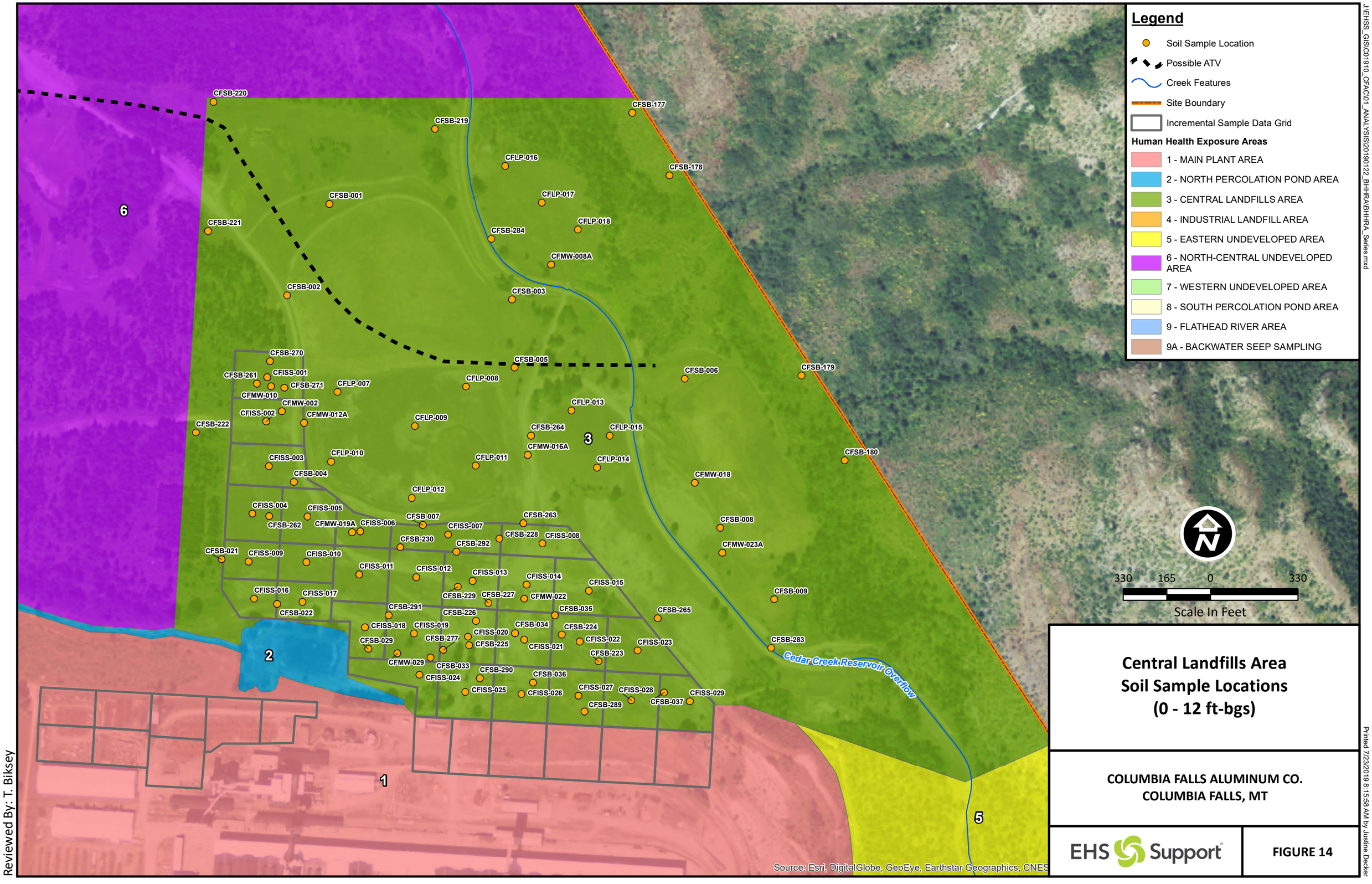

Legend

- Soil Sample Location
- Possible ATV
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING

Central Landfills Area Soil Sample Locations (0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 14

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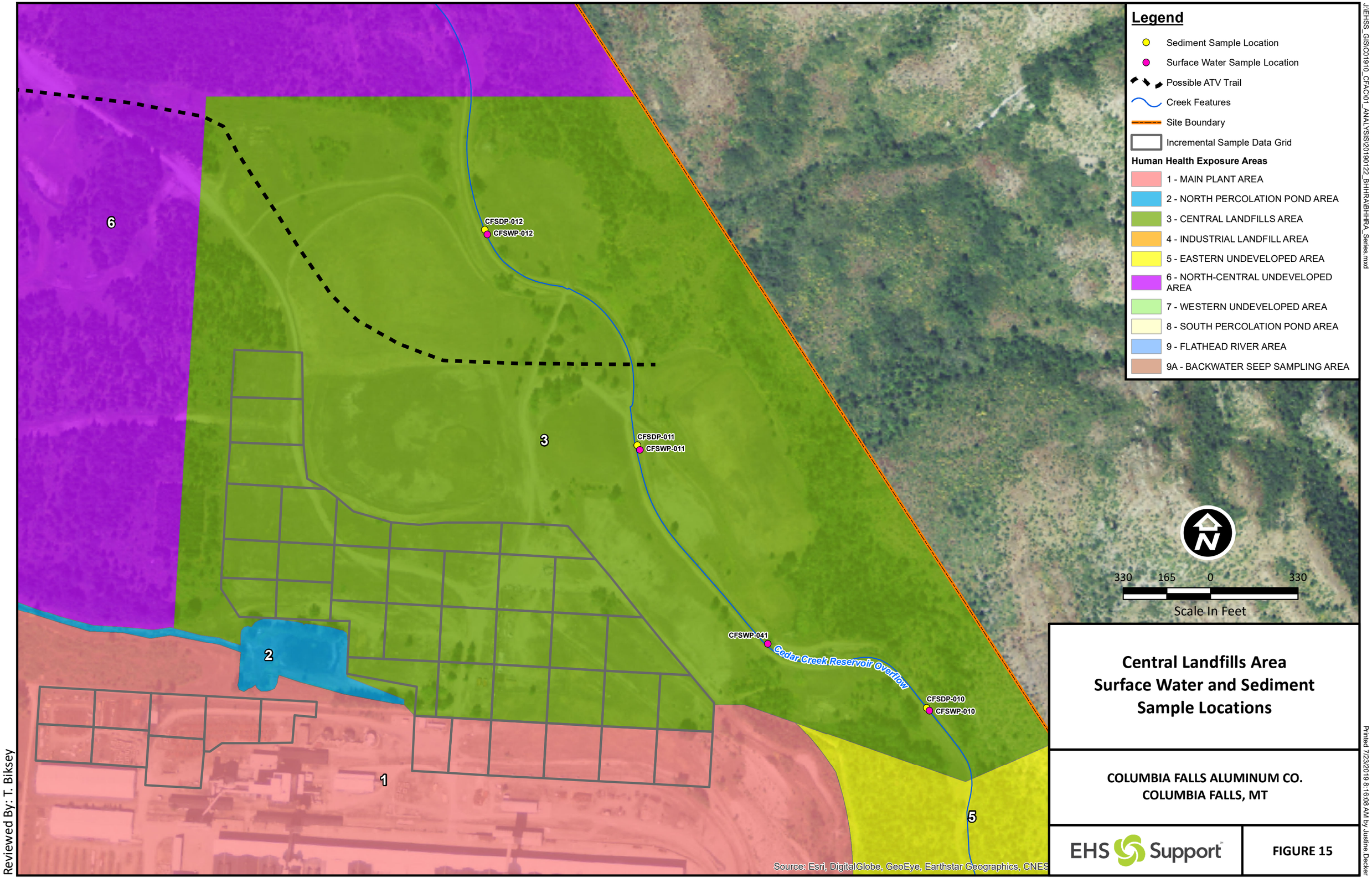

Legend

- Sediment Sample Location
- Surface Water Sample Location
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

N

330 165 0 330

Scale In Feet

Central Landfills Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 15

Reviewed By: T. Biksey

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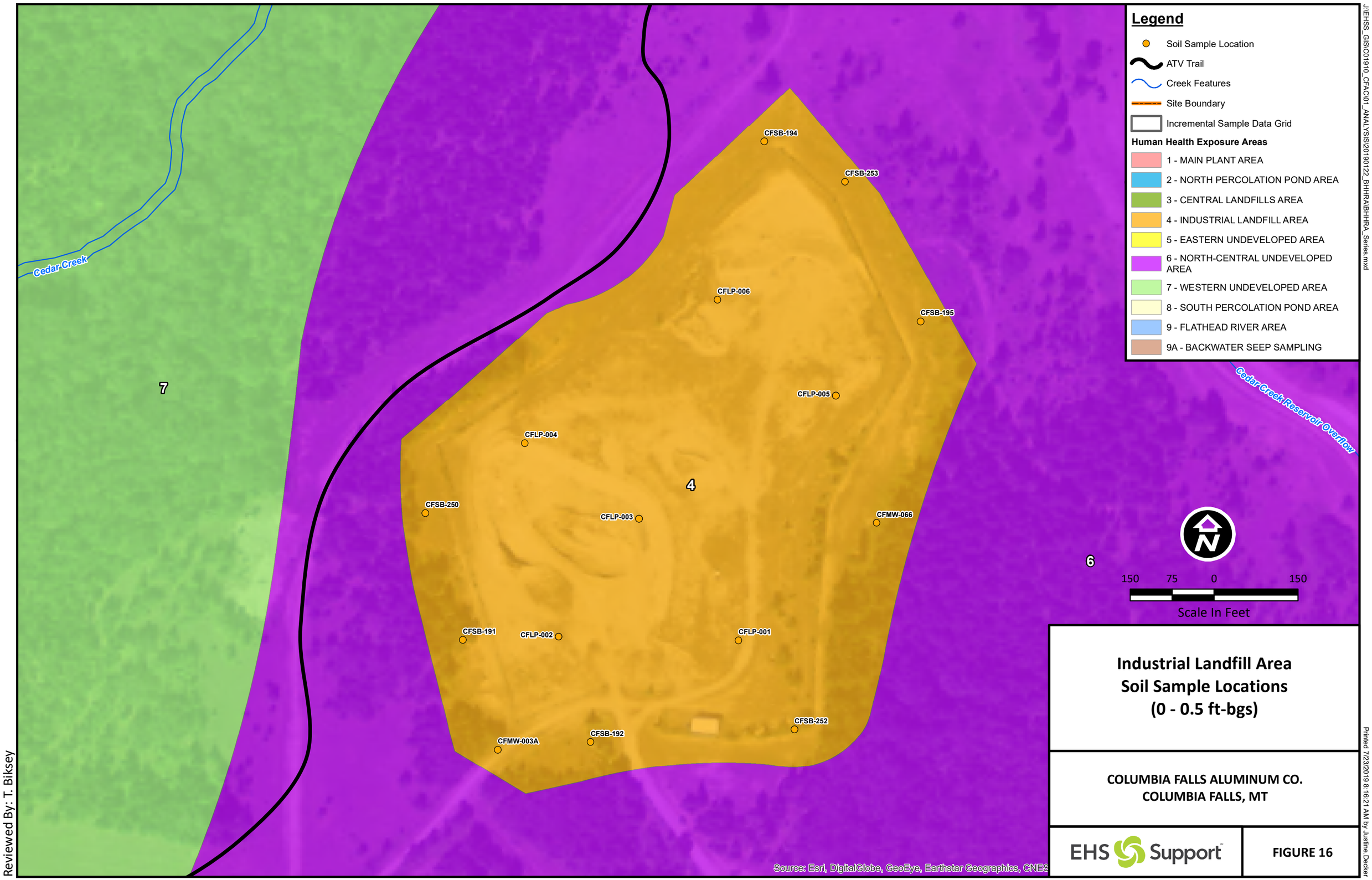

Industrial Landfill Area
Soil Sample Locations
(0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 16

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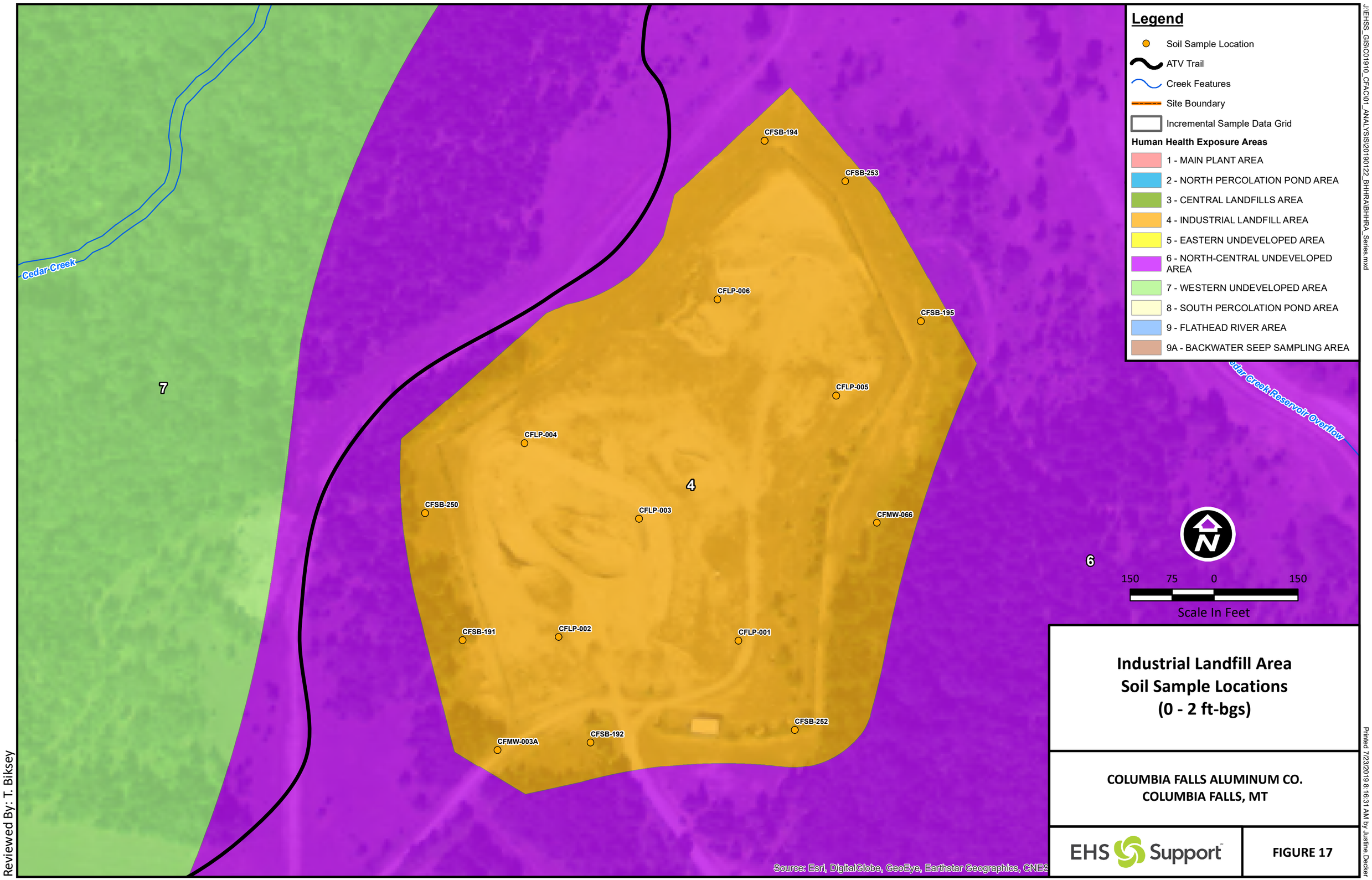

Industrial Landfill Area
Soil Sample Locations
(0 - 2 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 17

Reviewed By: T. Biksey

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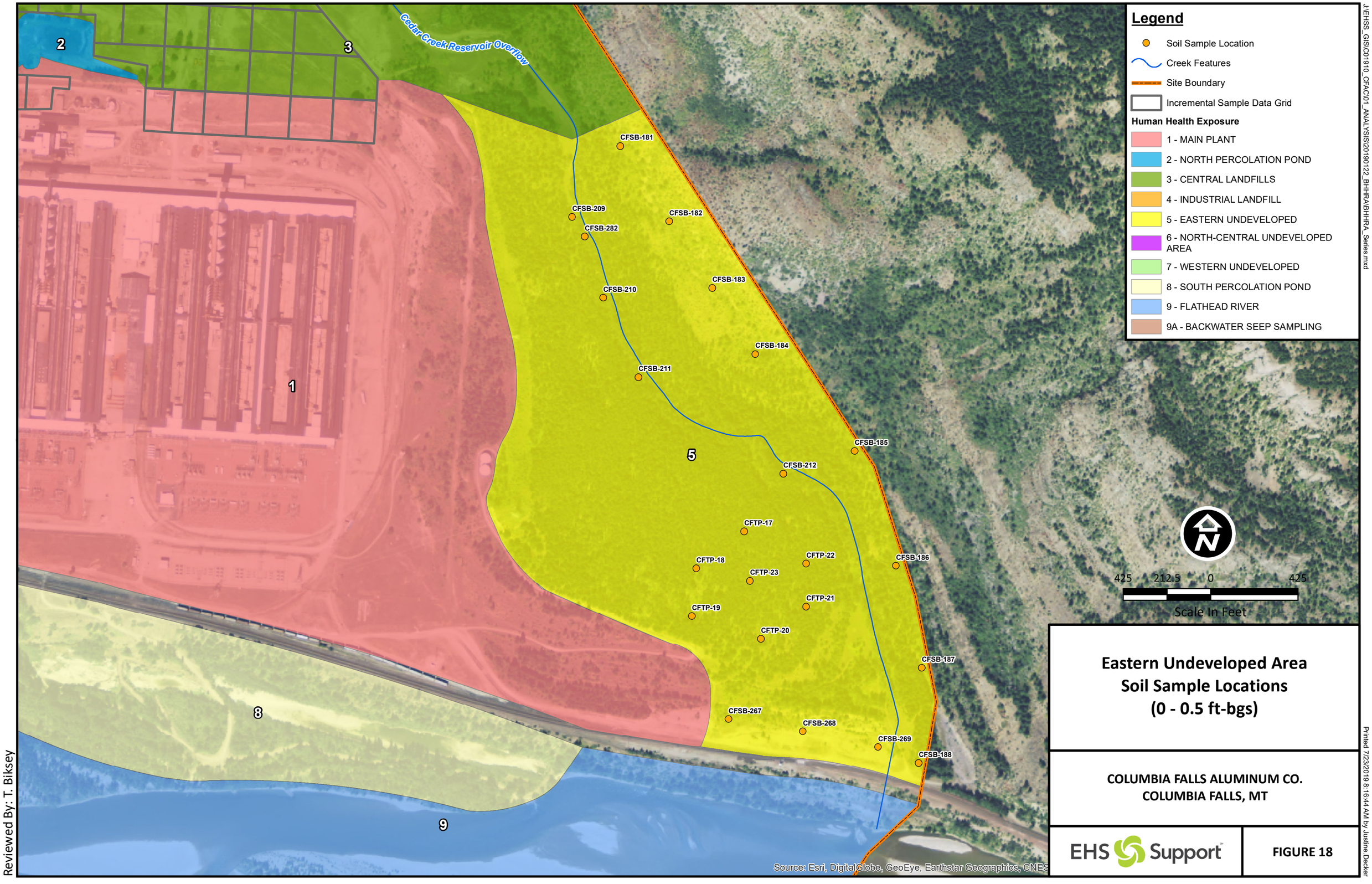

Eastern Undeveloped Area Soil Sample Locations (0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 18

Reviewed By: T. Biksey

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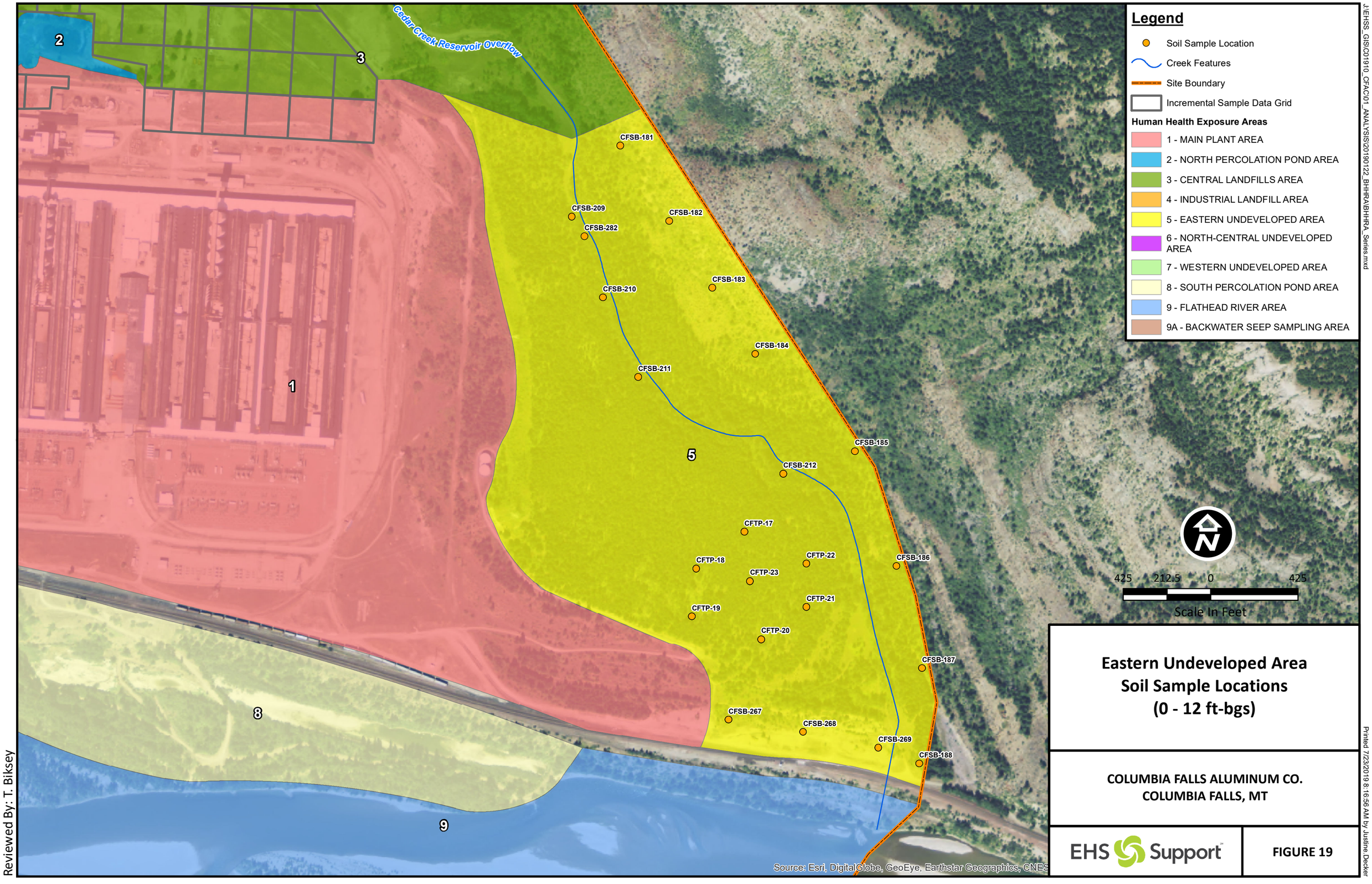

Eastern Undeveloped Area Soil Sample Locations (0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 19

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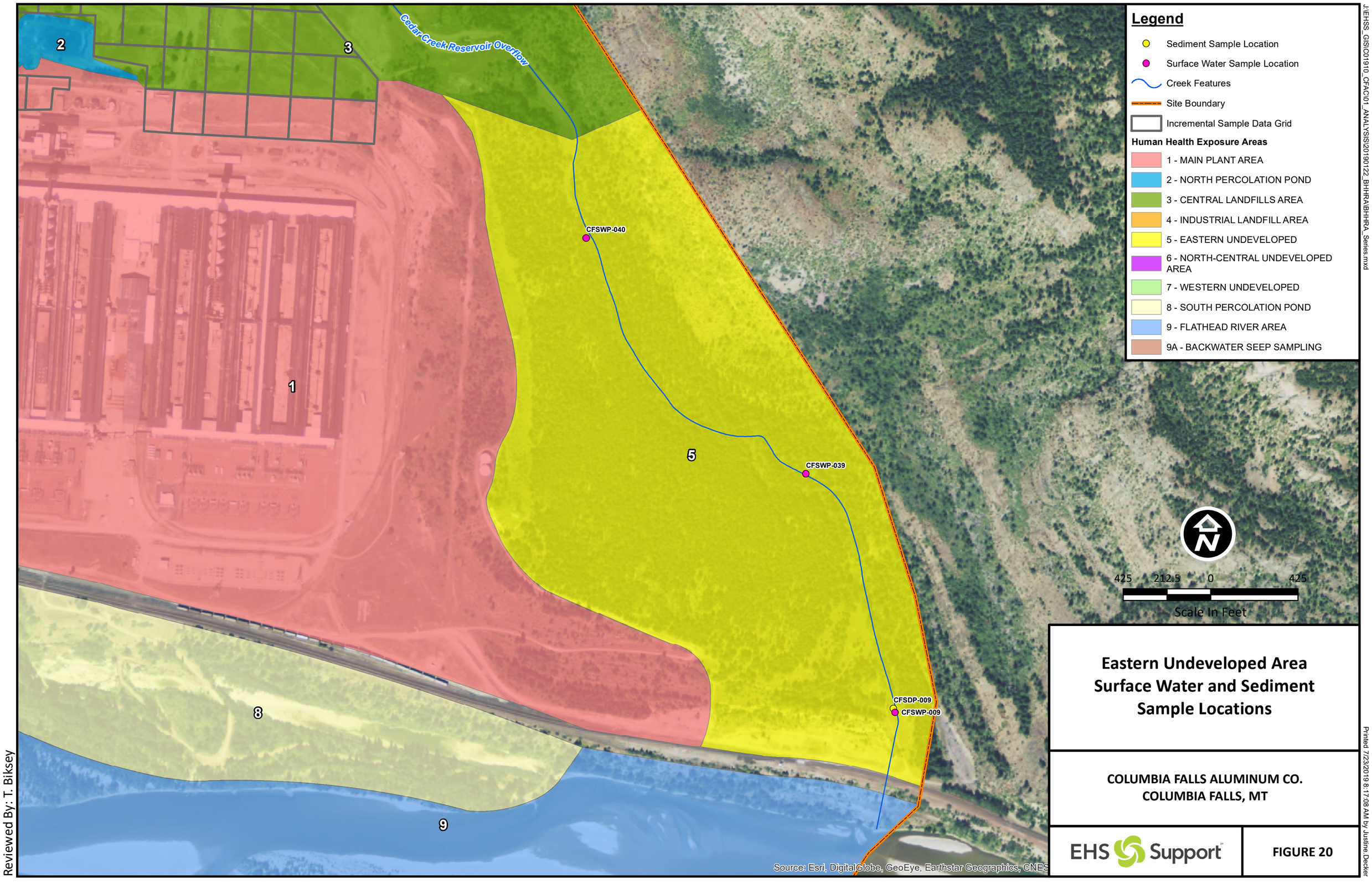

Legend

- Sediment Sample Location
- Surface Water Sample Location
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED
- 8 - SOUTH PERCOLATION POND
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING

425 212.5 0 425

Scale In Feet

Eastern Undeveloped Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 20

Reviewed By: T. Biksey

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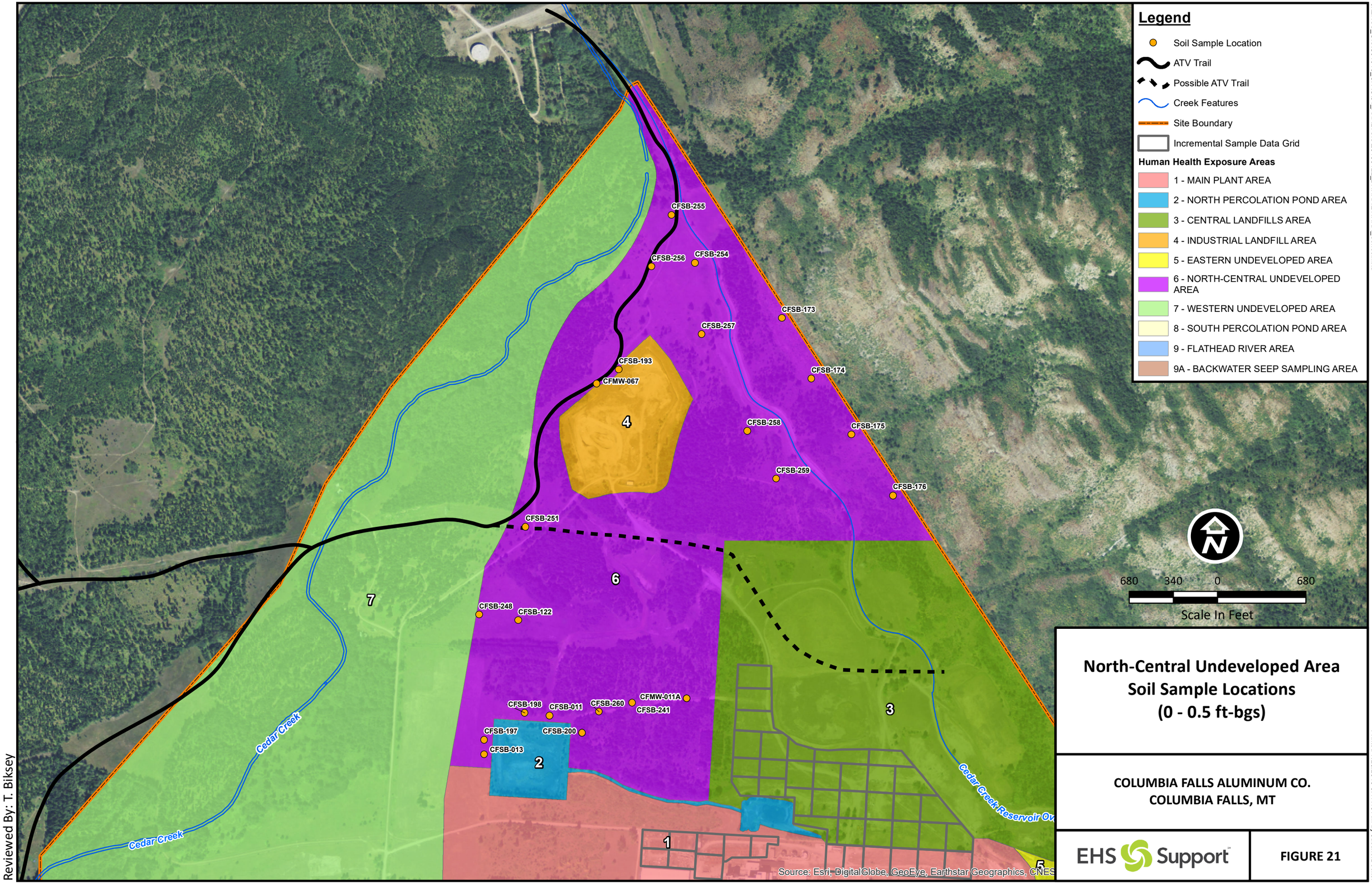
Legend
Soil Sample Location
ATV Trail
Possible ATV Trail
Creek Features
Site Boundary
Incremental Sample Data Grid
Human Health Exposure Areas
1 - MAIN PLANT AREA
2 - NORTH PERCOLATION POND AREA
3 - CENTRAL LANDFILLS AREA
4 - INDUSTRIAL LANDFILL AREA
5 - EASTERN UNDEVELOPED AREA
6 - NORTH-CENTRAL UNDEVELOPED AREA
7 - WESTERN UNDEVELOPED AREA
8 - SOUTH PERCOLATION POND AREA
9 - FLATHEAD RIVER AREA
9A - BACKWATER SEEP SAMPLING AREA
CFSB-255
CFSB-256
CFSB-254
CFSB-173
CFSB-257
CFSB-193
CFMW-067
CFSB-174
CFSB-258
CFSB-175
CFSB-259
CFSB-176
CFSB-251
CFSB-248
CFSB-122
CFSB-198
CFSB-011
CFSB-260
CFMW-011A
CFSB-241
CFSB-197
CFSB-200
CFSB-013
1
2
3
4
5
6
7
Cedar Creek
Cedar Creek
Cedar Creek Reservoir Ov
680 340 0 680
Scale In Feet
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES
North-Central Undeveloped Area
Soil Sample Locations
(0 - 0.5 ft-bgs)
COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT
EHS Support
FIGURE 21
Reviewed By: T. Biksey
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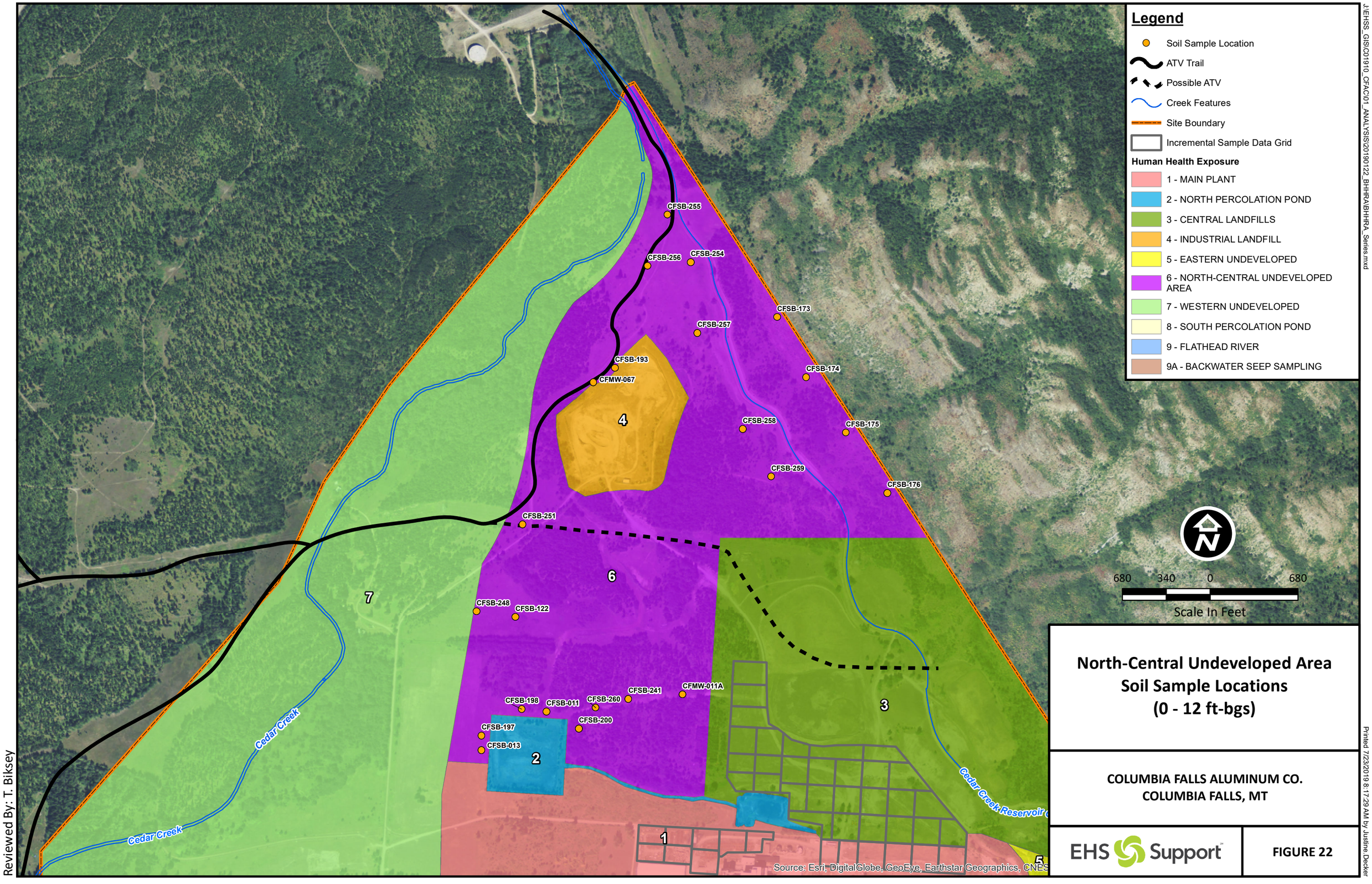

North-Central Undeveloped Area Soil Sample Locations (0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 22

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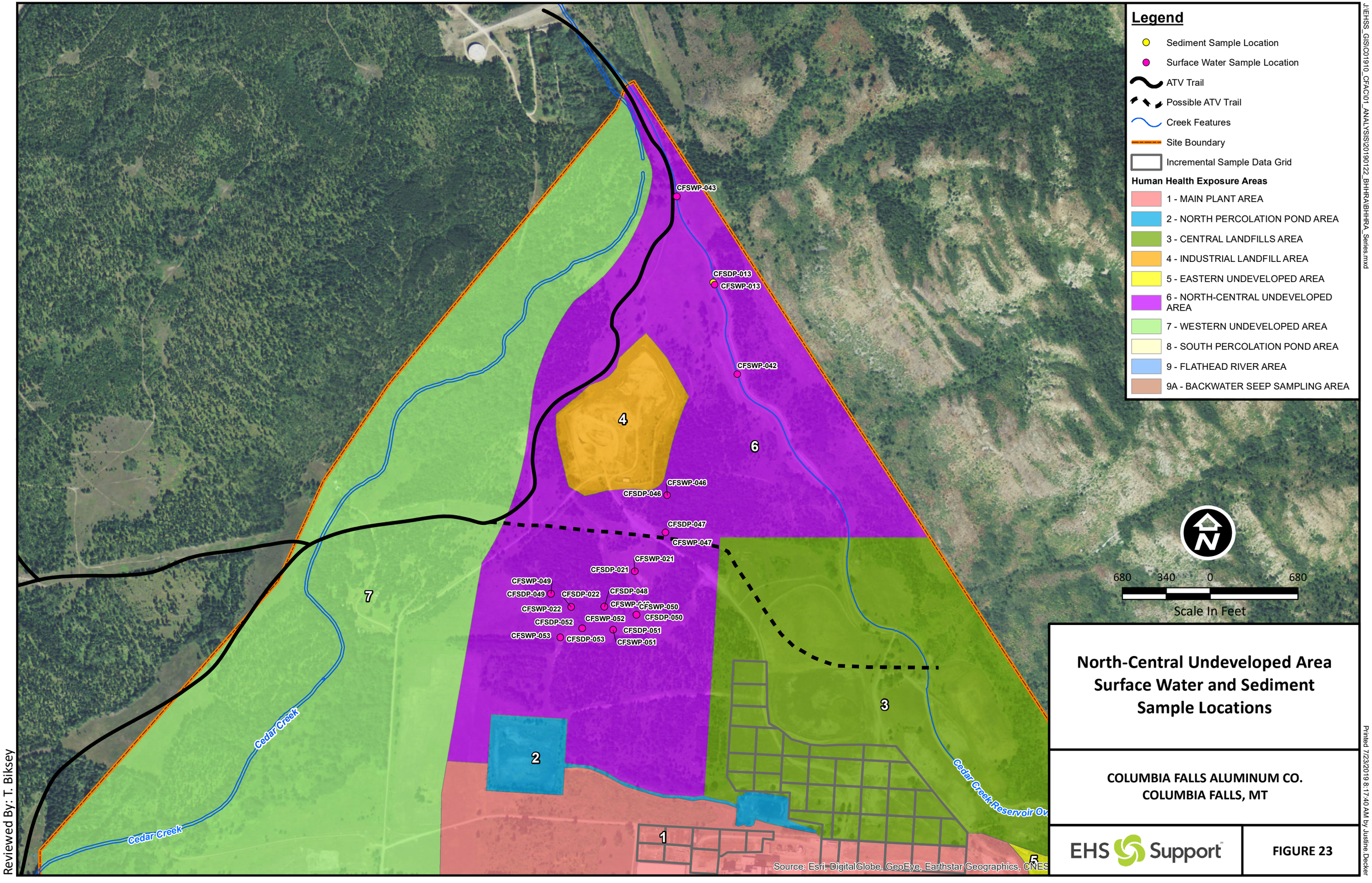

Legend

- Sediment Sample Location
- Surface Water Sample Location
- ATV Trail
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

North-Central Undeveloped Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 23

Reviewed By: T. Biksey

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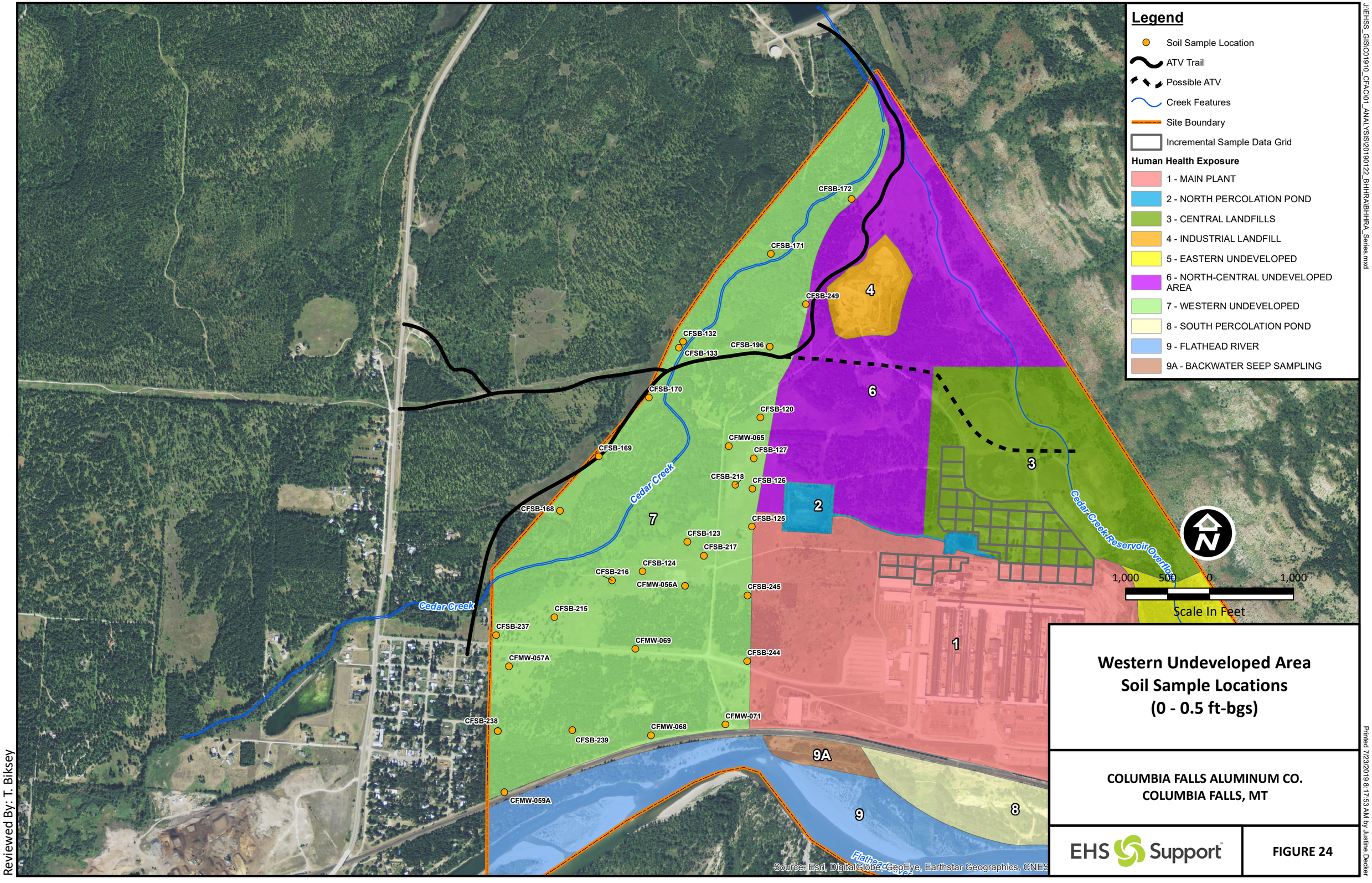

Western Undeveloped Area Soil Sample Locations (0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support™

FIGURE 24

Reviewed By: T. Biksey

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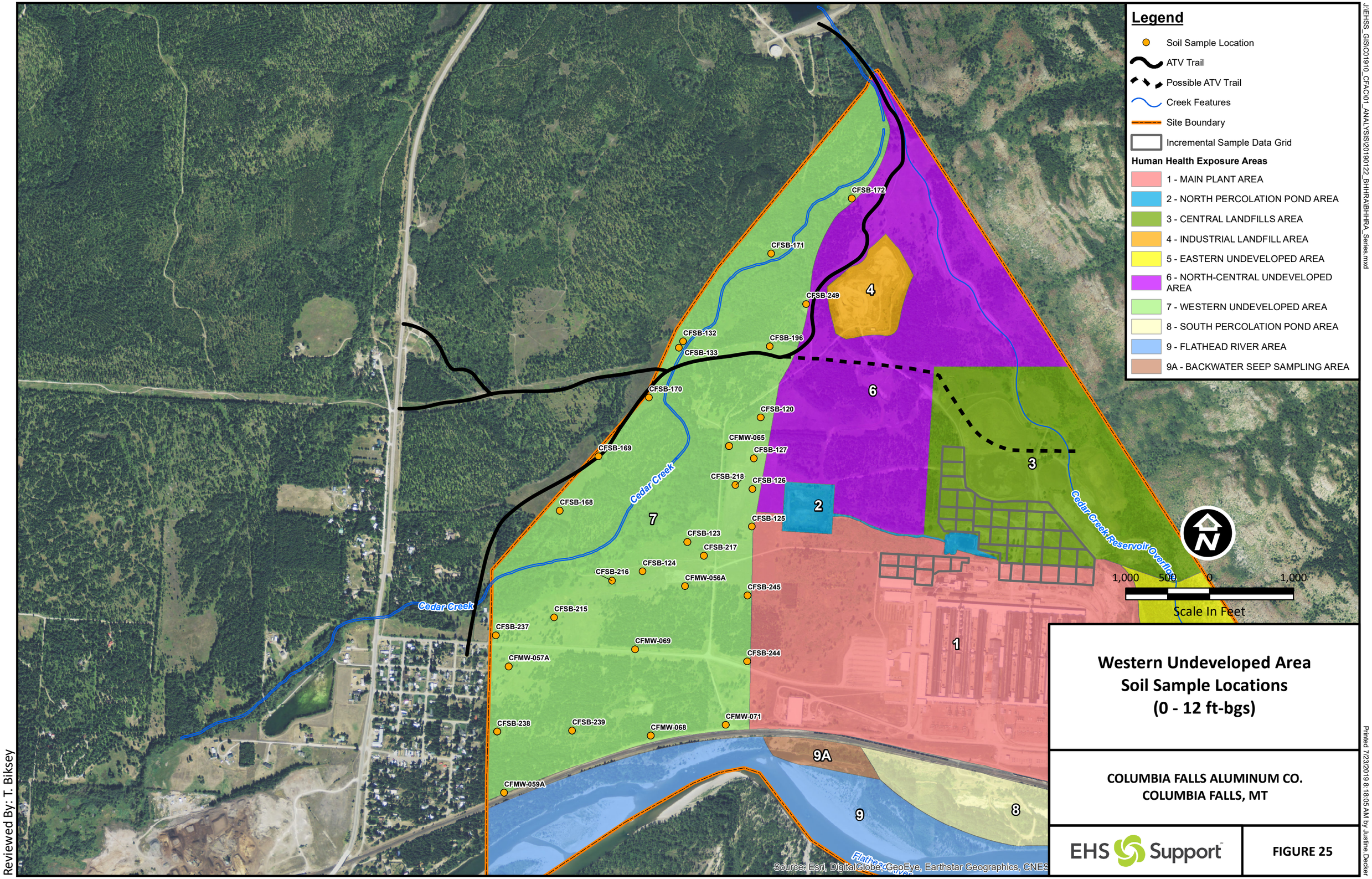

Western Undeveloped Area Soil Sample Locations (0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 25

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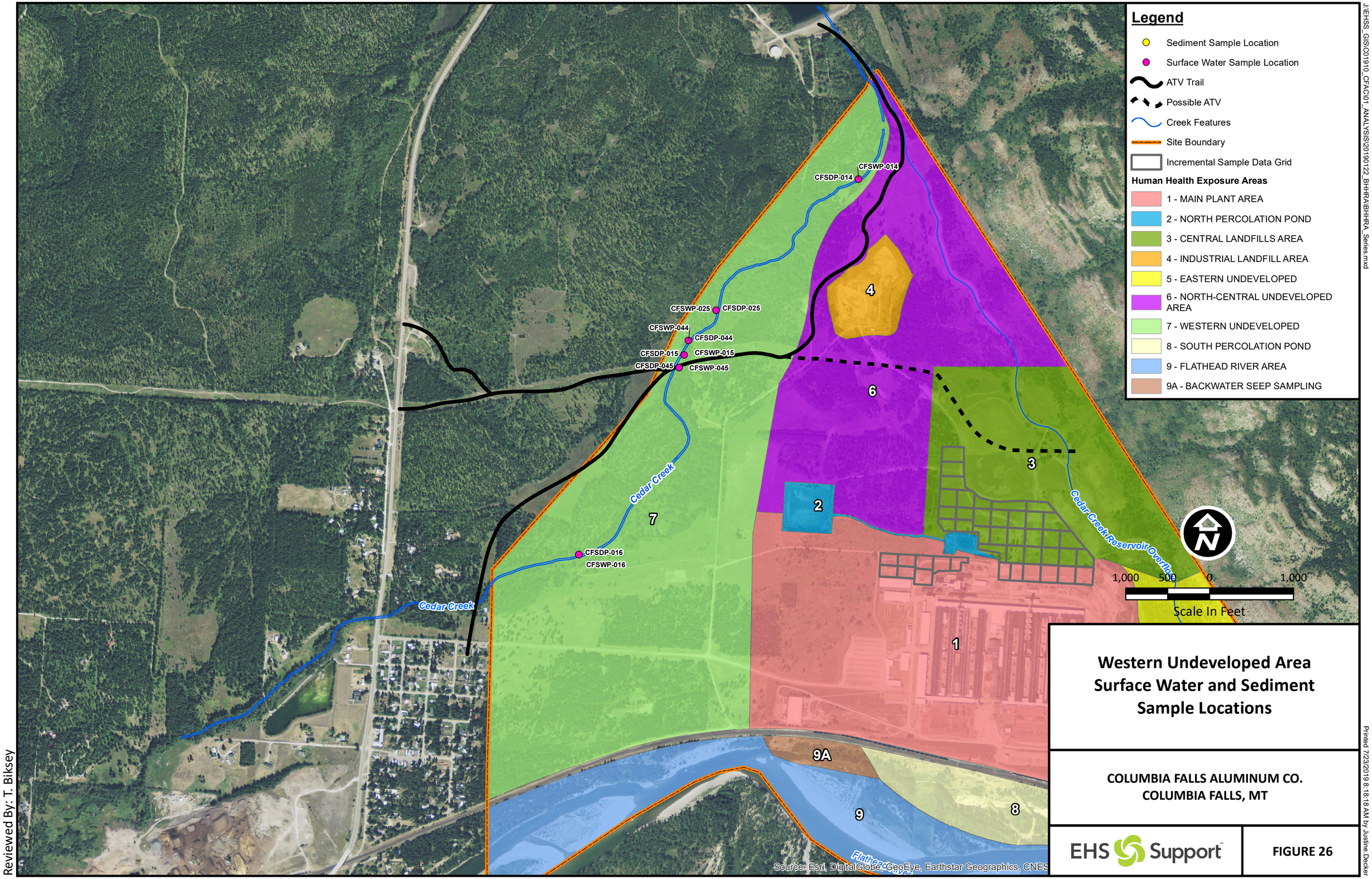

Legend

- Sediment Sample Location
- Surface Water Sample Location
- ATV Trail
- Possible ATV
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED
- 8 - SOUTH PERCOLATION POND
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING

Western Undeveloped Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 26

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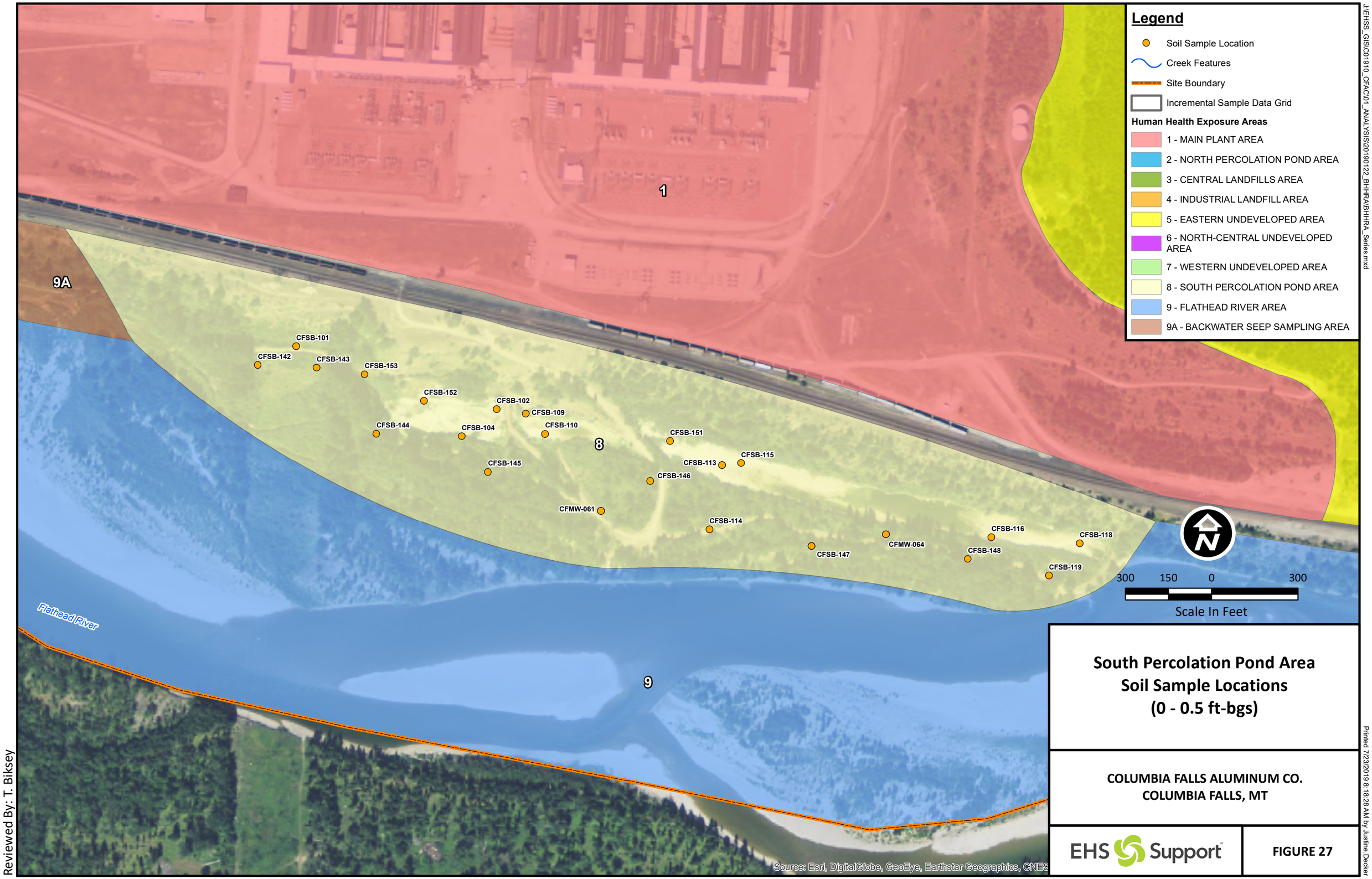

South Percolation Pond Area Soil Sample Locations (0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 27

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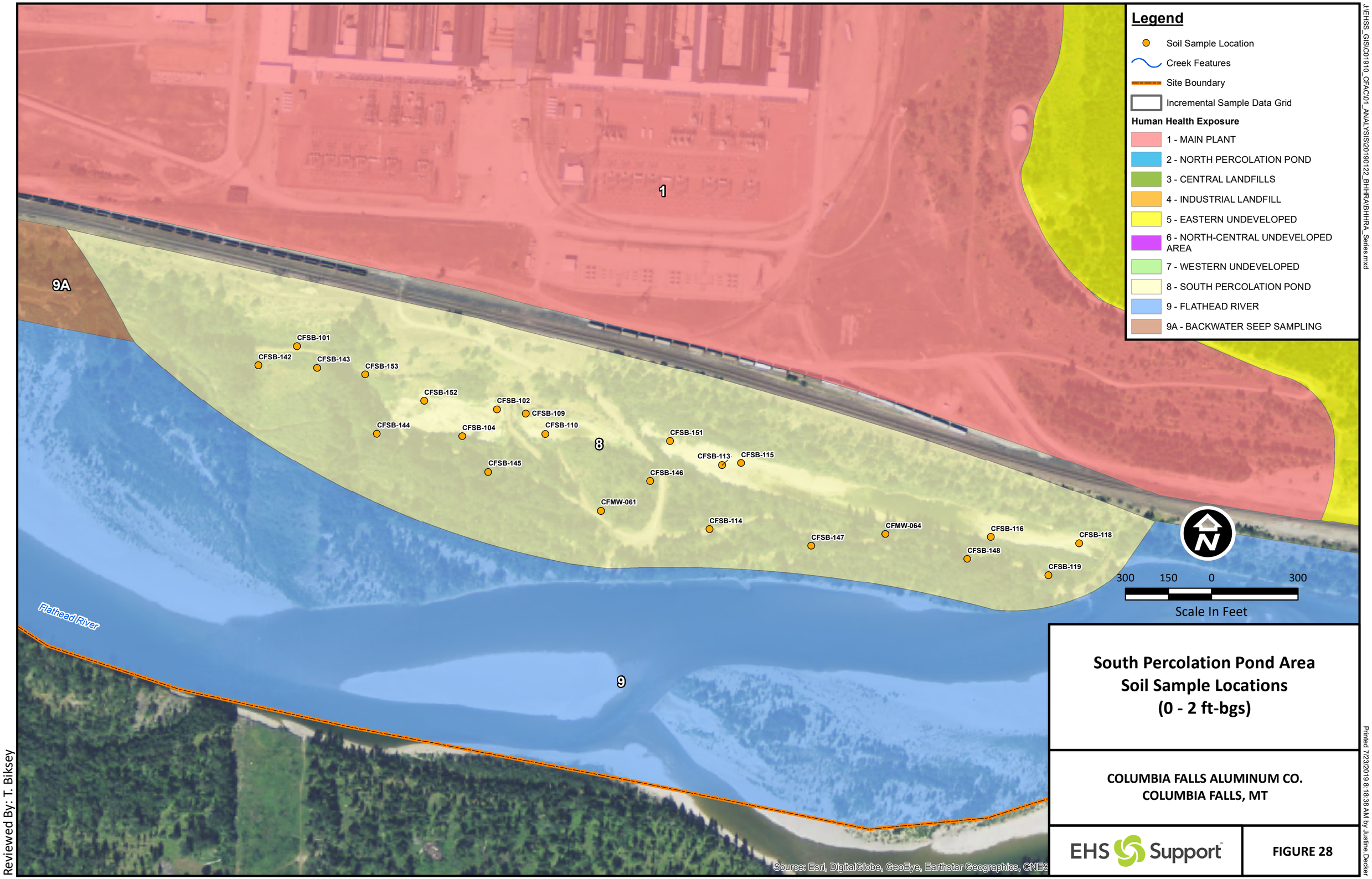

Legend

- Soil Sample Location
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure

- 1 - MAIN PLANT
- 2 - NORTH PERCOLATION POND
- 3 - CENTRAL LANDFILLS
- 4 - INDUSTRIAL LANDFILL
- 5 - EASTERN UNDEVELOPED
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED
- 8 - SOUTH PERCOLATION POND
- 9 - FLATHEAD RIVER
- 9A - BACKWATER SEEP SAMPLING

South Percolation Pond Area Soil Sample Locations (0 - 2 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 28

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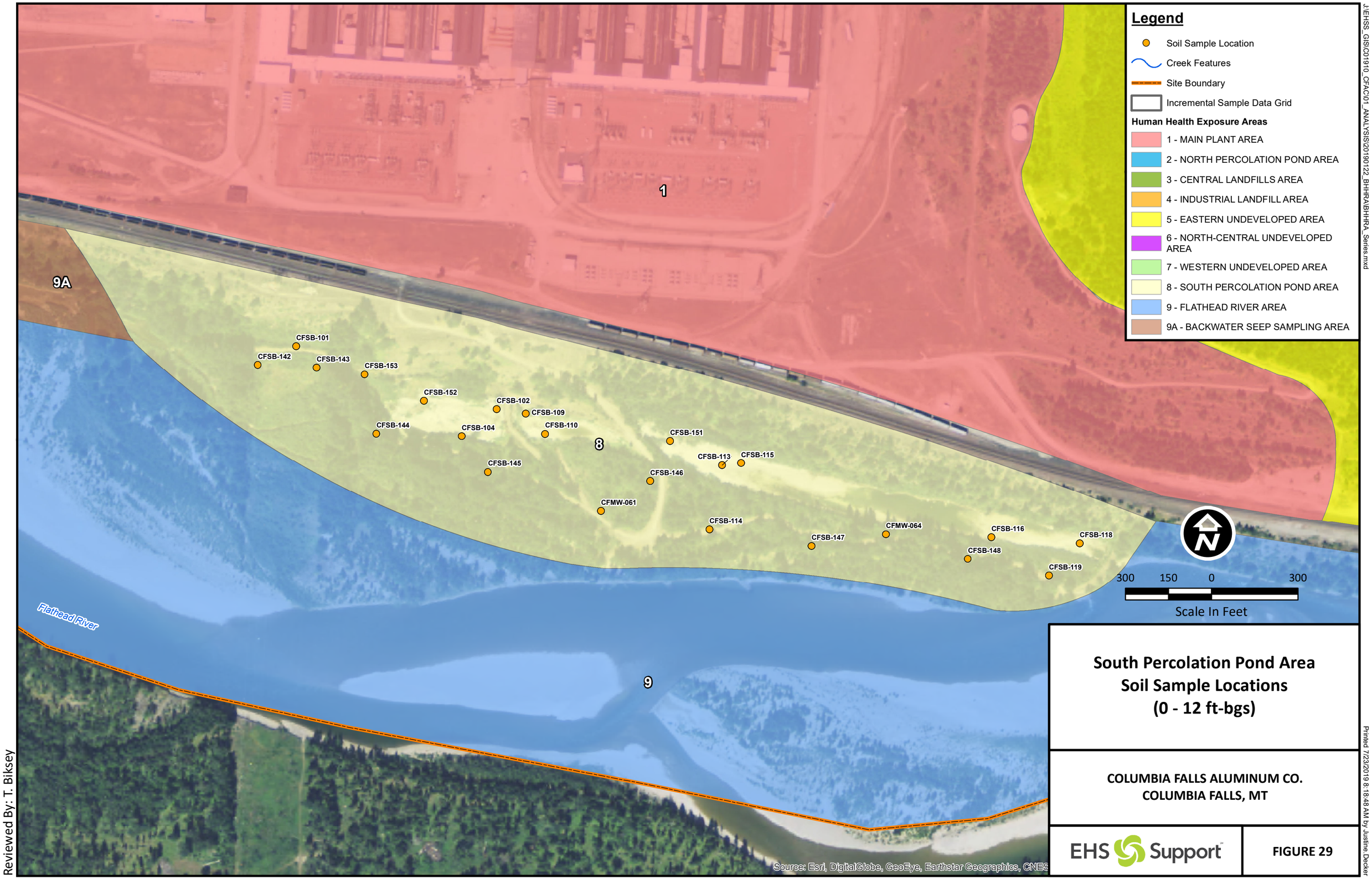

South Percolation Pond Area
Soil Sample Locations
(0 - 12 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 29

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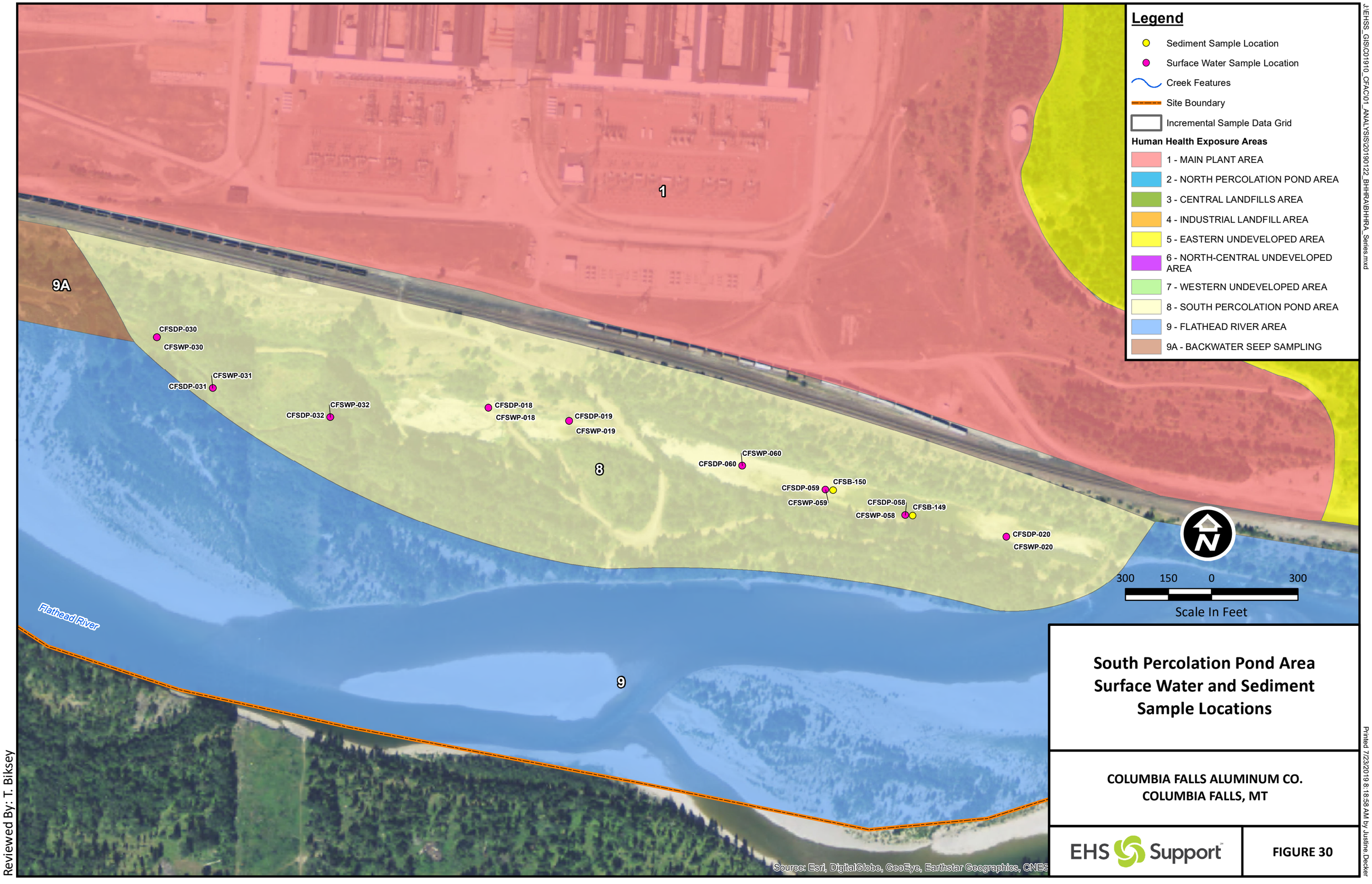

South Percolation Pond Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 30

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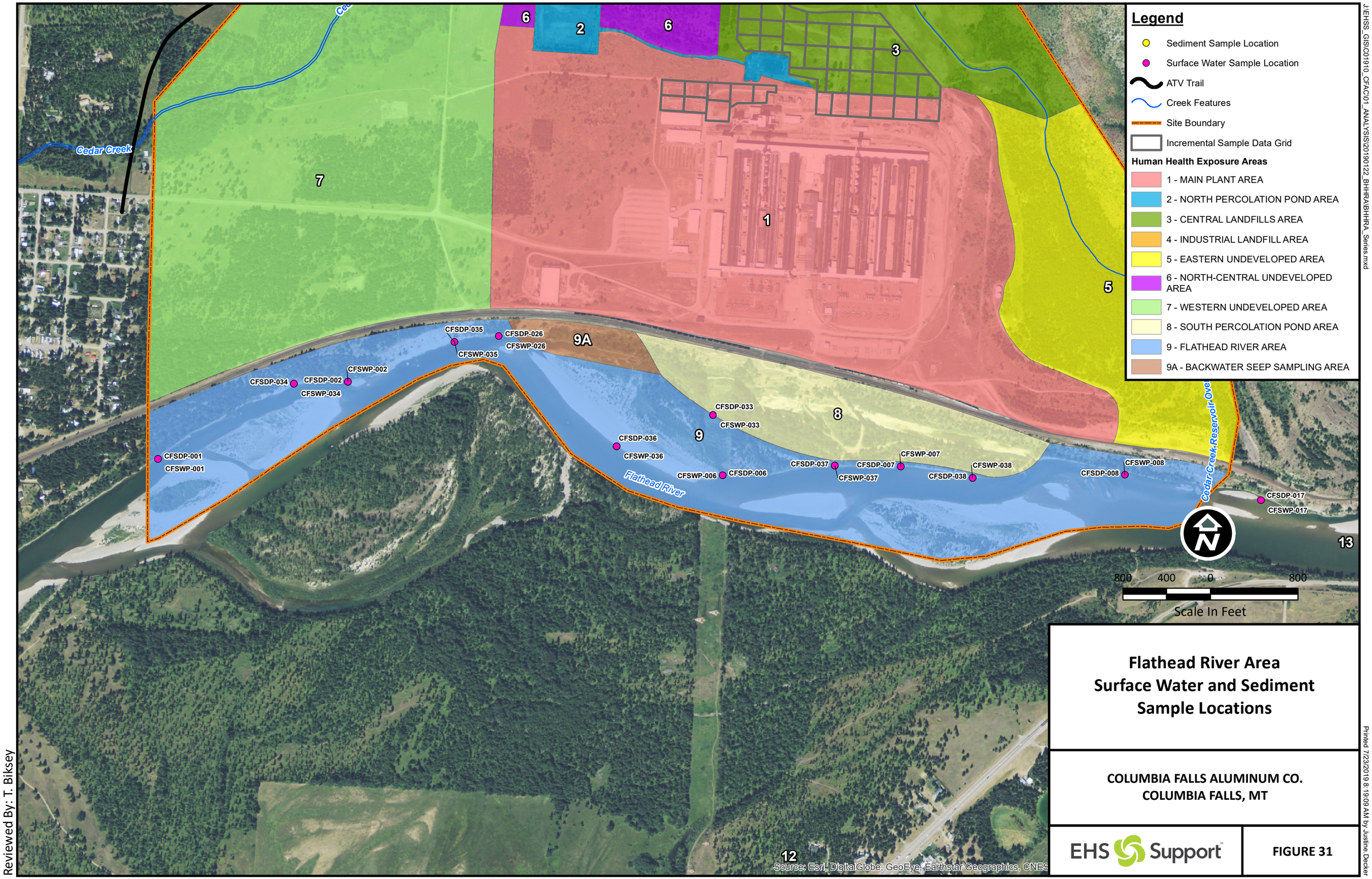

Flathead River Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 31

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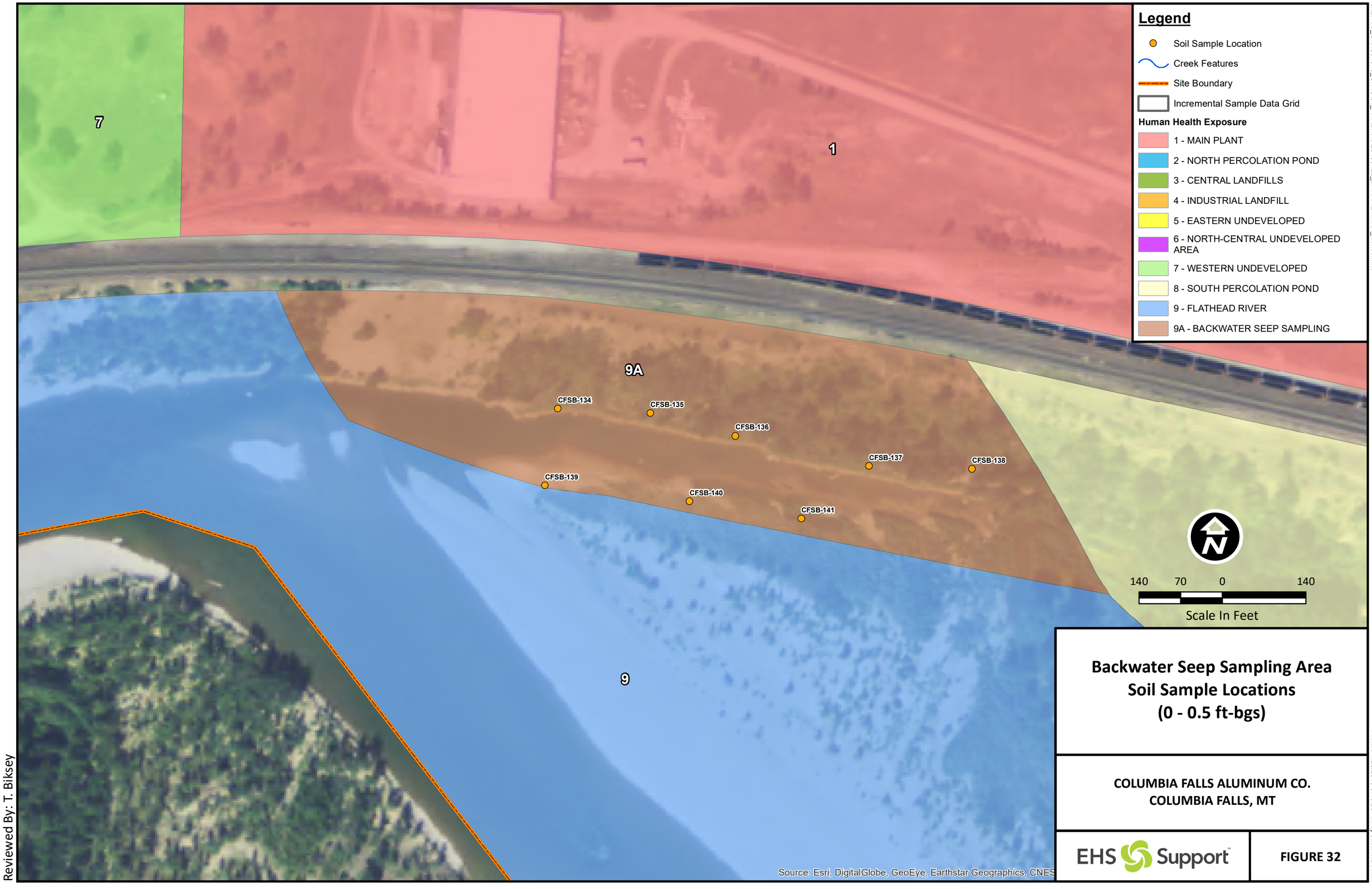

Backwater Seep Sampling Area
Soil Sample Locations
(0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 32

Reviewed By: T. Biksey

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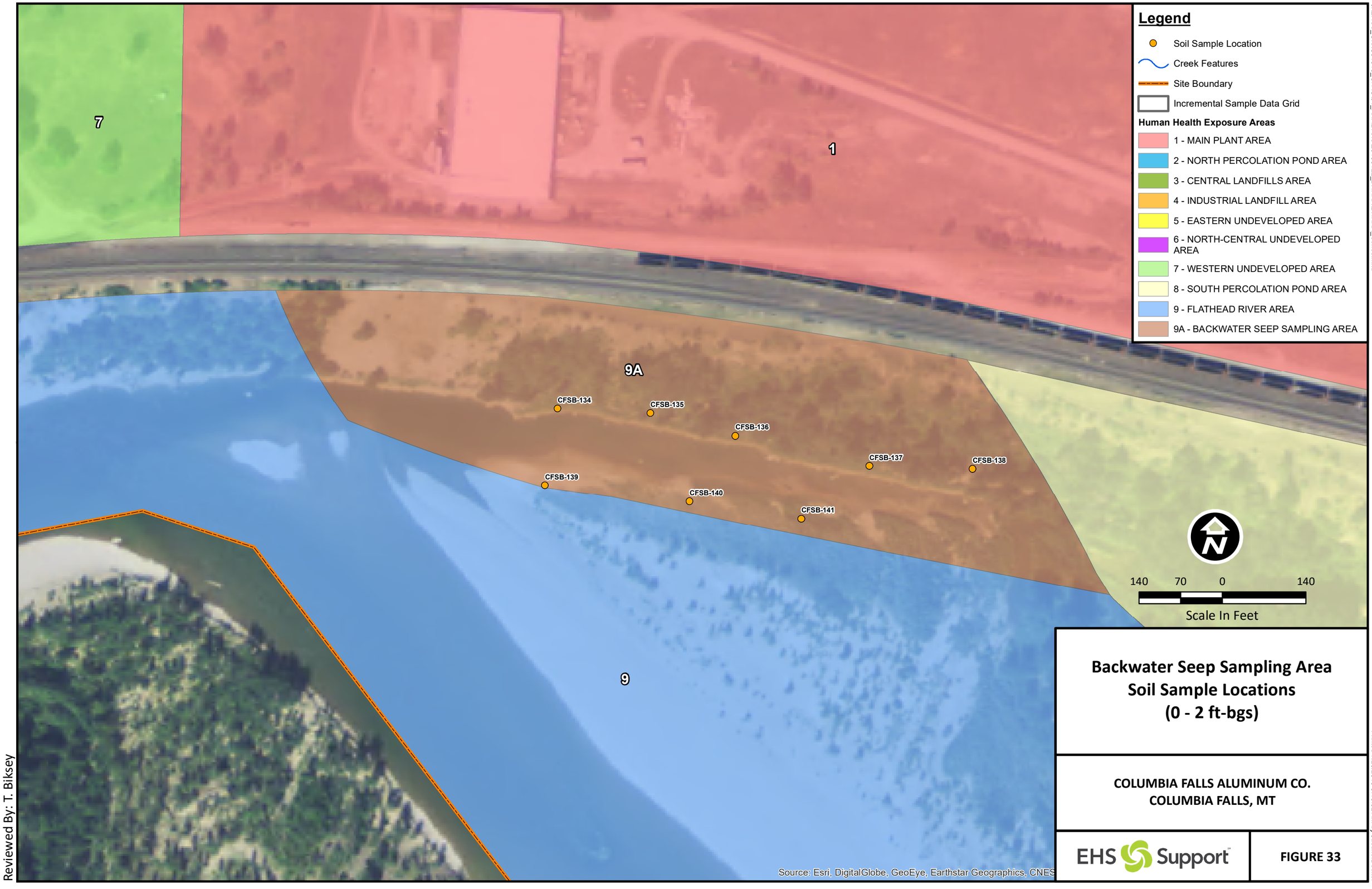

Backwater Seep Sampling Area
Soil Sample Locations
(0 - 2 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 33

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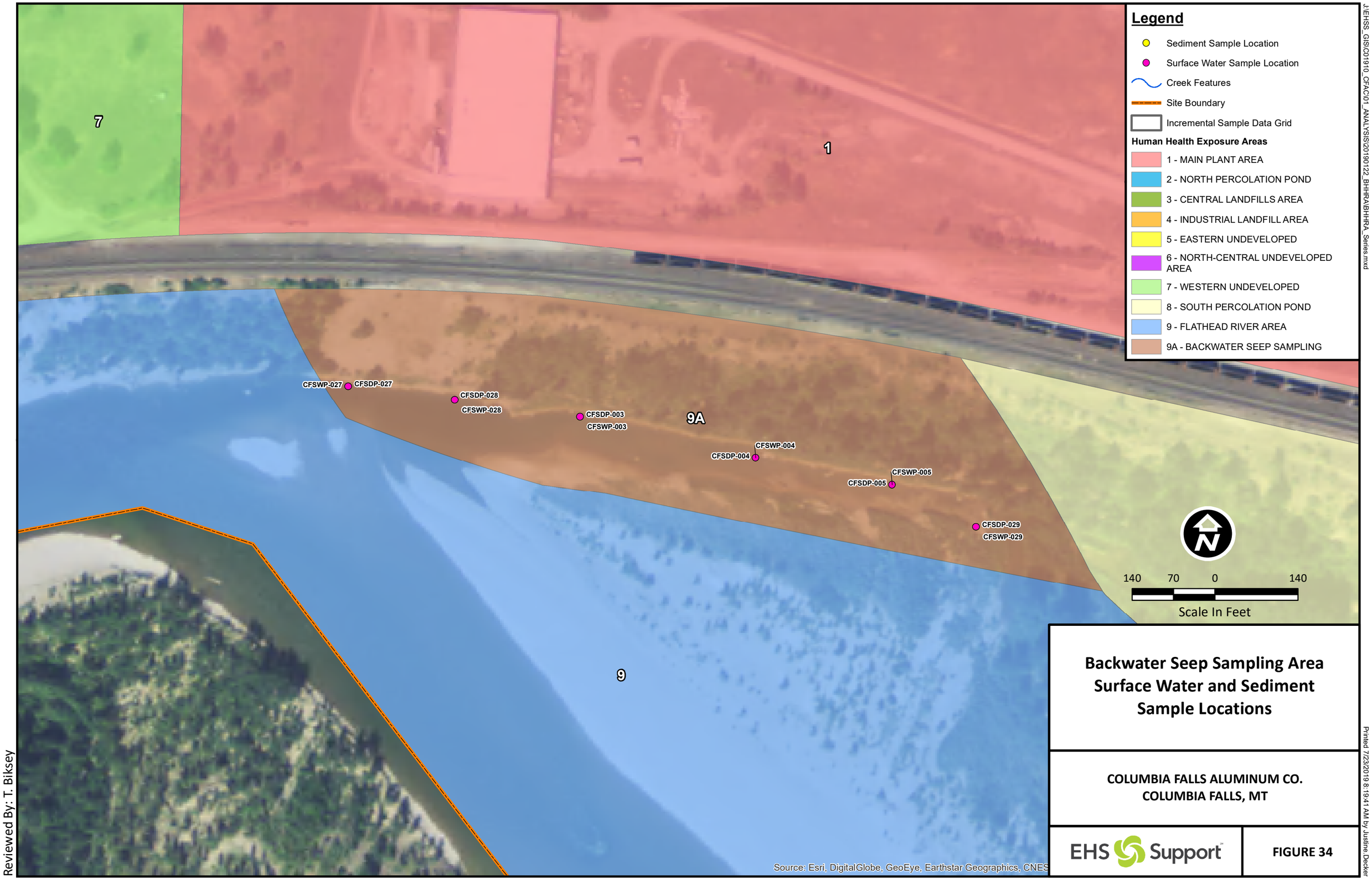
Printed 7/23/2019 8:19:32 AM by Justine.Decker



Backwater Seep Sampling Area Surface Water and Sediment Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 34

Reviewed By: T. Biksey

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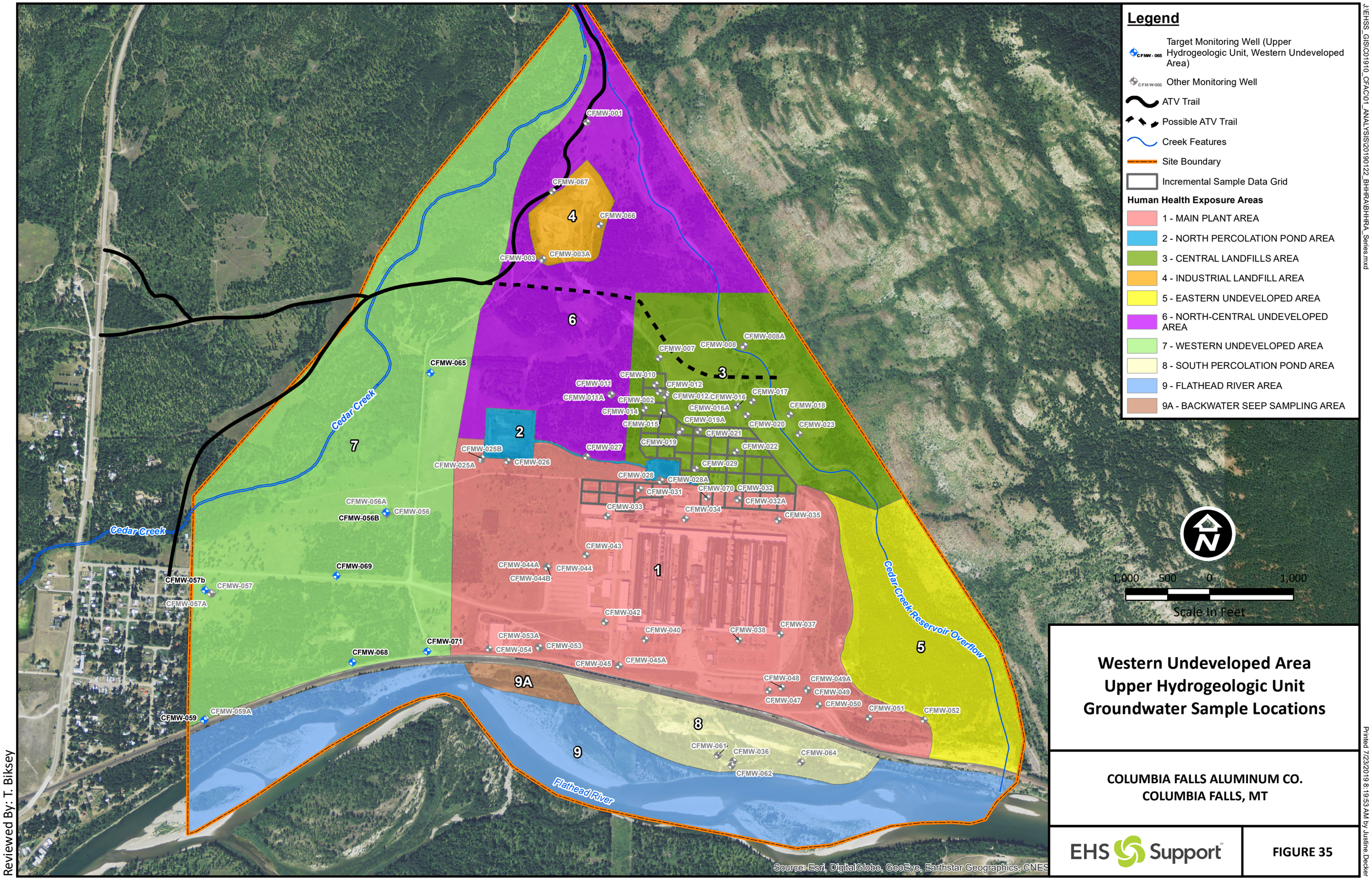

Legend

- Target Monitoring Well (Upper Hydrogeologic Unit, Western Undeveloped Area)
- Other Monitoring Well
- ATV Trail
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

Western Undeveloped Area Upper Hydrogeologic Unit Groundwater Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 35

Reviewed By: T. Biksey

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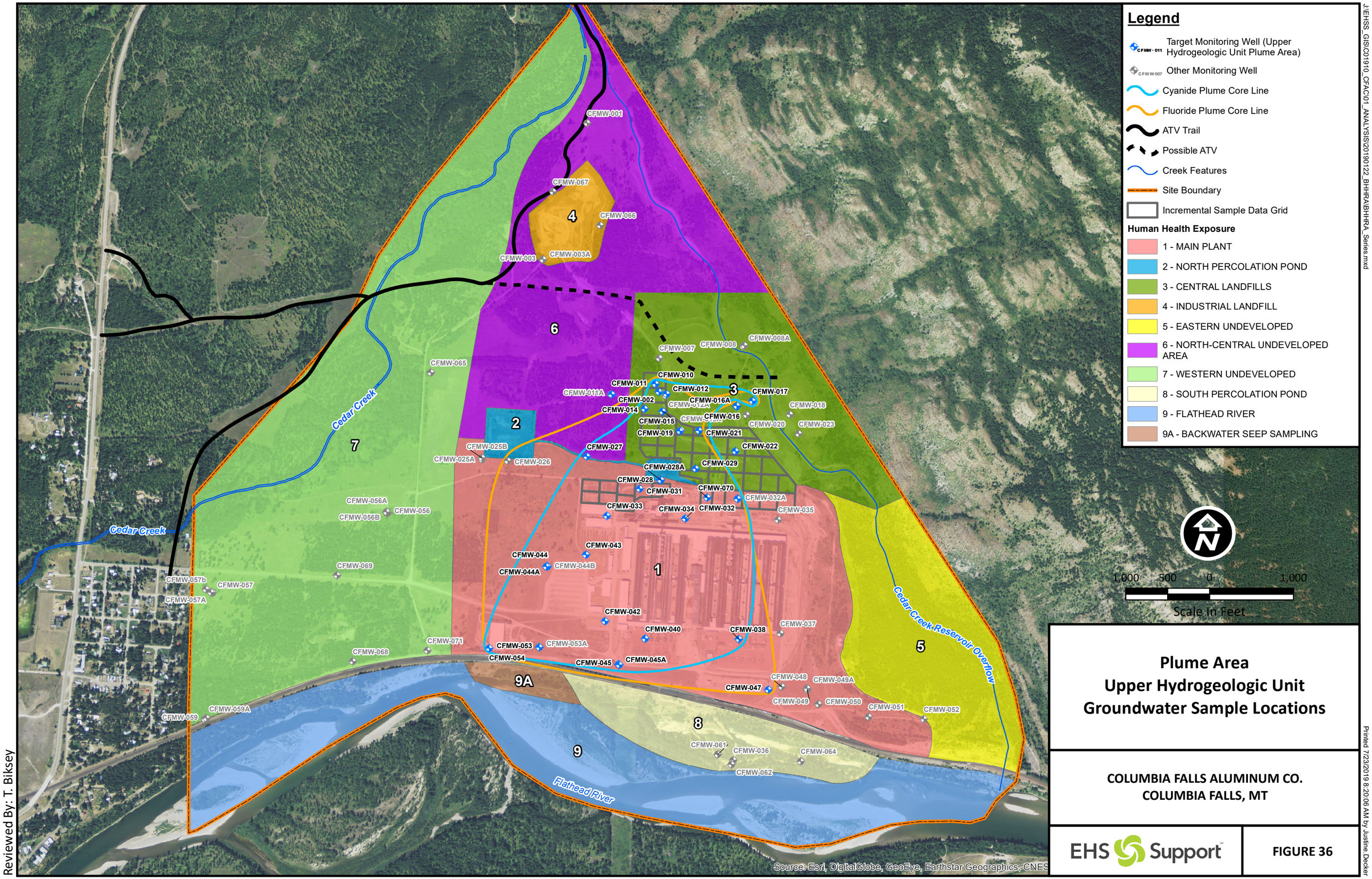

Plume Area
Upper Hydrogeologic Unit
Groundwater Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 36

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Legend

- Target Monitoring Well (Below Upper Hydrogeologic Unit) (CFMW-012A)
- Other Monitoring Well (CFMW-011)
- ATV Trail
- Possible ATV Trail
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure Areas

- 1 - MAIN PLANT AREA
- 2 - NORTH PERCOLATION POND AREA
- 3 - CENTRAL LANDFILLS AREA
- 4 - INDUSTRIAL LANDFILL AREA
- 5 - EASTERN UNDEVELOPED AREA
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED AREA
- 8 - SOUTH PERCOLATION POND AREA
- 9 - FLATHEAD RIVER AREA
- 9A - BACKWATER SEEP SAMPLING AREA

CFMW-001, CFMW-067, CFMW-066, CFMW-003, CFMW-003A, CFMW-065, CFMW-007, CFMW-008, CFMW-008A, CFMW-010, CFMW-011, CFMW-011A, CFMW-012, CFMW-012A, CFMW-002, CFMW-014, CFMW-015, CFMW-016, CFMW-016A, CFMW-017, CFMW-018, CFMW-019, CFMW-019A, CFMW-020, CFMW-021, CFMW-022, CFMW-023, CFMW-025A, CFMW-025B, CFMW-026, CFMW-027, CFMW-028, CFMW-028A, CFMW-029, CFMW-031, CFMW-070, CFMW-032, CFMW-032A, CFMW-033, CFMW-034, CFMW-035, CFMW-056A, CFMW-056B, CFMW-056, CFMW-043, CFMW-044A, CFMW-044, CFMW-044B, CFMW-069, CFMW-057b, CFMW-057, CFMW-057A, CFMW-042, CFMW-040, CFMW-038, CFMW-037, CFMW-071, CFMW-054, CFMW-053A, CFMW-053, CFMW-068, CFMW-045, CFMW-045A, CFMW-048, CFMW-049A, CFMW-049, CFMW-047, CFMW-050, CFMW-051, CFMW-052, CFMW-059, CFMW-059A, CFMW-061, CFMW-036, CFMW-064, CFMW-062

Cedar Creek, Cedar Creek Reservoir Overflow, Flathead River

1,000 500 0 1,000

Scale In Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES

Site-Wide Below Upper Hydrogeologic Unit Groundwater Sample Locations

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

EHS Support

FIGURE 37

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Recreational Trespasser (ATV Riding) Scenario includes soil samples (0-0.5 ft-bgs) collected within the Central Landfill Area, North-Central Landfill Area, and Western Undeveloped Area.

Recreational Trespasser (Hunting) Scenario - includes soil samples (0-0.5 ft-bgs) collected within the North-Central Landfill Area and Western Undeveloped Area.

Venison uptake exposure scenario for the Recreational Trespasser (Hunting) scenario includes soil samples (0-0.5 fft-bgs) collected from all vegetated areas across the site.

Legend

- Soil Sample Location
- Unvegetated
- ATV Trail
- Possible ATV
- Creek Features
- Site Boundary
- Incremental Sample Data Grid

Human Health Exposure

- 1 - MAIN PLANT
- 2 - NORTH PERCOLATION POND
- 3 - CENTRAL LANDFILLS
- 4 - INDUSTRIAL LANDFILL
- 5 - EASTERN UNDEVELOPED
- 6 - NORTH-CENTRAL UNDEVELOPED AREA
- 7 - WESTERN UNDEVELOPED
- 8 - SOUTH PERCOLATION POND
- 9 - FLATHEAD RIVER
- 9A - BACKWATER SEEP SAMPLING

19.23 Vegetated Acres
4
182.89 Vegetated Acres
Cedar Creek Reservoir Overflow
6
129.55 Vegetated Acres
3
3.22 Vegetated Acres
Cedar Creek
7
357.34 Vegetated Acres
Cedar Creek
147.58 Vegetated Acres
1
5
99.91 Vegetated Acres
8.88 Vegetated Acres
9A
173.57 Vegetated Acres
9
8
49.11 Vegetated Acres
Flathead River

1,000 500 0 1,000
Scale In Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES

Recreational Trespasser (ATV Riding, Hunting) Soil Sample Locations (0 - 0.5 ft-bgs)

COLUMBIA FALLS ALUMINUM CO.
COLUMBIA FALLS, MT

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FIGURE 38

Reviewed By: T. Biksey

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