APPENDIX N

WATER QUALITY TECHNICAL SUPPORT DOCUMENT

N-1 Surface Water Quality Baseline
N-2 Surface Water Quality Modelling Report
N-3 Surface Water Quality Predictive Modeling of Pit Lake Water Quality

Surface Water Quality Modelling Report

Springpole Gold Project
First Mining Gold Corp.

ONS2104

Prepared by:
WSP Canada Inc.

October 2024

Surface Water Quality Modelling Report
Springpole Gold Project

Red Lake District, Northwest Ontario
Project #ONS2104

Prepared for:

First Mining Gold Corp.
Suite 2700, 1188 West Georgia Street
Vancouver, British Columbia, V6E 4A2

Prepared by:

WSP Canada Inc.
6925 Century Avenue, Suite 600
Mississauga, Ontario, L5N 7K2
Canada
T: (905) 567-4444

EXECUTIVE SUMMARY

First Mining Gold Corp. proposes to develop, operate and eventually decommission / close an open pit gold and silver mine and ore process plant with supporting facilities known as the Springpole Gold Project (Project). The Project is located in a remote area of northwestern Ontario, approximately 110 kilometres (km) northeast of the Municipality of Red Lake and 145 km north of the Municipality of Sioux Lookout (Figure 1–1).

An environmental assessment pursuant to the *Canadian Environmental Assessment Act, 2012* (SC 2012, c. 19, s. 52) and the Ontario *Environmental Assessment Act* (RSO 1990, c. E.18) is required to be completed for the Project. This report is one of a series of Technical Support Documents prepared by WSP Canada Inc. on behalf of First Mining Gold Corp. to describe the predicted environmental effects of the Project.

This Surface Water Quality Report has been prepared to support the assessment of potential effects from the construction, operation, and closure phases of the Project on surface water quality. The model was conducted to assess the effects of development of the Project on the surface water quality of Birch Lake, Springpole Lake (north basin and the southeast arm) and small unnamed waterbodies in proximity of the mine site.

Simulations were conducted for construction, operations, active closure and post-closure phases. To support the effects assessment, water quality model results are benchmarked against a consistent set of Water Quality Guidelines for the Protection of Aquatic Life (WQG PAL). WQG PAL are based on rigorous study to specifically safeguard the most sensitive life stages of aquatic species for periods of indefinite exposure. This approach aligns with the evolving regulatory landscape and reflects the commitment to adhere to the most up-to-date standards in safeguarding aquatic ecosystems.

Key results of the surface water quality model are:

- The Project is protective of the receiving environment with While some parameters increase relative to baseline concentrations, no concentrations of water quality parameters being below WQG PAL during all phases.
- The general patterns observed for water quality estimates for most waterbodies can be related to seasonal water balance. and use of a strict mass balance approach
- CORMIX modelling was conducted to characterize mixing of treated effluent discharge to the southeast arm of Springpole Lake indicates that the full hydrodynamic mixing of treated effluent discharge will be achieved by a maximum of 100 m downstream of the discharge point in a worst-case low flow condition (7Q20 low flow).

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1.0 INTRODUCTION

1.1 Background

First Mining Gold Corp. (FMG) proposes to develop, operate and eventually decommission and close an open pit mine and ore process plant with supporting facilities known as the Springpole Gold Project (Project). The Project is located in a remote area of northwestern Ontario, approximately 110 kilometres (km) northeast of the Municipality of Red Lake and 145 km north of the Municipality of Sioux Lookout, shown in Figure 1-1.

An environmental assessment pursuant to the *Canadian Environmental Assessment Act, 2012* (SC 2012, c. 19, s. 52) and the Ontario *Environmental Assessment Act* (RSO 1990, c. E.18) is required to be completed for the Project. This document is part of a series of modelling / assessment reports prepared by WSP Canada Inc. (WSP) on behalf of FMG to describe the changes in environmental conditions.

During the consultation process, Project-specific input from regulatory agencies and Indigenous communities was considered at key milestones of the EA process including baseline studies, alternatives, assessment approach, mitigation and monitoring where appropriate. A comprehensive draft Environment Impact Statement / Environmental Assessment (EIS/EA) document was consulted on over the course of more than 2 years leading up the final submission. An overview of the consultation input that was considered during the effects assessment in relation to this report is summarized in Sections 6.6 to 6.9 of the final EIS/EA. The updated hydrological modelling, presented in this report, includes additional simulations, outputs, and discussion based on the additional field data/information collected since the preparation of the draft EIS/EA.

This report describes surface water quality modelling activities that have been conducted in support of the final EIS/EA. This report supersedes the Surface Water Quality Model Report prepared for the draft EIS/EA (Wood, 2022). This report is accompanied by an updated Surface Water Quality Baseline Report (WSP 2024a), which provides a comprehensive summary of the surface water data on which the model described in this report is based. This report also includes additional analyses and discussion based on feedback provided by government agencies and Indigenous communities.

1.2 Purpose and Objective of this Report

This Surface Water Quality Modelling Report has been prepared to assess the potential effects of the construction, operation, and closure of the Project on surface water quality of the receiving environment. To evaluate these effects of the Project, surface water quality modelling has been prepared to:

- Identify the key pathways of interaction of the Project on surface water quality of the receiving environment;
- Model changes to receiving environment surface water quality using appropriate surface water modelling methods and established data sources; and
- Act as the basis of the effects assessment for surface water quality.

1.3 Project Overview

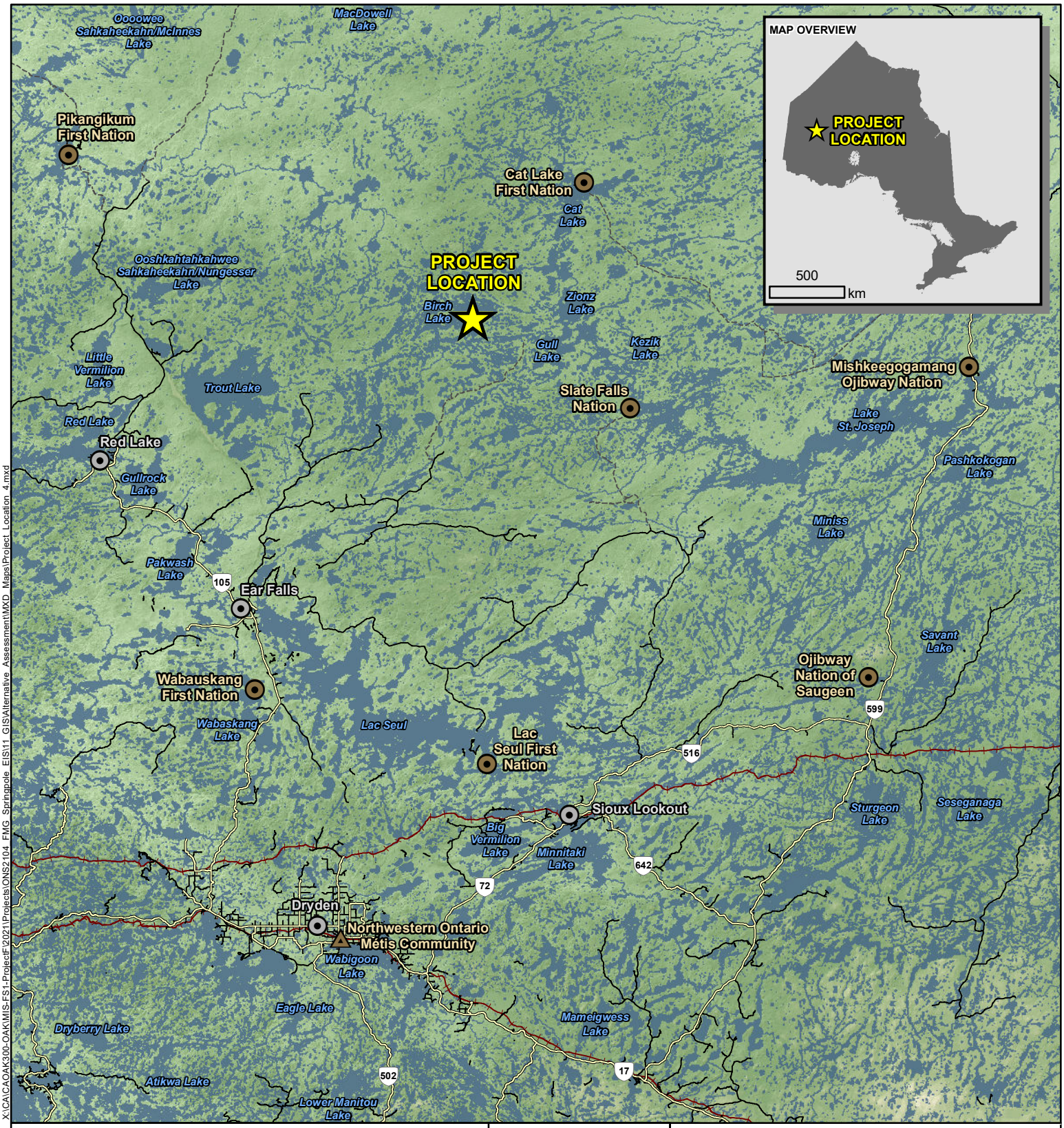
The mine site is situated between two prominent lakes: Birch Lake and Springpole Lake. Springpole Lake is part of the regional Birch Lake watershed and, at a regional scale, Springpole Lake flows through the Birch River (via the southeast arm of Springpole Lake), towards Lake St. Joseph to the south. Figure 1-2 presents the mine site location relative to the regional and subwatershed areas, as well as flow directions through the Birch Lake and Springpole Lake systems.

The Project is proposed to be mined as an open pit. To allow the development and safe operation of the open pit mine, two dikes will be established to facilitate controlled dewatering of the open pit basin. Ore from the open pit will be processed in an onsite process plant at approximately 30,000 tonnes per day (tpd). Tailings resulting from the processing of ore will be stored in a co-disposal facility (CDF).

The main components of the Project include:

- Open pit;
- Dikes (west dike and east dike);
- CDF for mine rock and tailings (north cell and south cell);
- Surficial soil stockpile
- Ore stockpiles;
- Process plant complex;
- Buildings and supporting infrastructure;
- Explosives storage facility;
- Water management and treatment facilities;
- Fish habitat development area;
- Accommodations complex;
- Aggregate and quarry operation(s);
- Transmission line; and
- Mine access road and co-located airstrip.

The construction, operations, active closure - pit filling, active closure, and post closure phases are represented in the surface water quality model. The construction phase refers to Year -3 to -1 of the Project during which dikes will be installed in a section of the north basin of Springpole Lake to isolate the mining area such that after controlled dewatering, open pit mining can occur. The construction phase is followed by the operations phase (or open pit mining phase), which refers to Years 1 to 10 of the Project. The active closure - pit filling phase refers to the beginning of closure once mining has ceased and flooding of the open pit has commenced. The active closure - pit filling phase is concurrent with and followed by the active closure and post closure phases.



LEGEND

- Project Location
- Town
- First Nation Reserve
- Northwestern Ontario Métis Community
- Highway
- Secondary Road
- Resource / Winter Road
- Railway

0 12.5 25 50 75 100 Kilometres

NOTES:
- Topographic information extracted from LIO, MNRF.

Datum: NAD83
Projection: UTM Zone 15N

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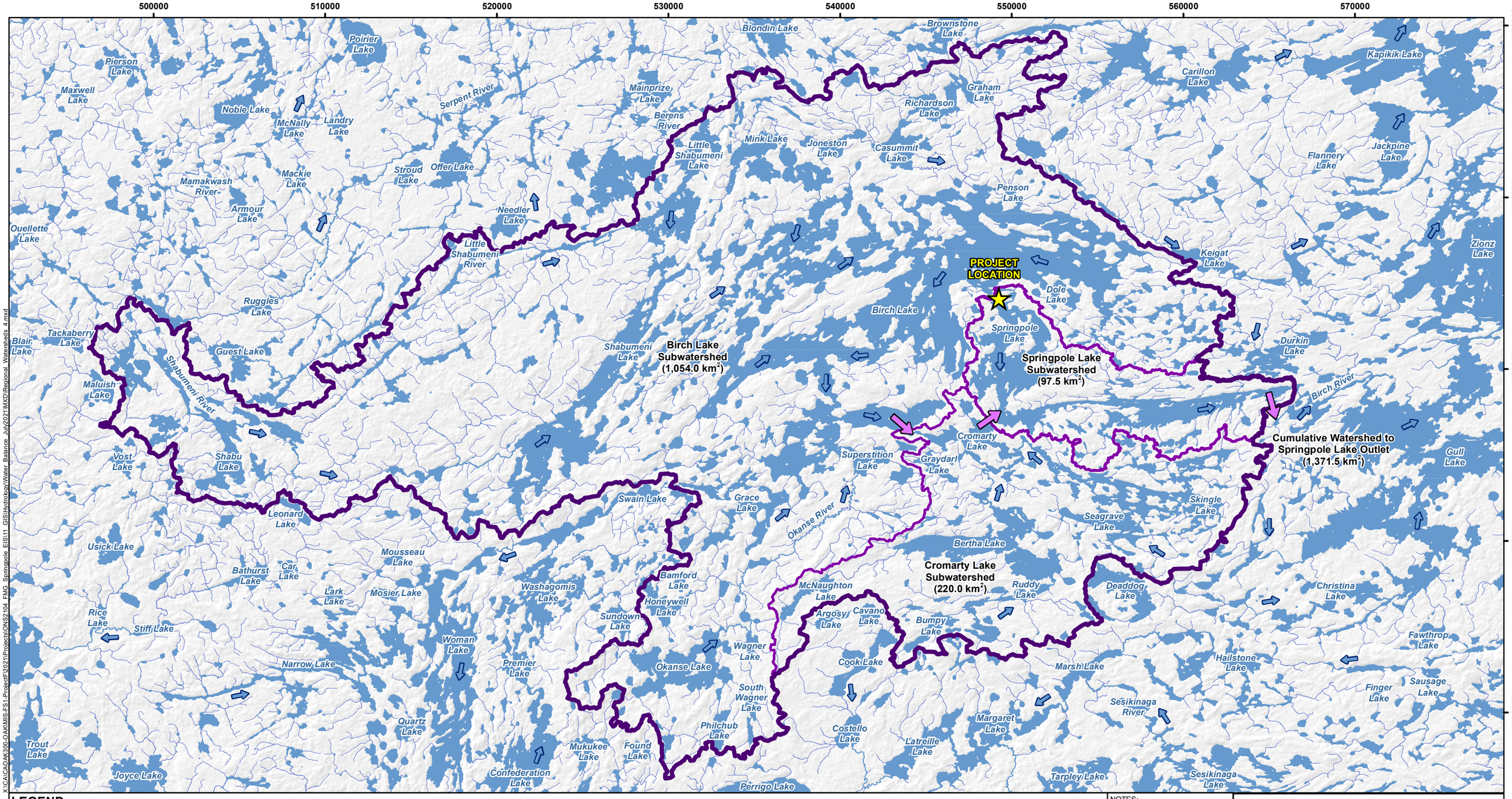
SPRINGPOLE GOLD PROJECT

Project Location

PROJECT N°: ONS2104	**FIGURE: 1-1**
SCALE: 1:1,500,000	DATE: September 2024



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LEGEND

- Project Location
- Cumulative Watershed to Springpole Lake Oulet (1,371.5 km²)
- Subwatershed (Labelled with Name and Local Area)
- Watercourse
- Waterbody
- Flow Direction
- Watershed Outlet Flow Direction

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, MNRF.
- Watershed delineations based on data provided by Aquaspheara, data obtained through the Ontario Flow Assessment Tool (OFAT) and LiDAR provided by First Mining Gold, 2020.

Datum: NAD83
Projection: UTM Zone 15N

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SPRINGPOLE GOLD PROJECT

Regional Watershed Areas

PROJECT N°: ONS2104 | **FIGURE: 1-2**

SCALE: 1:210,000 | DATE: November 2023

2.0 WATER MANAGEMENT OVERVIEW

This section describes the way in which site contact water will be collected, managed and discharged throughout the various phases of the Project, which informs the Surface Water Quality Model.

The layout of the surface water management infrastructure is provided in Figure 2-1 with the resulting sub-watersheds for the Project's ultimate footprint. Water management schematics, illustrating collection and routing of water on site and interactions for each phase of the Project are presented in Figure 2-2 to Figure 2-5.

Surface water management infrastructure such as ditching, berms and pumps are required to convey contact water to water storage facilities for re-use, or for treatment and discharge. All contact water from the Project mine site development area will be captured and managed by the water management system. This includes all haul roads but excludes the access road and treated effluent pipeline corridor.

The primary components and activities of the water management plan for the Project include the following:

- The CDF, which will consist of north and south cells, contained by perimeter embankments and separated by an internal dike, constructed of mine rock:
  - The north cell will contain surplus mine rock, co-disposed with non-acid generating (NAG) thickened tailings.
  - The south cell will contain potentially acid generation (PAG) tailings deposited as a slurry. It will remain saturated throughout operations.
  - Contact water from the north cell will be directed to the south cell through ongoing grading and localized pumping where necessary.
  - Contact water from the perimeter embankments, as well as interflow and seepage through or beneath the dikes will be captured by perimeter ditching and local collection ponds. Contact water collected in these ponds will be pumped back into the CDF.
- Low grade ore stockpile and associated nearby collection ponds (referred to as the low grade ore stockpile ponds for the purposes of the water quality model).
- Stockpile collection ponds to capture contact water from:
  - Fish habitat development area that will be excavated, and material will be used as a source material for site construction.
  - High/mid grade ore stockpile.
  - Surficial soil stockpile.
- Accommodations complex use of fresh water.
- Fresh water intake from Birch Lake.
- Process plant complex, and associated plant site pond.
- Central water storage pond (CWSP). The CWSP will be used as the secondary source of make-up water for the process plant (i.e., if the CDF cannot supply all make-up water demands, make-up water will be sourced from the CWSP). In the event that neither the CDF or CWSP can supply the process plant make-up water demand, supplemental water will be drawn from Birch Lake. Excess water from the Project, not required by the process plant, will be treated and discharged to the southeast arm of Springpole Lake.

- The open pit; water collected in the open pit will be pumped to the CWSP.
- Sewage treatment plant (STP) and effluent treatment plant (ETP) which discharge treated water to the southeast arm of Springpole Lake, approximately 9.3 km downstream the mine site and 3.6 km downstream of the confluence of Cromarty Lake with Springpole Lake (Springpole Lake inflow). The effluent discharge is located in a portion of the lake that has a defined current and provides naturally enhanced effluent mixing / attenuation. The discharge location is shown in Figure 2-1.
- In post-closure, the collection and treatment of site runoff will cease, and runoff will passively drain to either Birch Lake or the north basin, which flow into the southeast arm of Springpole Lake. Once site runoff and pit basin quality will meet acceptable criteria, the operation of the ETP will cease. If site runoff does not meet acceptable criteria for passive discharge, the active closure phase configuration will be maintained until it does. Once in post-closure, the site will begin passive discharge to the environment. Water reporting to the remaining water retention infrastructure (CWSP, flooded open pit) will be passively routed to Springpole Lake. Runoff reporting to the CDF runoff and seepage collection system will route to either Springpole Lake or Birch Lake based on the pre-development catchments. Additionally, in the closure phase, the open pit basin is filled and will be hydraulically reconnected to the north basin once acceptable water quality is achieved. Model results indicate that predicted concentrations of water quality parameters in the southeast arm are similar to baseline conditions and no parameters are predicted to be greater than applicable water quality guidelines.

The Project's water management system will be designed to manage the Environmental Design Flood, defined as a flood event with a 1:100 year return period for infrastructure that will exist throughout operation and closure, without discharge of untreated water to the environment. Additional discussion of water management during the various phase is presented in the Mine Site Water Balance (WSP 2024b)

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5695000

5690000

5685000

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OVERVIEW MAP

Enlarged Area

10 Km

Birch Lake

Fresh Water Intake Location

PROJECT LOCATION

Dole Lake

108 107 104 105 106 103 101 102

L-1 L-19 L-20 L-16

East Dike

West Dike

Springpole Lake (North Basin)

L-10 L-12 L-11 L-13 L-14

Durkin Lake

Birch River

Treated Effluent Discharge Point

Springpole Lake (Southeast Arm)

Birch Lake

Cromarty Lake

Satterly Lake

Seagrave Creek

Birch River

Seagrave Lake

Graydarl Lake

Seagrave Lake

LEGEND

- Project Location
- Fresh Water Intake Location
- Treated Effluent Discharge Point
- Effluent Discharge Pipeline
- Contour (10 m intervals)
- Watercourse
- Waterbody
- Flow Direction
- Watershed Outlet Flow Direction
- Cumulative Watershed to Springpole Lake Oulet
- Pre-developement Springpole Lake Subwatershed
- Project Watersheds (Labelled with ID)
- Dike

0 1 2 4 6 8 10 Kilometres

NOTES:
- Topographic information extracted from LIO, MNRF.
- Watershed delineations based on data provided by Aquaspheara, data obtained through the Ontario Flow Assessment Tool (OFAT) and LiDAR provided by First Mining Gold, 2020.

Datum: NAD83
Projection: UTM Zone 15N

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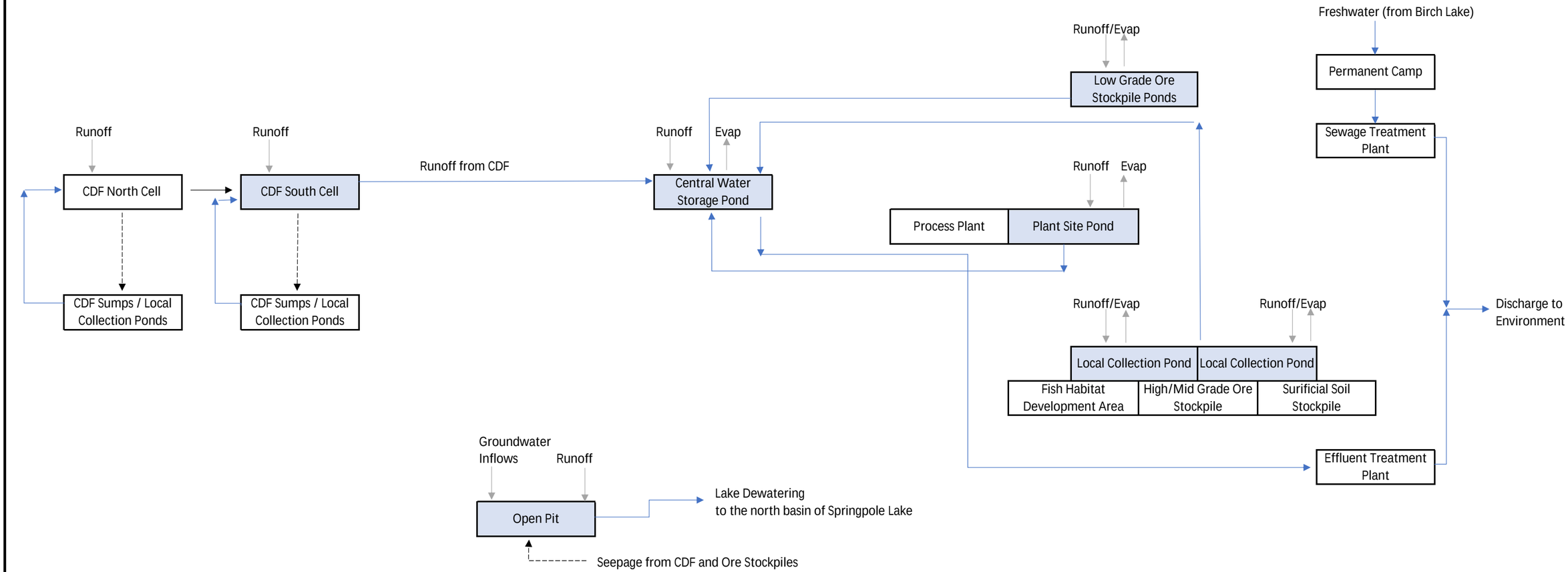
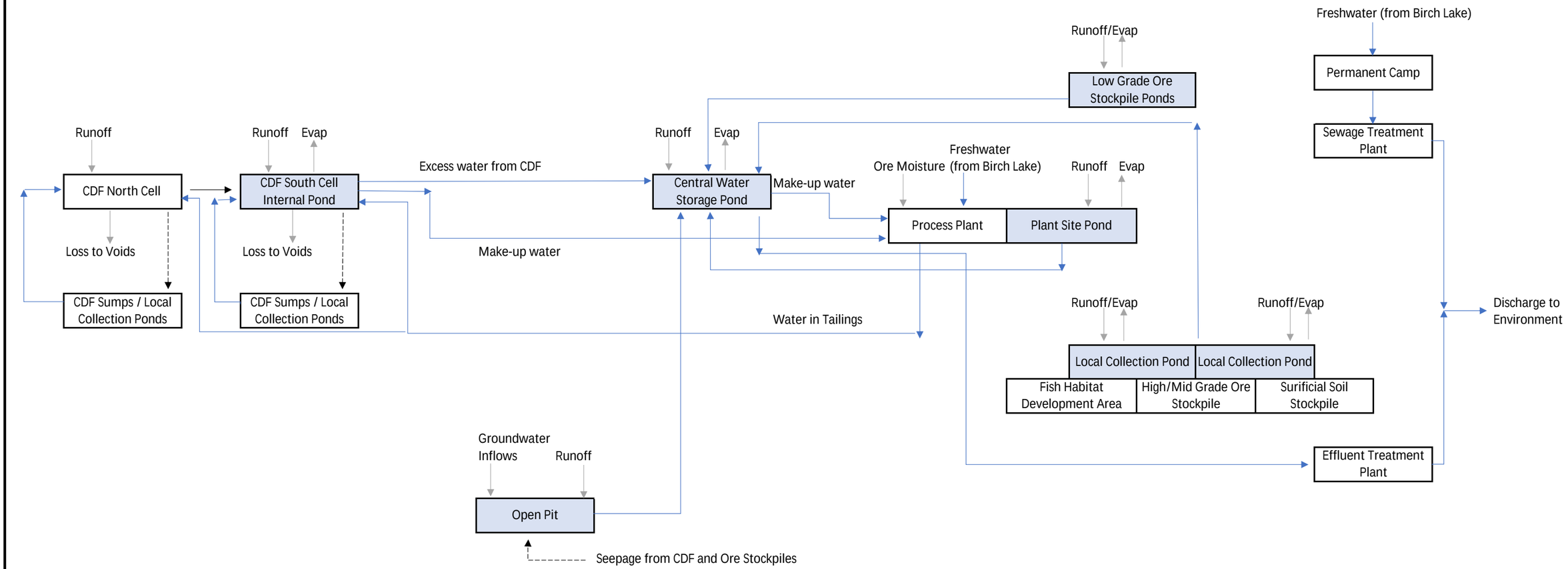
SPRINGPOLE GOLD PROJECT

Site Plan (Footprint) with Discharge Location, Springpole Lake (Southeast Arm)

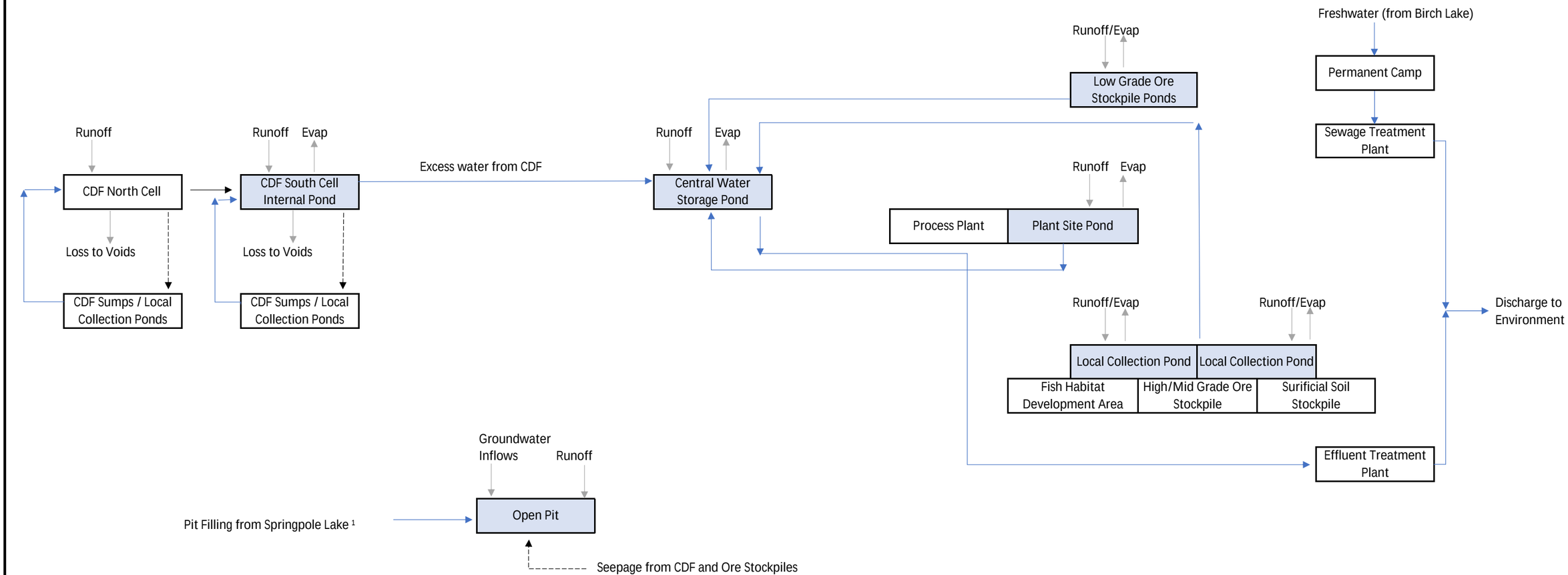
PROJECT N°: ONS2104	**FIGURE: 2-1**
SCALE: 1:70,000	DATE: December 2023



LEGEND: Input/Loss Pumped Flow Gravity Flow Seepage	CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD WSP E&I Canada Limited 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	COMPANY LOGO: wsp	PROJECT TITLE: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: CONSTRUCTION PHASE FLOW SCHEMATIC	DATE: DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 2-1



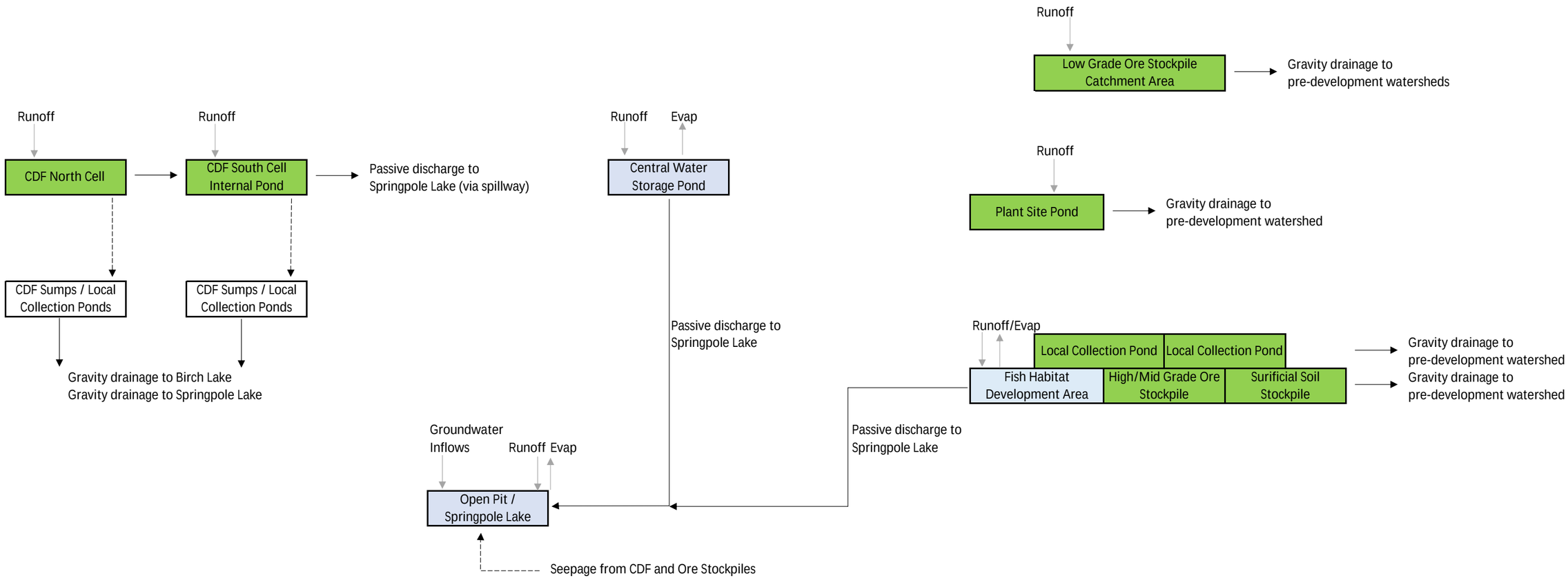
LEGEND: Input/Loss Pumped Flow Gravity Flow Seepage	CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD WSP E&I Canada Limited 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	COMPANY LOGO: wsp	PROJECT TITLE: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: OPERATIONS PHASE FLOW SCHEMATIC	DATE: DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 2-2



Note

1 - Freshwater taking from Springpole Lake may be used to accelerate pit filling; however this was not incorporated into the mine site water balance.

LEGEND: Input/Loss Pumped Flow Gravity Flow Seepage	CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD WSP E&I Canada Limited 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	COMPANY LOGO: WSP	PROJECT TITLE: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: ACTIVE CLOSURE - PIT FILLING PHASE FLOW SCHEMATIC	DATE: DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 2-3



Note

1 - Ore stockpiles will not be present at post closure. However, the associated contact water management ponds will still be present to capture runoff from the ore stockpile catchment.

2 - At post closure, the Springpole Lake dikes will be modified to allow natural flow of water between the reclaimed open pit basin and Springpole Lake.

LEGEND: Input/Loss Pumped Flow Gravity Flow Seepage Closed / Re-vegetated	CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD WSP E&I Canada Limited 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	COMPANY LOGO: wsp	PROJECT TITLE: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: POST CLOSURE PHASE FLOW SCHEMATIC	DATE: DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 2-5

3.0 METHODS

3.1 Data Sources

The surface water quality model has been developed for the receiving environment uses data and results as described in the following Technical Support Documents listed as follows:

Cumulative Surface Water Quality Baseline (WSP 2024a)	• Characterizes existing surface water quality conditions in the Project area, including Springpole Lake and Birch Lake. • The updated baseline water quality report incorporates new data collected as part of the ongoing baseline monitoring programs • Initial condition of the receiving environment is equivalent to 75th percentile baseline concentration for water quality parameters (Table 3-4 through Table 3-6).
Mine Site Water Balance Report (WSP 2024b)	• Predicts the quantity of site discharge to the receiving environment for the effluent treatment plant (ETP) and sewage treatment plant (STP); estimates runoff from the various modelled land uses. • Modelled parameters are flows (cubic metres per second [m^3/s]).
Mine Site Water Quality Estimate for Mine Operations and Closure (WSP 2024c)	• Provides water quality estimates for mine site features, including seepages and ETP influent qualities. The STP discharge constitutes <1% of the combined ETP / STP total discharge flow to the environment; effluent quality is thus assumed equivalent to predicted ETP quality. • Modelled parameters are concentrations (milligrams per litre [mg/L])
Receiver Water Balance Report (WSP 2024d)	• Predicts the changes in flows and flow regime in the receiving environment as a result of Project development, including changes in groundwater-surface water interactions as estimated by hydrogeological modelling (WSP 2024e) • Modelled parameters are flows (m^3/s).
CORMIX Mixing Study - Treated Effluent Discharge (Attachment A of this report)	• An evaluation of effluent mixing in the southeast arm of Springpole Lake was completed using CORMIX, assuming discharge via a multiport diffuser. • Modelled parameters are distance to mixing (m) and effluent strength along the mixing zone (%).

The following sections summarize integration of the studies identified above into the surface water quality model, as well as modelling methods, general inputs and conservative assumptions.

3.2 Model Configuration

3.2.1 Overview

In the surface water quality model, the Project interacts with the receiving environment through five general pathways over the life of the Project:

- Diverted non-contact water
- Contact water and seepage from Project components
- Treated effluent discharge to the receiving environment (southeast arm of Springpole Lake)
- Fugitive dust deposition
- Controlled refilling of the open pit and subsequent re-connection of the open pit basin to the north basin

To evaluate the potential effects of Project activities on the surface water quality, 12 model nodes were strategically placed in areas where effects to water quantity or quality may be observed as a result of the Project (Table 3-1).

3.2.2 Spatial and Temporal Modelling Domain

Surface water quality model nodes are inclusive of waterbodies that could be affected by the Project and are:

- Nodes 1 to 4 are located in inland waterbodies adjacent to the mine site;
- Node 11 is located in the northern end of the north basin, downstream of outflows of L-16 and dikes;
- Node 5 is located at the southern end of the north basin at its connection to the southeast arm;
- Nodes 6, 7, and 8 are located within the Birch Lake system, upstream of its entry into Springpole Lake;
- Effluent Discharge Location: approximately 100 m downstream of the treated effluent discharge location;
- Node 9 corresponds to water quality monitoring station SW-07a, approximately 1 km downstream of the treated effluent discharge location ; and
- Node 10 corresponds to water quality monitoring station SW-22, at the outlet of the Springpole Lake system.

The temporal boundaries of the surface water model are:

- **Construction Phase:** Years -3 to -1, representing the construction period for the Project.
- **Operations Phase:** Years 1 to 10, with the first year potentially representing a partial year as the Project transitions from construction into operations. Mining of the ore from the open pit will end in Year 10, at which time the pit will begin refilling with water.
- **Decommissioning and Closure Phase**:
  - **Active Closure:** Years 11 to 15, when final decommissioning and the majority of active reclamation activities are carried out; and
  - **Post-closure:** Years 16+, corresponding to the post-closure monitoring period and when the filled open pit basin will be reconnected to Springpole Lake.

3.2.3 Mass Balance Calculation

The surface water quality model was developed using a mass-balance in GoldSim to stimulate the volume and flow of water, and the concentrations and transport of chemical species, over the life of the Project. The model accounts for flows and chemical loadings entering and leaving Project components, such as the ETP, as well as chemical loadings entering the surface water receiving environment.

The generalized mass balance equations applied in the model are:

$$C_{A+B\,i} = \frac{(C_{A\,i} \times Q_A + C_{B\,i} \times Q_B)}{(Q_A + Q_B)} \quad \textbf{[Equation 1]}$$

Where:

$\mathbf{C_{Ai}}$ **and** $\mathbf{C_{Bi}}$ are the concentrations of chemical species *i* in waters A and B, respectively; and
$\mathbf{Q_A}$ **and** $\mathbf{Q_B}$ are the flow rates or volumes of water in waters A and B, respectively; $C_{A+B\,i}$ is the concentration of chemical species *i* in the mixed body of waters A and B.

$$\sum (Mass\ Loading\ In)_i - \sum (Mass\ Loading\ out)_i = \Delta C_i \times V \quad \textbf{[Equation 2]}$$

Where:

$\mathbf{\Delta C_i}$ is the change in concentration of chemical species *i* in a body of water; V is the volume of the body of water; and
$\mathbf{\sum (Mass\ Loading\ In)_i}$ **and** $\mathbf{\sum (Mass\ Loading\ out)_i}$ are the sum of masses of chemical species *i* added to, and removed from, the body of water, respectively.

The model simulates the concentration of water quality parameters (mg/L) in site discharge, fugitive seepage and the surface water receiving environment for each assessment node for all Project Phases (Section 3.2.2). Mining and water management activities during each of the above-listed Project phases are discussed in Section 2.0.

3.3 Modelled Parameters and Water Quality Benchmarks

Modelled parameters are listed in Table 3-2 and are:

- Parameters with Provincial Water Quality Objectives (PWQO) and interim PWQO (iPWQO) for the protection of aquatic life
- Nutrients and anions (nitrate, nitrate, ammonia, chloride, sulphate)
- Parameters identified by the Mine Rehabilitation Code of Ontario (O. Reg 35/24)
- Parameters with effluent criteria as per the federal Metal and Diamond Mine Effluent Regulation (MDMER)

Modelled parameters do not include total suspended solids (TSS). The industry-standard water quality models used cannot accurately represent or predict TSS levels due to the complexity of TSS sources and transport mechanisms, that make it difficult to establish consistent relationships between model input parameters and TSS levels. In Ontario, mining operations must adhere to stringent regulatory requirements and environmental standards governing water quality, including TSS levels. Comprehensive water management mitigation strategies for TSS were strategically integrated into the Project's design, providing proactive measures to safeguard water quality and minimize the potential for environmental effects.

To support the effects assessment, model results are benchmarked against a consistent set of Water Quality Guidelines for the Protection of Aquatic Life (WQG PAL) as per the latest guidance from the Ministry of the Environment, Conservation and Parks (MECP). WQG PAL are based on rigorous study to specifically safeguard the most sensitive life stages of aquatic species for periods of indefinite exposure. For parameters with PWQO and interim iPWQO, recent MECP guidance necessitates the utilization of the most up-to-date and scientifically defensible WQG PAL sourced from either the PWQO / iPWQO, Canadian Council of Ministers of the Environment Water Quality Guidelines (CCME), or Federal Water Quality Guidelines (FWQG). This approach ensures alignment with the evolving regulatory landscape and reflects the commitment to

adhere to the most up-to-date standards in safeguarding aquatic ecosystems. Water quality guidelines used to benchmark model results are listed in Table 3-3.

3.4 Data Inputs and Assumptions

Water quality model results are dependent on several inputs, including meteorological conditions, baseline hydrology and surface water quality conditions, outcomes of geochemical test work, and operational schedule and mine development planning. Where uncertainty exists, professional knowledge and experience was used to develop a conservative approach (Section 3.4.1) or a sensitivity analysis was completed (Section 3.5).

The general model assumptions include:

- Predictive modelling is conducted on a monthly time-step;
- For source term derivation, half the reported method detection limit (i.e., 0.5*MDL) was used for source terms if a chemical species was below the detection limit of the applied analytical method which is consistent with available guidance documents regarding data handling (EEM 2015, EPA 190). This half MDL substitution assumes that, on the average, all values between the MDL and zero could be present and that the average value of non-detects could be as high as half the detection limit. Through adherence available guidance documentation in this regard adheres to regulatory standards while promoting consistency in data interpretation and reporting across various stages of the Project life cycle and between provincial and federal jurisdictions relevant to the Project.
- The initial water quality of the receiving environment is equivalent to 75th percentile of baseline concentrations, which is a conservative assumption. A summary of baseline water quality by waterbody is presented in Table 3-4 through Table 3-6.
- Project operational and engineering components turn on and off instantaneously;
- Mixing of Project-related discharges (e.g., seepage, ETP discharge) to the receiving environment does not consider attenuation or dispersion and it is assumed to be instantaneous and complete;
- Precipitation and evaporation are assumed to be neutral inputs and outputs with no associated geochemical loads;
- Along seepage pathways and within the receiving environment, surface water quality parameters behave conservatively and are not reduced by mechanisms such as secondary mineral formation, attenuation through sorption process, or biogeochemical reactions (e.g., assimilation, biodegradation); and

3.4.1 ETP Influent Quality

The ETP influent quality is estimated by the Mine Site Water Quality Model (WSP 2024c) wherein geochemical loadings and contact water qualities of key mine features are estimated for the maximum Project extent. Mine contact waters assumed to report to the ETP from the CWSP and include:

- Runoff from the surficial soil stockpile, exposed lake sediment, and disturbed areas around the open pit are collected by ditching.
- Runoff from the ore stockpile areas including PAG and NAG rock along with natural and disturbed areas is collected by ditching and directed to the CWSP, including runoff from a portion of the ore stockpile within the CWSP catchment area.

- Drainage including seepage and runoff from the north cell, contact water from the NAG mine rock perimeter embankment, and seepage from south cell is collected in a seepage collection ditch around the CDF. The seepage collection ditch reports to the CWSP, and is either pumped back to the process plant as make-up water or pumped to the ETP.
- Open pit dewatering is pumped to the CWSP.
- Runoff from disturbed areas around the plant site area is directed to the process plant pond which also reports to the ETP.

The following influent quality estimates were generated by the Mine Site Water Quality Model (WSP 2024c):

- **Base Case:** representing the expected metal release rates for mine rock and tailings based on currently available kinetic testing results and geochemical information for the Project. This generally included the use of median release rates from ongoing Project humidity cell tests.
- **Conservative Case:** corresponds to the upper geochemistry case, represented by elevated metal release rates for mine rock and tailings based on currently available kinetic testing results and geochemical information for the Project. This generally included the use of 90th percentile and/ or maximum release rates from ongoing Project humidity cell tests (WSP 2024c).

Table 3-7 presents estimated water quality of the ETP influent from the Mine Site Water Quality Model (WSP 2024c).

3.4.2 Treated Effluent Discharge

The southeast arm of Springpole Lake is the proposed receiving environment for the Project and will receive treated effluent discharge from the Project during construction, operations and active closure phases as needed. Final effluent limits for any mine discharge to the southeast arm of Springpole Lake are set during the provincial permitting process. For the purposes of supporting the effects assessment, preliminary effluent limits have been developed in consideration of 7Q20 low flow conditions, in accordance with MECP Policy B-1-5 (MECP, July 2021). The 7Q20 low flow conditions refer to the lowest average streamflow that occurs over seven consecutive days and is expected to happen once every 20 years. Similarly, as per MECP Policy B-1-5, effluent criteria must be established in to achieve WQG PAL in the receiving environment. WQG PAL are based on peer-reviewed scientific study to specifically safeguard the most sensitive life stages of aquatic species for periods of indefinite exposure. Setting effluent limits at levels that achieve WQG PAL in the receiving environment will protect the integrity of water bodies and the health of aquatic life throughout the life of the Project from mine-related effluent.

Additionally, the effluent limits and the ETP will be designed to produce an effluent quality appropriate for discharge to the environment in accordance with applicable federal regulatory requirements, including the *Fisheries Act* and the MDMER. Best available technologies that are economical achievable and experience from other gold mines of similar scale have been considered for the ETP to meet protection requirements.

Water quality modelling studies and effluent criteria will be expanded upon and refined as part of the provincial approvals process. This may include additional accounting for items such as site-specific conditions, community feedback, available water treatment technologies, modifying agents such as water hardness, natural chelating agents such as dissolved organic carbon, receiving water species sensitivities.

To support the surface water quality model, maximum allowable effluent quality was back calculated such that applicable protection of aquatic criteria are achieved in the southeast arm of Springpole Lake.

Calculations were completed using the following equation:

$$C_E = ([C_F \times (F_R + F_E)] - (C_R \times F_R)) \div (F_E) \quad \textbf{[Equation 3]}$$

Where:

- C_E = maximum concentration of final treated effluent (i.e., proposed effluent criteria), calculated;
- F_E = maximum monthly estimated ETP discharge rate (240 L/s);
- F_R = 7Q20 low flow or minimum average monthly flow rate of the southeast arm;
- C_F = final concentration of the southeast arm after mixing (mg/L), which is equivalent to receiving water quality criteria for identified parameters); and
- C_R = initial baseline concentration of the southeast arm (mg/L); equivalent to the 75th percentile baseline data (Table 3-5)

Note, equivalence of the hydrodynamic and regulatory mixing zone is an objective of this assimilation capacity study back-calculation (Equation 3). That is, maximum allowable effluent quality was back-calculated relative to the available assimilation capacity of the southeast arm of Springpole Lake, such that receiving environment guidelines will be achieved at the end of the hydrodynamic mixing zone (see Attachment A). This mixing study will be expanded upon and detailed further as part of the provincial approvals process to determine acceptable discharge limits that will not compromise aquatic life in the receiving waters.

Results of the assimilation study are presented in Table 3-7. Where predicted influent quality (mg/L) greater than maximum allowable effluent quality (grey shaded parameters in Table 3-7), it is assumed in the surface water quality model that these parameters are targeted for treatment at the ETP, such that receiving environment benchmarks (C_F) are achieved in the southeast arm of Springpole Lake.

3.5 Model Cases

To support the effects assessment, water quality was modelled for a conservative expected case (Base Case) using the following inputs:

- **Initial baseline concentration:** The water quality model assumes a 75th percentile baseline concentration for water quality parameters to represent initial conditions.
- **Expected metal release rates**: The water quality model uses the expected metal release rates for mine rock and tailings based on currently available kinetic testing results and geochemical information for the Project. This generally included the use of median release rates from ongoing Project humidity cell tests (WSP 2024g).
- **Water balance model results for average conditions:** The construction, operations and closure phases were modelled under average annual climatic conditions. Monthly snowfall distribution (percent of precipitation that falls as snow) and runoff coefficients were based on Climate Normals and calibrated to observed runoff at a representative nearby streamflow gauge (WSP 2024d).
- **Expected groundwater changes**: The interaction between groundwater and surface water was assessed in the model by analyzing water budgets at surface water features determined through hydrogeological modelling (WSP 2024e). These modelled water budget changes provide a measure of potential changes in groundwater contribution (or losses) to surface water or baseflow of the receiving environment and the associated water balance.

- **Expected seepage rates:** Seepage rates from Project components to surface water were modeled for operation and closure; material seepages from Project components are not expected in advance of mine operation and tailings production. Hydrogeological model results indicate that more than 90% of seepages emanating from the north and south cell of the CDF report to the seepage collection system and then routed to the internal pond of the CDF south cell. The primary receiver of bypass seepage is the open pit, followed by Birch Lake. Expected seepage qualities are presented in Table 3-8.

In addition to the conservative Base Case, the following sensitivity analyses were completed to support the effects assessment for surface water quality:

- **Extreme Wet**: each Project Phase was stimulated under extreme wet climatic conditions (1 in 100 year wet) conditions; all other inputs were as described for base case.
- **Extreme Dry**: includes extreme dry climatic conditions (1 in 100 year dry), all other inputs were as described for base case.
- **Uppercase Seepage**: evaluates water quality impact under theoretically elevated fugitive seepage conditions, wherein increased loading rate from seepage to the receiving environment were assumed; this case represents uppercase or 'worst case' water quality case for the Project. Specifically, upper case seepage quality predictions are represented by elevated metal release rates for mine rock and tailings based on currently available kinetic testing results and geochemical information for the Project. This generally included the use of 90th percentile and/ or maximum release rates from ongoing Project humidity cell tests (WSP 2024g). Uppercase seepage qualities are presented in Table 3-8.

3.6 Use of the Conservative Approach

Conservative approaches are defined as those that provide estimates that will tend to be higher than expected so that potential effects from the Project will not be underestimated. For the surface water quality model those approaches include the following:

- Estimates are based on the principle of mass balance such that water quality parameters behave conservatively and are not further reduced by mechanisms such as secondary mineral formation (such as within the tailings mass), attenuation through sorption process, or biogeochemical reactions (assimilation, biodegradation). This will result in an overestimation for some parameters.
- Mass-balance modelling in the CDF does not include attenuation or loss of mass in the tailings void spaces. This will result in an overestimation for some parameters.
- Mass balance modelling informing the operations is conservatively restricted to the final year of operations (i.e., maximum build-out). In contrast, concentrations of water quality parameters in the CDF, CWSP and open pit dewatering waters are expected to increase over time to these maximum values, coincident with mining of the open pit and expansion of corresponding facilities.
- The potential influence of seepage on surface water is modelled as a strict mass balance and does not account for any attenuation of concentrations along the seepage flow path. This will result in an overestimation for some parameters.
- Initial condition of the receiving environment is equivalent to 75th percentile baseline concentration for water quality parameters

- Estimates for the receiving environment are mass balanced relative to informing monthly flows (e.g., flow from upstream nodes, catchment area inputs, seepage flow, ETP discharges; m^3/s) reporting to each node, wherein nodes within the large lake basins are modelled as flow-through cells in GoldSim. That is, monthly water quality estimates (mg/L) do not consider the additional available dilution or assimilation capacity from the standing volume of water in lake basins. This has resulted in an overestimation of water quality parameters.

The conservative approach outlined above ensures that estimated effects on surface water will not be underestimated.

Table 3-1: Water Quality Model Nodes

Waterbody	Node ID	Summary Description
Birch Lake	Node 6	• Corresponds to baseline surface water quality monitoring station SW-03 • Near-field node, north of the mine site; this model node is estimated to receive seepages from the CDF north cell. Catchment area inflows to node 6 are influenced by mine site development in construction and operations (reduced). Estimated chemistry of node 6 informs downstream nodes via a strict mass balance.
	Node 7	• Corresponds to baseline surface water quality monitoring station SW-24 • Near-field node, west of the CDF; node 7 is estimated to receive seepages from the CDF north cell and south cell. Catchment area inflows to node 06 • SW-24 are influenced by mine site development in construction, operations and closure phase (reduced). Estimated chemistry of SW-24 informs downstream nodes via a strict mass balance.
	Node 8	• Far-field node on Birch Lake, downstream of node 6 and node 7; is estimated to receive seepages from the CDF north cell. Estimated chemistry of node 8 informs downstream nodes in the southeast arm of Springpole Lake via a strict mass balance.
Springpole Lake, North Basin	Node 4	• Represents outlet flows of small unnamed Lake-16 (L-16) to the north basin of Springpole Lake. L-16 is estimated to receive seepages from the CDF north and south cell. Catchment area inflows to L-16 are influenced by mine site development in construction, operations and closure phase (reduced).
	Node 11	• Downstream of the West Dike and outflows of L-16, mid-basin model node.
	Node 5	• Corresponds to baseline surface water quality monitoring station SW-08a • At the southern end of the north basin, downstream of node 4 and upstream of the southeast arm and inflows from Cromarty Lake.
Springpole Lake, Southeast Arm	Effluent Discharge location	• Located at the assumed point of discharge in the southeast arm of Springpole Lake. Water quality estimates at the effluent discharge location will additionally reflect loadings upstream of the southeast arm, at the north basin and Birch Lake via a strict mass balance.
	Node 9	• Far-field node located ~1 km downstream of the point of discharges. Estimates at this node will also reflect loadings upstream at the north basin and Birch Lake via a strict mass balance.
	Node 10	• Downstream of all potential Project influences, at the outlet of Springpole Lake.
Small unnamed waterbodies	Node 3	• Small unnamed waterbody L-20 is proximate to the mine site; estimated to experience drawdown effects during open pit development.
	Node 1 Node 2	• Small unnamed waterbodies are included in the model to inform downstream loadings.

Table 3-2: Modelled Water Quality Parameters

Nutrients and Anions	**Total and Dissolved Metals**	
Sulphate	Aluminum (Al)	Molybdenum (Mo)
Phosphorus	Antimony (Sb)	Nickel (Ni)
Nitrate	Arsenic (As)	Strontium
Nitrite	Beryllium (Be)	Selenium (Se)
Ammonia	Boron (B)	Silver (Ag)
Total Cyanide	Cadmium (Cd)	Strontium
Major Cations	Chromium (Cr)	Uranium (U)
Calcium (Ca)	Cobalt (Co)	Thallium
Magnesium (Mg)	Copper (Cu)	Tungsten
Manganese (Mn)	Iron (Fe)	Vanadium (V)
Potassium (K)	Lead (Pb)	Zinc (Zn)
	Mercury (Hg)	Zirconium (Zr)

Table 3-3: Water Quality Criteria

Water Quality Parameter	Water Quality Guidelines (mg/L) [1]	
	Value	Source
Nitrate-N	3.0	CCME
Nitrite-N	0.06	CCME
Ammonia-N	1.8	CCME
Total Cyanide[2]	0.005	PWQO
Aluminum (Al)	0.83	FEQG
Antimony (Sb)	0.02	PWQO
Arsenic (As)	0.005	iPWQO
Beryllium (Be)	0.011	PWQO
Boron (B)	1.5	CCME
Cadmium (Cd)	0.00053	CCME
Chromium (Cr)	0.0089	CCME
Cobalt (Co)	0.00078	FEQG
Copper (Cu)	0.005	iPWQO
Iron (Fe)	0.3	PWQO
Lead (Pb)	0.009	FEQG
Mercury (Hg)	0.000026	CCME
Molybdenum (Mo)	0.073	CCME
Nickel (Ni)	0.025	PWQO
Phosphorus (P)	0.02	iPWQO
Selenium (Se)	0.1	PWQO
Silver (Ag)	0.00025	CCME
Uranium (U)	0.015	CCME
Vanadium (V)	0.12	FEQG
Zinc (Zn)	0.023	CCME

Notes:

1 Equivalent to water quality guidelines for the protection of aquatic life (long-term exposure). Water quality guidelines represent generic criteria that are inherently conservative as they are developed by governments or international organizations to identify the concentrations of parameters in the receiving environment that are protective of the most sensitive aquatic species for periods of indefinite exposure. As applicable, numerical guideline values summarized here were calculated using the most conservative approach (i.e., 25th percentile Birch Lake baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation).

2 Water quality guidelines in Ontario are for free cyanide in an unfiltered water sample. To support the effects assessment, have conservatively assumed that free cyanide is equivalent to total cyanide concentrations.

PWQO: Provincial Water Quality Objectives.
iPWQO: Interim Provincial Water Quality Objectives.
CCME: Canadian Council of Ministers of the Environment water quality guideline for the Protection of Aquatic Life.
FEQG: Federal Environmental Quality Guideline for the Protection of Aquatic Life.

Table 3-4: Baseline Water Quality, Birch Lake

Parameter	WQG PAL	Count	Minimum	25th	Average	75th	95th
Hardness (as $CaCO_3$)	-	260	25	27.9	32.7	31.1	31.1
pH (unitless)	6.5 to 8.5	260	6.0	7.4	7.5	7.6	7.6
Total Suspended Solids	-	260	0.5	1.5	7.7	1.5	1.5
Total Dissolved Solids	-	260	1.5	37	45	53	53
Acidity (as $CaCO_3$)	-	166	1	1	1.91	2.5	2.5
Alkalinity, Total (as $CaCO_3$)	-	261	15	28	35.1	31.6	31.6
Ammonia, Total (as N)	2.22	260	0.0025	0.0166	0.204	0.15	0.15
Chloride	128	112	0.16	0.25	0.458	0.5	0.5
Chloride	128	112	0.16	0.25	0.458	0.5	0.5
Nitrate-N	3	221	0.01	0.01	0.0444	0.05	0.05
Nitrite-N	0.06	221	0.005	0.005	0.005	0.005	0.005
Nitrate + Nitrite	-	43	0.05	0.05	0.0733	0.05	0.05
Phosphorus, Total	0.02	261	0.001	0.0074	0.0123	0.0128	0.0128
Phosphorus-Dissolved	-	126	0.0015	0.007	0.0148	0.025	0.025
Sulfate	-	205	0.5	1.01	1.22	1.26	1.26
Dissolved Inorganic Carbon	-	120	3.9	5.8	7.95	10	10
Dissolved Organic Carbon	-	193	5.1	8.1	9.77	9.77	9.77
Aluminum (Al)	0.8	260	0.0015	0.0085	0.0155	0.0148	0.0148
Antimony (Sb)	0.02	260	0.00005	0.00005	0.000101	0.00005	0.00005
Arsenic (As)	0.005	253	0.00038	0.00083	0.00105	0.0011	0.0011
Beryllium (Be)	0.011	260	0.00001	0.00001	0.000065	0.00005	0.00005
Cadmium (Cd)	0.0001	259	0.0000025	0.0000025	0.0000121	0.0000051	0.0000051
Cobalt (Co)	0.00078	259	0.00005	0.00005	0.0001	0.00005	0.00005
Copper (Cu)	0.005	253	0.00025	0.00055	0.000716	0.00076	0.00076
Iron (Fe)	1	253	0.005	0.024	0.0642	0.05	0.05
Lead (Pb)	0.009	260	0.000025	0.000025	0.0000776	0.0000565	0.0000565
Mercury (Hg)	0.000026	215	0.0000025	0.0000025	3.55E-06	0.0000025	0.0000025
Moly. (Mo)	0.073	260	0.000025	0.00008	0.000135	0.000155	0.000155
Nickel (Ni)	0.025	260	0.00025	0.00025	0.000374	0.00025	0.00025
Selenium (Se)	0.002	260	0.000025	0.0000768	0.000255	0.000116	0.000116
Silver (Ag)	0.0001	260	0.000005	0.000005	0.0000157	0.000025	0.000025
Thallium (Tl)	0.00025	260	0.000005	0.000005	0.0000124	0.000005	0.000005
Uranium (U)	0.005	253	0.000005	0.000015	0.0000238	0.000021	0.000021
Vanadium (V)	0.006	260	0.00025	0.00025	0.000272	0.00025	0.00025
Zinc (Zn)	0.02	260	0.0015	0.0015	0.00214	0.0025	0.0025
Zirconium (Zr)	0.004	250	0.00003	0.0001	0.000176	0.0001	0.0001

Notes:
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure)
- indicates value is not available
all units are mg/L (unless indicated otherwise)
all results are reported as total concentrations (e.g., total metals), unless indicated otherwise
Results less than the analytical detection limit (DL) were incorporated into summary statistics as half DL (0.5*DL)
- indicates value is not available
Grey shaded values are greater than identified WQG (none)

Table 3-5: Baseline Water Quality, Springpole Lake, North Basin

Parameter	WQG PAL	Count	Minimum	25th	Average	75th	95th
Hardness (as $CaCO_3$)	-	271	23.7	29.4	31	32	35.3
pH	6.5 to 8.5	270	6.4	7.3	7.4	7.6	7.7
Total Suspended Solids	-	271	0.5	1.25	7.62	1.5	50.5
Total Dissolved Solids	-	272	1.5	40	42.5	51	67
Acidity (as $CaCO_3$)	-	162	1	1	2.04	2.7	3.49
Alkalinity, Total (as $CaCO_3$)	-	272	23	29.7	31.2	32	34.9
Ammonia, Total (as N)	2.22	266	0.0025	0.0189	0.411	0.231	2.08
Ammonia, Un-ionized (as N)	0.02	3	0.005	0.005	0.005	0.005	0.005
Chloride	128	116	0.05	0.24	0.385	0.5	0.523
Nitrate (as N)	3	234	0.01	0.01	0.0374	0.05	0.116
Nitrite (as N)	0.06	234	0.005	0.005	0.00513	0.005	0.005
Nitrate + Nitrite	-	47	0.05	0.05	0.0536	0.05	0.085
Phosphorus, Total	0.02	272	0.001	0.00778	0.0136	0.0138	0.0251
Phosphorus, Dissolved	-	132	0.001	0.005	0.0128	0.015	0.025
Sulfate	-	220	1	1.47	1.74	1.89	2.39
Dissolved Inorganic Carbon	-	213	6.4	7.8	8.83	9.06	11.2
Dissolved Organic Carbon	-	266	6.3	7.86	9.15	9.43	15.3
Aluminum (Al)	0.75	272	0.0015	0.008	0.0159	0.016	0.0396
Antimony (Sb)	0.02	272	0.00005	0.00005	0.000111	0.00005	0.00025
Arsenic (As)	0.005	272	0.00033	0.0005	0.000583	0.00059	0.000894
Beryllium (Be)	0.011	272	0.00001	0.00001	0.0000708	0.00005	0.00025
Cadmium (Cd)	0.0001	272	0.0000025	0.0000025	0.0000137	5.93E-06	0.00005
Cobalt (Co)	0.00078	272	0.00005	0.00005	0.0001	0.00005	0.00025
Copper (Cu)	0.005	272	0.00025	0.00067	0.000915	0.00089	0.00145
Iron (Fe)	1	272	0.005	0.024	0.0505	0.05	0.131
Lead (Pb)	0.009	272	0.000025	0.000025	0.0000889	0.0000718	0.00025
Mercury (Hg)	0.000026	224	0.0000025	0.0000025	3.65E-06	0.0000025	6.29E-06
Molybdenum (Mo)	0.073	264	0.000025	0.0000978	0.000156	0.00015	0.00025
Nickel (Ni)	0.025	272	0.00025	0.00025	0.000336	0.00025	0.0005
Selenium (Se)	0.1	272	0.000025	0.00008	0.000285	0.000113	0.001
Silver (Ag)	0.0001	272	0.000005	0.000005	0.0000156	0.000025	0.00005
Thallium (Tl)	0.00025	272	0.000005	0.000005	0.0000105	0.000005	0.000025
Uranium (U)	0.005	272	0.000005	0.000011	0.0000381	0.0000165	0.00005
Vanadium (V)	0.006	272	0.00025	0.00025	0.000277	0.00025	0.0005
Zinc (Zn)	0.02	272	0.0015	0.0015	0.00214	0.0025	0.005
Zirconium (Zr)	0.004	272	0.00003	0.0001	0.000181	0.0001	0.0005

Notes:
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure),
- indicates value is not available
all units are mg/L (unless indicated otherwise)
all results are reported as total concentrations (e.g., total metals), unless indicated otherwise
Results less than the analytical detection limit (DL) were incorporated into summary statistics as half DL (0.5*DL)
- indicates value is not available
Grey shaded values are greater than identified WQG PAL

Table 3-6: Baseline Water Quality, Springpole Lake, Southeast Arm

Parameter	Guideline	Count	Minimum	25th	Average	75th	95th
Hardness (as $CaCO_3$)	-	186	23.9	26	27.7	28.9	31.6
pH (unitless)	6.5 to 8.5	187	6.32	7.3	7.35	7.52	7.63
Total Suspended Solids	-	187	0.25	1	5.87	1.5	45
Total Dissolved Solids	-	187	1.5	38.3	41.8	50	62
Acidity (as $CaCO_3$)	-	88	1	1	2	2.63	3.17
Alkalinity, Total (as $CaCO_3$)	-	187	10.8	25.6	27.4	29.1	31.6
Ammonia, Total (as N)	2.22	182	0.0025	0.0249	0.4	0.345	2.29
Chloride	128	3	0.005	0.005	0.005	0.005	0.005
Chloride	128	91	0.16	0.25	0.402	0.5	0.5
Nitrate-N	3	157	0.01	0.01	0.0332	0.05	0.076
Nitrite-N	0.06	157	0.005	0.005	0.00503	0.005	0.005
Nitrate + Nitrite	-	50	0.05	0.05	0.051	0.05	0.05
Phosphorus, Total	0.02	187	0.001	0.0083	0.0108	0.0123	0.0187
Phosphorus-Dissolved	-	112	0.001	0.00515	0.0108	0.015	0.025
Sulfate	-	141	0.5	1.11	1.3	1.5	1.8
Dissolved Inorganic Carbon	-	112	2.2	5.08	7.17	10.1	11.4
Dissolved Organic Carbon	-	149	5.6	9.3	10.3	10.9	12.5
Aluminum (Al)	0.8	186	0.0083	0.016	0.0248	0.0291	0.0424
Antimony (Sb)	0.02	186	0.00005	0.00005	0.00011	0.00025	0.00025
Arsenic (As)	0.005	186	0.0005	0.0005	0.000684	0.00079	0.00098
Beryllium (Be)	0.011	186	0.00001	0.00001	0.0000912	0.00025	0.00025
Cadmium (Cd)	0.0001	186	0.0000025	0.0000025	0.0000167	0.00005	0.00005
Cobalt (Co)	0.00078	186	0.00005	0.00005	0.0001	0.00025	0.00025
Copper (Cu)	0.005	186	0.00025	0.00061	0.000776	0.0008	0.0014
Iron (Fe)	1	186	0.026	0.05	0.0605	0.062	0.0868
Lead (Pb)	0.009	186	0.000025	0.000025	0.0000999	0.00025	0.00025
Mercury (Hg)	0.000026	136	0.0000025	0.0000025	5.25E-06	0.0000025	0.0000063
Moly. (Mo)	0.073	178	0.000025	0.000086	0.000146	0.00025	0.00025
Nickel (Ni)	0.025	186	0.00025	0.00025	0.000531	0.0005	0.00069
Selenium (Se)	0.1	186	0.00006	0.000082	0.000349	0.001	0.001
Silver (Ag)	0.0001	186	0.000005	0.000005	0.0000193	0.00005	0.00005
Thallium (Tl)	0.00025	186	0.000005	0.000005	0.0000115	0.000025	0.000025
Uranium (U)	0.005	186	0.000005	0.000017	0.0000273	0.00005	0.00005
Vanadium (V)	0.006	186	0.00025	0.00025	0.000272	0.00025	0.00025
Zinc (Zn)	0.02	186	0.0015	0.0015	0.00212	0.0025	0.00365
Zirconium (Zr)	0.004	186	0.00003	0.0001	0.000219	0.0005	0.0005

Notes:
WQG: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure).
- indicates value is not available
all units are mg/L (unless indicated otherwise)
all results are reported as total concentrations (e.g., total metals), unless indicated otherwise
Results less than the analytical detection limit (DL) were incorporated into summary statistics as half DL (0.5*DL)
- indicates value is not available
Grey shaded values are greater than identified WQG (none)

Table 3-7: Baseline Water Quality, Local Inland Waterbodies

Parameter	WQG PAL	Count	Minimum	25th	Average	75th	95th
Hardness (as $CaCO_3$)	-	113	24.9	36.2	48.4	57.7	72.4
pH	6.5 to 8.5	113	6.75	7.46	7.58	7.77	7.89
Total Suspended Solids	-	113	1.5	1.5	19.2	12.7	95
Total Dissolved Solids	-	113	1.5	59	67	89	104
Acidity (as $CaCO_3$)	-	90	1	1	2.47	3	4.84
Alkalinity, Total (as $CaCO_3$)	-	113	20	34.7	45.6	55.9	69
Ammonia, Total (as N)	2.22	111	0.0025	0.0296	0.235	0.232	0.936
Ammonia, Un-ionized (as N)	0.02	1	0.005	0.005	0.005	0.005	0.005
Chloride	128	38	0.11	0.25	0.488	0.56	0.941
Nitrate (as N)	3	101	0.01	0.01	0.0233	0.01	0.092
Nitrite (as N)	0.06	101	0.005	0.005	0.00512	0.005	0.005
Nitrate + Nitrite	-	9	0.05	0.05	0.0556	0.05	0.08
Phosphorus, Total	0.02	113	0.0037	0.0116	0.0188	0.021	0.0403
Phosphorus, Dissolved	-	46	0.001	0.0105	0.0152	0.0225	0.025
Sulfate	-	100	0.15	0.5	1.74	2.6	4.66
Dissolved Inorganic Carbon	-	46	5	7.33	15.6	20.4	23.3
Dissolved Organic Carbon	-	81	2.5	15.8	17.9	20	23.4
Aluminum (Al)	0.75	113	0.0041	0.0133	0.0336	0.0384	0.0792
Antimony (Sb)	0.02	113	0.00005	0.00005	7.35E-05	0.00005	0.00025
Arsenic (As)	0.005	113	0.00035	0.0005	0.000606	0.00068	0.000872
Beryllium (Be)	0.011	113	0.00001	0.00001	4.69E-05	0.00005	0.00025
Cadmium (Cd)	0.0001	113	2.5E-06	2.5E-06	9.32E-06	5.1E-06	0.00005
Cobalt (Co)	0.00078	113	0.00005	0.00005	7.66E-05	0.00005	0.00025
Copper (Cu)	0.005	113	0.00025	0.00025	0.000511	0.00052	0.00111
Iron (Fe)	1	113	0.034	0.065	0.159	0.15	0.497
Lead (Pb)	0.009	113	0.000025	0.000025	8.69E-05	0.000065	0.00025
Mercury (Hg)	0.000026	101	2.5E-06	2.5E-06	3.04E-06	2.5E-06	5.3E-06
Molybdenum (Mo)	0.073	108	0.000025	0.000025	0.000105	0.000178	0.00025
Nickel (Ni)	0.025	113	0.00025	0.00025	0.000283	0.00025	0.0005
Selenium (Se)	0.1	113	0.000025	0.000071	0.000189	0.0001	0.001
Silver (Ag)	0.0001	113	0.000005	0.000005	1.22E-05	0.000005	0.00005
Thallium (Tl)	0.00025	113	0.000005	0.000005	7.6E-06	0.000005	0.000025
Uranium (U)	0.005	113	0.000005	0.000005	1.29E-05	0.000013	0.00005
Vanadium (V)	0.006	113	0.00025	0.00025	0.000257	0.00025	0.00025
Zinc (Zn)	0.02	113	0.0015	0.0015	0.00184	0.0015	0.0034
Zirconium (Zr)	0.004	113	0.00003	0.0001	0.000143	0.0001	0.0005

Notes:
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure),
- indicates value is not available
all units are mg/L (unless indicated otherwise)
all results are reported as total concentrations (e.g., total metals), unless indicated otherwise
Results less than the analytical detection limit (DL) were incorporated into summary statistics as half DL (0.5*DL)
- indicates value is not available
Grey shaded values are greater than identified WQG PAL

Table 3-8: Assimilation Capacity Assessment Results, Treated Effluent Discharge

Parameter	Influent Quality[1]				Calculated Required Maximum Effluent Quality	
	Base Case		Conservative Case			
	Median	Maximum	Median	Maximum	Case 1: Minimum Monthly Average Receiver Flow (5.2 m^3/s)	Case 2: 7Q20 Low Flow (1.25 m^3/s)
pH	~4	~4	~4	~4	6.5 to 8.5, inclusive at all times	
Sulphate	264	310	327	383	2200	1340
Aluminum (Al)	0.6	0.7	0.7	0.8	12	3.6
Antimony (Sb)	0.02	0.02	0.02	0.02	0.34	0.12
Arsenic (As)	0.01	0.02	0.02	0.02	0.085	0.025
Beryllium (Be)	0.0002	0.0002	0.0002	0.0003	0.187	0.066
Boron (B)	0.03	0.04	0.06	0.06	26	9
Cadmium (Cd)	0.0004	0.0005	0.0005	0.0006	0.01	0.003
Chromium (Cr)	0.001	0.001	0.001	0.002	0.2	0.054
Cobalt (Co)	0.03	0.04	0.04	0.04	0.012	0.0035
Copper (Cu)	0.06	0.07	0.06	0.07	0.09	0.025
Iron (Fe)	5.4	6.8	5.5	6.9	5.4	1.5
Lead (Pb)	0.0007	0.0007	0.0008	0.0009	0.18	0.054
Phosphorus (P)	0.03	0.03	0.07	0.07	0.2	0.06
Molybdenum (Mo)	0.001	0.002	0.003	0.004	1.3	0.438
Nickel (Ni)	0.03	0.03	0.03	0.03	0.45	0.15
Selenium (Se)	0.003	0.003	0.004	0.005	0.03	0.01
Silver (Ag)	0.0003	0.0003	0.0003	0.0003	0.0045	0.001
Thallium (Tl)	0.0002	0.0003	0.0003	0.0004	0.017	0.0048
Uranium (U)	0.007	0.008	0.007	0.009	0.3	0.09
Vanadium (V)	0.004	0.004	0.006	0.006	2.7	0.72
Zinc (Zn)	0.04	0.04	0.08	0.08	0.5	0.14
Mercury (Hg)	0.000005	0.000005	0.000006	0.000006	0.0005	0.00014

Notes:

1 Influent quality estimates use CDF contact water result that incorporates Fe and Ca addition, and equilibration in PHREEQC, at CDF-mill process circuit (Appendix K-2)

Grey shaded values are greater than theoretical effluent calculations for 7Q20 low flow conditions

Table 3-9: CDF Seepage Quality Estimates

Parameter	Seepage Quality Operations [1]		Seepage Quality Initial Closure		Seepage Quality Final Closure [2]	
	Base Case	Upper Case	Base Case	Upper Case	Base Case	Upper Case
Sulphate	2200	2200	2200	2200	27	111
Aluminum	0.637	0.82	0.637	0.82	0.58	0.97
Antimony	0.553	0.551	0.553	0.551	0.012	0.021
Arsenic	0.0000236	0.0000507	0.00002	0.00005	0.0121	0.0203
Beryllium	0.0000000174	0.0000000231	0.0000000174	0.0000000231	0.00000768	0.0000221
Boron	0.325	0.354	0.325	0.354	0.035	0.098
Cadmium	0.000109	0.000275	0.000109	0.000275	0.0000277	0.00207
Chromium	0.00432	0.00695	0.00432	0.00695	0.0051	0.0057
Cobalt	0.0569	0.0666	0.0569	0.0666	0.000696	0.0397
Copper	0.000765	0.000811	0.000765	0.000811	0.00264	0.00316
Iron	0.0000479	0.0000444	0.0000479	0.0000444	0.000044	0.00005
Lead	0.000000435	0.000000492	0.000000435	0.000000492	0.00018	0.000162
Mercury	0.000138	0.000149	0.000138	0.000149	0.0000489	0.0000568
Molybdenum	0.03	0.03	0.03	0.03	0.0045	0.071
Nickel	0.00378	0.00418	0.00378	0.00418	0.00295	0.0205
Phosphorus	0.00535	0.013	0.00535	0.013	0.16	0.398
Selenium	0.0358	0.038	0.0358	0.038	0.0012	0.0041
Silver	0.000523	0.000675	0.000523	0.000675	0.00013	0.00056
Thallium	0.00442	0.00472	0.00442	0.00472	0.00016	0.00042
Tungsten	0.03	0.03	0.03	0.03	0.00239	0.00367
Uranium	0.0932	0.0937	0.0932	0.0937	0.0022	0.0028
Vanadium	0.00000272	0.00000474	0.00000272	0.00000474	0.00927	0.00969
Zinc	0.00281	0.00434	0.00281	0.00434	0.0104	0.0435

Notes:
All units are mg/L.
1 Operations seepage predictions represent average and maximum monthly concentrations for Year 10 of mining (maximum extent of mine operations; see Appendix K-2).
2 Final closure represents the future condition where residual pore water has been completely released from the tailings pile, and the only loading sources are the covered tailings and mine rock (see Appendix K-2)

545000 550000 555000 560000 565000

5695000

5690000

5685000

OVERVIEW MAP

Enlarged Area

10 Km

Birch Lake

Node 6

Node 1

L-1

Fresh Water Intake Location

Dole Lake

L-19

Node 2

Node 3

L-20

108 107 104 105 106 103 101 102

East Dike

West Dike

Node 7

L-16

Node 4

Node 11

Springpole Lake (North Basin)

Node 8

Durkin Lake

Effluent Discharge Location

Node 9

Node 5

Springpole Lake (Southeast Arm)

Node 10

Birch River

Birch Lake

Cromarty Lake

Satterly Lake

Seagrave Creek

Birch River

Seagrave Lake

Graydarl Lake

Seagrave Lake

Wenasaga Forestry Road

X:\CA\CAOAK300-OAK\MIS-FS1-Project\F2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\EIS\MXD\Receiver_Water_Balance_Model_Nodes_PostD_1.mxd

LEGEND

- Project Location
- Local Study Area for Surface Water Systems
- Regional Study Area for Surface Water Systems
- Fresh Water Intake Location
- Effluent Discharge Location
- Proposed Mine Feature
- Existing Road
- Contour (10 m intervals)
- Watercourse
- Waterbody
- Flow Direction
- Watershed Outlet Flow Direction
- Model Nodes (Labelled with ID)
- Watershed to Springpole Lake Oulet (Node 10)*
- Subwatershed*
- Project Watersheds (Labelled with ID)
- Dike

Node Watershed Areas
(natural/undisturbed watershed areas, excluding the Project footprint)

ID	Area (km^2)
Node 1	0.3
Node 2	0.5
Node 3	0.3
Node 4	0.4
Node 5	24.9
Node 6	2.8
Node 7	9.1
Node 8	758.3
Node 9	1308.7
Node 10	1361.7

NOTES:
- Topographic information extracted from LIO, MNRF.
- Watershed delineations based on data provided by Aquaspheara, data obtained through the Ontario Flow Assessment Tool (OFAT) and LiDAR provided by First Mining Gold, 2020.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- 230 kV transmission line provided by First Mining Gold, April 2024.
* Natural/undisturbed watershed areas, excluding the Project footprint

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

FIRST MINING GOLD

wsp

SPRINGPOLE GOLD PROJECT

Water Quality Model Nodes

PROJECT N°: ONS2104

FIGURE: 3-1

SCALE: 1:70,000

DATE: October 2024

4.0 MODEL RESULTS

The surface water quality model aimed to evaluate and understand the potential impacts of the proposed Project on concentrations of water quality parameters to ensure that mitigation measures are appropriately designed and implemented. Model results are presented in the following sections by waterbody.

4.1 Birch Lake

Water quality model results for Birch Lake were generated for the following nodes (Figure 3-1):

- Node 06, directly north of the mine site;
- Node 07, directly west of the CDF; and
- Node 08, downstream of all Project influences to Birch Lake, upstream of the southeast arm.

Surface water quality model results for the Base Case are presented in Table 4-1 to Table 4-3 and timeseries graphs are presented in Attachment B. Results of sensitivity cases are presented in Appendices C through E. Surface water quality in Birch Lake was used to inform the downstream surface water quality assessment of the southeast arm (Section 4.3).

During construction, Project interactions with the surface water quality of Birch Lake are largely limited to erosion and sedimentation effects due to soil disturbance; there will be no site runoff or seepage reporting to Birch Lake during construction. Model results indicate that there is little change relative to baseline conditions and results at all assessment nodes on Birch Lake are below WQG PAL for all modeled parameters and less than a 15% change relative to baseline concentrations, for Base Case and model sensitivity cases.

During operation and active closure, model results indicate that changes to surface water quality of Birch Lake are generally driven by:

- Changes to local surface water catchment area because of the development of mine site infrastructure and water management facilities; and
- Bypass seepage.

Water balance modelling (WSP 2024b) indicates seepage reporting to Birch Lake as:

Assessment Node	Seepage – Operation (m^3/day)			Seepage – Post Closure (m^3/day)	
	Low Grade Ore Stockpile	CDF South Cell	CDF North Cell	CDF South Cell	CDF North Cell
Node 06	10	0	5	0	19
Node 07	0	0	50	0	26
Node 08	0	0	28	0	26

In the water balance model (WSP 2024b) seepage represents groundwater flow that emanates from the source zone (CDF or low grade ore stockpile) and discharges directly to Birch Lake, as well as shallow seepage potentially bypassing CDF perimeter collection systems. Geochemical characterization studies for the Project (WSP 2024g) indicate that drainage and bypass seepage from the CDF will be circumneutral to slightly alkaline pH (e.g., pH 7 to 9). The modelled quality of seepage from the CDF is presented in Table 3-8.

During operation, the general patterns for water quality predictions in Birch Lake can be attributed to the seasonal water balance and conservative model assumptions related to the mass balance. The predicted water quality for Node 08 on Birch Lake, downstream of all Project influences, is below (i.e., better than) WQG PAL for all modelled parameters and represents less than a 15% change relative to baseline concentrations for most parameters. In the Upper-case Seepage scenario, while operation water quality estimates increase relative to Base Case, no exceedances of WQG PAL are predicted (Attachment D).

During operation, assessment nodes closer to the mine site (Node 06, Node 07) are below (i.e., better than) WQG PAL for all modelled parameters. Some parameters are estimated to be consistently measurably different relative to baseline concentrations. In Base Case, the greatest increases relative to baseline were generally observed for nitrate-N, sulphate, antimony, cobalt, selenium and uranium concentrations, though concentrations of these parameters remain well below WQG PAL. In the Upper-case Seepage scenario, while operation water quality results increase relative to Base Case, no exceedances of WQG PAL are predicted (Attachment D). Elevated concentrations during operation at Node 06 and Node 07 reflect the conservative nature of the water quality model (Section 3.4.1). Importantly, it was assumed that operation water quality results are equivalent to the final year of operation (maximum build-out), and that there is no delay or attenuation along seepage flow pathways. In contrast, concentrations of water quality parameters in the CDF and seepage are expected to increase over time to these maximum values, coincident with mining of the open pit and expansion of corresponding facilities.

During active closure and post-closure, the general patterns in water quality results in Birch Lake can be attributed to the seasonal water balance and conservative model assumptions related to the mass balance. The Project's water management system will continue to operate in active closure, until runoff from the reclaimed mine site, and excess water from the open pit basin (Section 2.0), is of acceptable quality to report directly to the environment. Runoff from the reclaimed mine site and seepage/contact water from the CDF will report to Birch Lake in post-closure. The predicted water quality for Node 08 within Birch Lake, downstream of all Project influences, is below (i.e., better than) WQG PAL for all modelled parameters and represents less than a 15% change relative to baseline concentrations for most parameters (Table 4-3). Closer to the mine site, Node 06 and Node 07 are below (i.e., better than) WQG PAL for all modelled parameters. Some post-closure parameters were consistently measurably different relative to baseline concentrations (Table 4-1 and Table 4-2). The greatest increases relative to baseline were generally for sulphate, aluminum, antimony, and cobalt. Note, modelled concentrations of these parameters remain well below WQG PAL. In the Upper-case Seepage scenario, while water quality results for operation increase relative to Base Case, there were no exceedances of WQG PAL (Attachment D)

Water quality results for Birch Lake were relatively insensitive to other sensitivity cases specific to climatic conditions (Attachment C). There were no elevated results above WQG PAL.

4.2 Springpole Lake, North Basin

Changes to surface water quality are quantitatively assessed at the following assessment nodes in the north basin (Figure 3-1):

- Node 11, downstream of outflows of L-16 and dikes; and
- Node 05, upstream of the confluence of the north basin with the southeast arm.

Modelling indicates that the Project interacts with the receiving environment through the following general pathways:

- Changes to local surface water catchment area because of temporary dewatering, re-filling, and then subsequent reconnection of the open pit basin;

- Contact runoff and seepage from Project components;
- Diverted non-contact water and freshwater takings to support pit filling; and
- The re-establishment of connection of the open pit basin to the north basin.

There are no surface water takings or discharge of treated effluent to the north basin; treated effluent is discharged to the southeast arm. (Section 6.8 of the final EIS/EA). Surface water quality model results are presented in Table 4-4 and Table 4-5 for Base Case and timeseries graphs are presented in Attachment B. Results of sensitivity cases are presented in Appendices C through E. Model results for surface water quality of the north basin informs estimates at the downstream assessment nodes in the southeast arm (Section 4.3).

During construction, the development of the dikes and associated water management infrastructure at the mine site will temporarily remove approximately 6.3 km^2 of catchment area from the north basin. This accounts for approximately 20% of the existing local catchment area reporting directly to Node 05 or 0.5% of the overall catchment area of Springpole Lake system (WSP 2024b). Once the open pit basin is isolated, the water will be pumped over the dikes back into Springpole Lake, at a rate defined to maintain consistency in lake levels with the natural variability. Controlled dewatering of the open pit basin is expected to take approximately six months to complete, based on continuous (24-hour, 7-day per week) pumping. During construction, there will be no bypass seepages reporting to the north basin. Potential Project interactions are generally restricted to nitrogen loading from blasting, site preparation, and potential dusting effects. Water quality results for the north basin are below (i.e., better than) WQG PAL for all modeled parameters, with less than a 15% change relative to baseline concentrations for all parameters except ammonia, beryllium, and silver.

Changes to surface water quality of the north basin are generally driven by seepage. Water balance modelling conducted for the Project (WSP 2024b) indicates the seepage reporting to the north basin as:

Assessment Node	**Seepage – Operation (m^3/day)**			**Seepage – Post-Closure (m^3/day)**	
	Low Grade Ore Stockpile	**CDF South Cell**	**CDF North Cell**	**CDF South Cell**	**CDF North Cell**
Node 11	0	12	0	24	0
Node 05	0	12	0	24	0
Total	**0**	**24**		**48**	

The above seepage estimates are summarized by Project phase and pathway to the receiver. Bypass seepage represents groundwater flow that emanates from the source zone (CDF or low grade ore stockpile) and discharges directly to the north basin, as well as shallow seepage that potentially bypasses the CDF perimeter collection systems. Geochemical characterization studies for the Project indicate that CDF seepage will be circumneutral to slightly alkaline pH (e.g., pH 7 to 9; Section 6.5 of the final EIS/EA).

During the operations phases, the general patterns in water quality results in the north basin can be attributed to the seasonal water balance and conservative model assumptions related to the mass balance. The modelled water quality for the north basin is below WQG PAL for all modelled parameters and represent less than a 15% change relative to baseline concentrations for most parameters. Some parameters were consistently measurably different relative to baseline concentrations, with concentrations at Node 11 relatively greater than Node 05. The greatest increases relative to baseline were generally observed for sulphate, antimony, cobalt, and uranium concentrations; however, all predicted concentrations of these

parameters remain well below WQG PAL. Elevated concentrations during operation for some parameters in the north basin reflect the highly conservative nature of the water quality model. In particular, it was assumed that water quality results for operation are equivalent to the final year of operation (maximum build-out), and that there is no delay or attenuation along seepage flow pathways. In contrast, concentrations of water quality parameters in the CDF and seepage are expected to increase over time to these maximum values, coincident with mining of the open pit and expansion of corresponding facilities. In the Upper-case Seepage scenario, while operation water quality increase relative to Base Case, no exceedances of WQG PAL are predicted (Attachment D).

During the active closure phase, mining and ore processing will have ceased, the reclamation activities will be occurring, and the Project's water management system will continue to operate. The active closure phases will continue until runoff from the reclaimed mine site, and excess water from the reclaimed open pit basin, is acceptable quality to report directly to the environment. Modelled water quality in active closure phase is similar to operation for most parameters. Water quality results for Node 11 and Node 05 are below (i.e., better than) WQG PAL for all modelled parameters and represent less than a 15% change relative to baseline concentrations for most parameters.

In the post-closure phase, runoff from the reclaimed mine site and seepage/contact water from the CDF reports to the north basin. The modelled water quality of for the north basin is below (i.e., better than) applicable WQG PAL for all modelled parameters. Some parameters were consistently measurably different relative to baseline concentrations in post-closure, largely as a result of the re-connection of the open pit basin and conversative nature of the mass balance model. The greatest increases relative to baseline were generally for sulphate, nitrate, antimony, mercury and molybdenum; however, concentrations of these parameters remain well below WQG PAL. In the Upper-case Seepage scenario, while water quality estimates for operations increase relative to Base Case, no exceedances of WQG PAL are predicted (Attachment D).

Water quality model results for the north basin are not sensitive to other sensitivity cases specific to surface flows and climatic condition (Attachment C). As a result, there were no additional elevated results above WQG PAL.

4.3 Springpole Lake, Southeast arm

The southeast arm is the proposed receiving environment for the Project and will receive treated effluent discharge (combined ETP and STP) during the construction, operation and active closure phase.

Water quality model results for the southeast arm were generated for the following nodes (Figure 3-1).

- Effluent Discharge Location: at the point of full hydrodynamic mixing
- Node 9: corresponds to water quality monitoring station SW-07a, approximately 1 km downstream of treated effluent discharge
- Node 10: corresponds to water quality monitoring station SW-22, at the outlet of Springpole Lake system

The Receiver Water Balance (WSP 2024d) indicates that discharge of treated effluent (combined STP and ETP) to the southeast arm is required through all Project phases, with the exception of in extreme dry climate conditions (1 in 100 year dry) during operations. Expected discharge requirements are conservative, as they do not account for storage, which would allow the site to store water during wetter conditions, in preparation for dry conditions. During operations, the annual effluent treated discharge to the southeast arm is approximately 1.11 million cubic metres (annual average rate: 0.035 cubic metres per second in an average climate year and represents up to 4% of the minimum monthly average flows (March of active

closure), or 16% under low flow 7Q20 conditions. To support the effects assessment, the mixing of treated effluent discharge with flows of the southeast arm was evaluated using CORMIX modeling (Attachment A). CORMIX is a computer program that simulates the mixing behavior of discharged water, such as treated effluent, in rivers, lakes, or oceans. This modeling assists in characterizing how the treated effluent discharge plume spreads and dilutes, ensuring that water quality remains within safe and environmentally compliant levels. The CORMIX model results indicate that complete hydrodynamic mixing is expected to occur within 100 m downstream of the proposed discharge location, which is approximately the width of the channel (Attachment A).

Water quality model results for the assessment nodes along the southeast arm are presented in Table 4-6, through Table 4-8 and timeseries graphs are presented in Attachment B. Results of sensitivity cases are presented in Attachment C and Attachment D. Model results show no exceedances of WQG PAL in the southeast arm in any phase because of the Project.

During the operation and active closure phases, the general patterns observed in the water quality of the southeast arm are influenced by seasonal water balance and treated effluent discharge. Water quality results in the southeast arm remain below WQG PAL for all modeled parameters, with most parameters showing less than a 15% change relative to baseline concentrations. As anticipated, the highest concentrations are at the discharge point, with levels decreasing downstream towards the lake outlet. Due to the conservative nature of the water quality model, which employs a strict mass-balance approach, the decrease in concentrations downstream from the discharge point to Node 9 is solely attributed to additional catchment inflows, without accounting for natural attenuation, sorption, or dispersion, which are conservatively assumed to be negligible. In reality, these processes would be expected to further reduce concentrations of water quality parameters *in situ*.

Some parameters were consistently measurably different relative to baseline concentrations in the southeast arm as a result of discharge of treated effluent. The greatest increases relative to baseline were generally sulphate, antimony, molybdenum, uranium and vanadium concentrations; however, predicted concentrations of these parameters remain well below WQG PAL.

In the post-closure phase, the collection and treatment of site runoff will cease, and runoff will passively drain to either Birch Lake (Section 4.1) or the north basin (Section 4.2), which flow into the southeast arm. Once site runoff and open pit basin water quality will meet acceptable criteria, the operation of the ETP will cease. If site runoff does not meet acceptable criteria for passive discharge, the active closure configuration will be maintained until it does. Once in post-closure, the site will begin passive discharge to the environment. Water reporting to the remaining water retention infrastructure (CWSP, open pit basin) will be passively routed to Springpole Lake. Runoff reporting to the CDF runoff and seepage collection system will route to either Springpole Lake or Birch Lake based on the pre-development catchments. Additionally, in post-closure, the open pit basin will be filled and will be hydraulically reconnected to the north basin once acceptable water quality is achieved. Model results indicate that predicted concentrations of water quality parameters in the southeast arm are similar to baseline conditions and no parameters are predicted to be greater than applicable water quality guidelines.

Water quality model results for the southeast arm are not sensitive to other sensitivity cases specific to surface flows and climatic condition (Attachment C). As a result, there were no additional elevated results above WQG PAL.

4.4 Local Inland Waterbodies

The scope of the surface water quality model for local inland waterbodies is restricted to L-20 (Node 3) because other local inland waterbodies are otherwise offset or compensated for as described in the draft Fish Habitat Offset / Compensation Plan (WSP 2024h).

During mine operations, modelling results indicate that the primary pathway for surface water quality effects on L-20 is fugitive seepage from the CDF which is estimated to report upstream of L-20 to L-19. Modelling results indicate that in operation and closure, the surface water quality of L-20 is indistinguishable from baseline conditions for Base Case (Table 4-9) and all sensitivity cases Attachment C, Attachment D).

Table 4-1: Water Quality Model Results, Node 06

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Existing Condition	January		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	February		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	March		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	April		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	May		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	June		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	July		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	August		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	September		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	October		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	November		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	December		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
Construction	January		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	February		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	March		0.014	0.050	0.0050	0.001	0.009	0.0001	0.0011	0.00005	0.005	0.000002	0.0003	0.00005	0.00068	0.035	0.000025	0.0000025	0.00025	0.00050	0.0010	0.000050	0.000050	0.00005	0.00005	0.0003	0.002
	April		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	May		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	June		0.110	0.010	0.0050	0.001	0.016	0.0001	0.0008	0.00005	0.005	0.000010	0.0002	0.00005	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	July		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	August		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	September		0.023	0.010	0.0050	0.001	0.012	0.0001	0.0010	0.00005	0.005	0.000002	0.0003	0.00005	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	October		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	November		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
	December		0.104	0.010	0.0050	0.001	0.011	0.0001	0.0012	0.00001	0.005	0.000002	0.0002	0.00005	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000050	0.00005	0.00002	0.0003	0.002
Operations	January		0.016	**0.093**	0.0051	**0.001**	0.010	**0.0010**	0.0011	0.00005	0.006	0.000003	0.0003	**0.00014**	0.00068	0.035	0.000025	0.0000027	**0.00030**	0.00051	0.0011	0.000051	0.000032	**0.00010**	**0.00021**	0.0002	0.002
	February		**0.016**	**0.106**	0.0051	**0.001**	**0.010**	**0.0012**	0.0011	0.00005	**0.006**	0.000003	0.0003	**0.00017**	0.00068	0.035	0.000025	0.0000028	**0.00031**	0.00051	0.0011	0.000051	0.000034	**0.00011**	**0.00025**	0.0002	0.002
	March		**0.017**	**0.117**	0.0051	**0.001**	**0.011**	**0.0015**	0.0011	0.00005	**0.006**	0.000003	0.0003	**0.00020**	0.00068	0.035	0.000025	**0.0000029**	**0.00033**	0.00051	0.0011	0.000051	0.000036	**0.00013**	**0.00029**	0.0002	0.002
	April		0.113	**0.087**	0.0052	**0.001**	0.017	**0.0017**	0.0008	0.00005	**0.006**	0.000010	0.0002	**0.00022**	0.00100	0.050	0.000025	**0.0000029**	**0.00019**	0.00051	**0.0002**	**0.000007**	0.000038	**0.00014**	**0.00029**	0.0002	0.002
	May		0.112	**0.062**	0.0051	**0.001**	0.017	**0.0011**	0.0008	0.00005	**0.006**	0.000010	0.0002	**0.00016**	0.00100	0.050	0.000025	0.0000028	**0.00016**	0.00051	**0.0002**	**0.000006**	0.000034	**0.00011**	**0.00020**	0.0002	0.002
	June		0.112	**0.064**	0.0051	**0.001**	0.017	**0.0012**	0.0008	0.00005	**0.006**	0.000010	0.0002	**0.00017**	0.00100	0.050	0.000025	0.0000028	**0.00016**	0.00051	**0.0002**	**0.000006**	0.000034	**0.00011**	**0.00021**	0.0002	0.002
	July		0.025	**0.063**	0.0051	**0.001**	0.013	**0.0012**	0.0010	0.00005	**0.006**	0.000003	0.0003	**0.00016**	0.00065	0.037	0.000025	0.0000028	**0.00017**	0.00026	**0.0002**	**0.000006**	0.000014	**0.00011**	**0.00021**	0.0002	0.002
	August		0.026	**0.083**	0.0052	**0.001**	**0.014**	**0.0016**	0.0010	0.00005	**0.006**	0.000003	0.0003	**0.00021**	0.00065	0.037	0.000025	**0.0000029**	**0.00019**	0.00026	**0.0002**	**0.000006**	0.000017	**0.00013**	**0.00028**	0.0002	0.002
	September		0.026	**0.077**	0.0051	**0.001**	**0.014**	**0.0015**	0.0010	0.00005	**0.006**	0.000003	0.0003	**0.00020**	0.00065	0.037	0.000025	**0.0000028**	**0.00018**	0.00026	**0.0002**	**0.000006**	0.000016	**0.00013**	**0.00026**	0.0002	0.002
	October		0.106	**0.080**	0.0051	**0.001**	**0.013**	**0.0015**	0.0012	0.00001	**0.006**	0.000003	0.0002	**0.00020**	0.00063	0.038	0.000025	**0.0000029**	**0.00017**	0.00026	**0.0002**	**0.000006**	0.000017	**0.00013**	**0.00027**	0.0002	0.002
	November		0.106	**0.078**	0.0051	**0.001**	**0.013**	**0.0015**	0.0012	0.00001	**0.006**	0.000003	0.0002	**0.00020**	0.00063	0.038	0.000025	**0.0000029**	**0.00017**	0.00026	**0.0002**	**0.000006**	0.000017	**0.00013**	**0.00026**	0.0002	0.002
	December		0.105	**0.043**	0.0051	**0.001**	0.012	**0.0008**	0.0012	0.00001	0.005	0.000003	0.0002	**0.00012**	0.00063	0.038	0.000025	0.0000027	**0.00013**	0.00025	**0.0001**	**0.000006**	0.000011	**0.00009**	**0.00014**	0.0002	0.002
Active Closure	January		**0.017**	0.051	0.0050	0.001	**0.011**	**0.0021**	0.0011	0.00005	**0.006**	**0.000003**	0.0003	**0.00026**	0.00068	0.035	0.000025	**0.0000030**	**0.00036**	0.00051	**0.0011**	0.000052	0.000041	**0.00016**	**0.00040**	0.0002	0.002
	February		**0.018**	0.051	0.0050	0.001	**0.012**	**0.0026**	0.0011	0.00005	**0.007**	**0.000003**	0.0003	**0.00032**	0.00068	0.035	0.000025	**0.0000031**	**0.00039**	0.00052	**0.0012**	0.000052	0.000046	**0.00019**	**0.00049**	0.0002	0.002
	March		**0.019**	0.052	0.0050	0.001	**0.012**	**0.0031**	0.0011	0.00005	**0.007**	**0.000003**	0.0003	**0.00037**	0.00068	0.035	0.000025	**0.0000033**	**0.00042**	0.00052	**0.0012**	0.000053	0.000050	**0.00022**	**0.00057**	0.0002	0.002
	April		0.115	**0.012**	0.0050	0.001	**0.020**	**0.0036**	0.0008	0.00005	**0.007**	0.000011	**0.0002**	**0.00041**	0.00100	0.050	0.000025	**0.0000034**	**0.00029**	0.00052	**0.0003**	**0.000008**	0.000053	**0.00024**	**0.00061**	0.0002	0.002
	May		0.113	**0.012**	0.0050	0.001	**0.018**	**0.0025**	0.0008	0.00005	**0.006**	0.000010	0.0002	**0.00030**	0.00100	0.050	0.000025	**0.0000031**	**0.00023**	0.00051	**0.0003**	**0.000007**	0.000044	**0.00018**	**0.00043**	0.0002	0.002
	June		0.113	**0.012**	0.0050	0.001	**0.018**	**0.0026**	0.0008	0.00005	**0.006**	0.000010	0.0002	**0.00031**	0.00100	0.050	0.000025	**0.0000031**	**0.00024**	0.00051	**0.0003**	**0.000007**	0.000045	**0.00019**	**0.00044**	0.0002	0.002
	July		**0.027**	**0.012**	0.0050	0.001	**0.015**	**0.0025**	0.0010	0.00005	**0.006**	**0.000003**	0.0003	**0.00030**	0.00065	0.037	0.000025	**0.0000031**	**0.00024**	0.00027	**0.0003**	**0.000007**	0.000025	**0.00018**	**0.00043**	0.0002	0.002
	August		**0.028**	**0.012**	0.0050	0.001	**0.016**	**0.0034**	0.0010	0.00005	**0.007**	**0.000003**	0.0003	**0.00039**	0.00065	0.037	0.000025	**0.0000033**	**0.00029**	0.00027	**0.0003**	**0.000008**	0.000032	**0.00023**	**0.00058**	0.0002	0.002
	September		**0.028**	**0.012**	0.0050	0.001	**0.015**	**0.0031**	0.0010	0.00005	**0.007**	**0.000003**	0.0003	**0.00037**	0.00065	0.037	0.000025	**0.0000033**	**0.00027**	0.00027	**0.0003**	**0.000008**	0.000030	**0.00022**	**0.00054**	0.0002	0.002
	October		0.108	**0.012**	0.0050	0.001	**0.015**	**0.0033**	0.0012	0.00001	**0.007**	**0.000003**	0.0002	**0.00038**	0.00063	0.038	0.000025	**0.0000033**	**0.00027**	0.00027	**0.0003**	**0.000008**	0.000031	**0.00022**	**0.00056**	0.0002	0.002
	November		0.108	**0.012**	0.0050	0.001	**0.015**	**0.0032**	0.0012	0.00001	**0.007**	**0.000003**	0.0002	**0.00037**	0.00063	0.038	0.000025	**0.0000033**	**0.00026**	0.00027	**0.0003**	**0.000008**	0.000030	**0.00022**	**0.00055**	0.0002	0.002
	December		0.106	0.011	0.0050	0.001	**0.013**	**0.0017**	0.0012	0.00001	**0.006**	**0.000003**	0.0002	**0.00022**	0.00063	0.038	0.000025	**0.0000029**	**0.00018**	0.00026	**0.0002**	**0.000007**	0.000018	**0.00014**	**0.00029**	0.0002	0.002

Table 4-1: Water Quality Model Results, Node 06

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Post Closure	January		**0.119**	**0.090**	0.0056	**0.002**	**0.056**	**0.0010**	**0.0020**	0.00005	**0.008**	**0.000005**	**0.0006**	**0.00011**	**0.00084**	0.031	**0.000039**	**0.0000064**	**0.00059**	**0.00070**	0.0010	0.000055	0.000035	**0.00024**	**0.00023**	**0.0010**	0.002
	February		**0.140**	**0.098**	**0.0058**	**0.002**	**0.065**	**0.0012**	**0.0022**	0.00004	**0.008**	**0.000005**	**0.0007**	**0.00012**	**0.00087**	0.030	**0.000042**	**0.0000072**	**0.00066**	**0.00074**	0.0010	0.000056	0.000038	**0.00028**	**0.00026**	**0.0012**	0.002
	March		**0.158**	**0.105**	**0.0059**	**0.003**	**0.073**	**0.0014**	**0.0023**	0.00004	**0.009**	**0.000006**	**0.0008**	**0.00013**	**0.00090**	0.030	**0.000044**	**0.0000079**	**0.00072**	**0.00078**	0.0010	0.000057	0.000039	**0.00032**	**0.00029**	**0.0013**	0.002
	April		**0.250**	**0.078**	**0.0060**	**0.003**	**0.085**	**0.0015**	**0.0022**	0.00004	**0.009**	**0.000012**	**0.0008**	**0.00013**	**0.00118**	0.041	**0.000046**	**0.0000084**	**0.00065**	**0.00080**	**0.0002**	**0.000021**	0.000041	**0.00034**	**0.00029**	**0.0014**	**0.003**
	May		**0.216**	**0.061**	0.0057	**0.002**	**0.068**	**0.0012**	**0.0018**	0.00004	**0.008**	0.000011	**0.0007**	**0.00011**	0.00113	0.043	**0.000041**	**0.0000070**	**0.00051**	**0.00073**	**0.0002**	**0.000017**	0.000037	**0.00027**	**0.00022**	**0.0011**	0.002
	June		**0.219**	**0.063**	0.0057	**0.002**	**0.070**	**0.0012**	**0.0019**	0.00004	**0.008**	0.000011	**0.0007**	**0.00012**	0.00114	0.043	**0.000041**	**0.0000071**	**0.00053**	**0.00074**	**0.0002**	**0.000017**	0.000037	**0.00028**	**0.00023**	**0.0011**	0.002
	July		**0.143**	**0.062**	0.0057	**0.002**	**0.065**	**0.0012**	**0.0020**	0.00004	**0.008**	**0.000005**	**0.0007**	**0.00011**	**0.00084**	0.033	**0.000041**	**0.0000070**	**0.00052**	**0.00052**	**0.0002**	**0.000017**	0.000020	**0.00027**	**0.00023**	**0.0011**	0.002
	August		**0.175**	**0.075**	**0.0059**	**0.003**	**0.080**	**0.0015**	**0.0023**	0.00004	**0.009**	**0.000006**	**0.0008**	**0.00013**	**0.00089**	0.031	**0.000045**	**0.0000082**	**0.00063**	**0.00059**	**0.0002**	**0.000020**	0.000024	**0.00033**	**0.00028**	**0.0013**	**0.003**
	September		**0.166**	**0.071**	**0.0059**	**0.003**	**0.075**	**0.0014**	**0.0022**	0.00004	**0.009**	**0.000005**	**0.0008**	**0.00013**	**0.00087**	0.032	**0.000044**	**0.0000079**	**0.00060**	**0.00057**	**0.0002**	**0.000019**	0.000023	**0.00032**	**0.00026**	**0.0013**	0.002
	October		**0.236**	**0.073**	**0.0059**	**0.003**	**0.077**	**0.0014**	**0.0024**	0.00001	**0.009**	**0.000006**	**0.0008**	**0.00013**	**0.00086**	0.032	**0.000045**	**0.0000081**	**0.00060**	**0.00058**	**0.0002**	**0.000020**	0.000023	**0.00032**	**0.00027**	**0.0013**	**0.003**
	November		**0.234**	**0.072**	**0.0059**	**0.003**	**0.076**	**0.0014**	**0.0024**	0.00001	**0.009**	**0.000006**	**0.0008**	**0.00013**	**0.00086**	0.032	**0.000044**	**0.0000080**	**0.00060**	**0.00057**	**0.0002**	**0.000020**	0.000023	**0.00032**	**0.00027**	**0.0013**	0.002
	December		**0.180**	**0.047**	0.0055	**0.002**	**0.049**	**0.0009**	**0.0019**	0.00001	**0.007**	**0.000004**	**0.0005**	**0.00010**	**0.00076**	0.034	**0.000036**	**0.0000057**	**0.00039**	**0.00044**	**0.0002**	**0.000014**	0.000016	**0.00021**	**0.00016**	**0.0009**	0.002

Notes:
All units are mg/L.
Water quality model results presented in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Appendix N-2.
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Birch Lake, these data were as follows:

	25th	75th
pH	7.4	7.6
Hardness (mg/L)	28	
DOC (mg/L)	8.1	
Chloride (mg/L)	0.25	
Alkalinity (mg/L)	28	

Only model results for parameters with WQG PAL are summarized here; results for all modelled parameters are presented in Appendix N-2.
Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (15% or greater change relative to baseline conditions).

Table 4-2: Water Quality Model Results, Node 07

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.02	0.005	0.83	0.020	0.005	0.011	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.0300	0.005	0.12	0.011
Existing Condition	January		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	February		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	March		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	April		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	May		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	June		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	July		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	August		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	September		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	October		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	November		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	December		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
Construction	January		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	February		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	March		0.014	0.048	0.005	0.001	0.006	0.0001	0.0012	0.000050	0.005	0.000003	0.0002	0.00005	0.0008	0.016	0.000025	0.0000025	0.00017	0.00025	0.0001	0.000025	0.00001	0.0001	0.00002	0.0003	0.002
	April		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	May		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	June		0.051	0.010	0.005	0.001	0.011	0.0001	0.0009	0.000050	0.005	0.000003	0.0002	0.00005	0.0005	0.036	0.000025	0.0000025	0.00025	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	July		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	August		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	September		0.130	0.010	0.005	0.001	0.011	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0007	0.027	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	October		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	November		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
	December		0.120	0.010	0.005	0.001	0.012	0.0001	0.0010	0.000050	0.005	0.000003	0.0002	0.00005	0.0006	0.055	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.00001	0.0001	0.00002	0.0003	0.002
Operations	January		0.019	0.171	0.005	0.002	0.009	0.0027	0.0012	0.000050	0.007	0.000003	0.0002	0.00032	0.0008	0.016	0.000025	0.0000031	0.00032	0.00027	0.0003	0.000027	0.00003	0.0002	0.00046	0.0002	0.002
	February		0.020	0.202	0.005	0.002	0.010	0.0033	0.0012	0.000050	0.007	0.000003	0.0002	0.00039	0.0008	0.016	0.000025	0.0000033	0.00035	0.00027	0.0003	0.000028	0.00003	0.0002	0.00057	0.0002	0.002
	March		0.021	0.230	0.005	0.002	0.011	0.0039	0.0012	0.000050	0.007	0.000003	0.0002	0.00045	0.0008	0.016	0.000025	0.0000035	0.00038	0.00027	0.0004	0.000028	0.00004	0.0003	0.00068	0.0002	0.002
	April		0.058	0.217	0.005	0.002	0.016	0.0045	0.0009	0.000050	0.008	0.000003	0.0002	0.00050	0.0005	0.036	0.000025	0.0000036	0.00049	0.00028	0.0004	0.000009	0.00004	0.0003	0.00077	0.0002	0.002
	May		0.056	0.154	0.005	0.002	0.014	0.0031	0.0009	0.000050	0.007	0.000003	0.0002	0.00036	0.0005	0.036	0.000025	0.0000032	0.00041	0.00027	0.0003	0.000008	0.00003	0.0002	0.00054	0.0002	0.002
	June		0.056	0.160	0.005	0.002	0.014	0.0032	0.0009	0.000050	0.007	0.000003	0.0002	0.00038	0.0005	0.036	0.000025	0.0000033	0.00042	0.00027	0.0003	0.000008	0.00003	0.0002	0.00056	0.0002	0.002
	July		0.135	0.156	0.005	0.002	0.014	0.0032	0.0010	0.000030	0.007	0.000003	0.0002	0.00037	0.0007	0.027	0.000025	0.0000033	0.00027	0.00027	0.0003	0.000008	0.00003	0.0002	0.00054	0.0002	0.002
	August		0.137	0.207	0.005	0.002	0.016	0.0043	0.0010	0.000030	0.007	0.000003	0.0002	0.00048	0.0007	0.027	0.000025	0.0000035	0.00033	0.00028	0.0004	0.000009	0.00004	0.0003	0.00073	0.0002	0.002
	September		0.136	0.192	0.005	0.002	0.015	0.0039	0.0010	0.000030	0.007	0.000003	0.0002	0.00045	0.0007	0.027	0.000025	0.0000034	0.00031	0.00027	0.0003	0.000009	0.00004	0.0003	0.00067	0.0002	0.002
	October		0.126	0.199	0.005	0.002	0.017	0.0041	0.0010	0.000010	0.007	0.000003	0.0002	0.00046	0.0006	0.055	0.000025	0.0000035	0.00031	0.00028	0.0003	0.000009	0.00004	0.0003	0.00070	0.0002	0.002
	November		0.126	0.195	0.005	0.002	0.017	0.0040	0.0010	0.000010	0.007	0.000003	0.0002	0.00046	0.0006	0.055	0.000025	0.0000035	0.00030	0.00028	0.0003	0.000009	0.00004	0.0003	0.00068	0.0002	0.002
	December		0.123	0.106	0.005	0.002	0.015	0.0021	0.0010	0.000010	0.006	0.000003	0.0002	0.00026	0.0006	0.055	0.000025	0.0000030	0.00020	0.00026	0.0002	0.000007	0.00002	0.0002	0.00036	0.0002	0.002
Active Closure	January		0.017	0.049	0.005	0.001	0.009	0.0020	0.0012	0.000050	0.006	0.000003	0.0002	0.00025	0.0008	0.016	0.000025	0.0000030	0.00028	0.00026	0.0002	0.000027	0.00002	0.0002	0.00036	0.0002	0.002
	February		0.018	0.049	0.005	0.001	0.009	0.0025	0.0012	0.000050	0.006	0.000003	0.0002	0.00031	0.0008	0.016	0.000025	0.0000031	0.00031	0.00027	0.0003	0.000027	0.00002	0.0002	0.00044	0.0002	0.002
	March		0.019	0.050	0.005	0.001	0.010	0.0030	0.0012	0.000050	0.007	0.000003	0.0002	0.00035	0.0008	0.016	0.000025	0.0000032	0.00033	0.00027	0.0003	0.000028	0.00003	0.0002	0.00052	0.0002	0.002
	April		0.056	0.012	0.005	0.001	0.015	0.0034	0.0009	0.000050	0.007	0.000003	0.0002	0.00039	0.0005	0.036	0.000025	0.0000033	0.00043	0.00027	0.0003	0.000008	0.00003	0.0002	0.00059	0.0002	0.002
	May		0.054	0.011	0.005	0.001	0.013	0.0024	0.0009	0.000050	0.006	0.000003	0.0002	0.00029	0.0005	0.036	0.000025	0.0000031	0.00038	0.00026	0.0002	0.000007	0.00002	0.0002	0.00042	0.0002	0.002
	June		0.054	0.012	0.005	0.001	0.013	0.0025	0.0009	0.000050	0.006	0.000003	0.0002	0.00030	0.0005	0.036	0.000025	0.0000031	0.00038	0.00027	0.0002	0.000007	0.00002	0.0002	0.00043	0.0002	0.002
	July		0.133	0.012	0.005	0.001	0.014	0.0024	0.0010	0.000030	0.006	0.000003	0.0002	0.00029	0.0007	0.027	0.000025	0.0000031	0.00023	0.00027	0.0002	0.000007	0.00002	0.0002	0.00042	0.0002	0.002
	August		0.134	0.012	0.005	0.001	0.014	0.0032	0.0010	0.000030	0.007	0.000003	0.0002	0.00038	0.0007	0.027	0.000025	0.0000033	0.00027	0.00027	0.0003	0.000008	0.00003	0.0002	0.00056	0.0002	0.002
	September		0.134	0.012	0.005	0.001	0.014	0.0030	0.0010	0.000030	0.007	0.000003	0.0002	0.00035	0.0007	0.027	0.000025	0.0000032	0.00026	0.00027	0.0003	0.000008	0.00003	0.0002	0.00051	0.0002	0.002
	October		0.124	0.012	0.005	0.001	0.016	0.0031	0.0010	0.000010	0.007	0.000003	0.0002	0.00037	0.0006	0.055	0.000025	0.0000033	0.00026	0.00027	0.0003	0.000008	0.00003	0.0002	0.00054	0.0002	0.002
	November		0.124	0.012	0.005	0.001	0.016	0.0031	0.0010	0.000010	0.007	0.000003	0.0002	0.00036	0.0006	0.055	0.000025	0.0000032	0.00025	0.00027	0.0003	0.000008	0.00003	0.0002	0.00052	0.0002	0.002
	December		0.122	0.011	0.005	0.001	0.014	0.0016	0.0010	0.000010	0.006	0.000003	0.0002	0.00021	0.0006	0.055	0.000025	0.0000029	0.00018	0.00026	0.0002	0.000006	0.00002	0.0001	0.00028	0.0002	0.002

Table 4-2: Water Quality Model Results, Node 07

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.02	0.005	0.83	0.020	0.005	0.011	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.0300	0.005	0.12	0.011
Post Closure	January		**0.053**	**0.063**	0.005	0.001	**0.024**	**0.0004**	**0.0015**	0.000048	**0.006**	0.000003	**0.0003**	**0.00007**	0.0008	0.015	**0.000030**	**0.0000040**	**0.00031**	**0.00034**	**0.0001**	0.000028	0.00001	0.0001	**0.00009**	**0.0005**	**0.002**
	February		**0.062**	**0.066**	0.005	0.001	**0.028**	**0.0005**	**0.0016**	0.000048	**0.006**	**0.000004**	**0.0004**	**0.00008**	0.0008	0.015	**0.000031**	**0.0000043**	**0.00034**	**0.00036**	**0.0001**	0.000029	0.00001	0.0001	**0.00010**	**0.0006**	**0.002**
	March		**0.070**	**0.069**	0.005	0.001	**0.032**	**0.0006**	**0.0016**	0.000047	**0.006**	**0.000004**	**0.0004**	**0.00008**	0.0008	0.015	**0.000032**	**0.0000046**	**0.00036**	**0.00038**	**0.0002**	**0.000029**	0.00001	**0.0002**	**0.00012**	**0.0007**	**0.002**
	April		**0.111**	**0.037**	0.005	0.001	**0.039**	**0.0006**	**0.0014**	0.000047	**0.007**	**0.000004**	**0.0004**	**0.00008**	**0.0006**	0.034	**0.000033**	**0.0000049**	**0.00046**	**0.00039**	**0.0001**	**0.000011**	0.00001	**0.0002**	**0.00013**	**0.0007**	**0.002**
	May		**0.094**	**0.029**	0.005	0.001	**0.031**	**0.0005**	**0.0013**	0.000048	**0.006**	0.000003	**0.0004**	**0.00007**	**0.0006**	0.034	**0.000031**	**0.0000042**	**0.00040**	**0.00035**	**0.0001**	**0.000010**	0.00001	0.0001	**0.00010**	**0.0006**	**0.002**
	June		**0.095**	**0.030**	0.005	0.001	**0.031**	**0.0005**	**0.0013**	0.000048	**0.006**	**0.000003**	**0.0004**	**0.00007**	**0.0006**	0.034	**0.000031**	**0.0000043**	**0.00040**	**0.00035**	**0.0001**	**0.000010**	0.00001	0.0001	**0.00010**	**0.0006**	**0.002**
	July		**0.169**	**0.029**	0.005	0.001	**0.031**	**0.0005**	**0.0014**	0.000029	**0.006**	**0.000003**	**0.0004**	**0.00007**	0.0007	0.026	**0.000031**	**0.0000042**	**0.00026**	**0.00035**	**0.0001**	**0.000010**	0.00001	0.0001	**0.00010**	**0.0006**	**0.002**
	August		**0.182**	**0.036**	0.005	0.001	**0.038**	**0.0006**	**0.0015**	0.000029	**0.007**	**0.000004**	**0.0004**	**0.00008**	0.0008	0.026	**0.000033**	**0.0000048**	**0.00031**	**0.00038**	**0.0001**	**0.000011**	0.00001	**0.0002**	**0.00012**	**0.0007**	**0.002**
	September		**0.178**	**0.034**	0.005	0.001	**0.036**	**0.0006**	**0.0015**	0.000029	**0.006**	**0.000004**	**0.0004**	**0.00008**	0.0008	0.026	**0.000032**	**0.0000046**	**0.00030**	**0.00037**	**0.0001**	**0.000011**	0.00001	**0.0002**	**0.00011**	**0.0007**	**0.002**
	October		**0.171**	**0.035**	0.005	0.001	**0.038**	**0.0006**	**0.0015**	0.000010	**0.006**	**0.000004**	**0.0004**	**0.00008**	0.0007	0.051	**0.000033**	**0.0000047**	**0.00029**	**0.00038**	**0.0001**	**0.000011**	0.00001	**0.0002**	**0.00012**	**0.0007**	**0.002**
	November		**0.170**	**0.034**	0.005	0.001	**0.038**	**0.0006**	**0.0015**	0.000010	**0.006**	**0.000004**	**0.0004**	**0.00008**	0.0007	0.051	**0.000033**	**0.0000046**	**0.00029**	**0.00038**	**0.0001**	**0.000011**	0.00001	**0.0002**	**0.00012**	**0.0007**	**0.002**
	December		**0.147**	**0.023**	0.005	0.001	**0.026**	**0.0003**	**0.0013**	0.000010	**0.006**	0.000003	**0.0003**	**0.00007**	0.0007	0.053	**0.000029**	**0.0000037**	**0.00020**	**0.00032**	**0.0001**	**0.000008**	0.00001	0.0001	**0.00007**	**0.0005**	0.002

Notes:
All units are mg/L.
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Appendix N-2.
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Birch Lake, these data were as follows:

	25th	75th
pH	7.4	7.6
Hardness (mg/L)	28	
DOC (mg/L)	8.1	
Chloride (mg/L)	0.25	
Alkalinity (mg/L)	28	

Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (15% or greater change relative to baseline conditions).

Table 4-3: Water Quality Model Results, Node 08

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.005	0.83	0.020	0.005	0.011	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Existing Condition	January		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00038	0.0005	0.000038	0.000015	0.00005	0.00005	0.0003	0.002
	February		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00038	0.0005	0.000038	0.000015	0.00005	0.00005	0.0003	0.002
	March		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00038	0.0005	0.000038	0.000015	0.00005	0.00005	0.0003	0.002
	April		0.110	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	May		0.110	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	June		0.110	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00100	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	July		0.023	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0003	0.000050	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	August		0.023	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0003	0.000050	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	September		0.023	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0003	0.000050	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	October		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	November		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	December		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
Construction	January		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00037	0.0005	0.000037	0.000015	0.00005	0.00005	0.0003	0.002
	February		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00037	0.0005	0.000037	0.000015	0.00005	0.00005	0.0003	0.002
	March		0.023	0.050	0.005	0.001	0.009	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000050	0.00075	0.034	0.000025	0.0000025	0.00018	0.00037	0.0005	0.000037	0.000015	0.00005	0.00005	0.0003	0.002
	April		0.109	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00099	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	May		0.109	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00099	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	June		0.109	0.010	0.005	0.001	0.016	0.00010	0.001	0.00005	0.005	0.000010	0.0002	0.000050	0.00099	0.050	0.000025	0.0000025	0.00010	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	July		0.024	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0002	0.000050	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	August		0.024	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0002	0.000050	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	September		0.024	0.010	0.005	0.001	0.012	0.00010	0.001	0.00005	0.005	0.000002	0.0002	0.000050	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	October		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	November		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	December		0.104	0.010	0.005	0.001	0.011	0.00010	0.001	0.00001	0.005	0.000002	0.0002	0.000050	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
Operations	January		0.023	0.053	0.005	0.001	0.010	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000057	0.00076	0.035	0.000025	0.0000025	0.00019	0.00038	0.0005	0.000037	0.000015	0.00005	**0.00006**	0.0003	0.002
	February		0.023	0.053	0.005	0.001	0.010	**0.00012**	0.001	0.00005	0.005	0.000004	0.0002	**0.000058**	0.00076	0.035	0.000025	0.0000025	0.00019	0.00038	0.0005	0.000037	0.000015	0.00005	**0.00006**	0.0003	0.002
	March		0.023	0.054	0.005	0.001	0.010	**0.00013**	0.001	0.00005	0.005	0.000004	0.0002	**0.000060**	0.00076	0.035	0.000025	0.0000025	0.00019	0.00038	0.0005	0.000037	0.000016	0.00005	**0.00006**	0.0003	0.002
	April		0.109	**0.015**	0.005	0.001	0.016	**0.00014**	0.001	0.00005	0.005	0.000010	0.0002	**0.000061**	0.00100	0.051	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0003	0.002
	May		0.109	**0.013**	0.005	0.001	0.016	0.00011	0.001	0.00005	0.005	0.000010	0.0002	**0.000058**	0.00100	0.051	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0003	0.002
	June		0.109	**0.013**	0.005	0.001	0.016	0.00011	0.001	0.00005	0.005	0.000010	0.0002	**0.000058**	0.00100	0.051	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0003	0.002
	July		0.025	**0.013**	0.005	0.001	0.012	0.00011	0.001	0.00005	0.005	0.000003	0.0002	**0.000058**	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	**0.00003**	0.0003	0.002
	August		0.025	**0.014**	0.005	0.001	0.012	**0.00013**	0.001	0.00005	0.005	0.000003	0.0002	**0.000061**	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0003	0.002
	September		0.025	**0.014**	0.005	0.001	0.012	**0.00013**	0.001	0.00005	0.005	0.000003	0.0002	**0.000060**	0.00065	0.038	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0003	0.002
	October		0.104	**0.014**	0.005	0.001	0.011	**0.00013**	0.001	0.00001	0.005	0.000003	0.0002	**0.000060**	0.00063	0.039	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0003	0.002
	November		0.104	**0.014**	0.005	0.001	0.011	**0.00013**	0.001	0.00001	0.005	0.000003	0.0002	**0.000060**	0.00063	0.039	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0003	0.002
	December		0.104	**0.012**	0.005	0.001	0.011	0.00009	0.001	0.00001	0.005	0.000003	0.0002	0.000055	0.00063	0.039	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	**0.00003**	0.0003	0.002

Table 4-3: Water Quality Model Results, Node 08

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.005	0.83	0.020	0.005	0.011	1.50	0.0001	0.001	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Active Closure	January		0.023	0.050	0.005	0.001	0.010	0.00010	0.001	0.00005	0.005	0.000004	0.0002	0.000055	0.00075	0.034	0.000025	0.0000025	0.00019	0.00037	0.0005	0.000037	0.000015	0.00005	**0.00006**	0.0002	0.002
	February		0.023	0.050	0.005	0.001	0.010	0.00011	0.001	0.00005	0.005	0.000004	0.0002	0.000056	0.00075	0.034	0.000025	0.0000025	0.00019	0.00037	0.0005	0.000037	0.000015	0.00005	**0.00006**	0.0002	0.002
	March		0.023	0.050	0.005	0.001	0.010	**0.00012**	0.001	0.00005	0.005	0.000004	0.0002	0.000057	0.00075	0.034	0.000025	0.0000025	0.00019	0.00037	0.0005	0.000037	0.000016	0.00005	**0.00006**	0.0002	0.002
	April		0.109	0.010	0.005	0.001	0.016	**0.00013**	0.001	0.00005	0.005	0.000010	0.0002	**0.000058**	0.00099	0.050	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0002	0.002
	May		0.109	0.010	0.005	0.001	0.016	0.00011	0.001	0.00005	0.005	0.000010	0.0002	0.000056	0.00099	0.050	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0002	0.002
	June		0.109	0.010	0.005	0.001	0.016	0.00011	0.001	0.00005	0.005	0.000010	0.0002	0.000056	0.00099	0.050	0.000025	0.0000025	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	**0.00003**	0.0002	0.002
	July		0.025	0.010	0.005	0.001	0.012	0.00011	0.001	0.00005	0.005	0.000003	0.0002	0.000056	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	**0.00003**	0.0002	0.002
	August		0.025	0.010	0.005	0.001	0.012	**0.00013**	0.001	0.00005	0.005	0.000003	0.0002	**0.000058**	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0002	0.002
	September		0.025	0.010	0.005	0.001	0.012	**0.00012**	0.001	0.00005	0.005	0.000003	0.0002	0.000057	0.00065	0.037	0.000025	0.0000025	0.00011	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0002	0.002
	October		0.104	0.010	0.005	0.001	0.011	**0.00012**	0.001	0.00001	0.005	0.000003	0.0002	**0.000058**	0.00063	0.038	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0002	0.002
	November		0.104	0.010	0.005	0.001	0.011	**0.00012**	0.001	0.00001	0.005	0.000003	0.0002	**0.000058**	0.00063	0.038	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.000006	0.00005	**0.00003**	0.0002	0.002
	December		0.104	0.010	0.005	0.001	0.011	0.00009	0.001	0.00001	0.005	0.000003	0.0002	0.000054	0.00063	0.038	0.000025	0.0000025	0.00009	0.00025	0.0001	0.000005	0.000005	0.00005	**0.00002**	0.0002	0.002
Post Closure	January		0.024	0.050	0.005	0.001	0.010	0.00006	0.001	0.00005	0.005	0.000004	0.0002	0.000051	0.00076	0.034	0.000025	0.0000025	0.00019	0.00038	0.0005	0.000037	0.000015	0.00005	0.00005	0.0003	0.002
	February		0.024	0.051	0.005	0.001	0.010	0.00006	0.001	0.00005	0.005	0.000004	0.0002	0.000051	0.00076	0.034	0.000025	0.0000026	0.00019	0.00038	0.0005	0.000038	0.000015	0.00005	0.00005	0.0003	0.002
	March		0.025	0.051	0.005	0.001	0.010	0.00007	0.001	0.00005	0.005	0.000004	0.0002	0.000051	0.00076	0.034	0.000025	0.0000026	0.00019	0.00038	0.0005	0.000038	0.000015	0.00005	0.00005	0.0003	0.002
	April		0.111	0.011	0.005	0.001	0.016	0.00007	0.001	0.00005	0.005	0.000010	0.0002	0.000051	0.00100	0.050	0.000025	0.0000026	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	May		0.111	0.011	0.005	0.001	0.016	0.00006	0.001	0.00005	0.005	0.000010	0.0002	0.000051	0.00100	0.050	0.000025	0.0000026	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	June		0.111	0.011	0.005	0.001	0.016	0.00006	0.001	0.00005	0.005	0.000010	0.0002	0.000051	0.00100	0.050	0.000025	0.0000026	0.00011	0.00050	0.0001	0.000005	0.000025	0.00005	0.00002	0.0003	0.002
	July		0.026	0.011	0.005	0.001	0.013	0.00006	0.001	0.00005	0.005	0.000003	0.0003	0.000051	0.00065	0.037	0.000025	0.0000026	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	August		0.026	0.011	0.005	0.001	0.013	0.00007	0.001	0.00005	0.005	0.000003	0.0003	0.000051	0.00065	0.037	0.000025	0.0000026	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	September		0.026	0.011	0.005	0.001	0.013	0.00007	0.001	0.00005	0.005	0.000003	0.0003	0.000051	0.00065	0.037	0.000025	0.0000026	0.00011	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	October		0.106	0.011	0.005	0.001	0.012	0.00007	0.001	0.00001	0.005	0.000003	0.0002	0.000051	0.00063	0.038	0.000025	0.0000026	0.00010	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	November		0.106	0.011	0.005	0.001	0.012	0.00007	0.001	0.00001	0.005	0.000003	0.0002	0.000051	0.00063	0.038	0.000025	0.0000026	0.00010	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002
	December		0.105	0.010	0.005	0.001	0.012	0.00006	0.001	0.00001	0.005	0.000003	0.0002	0.000051	0.00063	0.038	0.000025	0.0000025	0.00010	0.00025	0.0001	0.000005	0.000005	0.00005	0.00002	0.0003	0.002

Notes:
All units are mg/L.
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Appendix N-2.
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Birch Lake, these data were as follows:

	25th	75th
pH	7.4	7.6
Hardness (mg/L)	28	
DOC (mg/L)	8.1	
Chloride (mg/L)	0.25	
Alkalinity (mg/L)	28	

Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (15% or greater change relative to baseline conditions).

Table 4-4: Base Case Water Quality Results, Node 11

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**0.005**	**0.83**	**0.020**	**0.005**	**0.011**	**1.50**	**0.0001**	**0.0089**	**0.00078**	**0.005**	**0.3**	**0.00906**	**0.000026**	**0.073**	**0.025**	**0.1**	**0.00025**	**0.0008**	**0.030**	**0.005**	**0.12**	**0.011**
Existing Condition	**January**	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.000050	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	February	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.000050	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	March	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.000050	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	April	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.000010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	May	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.000010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	June	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.000010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	July	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.000010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	August	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.000010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	September	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.000010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	October	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.000010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	November	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.000010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	December	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.000010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
Construction	**January**	**0.044**	0.053	0.005	0.014	0.001	0.008	0.00013	0.0005	0.000050	0.0050	0.000005	0.00021	0.00007	0.00076	0.032	0.00003	0.000002	0.00018	0.00035	0.00047	0.000033	0.000013	0.00005	0.00003	0.00025	0.0015
	February	**0.136**	0.028	0.005	0.013	0.001	**0.014**	0.00006	0.0006	0.000050	0.0050	0.000003	0.00025	0.00005	0.00079	0.035	0.00003	0.000002	0.00013	0.00026	0.00014	0.000012	0.000006	0.00005	0.00002	0.00025	0.0015
	March	**0.136**	0.028	0.005	0.013	0.001	**0.014**	0.00006	0.0006	0.000050	0.0050	0.000003	0.00025	0.00005	0.00079	0.035	0.00003	0.000002	0.00013	0.00026	0.00014	0.000012	0.000006	0.00005	0.00002	0.00025	0.0015
	April	**0.139**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	**0.000046**	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	May	**0.138**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	**0.000046**	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	June	**0.138**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	**0.000046**	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	July	**0.135**	0.027	0.005	0.012	0.001	0.014	0.00005	0.0006	**0.000046**	0.0050	0.000002	0.00024	0.00005	0.00079	0.034	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	August	**0.125**	0.028	0.005	0.012	0.001	0.014	0.00005	0.0006	**0.000043**	0.0050	0.000002	0.00024	0.00005	0.00079	0.034	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000009**	0.000005	0.00005	0.00001	0.00025	0.0015
	September	**0.060**	0.038	0.005	0.011	0.001	0.014	0.00005	0.0005	**0.000023**	0.0050	0.000002	0.00021	0.00005	0.00076	0.029	0.00003	0.000002	0.00011	0.00025	0.00010	0.000007	0.000005	0.00005	0.00001	0.00025	0.0015
	October	0.197	**0.015**	0.005	0.010	0.001	0.010	0.00005	0.0006	**0.000024**	0.0050	0.000002	0.00019	0.00005	0.00071	0.028	0.00003	0.000002	0.00012	0.00025	0.00009	0.000007	0.000005	0.00005	0.00001	0.00025	0.0015
	November	0.201	0.014	0.005	0.009	0.001	0.009	0.00005	0.0006	**0.000022**	0.0050	0.000002	0.00019	0.00005	0.00071	0.027	0.00003	0.000002	0.00012	0.00025	0.00009	0.000006	0.000005	0.00005	0.00001	0.00025	0.0015
	December	0.208	0.013	0.005	0.009	0.001	0.009	0.00005	0.0006	**0.000019**	0.0050	0.000002	0.00018	0.00005	0.00070	0.027	0.00003	0.000002	0.00012	0.00025	0.00009	0.000006	0.000005	0.00005	0.00001	0.00025	0.0015
Operations	**January**	0.027	**0.091**	0.005	0.014	0.001	0.007	**0.00086**	0.0005	0.000050	0.0054	0.000006	0.00020	**0.00015**	0.00076	0.031	0.00002	0.000003	0.00022	0.00038	0.00058	0.000038	0.000020	**0.00009**	**0.00015**	0.00025	0.0015
	February	0.028	**0.100**	0.005	0.014	0.001	0.008	**0.00105**	0.0005	0.000050	0.0055	0.000006	0.00021	**0.00017**	0.00076	0.031	0.00002	0.000003	0.00023	0.00038	0.00059	0.000038	0.000022	**0.00010**	**0.00018**	0.00025	0.0015
	March	0.028	**0.107**	0.005	0.014	0.001	0.008	**0.00122**	0.0005	0.000050	0.0056	0.000006	0.00021	**0.00019**	0.00076	0.031	0.00002	0.000003	0.00024	0.00038	0.00060	0.000038	**0.000023**	**0.00011**	**0.00021**	0.00025	0.0015
	April	0.055	**0.075**	0.005	0.011	0.001	0.014	**0.00125**	0.0005	0.000010	0.0057	0.000004	0.00019	**0.00017**	0.00087	0.034	0.00002	0.000003	**0.00016**	0.00026	**0.00017**	0.000006	**0.000015**	**0.00012**	**0.00021**	0.00025	0.0015
	May	0.054	**0.058**	0.005	0.011	0.001	0.013	**0.00088**	0.0005	0.000010	0.0055	0.000004	0.00019	**0.00013**	0.00087	0.034	0.00002	0.000003	0.00014	0.00026	**0.00015**	0.000006	**0.000012**	**0.00009**	**0.00015**	0.00025	0.0015
	June	0.054	**0.061**	0.005	0.011	0.001	0.013	**0.00094**	0.0005	0.000010	0.0055	0.000004	0.00019	**0.00014**	0.00087	0.034	0.00002	0.000003	0.00015	0.00026	**0.00015**	0.000006	**0.000012**	**0.00010**	**0.00016**	0.00025	0.0015
	July	0.022	**0.085**	0.005	0.010	0.001	0.015	**0.00092**	0.0005	0.000010	0.0055	0.000003	0.00020	**0.00014**	0.00075	0.026	0.00002	0.000003	0.00016	0.00026	**0.00015**	0.000006	**0.000012**	**0.00010**	**0.00016**	0.00025	0.0015
	August	0.023	**0.099**	0.005	0.010	0.001	0.015	**0.00122**	0.0005	0.000010	0.0057	0.000003	0.00020	**0.00017**	0.00075	0.026	0.00002	0.000003	**0.00017**	0.00026	**0.00017**	0.000006	**0.000014**	**0.00011**	**0.00021**	0.00025	0.0015
	September	0.023	**0.094**	0.005	0.010	0.001	0.015	**0.00112**	0.0005	0.000010	0.0056	0.000003	0.00020	**0.00016**	0.00075	0.026	0.00002	0.000003	**0.00017**	0.00026	**0.00016**	0.000006	**0.000014**	**0.00011**	**0.00019**	0.00025	0.0015
	October	0.226	**0.062**	0.005	0.008	0.001	0.008	**0.00116**	0.0006	0.000010	0.0056	0.000003	0.00017	**0.00016**	0.00067	0.024	0.00002	0.000003	**0.00018**	0.00026	**0.00016**	0.000006	**0.000014**	**0.00011**	**0.00020**	0.00025	0.0015
	November	0.226	**0.061**	0.005	0.008	0.001	0.008	**0.00114**	0.0006	0.000010	0.0056	0.000003	0.00017	**0.00016**	0.00067	0.024	0.00002	0.000003	**0.00017**	0.00026	**0.00016**	0.000006	**0.000014**	**0.00011**	**0.00020**	0.00025	0.0015
	December	0.225	**0.036**	0.005	0.008	0.001	0.008	**0.00061**	0.0006	0.000010	0.0053	0.000003	0.00017	**0.00011**	0.00067	0.024	0.00002	0.000003	0.00015	0.00025	0.00012	0.000006	**0.000009**	**0.00008**	**0.00011**	0.00025	0.0015

Table 4-4: Base Case Water Quality Results, Node 11

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**0.005**	**0.83**	**0.020**	**0.005**	**0.011**	**1.50**	**0.0001**	**0.0089**	**0.00078**	**0.005**	**0.3**	**0.00906**	**0.000026**	**0.073**	**0.025**	**0.1**	**0.00025**	**0.0008**	**0.030**	**0.005**	**0.12**	**0.011**
Active Closure	**January**		0.027	0.058	0.005	0.014	0.001	0.007	**0.00081**	0.0005	0.000050	0.0054	0.000006	0.00020	**0.00015**	0.00076	0.031	0.00002	0.000003	0.00022	0.00038	0.00058	0.000038	0.000020	**0.00009**	**0.00014**	0.00025	0.0015
	February		0.027	0.058	0.005	0.014	0.001	0.008	**0.00099**	0.0005	0.000050	0.0055	0.000006	0.00020	**0.00017**	0.00076	0.031	0.00002	0.000003	0.00023	0.00038	0.00059	0.000038	0.000021	**0.00010**	**0.00017**	0.00025	0.0015
	March		0.028	0.058	0.005	0.014	0.001	0.008	**0.00115**	0.0005	0.000050	0.0056	0.000006	0.00021	**0.00018**	0.00076	0.031	0.00002	0.000003	0.00024	0.00038	0.00060	0.000038	**0.000023**	**0.00010**	**0.00020**	0.00025	0.0015
	April		0.054	0.019	0.005	0.011	0.001	0.013	**0.00118**	0.0005	0.000010	0.0057	0.000004	0.00019	**0.00017**	0.00087	0.034	0.00002	0.000003	**0.00016**	0.00026	**0.00017**	0.000006	**0.000014**	**0.00011**	**0.00020**	0.00025	0.0015
	May		0.054	0.019	0.005	0.011	0.001	0.013	**0.00082**	0.0005	0.000010	0.0054	0.000004	0.00019	**0.00013**	0.00087	0.034	0.00002	0.000003	0.00014	0.00025	**0.00015**	0.000006	**0.000011**	**0.00009**	**0.00014**	0.00025	0.0015
	June		0.054	0.019	0.005	0.011	0.001	0.013	**0.00088**	0.0005	0.000010	0.0055	0.000004	0.00019	**0.00013**	0.00087	0.034	0.00002	0.000003	0.00014	0.00026	**0.00015**	0.000006	**0.000012**	**0.00009**	**0.00015**	0.00025	0.0015
	July		0.022	0.044	0.005	0.010	0.001	0.015	**0.00086**	0.0005	0.000010	0.0055	0.000003	0.00020	**0.00013**	0.00075	0.026	0.00002	0.000003	0.00015	0.00026	**0.00015**	0.000006	**0.000011**	**0.00009**	**0.00015**	0.00025	0.0015
	August		0.022	0.044	0.005	0.010	0.001	0.015	**0.00114**	0.0005	0.000010	0.0056	0.000003	0.00020	**0.00016**	0.00075	0.026	0.00002	0.000003	**0.00017**	0.00026	**0.00016**	0.000006	**0.000014**	**0.00011**	**0.00020**	0.00025	0.0015
	September		0.022	0.044	0.005	0.010	0.001	0.015	**0.00104**	0.0005	0.000010	0.0056	0.000003	0.00020	**0.00015**	0.00075	0.026	0.00002	0.000003	0.00016	0.00026	**0.00016**	0.000006	**0.000013**	**0.00010**	**0.00018**	0.00025	0.0015
	October		0.226	0.011	0.005	0.008	0.001	0.008	**0.00109**	0.0006	0.000010	0.0056	0.000003	0.00017	**0.00016**	0.00067	0.024	0.00002	0.000003	0.00017	0.00026	**0.00016**	0.000006	**0.000013**	**0.00011**	**0.00019**	0.00025	0.0015
	November		0.226	0.011	0.005	0.008	0.001	0.008	**0.00106**	0.0006	0.000010	0.0056	0.000003	0.00017	**0.00015**	0.00067	0.024	0.00002	0.000003	0.00017	0.00026	**0.00015**	0.000006	**0.000013**	**0.00010**	**0.00018**	0.00025	0.0015
	December		0.224	0.010	0.005	0.008	0.001	0.008	**0.00057**	0.0006	0.000010	0.0053	0.000003	0.00017	**0.00010**	0.00067	0.024	0.00002	0.000003	0.00014	0.00025	0.00012	0.000005	**0.000009**	**0.00008**	**0.00010**	0.00025	0.0015
Post Closure	**January**		**0.262**	**0.62**	**0.015**	0.020	**0.002**	**0.032**	**0.00087**	**0.0011**	**0.000084**	0.0066	**0.000015**	**0.00051**	**0.00019**	0.00087	0.033	**0.00007**	**0.000005**	**0.00056**	**0.00183**	**0.00119**	0.000039	**0.000023**	**0.00019**	**0.00062**	**0.00066**	0.0021
	February		**0.261**	**0.58**	**0.015**	0.020	**0.002**	**0.039**	**0.00100**	**0.0012**	**0.000080**	0.0070	**0.000014**	**0.00056**	**0.00019**	0.00089	0.032	**0.00007**	**0.000006**	**0.00060**	**0.00174**	**0.00114**	0.000040	**0.000024**	**0.00022**	**0.00060**	**0.00077**	0.0022
	March		**0.312**	**0.71**	**0.017**	0.020	**0.002**	**0.042**	**0.00111**	**0.0013**	**0.000089**	0.0072	**0.000016**	**0.00061**	**0.00021**	0.00091	0.033	**0.00008**	**0.000006**	**0.00067**	**0.00209**	**0.00129**	0.000041	**0.000025**	**0.00024**	**0.00073**	**0.00082**	**0.0023**
	April		**0.422**	**0.98**	**0.023**	**0.020**	**0.002**	**0.046**	**0.00114**	**0.0013**	**0.000085**	0.0072	**0.000020**	**0.00064**	**0.00023**	0.00098	0.036	**0.00011**	**0.000006**	**0.00071**	**0.00274**	**0.00137**	**0.000021**	**0.000020**	**0.00025**	**0.00098**	**0.00081**	**0.0023**
	May		**0.579**	**1.57**	**0.034**	0.016	0.001	**0.029**	**0.00101**	**0.0010**	**0.000134**	0.0064	**0.000028**	**0.00060**	**0.00031**	0.00094	0.041	**0.00015**	**0.000005**	**0.00080**	**0.00418**	**0.00214**	**0.000022**	**0.000019**	**0.00022**	**0.00146**	**0.00053**	**0.0023**
	June		**0.510**	**1.33**	**0.029**	**0.017**	**0.002**	**0.033**	**0.00100**	**0.0010**	**0.000114**	0.0066	**0.000025**	**0.00059**	**0.00027**	0.00095	0.039	**0.00013**	**0.000005**	**0.00074**	**0.00359**	**0.00183**	**0.000021**	**0.000019**	**0.00022**	**0.00126**	**0.00059**	**0.0023**
	July		**0.379**	**0.97**	**0.022**	**0.018**	**0.002**	**0.038**	**0.00094**	**0.0011**	**0.000084**	0.0067	**0.000018**	**0.00057**	**0.00022**	0.00088	0.032	**0.00010**	**0.000005**	**0.00064**	**0.00266**	**0.00134**	**0.000019**	**0.000018**	**0.00021**	**0.00094**	**0.00066**	0.0022
	August		**0.424**	**1.07**	**0.024**	**0.019**	**0.002**	**0.044**	**0.00110**	**0.0012**	**0.000092**	0.0071	**0.000020**	**0.00063**	**0.00024**	0.00091	0.032	**0.00011**	**0.000006**	**0.00072**	**0.00294**	**0.00148**	**0.000021**	**0.000020**	**0.00024**	**0.00105**	**0.00076**	**0.0023**
	September		**0.455**	**1.19**	**0.026**	**0.018**	**0.002**	**0.040**	**0.00107**	**0.0012**	**0.000101**	0.0069	**0.000022**	**0.00062**	**0.00026**	0.00090	0.033	**0.00012**	**0.000006**	**0.00073**	**0.00322**	**0.00163**	**0.000021**	**0.000019**	**0.00023**	**0.00114**	**0.00069**	**0.0023**
	October		**0.623**	**1.41**	**0.031**	**0.020**	**0.002**	**0.032**	**0.00110**	**0.0012**	**0.000120**	0.0068	**0.000025**	**0.00062**	**0.00029**	0.00087	0.035	**0.00014**	**0.000006**	**0.00080**	**0.00380**	**0.00193**	**0.000023**	**0.000020**	**0.00024**	**0.00134**	**0.00065**	**0.0023**
	November		**0.573**	**1.20**	**0.027**	**0.020**	**0.002**	**0.035**	**0.00108**	**0.0012**	**0.000103**	0.0069	**0.000022**	**0.00061**	**0.00026**	0.00086	0.033	**0.00012**	**0.000006**	**0.00075**	**0.00328**	**0.00166**	**0.000021**	**0.000020**	**0.00023**	**0.00116**	**0.00069**	**0.0023**
	December		**0.478**	**0.89**	**0.021**	**0.016**	0.001	**0.025**	**0.00076**	**0.0010**	**0.000079**	0.0063	**0.000017**	**0.00047**	**0.00020**	0.00080	0.031	**0.00010**	**0.000005**	**0.00056**	**0.00248**	**0.00125**	**0.000016**	**0.000015**	**0.00018**	**0.00085**	**0.00054**	0.0021

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Springpole Lake these data were as follows:

	25th	75th
pH	7.3	7.6
Hardness (mg/L)	29.4	
DOC (mg/L)	7.8	
Chloride (mg/L)	0.24	
Alkalinity (mg/L)	29.7	

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (15% or greater change relative to baseline conditions)

Table 4-5: Base Case Water Quality Results, Node 05

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**0.005**	**0.83**	**0.020**	**0.005**	**0.01100**	**1.50**	**0.0001**	**0.0089**	**0.00078**	**0.005**	**0.3**	**0.00906**	**0.000026**	**0.073**	**0.025**	**0.1**	**0.00025**	**0.0008**	**0.03000**	**0.005**	**0.12**	**0.011**
Existing Condition	**January**	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.00010	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	February	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.00010	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	March	0.025	0.057	0.005	0.014	0.001	0.007	0.00015	0.0005	0.00010	0.0050	0.000006	0.00020	0.00008	0.00076	0.032	0.00003	0.000002	0.00019	0.00038	0.00055	0.000038	0.000015	0.00005	0.00003	0.00025	0.0015
	April	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.00010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	May	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.00010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	June	0.054	0.019	0.005	0.011	0.001	0.012	0.00005	0.0005	0.00010	0.0050	0.000004	0.00018	0.00005	0.00087	0.034	0.00003	0.000002	0.00010	0.00025	0.00010	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	July	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.00010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	August	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.00010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	September	0.020	0.045	0.005	0.010	0.001	0.014	0.00005	0.0005	0.00010	0.0050	0.000002	0.00019	0.00005	0.00075	0.026	0.00003	0.000002	0.00011	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	October	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.00010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	November	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.00010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
	December	0.208	0.010	0.005	0.008	0.001	0.007	0.00005	0.0006	0.00010	0.0050	0.000002	0.00016	0.00005	0.00067	0.024	0.00003	0.000002	0.00012	0.00025	0.00009	0.000005	0.000005	0.00005	0.00001	0.00025	0.0015
Construction	**January**	**0.044**	0.052	0.005	0.014	0.001	0.008	0.00013	0.0005	0.00010	0.0050	0.000005	0.00021	0.00008	0.00076	0.032	0.00003	0.000002	0.00018	0.00035	0.00048	0.000033	0.000013	0.00005	0.00003	0.00025	0.0015
	February	**0.136**	0.028	0.005	0.013	0.001	**0.014**	0.00006	0.0006	0.00010	0.0050	0.000003	0.00025	0.00005	0.00079	0.035	0.00003	0.000002	0.00013	0.00026	0.00014	0.000012	0.000006	0.00005	0.00002	0.00025	0.0015
	March	**0.136**	0.028	0.005	0.013	0.001	**0.014**	0.00006	0.0006	0.00010	0.0050	0.000003	0.00025	0.00005	0.00079	0.035	0.00003	0.000002	0.00013	0.00026	0.00014	0.000012	0.000006	0.00005	0.00002	0.00025	0.0015
	April	**0.138**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	0.00010	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	May	**0.138**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	0.00010	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	June	**0.138**	0.024	0.005	0.012	0.001	0.014	0.00005	0.0006	0.00010	0.0050	0.000003	0.00024	0.00005	0.00080	0.035	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	July	**0.135**	0.027	0.005	0.012	0.001	0.014	0.00005	0.0006	0.00010	0.0050	0.000002	0.00024	0.00005	0.00079	0.034	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000010**	0.000005	0.00005	0.00001	0.00025	0.0015
	August	**0.125**	0.028	0.005	0.012	0.001	0.014	0.00005	0.0006	0.00004	0.0050	0.000002	0.00024	0.00005	0.00079	0.034	0.00003	0.000002	0.00012	0.00025	0.00010	**0.000009**	0.000005	0.00005	0.00001	0.00025	0.0015
	September	**0.060**	0.038	0.005	0.011	0.001	0.014	0.00005	0.0005	0.00002	0.0050	0.000002	0.00021	0.00005	0.00076	0.029	0.00003	0.000002	0.00011	0.00025	0.00010	0.000007	0.000005	0.00005	0.00001	0.00025	0.0015
	October	0.192	**0.015**	0.005	0.010	0.001	0.010	0.00005	0.0006	0.00002	0.0050	0.000002	0.00019	0.00005	0.00071	0.028	0.00003	0.000002	0.00012	0.00025	0.00009	0.000007	0.000005	0.00005	0.00001	0.00025	0.0015
	November	0.196	0.015	0.005	0.009	0.001	0.009	0.00005	0.0006	0.00002	0.0050	0.000002	0.00019	0.00005	0.00071	0.027	0.00003	0.000002	0.00012	0.00025	0.00009	0.000007	0.000005	0.00005	0.00001	0.00025	0.0015
	December	0.202	0.013	0.005	0.009	0.001	0.009	0.00005	0.0006	0.00002	0.0050	0.000002	0.00018	0.00005	0.00070	0.027	0.00003	0.000002	0.00012	0.00025	0.00009	0.000006	0.000005	0.00005	0.00001	0.00025	0.0015
Operations	**January**	0.026	0.074	0.005	0.014	0.001	0.007	**0.00052**	0.0005	0.00005	0.0052	0.000006	0.00020	0.00012	0.00076	0.032	0.00002	0.000003	0.00021	0.00038	0.00057	0.000038	0.000018	0.00007	**0.00009**	0.00025	0.0015
	February	0.026	0.079	0.005	0.014	0.001	0.007	**0.00060**	0.0005	0.00005	0.0053	0.000006	0.00020	**0.00013**	0.00076	0.032	0.00002	0.000003	0.00021	0.00038	0.00057	0.000038	0.000018	0.00007	**0.00011**	0.00025	0.0015
	March	0.027	0.082	0.005	0.014	0.001	0.007	**0.00068**	0.0005	0.00005	0.0053	0.000006	0.00020	**0.00013**	0.00076	0.032	0.00002	0.000003	0.00021	0.00038	0.00058	0.000038	0.000019	**0.00008**	**0.00012**	0.00025	0.0015
	April	0.054	**0.047**	0.005	0.011	0.001	0.013	**0.00065**	0.0005	0.00001	0.0053	0.000004	0.00018	**0.00011**	0.00087	0.034	0.00002	0.000003	0.00013	0.00025	0.00013	0.000006	**0.000010**	**0.00008**	**0.00011**	0.00025	0.0015
	May	0.054	**0.039**	0.005	0.011	0.001	0.013	**0.00048**	0.0005	0.00001	0.0052	0.000004	0.00018	**0.00009**	0.00087	0.034	0.00002	0.000003	0.00012	0.00025	0.00012	0.000005	**0.000008**	0.00007	**0.00008**	0.00025	0.0015
	June	0.054	**0.041**	0.005	0.011	0.001	0.013	**0.00051**	0.0005	0.00001	0.0053	0.000004	0.00018	**0.00010**	0.00087	0.034	0.00002	0.000003	0.00012	0.00025	0.00013	0.000005	**0.000009**	0.00007	**0.00009**	0.00025	0.0015
	July	0.021	0.066	0.005	0.010	0.001	0.014	**0.00050**	0.0005	0.00001	0.0053	0.000003	0.00019	**0.00010**	0.00075	0.026	0.00002	0.000003	0.00013	0.00025	0.00012	0.000005	**0.000009**	0.00007	**0.00009**	0.00025	0.0015
	August	0.021	**0.073**	0.005	0.010	0.001	0.015	**0.00066**	0.0005	0.00001	0.0054	0.000003	0.00019	**0.00011**	0.00075	0.026	0.00002	0.000003	0.00014	0.00025	0.00013	0.000006	**0.000010**	**0.00008**	**0.00012**	0.00025	0.0015
	September	0.021	**0.070**	0.005	0.010	0.001	0.015	**0.00060**	0.0005	0.00001	0.0053	0.000003	0.00019	**0.00011**	0.00075	0.026	0.00002	0.000003	0.00014	0.00025	0.00013	0.000006	**0.000009**	**0.00008**	**0.00011**	0.00025	0.0015
	October	0.218	**0.037**	0.005	0.008	0.001	0.008	**0.00063**	0.0006	0.00001	0.0053	0.000003	0.00017	**0.00011**	0.00067	0.024	0.00002	0.000003	0.00015	0.00025	0.00013	0.000006	**0.000010**	**0.00008**	**0.00011**	0.00025	0.0015
	November	0.218	**0.037**	0.005	0.008	0.001	0.008	**0.00061**	0.0006	0.00001	0.0053	0.000003	0.00017	**0.00011**	0.00067	0.024	0.00002	0.000003	0.00015	0.00025	0.00012	0.000006	**0.000010**	**0.00008**	**0.00011**	0.00025	0.0015
	December	0.217	**0.024**	0.005	0.008	0.001	0.007	**0.00034**	0.0006	0.00001	0.0052	0.000003	0.00016	**0.00008**	0.00067	0.024	0.00002	0.000003	0.00013	0.00025	0.00011	0.000005	0.000007	0.00007	**0.00006**	0.00025	0.0015

Table 4-5: Base Case Water Quality Results, Node 05

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Active Closure	January		0.026	0.057	0.005	0.014	0.001	0.007	**0.00049**	0.0005	0.00005	0.0052	0.000006	0.00020	0.00011	0.00076	0.032	0.00002	0.000003	0.00020	0.00038	0.00056	0.000038	0.000018	0.00007	**0.00009**	0.00025	0.0015
	February		0.026	0.057	0.005	0.014	0.001	0.007	**0.00057**	0.0005	0.00005	0.0052	0.000006	0.00020	**0.00012**	0.00076	0.032	0.00002	0.000003	0.00021	0.00038	0.00057	0.000038	0.000018	0.00007	**0.00010**	0.00025	0.0015
	March		0.026	0.057	0.005	0.014	0.001	0.007	**0.00065**	0.0005	0.00005	0.0053	0.000006	0.00020	**0.00013**	0.00076	0.032	0.00002	0.000003	0.00021	0.00038	0.00057	0.000038	0.000019	**0.00008**	**0.00012**	0.00025	0.0015
	April		0.054	0.019	0.005	0.011	0.001	0.013	**0.00062**	0.0005	0.00001	0.0053	0.000004	0.00018	**0.00011**	0.00087	0.034	0.00002	0.000003	0.00013	0.00025	0.00013	0.000006	**0.000010**	**0.00008**	**0.00011**	0.00025	0.0015
	May		0.054	0.019	0.005	0.011	0.001	0.013	**0.00045**	0.0005	0.00001	0.0052	0.000004	0.00018	**0.00009**	0.00087	0.034	0.00002	0.000003	0.00012	0.00025	0.00012	0.000005	**0.000008**	0.00007	**0.00008**	0.00025	0.0015
	June		0.054	0.019	0.005	0.011	0.001	0.013	**0.00048**	0.0005	0.00001	0.0052	0.000004	0.00018	**0.00009**	0.00087	0.034	0.00002	0.000003	0.00012	0.00025	0.00012	0.000005	**0.000008**	0.00007	**0.00008**	0.00025	0.0015
	July		0.021	0.045	0.005	0.010	0.001	0.014	**0.00047**	0.0005	0.00001	0.0052	0.000003	0.00019	**0.00009**	0.00075	0.026	0.00002	0.000003	0.00013	0.00025	0.00012	0.000005	**0.000008**	0.00007	**0.00008**	0.00025	0.0015
	August		0.021	0.045	0.005	0.010	0.001	0.015	**0.00061**	0.0005	0.00001	0.0053	0.000003	0.00019	**0.00011**	0.00075	0.026	0.00002	0.000003	0.00014	0.00025	0.00013	0.000006	**0.000010**	**0.00008**	**0.00011**	0.00025	0.0015
	September		0.021	0.045	0.005	0.010	0.001	0.015	**0.00057**	0.0005	0.00001	0.0053	0.000003	0.00019	**0.00010**	0.00075	0.026	0.00002	0.000003	0.00014	0.00025	0.00013	0.000005	**0.000009**	**0.00008**	**0.00010**	0.00025	0.0015
	October		0.217	0.010	0.005	0.008	0.001	0.008	**0.00059**	0.0006	0.00001	0.0053	0.000003	0.00017	**0.00011**	0.00067	0.024	0.00002	0.000003	0.00015	0.00025	0.00012	0.000006	**0.000009**	**0.00008**	**0.00010**	0.00025	0.0015
	November		0.217	0.010	0.005	0.008	0.001	0.008	**0.00058**	0.0006	0.00001	0.0053	0.000003	0.00016	**0.00010**	0.00067	0.024	0.00002	0.000003	0.00014	0.00025	0.00012	0.000005	**0.000009**	**0.00008**	**0.00010**	0.00025	0.0015
	December		0.217	0.010	0.005	0.008	0.001	0.007	**0.00032**	0.0006	0.00001	0.0052	0.000003	0.00016	**0.00008**	0.00067	0.024	0.00002	0.000003	0.00013	0.00025	0.00011	0.000005	0.000007	0.00006	**0.00006**	0.00025	0.0015
Post Closure	January		**0.165**	**0.388**	**0.011**	0.018	0.001	**0.022**	**0.00057**	**0.0008**	0.00007	0.0059	**0.000011**	**0.00038**	**0.00014**	0.00082	0.033	**0.00005**	**0.000004**	**0.00041**	**0.00123**	**0.00093**	0.000039	0.000019	**0.00013**	**0.00038**	**0.00049**	0.0018
	February		**0.161**	**0.356**	**0.011**	0.019	0.001	**0.025**	**0.00064**	**0.0009**	0.00007	0.0061	**0.000011**	**0.00041**	**0.00014**	0.00083	0.032	**0.00005**	**0.000004**	**0.00042**	**0.00116**	**0.00089**	0.000039	0.000020	**0.00015**	**0.00036**	**0.00055**	0.0019
	March		**0.195**	**0.443**	**0.012**	0.020	**0.002**	**0.028**	**0.00072**	**0.0010**	0.00007	0.0063	**0.000012**	**0.00044**	**0.00016**	0.00085	0.032	**0.00006**	**0.000005**	**0.00047**	**0.00139**	**0.00099**	0.000039	0.000021	**0.00016**	**0.00045**	**0.00059**	0.0019
	April		**0.286**	**0.623**	**0.016**	**0.017**	**0.002**	**0.034**	**0.00073**	**0.0010**	0.00006	0.0064	**0.000014**	**0.00047**	**0.00017**	0.00094	0.036	**0.00008**	**0.000005**	**0.00048**	**0.00182**	**0.00090**	**0.000015**	**0.000015**	**0.00018**	**0.00062**	**0.00060**	0.0020
	May		**0.427**	**1.122**	**0.025**	0.014	0.001	**0.024**	**0.00073**	**0.0008**	0.00010	0.0060	**0.000021**	**0.00048**	**0.00023**	0.00092	0.039	**0.00011**	**0.000004**	**0.00060**	**0.00304**	**0.00155**	**0.000017**	**0.000015**	**0.00017**	**0.00104**	**0.00045**	0.0021
	June		**0.363**	**0.910**	**0.021**	0.015	0.001	**0.026**	**0.00069**	**0.0009**	0.00008	0.0061	**0.000018**	**0.00046**	**0.00020**	0.00093	0.038	**0.00010**	**0.000004**	**0.00053**	**0.00252**	**0.00127**	**0.000016**	**0.000014**	**0.00016**	**0.00086**	**0.00048**	0.0020
	July		**0.247**	**0.632**	**0.016**	**0.015**	0.001	**0.029**	**0.00061**	**0.0009**	0.00006	0.0061	**0.000012**	**0.00043**	**0.00016**	0.00083	0.030	**0.00007**	**0.000004**	**0.00044**	**0.00178**	**0.00088**	**0.000014**	**0.000013**	**0.00015**	**0.00060**	**0.00051**	0.0019
	August		**0.283**	**0.716**	**0.017**	**0.016**	**0.002**	**0.034**	**0.00074**	**0.0010**	0.00006	0.0064	**0.000014**	**0.00048**	**0.00018**	0.00085	0.030	**0.00008**	**0.000005**	**0.00051**	**0.00200**	**0.00100**	**0.000015**	**0.000015**	**0.00018**	**0.00069**	**0.00058**	0.0020
	September		**0.308**	**0.806**	**0.019**	**0.015**	0.001	**0.031**	**0.00072**	**0.0009**	0.00007	0.0062	**0.000015**	**0.00048**	**0.00019**	0.00085	0.031	**0.00009**	**0.000005**	**0.00052**	**0.00222**	**0.00111**	**0.000016**	**0.000015**	**0.00017**	**0.00076**	**0.00054**	0.0020
	October		**0.496**	**0.980**	**0.023**	**0.016**	0.001	**0.024**	**0.00078**	**0.0010**	0.00009	0.0063	**0.000018**	**0.00048**	**0.00022**	0.00081	0.031	**0.00010**	**0.000005**	**0.00059**	**0.00271**	**0.00137**	**0.000017**	**0.000016**	**0.00018**	**0.00094**	**0.00053**	0.0021
	November		**0.452**	**0.803**	**0.020**	**0.016**	0.001	**0.026**	**0.00074**	**0.0010**	0.00007	0.0063	**0.000016**	**0.00046**	**0.00019**	0.00080	0.030	**0.00009**	**0.000005**	**0.00054**	**0.00227**	**0.00114**	**0.000016**	**0.000015**	**0.00017**	**0.00078**	**0.00055**	0.0020
	December		**0.375**	**0.552**	**0.015**	**0.013**	0.001	**0.018**	**0.00049**	0.0009	0.00005	0.0058	**0.000011**	**0.00035**	**0.00014**	0.00075	0.028	**0.00007**	**0.000004**	**0.00039**	**0.00163**	**0.00080**	**0.000012**	**0.000011**	**0.00013**	**0.00053**	**0.00043**	0.0018

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Springpole Lake these data were as follows:

	25th	75th
pH	7.3	7.6
Hardness (mg/L)	29.4	
DOC (mg/L)	7.8	
Chloride (mg/L)	0.24	
Alkalinity (mg/L)	29.7	

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (15% or greater change relative to baseline conditions)

Table 4-6: Base Case Water Quality Model Results, Discharge Node

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.0000260	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Existing condition	January		0.008	0.067	0.005	0.012	0.001	0.016	0.00005	0.0006	0.00005	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000025	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	February		0.008	0.067	0.005	0.012	0.001	0.016	0.00005	0.0006	0.00005	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000025	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	March		0.008	0.067	0.005	0.012	0.001	0.016	0.00005	0.0006	0.00005	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000025	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	April		0.056	0.017	0.005	0.009	0.001	0.021	0.00005	0.0006	0.00001	0.0050	0.000002	0.00021	0.00005	0.00085	0.050	0.00003	0.0000025	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	May		0.056	0.017	0.005	0.009	0.001	0.021	0.00005	0.0006	0.00001	0.0050	0.000002	0.00021	0.00005	0.00085	0.050	0.00003	0.0000025	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	June		0.056	0.017	0.005	0.009	0.001	0.021	0.00005	0.0006	0.00001	0.0050	0.000002	0.00021	0.00005	0.00085	0.050	0.00003	0.0000025	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	July		0.025	0.037	0.005	0.011	0.001	0.023	0.00005	0.0007	0.00001	0.0050	0.000002	0.00023	0.00005	0.00064	0.050	0.00003	0.0000025	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.025	0.037	0.005	0.011	0.001	0.023	0.00005	0.0007	0.00001	0.0050	0.000002	0.00023	0.00005	0.00064	0.050	0.00003	0.0000025	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.025	0.037	0.005	0.011	0.001	0.023	0.00005	0.0007	0.00001	0.0050	0.000002	0.00023	0.00005	0.00064	0.050	0.00003	0.0000025	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.488	0.030	0.005	0.011	0.001	0.016	0.00015	0.0006	0.00013	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000025	0.00017	0.00025	0.00054	0.000028	0.000015	0.00027	0.00003	0.00025	0.0020
	November		0.488	0.030	0.005	0.011	0.001	0.016	0.00015	0.0006	0.00013	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000025	0.00017	0.00025	0.00054	0.000028	0.000015	0.00027	0.00003	0.00025	0.0020
	December		0.488	0.030	0.005	0.011	0.001	0.016	0.00015	0.0006	0.00013	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000025	0.00017	0.00025	0.00054	0.000028	0.000015	0.00027	0.00003	0.00025	0.0020
Construction	January		**0.018**	0.056	0.005	0.011	0.001	0.012	0.00005	0.0007	0.00005	0.0050	0.000006	0.00024	0.00005	0.00076	0.040	0.00003	0.0000025	0.00021	0.00033	0.00071	0.000042	0.000019	0.00005	0.00005	0.00025	0.0015
	February		**0.039**	0.051	0.005	0.011	0.001	0.012	0.00005	0.0007	0.00005	0.0050	0.000005	0.00024	0.00005	0.00076	0.039	0.00003	0.0000025	0.00019	0.00031	0.00061	0.000037	0.000016	0.00005	0.00004	0.00025	0.0015
	March		**0.039**	0.051	0.005	0.011	0.001	0.012	0.00005	0.0007	0.00005	0.0050	0.000005	0.00024	0.00005	0.00076	0.039	0.00003	0.0000025	0.00019	0.00031	0.00061	0.000037	0.000016	0.00005	0.00004	0.00025	0.0015
	April		**0.098**	0.015	0.005	0.009	0.001	0.017	0.00005	0.0007	**0.00004**	0.0050	**0.000006**	0.00021	0.00005	0.00091	0.047	0.00003	0.0000025	0.00010	0.00037	0.00010	0.000006	**0.000015**	0.00005	0.00002	0.00025	0.0015
	May		**0.099**	0.015	0.005	0.009	0.001	0.017	0.00005	0.0007	**0.00004**	0.0050	**0.000006**	0.00021	0.00005	0.00091	0.047	0.00003	0.0000025	0.00010	0.00037	0.00010	0.000006	**0.000015**	0.00005	0.00002	0.00025	0.0015
	June		**0.098**	0.015	0.005	0.009	0.001	0.017	0.00005	0.0007	**0.00004**	0.0050	**0.000006**	0.00021	0.00005	0.00091	0.047	0.00003	0.0000025	0.00010	0.00037	0.00010	0.000006	**0.000015**	0.00005	0.00002	0.00025	0.0015
	July		**0.046**	0.022	0.005	0.011	0.001	0.016	0.00005	0.0008	**0.00004**	0.0050	0.000002	0.00024	0.00005	0.00067	0.041	0.00003	0.0000025	0.00011	0.00025	0.00010	0.000006	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.036	0.021	0.005	0.010	0.001	0.016	0.00005	0.0008	**0.00004**	0.0050	0.000002	0.00024	0.00005	0.00066	0.041	0.00003	0.0000025	0.00011	0.00025	0.00010	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.027	0.021	0.005	0.010	0.001	0.016	0.00005	0.0009	**0.00003**	0.0050	0.000002	0.00024	0.00005	0.00065	0.042	0.00003	0.0000025	0.00011	0.00025	0.00010	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.248	0.018	0.005	0.010	0.001	0.013	0.00009	**0.0010**	0.00005	0.0050	0.000011	0.00022	0.00005	0.00063	0.044	0.00003	0.0000025	0.00012	0.00025	0.00026	0.000013	0.000009	0.00013	0.00002	0.00025	0.0017
	November		0.248	0.018	0.005	0.010	0.001	0.013	0.00009	**0.0010**	0.00005	0.0050	0.000011	0.00022	0.00005	0.00063	0.044	0.00003	0.0000025	0.00012	0.00025	0.00026	0.000013	0.000009	0.00013	0.00002	0.00025	0.0017
	December		0.249	0.018	0.005	0.010	0.001	0.013	0.00009	**0.0010**	0.00005	0.0050	0.000011	0.00022	0.00005	0.00062	0.044	0.00003	0.0000025	0.00012	0.00025	0.00026	0.000013	0.000009	0.00013	0.00002	0.00025	0.0017
Operations	January		**0.017**	0.058	0.005	0.011	0.001	0.012	**0.00012**	0.0007	0.00007	0.0054	0.000006	0.00026	0.00006	0.00076	0.042	0.00003	0.0000025	0.00034	0.00037	0.00072	0.000044	0.000019	0.00005	0.00006	**0.00045**	0.0015
	February		**0.017**	0.059	0.005	0.011	0.001	0.012	**0.00014**	0.0007	0.00007	0.0054	0.000006	0.00026	0.00006	0.00077	0.043	0.00003	0.0000025	0.00037	**0.00038**	0.00072	0.000044	0.000019	0.00005	0.00007	**0.00051**	0.0015
	March		**0.017**	0.059	0.005	0.011	0.001	0.013	**0.00016**	0.0007	**0.00008**	0.0055	0.000006	0.00026	0.00006	0.00077	0.043	0.00003	0.0000025	**0.00040**	**0.00039**	0.00072	0.000045	0.000019	0.00005	0.00007	**0.00057**	0.0015
	April		**0.088**	0.016	0.005	0.008	0.001	0.018	**0.00017**	0.0007	**0.00007**	0.0056	**0.000007**	0.00023	0.00006	0.00095	0.053	0.00004	0.0000025	**0.00031**	**0.00047**	0.00011	**0.000008**	**0.000018**	0.00005	**0.00004**	**0.00060**	0.0016
	May		**0.088**	0.015	0.005	0.008	0.001	0.018	**0.00014**	0.0007	**0.00006**	0.0054	**0.000007**	0.00022	0.00006	0.00095	0.052	0.00003	0.0000025	**0.00025**	**0.00045**	0.00011	0.000007	**0.000017**	0.00005	**0.00004**	**0.00049**	0.0015
	June		**0.089**	0.015	0.005	0.008	0.001	0.026	**0.00083**	0.0009	**0.00043**	**0.0122**	**0.000009**	**0.00049**	**0.00008**	0.00108	**0.085**	**0.00016**	0.0000028	**0.00280**	**0.00131**	**0.00018**	**0.000040**	**0.000017**	0.00005	**0.00021**	**0.00468**	0.0022
	July		0.025	0.023	0.005	0.011	0.001	0.033	**0.00158**	**0.0012**	**0.00084**	**0.0196**	**0.000007**	**0.00081**	**0.00010**	0.00094	**0.114**	**0.00030**	0.0000032	**0.00557**	**0.00209**	**0.00026**	**0.000077**	0.000005	0.00005	**0.00040**	**0.00924**	**0.0028**
	August		0.026	0.024	0.005	0.011	0.001	**0.038**	**0.00208**	**0.0013**	**0.00111**	**0.0244**	**0.000008**	**0.00100**	**0.00011**	**0.00104**	**0.137**	**0.00039**	0.0000034	**0.00736**	**0.00270**	**0.00031**	**0.000100**	0.000005	0.00005	**0.00052**	**0.01218**	**0.0033**
	September		0.026	0.024	0.005	0.011	0.001	**0.038**	**0.00203**	**0.0013**	**0.00109**	**0.0240**	**0.000008**	**0.00099**	**0.00011**	**0.00103**	**0.135**	**0.00038**	0.0000034	**0.00721**	**0.00264**	**0.00030**	**0.000098**	0.000005	0.00005	**0.00051**	**0.01193**	**0.0032**
	October		0.249	0.021	0.005	0.011	0.001	**0.037**	**0.00230**	**0.0014**	**0.00123**	**0.0262**	0.000017	**0.00100**	**0.00012**	**0.00105**	**0.148**	**0.00042**	0.0000035	**0.00806**	**0.00293**	0.00049	**0.000117**	0.000009	0.00014	**0.00057**	**0.01330**	**0.0036**
	November		0.250	0.021	0.005	0.010	0.001	0.021	**0.00085**	**0.0011**	**0.00044**	**0.0119**	0.000013	**0.00049**	**0.00008**	0.00076	0.078	**0.00015**	0.0000028	**0.00271**	**0.00112**	0.00034	**0.000047**	0.000009	0.00014	**0.00021**	**0.00450**	0.0023
	December		0.250	0.019	0.005	0.010	0.001	0.013	0.00014	**0.0010**	0.00007	0.0053	0.000011	0.00023	0.00005	0.00063	0.046	0.00003	0.0000025	0.00022	0.00028	0.00027	0.000015	0.000009	0.00014	0.00004	**0.00041**	0.0017

Table 4-6: Base Case Water Quality Model Results, Discharge Node

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.0000260	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Active closure	January		**0.129**	**0.115**	0.006	0.011	0.001	**0.025**	**0.00048**	0.0008	**0.00026**	**0.0344**	0.000007	**0.00041**	0.00007	0.00083	0.045	**0.00019**	0.0000030	**0.00166**	**0.00082**	**0.00267**	0.000060	0.000033	**0.00061**	**0.00033**	**0.00263**	0.0019
	February		**0.068**	0.083	0.006	0.011	0.001	0.018	**0.00027**	0.0007	**0.00014**	**0.0183**	0.000006	0.00032	0.00006	0.00079	0.042	**0.00010**	0.0000027	**0.00087**	**0.00055**	**0.00159**	0.000050	0.000025	**0.00030**	**0.00018**	**0.00132**	0.0017
	March		**0.136**	**0.119**	0.006	0.011	0.001	**0.026**	**0.00052**	0.0008	**0.00027**	**0.0362**	0.000007	**0.00042**	0.00007	0.00084	0.045	**0.00020**	0.0000030	**0.00175**	**0.00085**	**0.00279**	0.000061	0.000034	**0.00065**	**0.00035**	**0.00277**	0.0019
	April		**0.391**	**0.172**	**0.008**	0.008	0.001	**0.053**	**0.00117**	**0.0010**	**0.00060**	**0.0845**	**0.000011**	**0.00066**	**0.00009**	0.00115	0.063	**0.00048**	**0.0000038**	**0.00404**	**0.00172**	**0.00540**	**0.000054**	**0.000055**	**0.00157**	**0.00079**	**0.00668**	**0.0026**
	May		**1.408**	**0.706**	**0.018**	0.010	**0.003**	**0.171**	**0.00471**	**0.0017**	**0.00251**	**0.3516**	**0.000025**	**0.00218**	**0.00020**	**0.00185**	**0.107**	**0.00201**	**0.0000079**	**0.01727**	**0.00617**	**0.02321**	**0.000220**	**0.000182**	**0.00665**	**0.00333**	**0.02831**	**0.0064**
	June		**0.881**	**0.429**	**0.013**	0.009	**0.002**	**0.110**	**0.00287**	**0.0013**	**0.00152**	**0.2132**	**0.000018**	**0.00139**	**0.00014**	**0.00148**	**0.084**	**0.00121**	**0.0000058**	**0.01041**	**0.00387**	**0.01399**	**0.000134**	**0.000116**	**0.00402**	**0.00201**	**0.01710**	**0.0045**
	July		**0.613**	**0.330**	**0.011**	0.011	**0.002**	**0.084**	**0.00215**	**0.0013**	**0.00114**	**0.1595**	**0.000011**	**0.00112**	**0.00012**	**0.00106**	0.067	**0.00091**	**0.0000049**	**0.00776**	**0.00282**	**0.01040**	**0.000101**	**0.000079**	**0.00300**	**0.00150**	**0.01276**	**0.0037**
	August		**0.811**	**0.434**	**0.013**	0.011	**0.002**	**0.107**	**0.00286**	**0.0015**	**0.00151**	**0.2115**	**0.000013**	**0.00142**	**0.00014**	**0.00119**	**0.076**	**0.00120**	**0.0000057**	**0.01033**	**0.00369**	**0.01387**	**0.000133**	**0.000104**	**0.00399**	**0.00199**	**0.01696**	**0.0044**
	September		**0.950**	**0.507**	**0.014**	0.012	**0.002**	**0.123**	**0.00334**	**0.0016**	**0.00177**	**0.2480**	**0.000015**	**0.00163**	**0.00016**	**0.00129**	**0.082**	**0.00141**	**0.0000063**	**0.01214**	**0.00430**	**0.01630**	**0.000155**	**0.000121**	**0.00468**	**0.00234**	**0.01992**	**0.0050**
	October		**1.238**	**0.538**	**0.015**	0.011	**0.002**	**0.128**	**0.00361**	**0.0017**	**0.00191**	**0.2653**	0.000025	**0.00170**	**0.00017**	**0.00131**	**0.087**	**0.00151**	**0.0000066**	**0.01302**	**0.00459**	**0.01761**	**0.000174**	**0.000133**	**0.00509**	**0.00251**	**0.02132**	**0.0054**
	November		**0.936**	**0.379**	**0.012**	0.011	**0.002**	**0.093**	**0.00255**	**0.0015**	**0.00135**	**0.1858**	0.000021	**0.00125**	**0.00013**	**0.00110**	0.074	**0.00106**	**0.0000053**	**0.00908**	**0.00326**	**0.01232**	**0.000125**	**0.000095**	**0.00358**	**0.00175**	**0.01488**	**0.0043**
	December		0.580	**0.191**	**0.008**	0.010	0.001	**0.051**	**0.00127**	**0.0012**	**0.00067**	**0.0918**	0.000016	**0.00071**	**0.00009**	0.00085	0.058	**0.00052**	**0.0000039**	**0.00442**	**0.00170**	**0.00605**	**0.000067**	**0.000050**	**0.00179**	**0.00086**	**0.00728**	0.0029
Post-closure	January		**0.021**	0.065	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00035	0.00072	0.000042	0.000019	0.00005	0.00006	0.00026	0.0015
	February		**0.021**	0.064	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00035	0.00072	0.000042	0.000019	0.00005	0.00006	0.00026	0.0015
	March		**0.023**	0.066	0.005	0.011	0.001	0.013	**0.00008**	0.0007	0.00005	0.0051	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00036	0.00072	0.000042	0.000019	0.00005	0.00006	0.00027	0.0015
	April		**0.095**	**0.030**	0.005	0.008	0.001	0.019	**0.00008**	0.0007	**0.00004**	0.0051	**0.000007**	0.00022	0.00005	0.00094	0.049	0.00003	**0.0000026**	0.00011	**0.00044**	0.00013	0.000005	**0.000017**	0.00006	**0.00004**	0.00027	0.0015
	May		**0.101**	**0.050**	0.006	0.008	0.001	0.018	**0.00008**	0.0007	**0.00004**	0.0051	**0.000008**	0.00022	0.00006	0.00094	0.049	0.00003	**0.0000026**	0.00012	**0.00049**	**0.00015**	0.000005	**0.000017**	0.00006	**0.00005**	0.00026	0.0015
	June		**0.098**	**0.040**	0.005	0.008	0.001	0.018	**0.00008**	0.0007	**0.00004**	0.0051	**0.000007**	0.00021	0.00006	0.00094	0.049	0.00003	**0.0000026**	0.00012	**0.00047**	0.00014	0.000005	**0.000017**	0.00006	**0.00005**	0.00026	0.0015
	July		0.031	0.037	0.005	0.011	0.001	0.017	0.00007	0.0009	**0.00004**	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	**0.0000026**	0.00012	0.00029	0.00012	0.000005	0.000005	0.00005	**0.00004**	0.00026	0.0015
	August		0.033	0.040	0.005	0.011	0.001	0.017	**0.00008**	0.0009	**0.00004**	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	**0.0000026**	0.00012	0.00030	0.00012	0.000005	0.000005	0.00006	**0.00004**	0.00027	0.0015
	September		0.034	0.043	0.005	0.011	0.001	0.017	**0.00008**	0.0009	**0.00004**	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	**0.0000026**	0.00012	0.00031	0.00013	0.000005	0.000005	0.00006	**0.00004**	0.00027	0.0015
	October		0.258	**0.048**	0.006	0.010	0.001	0.014	0.00012	**0.0010**	0.00006	0.0051	0.000012	0.00023	0.00006	0.00063	0.044	0.00003	**0.0000026**	0.00014	0.00033	0.00030	0.000014	0.000009	0.00014	**0.00005**	0.00027	0.0017
	November		0.257	0.041	0.005	0.010	0.001	0.014	0.00012	**0.0010**	0.00006	0.0051	0.000012	0.00023	0.00005	0.00063	0.044	0.00003	**0.0000026**	0.00014	0.00031	0.00029	0.000014	0.000009	0.00014	0.00005	0.00027	0.0017
	December		0.254	0.031	0.005	0.010	0.001	0.013	0.00010	**0.0010**	0.00006	0.0050	0.000012	0.00022	0.00005	0.00063	0.044	0.00003	**0.0000026**	0.00013	0.00029	0.00028	0.000014	0.000009	0.00014	0.00004	0.00026	0.0017

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Springpole Lake these data were as follows:

	25th	75th
pH	7.3	7.6
Hardness (mg/L)	29.4	
DOC (mg/L)	7.8	
Chloride (mg/L)	0.24	
Alkalinity (mg/L)	29.7	

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded purple values were determined to be measurably different than existing conditions (15% or greater change relative to baseline conditions).

Table 4-7: Base Case Water Quality Model Results, Node 09

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.0000260	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Existing condition	January		0.008	0.067	0.005	0.012	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000050	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	February		0.008	0.067	0.005	0.012	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000050	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	March		0.008	0.067	0.005	0.012	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.050	0.00003	0.0000050	0.00025	0.00025	0.00100	0.000050	0.000025	0.00005	0.00005	0.00025	0.0015
	April		0.056	0.017	0.005	0.009	0.001	0.021	0.00010	0.0006	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.050	0.00003	0.0000050	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	May		0.056	0.017	0.005	0.009	0.001	0.021	0.00010	0.0006	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.050	0.00003	0.0000050	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	June		0.056	0.017	0.005	0.009	0.001	0.021	0.00010	0.0006	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.050	0.00003	0.0000050	0.00009	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	July		0.025	0.037	0.005	0.011	0.001	0.023	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.050	0.00003	0.0000050	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.025	0.037	0.005	0.011	0.001	0.023	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.050	0.00003	0.0000050	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.025	0.037	0.005	0.011	0.001	0.023	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.050	0.00003	0.0000050	0.00010	0.00025	0.00009	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.488	0.030	0.005	0.011	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.00017	0.00025	0.00054	0.000028	0.000015	0.00005	0.00003	0.00025	0.0020
	November		0.488	0.030	0.005	0.011	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.00017	0.00025	0.00054	0.000028	0.000015	0.00005	0.00003	0.00025	0.0020
	December		0.488	0.030	0.005	0.011	0.001	0.016	0.00010	0.0006	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.00017	0.00025	0.00054	0.000028	0.000015	0.00005	0.00003	0.00025	0.0020
Construction	January		0.018	0.057	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000050	0.00021	0.00032	0.00072	0.000042	0.000019	0.00005	0.00005	0.00025	0.0015
	February		0.038	0.052	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000005	0.00025	0.00005	0.00076	0.040	0.00003	0.0000050	0.00020	0.00031	0.00062	0.000037	0.000017	0.00005	0.00004	0.00025	0.0015
	March		0.038	0.052	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000005	0.00025	0.00005	0.00076	0.040	0.00003	0.0000050	0.00020	0.00031	0.00062	0.000037	0.000017	0.00005	0.00004	0.00025	0.0015
	April		0.097	0.015	0.005	0.009	0.001	0.017	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00091	0.047	0.00003	0.0000050	0.00010	0.00037	0.00010	0.000006	0.000015	0.00005	0.00002	0.00025	0.0015
	May		0.097	0.015	0.005	0.009	0.001	0.017	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00091	0.047	0.00003	0.0000050	0.00010	0.00037	0.00010	0.000006	0.000015	0.00005	0.00002	0.00025	0.0015
	June		0.097	0.015	0.005	0.009	0.001	0.017	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00091	0.047	0.00003	0.0000050	0.00010	0.00037	0.00010	0.000006	0.000015	0.00005	0.00002	0.00025	0.0015
	July		0.045	0.022	0.005	0.011	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00067	0.041	0.00003	0.0000050	0.00011	0.00025	0.00010	0.000006	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.036	0.022	0.005	0.011	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00066	0.042	0.00003	0.0000050	0.00011	0.00025	0.00010	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.027	0.022	0.005	0.010	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00065	0.042	0.00003	0.0000050	0.00011	0.00025	0.00010	0.000005	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.257	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000012	0.00025	0.00005	0.00063	0.044	0.00003	0.0000050	0.00012	0.00025	0.00027	0.000014	0.000009	0.00005	0.00002	0.00025	0.0017
	November		0.258	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000012	0.00025	0.00005	0.00063	0.044	0.00003	0.0000050	0.00012	0.00025	0.00027	0.000014	0.000009	0.00005	0.00002	0.00025	0.0017
	December		0.258	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000012	0.00025	0.00005	0.00062	0.044	0.00003	0.0000050	0.00012	0.00025	0.00027	0.000014	0.000009	0.00005	0.00002	0.00025	0.0017
Operations	January		0.017	0.059	0.005	0.011	0.001	0.012	0.00012	0.0007	0.00007	0.0053	0.000006	0.00026	0.00006	0.00076	0.042	0.00003	0.0000050	0.00033	0.00037	0.00073	0.000044	0.000019	0.00005	0.00006	0.00045	0.0015
	February		0.017	0.059	0.005	0.011	0.001	0.013	0.00014	0.0007	0.00007	0.0054	0.000006	0.00026	0.00006	0.00077	0.043	0.00003	0.0000050	0.00036	0.00038	0.00073	0.000044	0.000019	0.00005	0.00007	0.00050	0.0015
	March		0.017	0.060	0.005	0.011	0.001	0.013	0.00016	0.0007	0.00008	0.0055	0.000006	0.00026	0.00006	0.00077	0.043	0.00003	0.0000050	0.00040	0.00039	0.00073	0.000045	0.000019	0.00005	0.00007	0.00055	0.0015
	April		0.087	0.016	0.005	0.008	0.001	0.018	0.00017	0.0007	0.00006	0.0056	0.000007	0.00023	0.00006	0.00095	0.053	0.00004	0.0000050	0.00031	0.00046	0.00011	0.000008	0.000017	0.00005	0.00004	0.00058	0.0016
	May		0.087	0.015	0.005	0.008	0.001	0.018	0.00013	0.0007	0.00005	0.0054	0.000007	0.00022	0.00006	0.00094	0.052	0.00003	0.0000050	0.00024	0.00044	0.00011	0.000007	0.000017	0.00005	0.00004	0.00048	0.0015
	June		0.087	0.015	0.005	0.008	0.001	0.026	0.00080	0.0009	0.00042	0.0119	0.000009	0.00048	0.00008	0.00107	0.084	0.00015	0.0000028	0.00269	0.00127	0.00018	0.000039	0.000017	0.00005	0.00020	0.00451	0.0021
	July		0.025	0.024	0.005	0.011	0.001	0.032	0.00152	0.0012	0.00081	0.0190	0.000006	0.00079	0.00009	0.00093	0.111	0.00029	0.0000032	0.00535	0.00202	0.00025	0.000074	0.000005	0.00005	0.00038	0.00888	0.0028
	August		0.026	0.025	0.005	0.011	0.001	0.038	0.00200	0.0013	0.00107	0.0236	0.000008	0.00097	0.00011	0.00103	0.134	0.00037	0.0000034	0.00707	0.00260	0.00030	0.000096	0.000005	0.00005	0.00050	0.01171	0.0032
	September		0.026	0.024	0.005	0.011	0.001	0.037	0.00196	0.0013	0.00104	0.0232	0.000008	0.00096	0.00011	0.00102	0.132	0.00037	0.0000034	0.00692	0.00255	0.00030	0.000094	0.000005	0.00005	0.00049	0.01146	0.0031
	October		0.259	0.021	0.005	0.011	0.001	0.036	0.00222	0.0014	0.00119	0.0254	0.000018	0.00102	0.00011	0.00104	0.145	0.00041	0.0000035	0.00775	0.00282	0.00049	0.000114	0.000009	0.00014	0.00055	0.01279	0.0035
	November		0.259	0.021	0.005	0.010	0.001	0.021	0.00082	0.0011	0.00042	0.0117	0.000014	0.00048	0.00008	0.00076	0.077	0.00015	0.0000028	0.00261	0.00109	0.00035	0.000046	0.000009	0.00014	0.00020	0.00433	0.0023
	December		0.259	0.019	0.005	0.010	0.001	0.013	0.00014	0.0010	0.00007	0.0053	0.000012	0.00023	0.00005	0.00063	0.046	0.00003	0.0000050	0.00022	0.00028	0.00028	0.000015	0.000009	0.00014	0.00004	0.00040	0.0017

Table 4-7: Base Case Water Quality Model Results, Node 09

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.0000260	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Active closure	January		**0.124**	**0.113**	0.006	0.011	0.001	**0.025**	**0.00046**	0.0008	**0.00025**	**0.0332**	0.000007	**0.00040**	0.00007	0.00083	0.045	**0.00019**	0.0000029	**0.00161**	**0.00079**	0.00079	0.000060	0.000033	**0.00059**	**0.00032**	**0.00253**	0.0019
	February		**0.065**	0.082	0.005	0.011	0.001	0.018	**0.00026**	0.0007	**0.00014**	**0.0177**	0.000006	0.00032	0.00006	0.00079	0.043	**0.00010**	0.0000027	**0.00084**	**0.00054**	0.00077	0.000050	0.000025	**0.00029**	**0.00018**	**0.00128**	0.0017
	March		**0.131**	**0.117**	0.006	0.011	0.001	**0.025**	**0.00050**	0.0008	**0.00026**	**0.0349**	0.000007	**0.00041**	0.00007	0.00084	0.045	**0.00020**	0.0000030	**0.00169**	**0.00082**	0.00080	0.000061	0.000034	**0.00062**	**0.00034**	**0.00267**	0.0019
	April		**0.377**	**0.166**	**0.008**	0.008	0.001	**0.052**	**0.00113**	**0.0009**	**0.00058**	**0.0813**	**0.000011**	**0.00064**	**0.00009**	0.00113	0.062	**0.00046**	0.0000037	**0.00388**	**0.00166**	**0.00027**	**0.000052**	**0.000053**	**0.00151**	**0.00076**	**0.00643**	**0.0026**
	May		**1.355**	**0.679**	**0.018**	0.010	**0.003**	**0.165**	**0.00453**	**0.0017**	**0.00241**	**0.3380**	**0.000024**	**0.00210**	**0.00020**	**0.00181**	**0.104**	**0.00193**	**0.0000077**	**0.01660**	**0.00594**	**0.00065**	**0.000211**	**0.000175**	**0.00640**	**0.00320**	**0.02721**	**0.0062**
	June		**0.848**	**0.413**	**0.013**	0.009	**0.002**	**0.106**	**0.00276**	**0.0013**	**0.00146**	**0.2050**	**0.000017**	**0.00134**	**0.00014**	**0.00146**	**0.082**	**0.00117**	0.0000056	**0.01001**	**0.00372**	**0.00042**	**0.000129**	**0.000112**	**0.00386**	**0.00193**	**0.01644**	**0.0043**
	July		**0.590**	**0.318**	**0.011**	0.011	**0.002**	**0.082**	**0.00207**	**0.0013**	**0.00109**	**0.1534**	**0.000010**	**0.00109**	**0.00012**	**0.00104**	0.067	**0.00087**	0.0000048	**0.00746**	**0.00272**	**0.00030**	**0.000097**	**0.000076**	**0.00288**	**0.00144**	**0.01227**	**0.0036**
	August		**0.780**	**0.418**	**0.013**	0.011	**0.002**	**0.104**	**0.00275**	**0.0014**	**0.00145**	**0.2033**	**0.000013**	**0.00137**	**0.00014**	**0.00117**	0.075	**0.00116**	0.0000056	**0.00993**	**0.00355**	**0.00035**	**0.000128**	**0.000100**	**0.00383**	**0.00192**	**0.01630**	**0.0043**
	September		**0.914**	**0.488**	**0.014**	0.012	**0.002**	**0.120**	**0.00321**	**0.0015**	**0.00170**	**0.2384**	**0.000015**	**0.00157**	**0.00015**	**0.00126**	**0.081**	**0.00136**	0.0000062	**0.01167**	**0.00414**	**0.00040**	**0.000149**	**0.000117**	**0.00450**	**0.00225**	**0.01914**	**0.0048**
	October		**1.209**	**0.518**	**0.014**	0.011	**0.002**	**0.124**	**0.00348**	**0.0017**	**0.00184**	**0.2550**	0.000025	**0.00165**	**0.00016**	**0.00128**	**0.086**	**0.00145**	0.0000064	**0.01251**	**0.00441**	0.00065	**0.000169**	**0.000128**	**0.00490**	**0.00241**	**0.02049**	**0.0053**
	November		**0.919**	**0.365**	**0.012**	0.011	**0.002**	**0.090**	**0.00246**	**0.0015**	**0.00130**	**0.1787**	0.000021	**0.00121**	**0.00013**	**0.00108**	0.073	**0.00102**	0.0000052	**0.00873**	**0.00314**	0.00056	**0.000121**	**0.000092**	**0.00345**	**0.00169**	**0.01431**	**0.0042**
	December		0.576	**0.185**	**0.008**	0.010	0.001	**0.050**	**0.00123**	**0.0012**	**0.00065**	**0.0884**	0.000016	**0.00070**	**0.00009**	0.00084	0.058	**0.00050**	0.0000038	**0.00426**	**0.00164**	0.00044	**0.000066**	**0.000049**	**0.00173**	**0.00082**	**0.00700**	0.0029
Post-closure	January		**0.021**	0.065	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00035	0.00073	0.000042	0.000019	0.00005	0.00006	0.00026	0.0015
	February		**0.021**	0.064	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00034	0.00073	0.000042	0.000019	0.00005	0.00006	0.00026	0.0015
	March		**0.022**	0.066	0.005	0.011	0.001	0.013	0.00008	0.0007	0.00005	0.0051	0.000006	0.00025	0.00005	0.00076	0.040	0.00003	0.0000026	0.00022	0.00035	0.00073	0.000043	0.000019	0.00005	0.00006	0.00027	0.0015
	April		**0.094**	**0.029**	0.005	0.008	0.001	0.019	0.00008	0.0007	0.00003	0.0051	**0.000007**	0.00022	0.00005	0.00094	0.049	0.00003	0.0000026	0.00011	**0.00044**	0.00012	0.000005	**0.000017**	0.00006	**0.00004**	0.00027	0.0015
	May		**0.099**	**0.048**	0.006	0.008	0.001	0.018	0.00008	0.0007	0.00004	0.0051	**0.000007**	0.00022	0.00006	0.00094	0.050	0.00003	0.0000026	0.00012	**0.00048**	**0.00015**	0.000005	**0.000017**	0.00006	**0.00005**	0.00026	0.0015
	June		**0.096**	**0.039**	0.005	0.008	0.001	0.018	0.00008	0.0007	0.00004	0.0051	**0.000007**	0.00021	0.00005	0.00094	0.050	0.00003	0.0000026	0.00012	**0.00046**	0.00014	0.000005	**0.000017**	0.00005	**0.00004**	0.00026	0.0015
	July		0.031	0.037	0.005	0.011	0.001	0.017	0.00007	0.0009	0.00003	0.0050	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	0.0000026	0.00012	0.00029	0.00012	0.000005	0.000005	0.00005	**0.00003**	0.00026	0.0015
	August		0.033	0.040	0.005	0.011	0.001	0.017	0.00008	0.0009	0.00003	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	0.0000026	0.00012	0.00030	0.00012	0.000005	0.000005	0.00006	**0.00004**	0.00027	0.0015
	September		0.034	0.043	0.005	0.011	0.001	0.017	0.00008	0.0009	0.00003	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	0.0000026	0.00012	0.00031	0.00013	0.000005	0.000005	0.00006	**0.00004**	0.00027	0.0015
	October		0.267	**0.048**	0.006	0.010	0.001	0.014	0.00012	**0.0010**	0.00006	0.0051	0.000012	0.00023	0.00006	0.00063	0.044	0.00003	0.0000026	0.00014	0.00033	0.00031	0.000014	0.000009	**0.00014**	**0.00005**	0.00027	0.0017
	November		0.266	0.040	0.005	0.010	0.001	0.014	0.00012	**0.0010**	0.00006	0.0051	0.000012	0.00023	0.00005	0.00063	0.044	0.00003	0.0000026	0.00014	0.00031	0.00030	0.000014	0.000009	**0.00014**	0.00005	0.00027	0.0017
	December		0.263	0.031	0.005	0.010	0.001	0.013	0.00011	**0.0010**	0.00006	0.0050	0.000012	0.00023	0.00005	0.00063	0.044	0.00003	0.0000026	0.00013	0.00028	0.00029	0.000014	0.000009	**0.00014**	0.00004	0.00026	0.0017

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Springpole Lake these data were as follows:

	25th	75th
pH	7.3	7.6
Hardness (mg/L)	29.4	
DOC (mg/L)	7.8	
Chloride (mg/L)	0.24	
Alkalinity (mg/L)	29.7	

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded purple values are estimated to be measurably different than existing conditions (here defined as a 15% or greater change relative to baseline conditions)

Table 4-8: Base Case Water Quality Model Results, Node 10

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Existing condition	January		0.008	0.067	0.005	0.009	0.001	0.014	0.00010	0.0007	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.039	0.00003	0.0000050	0.0002	0.00762	0.00100	0.00005	0.000028	0.00005	0.00005	0.00088	0.0015
	February		0.008	0.067	0.005	0.009	0.001	0.014	0.00010	0.0007	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.039	0.00003	0.0000050	0.0002	0.00762	0.00100	0.00005	0.000028	0.00005	0.00005	0.00088	0.0015
	March		0.008	0.067	0.005	0.009	0.001	0.014	0.00010	0.0007	0.00006	0.0050	0.000008	0.00025	0.00005	0.00076	0.039	0.00003	0.0000050	0.0002	0.00762	0.00100	0.00005	0.000028	0.00005	0.00005	0.00088	0.0015
	April		0.141	0.017	0.005	0.013	0.001	0.032	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.055	0.00003	0.0000050	0.0001	0.00394	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	May		0.141	0.017	0.005	0.013	0.001	0.032	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.055	0.00003	0.0000050	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	June		0.141	0.017	0.005	0.013	0.001	0.032	0.00010	0.0007	0.00006	0.0050	0.000002	0.00025	0.00005	0.00085	0.055	0.00003	0.0000050	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	July		0.030	0.037	0.005	0.010	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.045	0.00003	0.0000050	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.030	0.037	0.005	0.010	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.045	0.00003	0.0000050	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.030	0.037	0.005	0.010	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00064	0.045	0.00003	0.0000050	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.488	0.030	0.005	0.015	0.001	0.015	0.00010	0.0009	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.0001	0.00025	0.00054	0.00003	0.000005	0.00005	0.00003	0.00025	0.0020
	November		0.488	0.030	0.005	0.015	0.001	0.015	0.00010	0.0009	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.0001	0.00025	0.00054	0.00003	0.000005	0.00005	0.00003	0.00025	0.0020
	December		0.488	0.030	0.005	0.015	0.001	0.015	0.00010	0.0009	0.00006	0.0050	0.000026	0.00025	0.00005	0.00061	0.054	0.00003	0.0000050	0.0001	0.00025	0.00054	0.00003	0.000005	0.00005	0.00003	0.00025	0.0020
Construction	January		0.017	0.057	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00075	0.040	0.00003	0.0000050	0.0002	0.00060	0.00072	0.00004	0.000019	0.00005	0.00005	0.00027	0.0015
	February		0.037	0.052	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000005	0.00025	0.00005	0.00076	0.040	0.00003	0.0000050	0.0002	0.00055	0.00062	0.00004	0.000017	0.00005	0.00004	0.00027	0.0015
	March		0.037	0.052	0.005	0.011	0.001	0.012	0.00010	0.0007	0.00006	0.0050	0.000005	0.00025	0.00005	0.00076	0.040	0.00003	0.0000050	0.0002	0.00055	0.00062	0.00004	0.000017	0.00005	0.00004	0.00027	0.0015
	April		0.098	0.015	0.005	0.009	0.001	0.018	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00090	0.047	0.00003	0.0000050	0.0001	0.00037	0.00010	0.00001	0.000014	0.00005	0.00002	0.00025	0.0015
	May		0.099	0.015	0.005	0.009	0.001	0.018	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00090	0.047	0.00003	0.0000050	0.0001	0.00037	0.00010	0.00001	0.000014	0.00005	0.00002	0.00025	0.0015
	June		0.099	0.015	0.005	0.009	0.001	0.018	0.00010	0.0007	0.00006	0.0050	0.000006	0.00025	0.00005	0.00090	0.047	0.00003	0.0000050	0.0001	0.00037	0.00010	0.00001	0.000014	0.00005	0.00002	0.00025	0.0015
	July		0.045	0.022	0.005	0.011	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00067	0.041	0.00003	0.0000050	0.0001	0.00025	0.00010	0.00001	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.036	0.021	0.005	0.011	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00066	0.042	0.00003	0.0000050	0.0001	0.00025	0.00010	0.00001	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.027	0.021	0.005	0.010	0.001	0.016	0.00010	0.0008	0.00006	0.0050	0.000002	0.00025	0.00005	0.00065	0.042	0.00003	0.0000050	0.0001	0.00025	0.00010	0.00001	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.250	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000011	0.00025	0.00005	0.00063	0.045	0.00003	0.0000050	0.0001	0.00025	0.00027	0.00001	0.000009	0.00005	0.00002	0.00025	0.0017
	November		0.250	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000011	0.00025	0.00005	0.00062	0.045	0.00003	0.0000050	0.0001	0.00025	0.00027	0.00001	0.000009	0.00005	0.00002	0.00025	0.0017
	December		0.250	0.018	0.005	0.010	0.001	0.013	0.00010	0.0010	0.00006	0.0050	0.000012	0.00025	0.00005	0.00062	0.045	0.00003	0.0000050	0.0001	0.00025	0.00027	0.00001	0.000009	0.00005	0.00002	0.00025	0.0017
Operations	January		0.017	0.059	0.005	0.011	0.001	0.013	0.00012	0.0007	0.00007	0.0053	0.000006	0.00025	0.00006	0.00076	0.042	0.00003	0.0000050	0.0003	0.00065	0.00073	0.00004	0.000020	0.00005	0.00007	0.00046	0.0015
	February		0.017	0.059	0.005	0.011	0.001	0.013	0.00014	0.0007	0.00007	0.0054	0.000006	0.00026	0.00006	0.00076	0.043	0.00003	0.0000050	0.0004	0.00066	0.00073	0.00004	0.000020	0.00005	0.00007	0.00051	0.0015
	March		0.017	0.060	0.005	0.011	0.001	0.013	0.00015	0.0007	0.00008	0.0055	0.000006	0.00026	0.00006	0.00076	0.043	0.00003	0.0000050	0.0004	0.00067	0.00073	0.00004	0.000020	0.00005	0.00007	0.00057	0.0015
	April		0.089	0.016	0.005	0.008	0.001	0.019	0.00016	0.0007	0.00006	0.0056	0.000007	0.00025	0.00006	0.00094	0.053	0.00003	0.00002	0.0003	0.00046	0.00011	0.00001	0.000017	0.00005	0.00004	0.00057	0.0015
	May		0.089	0.015	0.005	0.008	0.001	0.019	0.00013	0.0007	0.00005	0.0054	0.000007	0.00025	0.00006	0.00093	0.052	0.00003	0.0000050	0.0002	0.00043	0.00011	0.00001	0.000016	0.00005	0.00004	0.00047	0.0015
	June		0.089	0.015	0.005	0.008	0.001	0.026	0.00077	0.0009	0.00040	0.0117	0.000009	0.00047	0.00007	0.00106	0.083	0.00015	0.0000028	0.0026	0.00123	0.00018	0.00004	0.000016	0.00005	0.00020	0.00434	0.0021
	July		0.025	0.023	0.005	0.011	0.001	0.032	0.00146	0.0011	0.00078	0.0185	0.000006	0.00077	0.00009	0.00092	0.109	0.00028	0.0000031	0.0052	0.00195	0.00025	0.00007	0.000005	0.00005	0.00037	0.00855	0.0027
	August		0.026	0.024	0.005	0.011	0.001	0.037	0.00193	0.0012	0.00102	0.0229	0.000007	0.00094	0.00011	0.00101	0.130	0.00036	0.0000033	0.0068	0.00251	0.00030	0.00010	0.000005	0.00005	0.00048	0.01127	0.0031
	September		0.026	0.024	0.005	0.011	0.001	0.036	0.00188	0.0012	0.00100	0.0225	0.000007	0.00093	0.00011	0.00100	0.128	0.00035	0.0000033	0.0067	0.00246	0.00030	0.00009	0.000005	0.00005	0.00047	0.01103	0.0031
	October		0.250	0.021	0.005	0.011	0.001	0.035	0.00213	0.0014	0.00114	0.0246	0.000017	0.00099	0.00011	0.00102	0.141	0.00039	0.0000034	0.0075	0.00272	0.00049	0.00011	0.000009	0.00014	0.00053	0.01231	0.0035
	November		0.250	0.020	0.005	0.010	0.001	0.020	0.00079	0.0011	0.00041	0.0114	0.000013	0.00047	0.00007	0.00075	0.076	0.00014	0.0000028	0.0025	0.00105	0.00035	0.00005	0.000009	0.00014	0.00020	0.00417	0.0023
	December		0.250	0.019	0.005	0.010	0.001	0.013	0.00014	0.0010	0.00007	0.0053	0.000012	0.00023	0.00005	0.00063	0.046	0.00003	0.0000050	0.0002	0.00028	0.00028	0.00002	0.000009	0.00014	0.00003	0.00040	0.0017

Table 4-8: Base Case Water Quality Model Results, Node 10

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	1.8	3	0.06	0.02	0.005	0.83	0.020	0.005	0.01100	1.50	0.0001	0.0089	0.00078	0.005	0.3	0.00906	0.000026	0.073	0.025	0.1	0.00025	0.0008	0.03000	0.005	0.12	0.011
Active closure	January		**0.120**	**0.111**	0.006	0.011	0.001	**0.024**	**0.00045**	0.0008	**0.00024**	**0.0321**	0.000007	**0.00040**	0.00007	0.00082	0.045	**0.00018**	0.0000029	**0.0016**	0.00106	0.00075	0.00006	0.000032	**0.00057**	**0.00032**	**0.00247**	0.0019
	February		**0.063**	0.081	0.005	0.011	0.001	0.018	**0.00026**	0.0007	**0.00014**	**0.0172**	0.000006	0.00031	0.00006	0.00079	0.042	**0.00009**	0.0000027	**0.0008**	0.00081	0.00075	0.00005	0.000025	**0.00028**	**0.00018**	0.00126	0.0016
	March		**0.126**	**0.114**	0.006	0.011	0.001	**0.025**	**0.00048**	0.0008	**0.00025**	**0.0338**	0.000007	**0.00041**	0.00007	0.00083	0.045	**0.00019**	0.0000030	**0.0016**	0.00108	0.00078	0.00006	0.000033	**0.00060**	**0.00033**	**0.00260**	0.0019
	April		**0.368**	**0.160**	**0.008**	0.008	0.001	**0.051**	**0.00108**	0.0009	**0.00056**	**0.0784**	**0.000011**	**0.00062**	**0.00009**	0.00112	0.062	**0.00044**	0.0000037	**0.0037**	0.00161	0.00024	0.00005	**0.000051**	**0.00145**	**0.00073**	**0.00619**	**0.0025**
	May		**1.308**	**0.653**	**0.017**	0.010	**0.003**	**0.160**	**0.00436**	**0.0017**	**0.00232**	**0.3254**	**0.000024**	**0.00203**	**0.00019**	**0.00177**	**0.102**	**0.00186**	**0.0000075**	**0.0160**	**0.00572**	0.00056	0.00021	**0.000169**	**0.00615**	**0.00308**	**0.02618**	**0.0061**
	June		**0.821**	**0.397**	**0.012**	0.009	**0.002**	**0.103**	**0.00265**	**0.0013**	**0.00141**	**0.1973**	**0.000017**	**0.00130**	**0.00014**	**0.00143**	0.081	**0.00112**	0.0000055	**0.0096**	**0.00359**	0.00038	0.00013	**0.000108**	**0.00372**	**0.00186**	**0.01582**	**0.0042**
	July		**0.568**	**0.306**	**0.010**	0.011	**0.002**	**0.079**	**0.00199**	**0.0013**	**0.00105**	**0.1477**	**0.000010**	**0.00105**	**0.00011**	**0.00103**	0.066	**0.00084**	0.0000047	**0.0072**	**0.00263**	0.00030	0.00010	**0.000073**	**0.00277**	**0.00138**	**0.01180**	**0.0035**
	August		**0.751**	**0.402**	**0.012**	0.011	**0.002**	**0.101**	**0.00265**	**0.0014**	**0.00139**	**0.1957**	**0.000012**	**0.00133**	**0.00014**	**0.00115**	**0.074**	**0.00111**	0.0000055	**0.0096**	**0.00343**	0.00037	0.00013	**0.000096**	**0.00369**	**0.00184**	**0.01569**	**0.0042**
	September		**0.880**	**0.470**	**0.013**	0.012	**0.002**	**0.116**	**0.00309**	**0.0015**	**0.00164**	**0.2295**	**0.000014**	**0.00152**	**0.00015**	**0.00124**	**0.079**	**0.00131**	0.0000060	**0.0112**	**0.00399**	0.00042	0.00015	**0.000112**	**0.00433**	**0.00216**	**0.01842**	**0.0047**
	October		**1.164**	**0.498**	**0.014**	0.011	**0.002**	**0.119**	**0.00335**	**0.0017**	**0.00177**	**0.2455**	0.000024	**0.00159**	**0.00016**	**0.00126**	**0.084**	**0.00140**	0.0000063	**0.0120**	**0.00426**	0.00061	0.00017	**0.000124**	**0.00472**	**0.00232**	**0.01972**	**0.0051**
	November		**0.885**	**0.352**	**0.011**	0.011	**0.002**	**0.087**	**0.00236**	**0.0015**	**0.00125**	**0.1720**	0.000020	**0.00117**	**0.00013**	**0.00106**	0.072	**0.00098**	0.0000051	**0.0084**	**0.00303**	0.00052	0.00012	**0.000089**	**0.00332**	**0.00162**	**0.01377**	**0.0041**
	December		0.555	**0.178**	**0.008**	0.011	0.001	**0.049**	**0.00118**	0.0012	**0.00063**	**0.0852**	0.000016	**0.00068**	**0.00009**	0.00083	0.058	**0.00048**	0.0000038	**0.0041**	**0.00159**	0.00040	0.00007	**0.000047**	**0.00166**	**0.00079**	**0.00674**	0.0028
Post-closure	January		**0.020**	0.058	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000007	0.00025	0.00005	0.00075	0.041	0.00003	0.0000026	0.0002	0.00034	0.00072	0.00004	0.000019	**0.00006**	0.00006	0.00026	0.0015
	February		**0.020**	0.057	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0050	0.000006	0.00025	0.00005	0.00076	0.041	0.00003	0.0000026	0.0002	0.00034	0.00074	0.00004	0.000019	0.00005	0.00006	0.00026	0.0015
	March		**0.021**	0.060	0.005	0.011	0.001	0.013	0.00007	0.0007	0.00005	0.0051	0.000006	0.00025	0.00005	0.00076	0.041	0.00003	0.0000026	0.0002	0.00035	0.00074	0.00004	0.000019	0.00005	**0.00006**	0.00027	0.0015
	April		0.096	**0.026**	0.005	0.008	0.001	0.019	0.00008	0.0007	0.00003	0.0051	**0.000007**	0.00022	0.00005	0.00093	0.049	0.00003	0.0000026	0.0001	0.00043	**0.00016**	**0.00001**	**0.000017**	0.00006	**0.00004**	0.00027	0.0015
	May		0.101	**0.042**	0.006	0.008	0.001	0.018	0.00008	0.0007	0.00003	0.0051	**0.000007**	0.00022	0.00006	0.00093	0.050	0.00003	0.0000026	0.0001	**0.00047**	**0.00015**	0.00001	**0.000016**	0.00006	**0.00005**	0.00026	0.0015
	June		0.098	**0.034**	0.005	0.008	0.001	0.019	0.00008	0.0007	0.00003	0.0051	**0.000007**	0.00021	0.00005	0.00093	0.050	0.00003	0.0000026	0.0001	**0.00045**	**0.00014**	0.00001	**0.000016**	0.00005	**0.00004**	0.00026	0.0015
	July		0.031	0.032	0.005	0.011	0.001	0.017	0.00007	0.0009	0.00003	0.0050	0.000003	0.00025	0.00005	0.00066	0.042	0.00003	0.0000026	0.0001	0.00029	**0.00012**	0.00001	0.000005	0.00005	**0.00003**	0.00026	0.0015
	August		0.033	0.035	0.005	0.011	0.001	0.017	0.00008	0.0009	0.00003	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	0.0000026	0.0001	**0.00030**	**0.00012**	0.00001	0.000005	0.00006	**0.00004**	0.00027	0.0015
	September		0.033	0.038	0.005	0.011	0.001	0.017	0.00008	0.0009	0.00003	0.0051	0.000003	0.00025	0.00005	0.00065	0.042	0.00003	0.0000026	0.0001	**0.00030**	**0.00013**	0.00001	0.000005	0.00006	**0.00004**	0.00027	0.0015
	October		0.258	**0.040**	0.006	0.010	0.001	0.014	**0.00012**	0.0010	0.00006	0.0051	0.000012	0.00023	0.00006	0.00063	0.045	0.00003	0.0000026	0.0001	**0.00032**	0.00030	0.00001	**0.000009**	0.00014	**0.00005**	0.00027	0.0017
	November		0.257	0.030	0.005	0.010	0.001	0.014	**0.00012**	0.0010	0.00006	0.0051	0.000013	0.00023	0.00005	0.00063	0.045	0.00003	0.0000026	0.0001	**0.00031**	0.00031	0.00001	**0.000010**	0.00015	**0.00005**	0.00027	0.0017
	December		0.254	0.027	0.005	0.010	0.001	0.014	0.00011	0.0010	0.00006	0.0050	0.000013	0.00023	0.00005	0.00063	0.045	0.00003	0.0000026	0.0001	0.00028	0.00030	0.00001	**0.000009**	0.00015	0.00004	0.00026	0.0017

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For Springpole Lake these data were as follows:

	25th	75th
pH	7.3	7.6
Hardness (mg/L)	29.4	
DOC (mg/L)	7.8	
Chloride (mg/L)	0.24	
Alkalinity (mg/L)	29.7	

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded values are estimated to be measurably different than existing conditions (here defined as a 15% or greater change relative to baseline conditions)

Table 4-9: Base Case Water Quality Model Results, Node 3

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**0.005**	**0.83**	**0.020**	**0.005**	**0.01100**	**1.50**	**0.0001**	**0.0089**	**0.00078**	**0.005**	**0.3**	**0.00906**	**0.000026**	**0.073**	**0.025**	**0.1**	**0.00025**	**0.0008**	**0.03000**	**0.005**	**0.12**	**0.011**
Existing Condition	**January**	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	December	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
Construction	**January**	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	December	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
Operations	**January**	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.00000	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	December	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
Active Closure	**January**	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March	0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June	0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September	0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November	0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015

Table 4-9: Base Case Water Quality Model Results, Node 3

Project Phase	Month	Parameter	Ammonia-N	Nitrate-N	Nitrite-N	Phosphorus	Total Cyanide	Aluminum	Antimony	Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Tungsten	Uranium	Vanadium	Zinc
		WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**0.005**	**0.83**	**0.020**	**0.005**	**0.01100**	**1.50**	**0.0001**	**0.0089**	**0.00078**	**0.005**	**0.3**	**0.00906**	**0.000026**	**0.073**	**0.025**	**0.1**	**0.00025**	**0.0008**	**0.03000**	**0.005**	**0.12**	**0.011**
	December		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
Initial Closure	**January**		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	December		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
Post Closure	**January**		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	February		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	March		0.014	0.050	0.005	0.011	0.001	0.009	0.00005	0.0011	0.00005	0.0050	0.000002	0.00025	0.00005	0.00068	0.035	0.00003	0.0000025	0.0003	0.00050	0.00100	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015
	April		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	May		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	June		0.110	0.010	0.005	0.007	0.001	0.016	0.00005	0.0008	0.00005	0.0050	0.000010	0.00020	0.00005	0.00100	0.050	0.00003	0.0000025	0.0001	0.00050	0.00011	0.00000	0.000025	0.00005	0.00002	0.00025	0.0015
	July		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	August		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	September		0.023	0.010	0.005	0.010	0.001	0.012	0.00005	0.0010	0.00005	0.0050	0.000002	0.00025	0.00005	0.00065	0.038	0.00003	0.0000025	0.0001	0.00025	0.00010	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	October		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	November		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015
	December		0.104	0.010	0.005	0.009	0.001	0.011	0.00005	0.0012	0.00001	0.0050	0.000002	0.00020	0.00005	0.00063	0.038	0.00003	0.0000025	0.0001	0.00025	0.00009	0.00000	0.000005	0.00005	0.00002	0.00025	0.0015

Notes:
All units are mg/L
Water quality model results summarized in this table are Base Case (Expected Case); results of model sensitivity cases are presented in Attachment C and Attachment D
WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-2.
As applicable, numerical guideline values were calculated using the most conservative approach (i.e., 25th percentile baseline values for ameliorating factors, save for zinc, which uses 75th percentile pH for the FEQG calculation). For L-20 these data were as follows:

	25^{th}	75^{th}
pH		
Hardness (mg/L)		
DOC (mg/L)		
Chloride (mg/L)		
Alkalinity (mg/L)		

Only model results for parameters with WQG PAL are summarized here
Grey shaded values are greater than water quality guidelines (none).
Bolded values are estimated to be measurably different than existing conditions ((here defined as a 15% or greater change relative to baseline conditions)

5.0 SUMMARY

The surface water quality model aims to evaluate the potential effects of the proposed Project on concentrations of water quality parameters to support the understanding of how Project activities might alter water quality and to confirm that mitigation measures are appropriately designed. The model was conducted to assess the effects of development of the Project on the surface water quality of Birch Lake, Springpole Lake (north basin and the southeast arm) and local inland waterbodies. The surface water quality model was developed based on surface water quality baseline data collected through 2022, as well as inputs from the following technical supporting studies:

- Mine Site Water Balance Report (WSP 2024b)
- Mine Site Water Quality Model Report (WSP 2024c)
- Receiver Water Balance Report (WSP 2024d)
- CORMIX Mixing Study - Treated Effluent Discharge (Attachment A of this report)

The model was employed to stimulate changes to the concentration of water quality parameters in treated effluent discharge, bypass seepage, pit water quality, and the surface water receiving environment. Modelled parameters included

- Parameters with PWQO and iPWQO for the protection of aquatic life
- Nutrients and anions (nitrate, nitrate, ammonia, phosphorus, sulphate)
- Parameters identified by the Ontario Mine Closure Plan Regulation (O. Reg 240/00)
- Parameters with effluent criteria as per the MDMER

Simulations were conducted for construction, operation, active closure and post-closure. To support the effects assessment, water quality model results were benchmarked against a consistent set of WQG PAL as per the latest guidance from the MECP. The WQG PAL are based on rigorous study to specifically safeguard the most sensitive life stages of aquatic species for periods of indefinite exposure. This approach aligns with the evolving regulatory landscape and reflects the commitment to adhere to the most up-to-date standards in safeguarding aquatic ecosystems.

Key results of the surface water quality model are:

- The general patterns in water quality results for most assessment nodes can be related to seasonal water balance and the conservative model assumptions regarding seepages from the CDF.
- While some parameters increase relative to baseline concentrations, no concentrations of water quality parameters are greater than WQG PAL in any phase of the Project.
- CORMIX modelling was conducted to characterize mixing of treated effluent discharge to the southeast arm indicates that the full hydrodynamic mixing of treated effluent discharge will be achieved by a maximum of 100 m downstream of the discharge point in a worst-case flow condition (7Q20).

6.0 REFERENCES

Lorax Environmental Services (Lorax). 2022. Springpole Gold Project: Predictive Modeling of Pit Lake Water Quality.

MECP 2021. B-1-5 Deriving Receiving Water Based Point Source Effluent Requirements for Ontario Waters. Published June 26 2016; Updated Jul 12, 2021.

WSP Canada Inc. (WSP). 2024a. Springpole Gold Project. Surface Water Quality Baseline. August 2024

WSP Canada Inc. (WSP). 2024b. Springpole Gold Project, Mine Site Water Balance Report. July 2024.

WSP Canada Inc. (WSP). 2024c. Springpole Gold Project, Mine Site Water Quality Estimate for Mine Operations and Closure. July 2024.

WSP Canada Inc. (WSP). 2024d. Springpole Gold Project, Receiver Water Balance Report. July 2024.

WSP Canada Inc. (WSP). 2024e. Springpole Gold Project, Hydrogeological Modelling Report. July 2024.

WSP Canada Inc. (WSP). 2024f. Springpole Gold Project, Air Quality Modelling Report.

WSP Canada Inc. (WSP). 2024g. Springpole Gold Project. Geochemistry Technical Support Documents.

WSP Canada Inc. (WSP). 2024h. Springpole Gold Project, DRAFT *Fisheries Act*, Paragraph 35(2)(b) Authorization, Offset Plan and MDMER Schedule 2 Fish Habitat Compensation Plan. July 2024.

Attachment A Treated Effluent Discharge Mixing Study

Treated Effluent Discharge Mixing Study

Springpole Gold Project

Red Lake District, Northwest Ontario

ONS2104

Prepared by:
WSP Canada Inc.

October 2024

Report Name
Springpole Gold Project

Red Lake District, Northwest Ontario
Project #ONS2104

Prepared for:

First Mining Gold Corp.
Suite 2070, 1188 West Georgia Street
Vancouver, British Columbia, V6E 4A2

Prepared by:

WSP Canada Inc.
6925 Century Avenue, Suite 600
Mississauga, Ontario, L5N 7K2
Canada
T: (905) 567-4444

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1.0 INTRODUCTION

First Mining Gold Corp. (FMG) proposes to develop, operate, and eventually decommission / close an open pit gold and silver mine and ore process plant with supporting facilities known as the Springpole Gold Project (Project). The Project is in a remote area of northwestern Ontario, approximately 110 kilometres (km) northeast of the Municipality of Red Lake and 145 km north of the Municipality of Sioux Lookout (Figure 1-1).

An environmental assessment (EA) pursuant to the *Canadian Environmental Assessment Act, 2012* and the *Ontario Environmental Assessment Act* is required to be completed for the Project. This report is one of a series of reports prepared by WSP Canada Inc. (WSP) to characterize and describe the predicted environmental effects of the Project.

An environmental assessment (EA) pursuant to the *Canadian Environmental Assessment Act, 2012* and the *Ontario Environmental Assessment Act* is required to be completed for the Project. This report is one of a series of Technical Support Documents prepared by WSP Canada Inc. (WSP) on bfehalf of FMG to support the predicted environmental effects of the Project.

During the consultation process, Project-specific input from regulatory agencies and Indigenous communities was considered at key milestones of the EA process including baseline studies, alternatives, assessment approach, mitigation and monitoring where appropriate. A comprehensive draft Environment Impact Statement / Environmental Assessment (EIS/EA) document was consulted on over the course of more than 2 years leading up the final submission. An overview of the consultation input that was considered during the effects assessment in relation to this report is summarized in Sections 6.6 to 6.9 of the final EIS/EA. The updated mixing modelling, presented in this report, includes additional simulations, outputs, and discussion based on the additional field data/information collected since the preparation of the draft EIS/EA.

1.1 Purpose and Scope

WSP has completed an effluent mixing study for a combined treated effluent discharge into the southeast arm of Springpole Lake from the Project effluent treatment plant (ETP) and sewage treatment plant (STP). This evaluation of effluent mixing in the southeast arm of Springpole Lake was completed using the Cornell Mixing Zone Expert System (CORMIX), assuming discharge via a multiport diffuser. A pipeline will convey the treated effluent from the ETP and STP to the southeast arm of Springpole Lake. The proposed effluent discharge location is shown in Figure 1-2.

This report describes the methodology, model inputs and the results of the effluent mixing study that has been conducted in support of the EIS/EA. This report supersedes the mine site mixing modeling report prepared for the draft EIS/EA (Wood, 2022).

1.2 Project Overview

The Project is proposed to be mined as an open pit. To allow for the development and safe operation of the open pit mine, dikes will be established to facilitate controlled dewatering of the open pit basin. Ore from the open pit will be processed in an onsite process plant at approximately 30,000 tonnes per day (tpd). Mine rock and tailings resulting from the processing of ore will be stored in a co-disposal facility (CDF).

The main components of the Project include:

- Open pit;
- Dikes (Cofferdams) (west dike and east dike);

- CDF for mine rock and tailings (north cell and south cell);
- Surficial soil stockpile;
- Ore stockpiles;
- Process plant or process plant complex;
- Buildings and supporting infrastructure;
- Water management and treatment facilities;
- Fish habitat development area;
- Accommodations complex;
- Aggregate operation(s);
- Transmission line; and
- Mine access road and co-located airstrip.

The Project is expected to be developed over a three-year period. The mine site will be operated for a period of approximately 10 years. Decommissioning and closure of the site is expected to be up to approximately five years in length and will be followed by a period of environmental monitoring. The different phases of the Project include:

Construction Phase

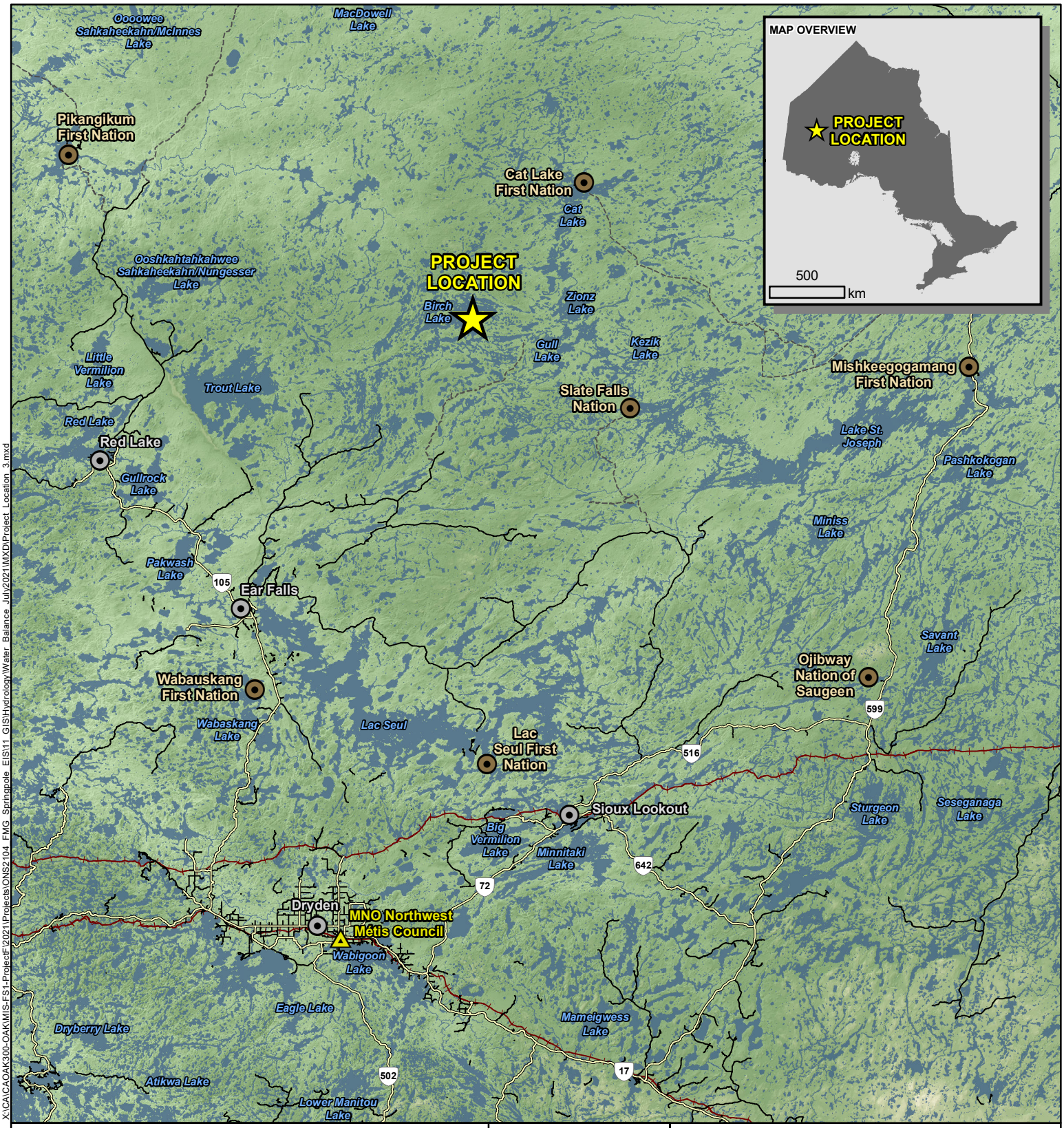
- Years -3 to -1, representing the construction period for the Project.

Operations Phase

- Years 1 to 10, with the first year potentially representing a partial year as the Project transitions from construction into operations. Mining of the ore from the open pit will end in Year 10, at which time the pit will begin refilling with water.

Decommissioning and Closure Phase

- Active Closure: Years 10 and 15, when final decommissioning and the majority of active reclamation activities are carried out.
- Post-Closure: Years 16+, corresponding to the post-closure monitoring period for the Project and when the filled open pit basin will be reconnected to Springpole Lake.



X:\CA\CA0AK300-OAK\MIS-FS1-Proiecf'2021\Projects\ONS2104 FMG Springpole EIS\11 GIS\Hydrology\Water Balance July2021\MXD\Project Location 3.mxd

LEGEND

- Project Location
- Town
- First Nation Reserve
- MNO Northwest Métis Council
- Highway
- Secondary Road
- Resource / Winter Road
- Railway

0 12.5 25 50 75 100 Kilometres

NOTES:
- Topographic information extracted from LIO, MNRF.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Project Location

PROJECT N°: ONS2104	FIGURE: 1-1
SCALE: 1:1,500,000	DATE: November 2023

545000 550000 555000 560000 565000

5695000

5690000

5685000

OVERVIEW MAP

Enlarged Area

10 Km

PROJECT LOCATION

Fresh Water Intake Location

East Dike

West Dike

Treated Effluent Discharge Point

Birch Lake

Dole Lake

Springpole Lake (North Basin)

Springpole Lake (Southeast Arm)

Durkin Lake

Birch River

Cromarty Lake

Satterly Lake

Seagrave Creek

Seagrave Lake

Graydarl Lake

101 102 103 104 105 106 107 108

L-1 L-10 L-11 L-12 L-13 L-14 L-16 L-19 L-20

X:\CA\CAOAK300-OAK\MIS-FS1-Project\F2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\Hydrology\Mine_Site_Water_Balance_Feb2022\MXD\Footprint_in_Natural_Springpole_Watershed_8.mxd

LEGEND

- Project Location
- Fresh Water Intake Location
- Treated Effluent Discharge Point
- Effluent Discharge Pipeline
- Contour (10 m intervals)
- Watercourse
- Waterbody
- Flow Direction
- Watershed Outlet Flow Direction
- Cumulative Watershed to Springpole Lake Oulet
- Pre-developement Springpole Lake Subwatershed
- Project Watersheds (Labelled with ID)
- Dike

0 1 2 4 6 8 10 Kilometres

NOTES:
- Topographic information extracted from LIO, MNRF.
- Watershed delineations based on data provided by Aquaspheara, data obtained through the Ontario Flow Assessment Tool (OFAT) and LiDAR provided by First Mining Gold, 2020.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

FIRST MINING GOLD

WSP

SPRINGPOLE GOLD PROJECT

Site Plan (Footprint) with Discharge Location, Springpole Lake (Southeast Arm)

PROJECT N°: ONS2104 | **FIGURE: 1-2**

SCALE: 1:70,000 | DATE: December 2023

2.0 CORMIX INPUTS AND METHODOLOGY

Effluent mixing was modeled using CORMIX, Version 12.0. Details on the software capabilities are available in Doneker and Jirka (2007); a brief summary is provided below.

CORMIX is a United States Environmental Protection Agency-approved mixing zone hydrodynamic model, widely used for the mixing analysis and outfall design of urban and industrial discharges into waterbodies. The system predicts mixing behavior and plume geometry based on ambient conditions and discharge characteristics. The model incorporates the configuration of the effluent discharge and provides a high resolution of effluent mixing behavior for the near-field region, where source properties dominate the mixing process. Effluent mixing in the near-field region is mostly affected by momentum flux, buoyancy flux and outfall geometry. As the plume travels further away from the source (i.e., into the far-field region), ambient conditions begin to dominate the trajectory and dilution of the plume through bulk mixing, buoyant spreading and passive diffusion due to ambient turbulence. Given the CORMIX formulation, prediction accuracy may be reduced in scenarios where a high-energy effluent is introduced into a lower-energy environment, such as the southeast arm of Springpole Lake.

Table 2–1 summarizes model inputs for the base case mixing scenario considered. Figure 2–1 provides a schematic cross-section illustrating the ambient geometry and discharge configuration inputs. The cross section of the receiving waterbody is represented as a rectangular, straight uniform channel to conform with model input requirements. The schematized cross section is shown in Figure 2–1. The following sections discuss inputs and assumptions applied for the treated effluent mixing study in further detail.

2.1 Ambient Geometry

The treated effluent will be discharged to the southeast arm of Springpole Lake (Figure 1-2). Effluent discharge was modelled using a diffuser located in the narrow channel connecting the north basin to the east arm of Springpole Lake. As a channel, a bounded cross-section was modelled. Based on bathymetry available in FMG and C. Portt and Associates (2018), the channel is approximately 160 meters (m) wide and up to 4 m deep at the proposed discharge location.

The ambient environment of the discharge location was modelled for 7Q20 low flow conditions in the receiving environment, consistent with MECP Policy B-1-5 for deriving receiving water based point source effluent requirements for Ontario waters (https://www.ontario.ca/page/b-1-5-deriving-receiving-water-based-point-source-effluent-requirements-ontario-water, *accessed January 2024*). The 7Q20 low flow condition is defined as the lowest consecutive 7-day average flow that is expected to occur in a 20-year return period. Low flows are most likely to occur in March when there are ice conditions because the ice conditions reduce the effective channel width and depth. The bottom surface of the ice was assumed to form at approximately the 7Q20 water level. The water level corresponding to the 7Q20 flow condition was calculated as 390.27 m asl, based on the rating curve developed for Springpole Lake outflow (WSP, 2024a).

The model was simulated assuming open channel flow. It was assumed that there would be no differences in mixing properties due to the hydraulics of flow under ice. Figure 2–1 provides a schematic illustrating the channel cross-section under ice conditions. The average depth (model input, HA) across the cross section assumed under ice conditions is 1.99 m; the depth at discharge (model input, HD) was assumed to be equal to HA (Table 2–1; Figure 2–1). The effective channel width under ice conditions was assumed to be 110 m (Table 2–1; Figure 2–1).

2.2 Ambient and Effluent Discharge Flow Rates

The ambient environment was modelled under 7Q20 flow conditions. The 7Q20 low flow condition is defined as the lowest consecutive 7-day average flow that is expected to occur in a 20-year return period. A regression analysis was performed as described in the Hydrology Baseline Report (WSP, 2024a) to estimate the 7Q20 flow values for the inlet and outlet of Springpole Lake. The regional Water Survey of Canada (WSC) stations used in the regression analysis are Cat River below Wesleyan Lake (04GA002), Trout Lake River above Big Falls (05QC003), Sturgeon River at McDougall Mills (05QA004), Pashkokogan River at Outlet of Paskokogan Lake (04GA003), Cedar River below Wabaskang Lake (05QE008), English River at Umfreville (05QA002), Roseberry River at Roseberry Lakes (04CA003), and Long-Legged River below Long-Legged Lake (05QE012) (WSP, 2024a).. The drainage area associated with the discharge location was estimated to be 1,308 km^2 using the Ministry of Natural Resources and Forestry Ontario Flow Assessment Tool. The results of the regression analysis were applied to this drainage area to estimate the 7Q20 flow value at the discharge location. The resulting 7Q20 flow value at the treated effluent discharge location is 1.25 m^3/s (Table 2–1).

The WSC station Sturgeon River at McDougall Mills (05QA004) was selected as the most representative station for Springpole Lake (WSP, 2024a). To determine the expected timing of a 7Q20 low flow event, the historical timing of the 7-day annual low flow period at this station from 1962 to 2021 was analyzed. Table 2–2 summarizes the occurrence of the 7-day low flow observed by month at Sturgeon River Station (05QA004), which demonstrates that the 7Q20 low flow event is most likely to occur in March.

Effluent discharge rates used in this CORMIX study were provided by the mine site water balance developed for the Project (WSP, 2024b). This CORMIX study considered effluent discharge rates for 3 different Project phases: construction, operations, and decommissioning and closure – active closure. For each Project phase, the maximum monthly discharge, assuming average climate conditions, was selected. Effluent discharge rates for each Project phase are presented in Table 2–3.

As is standard practice, effluent was simulated as a conservative tracer with an initial effluent strength of 100%.

2.3 Discharge Configuration

The simulation of the mixing process was carried out using CORMIX 2 (multiport diffuser). A schematic depicting the modeled discharge configuration is presented in Figure 2–1. Table 2–4 summarizes the inputs related to the discharge configuration. The model incorporated a 10-port unidirectional diffuser placed in the center of the channel with the ports pointing downstream slightly upwards at a vertical angle of 20°. A deeply submerged discharge was modeled, with the height of the port centres (H0) above the bottom of the schematized bounded cross section being less than one-third of the depth at discharge (HD).

2.4 Other CORMIX Inputs

2.4.1 Ambient and Effluent Density

The CORMIX model determines buoyancy flux characteristics based on effluent and ambient density differences. Buoyancy flux is a measure of the tendency for the effluent flow to rise (i.e., positive buoyancy) or to fall (i.e. negative buoyancy). Effluent discharge has the same density as ambient (Table 2–1) as the effluent flow will have a similar temperature to the ambient flow, as total dissolved solids (TDS) or temperature data for the expected effluent are not available.

The Manning's n value represents roughness characteristics of the ambient environment and is used in the model to calculate the friction parameters that influence the far-field mixing zone. Since the mixing process in the near-field region is governed by the initial jet characteristics (momentum flux, buoyancy flux and

outfall geometry), the Manning's n value is not expected to appreciably affect results for near-field mixing. A Manning's n value of 0.038 was assumed (Table 2–1), representative of a rock-cut channel (Chow, 1959).

Buoyancy effects on mixing tend to have the greatest impact beyond the initial turbulent mixing zone after most of the initial jet velocity has dissipated. In the modeled scenarios, complete vertical mixing is generally achieved very shortly after leaving the port, meaning that the impact of effluent density on the mixing zone would likely be very small.

2.4.2 Wind Speed

Wind speed is not important for near-field mixing but can impact plume behavior in the far-field, particularly for heated discharges, as wind impacts surface heat transfer and buoyant spreading processes (Doneker and Jirka, 2007). This study focuses on near-field mixing conservatively under assumed ice cover in an low flow (March) condition and involves a neutrally buoyant discharge (Section 2.4.1). Therefore, wind is not expected to affect the results of this study. No wind effects were assumed due to ice cover.

Table 2–1: CORMIX Model Inputs

7Q20 Ambient Flow Rate (m^3/s)	Effective Average Ambient Depth, HA (m)	Effective Depth at Discharge Location, HD (m)	Effective Channel Width (m)	Manning's n value	Effluent and Ambient Water Density (kg/m^3)	Wind Speed (m/s)
1.25	1.99	1.99	110	0.038	1,000	0

Notes:
Effective depth (HA, HD) and channel width assume water surface at 7Q20 flow based on Springpole Lake outflow rating curve (WSP, 2024a).

Table 2–2: Occurrence of 7-Day Low Flow by Month at Sturgeon River at McDougall Mills (05QA004)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Occurrence of 7-Day Low Flow	13%	10%	18%	15%	2%	0%	0%	5%	7%	8%	7%	15%

Notes:
The statistics presented in the table were based on records from 1961 to 2021excluding the years with missing data within the period of record. A total of 60 years of complete data available and used.

Table 2–3: Maximum Monthly Effluent Discharge Rate for Each Project Phase

Project Phase	Effluent Discharge Rate	
	m^3/day	m^3/s
Construction	18,961	0.22
Operations	9,722	0.11
Active Closure	20,790	0.24

Note: STP discharge is assumed to have ceased during active closure phase.

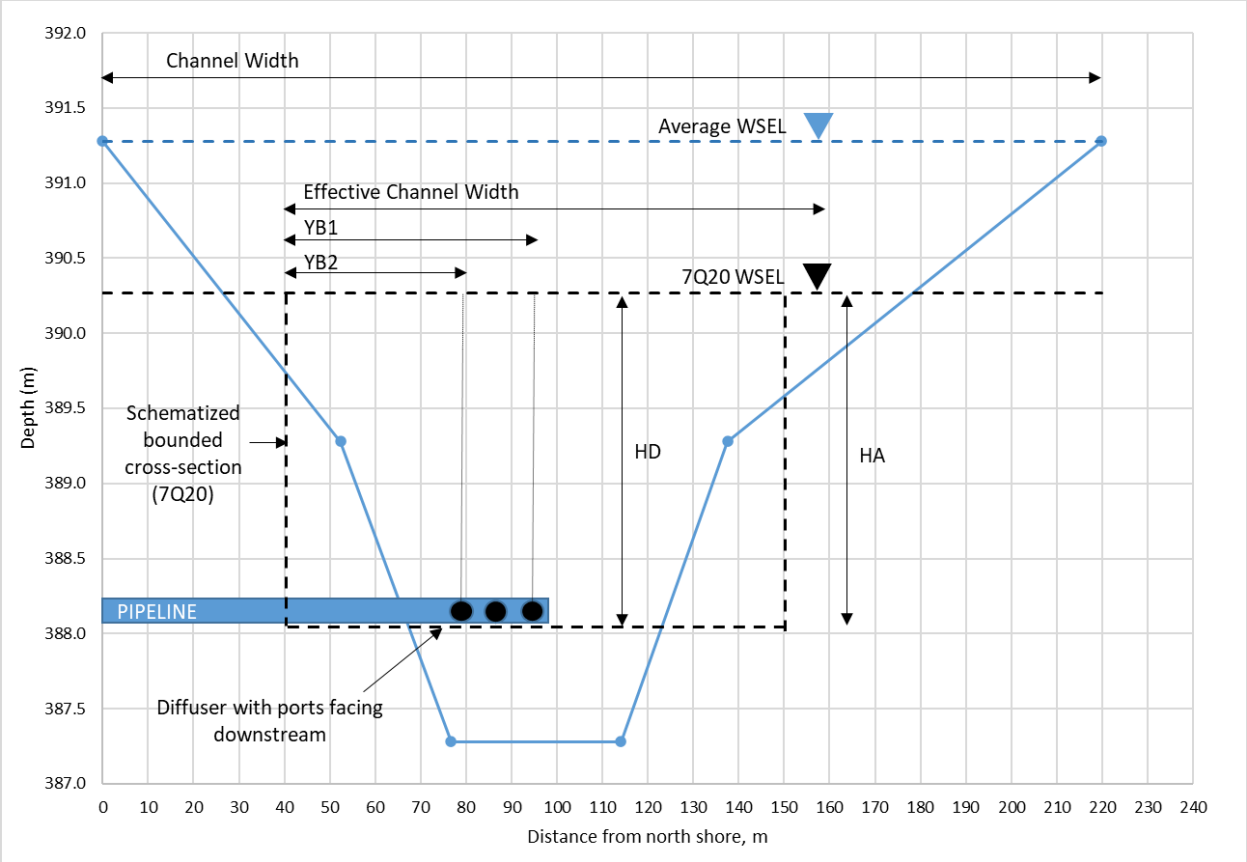
Table 2–4: Discharge Configuration Assumptions

Parameter	Value	Units
Diffuser length	13.5	m
Distance to first endpoint from nearest bank, YB1	48.25	m
Distance to the last endpoint from nearest bank, YB2	61.75	m
Height of port centres above bottom, H0	0.40	m
Port diameter	0.08	m
Contraction ratio	1	--
Total number of ports	10	--
Alignment angle gamma, γ	90	degrees
Vertical angle theta, θ	20	degrees
Horizontal angle sigma, σ	0	degrees
Relative orientation beta, β	90	degrees

Notes:

1 - Nearest bank assumed to be on the left side while looking downstream (i.e. north bank).
2 - Gamma, γ: Measured counterclockwise from the ambient current direction to the diffuser axis. γ = 90° represents a diffuser positioned perpendicular to the ambient current.
3 - Theta, θ: Vertical angle between port centrelines and horizontal plane.
4 - Sigma, σ: Measured counterclockwise from the ambient current direction to the port centrelines. σ = 0° when ports point downstream.
5 - Beta, β: Angle between port centrelines to the diffuser axis. β = 90° for unidirectional diffusers.

Figure 2-1: Schematic of Assumed Ambient Geometry and Discharge Configuration



3.0 RESULTS

The maximum extent of the mixing zone for expected case is presented in Figure 3-1. Table 3–1 presents key CORMIX model results, including the estimated length of the mixing zone (< 5 m), where the length of the mixing zone represents the distance downstream at which the ultimate dilution factor was achieved. The ultimate dilution factor is the ratio of the volume of effluent relative to the volume of the water in the channel, after complete hydrodynamic mixing is achieved. In all modelled scenarios, the treated effluent was predicted to reach or exceed its ultimate dilution factor quickly after being discharged from the diffuser.

CORMIX has can have limited capacity in modeling highly turbulent near field mixing. Due to the large velocity difference between the ambient water in Springpole Lake and the discharged effluent, significant turbulence is created in the immediate mixing zone. All model runs resulted in dilution factors above the maximum possible dilution factor (at complete mixing) occurring within the first few meters after the effluent discharge point. Based on WSP's professional judgment and experience, in these scenarios you can generally expect complete mixing to occur within a downstream distance approximately equal to the cross-sectional channel width. 100 m downstream was therefore selected as a reasonable upper bound on the mixing zone, based on the channel width (~110m, Figure 3-1).

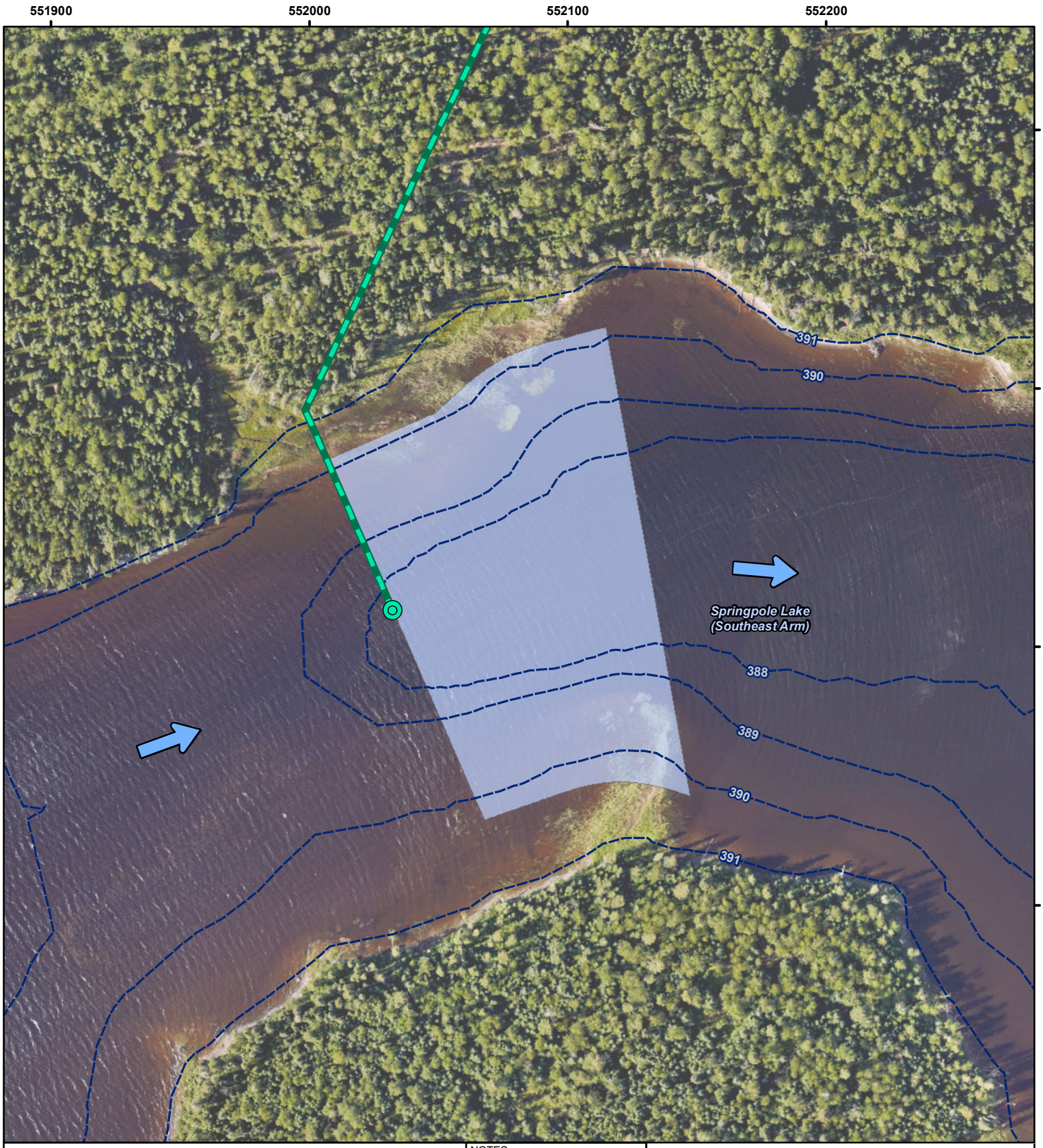
It is is expected that complete and homogenous mixing of the effluent with the ambient flow of the southeast arm of Springpole Lake will occur when the effluent velocity effects have dissipated at a distance several times the length of the initial mixing resulting from the momentum flux released from the diffuser. The high energy effluent flow is predicted to have dissipated within 10 m downstream of the proposed effluent discharge location. The effluent is expected to enter a co-flow stage with the ambient, and the plume is expected to move slowly downstream and towards the other bank. Table 3–1 provides the distance downstream at which CORMIX predicted the ultimate dilution factor was achieved.

In summary, key results from the modelling are:

- Complete hydrodynamic mixing is expected to occur within 100 m of the proposed discharge location (i.e., approximately same as the channel width).
- Assuming maximum discharge on 7Q20 low flow conditions, effluent strength at the point of complete hydrodynamic mixing ranges from 8.1% to 16%, depending on Project phase.
- The ultimate dilution factor available is limited by the assumed ratios of ambient (7Q20) and effluent flow rates (maximum monthly) used as inputs to the CORMIX model.
- The final diffuser design can be optimized as engineering advances for the Project and as part of the provincial permitting process.

Table 3–1: Summary of CORMIX Results

Scenario	Maximum Dilution Factor	Treated Effluent Strength at Ultimate Dilution	Downstream Distance to Ultimate Dilution
	-	%	m
Construction Phase	6.7	15%	<2m
Operations Phase	12.4	8.1%	3.7
Active Closure Phase	6.2	16%	<2m



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LEGEND

- Effluent Discharge Location
- Effluent Discharge Pipeline
- Bathymetry Contours (masl, 1 m interval)
- Maximum Extent of Effluent Mixing Zone under 7Q20 Flow Condition
- Assumed Ambient Flow Direction

Open water is shown on the images, however the modelling results are for under ice, low flow conditions.

NOTES:
- Aerial imagery provided by First Mining Gold, 2020.
- Placement of effluent discharge location and pipeline are approximate and subject to change.

Datum: NAD83
Projection: UTM Zone 15N

0 25 50 100 150 200 Metres

First Mining Gold

wsp

SPRINGPOLE GOLD PROJECT

Maximum Extent of Effluent Mixing Zone under 7Q20 Flow Condition

PROJECT N°: ONS2104	**FIGURE: 3-1**
SCALE: 1:2,000	DATE: October 2024

4.0 REFERENCES

Chow, V.T., 1959. Open Channel Hydraulics. McGraw-Hill, New York.

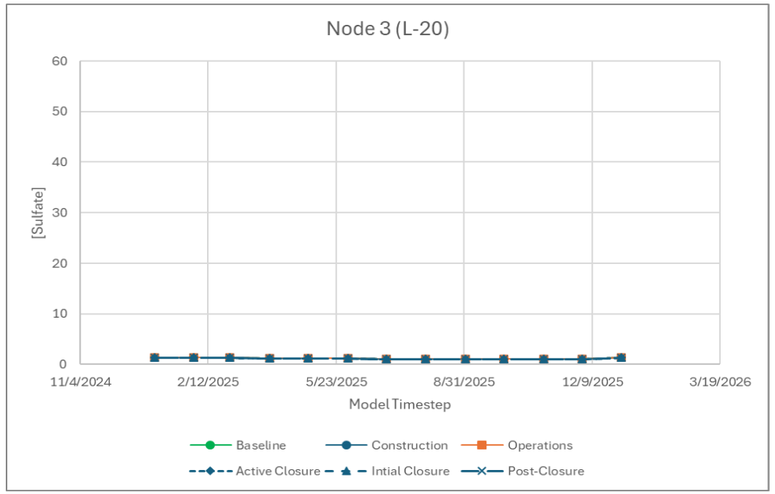
Doneker, R.L. and G.H. Jirka, 2007. CORMIX User Manual: A hydrodynamic mixing zone model and decision support system for pollutant discharge into surface waters. EPA-823-K-07-001.

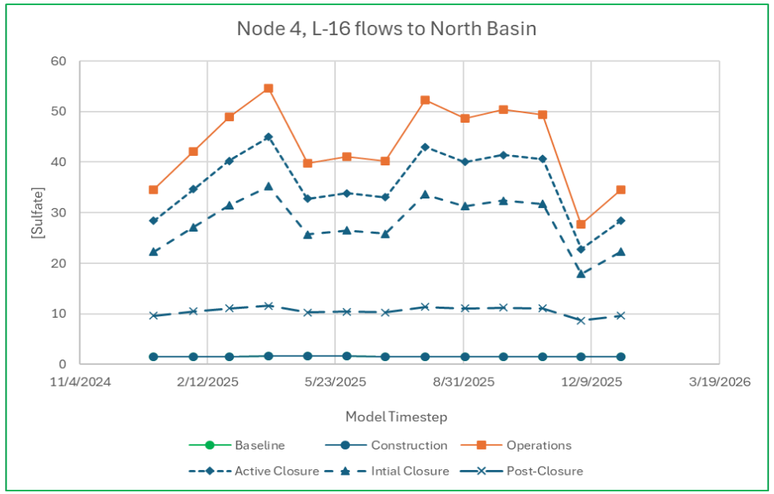
First Mining Gold Corp. and C. Portt and Associates. Springpole Gold Project Existing Conditions Report: Fish Community and Habitat. March 2018.

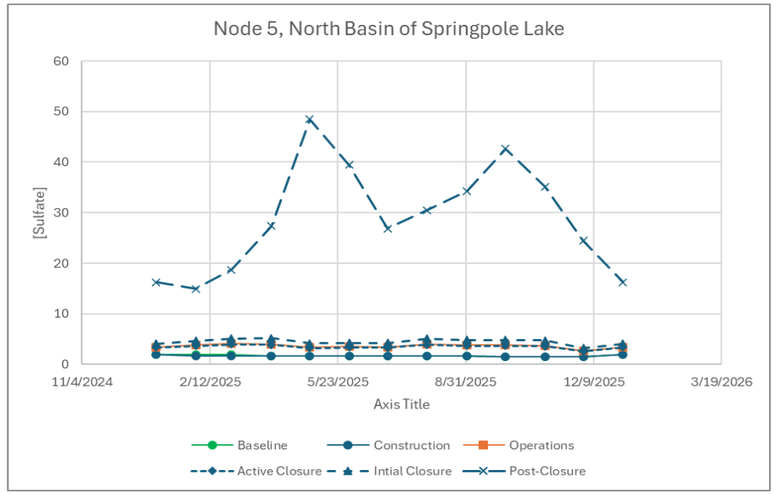
WSP, 2024a. Hydrology Baseline Report. Springpole Gold Project. February 2024.

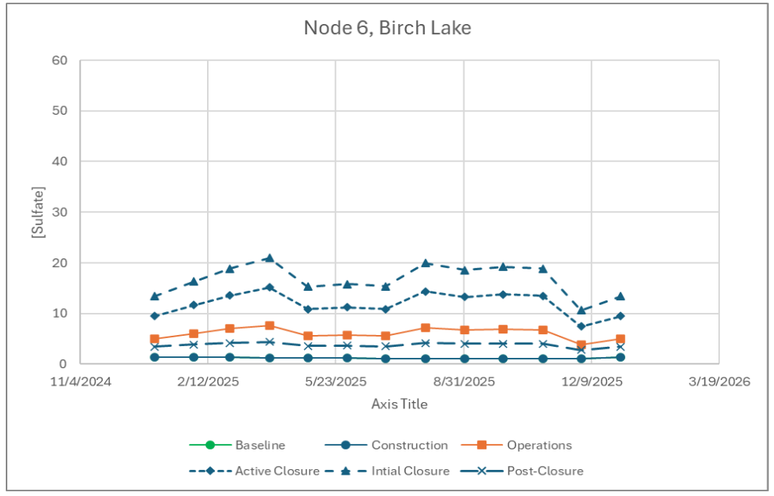
WSP, 2024b. Mine Site Water Balance Report Springpole Gold Project. April 2024.

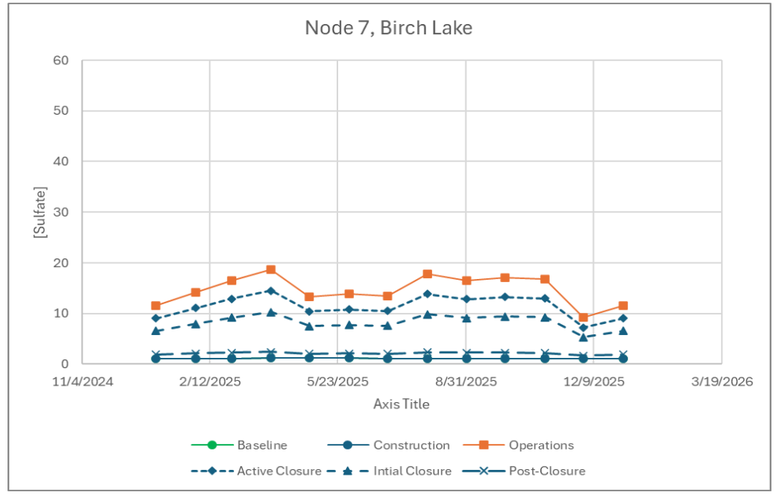
Attachment B
Base Case Time Series Graphs

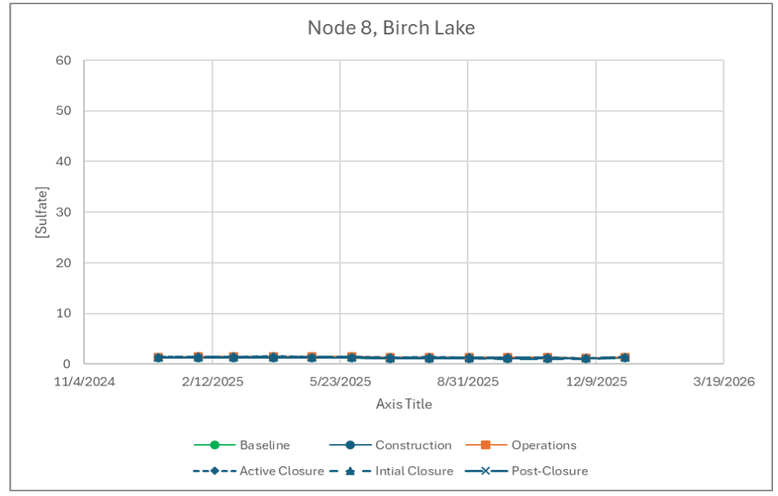

Node 3 (L-20)
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

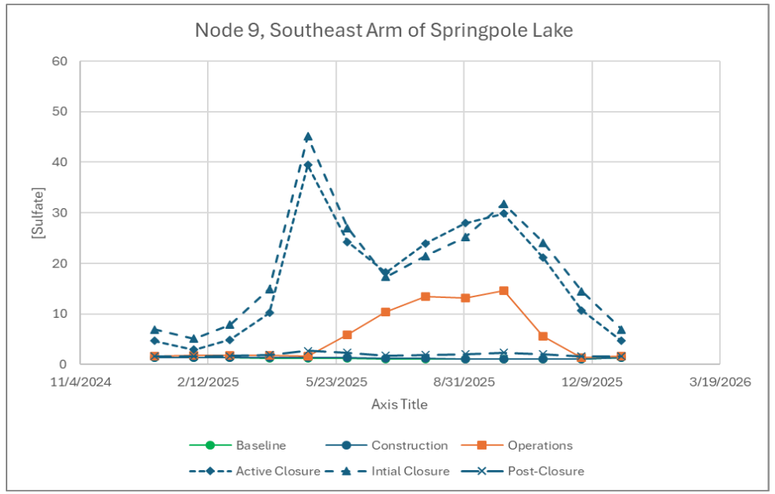

Node 4, L-16 flows to North Basin
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

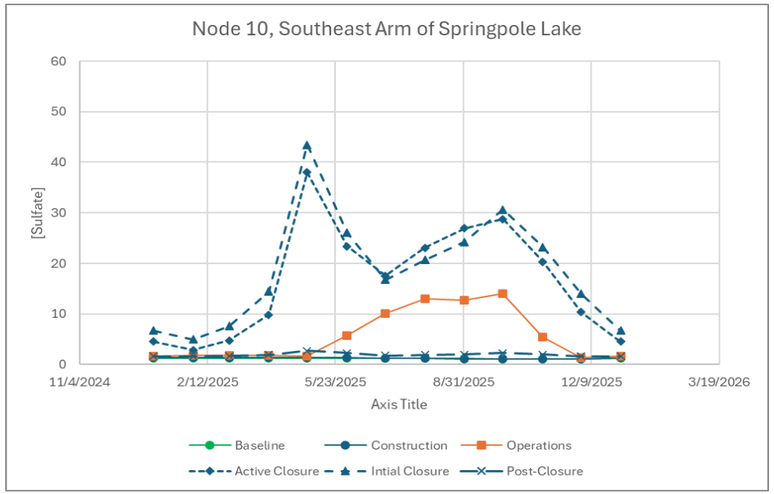

Node 5, North Basin of Springpole Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

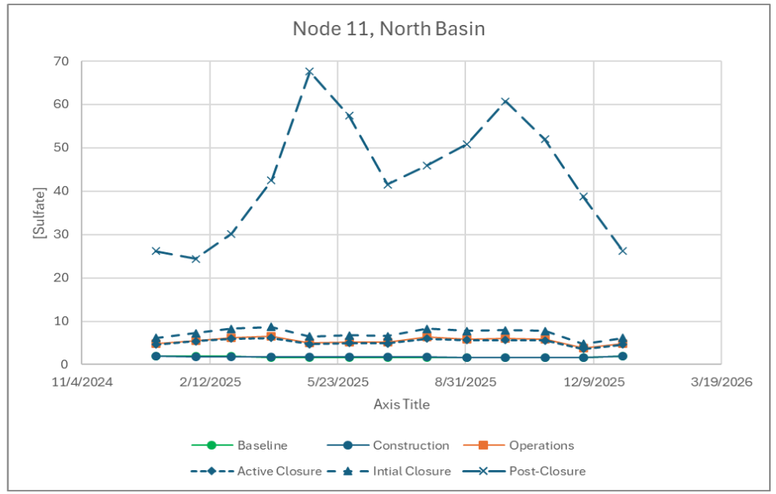

Node 6, Birch Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

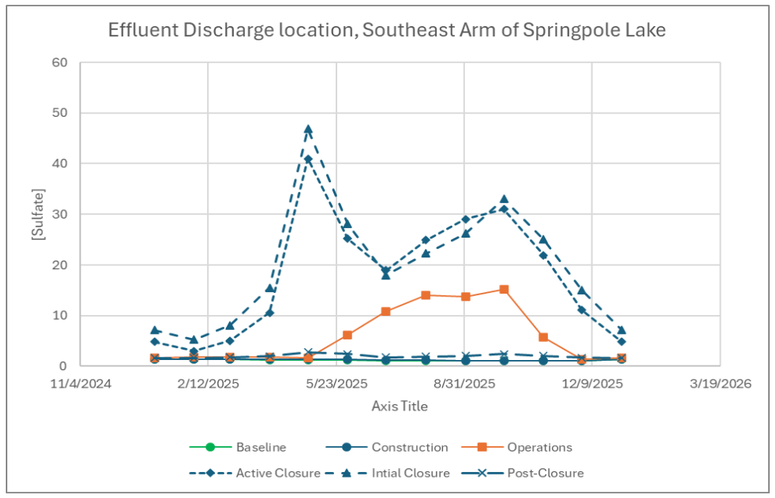

Node 7, Birch Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

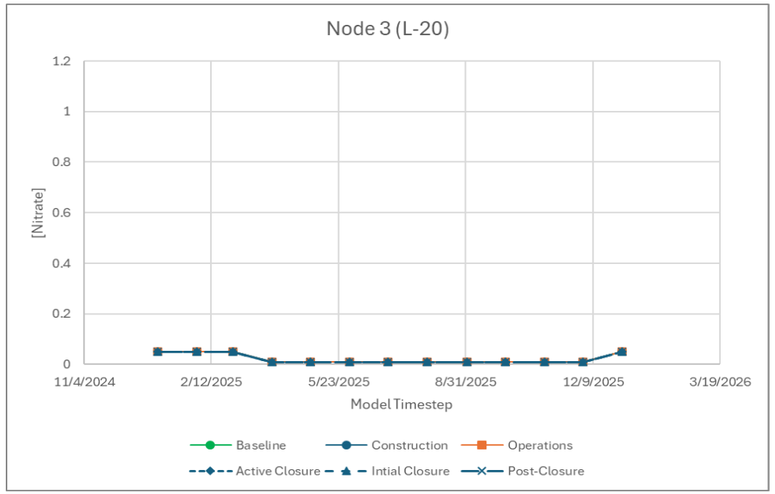

Node 8, Birch Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

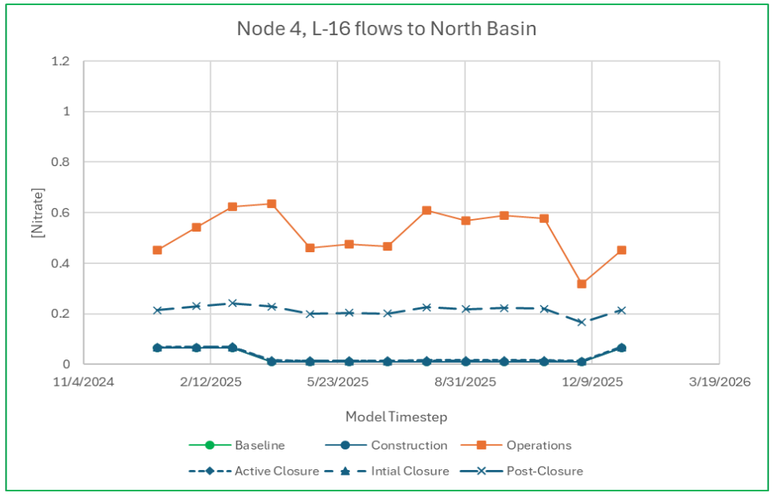

Node 9, Southeast Arm of Springpole Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

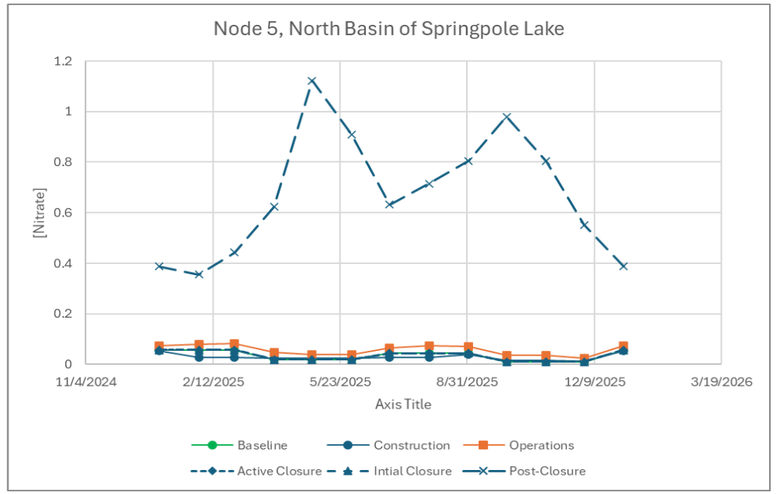

Node 10, Southeast Arm of Springpole Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

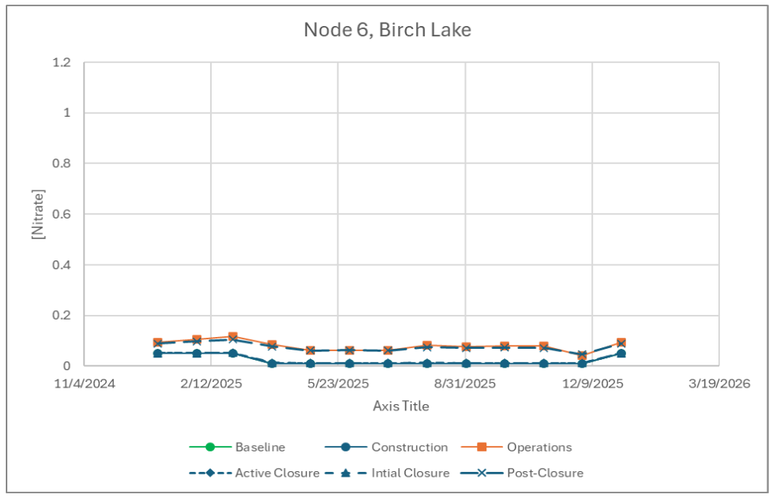

Node 11, North Basin
[Sulfate]
70
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

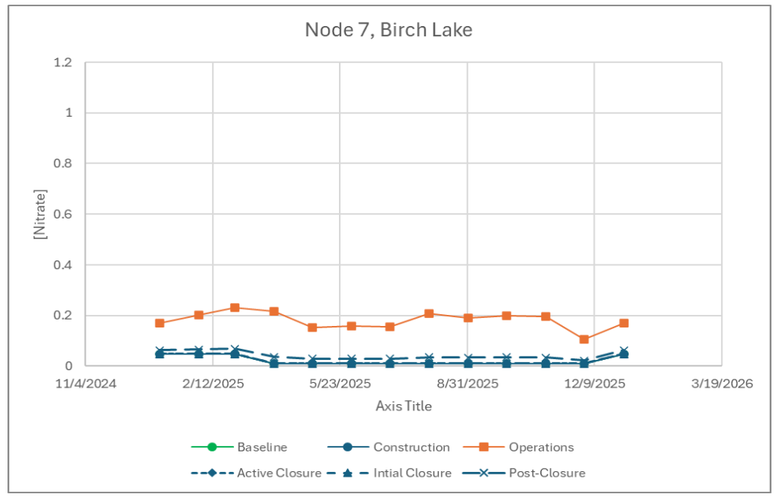

Effluent Discharge location, Southeast Arm of Springpole Lake
[Sulfate]
60
50
40
30
20
10
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

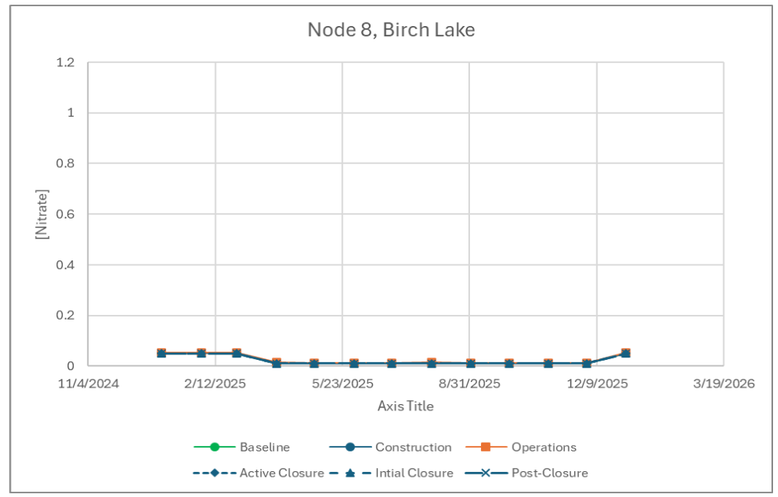

Node 3 (L-20)
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

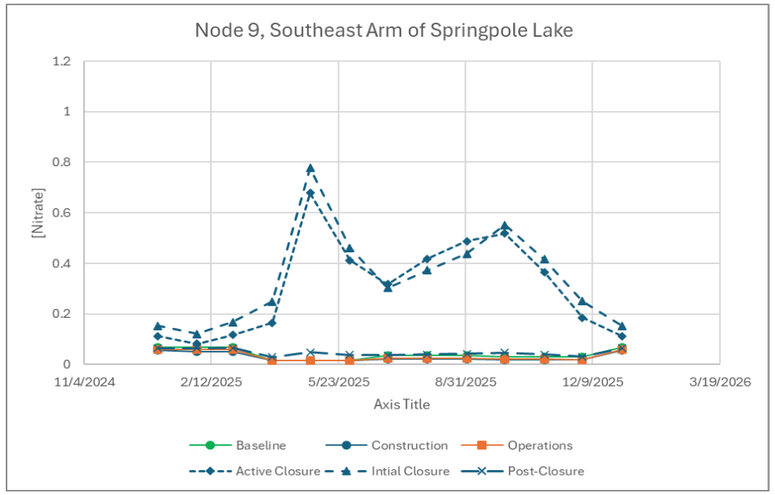

Node 4, L-16 flows to North Basin
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

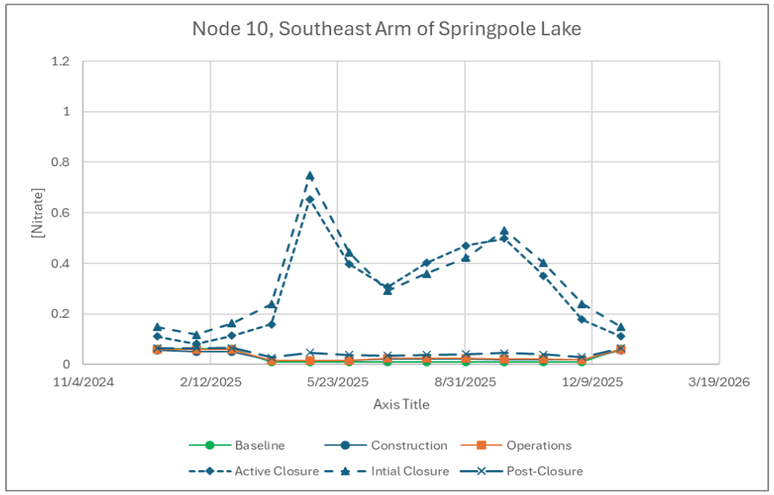

Node 5, North Basin of Springpole Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

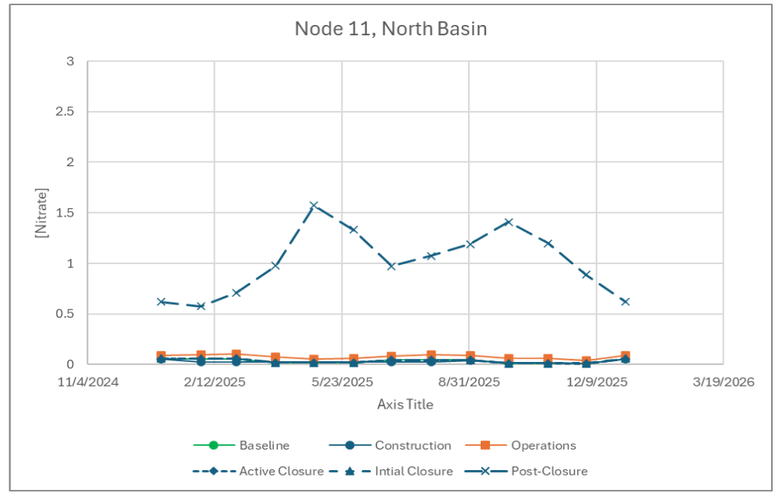

Node 6, Birch Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

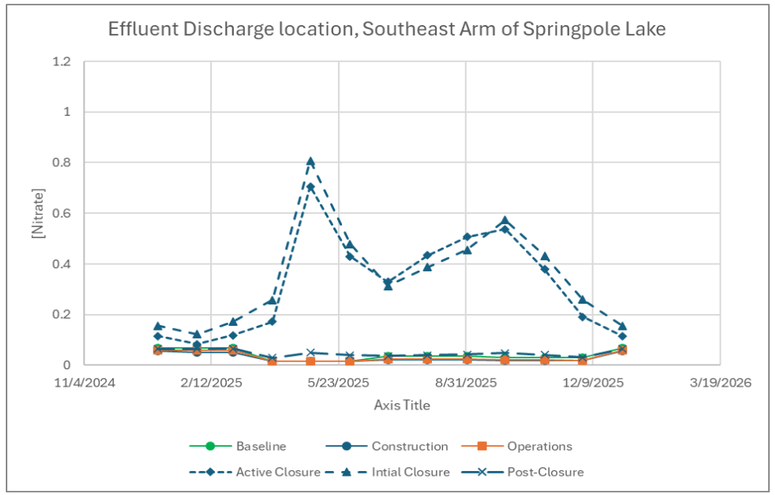

Node 7, Birch Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

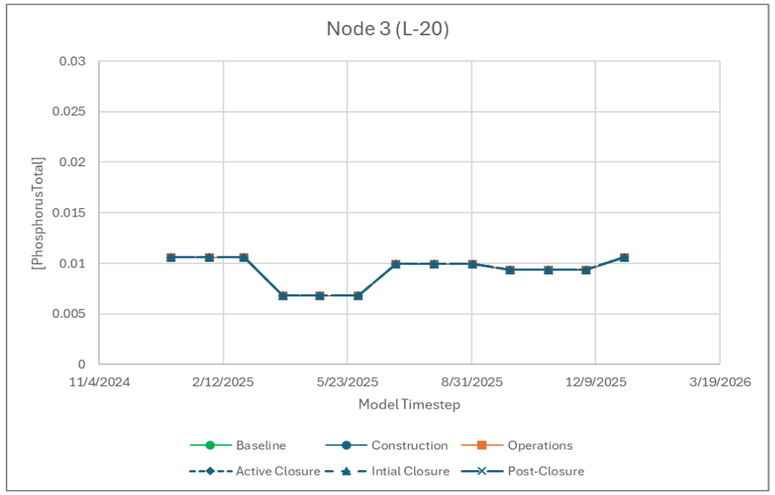

Node 8, Birch Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

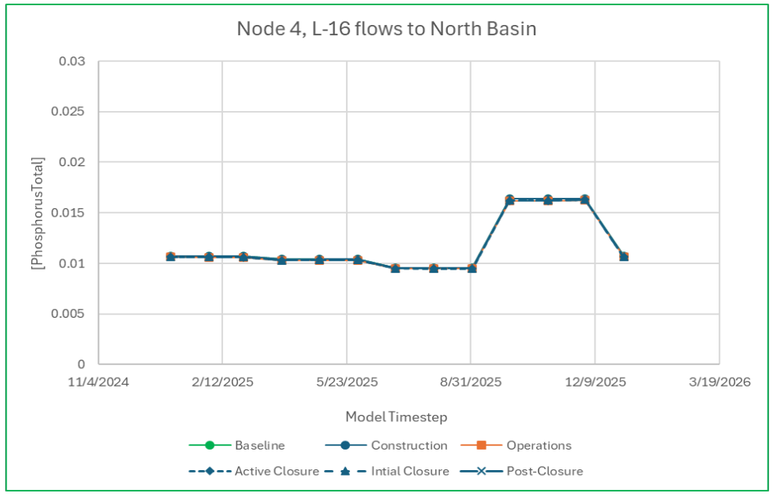

Node 9, Southeast Arm of Springpole Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

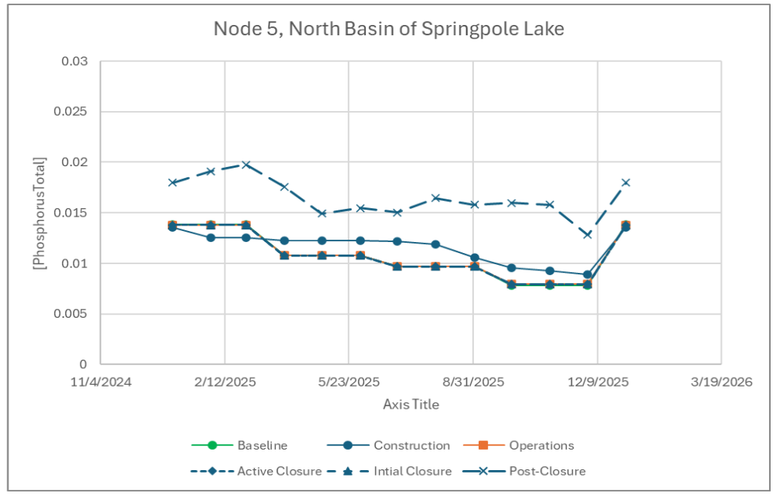

Node 10, Southeast Arm of Springpole Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

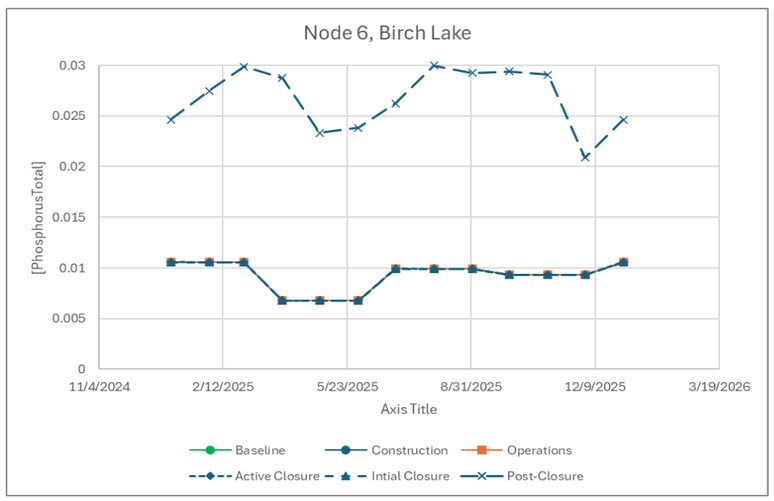

Node 11, North Basin
[Nitrate]
3
2.5
2
1.5
1
0.5
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

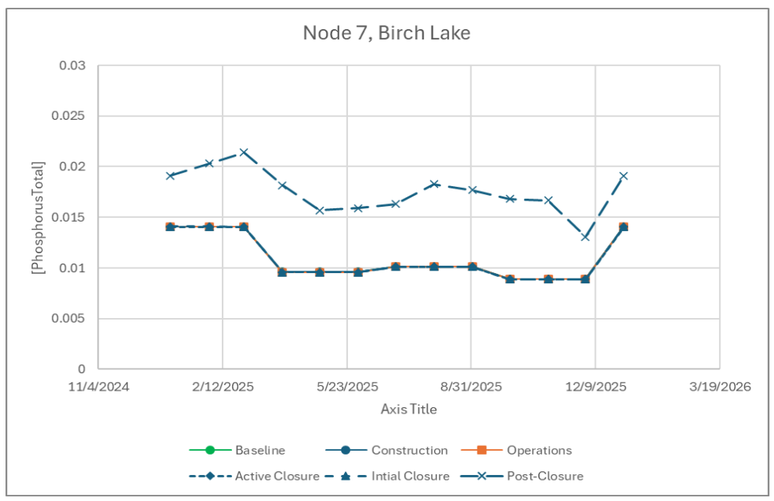

Effluent Discharge location, Southeast Arm of Springpole Lake
[Nitrate]
1.2
1
0.8
0.6
0.4
0.2
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

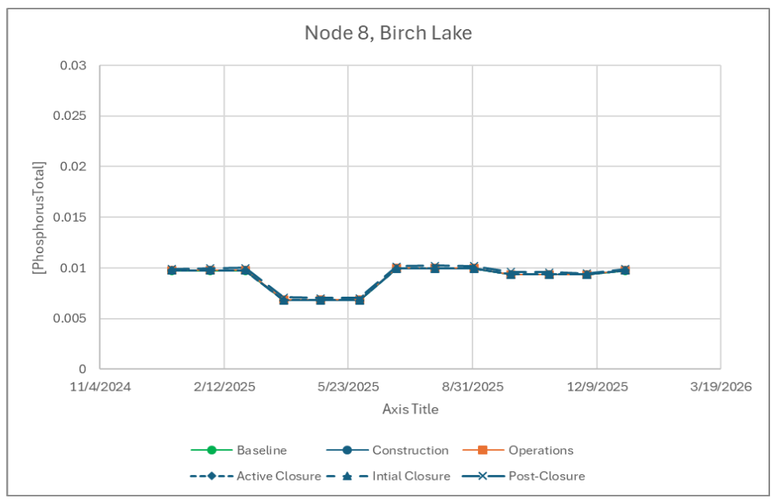

Node 3 (L-20)
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

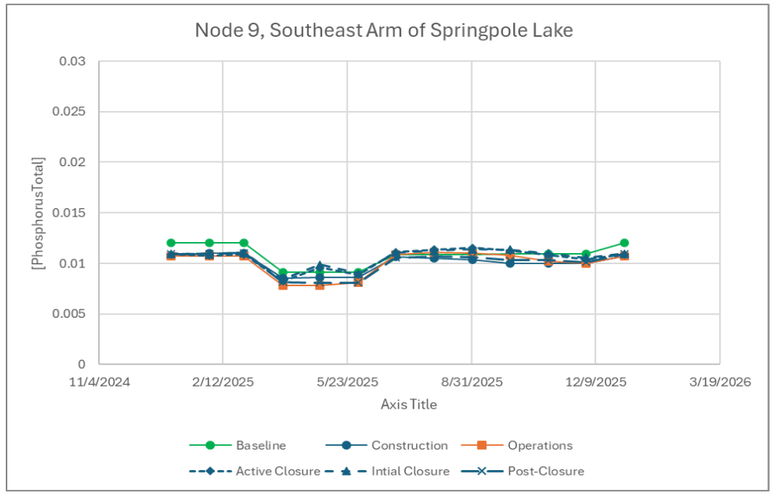

Node 4, L-16 flows to North Basin
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

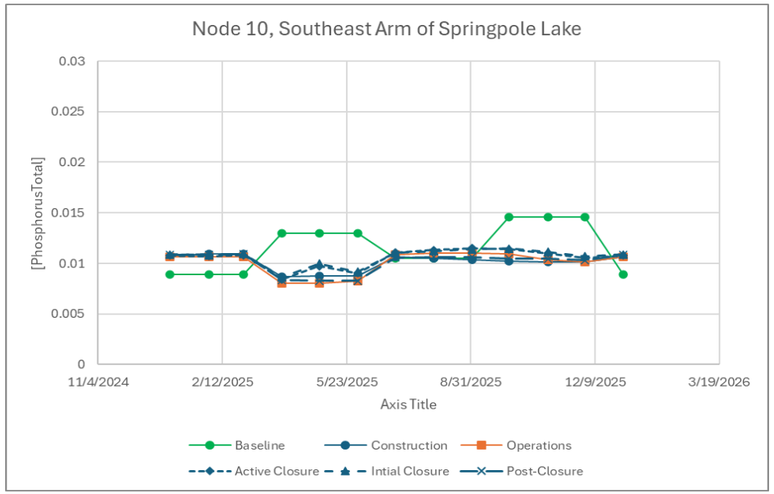

Node 5, North Basin of Springpole Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

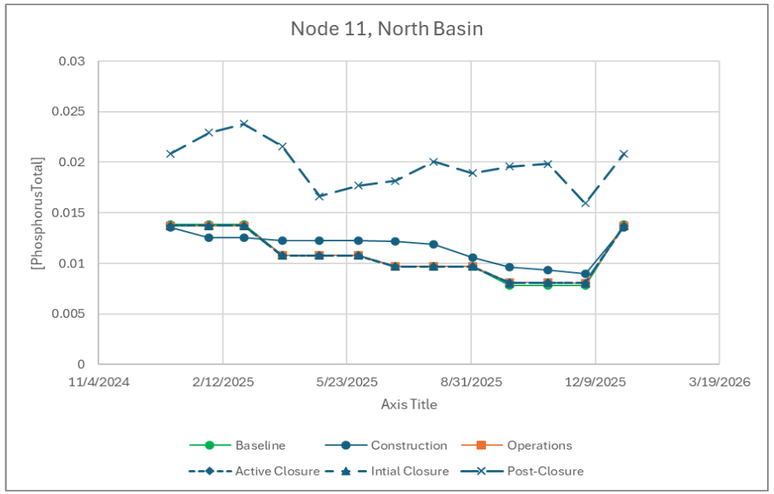

Node 6, Birch Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

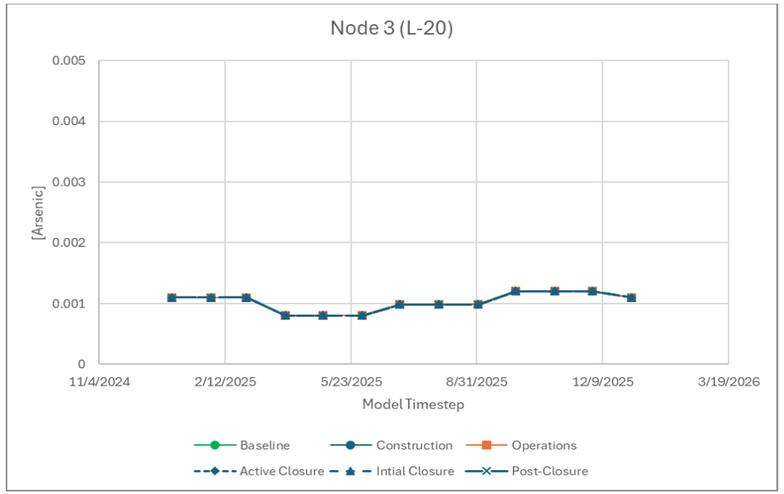

Node 7, Birch Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

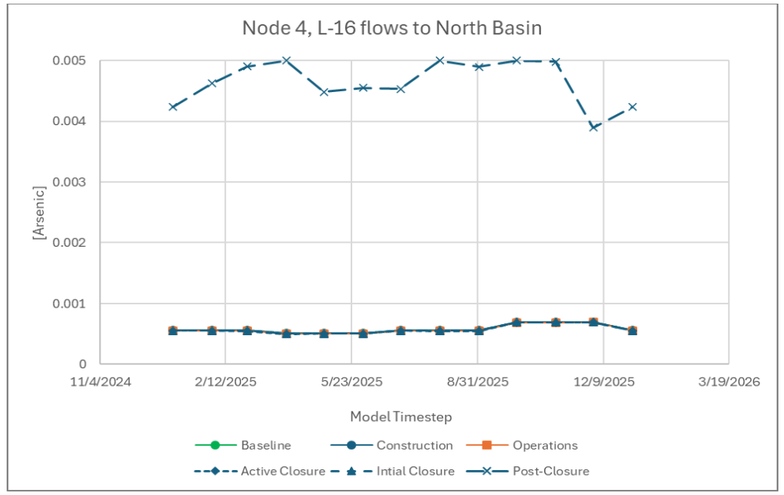

Node 8, Birch Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

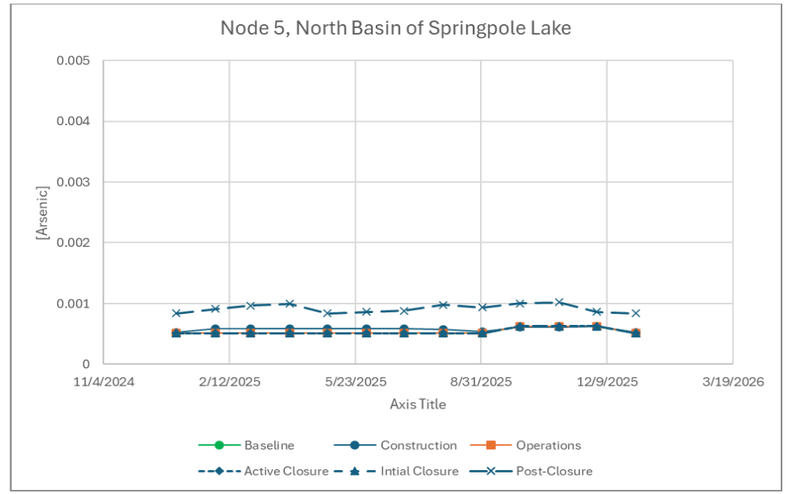

Node 9, Southeast Arm of Springpole Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

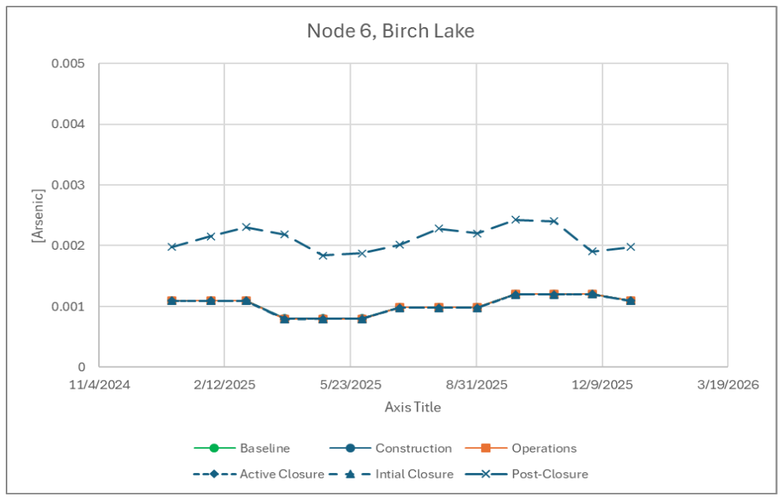

Node 10, Southeast Arm of Springpole Lake
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

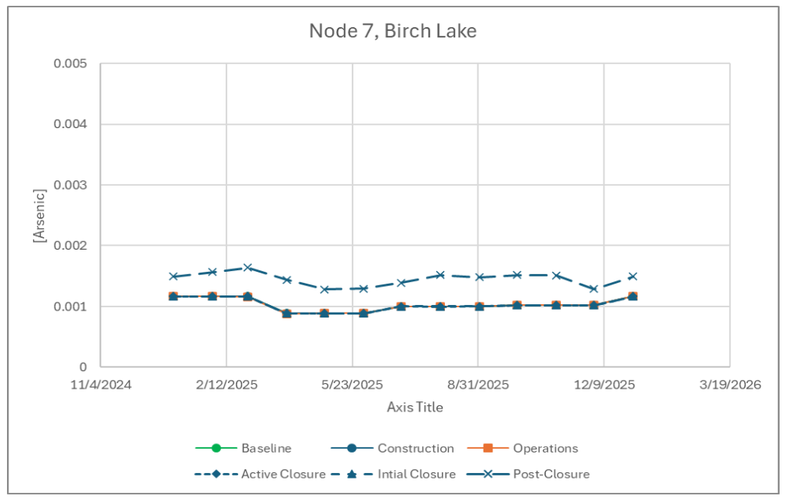

Node 11, North Basin
[PhosphorusTotal]
0.03
0.025
0.02
0.015
0.01
0.005
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

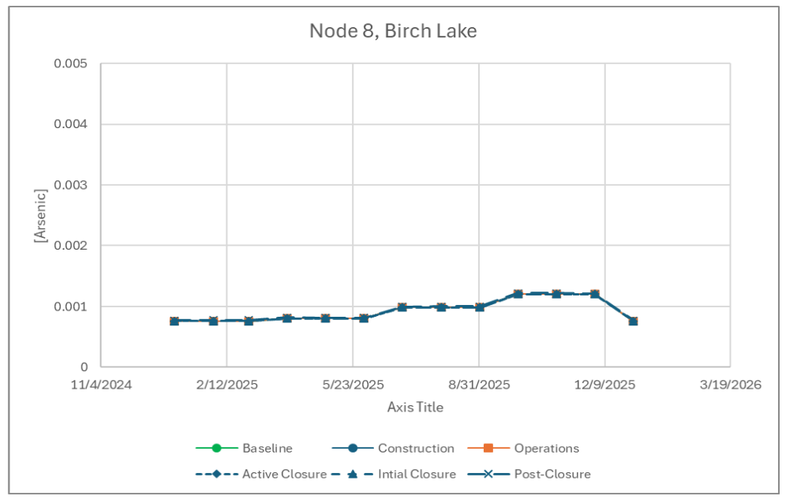

Node 3 (L-20)
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

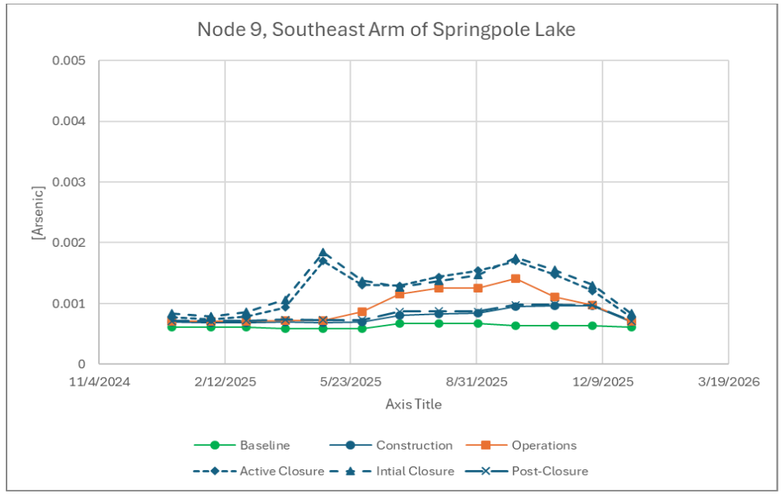

Node 4, L-16 flows to North Basin
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

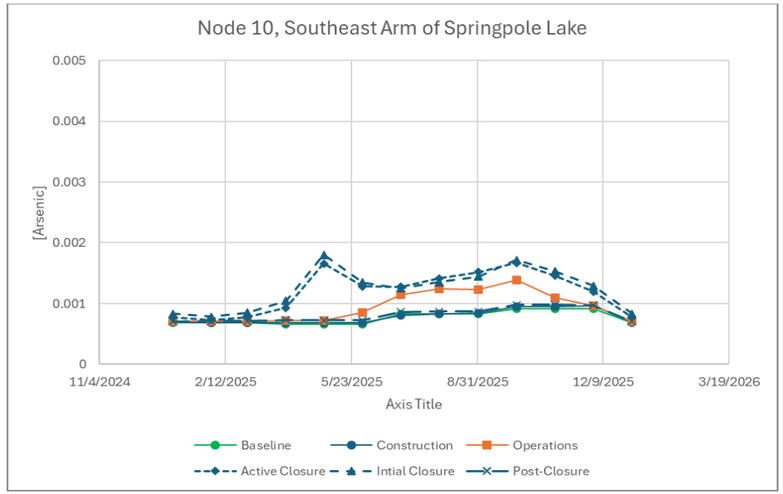

Node 5, North Basin of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

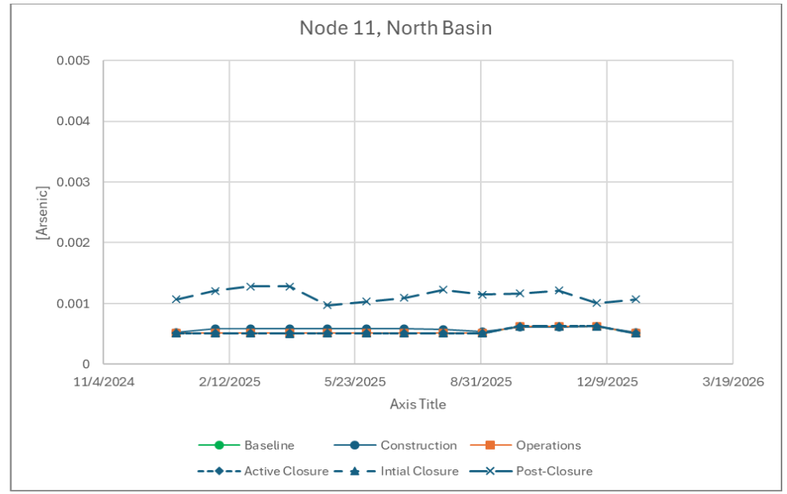

Node 6, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

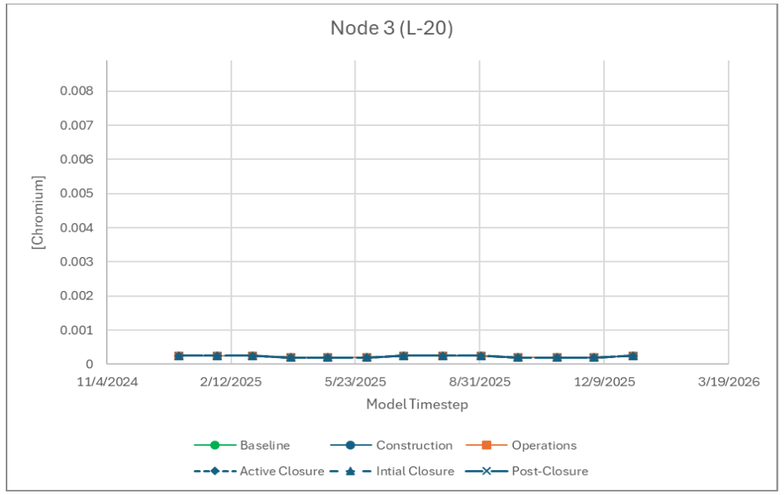

Node 7, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

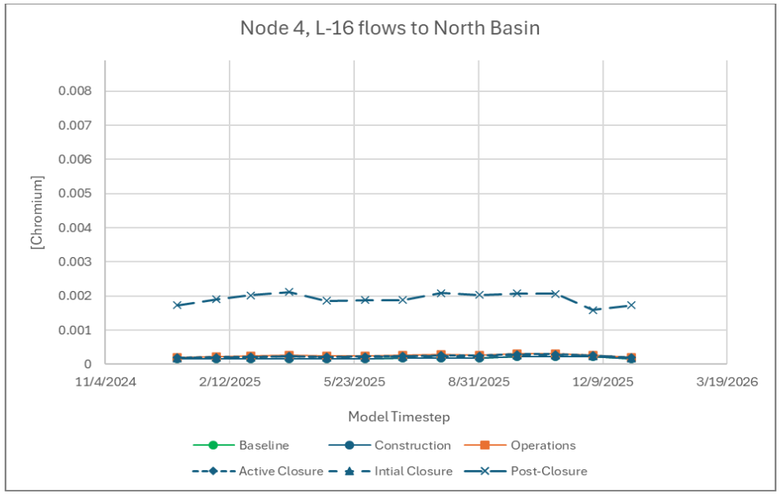

Node 8, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

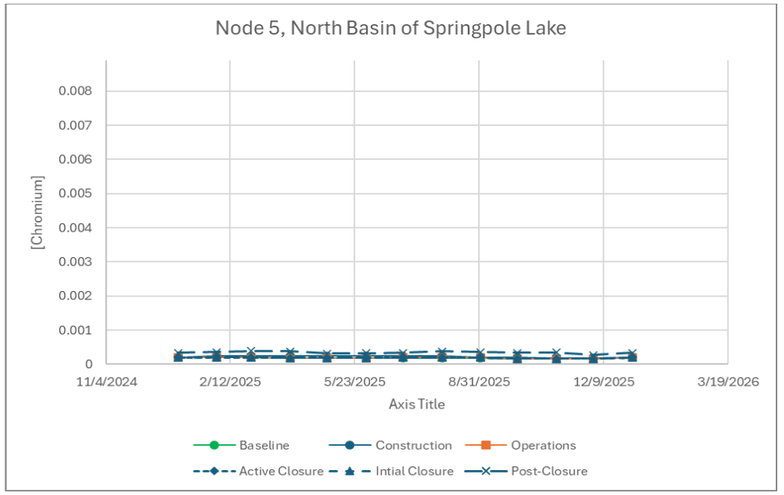

Node 9, Southeast Arm of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

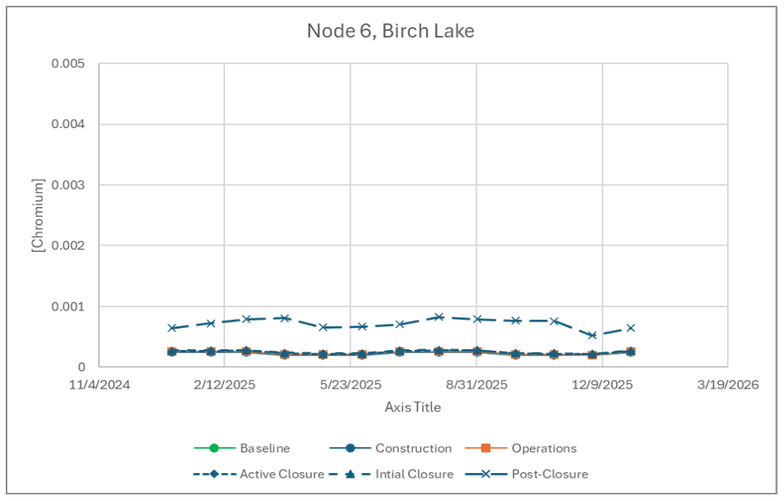

Node 10, Southeast Arm of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

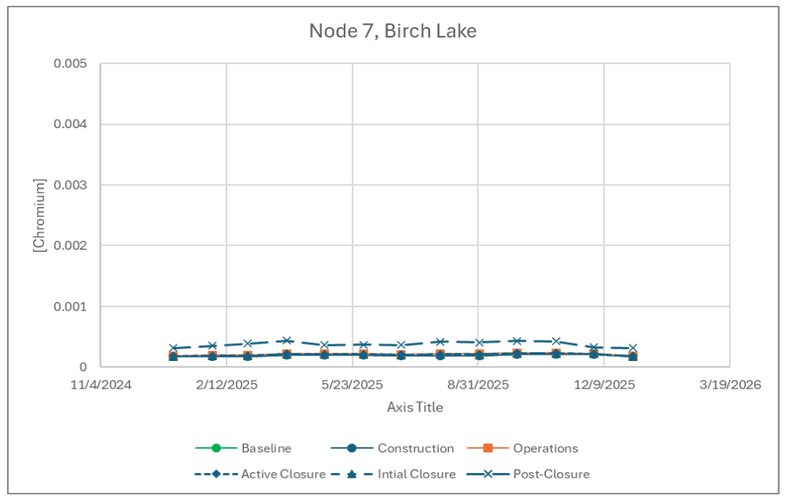

Node 11, North Basin
0.005
0.004
0.003
0.002
0.001
0
[Arsenic]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

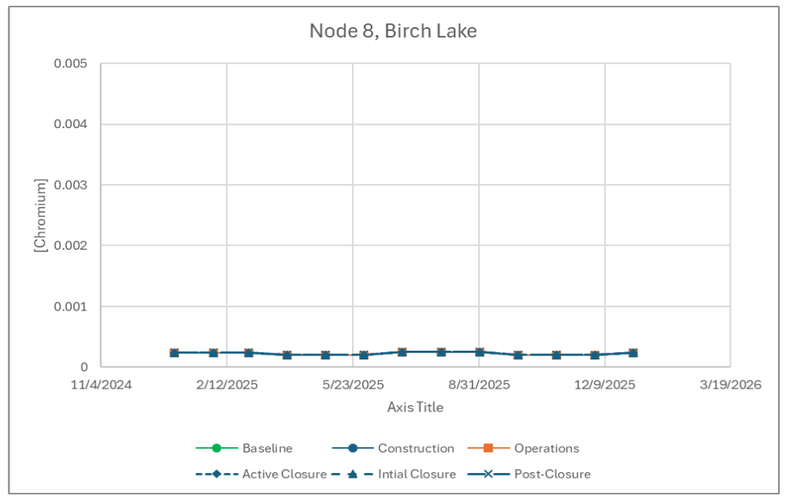

Node 3 (L-20)
[Chromium]
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

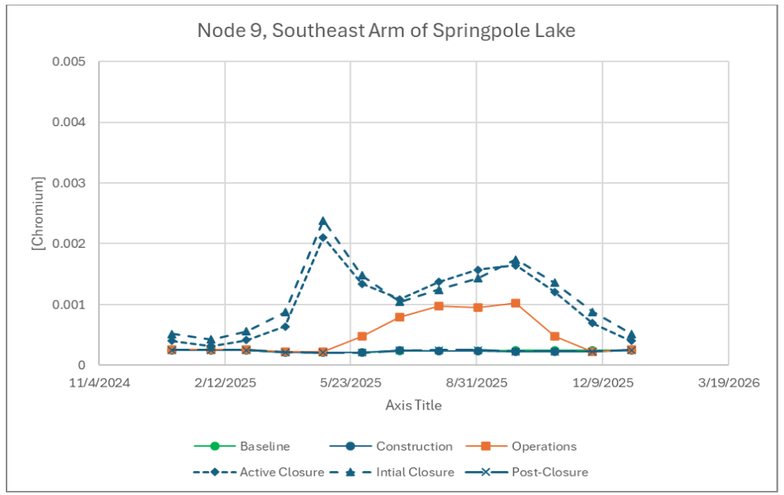

Node 4, L-16 flows to North Basin
[Chromium]
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

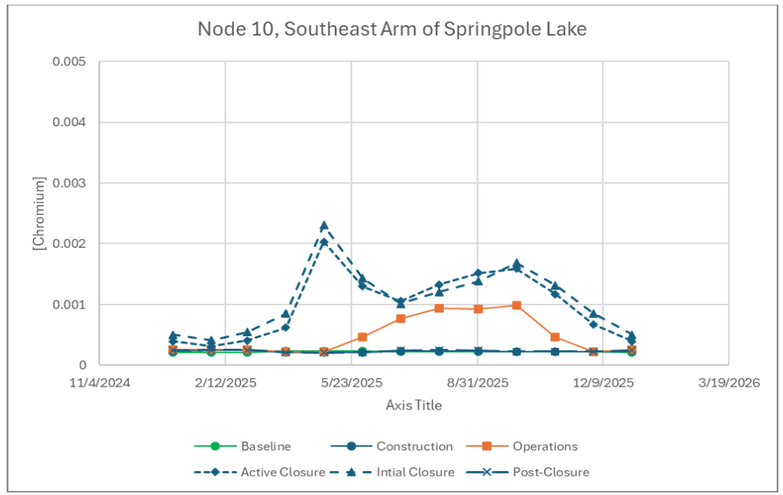

Node 5, North Basin of Springpole Lake
[Chromium]
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

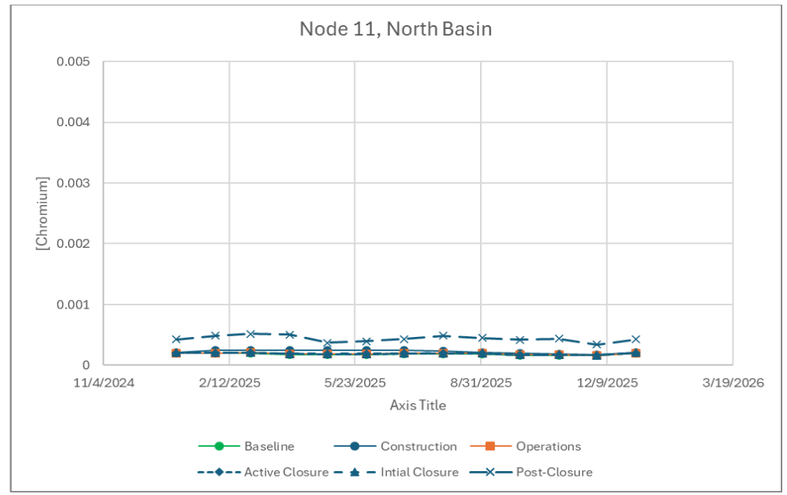

Node 6, Birch Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

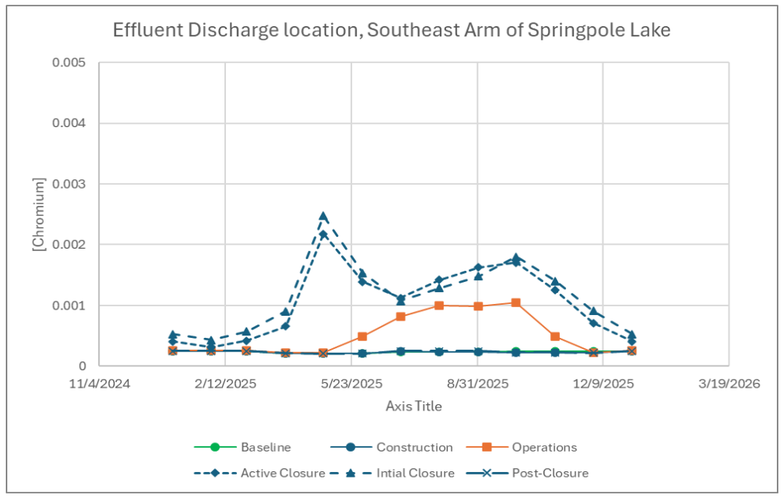

Node 7, Birch Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

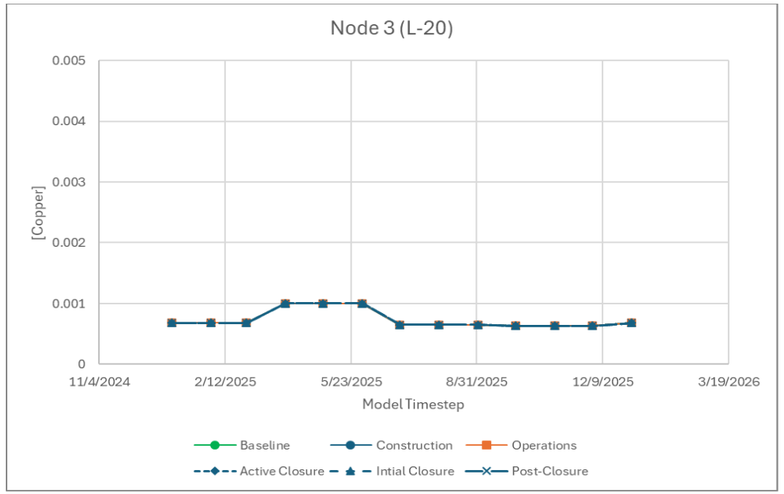

Node 8, Birch Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

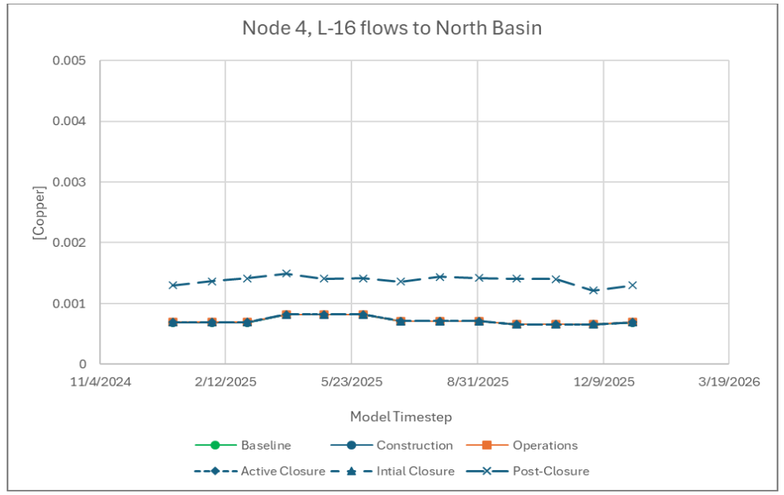

Node 9, Southeast Arm of Springpole Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

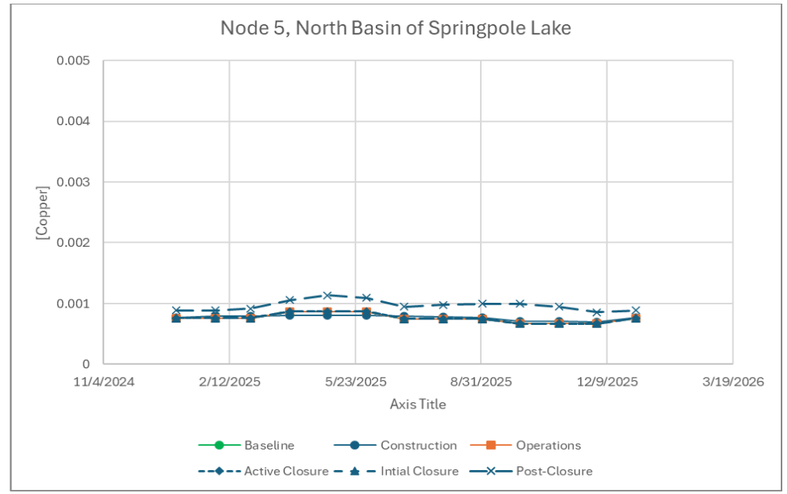

Node 10, Southeast Arm of Springpole Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

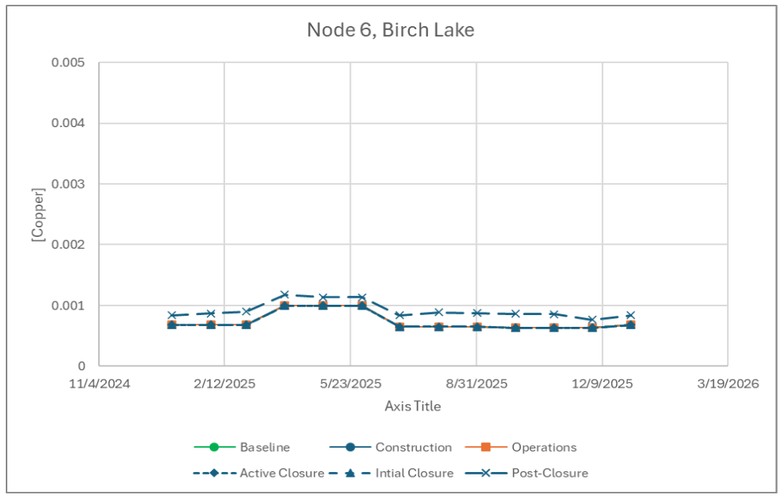

Node 11, North Basin
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

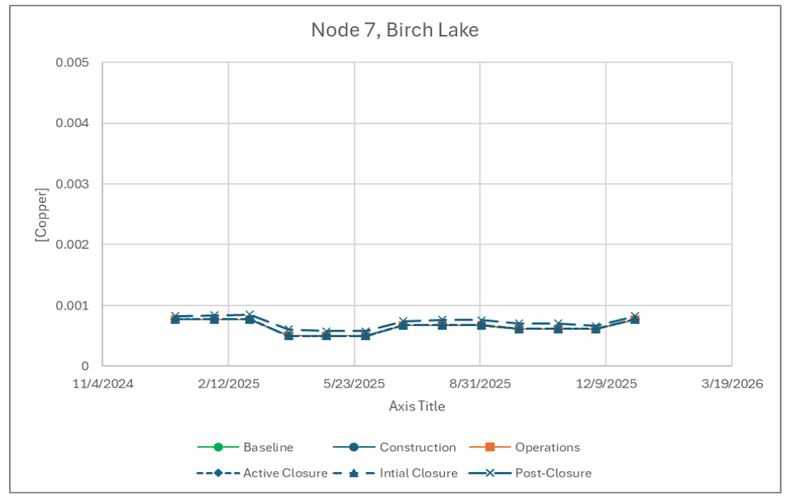

Effluent Discharge location, Southeast Arm of Springpole Lake
[Chromium]
0.005
0.004
0.003
0.002
0.001
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

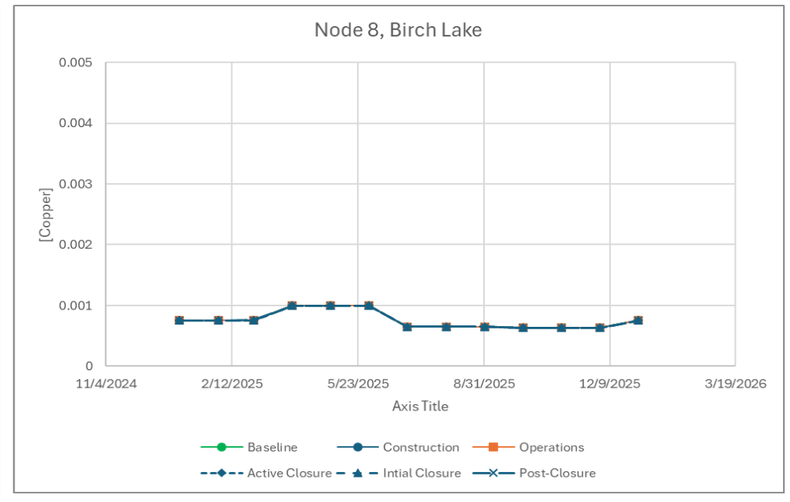

Node 3 (L-20)
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

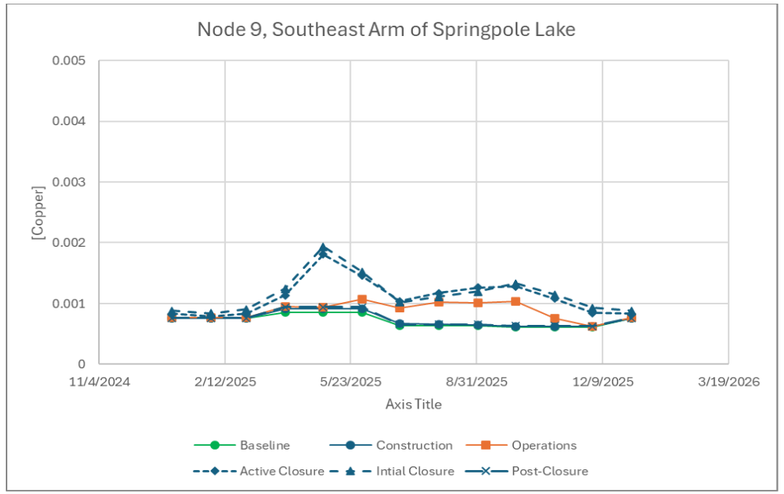

Node 4, L-16 flows to North Basin
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

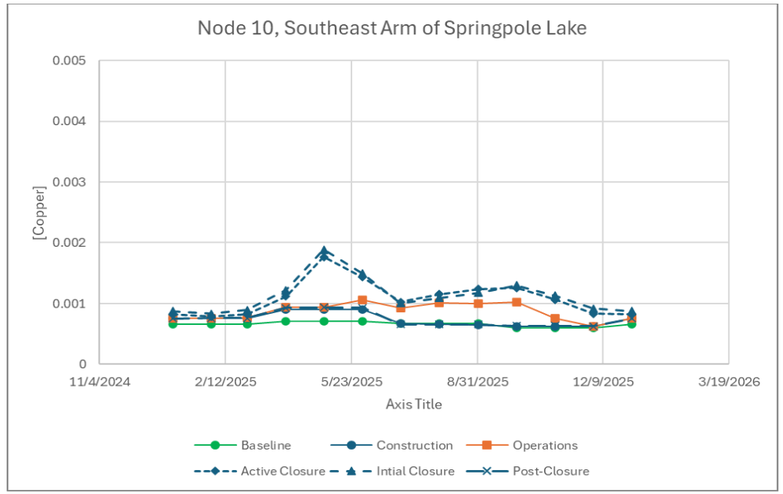

Node 5, North Basin of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

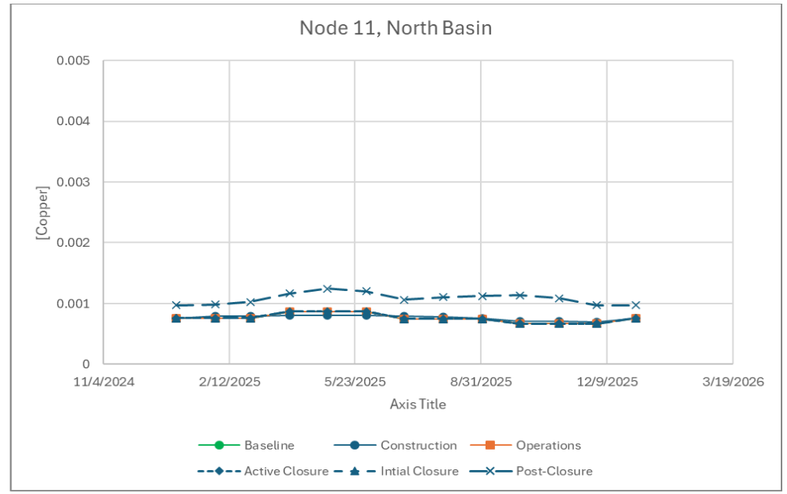

Node 6, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

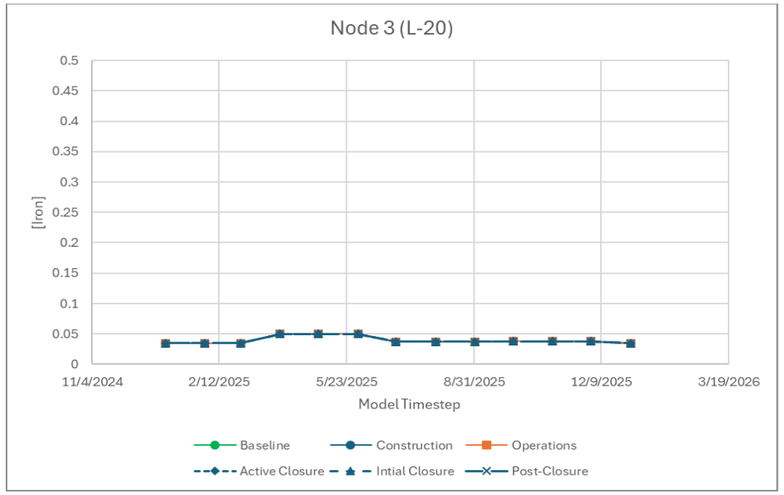

Node 7, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

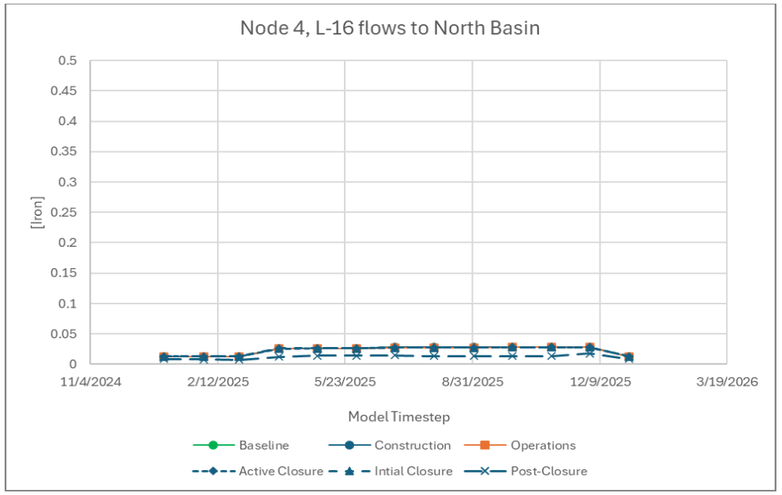

Node 8, Birch Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

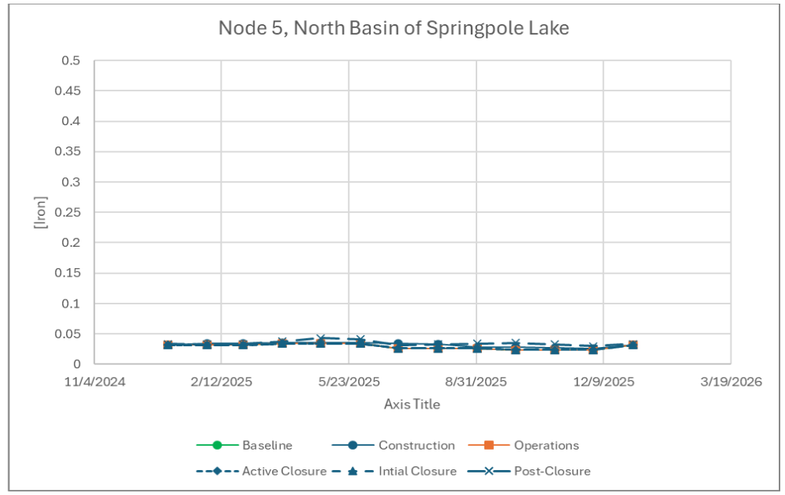

Node 9, Southeast Arm of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

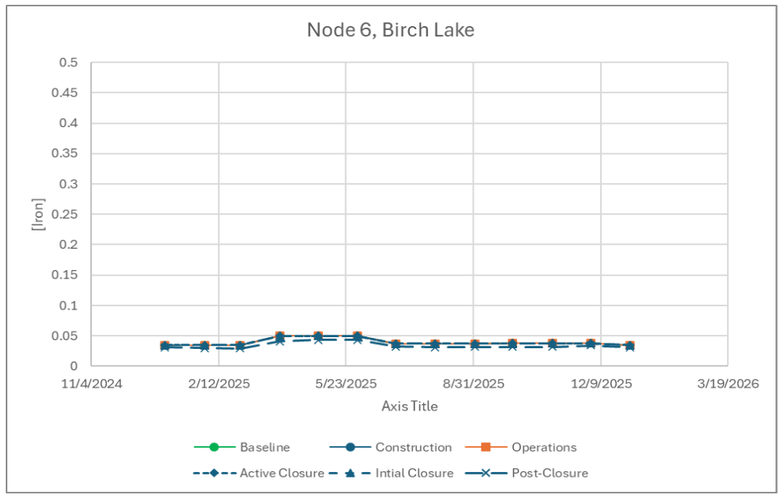

Node 10, Southeast Arm of Springpole Lake
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

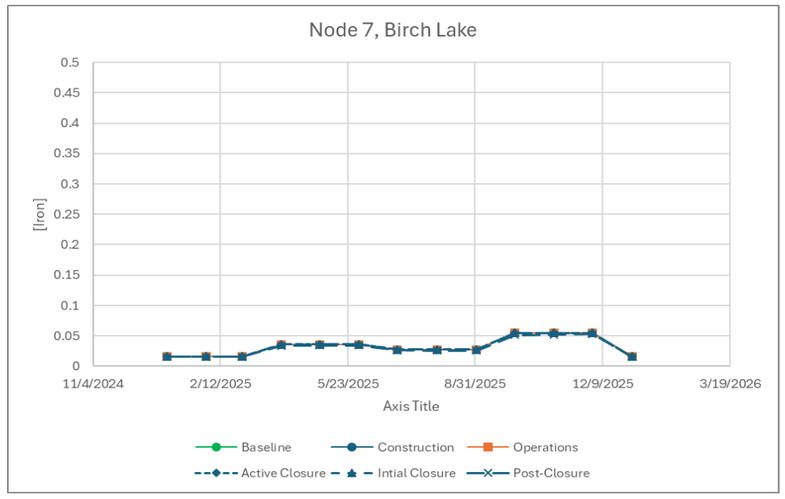

Node 11, North Basin
0.005
0.004
0.003
0.002
0.001
0
[Copper]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

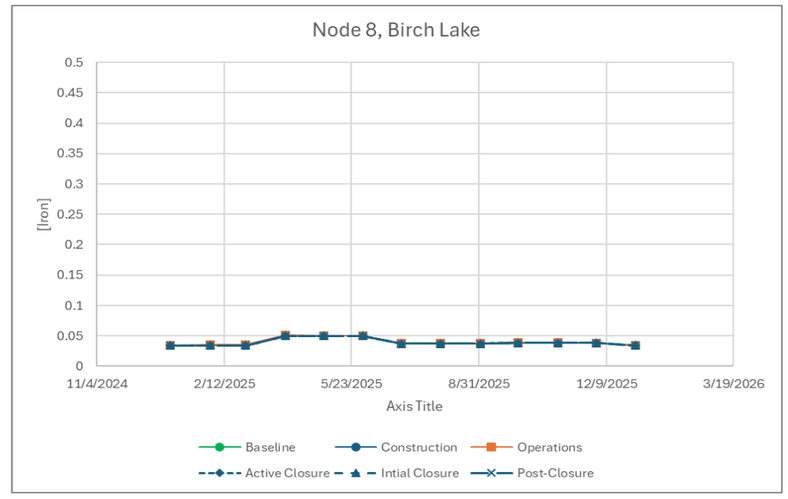

Node 3 (L-20)
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

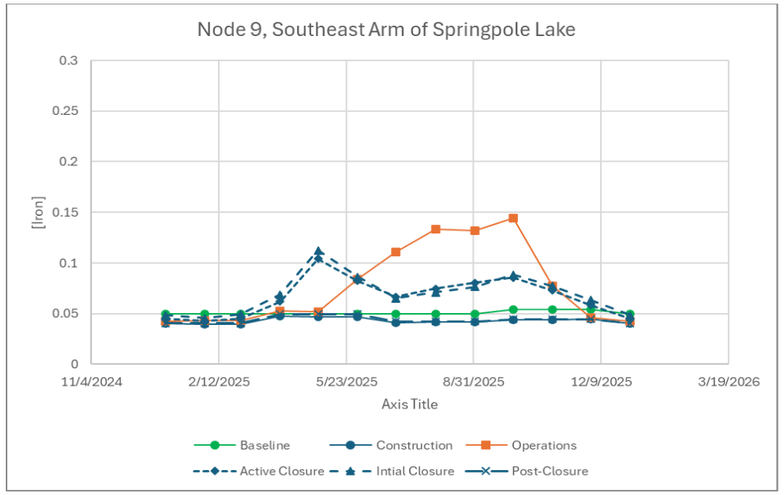

Node 4, L-16 flows to North Basin
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

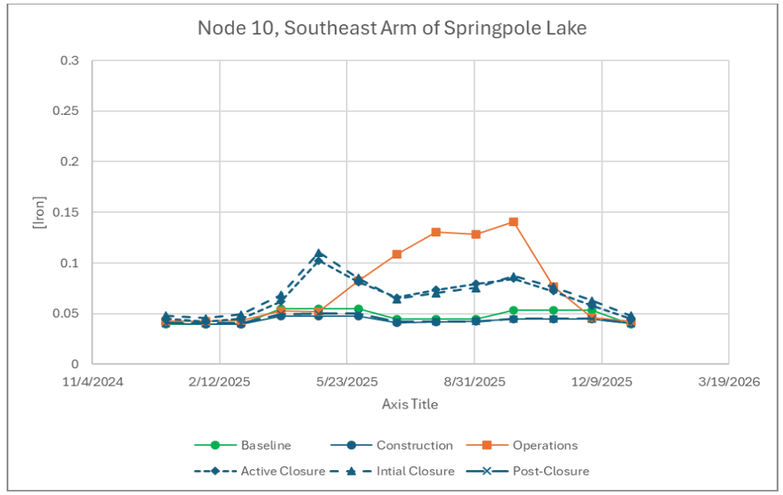

Node 5, North Basin of Springpole Lake
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

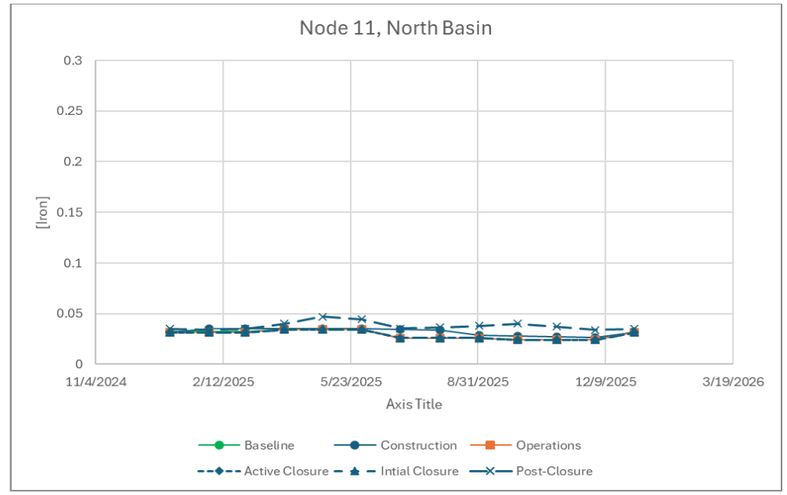

Node 6, Birch Lake
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

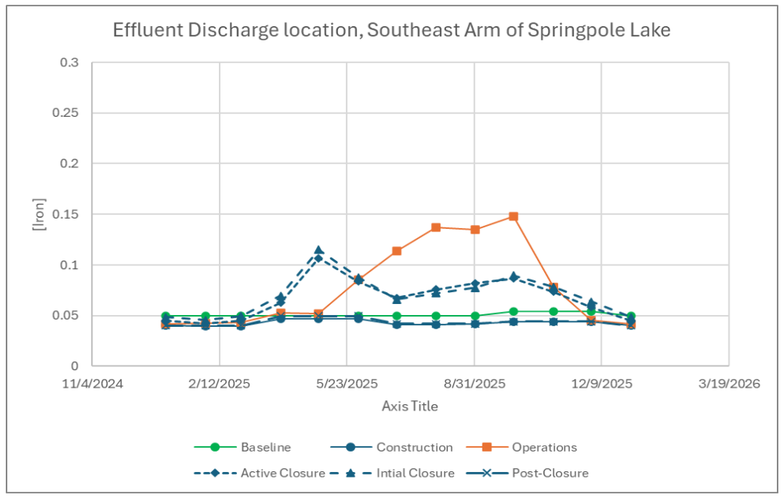

Node 7, Birch Lake
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

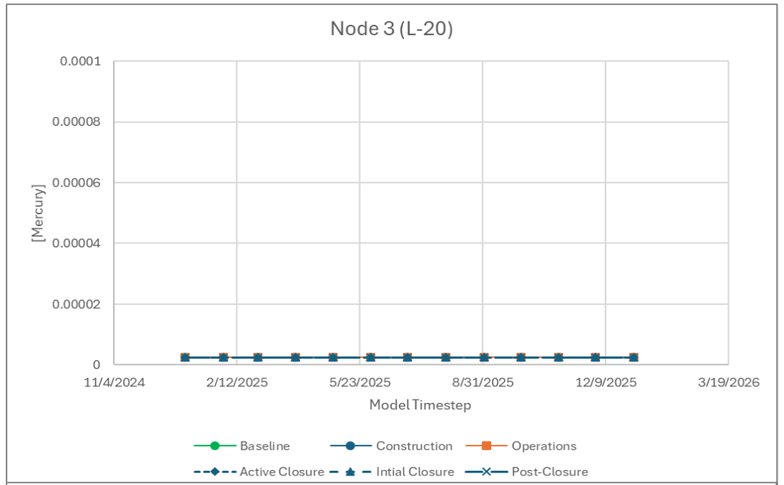

Node 8, Birch Lake
[Iron]
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

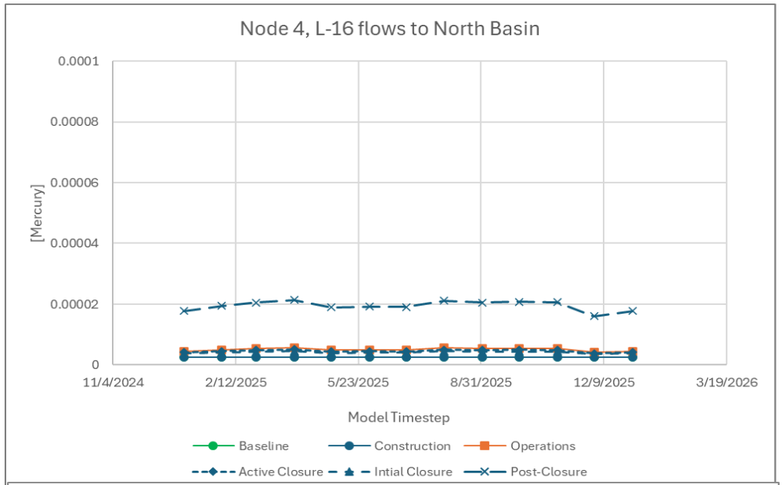

Node 9, Southeast Arm of Springpole Lake
[Iron]
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

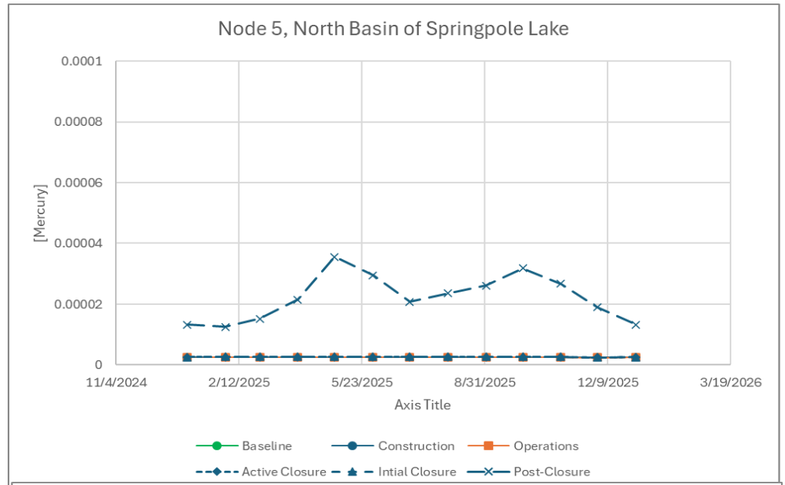

Node 10, Southeast Arm of Springpole Lake
[Iron]
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

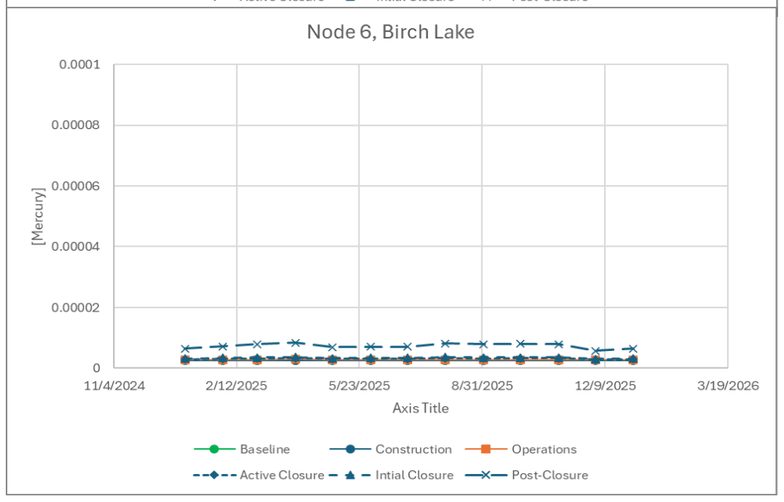

Node 11, North Basin
[Iron]
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

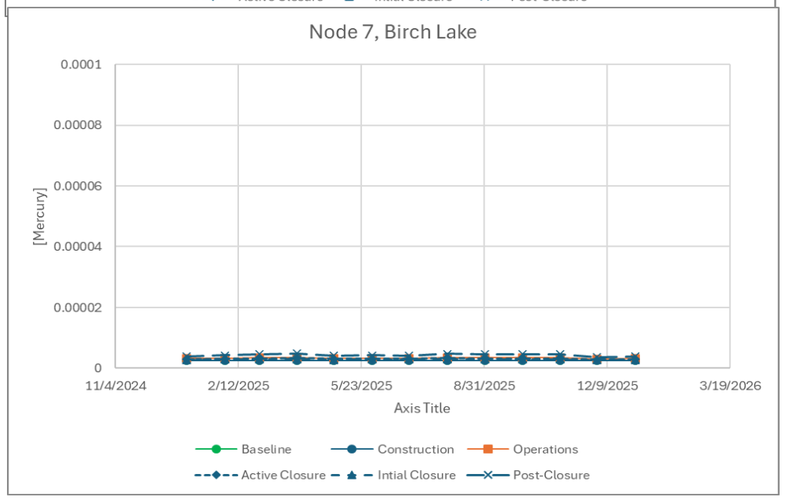

Effluent Discharge location, Southeast Arm of Springpole Lake
[Iron]
0.3
0.25
0.2
0.15
0.1
0.05
0
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

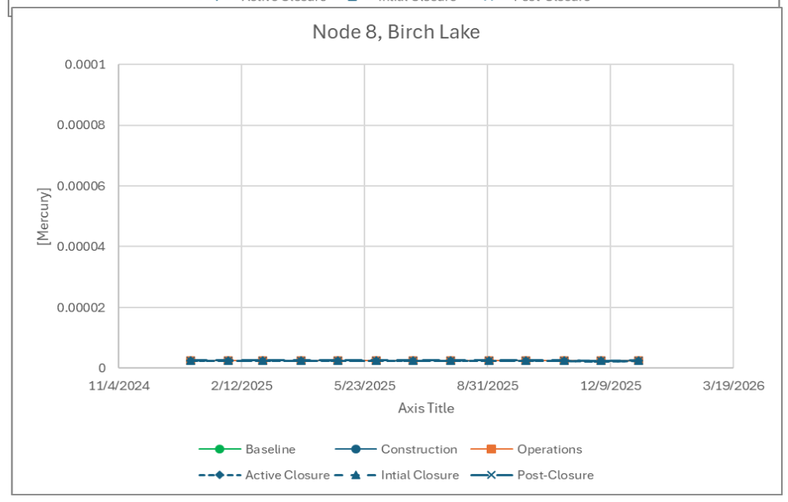

Node 3 (L-20)
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

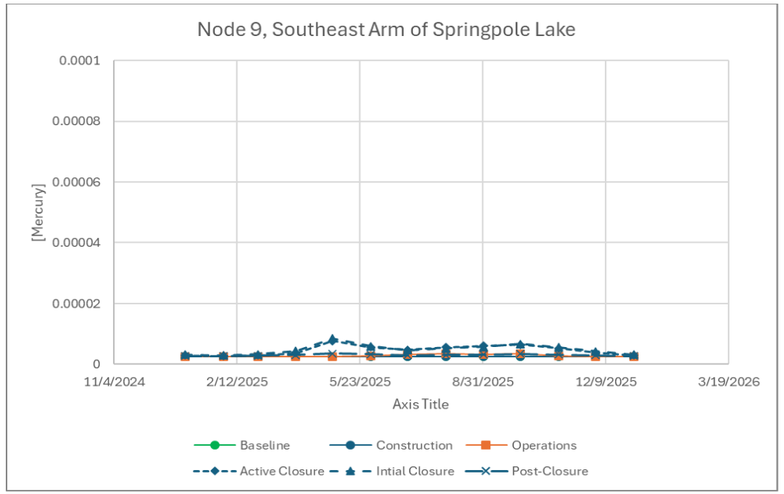

Node 4, L-16 flows to North Basin
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Model Timestep
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

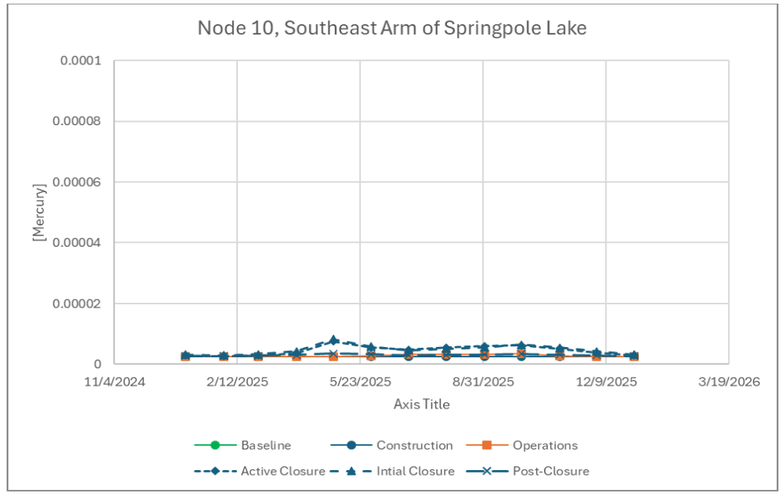

Node 5, North Basin of Springpole Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

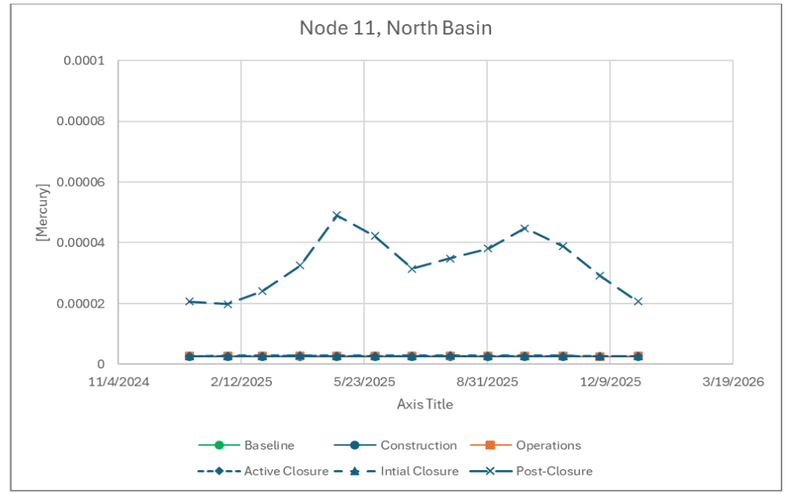

Node 6, Birch Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure


Node 7, Birch Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure


Node 8, Birch Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure


Node 9, Southeast Arm of Springpole Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure


Node 10, Southeast Arm of Springpole Lake
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure


Node 11, North Basin
0.0001
0.00008
0.00006
0.00004
0.00002
0
[Mercury]
11/4/2024
2/12/2025
5/23/2025
8/31/2025
12/9/2025
3/19/2026
Axis Title
Baseline
Construction
Operations
Active Closure
Intial Closure
Post-Closure

Attachment C
Water Quality Model Results, 100-yr Wet and 100-yr Dry Sensitivity Cases

Table C-1. 100-yr Wet Water Quality Model Results, Node 3

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.11	0.004
Construction	min	0.014	0.010	0.005	0.0068	1.03	0.001	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.0001
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.001	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.011	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.001	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003
Operations	min	0.014	0.010	0.005	0.0068	1.03	0.0010	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.00010
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.00103	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.0106	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.0010	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.0068	1.03	0.0010	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.00010
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.00103	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.011	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.0010	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003
Intial Closure	min	0.014	0.010	0.005	0.0068	1.03	0.0010	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.00010
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.00103	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.011	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.0010	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003
Final Closure	min	0.014	0.010	0.005	0.0068	1.03	0.0010	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.00010
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.00103	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.011	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.0010	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-2. 100-yr Wet Water Quality Model Results, Node 4

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.0009	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.11	0.004
Construction	min	0.02	0.010	0.005	0.0095	1.45	0.0010	0.0061	0.00005	0.00051	0.0067	0.000010	0.005	0.0000025	10.0	0.00015	0.00005	0.00065	0.013	0.000025	0.0005	1.44	0.0017	0.0000025	0.000104	0.00025	0.57	0.000005	0.000005	0.00005	0.000005	0.00025	0.0015	0.00010
	mean	0.19	0.027	0.005	0.012	1.55	0.001	0.0086	0.00005	0.00058	0.0074	0.000022	0.005	0.0000025	10	0.00018	0.00005	0.00072	0.023	0.000025	0.0005	1.5	0.0035	0.0000025	0.00011	0.00025	0.64	0.0000112	0.000005	0.00005	0.000011	0.00025	0.0015	0.0001
	max	0.69	0.065	0.005	0.016	1.65	0.001	0.011	0.00005	0.0007	0.008	0.00005	0.005	0.0000025	11	0.00022	0.00005	0.0008	0.029	0.000025	0.0005	1.6	0.0057	0.0000025	0.00012	0.00025	0.67	0.000025	0.000005	0.00005	0.000015	0.00025	0.0015	0.0001
Operations	min	0.03	0.19	0.0054	0.0095	16.92	0.002	0.012	0.0039	0.0005	0.0113	0.0000099	0.0073	0.0000032	15	0.00019	0.00045	0.00066	0.0128	0.0000246	0.00056	2.1	0.01	0.0000035	0.00031	0.00027	4.9	0.0000086	0.000036	0.00026	0.0007	0.000246	0.00151	0.000115
	mean	0.2	0.32	0.0056	0.012	26.71	0.003	0.016	0.006	0.00057	0.014	0.000022	0.009	0.0000037	18	0.00023	0.0007	0.00072	0.023	0.000025	0.0006	2.5	0.014	0.000004	0.00045	0.00029	8	0.000017	0.00006	0.00039	0.0011	0.00025	0.0015	0.00012
	max	0.7	0.4	0.0058	0.016	33.87	0.003	0.02	0.008	0.0007	0.015	0.00005	0.01	0.0000041	19	0.00028	0.0009	0.0008	0.028	0.000025	0.0006	2.7	0.018	0.0000045	0.0005	0.0003	10	0.000031	0.00007	0.0005	0.0014	0.00025	0.0015	0.00013
Active Closure, Pit Filling	min	0.027	0.012	0.005	0.0095	14.04	0.00105	0.0107	0.0032	0.0005	0.0106	0.0000099	0.0068	0.0000031	13.8	0.00018	0.00038	0.00066	0.0129	0.0000247	0.00055	1.9	0.0083	0.0000033	0.00027	0.00027	4.1	0.000008	0.00003	0.00022	0.00054	0.000247	0.00151	0.000112
	mean	0.06	0.03	0.005	0.012	22.05	0.0011	0.014	0.0052	0.00058	0.013	0.000022	0.008	0.0000035	16	0.00022	0.0006	0.00072	0.023	0.000025	0.00058	2.3	0.012	0.0000038	0.00039	0.00028	6	0.000016	0.000046	0.00033	0.0009	0.00025	0.0015	0.00012
	max	0.69	0.068	0.0051	0.016	27.93	0.0011	0.018	0.007	0.0007	0.014	0.00005	0.009	0.0000038	18	0.00026	0.0007	0.0008	0.028	0.000025	0.0006	2.5	0.016	0.0000041	0.0005	0.00029	8	0.00003	0.00006	0.0004	0.0011	0.00025	0.0015	0.00013
Intial Closure	min	0.025	0.012	0.005	0.0095	11.15	0.00104	0.0096	0.0025	0.00051	0.0099	0.0000099	0.0064	0.000003	13.0	0.000173	0.0003	0.00066	0.0129	0.0000248	0.00054	1.8	0.0068	0.0000031	0.00024	0.00027	3.3	0.0000073	0.000024	0.00018	0.00042	0.000248	0.00151	0.00011
	mean	0.2	0.029	0.005	0.012	17.37	0.0011	0.013	0.004	0.00058	0.011	0.000022	0.0073	0.0000033	15	0.00021	0.00046	0.00072	0.023	0.000025	0.00056	2.1	0.01	0.0000035	0.00033	0.00028	5.0	0.000015	0.000037	0.00027	0.0007	0.00025	0.0015	0.00012
	max	0.69	0.067	0.005	0.016	21.94	0.0011	0.016	0.005	0.0007	0.013	0.00005	0.008	0.0000035	16	0.00025	0.0006	0.0008	0.028	0.000025	0.00058	2.3	0.013	0.0000037	0.00038	0.00028	6	0.000029	0.00005	0.00033	0.0009	0.00025	0.0015	0.00012
Final Closure	min	0.35	0.123	0.0066	0.02	6.64	0.0039	0.124	0.0025	0.003	0.18	0.0000107	0.0115	0.0000079	17	0.00121	0.00019	0.00106	0.0088	0.00006	0.0033	3.0	0.29	0.0000123	0.0010	0.00083	1.9	0.000031	0.000037	0.00053	0.00046	0.0021	0.0033	0.0008
	mean	0.47	0.17	0.0072	0.02	8.48	0.0049	0.16	0.0033	0.0037	0.25	0.000018	0.014	0.00001	19	0.0015	0.00023	0.0012	0.015	0.000071	0.0043	3.6	0.39	0.000016	0.0013	0.001	2.3	0.000044	0.000048	0.0007	0.00061	0.0028	0.0039	0.001
	max	0.8	0.2	0.007	0.02	9.60	0.005	0.19	0.004	0.004	0.3	0.000036	0.015	0.000011	20	0.0017	0.0003	0.0014	0.021	0.00008	0.005	4	0.5	0.000018	0.0015	0.0011	3	0.00005	0.00005	0.0008	0.0007	0.003	0.004	0.0012

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-3. 100-yr Wet Water Quality Model Results, Node 5

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.033	0.012	0.005	0.0084	1.55	0.0010	0.0071	0.00005	0.00052	0.0072	0.000014	0.005	0.0000025	10	0.00017	0.00005	0.00068	0.025	0.000025	0.0005	1.4	0.0018	0.0000025	0.00011	0.00025	0.65	0.0000055	0.000005	0.00005	0.000012	0.00025	0.0015	0.00010
	mean	0.11	0.031	0.005	0.011	1.70	0.001	0.011	0.000067	0.00057	0.0074	0.000033	0.005	0.0000031	10	0.00021	0.000055	0.00076	0.031	0.000025	0.0005	1.5	0.0047	0.0000025	0.00013	0.00027	0.67	0.000013	0.0000067	0.00005	0.000016	0.00025	0.0015	0.0001
	max	0.21	0.055	0.005	0.014	1.98	0.001	0.014	0.00014	0.00062	0.0079	0.00005	0.005	0.0000056	11	0.00024	0.000078	0.00081	0.035	0.000025	0.0005	1.6	0.0058	0.0000025	0.00018	0.00037	0.68	0.000036	0.000014	0.00005	0.000031	0.00025	0.0015	0.0001
Operations	min	0.021	0.018	0.005	0.0079	2.20	0.001	0.0069	0.00022	0.00051	0.0071	0.000010	0.0051	0.0000025	10	0.00016	0.000067	0.00067	0.024	0.000025	0.0005	1.4	0.0019	0.0000025	0.00011	0.00025	0.85	0.0000052	0.0000064	0.000059	0.00004	0.00025	0.0015	0.000101
	mean	0.075	0.048	0.005	0.011	2.85	0.0011	0.010	0.00036	0.00054	0.0076	0.000022	0.0052	0.0000038	11	0.00019	0.00009	0.00076	0.029	0.000025	0.0005	1.5	0.0041	0.0000026	0.00015	0.00029	1.0	0.000015	0.00001	0.000065	0.00007	0.00025	0.0015	0.000101
	max	0.22	0.072	0.005	0.014	3.25	0.0011	0.014	0.0005	0.00063	0.0082	0.00005	0.0052	0.0000058	12	0.0002	0.00011	0.00087	0.034	0.000025	0.00051	1.7	0.0063	0.0000026	0.0002	0.00037	1.1	0.000038	0.000017	0.00007	0.00009	0.00025	0.0015	0.000101
Active Closure, Pit Filling	min	0.021	0.0101	0.005	0.0079	2.15	0.0010	0.0069	0.00021	0.00051	0.0071	0.000010	0.0051	0.0000025	10	0.00016	0.000066	0.00067	0.024	0.000025	0.0005	1.4	0.0018	0.0000025	0.00011	0.00025	0.84	0.0000051	0.0000063	0.000059	0.000038	0.00025	0.0015	0.000101
	mean	0.059	0.035	0.005	0.011	2.77	0.0010	0.010	0.00034	0.00054	0.0076	0.000022	0.0052	0.0000038	11	0.00019	0.00009	0.00076	0.029	0.000025	0.0005	1.5	0.0041	0.0000026	0.00015	0.00029	0.9	0.000015	0.00001	0.000064	0.00006	0.00025	0.0015	0.000101
	max	0.22	0.057	0.005	0.014	3.17	0.00101	0.014	0.0004	0.00063	0.0082	0.00005	0.0052	0.0000058	11	0.0002	0.00011	0.00087	0.034	0.000025	0.00051	1.7	0.0062	0.0000026	0.0002	0.00037	1.0	0.000038	0.000017	0.000068	0.00008	0.00025	0.0015	0.000101
Intial Closure	min	0.021	0.01	0.005	0.0079	2.51	0.001	0.007	0.0003	0.00051	0.0072	0.000010	0.0051	0.0000025	10	0.00016	0.000075	0.00067	0.024	0.000025	0.0005	1.5	0.002	0.0000026	0.00012	0.00025	0.94	0.0000052	0.000007	0.000063	0.000053	0.00025	0.0015	0.0001
	mean	0.075	0.035	0.005	0.011	3.36	0.001	0.01	0.00049	0.00054	0.0077	0.000022	0.0052	0.0000039	11	0.00019	0.0001	0.00076	0.029	0.000025	0.00051	1.5	0.0043	0.0000026	0.00015	0.00029	1.1	0.000015	0.000011	0.000072	0.00009	0.00025	0.0015	0.0001
	max	0.22	0.057	0.005	0.014	3.84	0.001	0.015	0.0006	0.00063	0.0084	0.00005	0.0053	0.0000058	12	0.0002	0.00013	0.00087	0.034	0.000025	0.00051	1.7	0.0065	0.0000026	0.00021	0.00038	1.2	0.000038	0.000019	0.00008	0.00011	0.00025	0.0015	0.0001
Final Closure	min	0.114	0.256	0.0087	0.011	10.60	0.0012	0.0167	0.00026	0.00071	0.0173	0.000037	0.0059	0.0000097	10	0.00023	0.000089	0.00083	0.03	0.000047	0.00066	1.5	0.0221	0.0000091	0.00038	0.00035	0.73	0.0000114	0.0000109	0.000127	0.000066	0.00038	0.0018	0.00042
	mean	0.28	0.655	0.0165	0.015	28.17	0.0013	0.023	0.00039	0.00078	0.023	0.000056	0.0066	0.0000159	11	0.00029	0.000109	0.00095	0.035	0.000087	0.00074	1.6	0.029	0.0000214	0.00058	0.00042	0.77	0.000022	0.000016	0.00019	0.000093	0.00044	0.0021	0.00096
	max	0.5	1.108	0.0251	0.018	47.85	0.0013	0.029	0.00046	0.0009	0.028	0.000072	0.0072	0.0000245	12	0.00032	0.00013	0.00112	0.044	0.000131	0.0008	1.8	0.038	0.000035 *	0.00081	0.00046	0.8	0.000039	0.00002	0.00025	0.00011	0.00049	0.0024	0.00156

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines.

- value not availabile

Table C-4. 100-yr Wet Water Quality Model Results, Node 6

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.014	0.010	0.005	0.0068	1.03	0.001	0.0089	0.00005	0.0008	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.035	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.0001
	mean	0.059	0.022	0.005	0.0093	1.17	0.001	0.012	0.00005	0.001	0.006	0.000041	0.005	0.0000042	9.8	0.00023	0.00005	0.00074	0.04	0.000025	0.0005	1.5	0.0034	0.0000025	0.00015	0.00038	0.56	0.000019	0.000016	0.00005	0.000028	0.00025	0.0015	0.00016
	max	0.11	0.05	0.005	0.011	1.31	0.001	0.016	0.00005	0.0012	0.0064	0.00005	0.005	0.000010	11	0.00025	0.00005	0.001	0.05	0.000025	0.0005	1.6	0.0049	0.0000025	0.00025	0.0005	0.58	0.00005	0.000025	0.00005	0.00005	0.00025	0.0015	0.0003
Operations	min	0.015	0.029	0.005	0.0068	2.61	0.0011	0.0095	0.000449	0.0008	0.0061	0.000010	0.0052	0.0000026	9.7	0.0002	0.000091	0.00063	0.035	0.000025	0.00051	1.5	0.0021	0.0000026	0.00011	0.00025	0.99	0.0000054	0.000008	0.000072	0.000085	0.00025	0.0015	0.000102
	mean	0.06	0.054	0.0051	0.0093	3.88	0.0012	0.012	0.0007	0.00103	0.0067	0.000041	0.0054	0.0000044	10.6	0.00023	0.00012	0.00074	0.04	0.000025	0.00051	1.6	0.0045	0.0000027	0.00018	0.00039	1.3	0.000019	0.000021	0.00009	0.00014	0.00025	0.0015	0.00016
	max	0.11	0.087	0.0051	0.0106	4.78	0.0013	0.017	0.001	0.0012	0.0072	0.00005	0.0055	0.0000102	12	0.00026	0.00014	0.0010	0.05	0.000025	0.00051	1.7	0.0062	0.0000027	0.00029	0.00051	1.5	0.000051	0.000032	0.0001	0.00018	0.00025	0.0015	0.0003
Active Closure, Pit Filling	min	0.016	0.011	0.005	0.0068	4.71	0.001	0.0102	0.000977	0.0008	0.0069	0.000010	0.0055	0.0000027	11	0.00021	0.000145	0.00063	0.035	0.000025	0.00051	1.6	0.0032	0.0000027	0.00014	0.00026	1.57	0.0000059	0.000012	0.00010	0.000174	0.00025	0.0015	0.0001
	mean	0.059	0.023	0.005	0.0093	7.33	0.001	0.013	0.0016	0.00103	0.0075	0.000041	0.0059	0.0000045	12	0.00024	0.00021	0.00074	0.04	0.000025	0.00052	1.7	0.0059	0.0000029	0.00023	0.00039	2.3	0.00002	0.000028	0.00013	0.00029	0.00025	0.0015	0.00017
	max	0.11	0.051	0.005	0.011	9.22	0.001	0.018	0.0021	0.0012	0.008	0.00005	0.0062	0.00001	13	0.00026	0.00026	0.0010	0.05	0.000025	0.00053	1.9	0.008	0.000003	0.00035	0.00051	2.8	0.000052	0.000041	0.00016	0.0004	0.00025	0.0015	0.00031
Intial Closure	min	0.017	0.011	0.005	0.0068	6.68	0.001	0.0109	0.001473	0.0008	0.0075	0.000010	0.0058	0.0000028	11	0.00021	0.000196	0.00063	0.035	0.000025	0.00052	1.6	0.0042	0.0000028	0.00017	0.00026	2.11	0.0000063	0.000016	0.000127	0.000258	0.00025	0.0015	0.00011
	mean	0.062	0.024	0.005	0.0093	10.41	0.001	0.014	0.0024	0.001	0.008	0.000041	0.0063	0.0000047	12	0.00024	0.00029	0.00074	0.04	0.000025	0.00054	1.8	0.007	0.0000031	0.00027	0.0004	3.1	0.000021	0.000034	0.00018	0.00042	0.00025	0.0015	0.00017
	max	0.11	0.051	0.005	0.011	13.08	0.001	0.019	0.003	0.0012	0.009	0.00005	0.007	0.000011	14	0.00027	0.0004	0.0010	0.05	0.000025	0.00055	2.0	0.009	0.0000032	0.00039	0.00052	4	0.000052	0.00005	0.00021	0.0005	0.00025	0.0015	0.00031
Final Closure	min	0.079	0.032	0.0053	0.016	2.10	0.0016	0.0343	0.000541	0.0015	0.0412	0.00001	0.0063	0.0000036	11	0.0004	0.000078	0.00071	0.032	0.000032	0.00105	1.8	0.0621	0.0000045	0.00027	0.00037	0.8	0.00001	0.000011	0.000147	0.000107	0.00063	0.0019	0.00024
	mean	0.14	0.056	0.0055	0.02	2.83	0.0019	0.048	0.0008	0.0017	0.061	0.000038	0.007	0.0000058	12	0.00054	0.00009	0.00085	0.036	0.000036	0.0014	2.0	0.09	0.0000056	0.00042	0.00055	1.0	0.000026	0.000025	0.0002	0.00017	0.0008	0.0021	0.00037
	max	0.2	0.09	0.0056	0.02	3.29	0.0021	0.06	0.001	0.002	0.07	0.000047	0.008	0.000011	13	0.0006	0.0001	0.0011	0.046	0.000039	0.0016	2.1	0.12	0.000006	0.0006	0.0007	1.0	0.000054	0.000035	0.00024	0.0002	0.001	0.0022	0.00052

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-5. 100-yr Wet Water Quality Model Results, Node 7

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.014	0.010	0.005	0.0089	1.05	0.001	0.0063	0.00005	0.00089	0.0063	0.000010	0.005	0.0000025	9.3	0.00017	0.00005	0.0005	0.016	0.000025	0.0005	1.4	0.0012	0.0000025	0.000091	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.0001
	mean	0.074	0.022	0.005	0.011	1.12	0.001	0.0098	0.00005	0.001	0.0068	0.000036	0.005	0.0000025	10	0.00019	0.00005	0.00065	0.032	0.000025	0.0005	1.6	0.0044	0.0000025	0.00016	0.00025	0.58	0.000011	0.000005	0.00005	0.00002	0.00025	0.0015	0.00011
	max	0.13	0.048	0.005	0.014	1.17	0.001	0.012	0.00005	0.0012	0.0074	0.00005	0.005	0.0000025	11	0.00021	0.00005	0.00077	0.055	0.000025	0.0005	1.8	0.008	0.0000025	0.00025	0.00025	0.63	0.000025	0.000005	0.00005	0.000023	0.00025	0.0015	0.00014
Operations	min	0.017	0.066	0.0051	0.0089	5.76	0.0013	0.008	0.001235	0.00089	0.0076	0.000010	0.0057	0.0000027	11	0.00018	0.000172	0.0005	0.016	0.000025	0.00052	1.7	0.0037	0.0000028	0.00016	0.00026	1.93	0.0000061	0.0000144	0.000114	0.000218	0.00025	0.0015	0.0001
	mean	0.077	0.11	0.0052	0.011	8.96	0.002	0.012	0.002	0.001	0.009	0.000036	0.0061	0.0000029	13	0.0002	0.00025	0.00065	0.032	0.000025	0.00053	1.9	0.008	0.000003	0.00026	0.00026	2.7	0.000013	0.000021	0.00016	0.00035	0.00025	0.0015	0.00012
	max	0.13	0.15	0.0053	0.014	11.34	0.002	0.015	0.0026	0.0012	0.01	0.00005	0.0065	0.000003	14	0.00023	0.00031	0.00077	0.055	0.000025	0.00054	2.1	0.012	0.0000031	0.00039	0.00027	3.4	0.000027	0.000025	0.00019	0.0005	0.00025	0.0015	0.00015
Active Closure, Pit Filling	min	0.016	0.011	0.005	0.0089	4.64	0.001	0.0076	0.000951	0.00089	0.0073	0.000010	0.0055	0.0000027	10	0.00018	0.000143	0.0005	0.016	0.000025	0.00051	1.6	0.0031	0.0000027	0.00014	0.00026	1.62	0.0000058	0.0000122	0.000099	0.00017	0.00025	0.0015	0.0001
	mean	0.059	0.023	0.005	0.011	7.08	0.001	0.011	0.0016	0.001	0.0083	0.000036	0.0059	0.0000028	12	0.0002	0.0002	0.00065	0.032	0.000025	0.00052	1.8	0.0068	0.0000029	0.00024	0.00026	2.2	0.000013	0.000017	0.00013	0.00027	0.00025	0.0015	0.00011
	max	0.13	0.049	0.005	0.014	8.91	0.001	0.014	0.002	0.0012	0.009	0.00005	0.0061	0.0000029	13	0.00022	0.00025	0.00077	0.055	0.000025	0.00053	2.0	0.011	0.000003	0.00035	0.00026	2.7	0.000027	0.000021	0.00016	0.0004	0.00025	0.0015	0.00015
Intial Closure	min	0.015	0.01	0.005	0.0089	3.51	0.001	0.0072	0.000667	0.00089	0.007	0.000010	0.0054	0.0000026	10	0.00018	0.000113	0.0005	0.016	0.000025	0.00051	1.6	0.0025	0.0000027	0.00012	0.00025	1.31	0.0000056	0.0000099	0.000083	0.000122	0.00025	0.0015	0.0001
	mean	0.075	0.022	0.005	0.011	5.20	0.001	0.011	0.0011	0.001	0.0078	0.000036	0.0056	0.0000027	11	0.0002	0.00016	0.00065	0.032	0.000025	0.00052	1.7	0.0061	0.0000028	0.00021	0.00026	1.7	0.000012	0.000013	0.00011	0.00019	0.00025	0.0015	0.00011
	max	0.13	0.049	0.005	0.014	6.47	0.001	0.014	0.0014	0.0012	0.009	0.00005	0.0058	0.0000028	13	0.00022	0.00019	0.00077	0.055	0.000025	0.00052	1.9	0.01	0.0000028	0.00032	0.00026	2.0	0.000026	0.000016	0.00012	0.00025	0.00025	0.0015	0.00014
Final Closure	min	0.037	0.018	0.0051	0.011	1.42	0.0012	0.0166	0.000219	0.0011	0.0184	0.00001	0.0054	0.0000029	10	0.00026	0.000059	0.00055	0.016	0.000027	0.00069	1.6	0.0262	0.0000032	0.00015	0.00029	0.66	0.0000068	0.0000072	0.000083	0.000049	0.00038	0.0016	0.00015
	mean	0.1	0.034	0.0052	0.015	1.72	0.0013	0.023	0.00033	0.0013	0.026	0.000035	0.0057	0.0000031	11	0.0003	0.000066	0.0007	0.031	0.000029	0.0008	1.7	0.036	0.0000036	0.00026	0.00032	0.72	0.000014	0.000009	0.0001	0.00007	0.00046	0.0017	0.00019
	max	0.16	0.061	0.0052	0.018	1.94	0.0014	0.028	0.0004	0.0014	0.033	0.000049	0.0059	0.0000033	12	0.00034	0.00007	0.00082	0.054	0.00003	0.0009	2.0	0.05	0.0000039	0.00037	0.00033	0.8	0.000028	0.00001	0.00012	0.00009	0.0005	0.0018	0.00024

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-6. 100-yr Wet Water Quality Model Results, Node 8

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.023	0.010	0.005	0.0068	1.03	0.001	0.0095	0.00005	0.00076	0.0055	0.000010	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.034	0.000025	0.0005	1.4	0.0012	0.0000025	0.000092	0.00025	0.55	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.0001
	mean	0.062	0.022	0.005	0.009	1.14	0.001	0.012	0.00005	0.00092	0.0058	0.000041	0.005	0.0000046	9.4	0.00022	0.00005	0.00076	0.039	0.000025	0.0005	1.5	0.0034	0.0000025	0.00013	0.00035	0.56	0.000015	0.000013	0.00005	0.000028	0.00025	0.0015	0.0001
	max	0.11	0.05	0.005	0.010	1.23	0.001	0.016	0.00005	0.0012	0.0061	0.00005	0.005	0.0000099	9.6	0.00025	0.00005	0.00099	0.05	0.000025	0.0005	1.5	0.0049	0.0000025	0.00018	0.0005	0.58	0.000037	0.000025	0.00005	0.000049	0.00025	0.0015	0.0001
Operations	min	0.023	0.011	0.005	0.0068	1.13	0.001	0.0095	0.000073	0.00076	0.0056	0.00001	0.005	0.0000025	9.1	0.0002	0.000053	0.00063	0.035	0.000025	0.0005	1.4	0.0013	0.0000025	0.000093	0.00025	0.58	0.000005	0.0000052	0.000051	0.000022	0.00025	0.0015	0.0001
	mean	0.062	0.024	0.005	0.009	1.30	0.001	0.012	0.00009	0.00092	0.0058	0.000041	0.005	0.0000047	9.4	0.00022	0.000055	0.00076	0.04	0.000025	0.0005	1.5	0.0035	0.0000025	0.00013	0.00035	0.6	0.000015	0.000013	0.000052	0.000035	0.00025	0.0015	0.0001
	max	0.11	0.052	0.005	0.010	1.41	0.001	0.016	0.0001	0.0012	0.0061	0.00005	0.005	0.0000099	9.6	0.00025	0.000057	0.0010	0.05	0.000025	0.0005	1.5	0.005	0.0000025	0.00019	0.0005	0.63	0.000037	0.000025	0.000053	0.000056	0.00025	0.0015	0.0001
Active Closure, Pit Filling	min	0.023	0.01	0.005	0.0068	1.12	0.001	0.0095	0.000072	0.00076	0.0056	0.000010	0.005	0.0000025	9.1	0.0002	0.000052	0.00063	0.034	0.000025	0.0005	1.4	0.0012	0.0000025	0.000093	0.00025	0.58	0.000005	0.0000052	0.000051	0.000022	0.00025	0.0015	0.0001
	mean	0.059	0.022	0.005	0.009	1.29	0.001	0.012	0.00009	0.00092	0.0058	0.000041	0.005	0.0000047	9.4	0.00022	0.000054	0.00076	0.039	0.000025	0.0005	1.5	0.0035	0.0000025	0.00013	0.00035	0.6	0.000015	0.000013	0.000052	0.000034	0.00025	0.0015	0.0001
	max	0.11	0.05	0.005	0.010	1.39	0.001	0.016	0.0001	0.0012	0.0061	0.00005	0.005	0.0000099	9.6	0.00025	0.000055	0.00099	0.05	0.000025	0.0005	1.5	0.005	0.0000025	0.00019	0.0005	0.63	0.000037	0.000025	0.000053	0.000056	0.00025	0.0015	0.0001
Intial Closure	min	0.023	0.01	0.005	0.0068	1.11	0.001	0.0095	0.00007	0.00076	0.0056	0.000010	0.005	0.0000025	9.1	0.0002	0.000052	0.00063	0.034	0.000025	0.0005	1.4	0.0012	0.0000025	0.000093	0.00025	0.58	0.000005	0.0000052	0.000051	0.000021	0.00025	0.0015	0.0001
	mean	0.062	0.022	0.005	0.009	1.27	0.001	0.012	0.00008	0.00092	0.0058	0.000041	0.005	0.0000047	9.4	0.00022	0.000053	0.00076	0.039	0.000025	0.0005	1.5	0.0035	0.0000025	0.00013	0.00035	0.6	0.000015	0.000013	0.000052	0.000034	0.00025	0.0015	0.0001
	max	0.11	0.05	0.005	0.010	1.38	0.001	0.016	0.00009	0.0012	0.0061	0.00005	0.005	0.0000099	9.6	0.00025	0.000054	0.00099	0.05	0.000025	0.0005	1.5	0.005	0.0000025	0.00019	0.0005	0.62	0.000037	0.000025	0.000052	0.000055	0.00025	0.0015	0.0001
Final Closure	min	0.024	0.01	0.005	0.0069	1.04	0.001	0.0098	0.000055	0.00077	0.0061	0.00001	0.005	0.0000025	9.0	0.0002	0.00005	0.00063	0.034	0.000025	0.00051	1.4	0.002	0.0000025	0.000094	0.00025	0.56	0.0000051	0.0000051	0.000051	0.000019	0.00025	0.0015	0.0001
	mean	0.063	0.023	0.005	0.0092	1.16	0.001	0.012	0.000059	0.00093	0.0064	0.000041	0.005	0.0000047	9.4	0.00023	0.00005	0.00076	0.039	0.000025	0.00051	1.5	0.0044	0.0000025	0.00013	0.00035	0.56	0.000015	0.000013	0.000052	0.000029	0.00026	0.0015	0.0001
	max	0.11	0.05	0.005	0.01	1.25	0.001	0.016	0.000061	0.0012	0.0068	0.00005	0.005	0.0000099	9.6	0.00025	0.000051	0.0010	0.05	0.000025	0.00051	1.5	0.0061	0.0000025	0.00019	0.0005	0.58	0.000037	0.000025	0.000052	0.00005	0.00026	0.0015	0.0001

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-7. 100-yr Wet Water Quality Model Results, Node 9

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.017	0.014	0.005	0.0082	1.08	0.0010	0.012	0.00005	0.00069	0.0059	0.000033	0.005	0.0000025	9.1	0.00021	0.00005	0.00062	0.04	0.000025	0.0005	1.4	0.0019	0.0000025	0.0001	0.00025	0.58	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.00010
	mean	0.094	0.029	0.005	0.01	1.21	0.001	0.015	0.00006	0.00079	0.0062	0.000044	0.005	0.0000065	9.4	0.00023	0.00005	0.00074	0.043	0.000025	0.00059	1.4	0.0049	0.0000025	0.00014	0.0003	0.59	0.000018	0.000012	0.00007	0.000029	0.00025	0.0015	0.00014
	max	0.26	0.057	0.005	0.011	1.35	0.001	0.017	0.00009	0.00096	0.0063	0.000058	0.005	0.000012	9.9	0.00024	0.000051	0.00092	0.048	0.000025	0.0009	1.6	0.0081	0.0000025	0.00021	0.00038	0.6	0.000042	0.000019	0.00014	0.000049	0.00025	0.0017	0.00018
Operations	min	0.017	0.014	0.005	0.0078	1.49	0.001	0.012	0.000092	0.0007	0.0058	0.000045	0.0052	0.0000057	9.0	0.00021	0.000054	0.00064	0.042	0.000028	0.0005	1.4	0.0019	0.0000025	0.00018	0.00033	0.59	0.0000061	0.0000052	0.000051	0.000029	0.00036	0.0015	0.000099
	mean	0.091	0.031	0.005	0.01	8.41	0.001	0.027	0.0012	0.00104	0.0061	0.00065	0.016	0.0000097	9.4	0.00066	0.000084	0.00096	0.097	0.00023	0.00059	1.4	0.0049	0.000003	0.0042	0.0017	0.61	0.000072	0.000013	0.000072	0.00031	0.007	0.0025	0.00014
	max	0.26	0.059	0.005	0.011	20.35	0.001	0.048	0.0031	0.0016	0.0063	0.0017	0.034	0.00002	9.9	0.0014	0.00014	0.0014	0.19	0.00058	0.0009	1.6	0.0082	0.0000039	0.0111	0.004	0.63	0.00016	0.000019	0.00014	0.00078	0.018	0.0044	0.00018
Active Closure, Pit Filling	min	0.056	0.078	0.0054	0.0082	2.59	0.0011	0.017	0.00021	0.00073	0.0057	0.00012	0.015	0.0000062	8.9	0.0003	0.000058	0.00078	0.042	0.00008	0.00049	1.3	0.0019	0.0000027	0.00072	0.0005	0.59	0.000046	0.000024	0.00025	0.00015	0.0011	0.0016	0.00021
	mean	0.06	0.27	0.01	0.01	15.12	0.0016	0.068	0.0017	0.0012	0.0061	0.0009	0.13	0.000013	9.4	0.0009	0.0001	0.0011	0.064	0.00072	0.00059	1.4	0.0048	0.0000044	0.0061	0.0023	0.61	0.00009	0.000071	0.0024	0.0012	0.01	0.0033	0.00045
	max	1.1	0.55	0.015	0.011	31.81	0.0024	0.14	0.0036	0.0016	0.0063	0.0019	0.27	0.000023	9.8	0.0017	0.00017	0.0016	0.09	0.0015	0.0009	1.6	0.0081	0.0000067	0.013	0.0048	0.63	0.00017	0.00014	0.0051	0.0026	0.022	0.0053	0.00079
Intial Closure	min	0.1	0.1	0.0058	0.0083	3.94	0.0011	0.022	0.00037	0.00076	0.0057	0.00021	0.027	0.0000068	8.9	0.00037	0.000063	0.00082	0.044	0.00015	0.00049	1.3	0.0019	0.0000029	0.0013	0.00069	0.59	0.000056	0.00003	0.00047	0.00026	0.002	0.0018	0.00024
	mean	0.64	0.32	0.01	0.011	17.87	0.0018	0.079	0.002	0.0012	0.0061	0.0011	0.15	0.000014	9.3	0.0011	0.00011	0.0011	0.068	0.00085	0.00059	1.4	0.0048	0.0000048	0.0073	0.0027	0.61	0.00011	0.000082	0.0028	0.0014	0.012	0.0036	0.00052
	max	1.3	0.67	0.017	0.012	38.77	0.0027	0.16	0.0044	0.0017	0.0063	0.0024	0.33	0.000026	9.8	0.0021	0.00019	0.0018	0.1	0.0019	0.00089	1.6	0.0081	0.0000076	0.016	0.0058	0.63	0.00021	0.00017	0.0063	0.0031	0.027	0.0062	0.0009
Final Closure	min	0.019	0.025	0.0051	0.008	1.51	0.001	0.012	0.000061	0.0007	0.0065	0.000034	0.005	0.0000028	9.0	0.00021	0.000051	0.00063	0.04	0.000026	0.00051	1.4	0.0028	0.0000027	0.00011	0.00025	0.58	0.0000053	0.0000053	0.000052	0.000021	0.00026	0.0015	0.00012
	mean	0.097	0.046	0.0053	0.01	1.92	0.001	0.015	0.000073	0.00081	0.0069	0.000045	0.0051	0.000007	9.4	0.00023	0.000052	0.00075	0.044	0.000027	0.0006	1.4	0.006	0.000003	0.00015	0.00031	0.59	0.000019	0.000013	0.000075	0.000032	0.00026	0.0016	0.00017
	max	0.27	0.063	0.0056	0.011	2.67	0.001	0.018	0.00011	0.00097	0.0072	0.000059	0.0051	0.000012	9.9	0.00025	0.000053	0.00094	0.05	0.000028	0.00091	1.6	0.01	0.0000035	0.00022	0.0004	0.61	0.000042	0.000019	0.00015	0.000051	0.00026	0.0017	0.00022

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-8. 100-yr Wet Water Quality Model Results, Node 10

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.017	0.014	0.005	0.0084	1.08	0.0010	0.012	0.00005	0.00069	0.0059	0.000032	0.005	0.0000025	9.1	0.00021	0.00005	0.00062	0.04	0.000025	0.0005	1.4	0.0019	0.0000025	0.0001	0.00025	0.57	0.0000059	0.0000005	0.000049	0.000018	0.00025	0.0015	0.00010
	mean	0.092	0.029	0.005	0.01	1.21	0.001	0.015	0.000059	0.00079	0.0062	0.000043	0.005	0.0000064	9.4	0.00023	0.00005	0.00074	0.044	0.000025	0.00059	1.4	0.0049	0.0000025	0.00014	0.00038	0.59	0.000012	0.000012	0.000069	0.00003	0.00026	0.0015	0.00014
	max	0.25	0.057	0.005	0.011	1.34	0.001	0.018	0.000088	0.00096	0.0064	0.000056	0.005	0.000012	9.9	0.00024	0.000051	0.00091	0.049	0.000025	0.00088	1.6	0.0081	0.0000025	0.00021	0.00061	0.6	0.000034	0.000019	0.00014	0.000052	0.00027	0.0017	0.00018
Operations	min	0.017	0.014	0.005	0.008	1.48	0.001	0.012	0.00009	0.0007	0.0058	0.000044	0.0052	0.0000056	8.9	0.00021	0.000054	0.00063	0.042	0.000028	0.0005	1.4	0.0019	0.0000025	0.00018	0.00032	0.59	0.0000053	0.0000052	0.00005	0.000028	0.00038	0.0015	0.000099
	mean	0.089	0.031	0.005	0.01	8.13	0.001	0.027	0.00115	0.00103	0.0061	0.00062	0.015	0.0000094	9.4	0.00064	0.000083	0.00095	0.096	0.00022	0.00059	1.4	0.0049	0.000003	0.0041	0.0017	0.61	0.000015	0.000013	0.000071	0.0003	0.0067	0.0025	0.00014
	max	0.25	0.059	0.005	0.011	19.62	0.001	0.047	0.003	0.0016	0.0064	0.0016	0.033	0.000019	9.9	0.00133	0.00013	0.0013	0.18	0.00056	0.00088	1.6	0.0082	0.0000038	0.0107	0.0038	0.63	0.000038	0.00002	0.00014	0.00075	0.018	0.0042	0.00018
Active Closure, Pit Filling	min	0.054	0.077	0.0054	0.0083	2.54	0.0011	0.017	0.00021	0.00073	0.0058	0.00012	0.015	0.0000061	8.9	0.0003	0.000057	0.00078	0.042	0.00008	0.00049	1.3	0.0019	0.0000027	0.0007	0.00077	0.59	0.0000053	0.000024	0.00024	0.00015	0.0011	0.0016	0.0002
	mean	0.06	0.26	0.009	0.01	14.59	0.0016	0.066	0.0016	0.0011	0.0061	0.00087	0.12	0.000013	9.4	0.00089	0.0001	0.001	0.063	0.00069	0.00059	1.4	0.0049	0.0000043	0.0059	0.0023	0.61	0.000015	0.000068	0.0023	0.0011	0.01	0.0032	0.00044
	max	1.1	0.53	0.015	0.011	30.65	0.0023	0.13	0.0035	0.0016	0.0063	0.0019	0.26	0.000023	9.9	0.0017	0.00016	0.0016	0.09	0.0015	0.00088	1.6	0.0081	0.0000065	0.013	0.0047	0.63	0.000038	0.00014	0.0049	0.0025	0.021	0.0051	0.00076
Intial Closure	min	0.1	0.1	0.0058	0.0085	3.84	0.0011	0.022	0.00036	0.00076	0.0057	0.0002	0.026	0.0000067	8.9	0.00036	0.000062	0.00081	0.044	0.00015	0.00049	1.3	0.0019	0.0000028	0.0013	0.001	0.59	0.0000054	0.00003	0.00045	0.00026	0.002	0.0018	0.00023
	mean	0.62	0.31	0.01	0.011	17.23	0.0017	0.076	0.0019	0.0012	0.0061	0.001	0.14	0.000014	9.3	0.001	0.00011	0.0011	0.067	0.00082	0.00058	1.4	0.0049	0.0000047	0.007	0.0027	0.61	0.000016	0.000079	0.0027	0.0014	0.012	0.0035	0.0005
	max	1.3	0.64	0.017	0.011	37.34	0.0026	0.16	0.0043	0.0017	0.0063	0.0023	0.32	0.000025	9.9	0.002	0.00019	0.0018	0.1	0.0018	0.00088	1.6	0.0081	0.0000074	0.016	0.0056	0.63	0.000038	0.00017	0.0061	0.003	0.026	0.006	0.0009
Final Closure	min	0.019	0.024	0.0051	0.0082	1.50	0.001	0.013	0.00006	0.0007	0.0065	0.000033	0.005	0.0000028	9.0	0.00021	0.000051	0.00063	0.04	0.000026	0.00051	1.4	0.0028	0.0000027	0.00011	0.00025	0.58	0.0000155	0.0000053	0.000052	0.000021	0.00026	0.0015	0.00012
	mean	0.095	0.046	0.0053	0.01	1.89	0.001	0.015	0.000072	0.00081	0.0069	0.000044	0.0051	0.0000068	9.4	0.00023	0.000052	0.00074	0.044	0.000027	0.0006	1.4	0.006	0.000003	0.00015	0.0004	0.59	0.000026	0.000013	0.000074	0.000033	0.00027	0.0016	0.00016
	max	0.26	0.063	0.0056	0.011	2.62	0.001	0.019	0.0001	0.00097	0.0072	0.000057	0.0051	0.000012	9.9	0.00025	0.000053	0.00093	0.05	0.000028	0.00089	1.6	0.009	0.0000035	0.00022	0.00061	0.61	0.00004	0.000019	0.00014	0.000054	0.00028	0.0017	0.00022

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not availabile

Table C-9. 100-yr Wet Water Quality Model Results, Node 11

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.039	0.013	0.005	0.0089	1.56	0.0010	0.0075	0.00005	0.00052	0.0072	0.000017	0.005	0.0000025	10	0.00018	0.00005	0.00069	0.026	0.000025	0.0005	1.4	0.002	0.0000025	0.00011	0.00025	0.65	0.0000059	0.000005	0.00005	0.000012	0.00025	0.0015	0.00010
	mean	0.12	0.03	0.005	0.011	1.70	0.001	0.012	0.000065	0.00057	0.0075	0.000036	0.005	0.000003	10	0.00022	0.000054	0.00076	0.031	0.000025	0.0005	1.5	0.0048	0.0000025	0.00013	0.00027	0.67	0.000012	0.0000065	0.00005	0.000016	0.00025	0.0015	0.0001
	max	0.21	0.054	0.005	0.014	1.95	0.001	0.014	0.00014	0.00062	0.0079	0.00005	0.005	0.0000053	11	0.00025	0.000076	0.0008	0.035	0.000025	0.0005	1.6	0.0058	0.0000025	0.00018	0.00036	0.68	0.000034	0.000014	0.00005	0.00003	0.00025	0.0015	0.0001
Operations	min	0.022	0.025	0.005	0.0081	2.83	0.0011	0.0071	0.00038	0.00051	0.0074	0.000010	0.0052	0.0000026	10	0.00016	0.000084	0.00067	0.024	0.000025	0.00051	1.5	0.0022	0.0000026	0.00013	0.00025	1.03	0.0000053	0.0000076	0.000068	0.000067	0.00025	0.0015	0.000101
	mean	0.078	0.06	0.0051	0.011	3.91	0.0012	0.01	0.0006	0.00054	0.0079	0.000022	0.0053	0.0000039	11	0.00019	0.00012	0.00076	0.029	0.000025	0.00051	1.6	0.0046	0.0000026	0.00016	0.00029	1.3	0.000015	0.000012	0.00008	0.00011	0.00025	0.0015	0.0001
	max	0.23	0.09	0.0051	0.014	4.51	0.0012	0.015	0.0008	0.00063	0.0085	0.00005	0.0054	0.0000058	12	0.0002	0.00014	0.00087	0.034	0.000025	0.00051	1.7	0.0068	0.0000027	0.00022	0.00037	1.4	0.000038	0.00002	0.00009	0.00014	0.00025	0.0015	0.0001
Active Closure, Pit Filling	min	0.021	0.01	0.005	0.0081	2.74	0.0010	0.0071	0.00035	0.00051	0.0073	0.000010	0.0052	0.0000026	10	0.00016	0.000081	0.00067	0.024	0.000025	0.0005	1.5	0.0021	0.0000026	0.00012	0.00025	1.0	0.0000053	0.0000074	0.000066	0.000063	0.00025	0.0015	0.000101
	mean	0.059	0.035	0.005	0.011	3.76	0.00101	0.01	0.0006	0.00054	0.0078	0.000022	0.0053	0.0000039	11	0.00019	0.00011	0.00076	0.029	0.000025	0.00051	1.6	0.0045	0.0000026	0.00016	0.00029	1.2	0.000015	0.000012	0.00008	0.0001	0.00025	0.0015	0.000102
	max	0.23	0.058	0.005	0.014	4.33	0.001	0.015	0.0007	0.00063	0.0085	0.00005	0.0054	0.0000058	12	0.0002	0.00014	0.00087	0.034	0.000025	0.00051	1.7	0.0067	0.0000027	0.00022	0.00037	1.4	0.000038	0.000019	0.00009	0.00013	0.00025	0.0015	0.0001
Intial Closure	min	0.022	0.01	0.005	0.0081	3.43	0.001	0.0073	0.00053	0.00051	0.0076	0.000010	0.0053	0.0000026	11	0.00017	0.000099	0.00067	0.024	0.000025	0.00051	1.5	0.0025	0.0000026	0.00014	0.00025	1.19	0.0000054	0.000009	0.000076	0.000092	0.00025	0.0015	0.0001
	mean	0.078	0.035	0.005	0.011	4.90	0.001	0.011	0.0009	0.00054	0.0081	0.000022	0.0055	0.0000039	11	0.00019	0.00014	0.00076	0.029	0.000025	0.00051	1.6	0.005	0.0000027	0.00017	0.00029	1.5	0.000016	0.000014	0.00009	0.00015	0.00025	0.0015	0.0001
	max	0.23	0.058	0.005	0.014	5.82	0.001	0.015	0.0011	0.00063	0.009	0.00005	0.0056	0.0000059	12	0.00021	0.00017	0.00087	0.034	0.000025	0.00052	1.8	0.0073	0.0000028	0.00023	0.00038	1.8	0.000038	0.000022	0.00011	0.00019	0.00025	0.0015	0.0001
Final Closure	min	0.187	0.419	0.0117	0.014	17.62	0.0013	0.0231	0.0004	0.00083	0.023	0.000055	0.0066	0.0000128	11	0.00028	0.000114	0.00091	0.033	0.000065	0.00075	1.6	0.0301	0.0000145	0.00054	0.00042	0.78	0.0000155	0.0000148	0.000185	0.000102	0.00046	0.0021	0.00068
	mean	0.4	0.992	0.0227	0.017	42.53	0.0014	0.031	0.00057	0.0009	0.032	0.000074	0.0074	0.0000225	11	0.00035	0.000137	0.00105	0.039	0.00012	0.0009	1.7	0.044	0.00003*	0.00082	0.0005	0.83	0.000026	0.00002	0.00026	0.00014	0.00055	0.0024	0.00144
	max	0.62	1.57	0.0336	0.02	67.44	0.0016	0.039	0.0007	0.001	0.04	0.000098	0.0081	0.0000333	12	0.00041	0.00016	0.00123	0.048	0.000175	0.0011	1.9	0.06	0.000049*	0.00111	0.00053	0.9	0.00004	0.000023	0.00033	0.00015	0.0007	0.0028	0.00218

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

*In accordance with O.Reg. 35/24 (38)(2), only PWQO apply in Post-closure; mercury predictions are less than PWQO in post-closure and no significant adverse effect to water quality is identified. The Hg result at node 11 is result is driven by the assumption that pit water quality will be equivalent to PWQO in Closure. Pit water quality ranges up to 0.00009 mg/L, which is above the CCME guideline but below the PWQO;

- value not available

Table C-10. 100-yr Wet Water Quality Model Results, Node 12

Project Phase	Parameter	AmmoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Potassium]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128	0.005	0.83	0.02	0.005	-	0.011	1.5	0.0001	-	0.0089	0.00078	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	-	0.00025	0.0008	0.03	0.005	0.12	0.023	0.004
Construction	min	0.018	0.0138	0.005	0.0082	1.1	0.001	0.012	0.00005	0.00069	0.0059	0.000034	0.005	0.0000025	9.1	0.00021	0.00005	0.00062	0.04	0.000025	0.0005	1.4	0.0018	0.0000025	0.0001	0.00025	0.58	0.000005	0.000005	0.00005	0.000018	0.00025	0.0015	0.0001
	mean	0.092	0.029	0.005	0.0099	1.2	0.001	0.014	0.000059	0.0008	0.0062	0.000044	0.005	0.0000064	9.4	0.00023	0.00005	0.00074	0.043	0.000025	0.00059	1.4	0.0048	0.0000025	0.00014	0.0003	0.59	0.000018	0.000012	0.000069	0.000029	0.00025	0.0015	0.00014
	max	0.25	0.0564	0.005	0.0108	1.3	0.001	0.017	0.000087	0.00098	0.0063	0.000055	0.005	0.0000113	9.8	0.00024	0.000051	0.0009	0.048	0.000025	0.00087	1.6	0.0079	0.0000025	0.00021	0.00039	0.6	0.000042	0.000019	0.000134	0.000049	0.00025	0.0017	0.00018
Operations	min	0.017	0.0141	0.005	0.0078	1.5	0.001	0.012	0.000094	0.0007	0.0058	0.000047	0.0052	0.0000056	9.0	0.00021	0.000054	0.00064	0.041	0.000029	0.0005	1.4	0.0019	0.0000025	0.00019	0.00033	0.59	0.0000061	0.0000052	0.000051	0.000029	0.00037	0.0015	0.0001
	mean	0.089	0.0307	0.005	0.0102	8.7	0.001	0.027	0.001241	0.00105	0.0061	0.000673	0.0164	0.0000096	9.4	0.00067	0.000086	0.00097	0.099	0.000238	0.00058	1.4	0.0048	0.000003	0.00439	0.00174	0.61	0.000074	0.000013	0.000071	0.000322	0.00724	0.0026	0.00014
	max	0.25	0.0582	0.005	0.0114	21.1	0.001	0.049	0.00323	0.00165	0.0063	0.001751	0.0356	0.0000197	9.8	0.00142	0.00014	0.0014	0.194	0.00060	0.00087	1.6	0.008	0.0000039	0.01158	0.00411	0.63	0.0001633	0.000019	0.000135	0.000807	0.01909	0.0045	0.00018
Active Closure, Pit Filling	min	0.058	0.078	0.0054	0.0081	2.6	0.0011	0.017	0.000222	0.00073	0.0057	0.000127	0.0158	0.0000061	8.9	0.0003	0.000058	0.00079	0.042	0.000087	0.00049	1.3	0.0019	0.0000027	0.00074	0.00051	0.59	0.0000472	0.000024	0.000257	0.000156	0.00112	0.0017	0.0002
	mean	0.059	0.281	0.0098	0.0104	15.7	0.0017	0.07	0.001765	0.00118	0.0061	0.000943	0.1309	0.0000131	9.4	0.00095	0.000107	0.00107	0.064	0.000745	0.00058	1.4	0.0048	0.0000045	0.00638	0.00241	0.61	0.0000963	0.000073	0.002469	0.001233	0.01044	0.0033	0.00046
	max	1.15	0.5681	0.0155	0.0115	33.1	0.0024	0.14	0.003777	0.00166	0.0063	0.002018	0.2827	0.0000233	9.8	0.00179	0.000171	0.0017	0.095	0.001612	0.00087	1.6	0.0079	0.0000068	0.01385	0.00502	0.63	0.0001769	0.000149	0.005341	0.002668	0.02273	0.0054	0.00081
Intial Closure	min	0.1	0.1	0.0059	0.0083	4.0	0.0011	0.022	0.00039	0.00077	0.0057	0.00021	0.028	0.0000068	8.9	0.00037	0.000063	0.00082	0.044	0.00016	0.00049	1.3	0.0019	0.0000029	0.0013	0.00071	0.59	0.000056	0.00003	0.00049	0.00027	0.0021	0.0018	0.00023
	mean	0.66	0.33	0.011	0.011	19	0.0018	0.081	0.0021	0.0013	0.0061	0.0011	0.16	0.000014	9.3	0.0011	0.00012	0.0011	0.068	0.00089	0.00058	1.4	0.0047	0.0000049	0.0076	0.0028	0.61	0.00011	0.000085	0.0029	0.0015	0.012	0.0037	0.00053
	max	1.4	0.69	0.018	0.012	40	0.0028	0.17	0.0046	0.0018	0.0063	0.0025	0.35	0.000025	9.8	0.0021	0.0002	0.0018	0.11	0.002	0.00087	1.6	0.0079	0.0000078	0.017	0.0061	0.63	0.00022	0.00018	0.0065	0.0033	0.028	0.0063	0.001
Final Closure	min	0.02	0.025	0.0051	0.0079	1.5	0.001	0.012	0.000061	0.00071	0.0065	0.000035	0.005	0.0000029	9.0	0.00021	0.000051	0.00063	0.04	0.000026	0.00051	1.4	0.0028	0.0000027	0.00011	0.00025	0.58	0.0000053	0.0000053	0.000053	0.000021	0.00026	0.0015	0.00012
	mean	0.095	0.047	0.0053	0.01	1.9	0.001	0.015	0.000073	0.00081	0.0069	0.000045	0.0051	0.0000069	9.4	0.00023	0.000052	0.00075	0.044	0.000027	0.0006	1.4	0.006	0.000003	0.00015	0.00031	0.59	0.000019	0.000013	0.000074	0.000032	0.00026	0.0016	0.00017
	max	0.26	0.063	0.0056	0.011	2.7	0.001	0.018	0.0001	0.00099	0.0072	0.000056	0.0051	0.000012	9.8	0.00025	0.000053	0.00095	0.05	0.000028	0.00088	1.6	0.009	0.0000035	0.00022	0.00041	0.61	0.000042	0.000019	0.00014	0.000051	0.00026	0.0017	0.00022

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-11. 100-yr Dry Water Quality Model Results, Node 3

Project Phase	Parameter	ummoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.83**	**0.02**	**0.0050**	**-**	**0.011**	**1.5**	**0.0001**	**-**	**0.0089**	**0.0009**	**0.005**	**0.3**	**0.009**	**-**	**-**	**-**	**0.000026**	**0.073**	**0.025**	**0.00025**	**0.0008**	**0.03**	**0.005**	**0.12**	**0.11**	**0.004**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Operations	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.001	0.029	0.016	0.0007	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.002	0.047	0.001	0.0013	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-11. 100-yr Dry Water Quality Model Results, Node 4

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.83**	**0.02**	**0.0050**	**-**	**0.011**	**1.5**	**0.0001**	**-**	**0.0089**	**0.0009**	**0.005**	**0.3**	**0.009**	**-**	**-**	**-**	**0.000026**	**0.073**	**0.025**	**0.00025**	**0.0008**	**0.03**	**0.005**	**0.12**	**0.11**	**0.004**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.693	0.065	0.005	0.016	1.65	0.001	0.011	0.00005	0.0007	0.008	0.000	0.005	0.0000025	11.30	0.00022	0.00005	0.0008	0.029	0.00003	0.001	1.63	0.0057	0.000002	0.0001	0.0003	0.000025	0.0000	0.00005	0.00001	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.706	1.193	0.008	0.016	101.75	0.005	0.039	0.00050	0.0007	0.032	0.000	0.020	0.0000073	38.10	0.00039	0.00070	0.0008	0.028	0.00002	0.001	5.25	0.0448	0.000009	0.0015	0.0004	0.000046	0.0002	0.00141	0.00425	0.00024	0.00156	0.00020
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.698	0.075	0.005	0.016	83.92	0.001	0.034	0.00050	0.0007	0.027	0.000	0.017	0.0000065	33.10	0.00036	0.00070	0.0008	0.028	0.00002	0.001	4.58	0.0375	0.000008	0.0012	0.0004	0.000042	0.0002	0.00117	0.00349	0.00025	0.00155	0.00018
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.001	0.029	0.01617	0.0007	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00070	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.002	0.047	0.00088	0.0013	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.802	0.285	0.009	0.02	13.80	0.005	0.284	0.00584	0.0050	0.427	0.000	0.020	0.0000154	25.25	0.00255	0.00038	0.0016	0.013	0.00011	0.007	5.21	0.6901	0.000026	0.0022	0.0016	0.000070	0.0001	0.00119	0.00107	0.00468	0.00569	0.00176

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-13. 100-yr Dry Water Quality Model Results, Node 5

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal]	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum]	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.83**	**0.02**	**0.0050**	**-**	**0.011**	**1.5**	**0.0001**	**-**	**0.0089**	**0.0009**	**0.005**	**0.3**	**0.009**	**-**	**-**	**-**	**0.000026**	**0.073**	**0.025**	**0.00025**	**0.0008**	**0.03**	**0.005**	**0.12**	**0.11**	**0.004**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.159	0.031	0.005	0.013	1.75	0.0010	0.014	0.000	0.0006	0.008	0.000050	0.005	0.0000031	10.36	0.00024	0.00006	0.0008	0.035	0.00003	0.001	1.50	0.0058	0.000002	0.0001	0.0003	0.000015	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.219	0.108	0.005	0.014	6.75	0.0014	0.015	0.001	0.0006	0.009	0.000050	0.006	0.0000060	12.35	0.00021	0.00019	0.0009	0.034	0.00002	0.001	1.78	0.0077	0.000003	0.0002	0.0004	0.000038	0.0000	0.00012	0.00023	0.00025	0.00150	0.00011
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.218	0.058	0.005	0.014	6.40	0.0010	0.015	0.001	0.0006	0.009	0.000050	0.006	0.0000059	12.28	0.00021	0.00018	0.0009	0.034	0.00002	0.001	1.77	0.0076	0.000003	0.0002	0.0004	0.000038	0.0000	0.00011	0.00021	0.00025	0.00150	0.00010
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.016	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00077	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.001	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.452	1.133	0.025	0.02	48.96	0.0020	0.058	0.001	0.0015	0.071	0.000072	0.008	0.0000254	13.16	0.00056	0.00015	0.0012	0.042	0.00014	0.002	2.12	0.1087	0.000036*	0.0009	0.0006	0.000042	0.0000	0.00033	0.00021	0.00095	0.00268	0.00167

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines.

*In accordance with O.Reg. 35/24 (38)(2), only PWQO apply in Post-closure; mercury predictions are less than PWQO in post-closure and no significant adverse effect to water quality is identified. The Hg result at node 11 is result is driven by the assumption that pit water quality will be equivalent to PWQO in Closure. Pit water quality ranges up to 0.00009 mg/L, which is above the CCME guideline but below the PWQO;

- value not available

Table C-14. 100-yr Dry Water Quality Model Results, Node 6

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.0001	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.00600	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Operations	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.116	0.195	0.005	0.011	15.21	0.002	0.020	0.004	0.0012	0.009	0.000	0.007	0.0000106	14.45	0.00027	0.00041	0.0010	0.050	0.00002	0.001	2.06	0.0101	0.000003	0.0004	0.0005	0.000053	0.0001	0.00024	0.00061	0.00025	0.00151	0.00031
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.120	0.054	0.005	0.011	31.67	0.001	0.024	0.008	0.0012	0.013	0.000	0.009	0.0000114	18.49	0.00030	0.00077	0.0010	0.050	0.00002	0.001	2.61	0.0165	0.000004	0.0006	0.0005	0.000056	0.0001	0.00047	0.00131	0.00025	0.00152	0.00032
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.001	0.029	0.016	0.0007	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00077	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.002	0.047	0.001	0.0013	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.342	0.142	0.007	0.022	6.50	0.004	0.130	0.003	0.0032	0.181	0.000	0.012	0.0000131	16.70	0.00121	0.00019	0.0013	0.038	0.00006	0.003	3.04	0.2899	0.000012	0.0010	0.0010	0.000061	0.0001	0.00053	0.00046	0.00213	0.00328	0.00088

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-15. 100-yr Dry Water Quality Model Results, Node 7

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.00600	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.130	0.048	0.005	0.014	1.17	0.0010	0.012	0.0001	0.0012	0.007	0.000050	0.005	0.0000025	11.20	0.00021	0.00005	0.0008	0.055	0.00003	0.0005	1.77	0.0080	0.000002	0.00025	0.0003	0.000025	0.000005	0.00005	0.00002	0.00025	0.00150	0.00014
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.144	0.448	0.006	0.014	38.22	0.0036	0.022	0.0094	0.0012	0.017	0.000049	0.010	0.0000043	21.38	0.00027	0.00077	0.0008	0.055	0.00002	0.0006	3.00	0.0218	0.000005	0.00075	0.0003	0.000032	0.000079	0.00055	0.00159	0.00025	0.00152	0.00017
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.139	0.052	0.005	0.014	29.43	0.0011	0.020	0.0072	0.0012	0.015	0.000050	0.009	0.0000039	18.92	0.00026	0.00078	0.0008	0.055	0.00002	0.0006	2.71	0.0185	0.000004	0.00063	0.0003	0.000031	0.000062	0.00043	0.00122	0.00025	0.00152	0.00017
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00078	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.232	0.090	0.006	0.022	3.70	0.0024	0.066	0.0012	0.0021	0.090	0.000046	0.008	0.0000051	13.93	0.00067	0.00012	0.0009	0.051	0.00004	0.0018	2.41	0.1409	0.000007	0.00066	0.0005	0.000033	0.000020	0.00028	0.00024	0.00114	0.00235	0.00046

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-16. 100-yr Dry Water Quality Model Results, Node 8

Project Phase	Parameter	ummoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.00600**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.109	0.050	0.005	0.010	1.23	0.0010	0.016	0.0001	0.0012	0.006	0.000050	0.005	0.0000099	9.58	0.00025	0.00005	0.0010	0.050	0.00003	0.0005	1.54	0.0049	0.000002	0.00018	0.0005	0.000037	0.000025	0.00005	0.00005	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.059	0.005	0.010	1.98	0.0011	0.016	0.0002	0.0012	0.006	0.000050	0.005	0.0000100	9.77	0.00025	0.00007	0.0010	0.052	0.00003	0.0005	1.56	0.0053	0.000003	0.00019	0.0005	0.000038	0.000026	0.00006	0.00008	0.00025	0.00151	0.00010
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.010	1.90	0.0010	0.016	0.0002	0.0012	0.006	0.000050	0.005	0.0000099	9.76	0.00025	0.00007	0.0010	0.050	0.00002	0.0005	1.56	0.0052	0.000003	0.00019	0.0005	0.000038	0.000026	0.00006	0.00007	0.00025	0.00150	0.00010
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00078	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.113	0.051	0.005	0.011	1.31	0.0010	0.018	0.0001	0.0012	0.009	0.000050	0.005	0.0000100	9.68	0.00027	0.00005	0.0010	0.050	0.00003	0.0005	1.56	0.0094	0.000003	0.00020	0.0005	0.000038	0.000025	0.00006	0.00006	0.00028	0.00153	0.00011

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-17. 100-yr Dry Water Quality Model Results, Node 9

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.12000**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.249	0.054	0.005	0.011	1.35	0.0010	0.017	0.0001	0.0009	0.006	0.000057	0.005	0.0000111	9.85	0.00024	0.00005	0.0009	0.048	0.00003	0.0009	1.55	0.0079	0.000002	0.00020	0.0004	0.000040	0.000018	0.00013	0.00005	0.00025	0.00168	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.259	0.063	0.005	0.011	2.55	0.0010	0.019	0.0003	0.0010	0.006	0.000107	0.006	0.0000122	9.95	0.00028	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0083	0.000003	0.00060	0.0005	0.000048	0.000020	0.00015	0.00010	0.00097	0.00175	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.647	0.833	0.021	0.011	48.41	0.0031	0.199	0.0056	0.0019	0.006	0.002961	0.415	0.0000282	9.92	0.00254	0.00023	0.0020	0.117	0.00237	0.0009	1.57	0.0082	0.000009	0.02040	0.0072	0.000250	0.000212	0.00786	0.00394	0.03343	0.00733	0.00115
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.266	0.074	0.006	0.011	2.91	0.0011	0.020	0.0001	0.0010	0.010	0.000058	0.005	0.0000122	9.94	0.00026	0.00005	0.0009	0.050	0.00003	0.0009	1.58	0.0134	0.000004	0.00023	0.0004	0.000043	0.000019	0.00015	0.00006	0.00029	0.00174	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-18. 100-yr Dry Water Quality Model Results, Node 10

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.12000**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.241	0.054	0.005	0.011	1.34	0.0010	0.018	0.0001	0.0009	0.006	0.000055	0.005	0.0000108	9.87	0.00024	0.00005	0.0009	0.049	0.00003	0.0008	1.55	0.0079	0.000002	0.00020	0.0006	0.000034	0.000018	0.00013	0.00005	0.00027	0.00167	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.250	0.063	0.005	0.011	2.50	0.0010	0.020	0.0003	0.0010	0.006	0.000104	0.006	0.0000118	9.96	0.00028	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0083	0.000003	0.00059	0.0007	0.000038	0.000020	0.00014	0.00010	0.00094	0.00174	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.590	0.801	0.020	0.011	46.62	0.0030	0.193	0.0054	0.0019	0.006	0.002849	0.399	0.0000274	9.94	0.00246	0.00023	0.0020	0.115	0.00228	0.0009	1.57	0.0082	0.000009	0.01963	0.0070	0.000038	0.000204	0.00757	0.00379	0.03217	0.00711	0.00111
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.257	0.074	0.006	0.011	2.84	0.0011	0.021	0.0001	0.0010	0.010	0.000056	0.005	0.0000119	9.96	0.00026	0.00005	0.0009	0.050	0.00003	0.0009	1.58	0.0132	0.000004	0.00023	0.0006	0.000038	0.000020	0.00015	0.00006	0.00031	0.00173	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Table C-19. 100-yr Dry Water Quality Model Results, Node 11

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal]	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum]	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.00600**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.154	0.028	0.005	0.013	1.73	0.0010	0.014	0.0001	0.0006	0.008	0.000050	0.005	0.0000028	10.29	0.00025	0.00005	0.0008	0.035	0.00003	0.0005	1.48	0.0058	0.000002	0.00013	0.0003	0.000012	0.000006	0.00005	0.00002	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.228	0.160	0.005	0.014	11.47	0.0017	0.017	0.0025	0.0006	0.010	0.000050	0.006	0.0000061	13.55	0.00021	0.00030	0.0009	0.034	0.00002	0.0005	1.94	0.0095	0.000003	0.00030	0.0004	0.000039	0.000032	0.00018	0.00043	0.00025	0.00151	0.00011
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.227	0.058	0.005	0.014	10.79	0.0010	0.016	0.0024	0.0006	0.010	0.000050	0.006	0.0000061	13.42	0.00021	0.00029	0.0009	0.034	0.00002	0.0005	1.92	0.0093	0.000003	0.00029	0.0004	0.000039	0.000031	0.00017	0.00040	0.00025	0.00151	0.00011
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00078	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.603	1.553	0.033	0.022	66.81	0.0026	0.080	0.0015	0.0020	0.106	0.000096	0.010	0.0000336	14.25	0.00076	0.00019	0.0013	0.045	0.00018	0.0021	2.39	0.1672	0.0000498*	0.00127	0.0007	0.000044	0.000034	0.00046	0.00031	0.00132	0.00318	0.00227

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

*In accordance with O.Reg. 35/24 (38)(2), only PWQO apply in Post-closure; mercury predictions are less than PWQO in post-closure and no significant adverse effect to water quality is identified. The Hg result at node 11 is result is driven by the assumption that pit water quality will be equivalent to PWQO in Closure. Pit water quality ranges up to 0.00009 mg/L, which is above the CCME guideline but below the PWQO;

- value not available

Table C-20. 100-yr Dry Water Quality Model Results, Node 12

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.12000**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.240	0.054	0.005	0.011	1.34	0.0010	0.017	0.0001	0.0009	0.006	0.000054	0.005	0.0000105	9.84	0.00024	0.00005	0.0009	0.048	0.00003	0.0008	1.55	0.0077	0.000002	0.00020	0.0004	0.000039	0.000017	0.00013	0.00005	0.00025	0.00167	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.250	0.063	0.005	0.011	2.61	0.0010	0.019	0.0003	0.0010	0.006	0.000110	0.006	0.0000116	9.94	0.00029	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0082	0.000003	0.00062	0.0006	0.000047	0.000020	0.00014	0.00010	0.00100	0.00174	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.712	0.866	0.021	0.011	50.32	0.0032	0.206	0.0058	0.0020	0.006	0.003081	0.432	0.0000292	9.92	0.00264	0.00024	0.0021	0.120	0.00246	0.0009	1.57	0.0080	0.000009	0.02123	0.0075	0.000250	0.000220	0.00818	0.00410	0.03478	0.00756	0.00120
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.257	0.075	0.006	0.011	2.97	0.0011	0.020	0.0001	0.0010	0.010	0.000055	0.005	0.0000117	9.94	0.00026	0.00005	0.0010	0.050	0.00003	0.0009	1.58	0.0135	0.000004	0.00023	0.0004	0.000042	0.000019	0.00014	0.00006	0.00029	0.00173	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

- value not available

Attachment D
Water Quality Model Results, Upper Case.

Table D-1. Upper Case Seepage Quality Model Results, Node 3

Project Phase	Parameter	ummoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.83**	**0.02**	**0.0050**	**-**	**0.011**	**1.5**	**0.0001**	**-**	**0.0089**	**0.0009**	**0.005**	**0.3**	**0.009**	**-**	**-**	**-**	**0.000026**	**0.073**	**0.025**	**0.00025**	**0.0008**	**0.03**	**0.005**	**0.12**	**0.11**	**0.004**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Operations	min	0.014	0.010	0.005	0.007	1.22	0.001	0.011	0.000	0.0009	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00006	0.0007	0.040	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.38	0.001	0.014	0.000	0.0012	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00006	0.0008	0.046	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.55	0.001	0.018	0.000	0.0013	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00006	0.0012	0.057	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.22	0.001	0.011	0.000	0.0009	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00006	0.0007	0.040	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.38	0.001	0.014	0.000	0.0012	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00006	0.0008	0.046	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.55	0.001	0.018	0.000	0.0013	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00006	0.0012	0.057	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Intial Closure	min	0.014	0.010	0.005	0.007	1.22	0.001	0.011	0.000	0.0009	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.000058	0.0007	0.040	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.38	0.001	0.014	0.000	0.0012	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.000058	0.0008	0.046	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	77.49	0.001	0.034	0.016	0.0008	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00003	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.22	0.001	0.011	0.000	0.0009	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	30.32	0.002	0.055	0.001	0.0014	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.110	0.050	0.005	0.011	1.55	0.001	0.018	0.000	0.0013	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-2. Upper Case Seepage Quality Model Results, Node 5

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.83**	**0.02**	**0.0050**	**-**	**0.011**	**1.5**	**0.0001**	**-**	**0.0089**	**0.0009**	**0.005**	**0.3**	**0.009**	**-**	**-**	**-**	**0.000026**	**0.073**	**0.025**	**0.00025**	**0.0008**	**0.03**	**0.005**	**0.12**	**0.11**	**0.004**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.693	0.065	0.005	0.016	1.65	0.001	0.011	0.00005	0.0007	0.008	0.000	0.005	0.0000025	11.30	0.00022	0.00005	0.0008	0.029	0.00003	0.001	1.63	0.0057	0.000002	0.0001	0.0003	0.000025	0.0000	0.00005	0.00001	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.706	1.193	0.008	0.016	101.75	0.005	0.039	0.00050	0.0007	0.032	0.000	0.020	0.0000073	38.10	0.00039	0.00070	0.0008	0.028	0.00002	0.001	5.25	0.0448	0.000009	0.0015	0.0004	0.000046	0.0002	0.00141	0.00425	0.00024	0.00156	0.00020
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.698	0.075	0.005	0.016	83.92	0.001	0.034	0.00050	0.0007	0.027	0.000	0.017	0.0000065	33.10	0.00036	0.00070	0.0008	0.028	0.00002	0.001	4.58	0.0375	0.000008	0.0012	0.0004	0.000042	0.0002	0.00117	0.00349	0.00025	0.00155	0.00018
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.00005	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.001	0.029	0.01617	0.0007	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00070	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.00005	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.002	0.047	0.00088	0.0013	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.802	0.285	0.009	0.02	13.80	0.005	0.284	0.00584	0.0050	0.427	0.000	0.020	0.0000154	25.25	0.00255	0.00038	0.0016	0.013	0.00011	0.007	5.21	0.6901	0.000026	0.0022	0.0016	0.000070	0.0001	0.00119	0.00107	0.00468	0.00569	0.00176

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-3. Upper Case Seepage Quality Model Results, Node 6

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal]	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum]	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.83	0.02	0.0050	-	0.011	1.5	0.0001	-	0.0089	0.0009	0.005	0.3	0.009	-	-	-	0.000026	0.073	0.025	0.00025	0.0008	0.03	0.005	0.12	0.11	0.004
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000050	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000050	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.159	0.031	0.005	0.013	1.75	0.0010	0.014	0.000067	0.0006	0.008	0.000050	0.005	0.0000031	10.36	0.00024	0.00006	0.0008	0.035	0.00003	0.001	1.50	0.0058	0.000002	0.0001	0.0003	0.000015	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000050	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000050	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.219	0.108	0.005	0.014	6.75	0.0014	0.015	0.001334	0.0006	0.009	0.000050	0.006	0.0000060	12.35	0.00021	0.00019	0.0009	0.034	0.00002	0.001	1.78	0.0077	0.000003	0.0002	0.0004	0.000038	0.0000	0.00012	0.00023	0.00025	0.00150	0.00011
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000050	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000050	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.218	0.058	0.005	0.014	6.40	0.0010	0.015	0.001245	0.0006	0.009	0.000050	0.006	0.0000059	12.28	0.00021	0.00018	0.0009	0.034	0.00002	0.001	1.77	0.0076	0.000003	0.0002	0.0004	0.000038	0.0000	0.00011	0.00021	0.00025	0.00150	0.00010
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000050	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.000050	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.016167	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00077	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.000050	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.000879	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.452	1.133	0.025	0.02	48.96	0.0020	0.058	0.001016	0.0015	0.071	0.000072	0.008	0.0000254	13.16	0.00056	0.00015	0.0012	0.042	0.00014	0.002	2.12	0.1087	0.000036*	0.0009	0.0006	0.000042	0.0000	0.00033	0.00021	0.00095	0.00268	0.00167

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines.

*In accordance with O.Reg. 35/24 (38)(2), only PWQO apply in Post-closure; mercury predictions are less than PWQO in post-closure and no significant adverse effect to water quality is identified. The Hg result at node 11 is result is driven by the assumption that pit water quality will be equivalent to PWQO in Closure. Pit water quality ranges up to 0.00009 mg/L, which is above the CCME guideline but below the PWQO;

Table D-4. Upper Case Seepage Quality Model Results, Node 4

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.0001**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.00600**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.011	1.31	0.001	0.016	0.000	0.0012	0.006	0.000	0.005	0.0000100	11.00	0.00025	0.00005	0.0010	0.050	0.00003	0.001	1.60	0.0049	0.000002	0.0003	0.0005	0.000050	0.0000	0.00005	0.00005	0.00025	0.00150	0.00030
Operations	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.116	0.195	0.005	0.011	15.21	0.002	0.020	0.004	0.0012	0.009	0.000	0.007	0.0000106	14.45	0.00027	0.00041	0.0010	0.050	0.00002	0.001	2.06	0.0101	0.000003	0.0004	0.0005	0.000053	0.0001	0.00024	0.00061	0.00025	0.00151	0.00031
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.120	0.054	0.005	0.011	31.67	0.001	0.024	0.008	0.0012	0.013	0.000	0.009	0.0000114	18.49	0.00030	0.00077	0.0010	0.050	0.00002	0.001	2.61	0.0165	0.000004	0.0006	0.0005	0.000056	0.0001	0.00047	0.00131	0.00025	0.00152	0.00032
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.001	0.012	0.000	0.0010	0.006	0.000	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.001	1.47	0.0034	0.000002	0.0001	0.0004	0.000019	0.0000	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.001	0.029	0.016	0.0007	0.023	0.000	0.014	0.0000056	27.97	0.00033	0.00077	0.0008	0.028	0.00002	0.001	3.89	0.0301	0.000006	0.0010	0.0004	0.000038	0.0001	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.001	0.009	0.000	0.0008	0.006	0.000	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.001	1.40	0.0012	0.000002	0.0001	0.0003	0.000005	0.0000	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.002	0.047	0.001	0.0013	0.060	0.000	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.001	1.96	0.0891	0.000021	0.0007	0.0005	0.000026	0.0000	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.342	0.142	0.007	0.022	6.50	0.004	0.130	0.003	0.0032	0.181	0.000	0.012	0.0000131	16.70	0.00121	0.00019	0.0013	0.038	0.00006	0.003	3.04	0.2899	0.000012	0.0010	0.0010	0.000061	0.0001	0.00053	0.00046	0.00213	0.00328	0.00088

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-5. Upper Case Seepage Quality Model Results, Node 7

Project Phase	Parameter	ammoniaTota	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.00600	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.130	0.048	0.005	0.014	1.17	0.0010	0.012	0.0001	0.0012	0.007	0.000050	0.005	0.0000025	11.20	0.00021	0.00005	0.0008	0.055	0.00003	0.0005	1.77	0.0080	0.000002	0.00025	0.0003	0.000025	0.000005	0.00005	0.00002	0.00025	0.00150	0.00014
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.144	0.448	0.006	0.014	38.22	0.0036	0.022	0.0094	0.0012	0.017	0.000049	0.010	0.0000043	21.38	0.00027	0.00077	0.0008	0.055	0.00002	0.0006	3.00	0.0218	0.000005	0.00075	0.0003	0.000032	0.000079	0.00055	0.00159	0.00025	0.00152	0.00017
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.139	0.052	0.005	0.014	29.43	0.0011	0.020	0.0072	0.0012	0.015	0.000050	0.009	0.0000039	18.92	0.00026	0.00078	0.0008	0.055	0.00002	0.0006	2.71	0.0185	0.000004	0.00063	0.0003	0.000031	0.000062	0.00043	0.00122	0.00025	0.00152	0.00017
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00078	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.232	0.090	0.006	0.022	3.70	0.0024	0.066	0.0012	0.0021	0.090	0.000046	0.008	0.0000051	13.93	0.00067	0.00012	0.0009	0.051	0.00004	0.0018	2.41	0.1409	0.000007	0.00066	0.0005	0.000033	0.000020	0.00028	0.00024	0.00114	0.00235	0.00046

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-6. Upper Case Seepage Quality Model Results, Node 8

Project Phase	Parameter	ummoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.00600	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.109	0.050	0.005	0.010	1.23	0.0010	0.016	0.0001	0.0012	0.006	0.000050	0.005	0.0000099	9.58	0.00025	0.00005	0.0010	0.050	0.00003	0.0005	1.54	0.0049	0.000002	0.00018	0.0005	0.000037	0.000025	0.00005	0.00005	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.059	0.005	0.010	1.98	0.0011	0.016	0.0002	0.0012	0.006	0.000050	0.005	0.0000100	9.77	0.00025	0.00007	0.0010	0.052	0.00003	0.0005	1.56	0.0053	0.000003	0.00019	0.0005	0.000038	0.000026	0.00006	0.00008	0.00025	0.00151	0.00010
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.110	0.050	0.005	0.010	1.90	0.0010	0.016	0.0002	0.0012	0.006	0.000050	0.005	0.0000099	9.76	0.00025	0.00007	0.0010	0.050	0.00002	0.0005	1.56	0.0052	0.000003	0.00019	0.0005	0.000038	0.000026	0.00006	0.00007	0.00025	0.00150	0.00010
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00078	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.113	0.051	0.005	0.011	1.31	0.0010	0.018	0.0001	0.0012	0.009	0.000050	0.005	0.0000100	9.68	0.00027	0.00005	0.0010	0.050	0.00003	0.0005	1.56	0.0094	0.000003	0.00020	0.0005	0.000038	0.000025	0.00006	0.00006	0.00028	0.00153	0.00011

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-7. Upper Case Seepage Quality Model Results, Node 9

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.12000	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.249	0.054	0.005	0.011	1.35	0.0010	0.017	0.0001	0.0009	0.006	0.000057	0.005	0.0000111	9.85	0.00024	0.00005	0.0009	0.048	0.00003	0.0009	1.55	0.0079	0.000002	0.00020	0.0004	0.000040	0.000018	0.00013	0.00005	0.00025	0.00168	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.259	0.063	0.005	0.011	2.55	0.0010	0.019	0.0003	0.0010	0.006	0.000107	0.006	0.0000122	9.95	0.00028	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0083	0.000003	0.00060	0.0005	0.000048	0.000020	0.00015	0.00010	0.00097	0.00175	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.647	0.833	0.021	0.011	48.41	0.0031	0.199	0.0056	0.0019	0.006	0.002961	0.415	0.0000282	9.92	0.00254	0.00023	0.0020	0.117	0.00237	0.0009	1.57	0.0082	0.000009	0.02040	0.0072	0.000250	0.000212	0.00786	0.00394	0.03343	0.00733	0.00115
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.02	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.266	0.074	0.006	0.011	2.91	0.0011	0.020	0.0001	0.0010	0.010	0.000058	0.005	0.0000122	9.94	0.00026	0.00005	0.0009	0.050	0.00003	0.0009	1.58	0.0134	0.000004	0.00023	0.0004	0.000043	0.000019	0.00015	0.00006	0.00029	0.00174	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-8. Upper Case Seepage Quality Model Results, Node 10

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.12000	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.241	0.054	0.005	0.011	1.34	0.0010	0.018	0.0001	0.0009	0.006	0.000055	0.005	0.0000108	9.87	0.00024	0.00005	0.0009	0.049	0.00003	0.0008	1.55	0.0079	0.000002	0.00020	0.0006	0.000034	0.000018	0.00013	0.00005	0.00027	0.00167	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.250	0.063	0.005	0.011	2.50	0.0010	0.020	0.0003	0.0010	0.006	0.000104	0.006	0.0000118	9.96	0.00028	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0083	0.000003	0.00059	0.0007	0.000038	0.000020	0.00014	0.00010	0.00094	0.00174	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.590	0.801	0.020	0.011	46.62	0.0030	0.193	0.0054	0.0019	0.006	0.002849	0.399	0.0000274	9.94	0.00246	0.00023	0.0020	0.115	0.00228	0.0009	1.57	0.0082	0.000009	0.01963	0.0070	0.000038	0.000204	0.00757	0.00379	0.03217	0.00711	0.00111
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.257	0.074	0.006	0.011	2.84	0.0011	0.021	0.0001	0.0010	0.010	0.000056	0.005	0.0000119	9.96	0.00026	0.00005	0.0009	0.050	0.00003	0.0009	1.58	0.0132	0.000004	0.00023	0.0006	0.000038	0.000020	0.00015	0.00006	0.00031	0.00173	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

Table D-9. Upper Case Seepage Quality Model Results, Node 11

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal]	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum]	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	1.8	3	0.06	0.02	128.00	0.005	0.830	0.020	0.0050	-	0.011	1.500	0.000100	-	0.00890	0.00078	0.0050	0.300	0.00900	-	-	-	0.000026	0.0730	0.0250	0.000250	0.0003	0.03000	0.00500	0.00600	0.02000	0.00400
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.154	0.028	0.005	0.013	1.73	0.0010	0.014	0.0001	0.0006	0.008	0.000050	0.005	0.0000028	10.29	0.00025	0.00005	0.0008	0.035	0.00003	0.0005	1.48	0.0058	0.000002	0.00013	0.0003	0.000012	0.000006	0.00005	0.00002	0.00025	0.00150	0.00010
Operations	min	0.014	0.010	0.005	0.007	1.24	0.0010	0.011	0.0001	0.0010	0.006	0.000010	0.005	0.0000030	9.00	0.00024	0.00006	0.0008	0.042	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.40	0.0010	0.014	0.0001	0.0012	0.006	0.000041	0.005	0.0000051	9.80	0.00027	0.00006	0.0009	0.048	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.228	0.160	0.005	0.014	13.76	0.0017	0.020	0.0025	0.0008	0.010	0.000050	0.006	0.0000073	13.55	0.00026	0.00036	0.0010	0.041	0.00003	0.0005	1.94	0.0095	0.000003	0.00030	0.0004	0.000039	0.000032	0.00018	0.00043	0.00025	0.00151	0.00011
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.24	0.0010	0.011	0.0001	0.0010	0.006	0.000010	0.005	0.0000030	9.00	0.00024	0.00006	0.0008	0.042	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.40	0.0010	0.014	0.0001	0.0012	0.006	0.000041	0.005	0.0000051	9.80	0.00027	0.00006	0.0009	0.048	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.227	0.058	0.005	0.014	12.95	0.0010	0.020	0.0024	0.0008	0.010	0.000050	0.006	0.0000073	13.42	0.00026	0.00035	0.0010	0.041	0.00003	0.0005	1.92	0.0093	0.000003	0.00029	0.0004	0.000039	0.000031	0.00017	0.00040	0.00025	0.00151	0.00011
Intial Closure	min	0.014	0.010	0.005	0.007	1.24	0.0010	0.011	0.0001	0.0010	0.006	0.000010	0.005	0.0000030	9.00	0.00024	0.00006	0.0008	0.042	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.40	0.0010	0.014	0.0001	0.0012	0.006	0.000041	0.005	0.0000051	9.80	0.00027	0.00006	0.0009	0.048	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	78.80	0.0013	0.035	0.0162	0.0008	0.023	0.000049	0.014	0.0000067	27.97	0.00040	0.00078	0.0010	0.034	0.00003	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.24	0.0010	0.011	0.0001	0.0010	0.006	0.000010	0.005	0.0000030	9.00	0.00024	0.00006	0.0008	0.042	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	30.83	0.0019	0.056	0.0009	0.0015	0.060	0.000050	0.008	0.0000184	12.27	0.00059	0.00016	0.0012	0.039	0.00010	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.603	1.553	0.033	0.022	80.17	0.0026	0.097	0.0015	0.0023	0.106	0.000096	0.010	0.0000403	14.25	0.00091	0.00023	0.0015	0.055	0.00021	0.0021	2.39	0.1672	0.0000498*	0.00127	0.0007	0.000044	0.000034	0.00046	0.00031	0.00132	0.00318	0.00227

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).

*In accordance with O.Reg. 35/24 (38)(2), only PWQO apply in Post-closure; mercury predictions are less than PWQO in post-closure and no significant adverse effect to water quality is identified. The Hg result at node 11 is result is driven by the assumption that pit water quality will be equivalent to PWQO in Closure. Pit water quality ranges up to 0.00009 mg/L, which is above the CCME guideline but below the PWQO;

Table D-10. Upper Case Seepage Quality Model Results, Node 12

Project Phase	Parameter	ammoniaTot	[Nitrate-N]	[Nitrite-N]	hosphorusTot	[Sulfate]	[CyanideTotal	[Aluminum]	[Antimony]	[Arsenic]	[Barium]	[Beryllium]	[Boron]	[Cadmium]	[Calcium]	[Chromium]	[Cobalt]	[Copper]	[Iron]	[Lead]	[Lithium]	[Magnesium]	[Manganese]	[Mercury]	[Molybdenum	[Nickel]	[Silver]	[Thallium]	[Tungsten]	[Uranium]	[Vanadium]	[Zinc]	[Zirconium]
	WQG PAL	**1.8**	**3**	**0.06**	**0.02**	**128.00**	**0.005**	**0.830**	**0.020**	**0.0050**	**-**	**0.011**	**1.500**	**0.000100**	**-**	**0.00890**	**0.00078**	**0.0050**	**0.300**	**0.00900**	**-**	**-**	**-**	**0.000026**	**0.0730**	**0.0250**	**0.000250**	**0.0003**	**0.03000**	**0.00500**	**0.12000**	**0.02000**	**0.00400**
Construction	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.240	0.054	0.005	0.011	1.34	0.0010	0.017	0.0001	0.0009	0.006	0.000054	0.005	0.0000105	9.84	0.00024	0.00005	0.0009	0.048	0.00003	0.0008	1.55	0.0077	0.000002	0.00020	0.0004	0.000039	0.000017	0.00013	0.00005	0.00025	0.00167	0.00017
Operations	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.250	0.063	0.005	0.011	2.61	0.0010	0.019	0.0003	0.0010	0.006	0.000110	0.006	0.0000116	9.94	0.00029	0.00007	0.0010	0.057	0.00005	0.0009	1.57	0.0082	0.000003	0.00062	0.0006	0.000047	0.000020	0.00014	0.00010	0.00100	0.00174	0.00018
Active Closure, Pit Filling	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	1.712	0.866	0.021	0.011	50.32	0.0032	0.206	0.0058	0.0020	0.006	0.003081	0.432	0.0000292	9.92	0.00264	0.00024	0.0021	0.120	0.00246	0.0009	1.57	0.0080	0.000009	0.02123	0.0075	0.000250	0.000220	0.00818	0.00410	0.03478	0.00756	0.00120
Intial Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.059	0.022	0.005	0.009	1.17	0.0010	0.012	0.0001	0.0010	0.006	0.000041	0.005	0.0000042	9.80	0.00023	0.00005	0.0007	0.040	0.00003	0.0005	1.47	0.0034	0.000002	0.00015	0.0004	0.000019	0.000016	0.00005	0.00003	0.00025	0.00150	0.00016
	max	0.697	0.073	0.005	0.016	65.67	0.0013	0.029	0.0162	0.0007	0.023	0.000049	0.014	0.0000056	27.97	0.00033	0.00005	0.0008	0.028	0.00002	0.0008	3.89	0.0301	0.000006	0.00098	0.0004	0.000038	0.000133	0.00092	0.00272	0.00025	0.00154	0.00016
Final Closure	min	0.014	0.010	0.005	0.007	1.03	0.0010	0.009	0.0001	0.0008	0.006	0.000010	0.005	0.0000025	9.00	0.00020	0.00005	0.0006	0.035	0.00003	0.0005	1.40	0.0012	0.000002	0.00009	0.0003	0.000005	0.000005	0.00005	0.00002	0.00025	0.00150	0.00010
	mean	0.312	0.593	0.015	0.020	25.69	0.0019	0.047	0.0009	0.0013	0.060	0.000050	0.008	0.0000153	12.27	0.00049	0.00013	0.0010	0.033	0.00009	0.0013	1.96	0.0891	0.000021	0.00071	0.0005	0.000026	0.000021	0.00027	0.00018	0.00083	0.00242	0.00100
	max	0.257	0.075	0.006	0.011	2.97	0.0011	0.020	0.0001	0.0010	0.010	0.000055	0.005	0.0000117	9.94	0.00026	0.00005	0.0010	0.050	0.00003	0.0009	1.58	0.0135	0.000004	0.00023	0.0004	0.000042	0.000019	0.00014	0.00006	0.00029	0.00173	0.00021

Notes

All units are mg/L

WQG PAL: Water Quality Guideline for the Protection of Aquatic Life (long-term exposure) identified in Table 3-3.

Orange shaded values are greater than water quality guidelines (none).