APPENDIX M

HYDROLOGY TECHNICAL SUPPORT DOCUMENTS

M-1 Baseline Hydrology Report
M-2 Mine Site Water Balance
M-3 Receiver Water Balance

Mine Site Water Balance Report

Springpole Gold Project

First Mining Gold Corp.

ONS2104

Prepared by:
WSP Canada Inc.

October 2024

Mine Site Water Balance Report

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

Copyright

The contents and layout of this report are subject to copyright owned by WSP Canada Inc.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
Ausenco	Ausenco Engineering Canada Inc.
CDF	Co-disposal facility
CWSP	Central water storage pond
ECCC	Environment and Climate Change Canada
EIS/EA	Environmental Impact Statement / Environmental Assessment
ETP	Effluent treatment plant
FMG	First Mining Gold Corp.
km	kilometres
masl	metres above sea level
m^2	square metres
m^3	cubic metres
m^3/day	cubic metres per day
m^3/hr	cubic metres per hour
mm	millimetres
Ha	hectares
Mm^3/year	million cubic metres per year
NAG	Non-potentially acid generating
PAG	Potentially acid generating
PFS	Prefeasibility Study
Project	Springpole Gold Project
RCP	Representative Concentration Pathways
ROCs	Annual Runoff Coefficients
STP	Sewage treatment plant
tpd	tonnes per day
WSP	WSP E&I Canada Limited
WSC	Water Survey of Canada

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 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 (EA) pursuant to the *Canadian Environmental Assessment Act*, 2012 and the Ontario *Environmental Assessment Act* 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 support the EA and Project design.

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 EA document was consulted on over the course of more than 2 years leading up the final EA submission. An overview of the consultation input that was considered during the effects assessment in relation to this report is summarized in the final Environment Impact Statement / Environmental Assessment (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.

The intent herein is to describe surface water modelling activities that have been conducted in support of the EIS/EA. This report supersedes the mine site water balance report prepared for the draft EIS/EA (Wood, 2022). This report is accompanied by an updated hydrology baseline conditions report (WSP, 2024), which provides a comprehensive summary of the hydrological data on which the mine site water balance 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.

1.1 Purpose and Objective of the Report

This Mine Site Water Balance Report has been prepared to:

- Estimate the quantity of water takings and discharge of treated water to the environment to support the receiver water quality and hydrology effects assessment; and
- To provide the basis of the mine site water quality model and assessment.

1.2 Project Overview

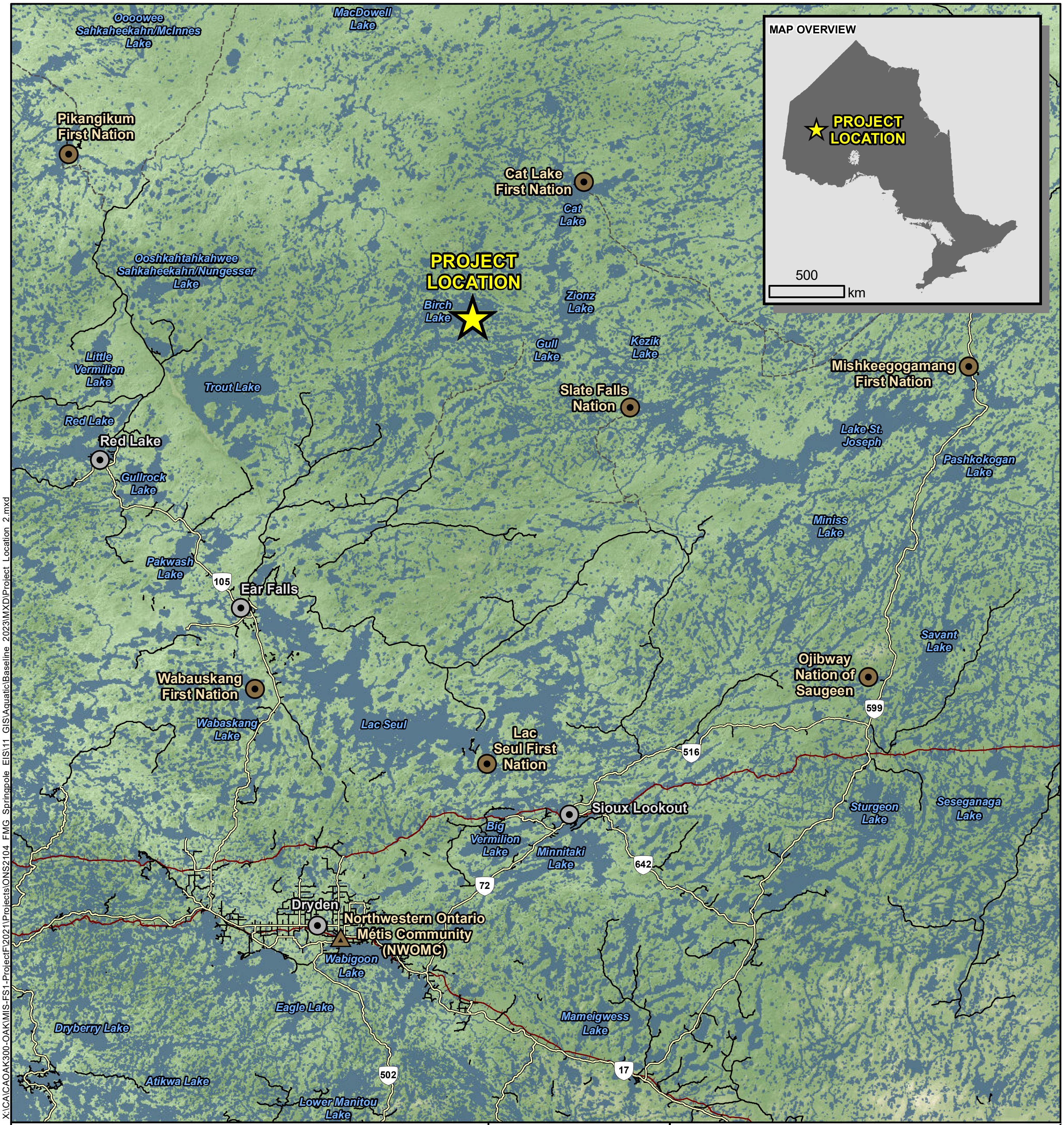
The ore body is located under a small portion of the north basin of Springpole Lake. To allow for the development and safe operation of the open pit mine, two dikes will be established to facilitate controlled dewatering of the mining area. Ore from the open pit will be processed in an onsite process 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;
- Springpole Lake Dikes;
- CDF for mine rock and tailings;
- 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 Project is expected to be developed over a three-year period 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 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.



X:\CA\CAOAK300-OAK\MIS-FS1-Project\F\2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\Aquatic\Baseline_2023\MXD\Project_Location_2.mxd

LEGEND

- Project Location
- Town
- First Nation Reserve
- Northwestern Ontario Métis Community (NWOMC)
- 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 E S W

FIRST MINING GOLD

WSP

SPRINGPOLE GOLD PROJECT

Project Location

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

2.0 BACKGROUND

A prefeasibility (PFS) water balance was developed by Ausenco Engineering Canada Inc. (Ausenco) in 2021 (Ausenco 2021). It was developed in GoldSim and was representative of the operations mining phase. In 2022, WSP, formerly known as Wood Environment & Infrastructure Americas, a division of Wood Canada Limited (Wood), developed a new GoldSim mine site water balance in support of the draft Environmental Impact Statement / Environmental Assessment (EIS/EA). It reflected an advancement in planning and design and was extended to simulate the closure phases of the Project.

Since the preparation of the draft EIS/EA, additional advancements have been made in data collection, planning and design to support the submission of the final EIS/EA. This includes the development of site layout and mine plan optimizations, a high-level water management plan, as well as supplementary modeling. This report presents the updated mine site water balance modeling, reflective of these advancements, as well as feedback provided by government agencies and Indigenous communities. The model has also been extended to simulate the construction phase of the Project. It now captures all Project phases described in the EIS / EA Project Description.

3.0 WATER MANAGEMENT PLAN

This section describes the way in which site contact water will be collected, managed and discharged throughout the various phases of the Project. It forms the basis of the Mine Site Water Balance.

The construction, operations, active closure - pit filling period, active closure - post pit filling contingency, and post closure phases have been considered. The construction phase refers to Year -3 to -1 of the Project. It 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 period refers to the beginning of closure once mining has ceased and flooding of the open pit has commenced. The active closure - pit filling period is concurrent with and followed by the active closure – post pit filling contingency and post closure phases.

3.1 Overview

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. The Project's water management system will be designed to manage the Environmental Design Flood (EDF) without discharge of untreated water to the environment. The EDF has been defined as a flood event with a 1:100 year return period for infrastructure that will exist throughout the operations and closure Project phases. A lower design event may be selected for temporary water management features which will exist throughout the construction phase only (consistent with other mining projects in Northern Ontario).

The IDF is defined as the largest runoff event that a facility is designed to safely withstand and prevent overtopping of the water containment structures. Consistent with the *Co-Disposal Facility Conceptual Design Report - DRAFT* (WSP, 2024b), it has been conservatively assumed that the CDF will have an 'Extreme' hazard classification, and as such the IDF for the CDF will be defined as the Probable Maximum Flood (PMF). The 72-hr Probable Maximum Precipitation was calculated to be about 400 mm by Knight Piésold (March 2021) and has been used as the IDF criteria for the CDF.

The detailed design of the water management infrastructure will be completed at a later stage of Project engineering for permitting. However, for the purposes of the EIS / EA and supporting the effects assessment, a preliminary layout of the surface water management infrastructure is provided in Figure 3-1 with the resulting sub-watersheds for the Project's ultimate footprint. The total collection area associated with the Project site, defined by the sub-watersheds is 984.8 hectares (ha). 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 pipline corridor.

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

- The Co-Disposal Facility (CDF) which will consist of north and south cells, contained by perimeter dams and separated by an internal dam, constructed of mine rock:
    - The north cell will contain surplus mine rock, co-disposed with NAG thickened tailings.
    - The south cell will contain PAG tailings deposited as a slurry. It will remain under a water cover in the CDF internal pond (south cell) 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 dams, as well as interflow and seepage through or beneath the dams will be captured by perimeter ditching and local collection ponds. Contact water collected in these ponds will be pumped back into the CDF.

- The open pit and its local collection ponds.
- Low grade ore stockpile and associated local collection ponds (referred to as the low grade ore stockpile ponds for the purposes of the mine site water balance).
- Local stockpile collection ponds to capture contact water from:
  - Fish habitat development area which will be excavated, and material will be used as a source material for site construction.
  - High/mid grade ore stockpile, located within a portion of the fish habitat development area.
  - Surficial soil stockpile.
- Accommodations complex.
- Fresh water intake from Birch Lake.
- Process plant complex, and associated plant site pond.
- Central water storage pond (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, much like a river, and provides natural effluent mixing / attenuation. The discharge location is shown in Figure 3-2.

The following sub-sections describe water management during the various Project phases, in greater detail.

3.2 Construction Phase

Years -3 to -1 of the Project are referred to as the construction phase. This phase is representative of the period during which pre-development activities are carried out, such as ground clearing, construction of the mine site facilities, construction of the Springpole Lake dikes, and controlled dewatering of the open pit area.

Figure 3-3 presents the water management concept for the construction phase, in the form of a flow diagram. For the purposes of supporting the EIS / EA effects assessment, this model considers a conservative year of construction during which:

- The mine site footprint has been developed to its full extent.
- Controlled dewatering of the isolated open pit basin is in progress, and is discharging to the north basin of Springpole Lake at the maximum allowable rate (up to 10% of Springpole Lake inflows).
- All site contact water (outside of the open pit basin) is directed to the CWSP.
- Fresh water takings from Birch Lake will be required for the accommodations complex only.
- Excess contact water from the Project will be treated and discharged to the southeast arm of Springpole Lake.

The simulated year is considered conservative as it is expected to generate the greatest change to receiving environment flow conditions. It is unlikely that all of the above conditions will occur at the same time. Furthermore, the need to collect and treat all water (with ETP discharge to the southeast arm of Springpole Lake) may not be necessary during the construction phase. This will ultimately be determined by regulators during permitting.

3.3 Operations Phase

Years 1 to 10 of the Project are referred to as the operations phase. During this time, both the mine and process plant are actively operating.

Figure 3-4 presents the water management concept for the operations phase. Site contact water is collected in local collection ponds, within each sub-watershed. All contact water from these local collection ponds, that is not required by the process plant or mine operations, is ultimately conveyed to the CWSP. From the CWSP, collected contact water is treated and discharged to the southeast arm of Springpole Lake. More detailed assumptions regarding the operations phase water management plan are summarized below:

- All mine site development area contact water requires treatment through the ETP prior to discharge to the southeast arm of Springpole Lake.
- Contact water from the CDF catchment area reports to the CDF internal pond in the south cell for storage. This will include direct precipitation on the CDF as well as water reporting to the CDF with the NAG tailings and PAG tailings streams. Water stored in the CDF internal pond is the primary source of make-up water for the process plant. Excess water will be directed to the CWSP for treatment and discharge.
- Contact water from the low grade ore stockpile will be collected by a perimeter ditching system and directed to the local collection ponds, where they will be transferred to the CWSP for treatment and discharge.
- Seepage from the CDF and ore stockpiles will be captured to the extent practicable through site infrastructure and ditching systems. Interflow, defined as water that has infiltrated into the subsurface and returned to surface as overland flow, will be captured by the CDF and ore stockpile ditching systems and returned to the respective local collection ponds, before being transferred with surface runoff, as described above. Seepage reporting to the open pit and CWSP (i.e., seepage that was not captured by the CDF / ore stockpile ditching systems) was also modelled in the mine site water balance.
- Contact water from the fish habitat development area, high/mid grade ore stockpile and surficial soil stockpile will be collected in local collection ponds or ditches and transferred to the CWSP for treatment and discharge.
- Water collected in the open pit will be pumped to the CWSP. This water will include surface runoff from the open pit basin's catchment area, seepage from the CDF and ore stockpiles, and groundwater inflows from the surrounding area.
- Contact water from the process plant complex will be collected in the plant site pond. Water collected in the plant site pond will be sent to the CWSP for treatment and discharge.
- Fresh water required for the process plant and the accommodations complex will be supplied from a raw water tank which is supplied by Birch Lake.
- 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.

- Domestic sewage and grey water from the site, including the accommodations complex, will be treated in a STP and discharged with ETP effluent to a single discharge location to the southeast arm of Springpole Lake.

3.4 Active Closure - Pit Filling Period

Filling of the open pit with water (i.e., the active closure - pit filling period) is expected to commence once open pit mining and ore processing have ceased (i.e., after Year 10 of the Project). A pit filling time of approximately to5 years is estimated to fill the open pit and fish habitat development area to the average natural elevation of Springpole Lake (391 metres above sea level [masl]). This base case assumes that active filling with water from Springpole Lake will be used to accelerate the pit filling; however, this is not pertinent to the mine site water balance, as it does not impact the runoff and discharge simulations made in this modelling scenario.

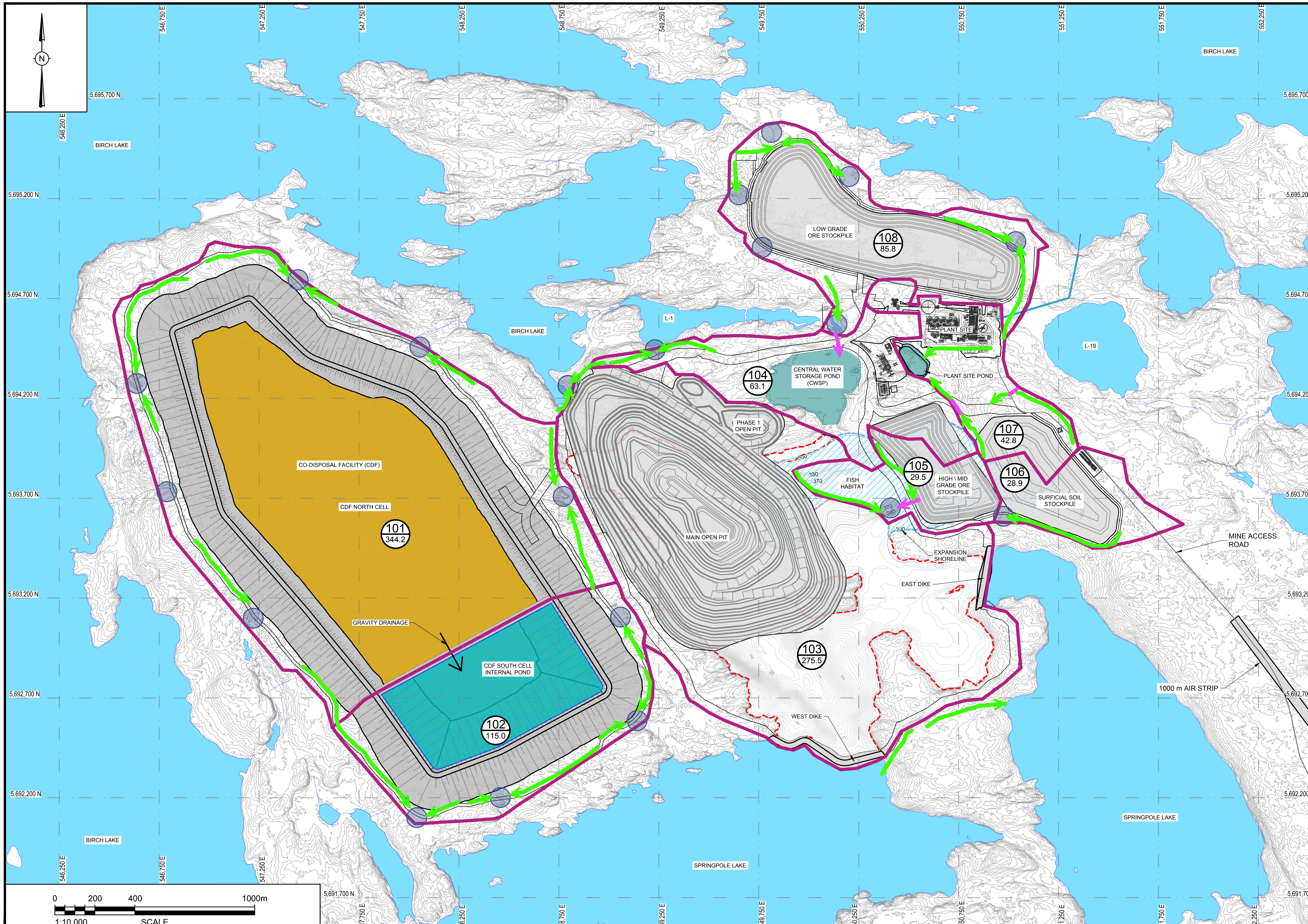
Figure 3-5 presents the water management concept for the active closure - pit filling period. During the active closure - pit filling period, dewatering of the open pit to the CWSP will cease. For modeling purposes, all mine site contact water will continue to be collected, treated and discharged to the southeast arm of Springpole Lake, with the exception of water collected in the open pit (including local runoff, groundwater inflows, and seepage from site facilities). Fresh water will continue to be sourced from Birch Lake for the accommodations complex during the active closure - pit filling period, and the STP discharge was also assumed to be sent to the southeast arm of Springpole Lake.

3.5 Active Closure – Post Pit Filling Contingency

Figure 3-6 presents the water management concept for the active closure – post pit filling contingency. For the purposes of this mine site water balance, the active closure – post pit filling contingency starts after pit filling is complete. The active closure – post pit filling contingency was modelled to simulate a closure scenario in which the water quality of the pit lake and the site contact water is not yet suitable for passive discharge to the environment. Therefore, during active closure – post pit filling contingency excess water from the pit lake and site contact water will continue to be directed to the ETP for treatment before discharge to the environment (southeast arm of Springpole Lake). If the water quality of the pit lake and site runoff is deemed suitable for passive discharge to the environment, the site may move directly from the active closure - pit filling period to the post closure phase. However, if site runoff is not acceptable for passive discharge, then the active closure – post pit filling contingency configuration will be retained until it is.

3.6 Post Closure Phase

The active closure – post pit filling contingency is followed by post closure. Figure 3-7 presents the water management concept for the post closure phase. Post closure commences only when water quality of the pit lake and the site contact water is acceptable for passive discharge to the environment. At this time, the pit lake will be connected to Springpole Lake through a partial removal of the Springpole Lake dikes. The ETP will be decommissioned, and the site catchment areas will passively discharge as they do at present day to either Springpole Lake or Birch Lake.



NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

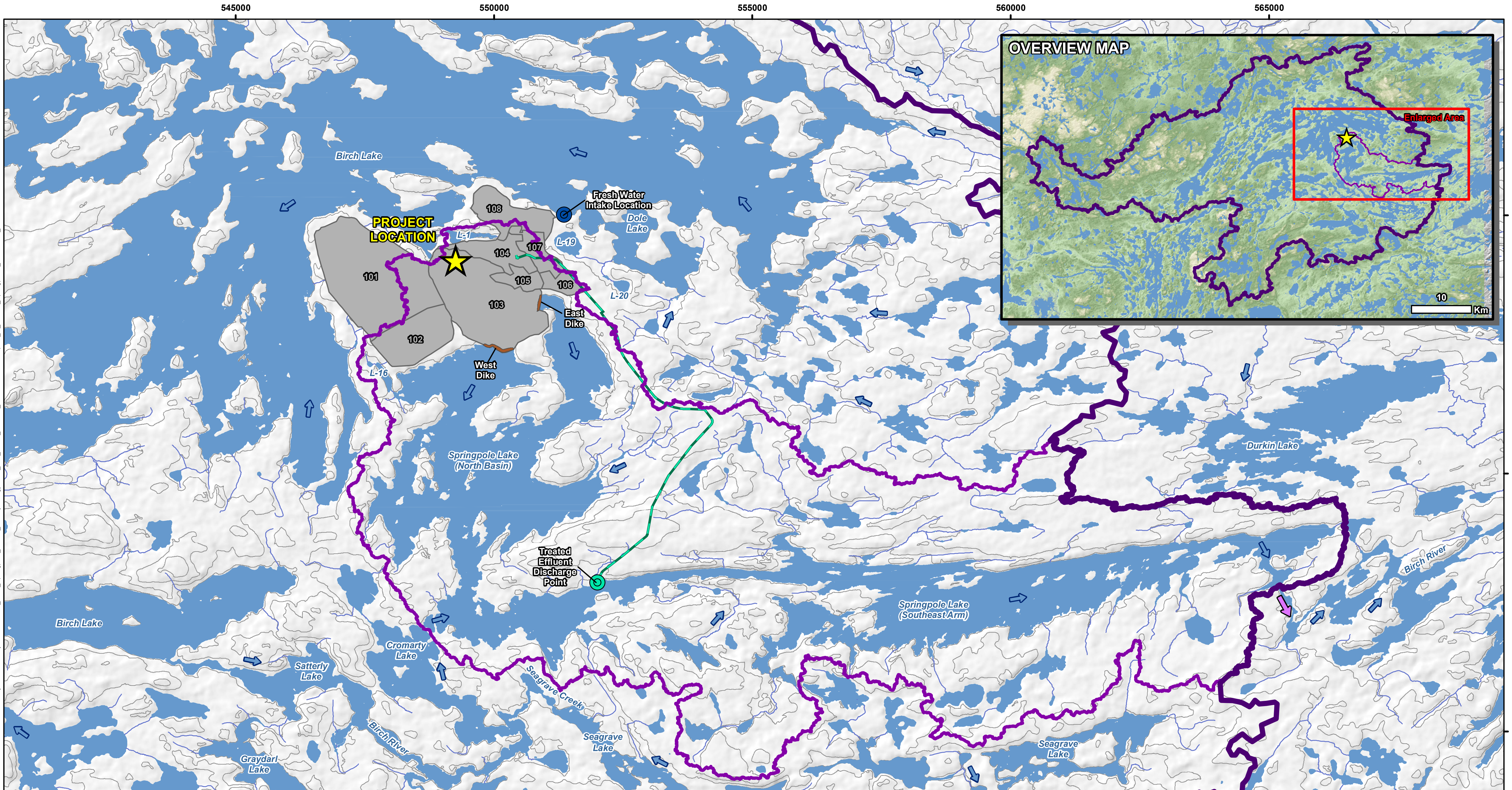
- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 / 115 — WATERSHED ID / WATERSHED AREA (ha)
- DITCH
- CULVERT
- SUMP/LOCAL COLLECTION POND
- BERM / WATER CONTROL STRUCTURE

WATERSHED AREAS SUMMARY TABLE

CATCHMENT ID	CATCHMENT AREA (ha)
101	344.2
102	115.0
103	275.5
104	63.1
105	29.5
106	28.9
107	42.8
108	85.8
TOTAL:	984.8

CLIENT LOGO	CLIENT:	DWN BY:	COMPANY LOGO	PROJECT	DATE:
FIRST MINING GOLD	FIRST MINING GOLD	CHK'D BY:	wsp	SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE	DECEMBER 2023
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	DATUM: UTM NAD 83		TITLE	PROJECT NO:
		PROJECTION: ZONE		ULTIMATE OPERATIONS SITE PLAN WITH CONCEPTUAL WATER MANAGEMENT PLAN	REV. NO.: B
		SCALE: AS SHOWN			FIGURE No. 3-1

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 3-1A.dwg - 3-1A - Mar. 28, 2024 11:43am - wds_kyle.johnson



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

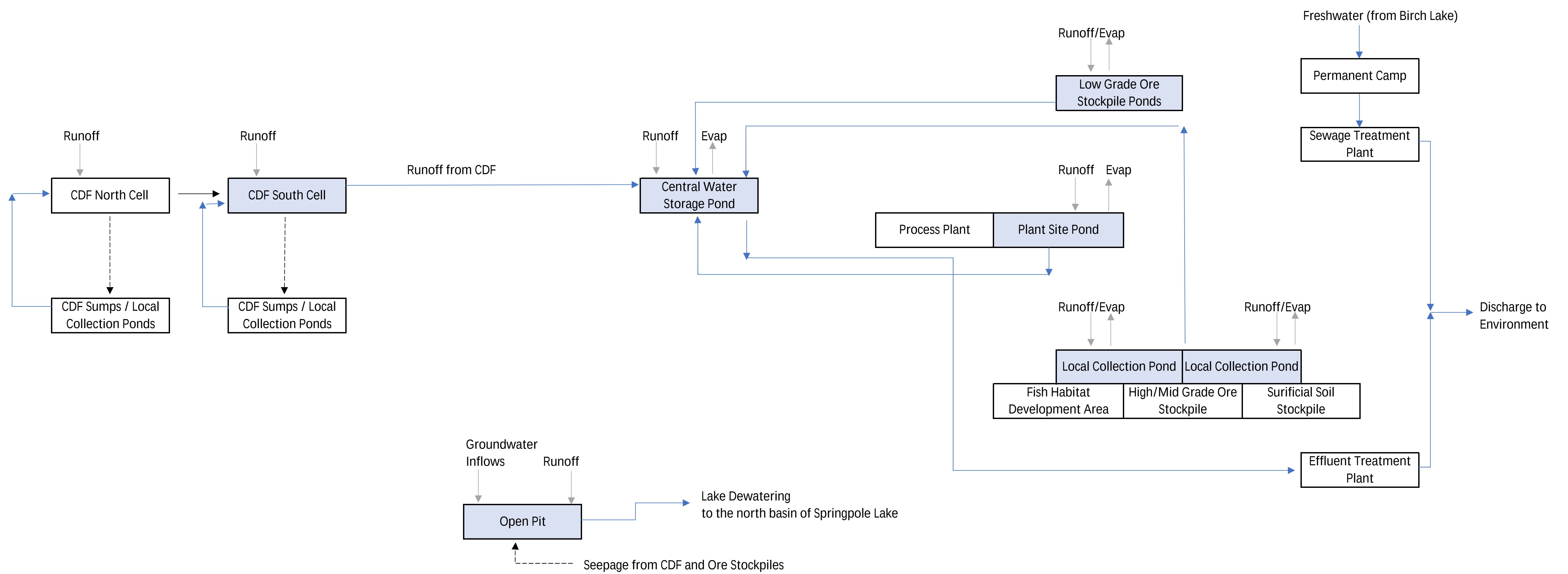
FIRST MINING GOLD

wsp

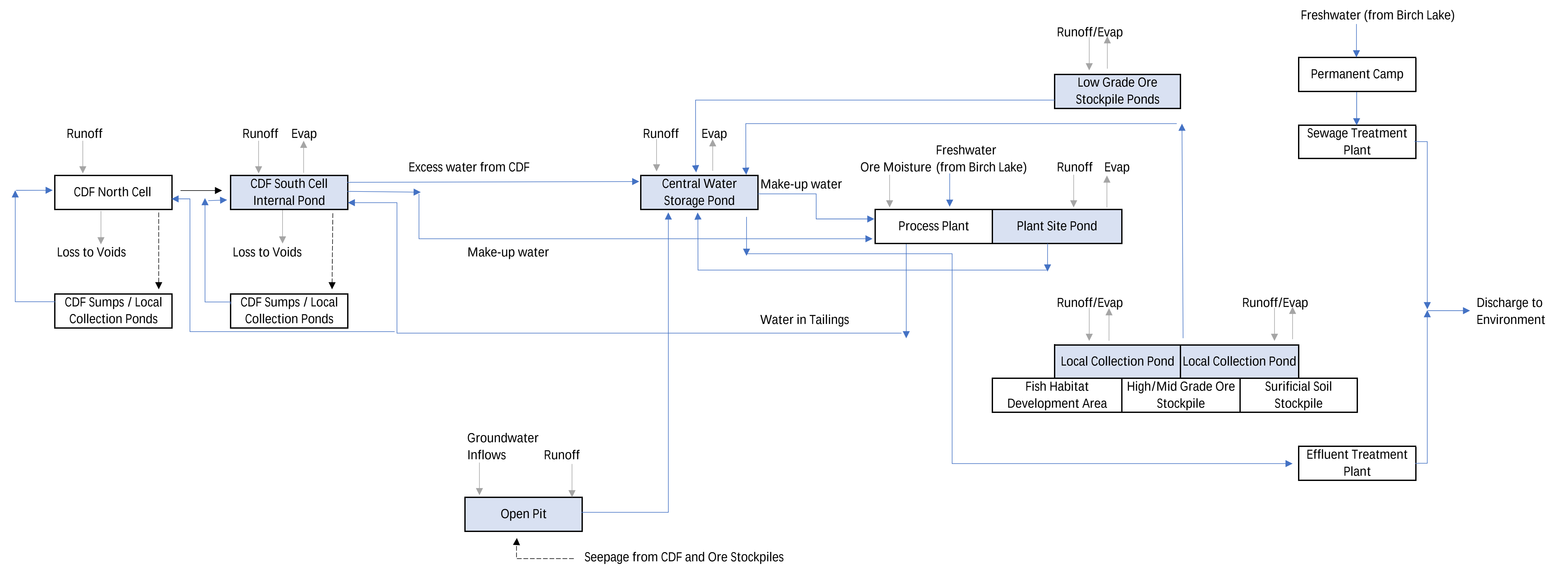
SPRINGPOLE GOLD PROJECT

Project Footprint (Ultimate Conditions) Within the Springpole Lake Watershed

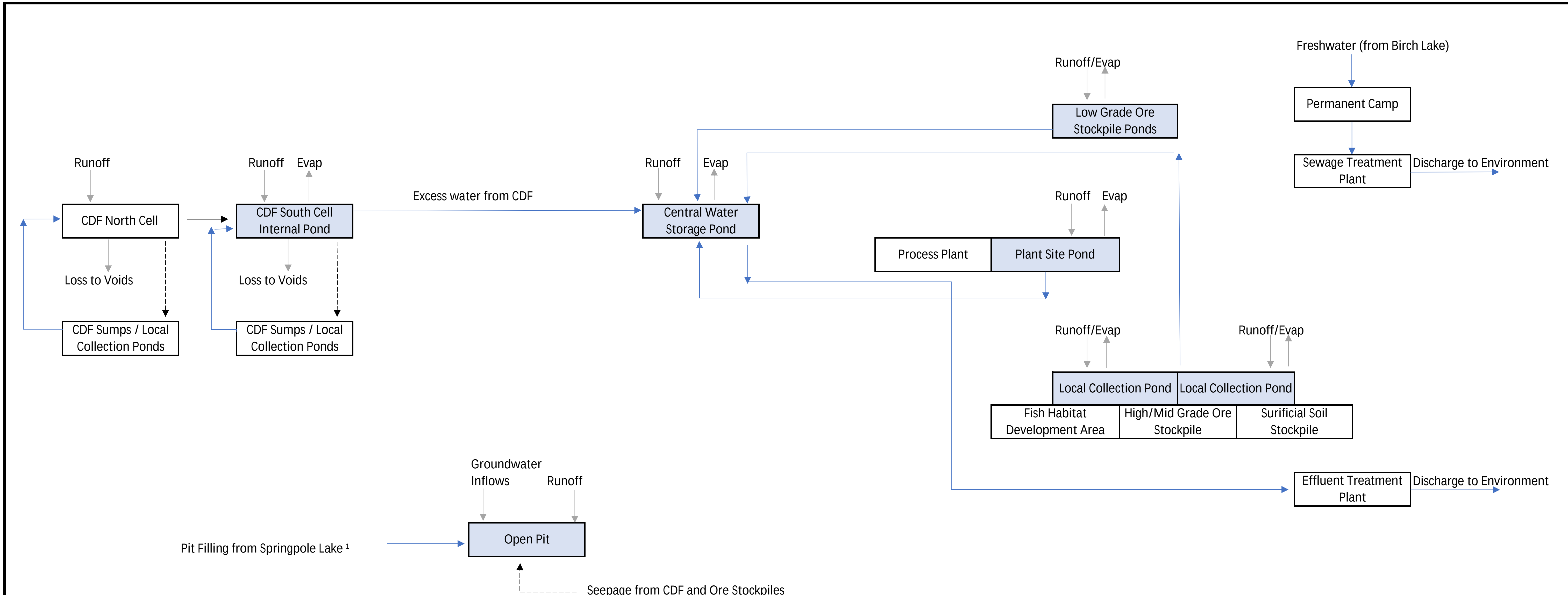
PROJECT Nº: ONS2104	FIGURE: 3-2
SCALE: 1:70,000	DATE: October 2024



LEGEND:	CLIENT LOGO:	CLIENT:	COMPANY LOGO:	PROJECT TITLE:	DATE:
Input/Loss Pumped Flow Gravity Flow Seepage	FIRST MINING GOLD	FIRST MINING GOLD WSP Canada Inc. 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	wsp	SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: CONSTRUCTION PHASE FLOW SCHEMATIC	DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 3-3



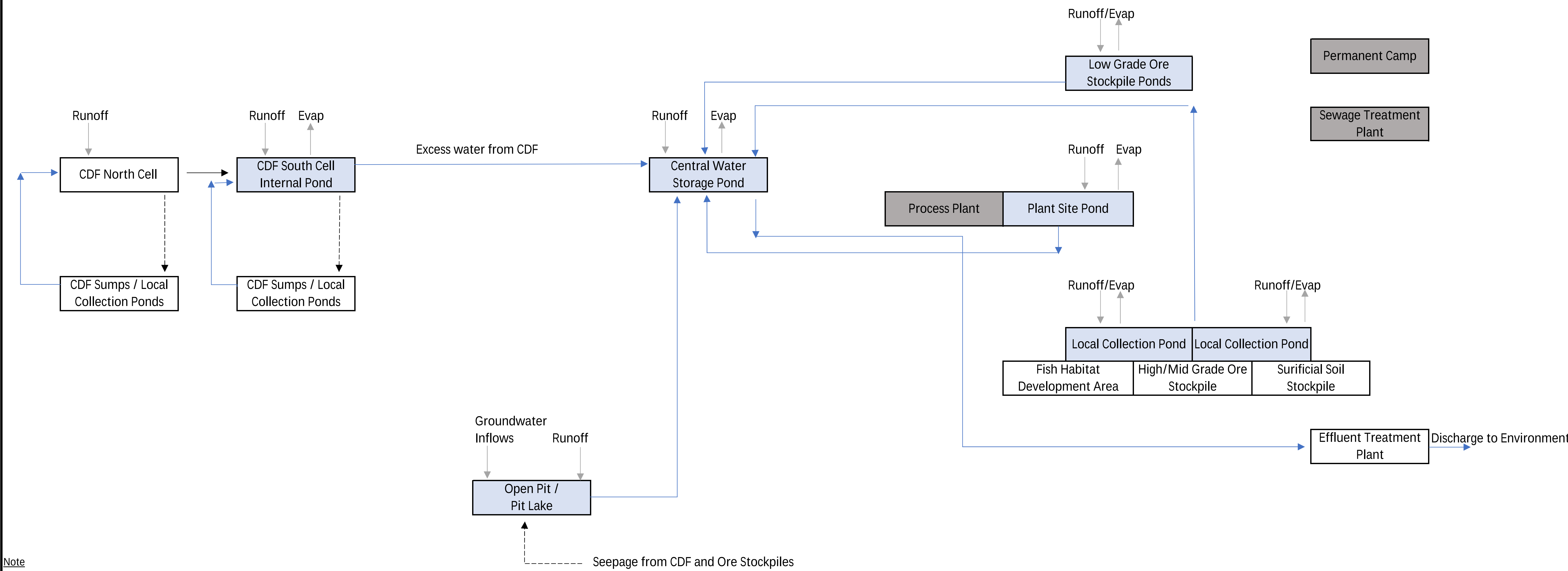
LEGEND:	CLIENT LOGO:	CLIENT:	COMPANY LOGO:	PROJECT TITLE:	DATE:
Input/Loss Pumped Flow Gravity Flow Seepage	FIRST MINING GOLD	FIRST MINING GOLD WSP Canada Inc. 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2	wsp	SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: OPERATIONS PHASE FLOW SCHEMATIC	DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 3-4



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 Canada Inc. 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: 3-5



Note

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

LEGEND:
Input/Loss
Pumped Flow
Gravity Flow
Seepage
Removed / Decommissioned

CLIENT LOGO:

CLIENT:
FIRST MINING GOLD

WSP Canada Inc.
6925 Century Avenue, Suite 600
Mississauga, Ontario, Canada, L5N 7K2

COMPANY LOGO:

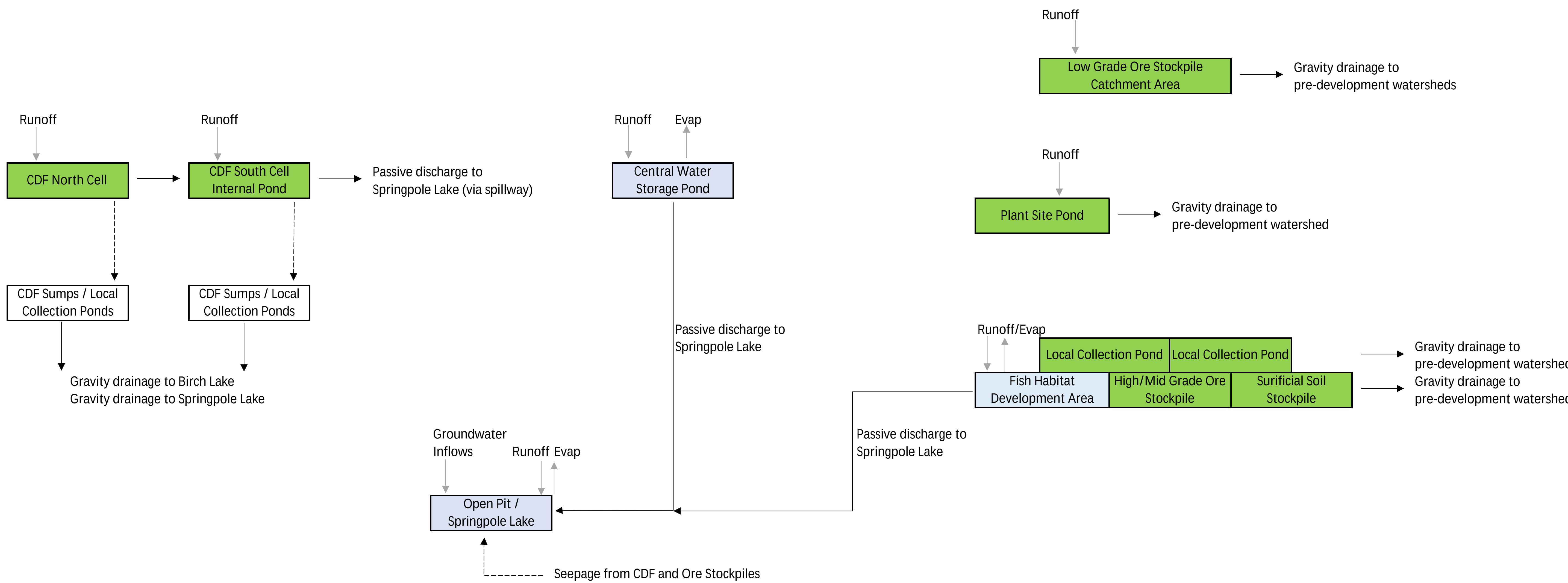
PROJECT TITLE:
SPRINGPOLE GOLD PROJECT
MINE SITE WATER BALANCE

DRAWING TITLE:
ACTIVE CLOSURE PHASE
FLOW SCHEMATIC

DATE:
DECEMBER 2023

PROJECT NO:
ONS2104

FIGURE NO:
3-6



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:	CLIENT LOGO:	CLIENT:	COMPANY LOGO:	PROJECT TITLE:	DATE:
Input/Loss Pumped Flow Gravity Flow Seepage Closed / Re-vegetated	FIRST MINING GOLD	FIRST MINING GOLD WSP Canada Inc. 6925 Century Avenue, Suite 600 Mississauga, Ontario, Canada, L5N 7K2		SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE DRAWING TITLE: POST CLOSURE PHASE FLOW SCHEMATIC	DECEMBER 2023 PROJECT NO: ONS2104 FIGURE NO: 3-7

4.0 METHODOLOGY AND MODELLING SCENARIOS

The mine site water balance model was developed using GoldSim version 14.0 with a monthly time step. The five phases (construction, operations, active closure - pit filling period, active closure – post pit filling contingency and post closure) were simulated deterministically under various climate conditions to support the receiver water quality and flow effects assessment, as well as the development of the mine site water quality model. A total of 17 modelling scenarios were simulated to capture the various mining phases and climate conditions, as discussed below. The operations phase was modelled over a 10-year period. A one-year snapshot was modelled for the construction, active closure - pit filling period, active closure – post pit filling contingency and post closure phases. Figure 4-1 provides a summary of the modelling scenarios in the context of the mine life.

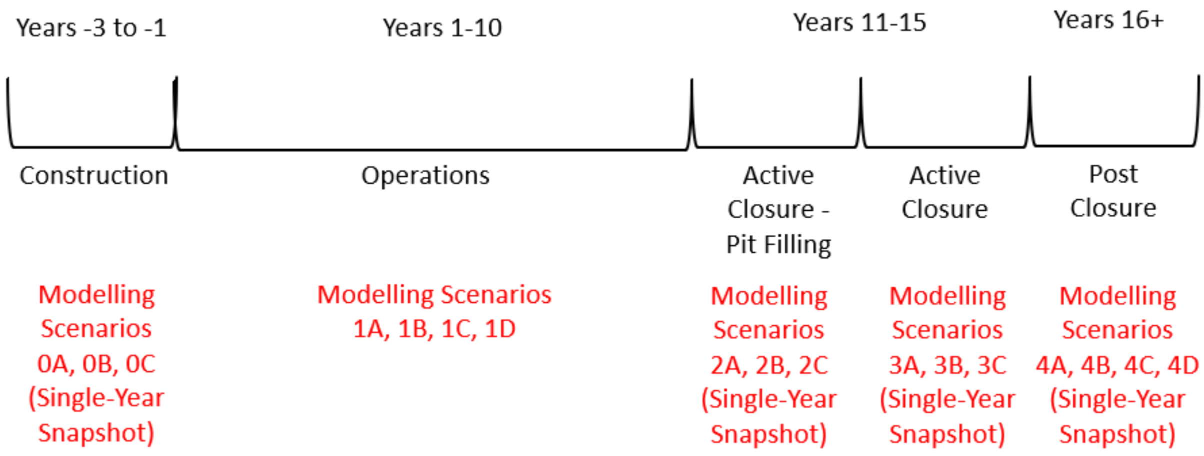
The following climate scenarios were simulated over a period of 10 years for the operations phase:

- **Scenario 1A (Average Conditions):** The operations phase was simulated under average annual precipitation conditions. Critical years were identified from this simulation to support the wet and dry simulations (Scenarios 1B and 1C).
- **Scenario 1B (Average Conditions with 1:100 Wet Year in Final Year):** The operations phase was simulated under average annual precipitation conditions for years 1 to 9, and 1:100 wet year conditions were applied to Year 10. Year 10 was identified as the critical wet year as it produced the greatest amount of discharge in Scenario 1A.
- **Scenario 1C (Average Conditions with 1:100 Dry Year in First Year):** The operations phase was simulated under 1:100 dry year precipitation conditions in Year 1, and average annual conditions for Years 2 to 10. Year 1 was identified as the critical dry year as it produced the least amount of discharge in Scenario 1A.
- **Scenario 1D (Historical Conditions):** The operations phase was simulated using a historical climate sequence representative of near-average conditions to assess inter-annual variability. The 10-year historical sequence selected for use in the model is sourced from Environment and Climate Change Canada (ECCC) station in Red Lake (Station 6016975) and covers the period from January 1994 to January 2004.

For the remaining 13 modelling scenarios simulating the construction, active closure - pit filling period, active closure – post pit filling contingency and post closure phases, a single-year snapshot was modelled. Note the scenario numbers are ordered chronologically, with 0 corresponding to construction phase, and 4 corresponding to post closure. The following climate scenarios were modelled:

- **Construction:** A single year snapshot was modelled for three climate scenarios: 0A) average annual precipitation, 0B) 1:100 wet year and 0C) 1:100 dry year.
- **Active Closure - Pit Filling Period:** A single year snapshot was modelled for three climate scenarios: 2A) average annual precipitation, 2B) 1:100 wet year and 2C) 1:100 dry year.
- **Active Closure – Post Pit Filling Contingency:** A single year snapshot was modelled for three climate scenarios: 3A) average annual precipitation, 3B) 1:100 wet year and 3C) 1:100 dry year.
- **Post Closure:** A single year snapshot was modelled for four climate scenarios: 4A) average annual precipitation, 4B) 1:100 wet year 4C) 1:100 dry year and 4D) average annual conditions with climate change. Climate change assumptions are discussed in Section 5.1.5

Figure 4-1: Modelling Scenarios



5.0 DESIGN DATA AND ASSUMPTIONS

5.1 Climate Data

5.1.1 Precipitation

Precipitation inputs for the mine site water balance are based on the 2022 Hydrology Baseline Report (WSP 2024). The Environment and Climate Change Canada (ECCC) station in Red Lake (Station 6016975), located 110 km from the Project site was chosen as the primary data source due to its proximity to the Project site and its period of record (48 years of complete precipitation records). Average year precipitation was selected based on Red Lake 1981 to 2010 Climate Normals. Wet and dry year values were calculated during the development of the 2022 Hydrology Baseline Report (WSP 2024) based on 48 years of precipitation records. The annual precipitation for the average, 1:100 wet, and 1:100 dry years is 686, 1050, and 345 mm, respectively (Table 5-1). Table 5-2 summarizes the average year monthly precipitation distribution, based on Climate Normals. This monthly distribution was applied to the 1:100 wet and 1:100 dry years. Monthly Red Lake precipitation data from 1994 to 2003 (Figure 5-1) were used for the historical precipitation sequence for the operations phase (Scenario 1D). This historical sequence was selected due to its mixture of representative average, wet and dry years. The average annual precipitation during this period was approximately 668 mm, which is comparable to the average year climate scenario. Furthermore, the wettest and driest years in the historical sequence fall within the 1:100 wet and dry year extremes. The wettest year occurred in 2000 with an annual precipitation of 897 mm, and the driest year occurred in 1994 with an annual precipitation of 588 mm.

5.1.2 Snowfall and Snowmelt

Precipitation was allocated as either rainfall or snowfall. The monthly snowfall distribution (percent of precipitation that falls as snow) is summarized in Table 5-3 and is based on Climate Normals. This monthly distribution was applied to all climate scenarios.

It was assumed that snowfall would accumulate as snowpack. Snow was assumed to accumulate from November to April. An assumed monthly snowmelt distribution (percent of snowpack that melts) is provided in Table 5-4 and was applied for all climate scenarios.

The snowmelt distribution was calibrated to observed runoff at a representative nearby streamflow gauge. Water Survey of Canada (WSC) Station 05QA004 (Sturgeon River at McDougall Mills), located 145 km southeast from the Project site, was determined to be representative of flow conditions for the Springpole Project based on the Hydrology Baseline Report (WSP 2024). This station was selected based on its length and completeness of record, and alignment with monitoring data. Sturgeon River flow data from 1961 to 2022 (presented in WSP 2024 were used for comparison). Figure 5-2 provides a comparison of average year natural ground runoff simulated in GoldSim (based on the snowmelt assumptions in Table 5-4, and a natural ground runoff coefficient) compared to mean monthly Sturgeon River runoff. Overall, Sturgeon River runoff and simulated natural ground runoff align well. It is noted that during the winter months (December to March) there appears to be more runoff in the Sturgeon River watershed compared to the simulated natural ground runoff. However, lower flows are expected at the Project site during these months as the site watershed areas are smaller than the Sturgeon River watershed (catchment area 4,440 km^2), and are therefore assumed to have less baseflow.

5.1.3 Temperature

Monthly temperature inputs were derived from Red Lake Climate Normals and are provided in Table 5-5. These values were applied for all climate scenarios (average, wet and dry conditions) to estimate lake evaporation. Monthly Red Lake temperature data from 1994 to 2003 were used for the historical sequence for the operations phase (Scenario 1D).

5.1.4 Evaporation

Lake evaporation was simulated in GoldSim using the Hamon equation, utilizing the temperature inputs discussed above. The Hamon equation also requires the site latitude and solar declination as inputs. A latitude of 51.4° was used. Solar declination for the site was calculated for each month using an Excel-based calculator available on the National Oceanic and Atmospheric Administration (NOAA) website (NOAA, 2020). The solar declination values and resulting average monthly evaporation are presented in Table 5-6.

The mean annual lake evaporation for the Project area was estimated to be approximately 460 millimetres (mm) in the Hydrology Baseline Report (WSP 2024). This value was based on information provided in the Project meteorology report (Ausenco 2020) and the Hydrological Atlas of Canada (Natural Resources Canada 1978). With average monthly temperatures from the Red Lake Climate Normals (Table 5-5), the Hamon equation generated a similar average annual lake evaporation (460 mm). The average annual lake evaporation for the historical temperature sequence was calculated to be 456 mm (Scenario 1D).

5.1.5 Climate Change

Climate change was modelled in GoldSim for the post closure phase (Scenario 4D) to represent the potential long-term effects of climate change on the mine site water balance. Increases / decreases in temperature and precipitation were determined based a comparison of 1976 to 2005 data and 2051 to 2080 projected values for Red Lake from Climate Atlas of Canada (Prairie Climate Centre 2019). Table 5-7 summarizes climate change values for Red Lake from this document, as well as the temperature and precipitation increases / decreases that were modelled in GoldSim.

The 2051 to 2080 projected values are based on the higher of the two projections published in Representative Concentration Pathways (RCPs), published by the Climate Atlas of Canada (Prairie Climate Centre 2019). The RCP 8.5 scenario assumes that greenhouse gas concentrations will continue to increase at approximately the same rate as they are increasing today, compared to the lower projection (RCP 4.5) scenario which assumes that greenhouse gas emissions will stabilize by the end of the century.

The precipitation and temperature baseline data (1976-2005) utilized by the Climate Atlas of Canada is sourced from a number of international datasets. To best estimate the climate impacts at the Project location, the absolute increase in average monthly precipitation and temperature were applied to the average monthly precipitation and temperature data from Red Lake Climate Normals (1981 to 2010). This results in a mean average annual temperature and precipitation of 6.0 °C and 733.4 mm respectively.

Lake evaporation under climate change conditions was calculated using the Hamon equation, which utilizes temperature as an input (Section 5.1.4). The annual lake evaporation is modeled to increase to 598 mm, due to a projected increase in temperature. This is a 138 mm increase in evaporation compared to current average conditions. For comparison purposes, evaporation projections for Dryden, Ontario (located approximately 190 km south of the Project site) were reviewed. These projections were calculated by WSP based on the Handbook of Hydrology (Maidment 1992) and temperature projections data from the Ministry of Natural Resources and Forestry Climate Change Research Report 44 (McDermid et al. 2015). An increase in evaporation of between 70 mm and 164 mm is expected in the Dryden area between 2041 and 2100, for a high carbon scenario (RCP 8.5). The increase in annual lake evaporation simulated using the Hamon equation in GoldSim (138 mm) falls within this range.

5.2 Catchment Areas and Land Uses

The mine site development area was divided into eight catchment areas based on a comprehensive review of site topography, and the mapping of necessary surface water management infrastructure (ditches, berms, etc.) required to contain and manage site contact water. Figure 3-1 presents the Project catchment areas. The total footprint of the Project (984.8 ha) is applied for all Project phases, however the land uses within the footprint change with time. Approximately half (47%) of the total site footprint is occupied by the CDF, and 28% by the open pit and the dewatered portion of the open pit basin. The remaining 25% consists of the various stockpiles, plant site area, and fish habitat development area.

The following land uses were modelled: natural ground, disturbed ground, pit walls, north cell, embankments/rock dams, high/mid grade ore stockpile, low grade ore stockpile, surficial soil stockpile, lakebed sediment, ponded areas. For the closure phases, the following land uses were incorporated: revegetated ground, CDF north cell revegetated closure surface, CDF south cell revegetated closure surface.

The following sections discuss land uses throughout the Project phases in greater detail. These align with the preliminary water management plan described in Section 3.0.

5.2.1 Construction Phase

Table 5-8 and Figure 5-3 present the modelled land uses for the construction phase. Assumptions in modelling the construction phase are as follows:

- Contact water from ultimate mine site footprint is captured (984.8 ha). This is a conservative assumption as the full site footprint will likely not be fully developed until the end of the construction phase.
- Surficial soil is assumed to occupy the full footprint of the surficial soil stockpile.
- High/mid grade ore stockpile is assumed to be disturbed ground, with no ore stockpiled.
- Low grade ore stockpile is assumed to be disturbed ground, with no ore stockpiled.
- The plant site area is assumed to be fully developed, and modelled as disturbed ground.
- The fish habitat development area is assumed to be fully excavated, and is modelled as disturbed ground.
- The model considers a year during which lake dewatering is occurring. Therefore, it has been assumed that the dewatering is half complete, and the dewatered portion of the open pit basin is still partially flooded. Shoreline areas within the open pit catchment (Catchment 103 in Figure 5-3) bordering the mine site are modelled as disturbed ground. The shoreline area between the Springpole Lake dikes is modelled as natural ground. The dikes are modelled as dam/rock.
- Starter dams are assumed to be constructed within the CDF. Dams are modelled as dam/rock land use.
- The contained area of the CDF north cell is assumed to be cleared and modelled as disturbed ground.
- It is assumed that the CDF south cell will be ponded.

5.2.2 Operations Phase

For the operations phase (Years 1 to 10 of operations), several of the site infrastructure land uses will change as the mine develops. At the beginning of Year 1, land uses generally align with the construction phase and consist of a large area of disturbed ground. As the mine site develops, the total disturbed ground area is converted into features such as the ore stockpiles, open pit, and deposited waste in the CDF.

The modelled land uses corresponding to the ultimate operations phase (end of Year 10) is provided in Table 5-9 and Figure 5-4. Land uses for each site catchment by year of operations are provided in Attachment A. Land uses were interpolated between years using GoldSim.

The following assumptions for modelling purposes were made regarding land uses during the operations phase:

- **Ore Stockpiles:** Although the ore stockpiles height and capacity will vary over time, it is assumed that the footprint (and therefore catchment areas and land use) will remain relatively constant throughout operations as a result of the runoff and seepage collection system. The footprints of the stockpile areas are assumed to start as disturbed ground, but be covered by ore by the end of Year 1.
- **Surficial Soil Stockpile:** It is understood that the surficial soil stockpile will be developed to its full extent by the beginning of mine operations, and the land uses will remain constant throughout the operations phase.
- **CDF:** Appendices A-1 and A-2 present CDF assumed land uses throughout the operations phase. Linear interpolation was applied in GoldSim between each year. It was assumed that the CDF starter dams will be developed to their full footprints by the end of Year 3. Mine rock and NAG tailings will be deposited as combined waste within the north cell, and are modelled using a single land use. While the volume of combined waste will continue to increase throughout operations, it is assumed that the full area within the north cell will be covered by combined waste material by the end of Year 3.

  Due to the process of hydraulic tailings deposition, 15% of the north cell is considered to be wet. This area is effectively modeled as a ponded surface, and will be subject to a higher runoff coefficient and evaporation.

  The CDF south cell is considered as a ponded surface throughout operations, as a continuous water cover will be maintained.
- **Open Pit:** As the open pit is developed within the dewatered lake basin, land uses will change from lakebed sediment to pit walls. The open pit footprint will reach the maximum areal extent by the end of Year 6. Linear interpolation was applied in GoldSim between each year.
- **CWSP:** The catchment reporting to the CWSP is assumed to be fully developed at the start of operations and will remain constant throughout the operations phase.
- **Plant Site:** The plant site infrastructure is assumed to be fully developed at the start of operations and will remain constant throughout operations phase.

5.2.3 Active Closure - Pit Filling Period

Table 5-10 and Figure 5-5 present the modelled land uses for the active closure - pit filling period. Assumptions include:

- The land uses within the surficial soil stockpile, CWSP, CDF and plant site catchments (101, 102, 104, 106 and 107 in Figure 3-1) were assumed to be the same as the end of operations.
- Ore processing is complete, and both the high/mid grade and low grade stockpiles are depleted. The stockpile areas are modeled as disturbed ground.
- The open pit is half filled with water (i.e., pit lake is at 50% of its full capacity), to reflect median conditions as the open pit fills.

5.2.4 Active Closure – Post Pit Filling Contingency

Table 5-11 and Figure 5-6 present the modelled land uses for the active closure – post pit filling contingency. Assumptions include:

- Disturbed ground, former ore stockpile area (i.e., areas that were previously occupied by the ore stockpiles during operations), and the surficial soil stockpile will be revegetated.
- The open pit was modelled as a pit lake (i.e., ponded). The disturbed area contributing to the fish habitat development area, and the lakebed sediment area in Catchments 103, 104 and 105 (Figure 3-1) will be filled with water (ponded) as shown in Figure 5-6.
- The CDF perimeter embankments will be revegetated. The north cell will be covered by a growth medium of locally derived overburden / organic materials and revegetated. The south cell will be covered with a permeable vegetated cover to maintain a water cover over the PAG tails.

5.2.5 Post Closure Phase

The land used for the active closure – post pit filling contingency were generally carried into to the post closure phase (Figure 5-7). Table 5-12 presents the modelled land uses for the post closure phase. The Springpole Lake dikes were assumed to be modified to allow natural flow of water between the reclaimed basin and Springpole Lake.

During this phase, it is assumed that no active water management will be maintained. This includes pumping of perimeter ditches and sumps around the CDF and ore stockpiles. Contact water reporting the CDF, CWSP, or open pit is assumed to passively discharge to Springpole Lake via modified spillways. Runoff reporting outside of the remaining containment structures is assumed to passively runoff to Birch Lake or Springpole Lake, according the pre-development natural catchment areas within the Project area. The areas reporting to Birch Lake include the majority of the former low grade ore stockpile footprint, the northern perimeter of the CDF, the eastern half of the remediated plant site area, and a small region north of the remediated open pit and CWSP. The remainder of the site will ultimately report to Springpole Lake.

5.3 Runoff Coefficients

Table 5-13 presents the runoff coefficients assumed for various land uses. These values are representative of surface runoff and interflow (defined as water that has infiltrated into the subsurface and returned to surface as overland flow).

The runoff coefficient applied to natural ground was developed based on gauged flow records from both the baseline monitoring program, as well as natural analogue hydrometric stations. Other runoff coefficients were selected based on engineering judgement and are consistent with numerous Projects in the northern

Ontario. This includes mining-related water balance models for both environmental assessments and more progressed engineering studies. Some runoff coefficients, such as those applied to the CDF facility, were further informed by Project-specific groundwater modeling (infiltration rates) and typical evapotranspiration loss estimates.

Lastly, the selected runoff coefficients were reviewed in comparison with one another to confirm they compared in a rational manner. For example, hardened surfaces (disturbed ground) should generate higher runoff than natural surfaces.

5.4 Process Plant and Accommodations Complex

Water requirements for the process plant include fresh water takings from Birch Lake and make-up water recycled from the CDF internal pond. The process plant may also be supplied with make-up water from the CWSP if there is not enough water available in the CDF. When neither the CDF or CWSP are able to supply make-up water demands, supplemental water takings from Birch Lake will be required.

Table 5-14 summarizes process plant and accommodations complex flow assumptions during the operations and active closure - pit filling periods. Both the process plant and accommodations complex will be decommissioned prior to the active closure – post pit filling contingency and post closure phases (i.e., fresh water takings from Birch Lake will cease). It is assumed that the process plant will operate 22 hours per day.

5.5 Void Loss within the CDF

As tailings and mine rock are deposited in the CDF, void space within them is anticipated to trap water, acting as a loss term to the water balance. These losses will only be generated during the operations phase when the process plant is operational, and waste material is being deposited in the CDF.

Void loss within the CDF has been calculated based on the tailings and mine rock tonnages, and material properties, summarized in Table 5-15. On average, it is estimated to account for a loss of 17,784 m^3/day.

Void loss in the north cell accounts for the majority (compared to the south cell) due to the greater tonnage of waste material it contains. The north cell waste material is comprised of two sources, roughly equivalent in volume; surplus mine rock and NAG tailings, which will be deposited as combined waste. As noted in Table 5-15, the void ratio of mine rock may range from 0.30 to 0.45, depending on numerous factors such as the amount of co-mingling between mine rock and tailings, the mine rock particle size distribution, the degree of saturation throughout the north cell and the methods of disposal. Due to the volume of tailings and mine rock deposited in the north cell, the assumptions around void loss in this cell have the potential to impact the overall site water balance significantly. A greater void ratio would result in greater losses, and may require additional fresh water takings to support the process plant, while a lower void ratio would result in lesser losses and increase treatment and discharge requirements. To maximize conservatism in estimating potential water takings and treatment/discharge rates, the lower bound void ratio has been utilized during the 1:100 wet year (occurring in Year 10 of operations in Scenario 1B). The upper bound void ratio is used during the 1:100 dry year (occurring in Year 1 of operations in Scenario 1C).

Void losses in the south cell are based on the tailings properties in Table 5-15 and the understanding that the material will remain saturated, under a water cover, throughout operations.

5.6 Groundwater Inflows to Open Pit

The EIS/EA mine site water balance incorporates groundwater inflows to the open pit based on hydrogeological modelling carried out by WSP. The methods and assumptions used in calculating these values are provided in the Hydrogeological Modelling Report (WSP 2023). Groundwater inflows to the open pit for all Project phases are provided Table 5-16. These values are representative of subsurface flow from areas where infiltration does not originate from the CDF or ore stockpiles. Seepage originating from the CDF and ore stockpiles is presented as a separate mine site water balance input discussed in Section 5.7.

Groundwater inflows to the open pit at the end of mine life and post closure were calculated through groundwater modelling conducted by WSP (WSP 2023). Groundwater inflow estimates for construction, and intermediate years of operations (Years -1, 2, 3 and 6) were estimated with the same model (Table 5-16). Rates were linearly interpolated in GoldSim between these values.

Groundwater inflows to the open pit are expected to peak at 2,637 m^3/day at the end of operations (Year 10) when the open pit is at its greatest extent. Groundwater inflows will then decrease to approximately 240 m^3/day once the reclaimed basin has filled and joined with the fish habitat development area and the portion of the north basin Springpole Lake which had previously been dewatered (active closure). This rate of 240 m^3/day was applied to the active closure and post closure phases (Table 5-16).

During the pit filling stage, groundwater inflows are expected to gradually decrease from the Year 10 rate of 2,637 m^3/day (representative of when the open pit is fully dewatered) to the closure rate of 240 m^3/day (representative of when the open pit and dewater lake area is flooded). For modelling purposes, it was assumed that the groundwater inflow rate for the pit filling stage is 1,439 m^3/day, the average of the Year 10 value and closure values.

Seepage through the two dikes in Springpole Lake has not been considered as the dikes have been engineered to be impermeable. Seepage through bedrock beneath the two lake dikes from Springpole Lake into the open pit is included in the values in Table 5-16.

5.7 Seepage from CDF and Ore Stockpiles

The EIS/EA mine site water balance incorporates seepage values based on hydrogeological modelling carried out by WSP. The methods and assumptions used in calculating these values are provided in the Hydrogeological Modelling Report (WSP 2023). The design of the CDF includes a liner applied to the west, south and east dam walls of the CDF south cell, and that the south cell will be maintained at under saturated conditions.

The hydrogeological model (WSP 2023) models the seepage rate out of the CDF and ore stockpiles, as well as where the seepage reports to. Model findings show that the majority of CDF and ore stockpile seepages will report to the perimeter runoff and seepage collection system (ie., overland seepage or interflow) and the open pit, with a small portion bypassing site infrastructure. Overland seepage (interflow) is captured in the runoff coefficients (Section 5.3).

Seepage estimates from the CDF and ore stockpiles reporting to the open pit and receiving environment are provided in Table 5-17. Seepage rates for the operations mining phase are based on a fully dewatered open pit, and seepage rates for active and post closure are based on a filled pit. For the purposes of the EIS/EA mine site water balance, interflow captured by the CDF and ore stockpile ditching systems will be returned to the respective storages in the CDF and ore stockpile catchment areas. Thus, the values presented in Table 5-17 represent only seepage leaving the CDF and ore stockpile catchment areas and reporting to the open pit and receiving environment. The values for the CDF include interflow, which will be pumped back into the CDF facility. As such these values do not function as a loss from the CDF, but are included to support development of the water quality model.

It is expected that seepage rates will gradually change as the open pit fills during the pit filling phase. For modelling purposes, the seepage rates during the active closure - pit filling period were assumed to be the average of the operations and closure values.

5.8 Pond Storage Capacities

For the purposes of estimating potential water takings and discharges for the EIS / EA effects assessment, the majority of operational storage within the site was considered to be the open pit, CWSP and south cell of the CDF. Ponds were modelled in GoldSim as transfer ponds, with nominal storage capacities, after which overflows were directed elsewhere (e.g., to the CWSP, the ETP, or to the environment). The impact of this conservative assumption is that runoff and treatment requirements produced by wet months is observed immediately, as are the fresh water demands during dry months. The addition of storage to the water balance would buffer these extreme wet and dry conditions.

The following assumptions were made regarding the storage capacities of the various ponds:

- The CWSP was modelled with a nominal capacity of 500,000 m^3. The pond was assumed to be at 10% capacity at the start of the operations phase, due to the simulation beginning in the middle of the low flow period. As the critical 1:100 dry year in scenario 3C occurs in Year 1, this provides a better representation of a worst case scenario for site water availability. During the construction, active closure - pit filling period, active closure – post pit filling contingency and post-closure phases, the CWSP is assumed to be full at the beginning of the simulation.
- The plant site pond and surficial soil stockpile pond were modelled as transfer ponds (no storage) with net inflows directed to the CWSP.
- The high/mid grade ore stockpile pond and the low grade ore stockpile ponds were modelled with a small storage of 10,000 m^3 to account for potential small net negative inflow periods during the winter. They operate as transfer ponds, with overflows directed to the CWSP. For the active and post closure phases, the capacity of the high grade ore stockpile is increased to 100,000 m^3 to reflect the flooded fish habitat area.
- The CDF south cell pond was modelled with a maximum volume of 50,000 m^3. The actual volume of this pond is expected to be larger, but a smaller volume was assumed due to the need to maintain continuous water cover. The pond was assumed to be full at the start of the mine site water balance. Overflows are directed to the process plant (make-up water), with the remainder being routed to the CWSP.
- The CDF north cell pond was modelled with a maximum storage of 10,000 m^3 to account for seepage and evaporation losses. Overflows are routed to the CDF south cell pond.
- The open pit was modelled with varying storages, depending on the Project phase. During the operations, active closure, and post closure phases, the open pit was modeled as an overflowing basin with no active storage. However during construction, it was modeled with an active basin volume of approximately 18.6 Mm^3 to support the lake dewatering simulation (explained further in Section 5.9). During the active closure - pit filling period, the open pit / pit lake was modelled with an active volume of 0 m^3 to support the simulation of the accumulation of runoff generated by the open pit watershed during this phase.

5.9 Construction Phase Lake Dewatering

The construction phase scenarios are modeled to include dewatering of the open pit area. The maximum discharge rate from the dewatered area will not exceed 10% of the average monthly flows reporting to the inlet of Springpole Lake from Cromarty Lake (catchment area 1,274 km^2). Average flows at this location are provided in Springpole Baseline Hydrology Report (WSP 2024). It is also assumed that 1:100 year high and low flows at this location will correspond to the 1:100 wet and dry year precipitation.

The model uses the average water level of Springpole Lake as the active level of the Springpole Lake at 391.23 masl, corresponding to a basin volume of approximately 18.6 Mm^3.

The monthly dewatering rates for the three climate scenarios are provided in Table 5-18.

Table 5-1: Annual Precipitation

Climate Scenario	Annual Precipitation (mm)
Average	686
1:100 Wet	1,050
1:100 Dry	345

Source:
WSP 2024.

Table 5-2: Monthly Precipitation Distribution for Average Conditions

Month	Average	
	Monthly Precipitation (mm)	Monthly Distribution
Jan	26.8	3.9%
Feb	17.3	2.5%
Mar	28.4	4.1%
Apr	34	5.0%
May	73.4	10.7%
Jun	99	14.4%
Jul	103.4	15.1%
Aug	88.3	12.9%
Sep	83	12.1%
Oct	59.7	8.7%
Nov	42.9	6.3%
Dec	30.2	4.4%
Annual	686.4	100%

Source:
Red Lake 1981-2010 Climate Normals (ECCC Station 6016975).

Table 5-3: Monthly Snowfall Distribution

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation (mm)	26.8	17.3	28.4	34	73.4	99	103.4	88.3	83	59.7	42.9	30.2	686.4
Rainfall (mm)	0.3	1.3	6.9	17.7	66.9	98.8	103.4	88.3	82	40.9	8.4	0.7	515.7
Snowfall (mm water equivalent)	26.5	16	21.5	16.3	6.5	0.2	0	0	1	18.8	34.5	29.5	170.8
Precipitation as Snow (%)	98.9	92.5	75.7	47.9	8.9	0.2	0.0	0.0	1.2	31.5	80.4	97.7	24.9

Source:
ECCC 1981-2010 Climate Normals for Red Lake (Station 6016975). Snowfall as mm water equivalent is calculated by subtracting monthly rainfall from monthly precipitation.

Table 5-4: Assumed Monthly Snowmelt Distribution (%)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Percent of monthly snowpack that melts within the month	5	5	5	50	100	100	100	100	100	100	50	15

Note:
Snowmelt distribution was assumed by WSP based on calibration to streamflow data at WSC Station 05QA004 (Sturgeon River at McDougall Mills).

Table 5-5: Average Monthly Temperature (°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Monthly Temp.	-18.3	-15	-7.4	2.2	9.6	15.1	18.1	17	11	3.7	-5.7	-15.3	1.3

Source:
ECCC 1981-2010 Climate Normals for Red Lake (Station 6016975).

Table 5-6: Springpole Site Solar Declination and Average Monthly Evaporation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Solar Declination (degrees)	-20.68	-12.62	-1.6	9.96	18.96	23.08	21.06	13.48	2.67	-8.92	-18.48	-23.02
Average Monthly Evaporation (mm)	0	0	0	32.44	61.35	88.57	106.58	90.26	52.44	28.40	0	0

Source:
NOAA (2020). Based on a site latitude of 51.4°. Average monthly evaporation calculated using the Hamon equation as described in Section 5.1.4.

Table 5-7: Climate Change Projections for Red Lake

Month	Temperature (°C)			Precipitation (mm)		
	Current Conditions (1976-2005)	Projected Values (2051-2080)	Increase (°C)	Current Conditions (1976-2005)	Projected Values (2051-2080)	Increase (mm)
Jan	-19.3	-13.3	6.0	33	39	6.0
Feb	-15.3	-10.4	4.9	22	26	4.0
Mar	-8.1	-3.8	4.3	25	29	4.0
Apr	1.8	6.0	4.2	33	40	7.0
May	9.5	13.4	3.9	62	68	6.0
Jun	15.5	19.2	3.7	86	90	4.0
Jul	18.5	23.0	4.5	83	79	-4.0
Aug	17.0	21.9	4.9	75	72	-3.0
Sep	11.0	15.5	4.5	73	77	4.0
Oct	4.3	8.5	4.2	50	55	5.0
Nov	-5.6	-0.8	4.8	39	44	5.0
Dec	-14.9	-8.8	6.1	34	43	9.0
Year	1.2	5.9	4.7	615	662	47

Source/Notes:
Climate Atlas of Canada (Prairie Climate Centre 2019). Absolute increases to monthly temperature and precipitation were applied to average monthly climate conditions for Red Lake 1981-2010 Climate Normals (ECCC Station 6016975).

Table 5-8: Modelled Site Land Uses (m^2) – Construction Phase

Land Use	CDF North Cell [101]	CDF South Cell [102]	Open Pit [103]	CWSP [104]	High/Mid Grade Ore Stockpile [105]	Surficial Soil Stockpile [106]	Plant Site [107]	Low Grade Ore Stockpile [108]
Natural Ground	0	0	158,566	0	0	72,574	130,496	245,200
Disturbed Ground	2,985,371	494,204	618,174	517,058	294,000	37,733	196,394	604,608
Pit Walls	0	0	593,871	0	0	0	0	0
Dam / Rock	456,629	187,598	102,102	0	0	0	0	0
Surficial Soil	0	0	0	0	0	155,694	89,282	0
Lakebed Sediment	0	0	1,282,287	0	0	0	0	0
Pond	0	468,199	0	113,942	0	0	11,828	8,191
Total	**3,442,000**	**1,150,000**	**2,755,000**	**631,000**	**294,000**	**266,000**	**428,000**	**858,000**

Table 5-9: Modelled Site Land Uses (m^2) – Ultimate Operations Phase

Land Use	CDF North Cell [101]	CDF South Cell [102]	Open Pit [103]	CWSP [104]	High/Mid Grade Ore Stockpile [105]	Surficial Soil Stockpile [106]	Plant Site [107]	Low Grade Ore Stockpile [108]
Natural Ground	0	0	158,566	0	0	78,849	130,496	245,200
Disturbed Ground	660,617	267,419	437,360	440,365	120,432	40,995	196,394	96,715
Pit Walls	0	0	1,261,260	0	0	0	0	0
Combined Waste	1,813,590	0	0	0	0	0	0	0
Dam / Rock	967,793	414,383	102,102	0	0	0	0	0
Low Grade Ore	0	0	0	0	0	0	0	507,893
High/Mid Grade Ore	0	0	0	76,693	173,568	0	0	0
Surficial Soil	0	0	0	0	0	169,156	89,282	0
Lakebed Sediment	0	0	795,712	0	0	0	0	0
Pond	0	468,199	0	113,942	0	0	11,828	8,191
Total	**3,442,000**	**1,150,000**	**2,755,000**	**631,000**	**294,000**	**289,000**	**428,000**	**858,000**

Table 5-10: Modelled Site Land Uses (m^2) – Active Closure - Pit Filling Period

Land Use	CDF North Cell [101]	CDF South Cell [102]	Open Pit [103]	CWSP [104]	High/Mid Grade Ore Stockpile [105]	Surficial Soil Stockpile [106]	Plant Site [107]	Low Grade Ore Stockpile [108]
Natural Ground	0	0	158,566	0	0	72,574	130,496	245,200
Disturbed Ground	660,617	267,419	437,360	517,058	294,000	37,733	196,394	604,608
Pit Walls	0	0	427,292	0	0	0	0	0
Combined Waste	1,813,590	0	0	0	0	0	0	0
Dam / Rock	967,793	414,383	102,102	0	0	0	0	0
Surficial Soil	0	0	0	0	0	155,694	89,282	0
Lakebed Sediment	0	0	795,712	0	0	0	0	0
Pond	0	468,199	833,967	113,942	0	0	11,828	8,191
Total	**3,442,000**	**1,150,000**	**2,755,000**	**631,000**	**294,000**	**266,000**	**428,000**	**858,000**

Table 5-11: Modelled Site Land Uses (m^2) – Active Closure – Post Pit Filling Contingency

Land Use	CDF North Cell [101]	CDF South Cell [102]	Open Pit [103]	CWSP [104]	High/Mid Grade Ore Stockpile [105]	Surficial Soil Stockpile [106]	Plant Site [107]	Low Grade Ore Stockpile [108]
Natural Ground	0	0	158,464	0	0	72,574	130,496	245,200
Dam / Rock	0	0	102,036	0	0	0	0	0
Pond	0	0	2,055,645	113,942	283,197	0	0	8,191
CDF North Cell Closure Surface	1,813,590	0	0	0	0	0	0	0
CDF South Cell Closure Surface	0	468,199	0	0	0	0	0	0
Revegetated	1,628,410	681,801	438,855	517,058	10,803	193,426	297,504	604,608
Total	**3,442,000**	**1,150,000**	**2,755,000**	**631,000**	**294,000**	**266,000**	**428,000**	**858,000**

Table 5-12: Modelled Site Land Uses (m^2) –Post Closure Phase

Land Use	CDF North Cell [101]	CDF South Cell [102]	Open Pit [103]	CWSP [104]	High/Mid Grade Ore Stockpile [105]	Surficial Soil Stockpile [106]	Plant Site [107]	Low Grade Ore Stockpile [108]
Natural Ground	0	0	158,464	0	0	72,574	130,496	245,200
Dam / Rock	0	0	102,036	0	0	0	0	0
Pond	0	0	2,055,645	113,942	283,197	0	0	8,191
CDF North Cell Closure Surface	1,813,590	0	0	0	0	0	0	0
CDF South Cell Closure Surface	0	468,199	0	0	0	0	0	0
Revegetated	1,628,410	681,801	438,855	517,058	10,803	193,426	297,504	604,608
Total	**3,442,000**	**1,150,000**	**2,755,000**	**631,000**	**294,000**	**266,000**	**428,000**	**858,000**

Table 5-13: Runoff Coefficients by Modelled Land Use for Project Phases

<table>
<tr><th>Land Use</th><th colspan="5">Runoff Coefficient</th></tr>
<tr><th>Phase</th><th>Construction</th><th>Operations</th><th>Active Closure - Pit Filling Period</th><th>Active Closure – Post Pit Filling Contingency</th><th>Post Closure</th></tr>
<tr><td>Natural Ground</td><td colspan="5">0.4</td></tr>
<tr><td>Disturbed Ground</td><td colspan="5">0.7</td></tr>
<tr><td>Pit Walls</td><td colspan="5">0.9</td></tr>
<tr><td>Combined Waste</td><td colspan="5">0.7</td></tr>
<tr><td>Dam / Rock</td><td colspan="5">0.5</td></tr>
<tr><td>Low Grade Ore</td><td>N/A</td><td colspan="2">0.5</td><td colspan="2">N/A</td></tr>
<tr><td>High/Mid Grade Ore</td><td>N/A</td><td colspan="2">0.5</td><td colspan="2">N/A</td></tr>
<tr><td>Surficial Soil Stockpile</td><td colspan="3">0.5</td><td colspan="2">N/A</td></tr>
<tr><td>Lakebed Sediment</td><td>0.8</td><td colspan="4">0.5</td></tr>
<tr><td>Pond</td><td colspan="5">1.0</td></tr>
<tr><td>CDF North Cell Closure Surface (Revegetated)</td><td colspan="3">N/A</td><td colspan="2">0.7</td></tr>
<tr><td>CDF South Cell Closure Surface (Revegetated)</td><td colspan="3">N/A</td><td colspan="2">0.4</td></tr>
<tr><td>Revegetated</td><td colspan="3">N/A</td><td colspan="2">0.4</td></tr>
</table>

Notes:

1 N/A values refer to land uses not present in the given phase.

2 Lakebed sediment assumed to have high clay content. Runoff coefficient expected to decrease as the sediment dries, and naturally vegetates after the construction phase.

3 Natural ground, revegetated, and south cell closure runoff coefficients calculated using average precipitation from Red Lake 1981 to 2010 Climate Normals, and average flows from Water Survey of Canada (WSC) Station 05QA004 (Sturgeon River at McDougall Mills).

Table 5-14: Process Plant and Accommodations Complex Flow Assumptions

Parameter	Unit	Phase	Value
Ore water content	m^3/hr	Operations	72
Fresh water demand for process plant	m^3/hr	Operations	182
Make-up water for process plant from CDF/CWSP	m^3/hr	Operations	1178
Water in tailings to CDF north cell (NAG)	m^3/hr	Operations	1201
Water in tailings to CDF south cell (PAG)	m^3/hr	Operations	231
Fresh water demand for accommodations process	m^3/hr	Construction, Operations, Active Closure - Pit Filling Period	3.6
Domestic sewage / grey water from accommodations complex to STP	m^3/hr	Construction, Operations, Active Closure - Pit Filling Period	3.6

Source:
Ausenco (2023a)

Table 5-15: Mine Waste Parameters

Deposition Location		CDF South Cell	CDF North Cell			
Waste Material		PAG Tailings	NAG Tailings	PAG Mine Rock		
				Average	Upper Bound	Lower Bound
Void Ratio	-	1.1	1.1	0.38	0.45	0.30
Total Production Tonnage	Mt	20.2	80.8	146.0		
Nominal Void Loss	Mm^3/year	0.87	5.62			

Notes:
1 PAG mine rock void ratios: upper bound used for 1:100 dry year modelling, lower bound used for 1:100 wet year modelling, as discussed in Section 5.5.
2 Nominal void loss based on average production schedule, assuming a production time of 9.5 years.

Table 5-16: Groundwater Inflows to Open Pit

Mining Phase	End of Year of Operations	Groundwater Inflows (m^3/day)
Construction	-3 to -1	348
Operations	0	348
	2	1894
	3	2157
	6	2387
	10	2637
Active Closure - Pit Filling Period		1439
Active Closure – Post Pit Filling Contingency and Post Closure		240

Notes:
1 Groundwater inflows were derived from modelling carried out by WSP (2023).
2 Groundwater inflows do not include seepages from other site locations.
3 Groundwater inflows were linearly interpolated between the years specified in the table.
4 Active closure - pit filling period value is calculated as the average of the Operations Year 10 and Active – Post Closure Contingency and Post Closure values.
5 Active – post pit filling contingency / post closure values provided by WSP's hydrogeological modelling team to support the needs of the mine site water balance. This value was calculated using the methods described in WSP (2023) and is representative of groundwater inflows to the open pit, fish habitat development area, and the portion of the north basin Springpole Lake which will have been filled with water.

Table 5-17: Site Seepage Rates

Seepage Destination		Seepage to Perimeter Ditches (m³/day)		Seepage to Open Pit (m³/day)				Seepage to Environment (m³/day)		
Seepage Source		CDF North Cell [101]	CDF South Cell [102]	CDF North Cell [101]	CDF South Cell [102]	High/Mid Grade Ore Stockpile [105]	Low Grade Ore Stockpile [108]	CDF North Cell [101]	CDF South Cell [102]	Low Grade Ore Stockpile [108]
Phase	Construction	694	372	167	134	30	66	86	17	10
	Operations	694	372	167	134	30	66	86	17	10
	Active Closure - Pit Filling Period	775	424	94	77	30	33	79	23	5
	Active Closure – Post Pit Filling Contingency and Post Closure	855	475	21	19	0	0	71	29	0

Notes:
1 Seepage rates were derived from modelling carried out by WSP (2023).
2 Seepage rates are assumed to be constant throughout the phase considered.
3 Active closure - pit filling period values are calculated as the average of the Operations Year 10 and Active – Post Pit Filling Contingency and Post Closure values.
4 Active – post pit filling contingency / post closure values provided by WSP's hydrogeological modelling team to support the needs of the mine site water balance. This value was calculated using the modelling described in WSP (2023) and is representative of groundwater inflows to the open pit, fish habitat development area, and the portion of the north basin Springpole Lake which will have been filled with water.

Table 5-18: Construction Phase Open Pit Maximum Dewatering Rates

Month	Maximum Allowable Pit Dewatering Rate (m^3/s)		
	Scenario 0A: Average Year	Scenario 0B: 1:100 Wet Year	Scenario 0C: 1:100 Dry Year
Jan	0.67	1.17	0.31
Feb	0.57	0.99	0.26
Mar	0.50	0.87	0.23
Apr	0.72	1.25	0.33
May	2.08	3.62	0.96
Jun	2.13	3.70	0.98
Jul	1.57	2.73	0.72
Aug	1.14	1.98	0.53
Sep	1.09	1.90	0.50
Oct	1.12	1.94	0.52
Nov	1.08	1.88	0.50
Dec	0.85	1.47	0.39

Notes:
1 Dewatering rates are calculated as 10% of the average monthly flow through the Springpole Lake inlet, from Cromarty Lake (WSP 2024).

Figure 5-1: Historical Precipitation Series

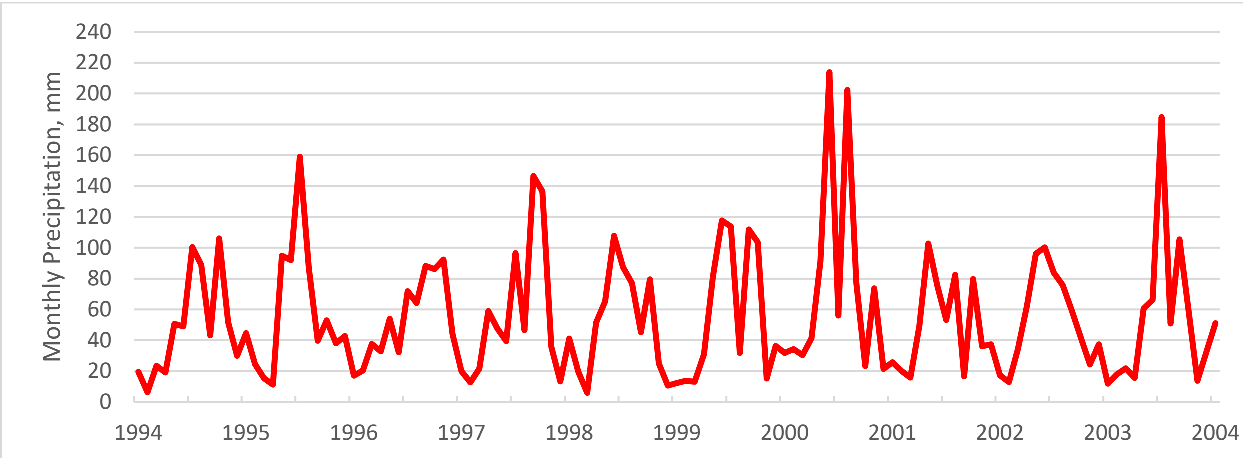
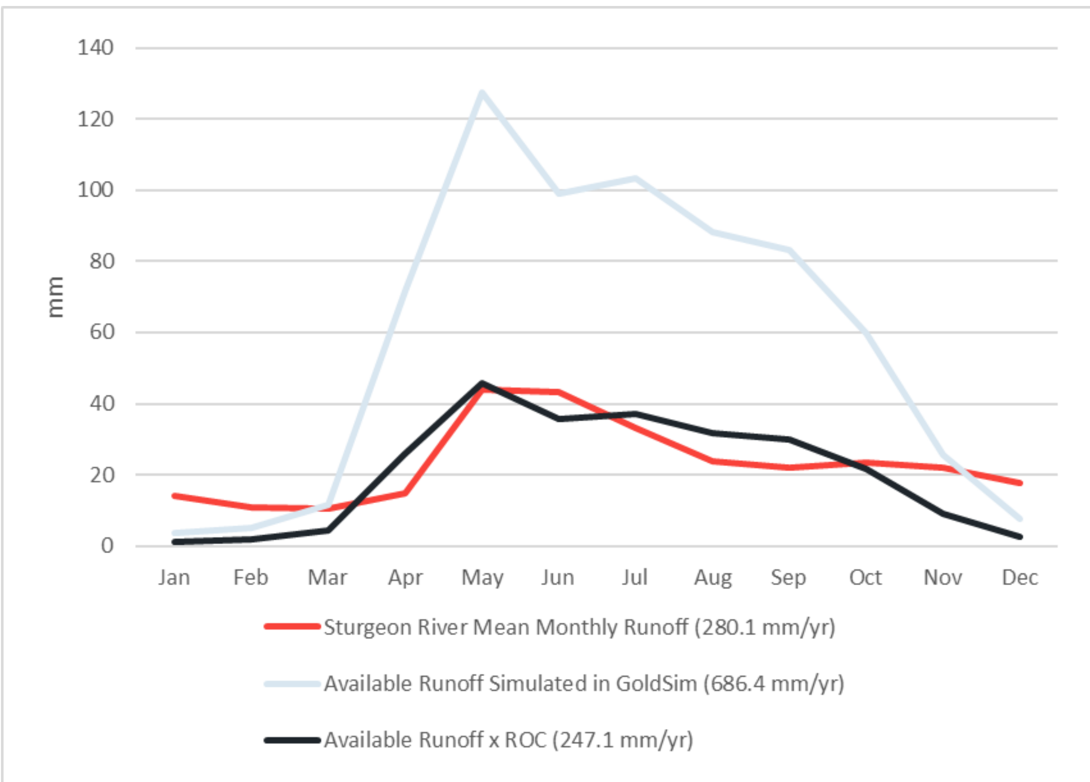
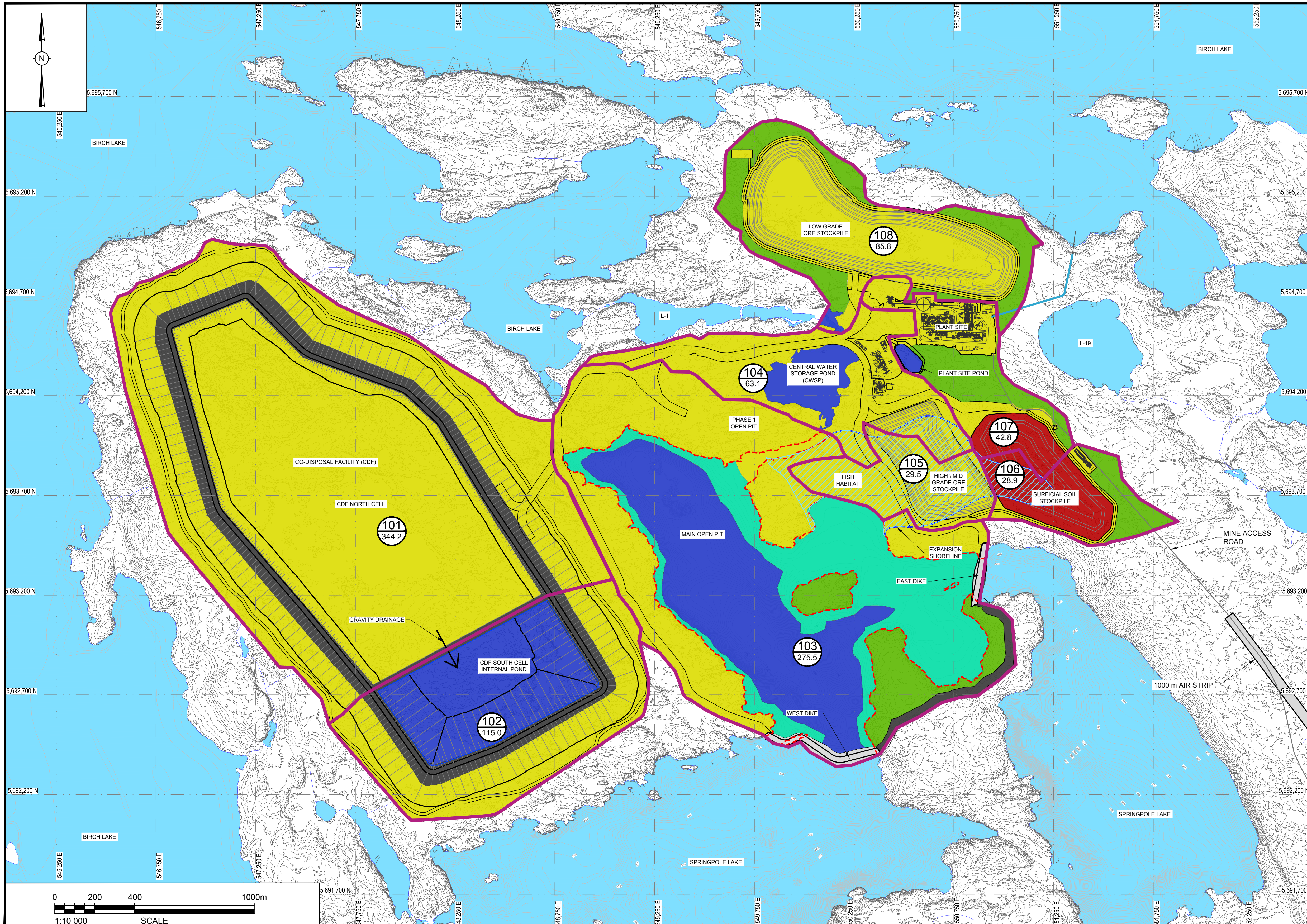


Figure 5-2: Average Year Calculated Monthly Runoff vs. Sturgeon River Monthly Runoff



Notes:
Mean monthly runoff for Sturgeon River calculated based on streamflow data from 1961-2020 at WSC Station 05QA004 (WSP 2024).
runoff coefficient (ROC) of 0.41 assumed for natural ground.



NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 WATERSHED ID
- 115 WATERSHED AREA (ha)

LAND USE LEGEND:

- NATURAL GROUND
- LAKE SEDIMENT
- SURFICIAL SOIL
- POND
- DISTURBED GROUND
- DAM ROCK

CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD	DWN BY:
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	CHK'D BY:
		DATUM: UTM NAD 83
		PROJECTION: ZONE
		SCALE: AS SHOWN

COMPANY LOGO: wsp	PROJECT: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE	DATE: DECEMBER 2023
		PROJECT NO:
	TITLE: CONSTRUCTION PHASE SITE PLAN WITH LAND USES	REV. NO.: B
		FIGURE No. 5-3

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 5-3.dwg - 5-3 - Mar. 28, 2024 11:46am - wds_kyle.johnson

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 WATERSHED ID
- 115 WATERSHED AREA (ha)

LAND USE LEGEND:

- NATURAL GROUND
- LAKE SEDIMENT
- SURFICIAL SOIL
- POND
- DISTURBED GROUND
- PIT WALLS
- DAM ROCK
- COMBINED WASTE
- HIGH/MID GRADE ORE
- LOW GRADE ORE

CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD	DWN BY:	COMPANY LOGO: wsp
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	CHK'D BY:	
		DATUM: UTM NAD 83	
		PROJECTION: ZONE	
		SCALE: AS SHOWN	

PROJECT: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE	DATE: DECEMBER 2023
	PROJECT NO:
TITLE: ULTIMATE OPERATIONS PHASE SITE PLAN WITH LAND USES	REV. NO.: B
	FIGURE No. 5-4

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 5-4.dwg - 5-4 - Mar. 28, 2024 11:49am - wds_kyle.johnson

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

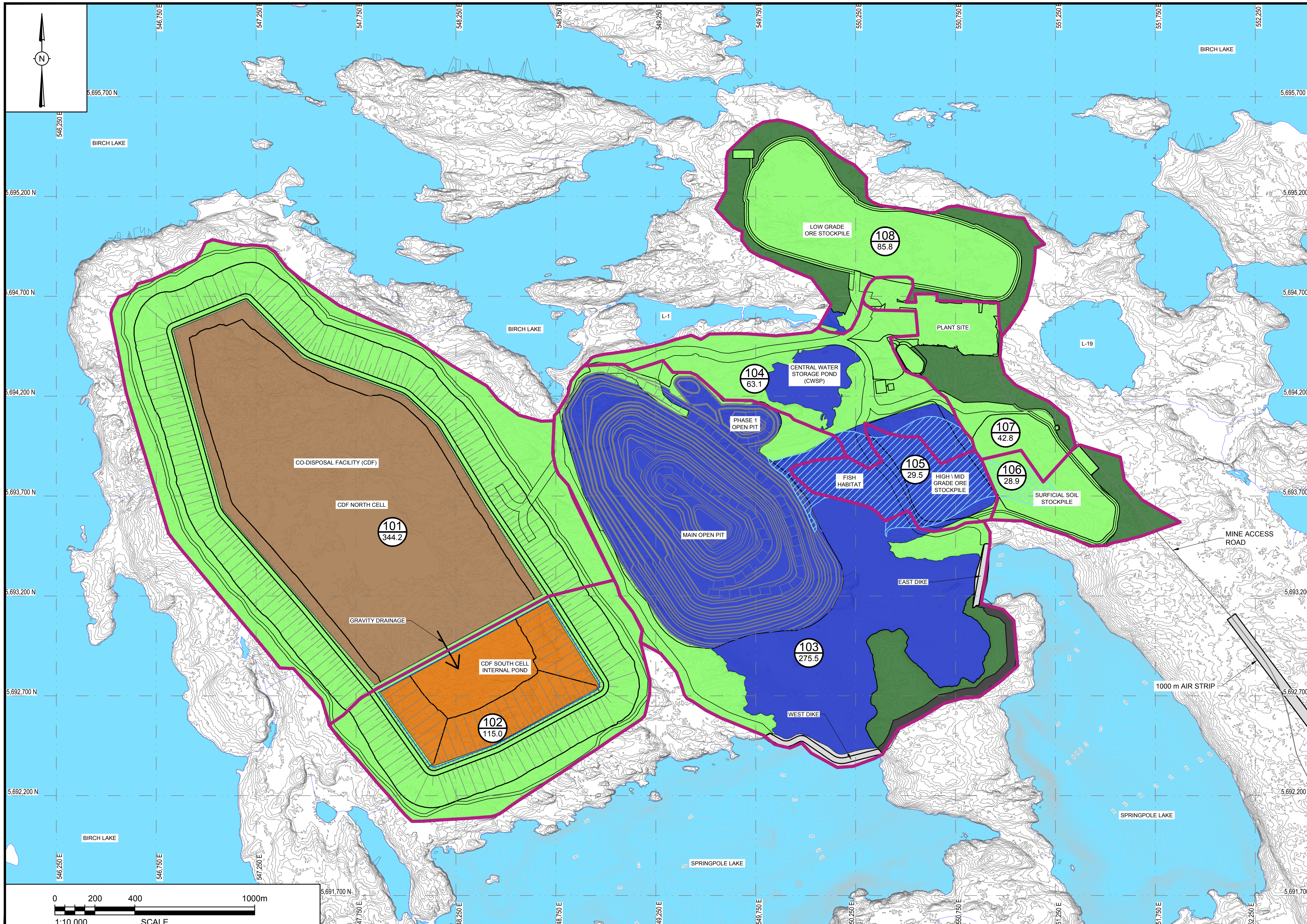
- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 WATERSHED ID
- 115 WATERSHED AREA (ha)

LAND USE LEGEND:

- NATURAL GROUND
- LAKE SEDIMENT
- SURFICIAL SOIL
- POND
- DISTURBED GROUND
- PIT WALLS
- DAM ROCK
- COMBINED WASTE

CLIENT LOGO	CLIENT:		COMPANY LOGO	PROJECT	DATE:
FIRST MINING GOLD	FIRST MINING GOLD	DWN BY: CHK'D BY:	wsp	SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE	DECEMBER 2023 PROJECT NO:
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	DATUM: UTM NAD 83 PROJECTION: ZONE SCALE: AS SHOWN		TITLE ACTIVE CLOSURE - PIT FILLLING PHASE SITE PLAN WITH WITH LAND USES	REV. NO.: B FIGURE No. 5-5

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 5-5.dwg - 5-5 - Mar. 28, 2024 11:52am - wds_kyle.johnson



NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

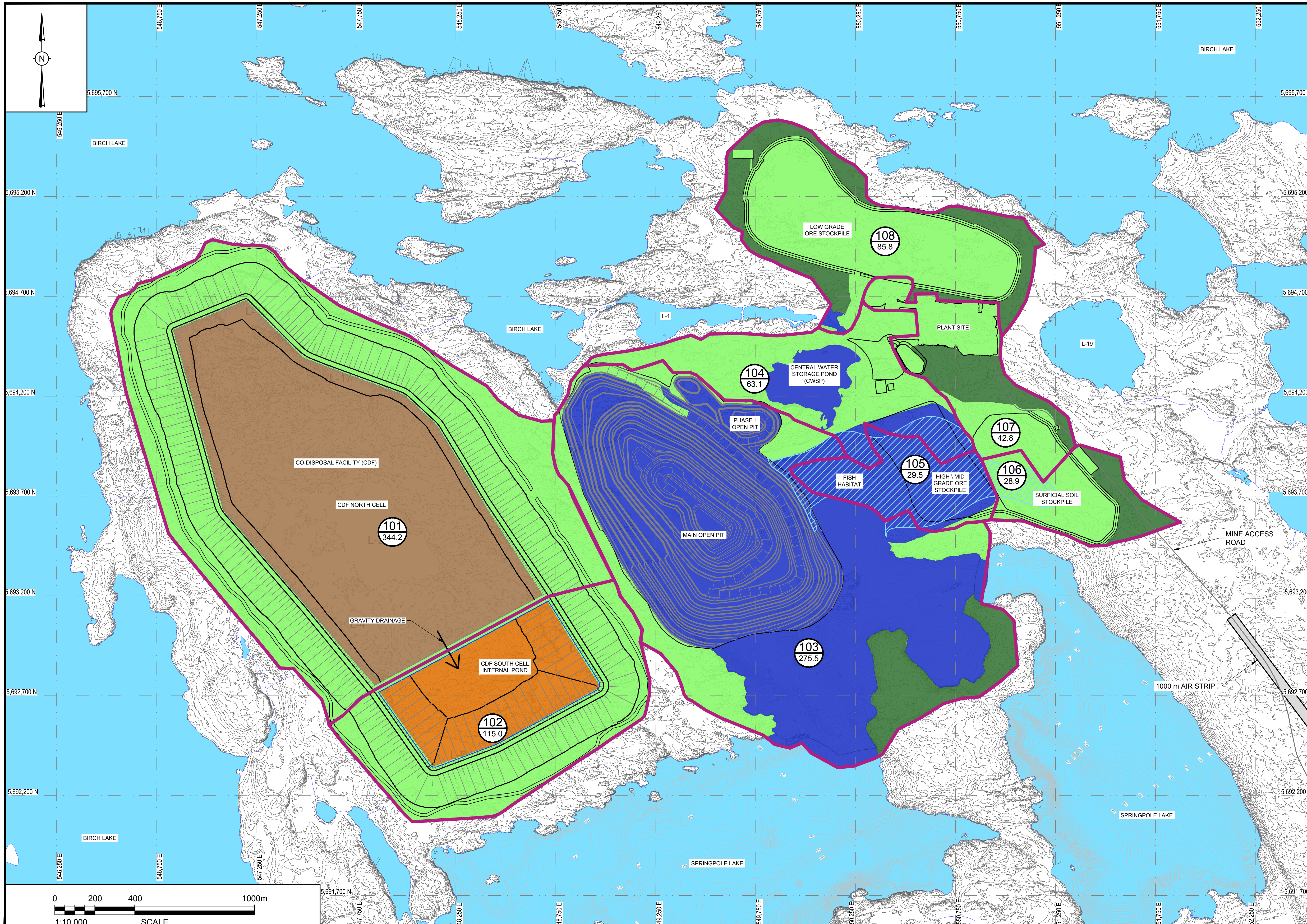
- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 WATERSHED ID
- 115 WATERSHED AREA (ha)

LAND USE LEGEND:

- NATURAL GROUND
- POND
- DAM ROCK
- RE-VEGETATED
- RE-VEGETATED NORTH CELL AT CLOSURE
- RE-VEGETATED SOUTH CELL AT CLOSURE

CLIENT LOGO	CLIENT:	DWN BY:	COMPANY LOGO	PROJECT	DATE:
FIRST MINING GOLD	FIRST MINING GOLD	CHK'D BY:	wsp	SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE	DECEMBER 2023
		DATUM: UTM NAD 83			PROJECT NO:
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	PROJECTION: ZONE		TITLE ACTIVE CLOSURE PHASE SITE PLAN WITH LAND USE	REV. NO.: B
		SCALE: AS SHOWN			FIGURE No. 5-6

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 5-6.dwg - 5-6 - Mar. 28, 2024 11:55am - wds_kyle.johnson



NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS. GRID COORDINATES ARE IN NAD 1983 UTM ZONE 15N.
2. THE DIGITAL FILES FOR THE BASE MAP WERE PRODUCED FROM DRAWING SP-0000-GX-LYD-0003-1.dwg, PROVIDED BY AUSENCO.

LEGEND:

- CONTOUR (1 m INTERVAL)
- BATHYMETRY CONTOUR (1 m INTERVAL)
- WATERBODY
- SUB-WATERSHED
- 101 WATERSHED ID
- 115 WATERSHED AREA (ha)

LAND USE LEGEND:

- NATURAL GROUND
- POND
- DAM ROCK
- RE-VEGETATED
- RE-VEGETATED NORTH CELL AT CLOSURE
- RE-VEGETATED SOUTH CELL AT CLOSURE

CLIENT LOGO: FIRST MINING GOLD	CLIENT: FIRST MINING GOLD	DWN BY:	COMPANY LOGO: WSP	PROJECT: SPRINGPOLE GOLD PROJECT MINE SITE WATER BALANCE
	WSP Canada Inc. 6925 Century Ave., Suite 600 Mississauga, Ontario, Canada, L5N 7K2	CHK'D BY:		TITLE: POST CLOSURE PHASE PLAN WITH LAND USE
		DATUM: UTM NAD 83		DATE: MARCH 2024
		PROJECTION: ZONE		PROJECT NO:
		SCALE: AS SHOWN		REV. NO.: A
				FIGURE No. 5-7

\\corp.pbwan.net\GLB-E&I\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104_FMG_Springpole_EIS\13_CAD\03_Figures\005 - Water Management Planning\02_10-11-2023 Updated Figures\LAND USE FIG 5-7.dwg - 5-6 - Mar. 28, 2024 11:58am - wds_kyle.johnson

6.0 RESULTS

The primary objectives of this mine site water balance analysis were to model the quantity of water taking requirements and site discharge to the environment to support the receiver water quality and flow effects assessment, and to quantify runoff from the various modelled land uses to support the mine site water quality model.

Table 6-1 through Table 6-4 provide a summary of the operations phase annual inflows and outflows from the Project site, as well the annual discharge of treated water to the environment from the combined ETP and STP, throughout the 10 years of operations, for the four climate scenarios: 1) average conditions, 2) average conditions with 1:100 wet year in final Year, 3) average conditions with 1:100 dry year in first year, and 4) historical climate sequence.

Table 6-5 provides a similar summary for the construction, active closure - pit filling period, active closure – post pit filling contingency, and post closure phases, under each of the climate scenarios (13 modelling scenarios).

Throughout all phases and scenarios, inflows to the Project are largely driven by site runoff from the 984.8 ha Project site. Losses (apart from site discharge) are driven by void loss in the CDF during operations, and evaporation outside of operations.

Sections 6.1 to 6.5 discuss key results from each of the Project phases evaluated.

6.1 Construction Phase

The construction phase scenarios produce the highest total discharge requirements of all the Project phases. Discharge will include flows from the lake dewatering process (into the north basin of Springpole Lake), as well as combined ETP/STP treated discharge to the southeast arm of Springpole Lake. The higher discharge rates are attributed to:

- During construction, there is a large amount of disturbed ground as the site is cleared, overburden is stripped, and roads are constructed. The disturbed land use will generate higher runoff volumes.
- During construction, active deposition of waste material in the CDF has not commenced. Therefore void losses described in Section 5.5 are not yet present.
- Lake dewatering will be carried out as described in Section 5.9. This process will discharge water into the north basin of Springpole Lake, at rates governed by the flow / climate conditions and dewatering schedule. With average and 1:100 wet year climate conditions, the dewatering process does not require the full year (Figure 6-3). Total site discharge reflects this.

The lake dewatering process will remove the volume of Springpole Lake isolated by the dikes, as well as runoff, groundwater inflows, and seepages reporting to the open pit catchment area. Therefore, treatment and discharge via combined ETP and STP during the construction phase does not include contributions from the open pit catchment area.

An annual summary of the construction phase water balance is provided in Table 6-5. The total annual discharge to the environment, inclusive of the STP/ETP, and lake dewatering rates, is 22.91 Mm^3, 25.30 Mm^3, and 17.79 Mm^3 (annual average rate: 0.72 m^3/s, 0.80 m^3/s, 0.56 m^3/s), for the average year, 1:100 wet year, and 1:100 dry year respectively. The majority of this rate is driven by the lake dewatering. The discharge of treated water from the combined STP and ETP only are 2.92 Mm^3, 4.58 Mm^3 and 1.37 Mm^3 (annual average rate: 0.093 m^3/s, 0.145 m^3/s, 0.043 m^3/s), for the average year, 1:100 wet year, and 1:100 dry year respectively. The ETP discharge rate during the construction phase will increase once the lake dewatering process is complete and the open pit basin reports to the ETP with the rest of the Project site.

The ETP estimates conservatively capture the entire Project site area.

The total annual water takings during the construction phase are limited to the fresh water demands for the accomodations complex (0.03 Mm^3).

6.2 Operations Phase

The need for water takings and discharge of treated contacted water to the environment varies throughout the operations phase, depending on climate conditions. Annual summaries of the various operations phase water balances are provided in Table 6-1 to Table 6-4. The 1:100 wet year (Year 10 of Scenario 1B) simulates the potential increased discharge during an extreme wet year, while the 1:100 dry year (Year 1 of Scenario 1C) simulates the potential increased supplemental water takings required during an extreme dry year. Estimates of water takings and discharges 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.

Discharge generally increases throughout the operation phase, as a result of increased groundwater inflows to the open pit and site runoff as various site features develop. However, in comparison to the construction phase, there is reduced total discharge to the environment, largely driven by the completion of the lake dewatering process and the void losses observed in the CDF. Void losses are calculated to account for approximately 6.5 Mm^3 annually (annual average rate: 0.206 m^3/s). As a result, the annual treated discharge to the environment (combined STP and ETP) is approximately 1.11 Mm^3 (annual average rate: 0.035 m^3/s) in an average climate year, and approximately 3.59 Mm^3 (annual average rate: 0.114 m^3/s) in a 1:100 wet year. In a 1:100 dry year, only discharge from the STP is anticipated (0.03 Mm^3, 0.001 m^3/s).

Figure 6-1 illustrates monthly discharge to environment from the ETP throughout the operations phase for the four climate scenarios. The monthly discharge follows a seasonal pattern, peaking in July, and dropping to zero throughout the winter months (November to April).

In all climate conditions, supplemental water takings from Birch Lake are required to meet the process plant demand. The average supplemental water taking required over a 10-year average climate scenario would be 0.68 Mm^3/year (annual average rate: 0.022 m^3/s). This demand is in addition to the fresh water demand required by the process plant and accommodations complex. The greatest total fresh water takings and supplemental takings from Birch Lake are required in the 1:100 dry year scenario (Year 1 of Scenario 1C). In this scenario, the required supplemental water takings from Birch Lake are 2.47 Mm^3 (annual average rate: 0.0783 m^3/s), with no discharge from the site. Combined with the nominal process water takings and accommodations complex requirements, this results in a total annual water takings from Birch Lake of 3.96 Mm^3/year (annual average rate: 0.126 m^3/s), the maximum under all modelled scenarios. Total fresh water takings from Birch Lake are approximately 2.18 Mm^3 and 1.94 Mm^3 (annual average rate: 0.069 m^3/s, 0.062 m^3/s), in average and 1:100 wet year conditions, respectively.

Figure 6-2 illustrates the supplemental water taking demands on a monthly basis. In average and 1:100 wet year conditions, supplemental water takings are limited to the late winter months of January to March. However in a 1:100 dry year, supplemental water takings are required throughout the year with the exception of April.

As noted above, these estimates of water takings and discharges are conservative. Optimization of storage within the available storage facilities would reduce the amount of water taking and discharge required.

When considering the historical sequence (Scenario 1D), the average annual total discharge to the environment is 1.07 Mm^3 (annual average rate: 0.034 m^3/s), which is comparable to the average annual conditions evaluated in Scenario 1A. It is noted that the months of June and August in Year 7 show high discharge volumes compared to average and wet year conditions; this is due to high monthly precipitation

(214 mm and 202 mm modelled in June and August of Year 7, respectively). However, the overall annual total discharge volume for Year 7 (2.58 Mm^3, Table 6-4) is less than the 1:100 wet year (3.59 Mm^3, Table 6-2), primarily due to less annual precipitation (897 mm in Year 7 compared to 1,050 mm in a 1:100 wet year).

6.3 Active closure - Pit Filling Period

During the active closure - pit filling period, site contact water will continue to be collected, treated and discharged to the southeast arm of Springpole Lake, with the exception of water reporting to the open pit. Water reporting to the open pit, including local runoff, groundwater inflows and seepages from the CDF and Ore Stockpiles will be allowed to accumulate to support the pit filling process.

Annual discharge of treated water to the environment via the combined ETP/STP is anticipated to be 2.88 Mm^3, 4.49 Mm^3, and 1.38 Mm^3 (annual average rate: 0.091 m^3/s, 0.142 m^3/s, 0.044 m^3/s) per year under the average, 1:100 wet, and 1:100 dry climate year scenarios, respectively. ETP discharge during this phase is similar to the construction phase. In both scenarios, water reporting to the open pit catchment is excluded from the total site discharge. When excluding the open pit catchment, the modelled land uses during the active closure - pit filling period are also similar to the construction phase.

Fresh water takings from Birch Lake will be limited to the needs of the accommodations complex (0.03 Mm^3). Water accumulation in the open pit from local runoff, groundwater inflows, and site seepage, are approximately 1.63 Mm^3, 2.32 Mm^3 and 0.97 Mm^3 (annual average rate: 0.052 m^3/s, 0.074 m^3/s, 0.031 m^3/s) for the average, 1:100 wet, and 1:100 dry climate year scenarios respectively. As previously mentioned, additional fresh water taking from the north basin of Springpole Lake is expected to be required to accelerate the pit filling; however, this has not been incorporated into this water balance. The rate at which the open pit is filled will be primarily driven by the additional fresh water takings from the north basin, with local runoff, groundwater inflows, and site seepage contributing to a lesser extent.

The Project is expected to generate more water during the active closure - pit filling period compared to the operations phase, active – post pit filling contingency and post closure phases. This is attributed to some or all of the following factors:

- The absence of void losses in the CDF since operation of the process plant has ceased.
- Higher runoff coefficients associated with the active closure - pit filling period compared to the active – post pit filling contingency and post closure phases. As the mine progresses towards post closure, the developed areas are revegetated, resulting in lower runoff coefficients. Additionally, the open pit, fish habitat development area and dewatered portion of Springpole Lake will be filled with water during active – post pit filling contingency and post closure, resulting in more lake evaporation.
- Groundwater inflows to the open pit are greater during the reclaimed basin filling phase compared to the active – post pit filling contingency and post closure phases when the open pit has been filled.

6.4 Active Closure – Post Pit Filling Contingency

During the active closure – post pit filling contingency, all water takings will have ceased. Discharge of treated water to environment via the ETP to the southeast arm of Springpole Lake will continue. Total site inflows are calculated to decrease during active closure – post pit filling contingency compared to the operations phase for average conditions. This is due to:

- A reduction in runoff as the site moves towards post reclamation resulting in changing land uses;
- The cessation of ore processing (i.e., no fresh water takings for the process plant or inflows to the process plant from water in ore);
- The assumption that the accommodations complex would be decommissioned and associated fresh water takings would cease; and
- Reduced groundwater and seepage inflows to the filled open pit basin.
- Despite the reduced inflows, the total discharge of treated water to the environment increases from the operations phase due to the lack of void loss in the CDF during the active closure – post pit filling contingency. Annual discharge to the environment is modeled to be 3.09 Mm^3, 5.15 Mm^3, and 1.33 Mm^3 (annual average rate: 0.098 m^3/s, 0.163 m^3/s, 0.042 m^3/s) for the average, 1:100 wet, and 1:100 dry climate year scenarios respectively.

Figure 6-4 illustrates monthly discharge to the environment via the ETP during active closure – post pit filling contingency (note that the accommodations complex and STP are decommissioned at active closure – post pit filling contingency) compared to average conditions during operations.

6.5 Post Closure Phase

At post closure, it is assumed that water quality will meet acceptable discharge criteria and operation of the ETP will cease. If site runoff is not acceptable for passive discharge, then the active closure – post pit filling contingency configuration will be retained until it is. 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.

It was assumed that runoff from the former low grade ore stockpile catchment (Catchment 108) will passively discharge to Birch Lake, while runoff from the remainder of the mine site will passively discharge to Springpole Lake. The total discharge to environment during post closure and active closure – post pit filling contingency are similar – approximately 3.11 Mm^3, 5.17 Mm^3, 1.37 Mm^3 (annual average rate: 0.099 m^3/s, 0.164 m^3/s, 0.043 m^3/s) in the average, 1:100 wet and 1:100 dry year climate scenarios, respectively.

There is less modelled discharge to the environment during the climate change scenario (3.00 Mm^3/year; Table 6-5) compared to average conditions. Although there is more runoff generated due to a predicted increase in precipitation, there is also more evaporation projected due to climate change, resulting in less modelled net runoff compared to current average conditions.

Table 6-1: Operations Phase Annual Water Balance - Scenario 1A (Average Conditions) (Mm³/year)

Year	1	2	3	4	5	6	7	8	9	10	Average
Inflows											
Water in Ore	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Fresh Water Takings for Process Plant from Birch Lake	1.46	1.47	1.46	1.46	1.46	1.47	1.46	1.46	1.46	1.47	1.46
Supplemental Fresh Water Takings from Birch Lake	0.87	0.83	0.71	0.67	0.65	0.65	0.63	0.62	0.61	0.61	0.68
Fresh Water Takings for Accommodations Complex from Birch Lake	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Groundwater Inflows to Open Pit	0.27	0.55	0.74	0.80	0.83	0.86	0.88	0.91	0.93	0.95	0.77
Total Site Runoff	4.45	4.40	4.40	4.42	4.46	4.49	4.51	4.51	4.51	4.51	4.47
North Cell 101 Runoff	1.59	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58
South Cell 102 Runoff	0.62	0.61	0.60	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.60
Open Pit 103 Runoff	1.19	1.21	1.23	1.25	1.29	1.32	1.34	1.34	1.34	1.34	1.29
CWSP 104 Runoff	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
High Med Grade Ore Stockpile 105 Runoff	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Surficial Soil Stockpile 106 Runoff	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Plant Site 107 Runoff	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Low Grade Ore Stockpile 108 Runoff	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total Inflows	**7.66**	**7.86**	**7.92**	**7.96**	**8.01**	**8.08**	**8.09**	**8.10**	**8.12**	**8.15**	**7.99**
Losses											
North Cell CDF Void Loss	5.62	5.64	5.62	5.62	5.62	5.64	5.62	5.62	5.62	5.64	5.63
South Cell CDF Void Loss	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Total Site Evaporation	0.30	0.34	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
North Cell 101 Evaporation	0.02	0.06	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.11
South Cell 102 Evaporation	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Open Pit 103 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Evaporation	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
High Med Grade Ore Stockpile 105 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surficial Soil Stockpile 106 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Site 107 Evaporation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Low Grade Ore Stockpile 108 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Losses	**6.79**	**6.85**	**6.87**	**6.89**	**6.89**	**6.91**	**6.89**	**6.89**	**6.89**	**6.91**	**6.88**
Discharge											
STP Discharge to Environment (Springpole Lake)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETP Discharge to Environment (Springpole Lake)	0.85	0.93	1.00	1.03	1.08	1.13	1.16	1.18	1.19	1.20	1.08
Passive Discharge to Environment (Springpole Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Passive Discharge to Environment (Birch Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Discharge	**0.88**	**0.96**	**1.03**	**1.06**	**1.11**	**1.16**	**1.19**	**1.21**	**1.22**	**1.23**	**1.11**
Change in Storage											
CDF North Cell 101 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CDF South Cell 102 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Pit 103 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Change in Storage	-0.02	0.05	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01
Total Change in Site Storage	**-0.02**	**0.05**	**0.02**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Seepage to Environment	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Table 6-2: Operations Phase Annual Water Balance Summary - Scenario 1B (Average Conditions with 1:100 Wet in Final Year (Mm^3/year)

Year	1	2	3	4	5	6	7	8	9	10	Average
Inflows											
Water in Ore	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Fresh Water Takings for Process Plant from Birch Lake	1.46	1.47	1.46	1.46	1.46	1.47	1.46	1.46	1.46	1.47	1.46
Supplemental Fresh Water Takings from Birch Lake	0.87	0.83	0.71	0.67	0.65	0.65	0.63	0.62	0.61	0.44	0.67
Fresh Water Takings for Accommodations Complex from Birch Lake	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Groundwater Inflows to Open Pit	0.27	0.55	0.74	0.80	0.83	0.86	0.88	0.91	0.93	0.95	0.77
Total Site Runoff	4.45	4.40	4.40	4.42	4.46	4.49	4.51	4.51	4.51	6.76	4.69
North Cell 101 Runoff	1.59	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	2.36	1.66
South Cell 102 Runoff	0.62	0.61	0.60	0.59	0.59	0.59	0.59	0.59	0.59	0.89	0.63
Open Pit 103 Runoff	1.19	1.21	1.23	1.25	1.29	1.32	1.34	1.34	1.34	2.01	1.35
CWSP 104 Runoff	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.47	0.33
High Med Grade Ore Stockpile 105 Runoff	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.18	0.12
Surficial Soil Stockpile 106 Runoff	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.15	0.10
Plant Site 107 Runoff	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.25	0.18
Low Grade Ore Stockpile 108 Runoff	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.44	0.31
Total Inflows	**7.66**	**7.86**	**7.92**	**7.96**	**8.01**	**8.08**	**8.09**	**8.10**	**8.12**	**10.23**	**8.20**
Losses											
North Cell CDF Void Loss	5.62	5.64	5.62	5.62	5.62	5.64	5.62	5.62	5.62	5.18	5.58
South Cell CDF Void Loss	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Total Site Evaporation	0.30	0.34	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
North Cell 101 Evaporation	0.02	0.06	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.11
South Cell 102 Evaporation	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Open Pit 103 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Evaporation	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
High Med Grade Ore Stockpile 105 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surficial Soil Stockpile 106 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Site 107 Evaporation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Low Grade Ore Stockpile 108 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Losses	**6.79**	**6.85**	**6.87**	**6.89**	**6.89**	**6.91**	**6.89**	**6.89**	**6.89**	**6.45**	**6.83**
Discharge											
STP Discharge to Environment (Springpole Lake)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETP Discharge to Environment (Springpole Lake)	0.85	0.93	1.00	1.03	1.08	1.13	1.16	1.18	1.19	3.56	1.31
Passive Discharge to Environment (Springpole Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Passive Discharge to Environment (Birch Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Discharge	**0.88**	**0.96**	**1.03**	**1.06**	**1.11**	**1.16**	**1.19**	**1.21**	**1.22**	**3.59**	**1.34**
Change in Storage											
CDF North Cell 101 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CDF South Cell 102 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Pit 103 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Change in Storage	-0.02	0.05	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.19	0.03
Total Change in Site Storage	**-0.02**	**0.05**	**0.02**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.19**	**0.03**
Seepage to Environment	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Table 6-3: Operations Phase Annual Water Balance Summary – Scenario 1C (Average Conditions with 1:100 Dry in First Year) (M m³/year)

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Average**
Inflows											
Water in Ore	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Fresh Water Takings for Process Plant from Birch Lake	1.46	1.47	1.46	1.46	1.46	1.47	1.46	1.46	1.46	1.47	1.46
Supplemental Fresh Water Takings from Birch Lake	2.47	0.89	0.71	0.67	0.65	0.65	0.63	0.62	0.61	0.61	0.85
Fresh Water Takings for Accommodations Complex from Birch Lake	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Groundwater Inflows to Open Pit	0.27	0.55	0.74	0.80	0.83	0.86	0.88	0.91	0.93	0.95	0.77
Total Site Runoff	2.36	4.27	4.40	4.42	4.46	4.49	4.51	4.51	4.51	4.51	4.24
North Cell 101 Runoff	0.84	1.54	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.50
South Cell 102 Runoff	0.33	0.59	0.60	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.57
Open Pit 103 Runoff	0.63	1.17	1.23	1.25	1.29	1.32	1.34	1.34	1.34	1.34	1.23
CWSP 104 Runoff	0.17	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.30
High Med Grade Ore Stockpile 105 Runoff	0.07	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11
Surficial Soil Stockpile 106 Runoff	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09
Plant Site 107 Runoff	0.09	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16
Low Grade Ore Stockpile 108 Runoff	0.17	0.29	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.28
Total Inflows	**7.17**	**7.79**	**7.92**	**7.96**	**8.01**	**8.08**	**8.09**	**8.10**	**8.12**	**8.15**	**7.94**
Losses											
North Cell CDF Void Loss	6.02	5.64	5.62	5.62	5.62	5.64	5.62	5.62	5.62	5.64	5.67
South Cell CDF Void Loss	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Total Site Evaporation	0.30	0.34	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
North Cell 101 Evaporation	0.02	0.06	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.11
South Cell 102 Evaporation	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Open Pit 103 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Evaporation	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
High Med Grade Ore Stockpile 105 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surficial Soil Stockpile 106 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Site 107 Evaporation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Low Grade Ore Stockpile 108 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Losses	**7.19**	**6.85**	**6.87**	**6.89**	**6.89**	**6.91**	**6.89**	**6.89**	**6.89**	**6.91**	**6.92**
Discharge											
STP Discharge to Environment (Springpole Lake)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETP Discharge to Environment (Springpole Lake)	0.00	0.82	1.00	1.03	1.08	1.13	1.16	1.18	1.19	1.20	0.98
Passive Discharge to Environment (Springpole Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Passive Discharge to Environment (Birch Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Discharge	**0.03**	**0.86**	**1.03**	**1.06**	**1.11**	**1.16**	**1.19**	**1.21**	**1.22**	**1.23**	**1.01**
Change in Storage											
CDF North Cell 101 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CDF South Cell 102 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Pit 103 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Change in Storage	-0.05	0.08	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01
Total Change in Site Storage	**-0.05**	**0.08**	**0.02**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Seepage to Environment	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Table 6-4: Operations Phase Annual Water Balance Summary – Scenario 1D (Historical) (Mm^3/year)

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Average**
Inflows											
Water in Ore	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Fresh Water Takings for Process Plant from Birch Lake	1.46	1.47	1.46	1.46	1.46	1.47	1.46	1.46	1.46	1.47	1.46
Supplemental Fresh Water Takings from Birch Lake	0.94	0.83	0.77	0.50	0.74	0.84	0.72	0.69	0.66	0.73	0.74
Fresh Water Takings for Accommodations Complex from Birch Lake	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Groundwater Inflows to Open Pit	0.27	0.55	0.74	0.80	0.83	0.86	0.88	0.91	0.93	0.95	0.77
Total Site Runoff	3.79	4.46	3.98	4.64	4.04	4.35	5.85	3.91	4.26	4.27	4.35
North Cell 101 Runoff	1.35	1.61	1.43	1.66	1.43	1.53	2.04	1.37	1.49	1.49	1.54
South Cell 102 Runoff	0.53	0.62	0.54	0.62	0.54	0.57	0.77	0.51	0.56	0.56	0.58
Open Pit 103 Runoff	1.02	1.23	1.11	1.32	1.17	1.28	1.74	1.16	1.27	1.27	1.26
CWSP 104 Runoff	0.27	0.32	0.29	0.33	0.29	0.31	0.41	0.27	0.30	0.30	0.31
High Med Grade Ore Stockpile 105 Runoff	0.11	0.12	0.11	0.12	0.11	0.11	0.15	0.10	0.11	0.11	0.12
Surficial Soil Stockpile 106 Runoff	0.09	0.10	0.09	0.10	0.09	0.10	0.13	0.09	0.09	0.09	0.10
Plant Site 107 Runoff	0.14	0.17	0.15	0.18	0.15	0.16	0.22	0.15	0.16	0.16	0.17
Low Grade Ore Stockpile 108 Runoff	0.28	0.30	0.27	0.31	0.27	0.29	0.38	0.26	0.28	0.28	0.29
Total Inflows	**7.06**	**7.92**	**7.56**	**8.01**	**7.68**	**8.12**	**9.52**	**7.57**	**7.92**	**8.03**	**7.94**
Losses											
North Cell CDF Void Loss	5.62	5.64	5.62	5.62	5.62	5.64	5.62	5.62	5.62	5.64	5.63
South Cell CDF Void Loss	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Total Site Evaporation	0.30	0.33	0.37	0.38	0.43	0.41	0.38	0.42	0.36	0.43	0.38
North Cell 101 Evaporation	0.02	0.06	0.10	0.12	0.13	0.13	0.12	0.13	0.11	0.13	0.11
South Cell 102 Evaporation	0.21	0.21	0.21	0.20	0.23	0.22	0.20	0.23	0.19	0.23	0.21
Open Pit 103 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Evaporation	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.06	0.05
High Med Grade Ore Stockpile 105 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surficial Soil Stockpile 106 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Site 107 Evaporation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Low Grade Ore Stockpile 108 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Losses	**6.79**	**6.84**	**6.86**	**6.87**	**6.92**	**6.92**	**6.87**	**6.91**	**6.85**	**6.94**	**6.88**
Discharge											
STP Discharge to Environment (Springpole Lake)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
ETP Discharge to Environment (Springpole Lake)	0.22	1.12	0.40	1.32	0.77	1.18	2.55	0.62	1.08	1.09	1.04
Passive Discharge to Environment (Springpole Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Passive Discharge to Environment (Birch Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Discharge	**0.25**	**1.15**	**0.43**	**1.36**	**0.80**	**1.21**	**2.58**	**0.65**	**1.12**	**1.12**	**1.07**
Change in Storage											
CDF North Cell 101 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CDF South Cell 102 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Pit 103 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CWSP 104 Change in Storage	0.02	-0.07	0.27	-0.21	-0.04	-0.01	0.07	0.01	-0.04	-0.02	0.00
Total Change in Site Storage	**0.02**	**-0.07**	**0.27**	**-0.21**	**-0.04**	**-0.01**	**0.07**	**0.01**	**-0.04**	**-0.02**	**0.00**
Seepage to Environment	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Table 6-5: Construction, Active Closure - Pit Filling Period, Active Closure – Post Pit Filling Contingency, and Post Closure Annual Water Balance Summary (Mm³/year)

Phase	0A	0B	0C	2A	2B	2C	3A	3B	3C	4A	4B	4C	4D
	Construction			**Active Closure - Pit Filling Period**			**Active Closure – Post Pit Filling Contingency**			**Post Closure**			
Climate Scenario	Average	1:100 Wet	1:100 Dry	Average	1:100 Wet	1:100 Dry	Average	1:100 Wet	1:100 Dry	Average	1:100 Wet	1:100 Dry	Average+Climate Change
Inflows													
Water in Ore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fresh Water Takings for Process Plant from Birch Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fresh Water Takings for Accommodations Complex from Birch Lake	0.03	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Groundwater Inflows to Open Pit	0.13	0.13	0.13	0.53	0.53	0.53	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Total Site Runoff	4.80	7.19	2.55	4.61	6.92	2.45	4.13	6.20	2.20	4.13	6.19	2.19	4.36
North Cell 101 Runoff	1.59	2.39	0.85	1.52	2.28	0.81	1.33	1.99	0.71	1.33	1.99	0.71	1.40
South Cell 102 Runoff	0.62	0.93	0.33	0.59	0.89	0.31	0.32	0.49	0.17	0.32	0.49	0.17	0.34
Open Pit 103 Runoff	1.48	2.22	0.79	1.40	2.10	0.74	1.61	2.42	0.86	1.61	2.42	0.86	1.70
CWSP 104 Runoff	0.33	0.49	0.17	0.33	0.49	0.17	0.22	0.34	0.12	0.22	0.34	0.12	0.24
High Med Grade Ore Stockpile 105 Runoff	0.14	0.21	0.08	0.14	0.21	0.08	0.20	0.30	0.10	0.20	0.30	0.10	0.21
Surficial Soil Stockpile 106 Runoff	0.10	0.15	0.05	0.10	0.15	0.05	0.08	0.12	0.04	0.07	0.11	0.04	0.08
Plant Site 107 Runoff	0.17	0.25	0.09	0.17	0.25	0.09	0.12	0.18	0.06	0.12	0.18	0.06	0.13
Low Grade Ore Stockpile 108 Runoff	0.37	0.55	0.19	0.37	0.55	0.19	0.24	0.37	0.13	0.24	0.37	0.13	0.26
Total Inflows	**4.95**	**7.35**	**2.71**	**5.17**	**7.47**	**3.01**	**4.22**	**6.29**	**2.28**	**4.22**	**6.28**	**2.28**	**4.44**
Losses													
North Cell CDF Void Loss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Cell CDF Void Loss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Site Evaporation	0.64	0.64	0.64	0.66	0.66	0.66	1.13	1.13	1.13	1.13	1.13	1.13	1.47
North Cell 101 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Cell 102 Evaporation	0.22	0.22	0.22	0.22	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Pit 103 Evaporation	0.36	0.36	0.36	0.38	0.38	0.38	0.95	0.95	0.95	0.95	0.95	0.95	1.23
CWSP 104 Evaporation	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.07
High Med Grade Ore Stockpile 105 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.13	0.13	0.13	0.13	0.17
Surficial Soil Stockpile 106 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Site 107 Evaporation	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low Grade Ore Stockpile 108 Evaporation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Losses	**0.64**	**0.64**	**0.64**	**0.66**	**0.66**	**0.66**	**1.13**	**1.13**	**1.13**	**1.13**	**1.13**	**1.13**	**1.47**
Discharge													
STP Discharge to Environment (Springpole Lake)	0.03	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETP Discharge to Environment (Springpole Lake)	2.89	4.55	1.34	2.85	4.46	1.35	3.09	5.15	1.33	0.00	0.00	0.00	0.00
Passive Discharge to Environment (Springpole Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.34	4.09	0.88	2.19
Passive Discharge to Environment (Birch Lake)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	1.08	0.48	0.81
Lake Dewatering to North Basin of Springpole Lake	19.99	20.72	16.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Discharge	**22.91**	**25.30**	**17.79**	**2.88**	**4.49**	**1.38**	**3.09**	**5.15**	**1.33**	**3.11**	**5.17**	**1.37**	**3.00**
Change in Storage													
CDF North Cell 101 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
CDF South Cell 102 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.01	-0.03	-0.01
Open Pit 103 Change in Storage [1,2]	-18.60	-18.60	-15.73	1.63	2.32	0.97	0.00	0.00	-0.14	0.00	0.00	-0.14	0.00
CWSP 104 Change in Storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Site Storage	**-18.60**	**-18.60**	**-15.73**	**1.63**	**2.32**	**0.97**	**0.00**	**0.00**	**-0.18**	**-0.03**	**-0.02**	**-0.21**	**-0.02**
Seepage to Environment	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

Notes:

1 Change in storage to the open pit basin during the construction phase is negative due to the lake dewatering process which will remove the volume of Springpole Lake isolated by the dikes, as well as runoff, groundwater inflows, and seepages reporting to the open pit catchment area.

2 Change in storage to the open pit basin during the active closure - pit filling period represents local runoff from the open pit watershed, groundwater inflows and site seepages allowed to accumulate to support the pit filling process. It is understood that additional fresh water taking from Springpole Lake may be used to accelerate the pit filling; however, this additional taking from Springpole Lake is not included in the results presented. The total change in storage during the active closure - pit filling period would be a sum of the Project site contributions and the additional water takings from Springpole Lake.

Figure 6-1: ETP Discharge to Environment during Operations Phase

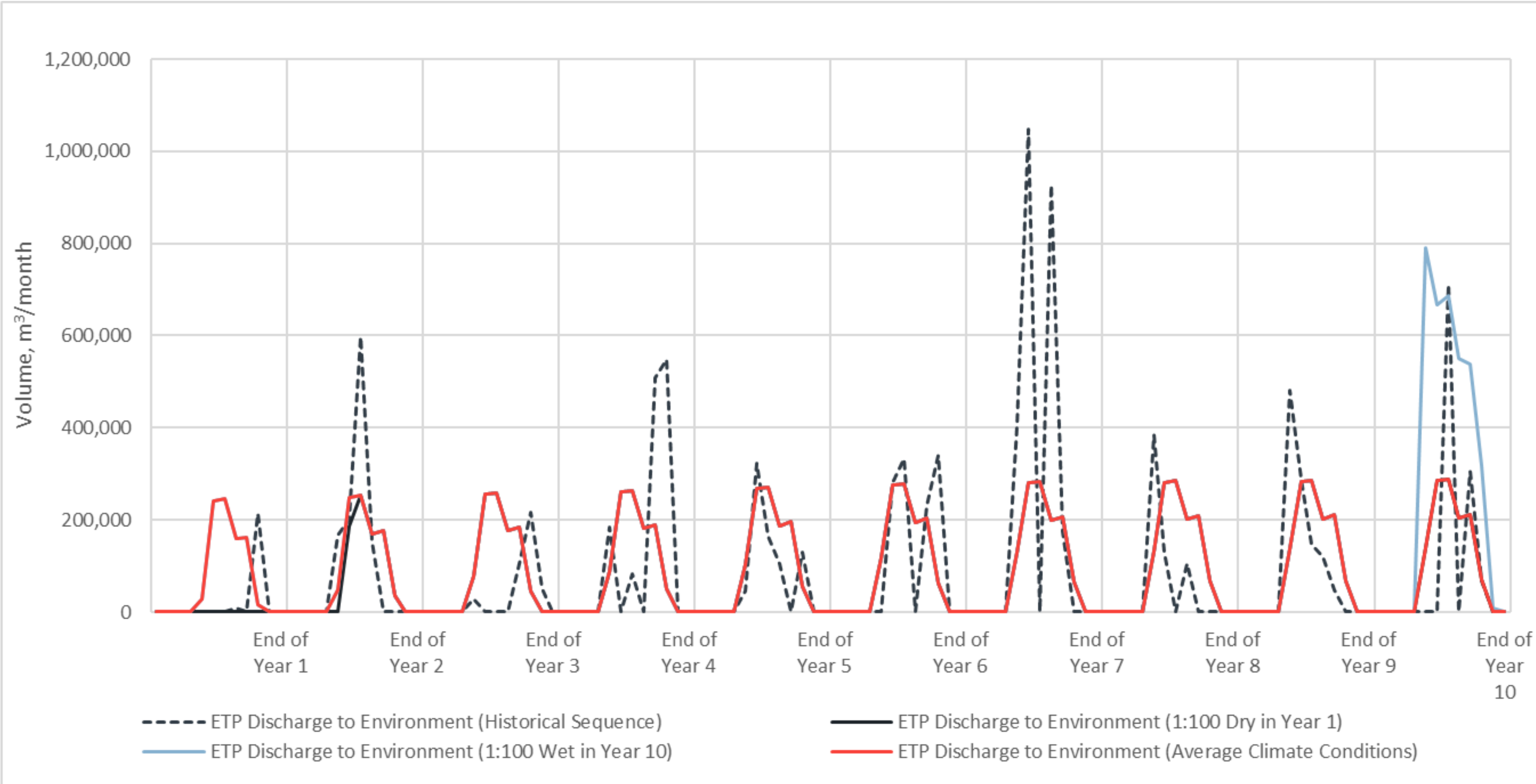


Figure 6-2: Monthly Supplemental Water Takings Required During Operations Phase

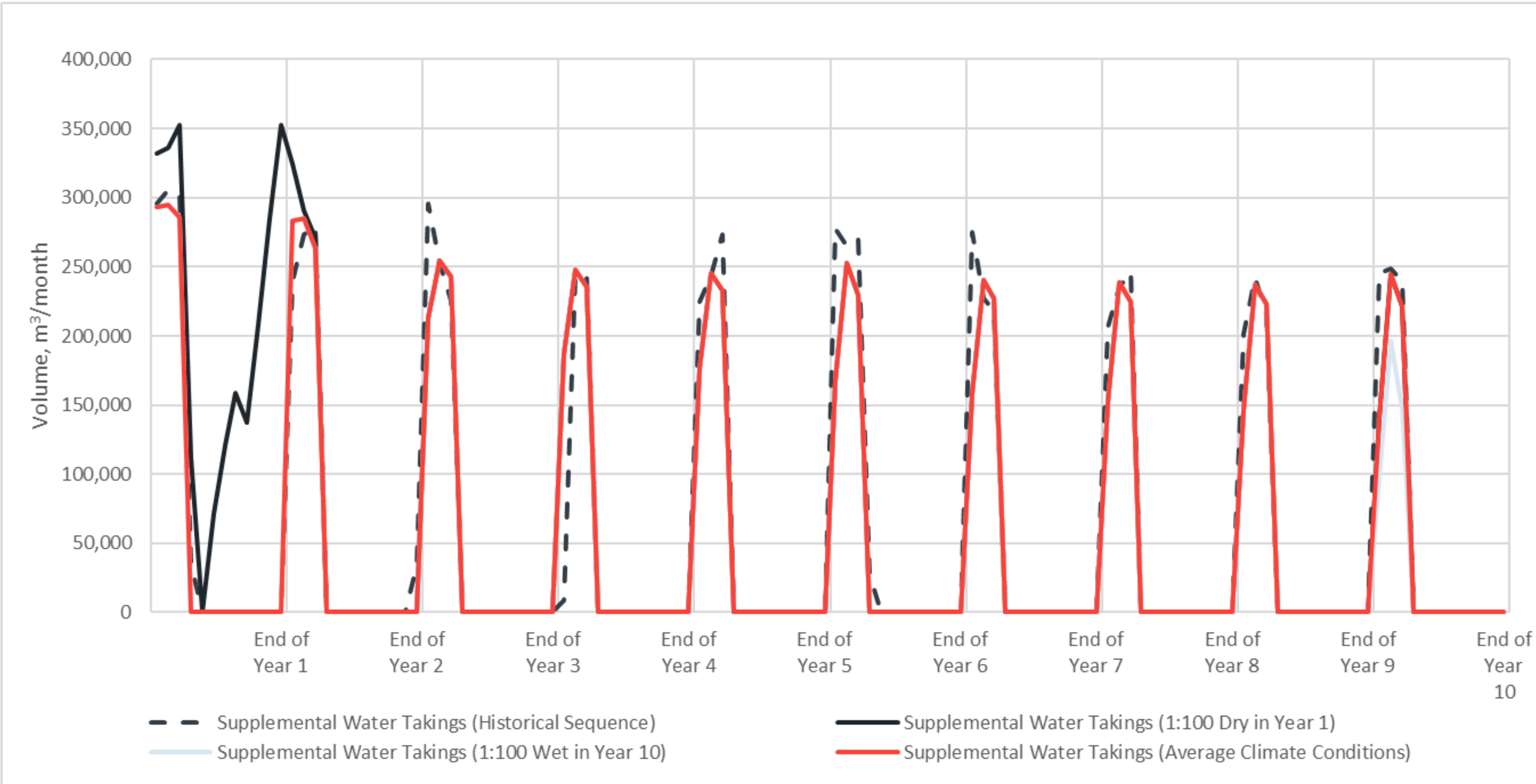


Figure 6-3: Open Pit Catchment Lake Dewatering

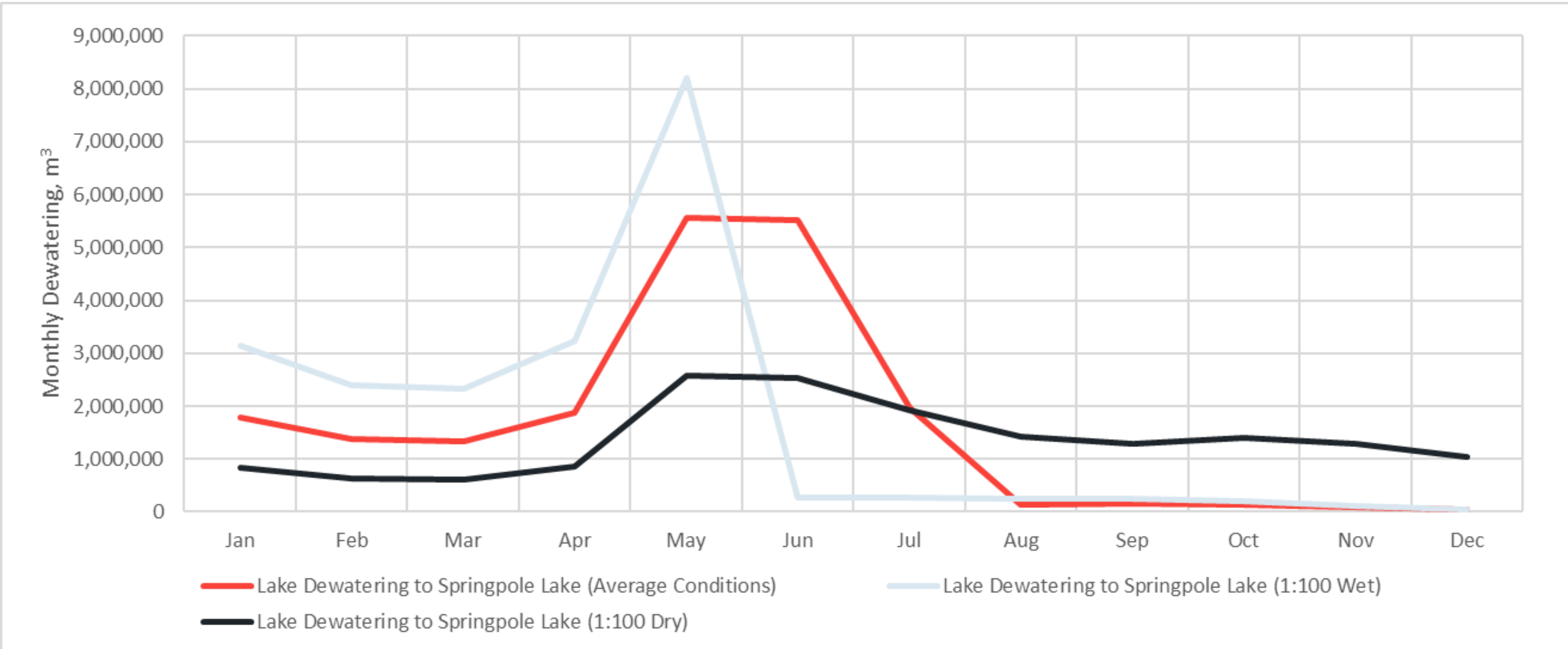
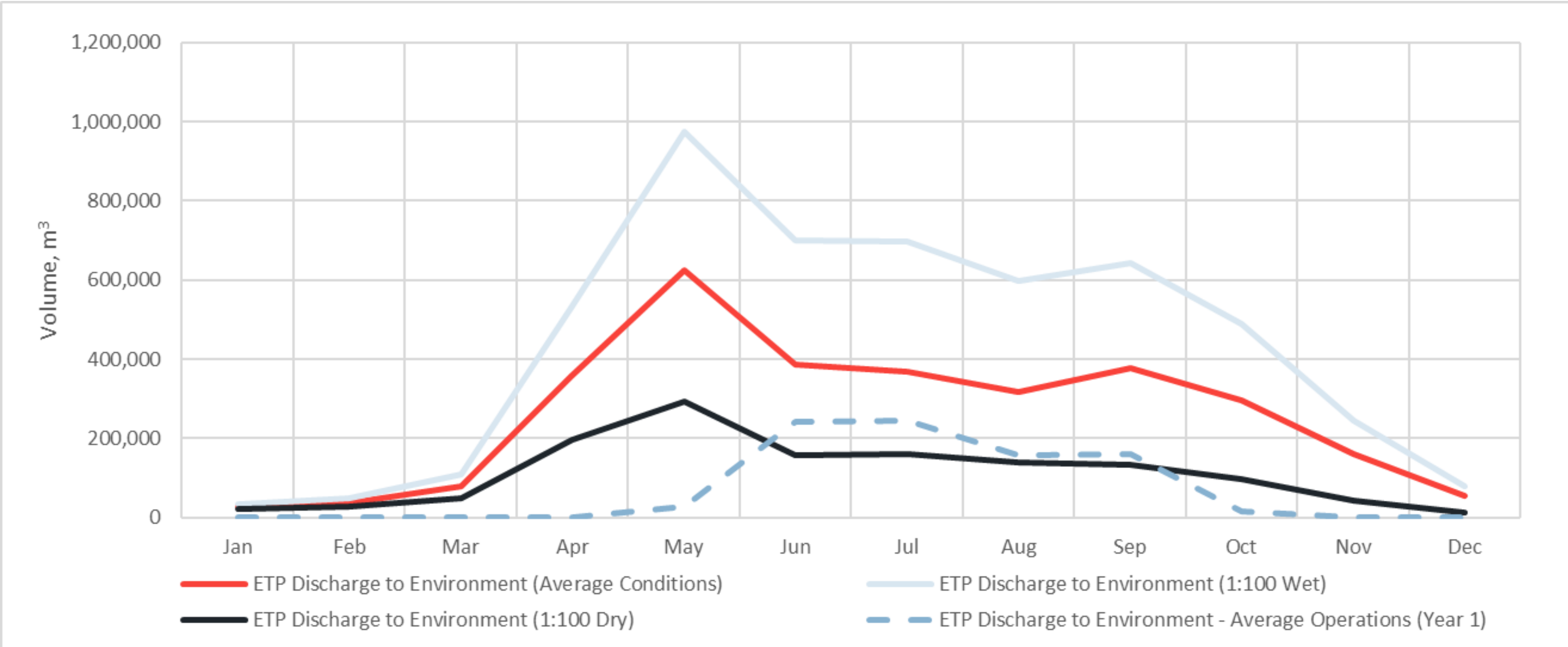


Figure 6-4: Discharge to Environment from ETP during Active Closure – Post Pit Filling Contingency



7.0 SUMMARY

A GoldSim model on a monthly time step was developed by WSP for the EIS/EA mine site water balance analysis. The primary objectives of this mine site water balance analysis were to model the quantity of water taking requirements and site discharge of treated water to the environment to support the receiver water quality and flow effects assessment, and to quantify runoff from the various modelled land uses to support the mine site water quality model.

A total of 17 scenarios were modelled for the construction, operations, active closure - pit filling period, active closure – post pit filling contingency and post closure phases, under various climate conditions.

Throughout all phases and scenarios, inflows to the Project are largely driven by site runoff from the 984.8 ha Project site. Losses (apart from site discharge) are driven by void loss in the CDF during operations, and evaporation outside of operations.

Discharge of treated water to the environment is expected to be necessary through all Project phases, with the exception of extreme dry climate conditions during the operations phase. The highest total discharge simulated in this model occurs during the construction phase under the 1:100 wet year scenario, at a rate of 25.30 Mm^3/year. This is primarily driven by dewatering from the open pit basin to the north basin of Springpole Lake. The highest ETP discharge simulated occurs during the construction and active closure phases. A treatment and discharge rate of 2.89 and 3.09 Mm^3/year is required during average years for these phases, respectively. The ETP discharge rate during the construction phase will increase once the lake dewatering process is complete and the open pit basin reports to the ETP with the rest of the Project site.

During the operations phase, supplemental water takings will be required in addition to the process plant and accommodations complex fresh water requirements, due to substantial void losses in the CDF. The greatest total fresh water takings from Birch Lake, to support these processes, is expected to occur during operations phase, under the 1:100 dry year climate scenario (Year 1 of operations), at a rate of 3.96 Mm^3/year. Other fresh water taking demands are anticipated to be taken from the north basin of Springpole Lake to accelerate the pit filling process. This will increase total water takings for the Project and is assessed in the receiver water balance and flow effects assessment.

The modeled water takings and discharges simulated by the Mine Site Water Balance are conservative. Optimization of storage within the available storage facilities will reduce the amount of water taking and discharge required.

WSP Canada Inc.

Prepared by:

Original Signed

Rob Howard, B. Eng.
Hydrologist

Original Signed

Mei Ling Tamkei, P.Eng.
Senior Water Resources Engineer

Reviewed by:

Original Signed

Mark Sullivan, P.Eng., MBA
Principal Water Resources Engineer

8.0 REFERENCES

Ausenco, 2023a. Process Water Balance Information, Response to RFI ONS2104-RFI-055 Rev 1. April 14, 2023. Ausenco document number: 104496-ER-E0000-11102-001 Rev 1

Ausenco, 2023b. Personal communications (e-mail). RE: Springpole Conceptual Water Management Plan Workshop (Part 2 of 2). August 18 & 24, 2023.

Maidment, David R. 1992. Handbook of Hydrology. McGraw-Hill.

McDermid, J., S. Fera, A. Hogg. 2015. Climate change projections for Ontario: An updated synthesis for policymakers and planners. Ministry of Natural Resources and Forestry Climate Change Research Report CCRR-44.

National Oceanic and Atmospheric Administration (NOAA). 2020. Solar Calculator. https://www.esrl.noaa.gov/gmd/grad/solcalc/calcdetails.html.

Natural Resources Canada. 1978. Hydrological Atlas of Canada, pp.5-7.

Prairie Climate Centre. 2019. Climate Atlas of Canada. Municipality Red Lake. https://climateatlas.ca/map/canada/plus30_2030_85#z=7&lat=51.77&lng=-90.54&city=157

Wood, 2022. Springpole Gold Project 2022 Mine Site Water Balance Report. April 2022.

WSP, 2023. Springpole Gold Project 2023 Hydrogeological Modelling Report. September 2023.

WSP, 2024. Springpole Gold Project 2022 Hydrology Baseline Report. February 2024.

Attachment A
Operations Phase Annual Land Use Tables

Attachment A-1: Modelled Land Uses for the CDF North Cell Catchment Area [Catchment 101] (m^2) – Operations Phase

End of Year of Operations	Disturbed Ground	Combined Waste	Dam / Rock
CDF North Cell (Total 3,442,000 m^2)			
-1	2,985,371	0	456,629
1	2,211,160	603,978	626,862
2	1,434,828	1,209,611	797,561
3	660,617	1,813,590	967,793
4	660,617	1,813,590	967,793
5	660,617	1,813,590	967,793
6	660,617	1,813,590	967,793
7	660,617	1,813,590	967,793
8	660,617	1,813,590	967,793
9	660,617	1,813,590	967,793
10	660,617	1,813,590	967,793

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 CDF north cell combined waste area assumed to reach full areal footprint by end of Year 3.
4 CDF perimeter dams assumed to be reach full areal footprint by end of Year 3.

Attachment A-2: Modelled Land Uses for CDF South Cell Catchment [102]

End of Year of Operations	Disturbed Ground	Dam / Rock	Pond
CDF South Cell (Total 1,150,000 m^2)			
-1	494,204	187,598	468,199
1	418,678	263,124	468,199
2	342,945	338,857	468,199
3	267,419	414,383	468,199
4	267,419	414,383	468,199
5	267,419	414,383	468,199
6	267,419	414,383	468,199
7	267,419	414,383	468,199
8	267,419	414,383	468,199
9	267,419	414,383	468,199
10	267,419	414,383	468,199

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 CDF perimeter dams assumed to reach full areal footprint by end of Year 3.

Attachment A-3: Modelled Land Uses for Open Pit Catchment [103]

End of Year of Operations	Natural Ground	Disturbed Ground	Pit Walls	Dam / Rock	Lakebed Sediment
Open Pit (Total 2,755,000 m^2)					
-1	158,566	618,174	593,871	102,102	1,282,287
1	158,566	618,174	654,326	102,102	1,221,832
2	158,566	618,174	714,947	102,102	1,161,212
3	158,566	618,174	775,402	102,102	1,100,756
4	158,566	557,958	937,207	102,102	999,168
5	158,566	497,742	1,099,011	102,102	897,579
6	158,566	437,360	1,261,260	102,102	795,712
7	158,566	437,360	1,261,260	102,102	795,712
8	158,566	437,360	1,261,260	102,102	795,712
9	158,566	437,360	1,261,260	102,102	795,712
10	158,566	437,360	1,261,260	102,102	795,712

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 Open pit catchment assumed to be fully dewatered with pre-production pit at the start of operations phase.
4 Open pit assumed to reach full areal footprint by the end of Year 6.

Attachment A-4: Modelled Land Uses for CWSP Catchment [104]

End of Year of Operations	Disturbed Ground	High/Mid Grade Ore	Pond
CWSP (Total 631,000 m^2)			
-1	517,058	0	113,942
1	440,365	76,693	113,942
2	440,365	76,693	113,942
3	440,365	76,693	113,942
4	440,365	76,693	113,942
5	440,365	76,693	113,942
6	440,365	76,693	113,942
7	440,365	76,693	113,942
8	440,365	76,693	113,942
9	440,365	76,693	113,942
10	440,365	76,693	113,942

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 Segment of high/mid Grade ore stockpile reporting to CWSP catchment assumed to have no ore stockpiled at start of operations, and reaches full areal extend by the end of Year 1.

Attachment A-5: Modelled Land Uses for High/Mid Grade Ore Stockpile Catchment [105]

End of Year of Operations	Disturbed Ground	High/Mid Grade Ore
High/Mid Grade Ore Stockpile (Total 294,000 m^2)		
-1	294,000	0
1	120,432	173,568
2	120,432	173,568
3	120,432	173,568
4	120,432	173,568
5	120,432	173,568
6	120,432	173,568
7	120,432	173,568
8	120,432	173,568
9	120,432	173,568
10	120,432	173,568

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 High/mid grade ore stockpile assumed to have no ore stockpiled at start of operations, and reaches full areal extend by the end of Year 1.

Attachment A-6: Modelled Land Uses for Surficial Soil Stockpile Catchment [106]

End of Year of Operations	Natural Ground	Disturbed Ground	Surficial Soil
Surficial Soil Stockpile (Total 266,000 m^2)			
-1	78,849	40,995	169,156
1	78,849	40,995	169,156
2	78,849	40,995	169,156
3	78,849	40,995	169,156
4	78,849	40,995	169,156
5	78,849	40,995	169,156
6	78,849	40,995	169,156
7	78,849	40,995	169,156
8	78,849	40,995	169,156
9	78,849	40,995	169,156
10	78,849	40,995	169,156

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 Surficial soil stockpile assumed to be at the full areal footprint by the beginning of operations.

Attachment A-7: Modelled Land Uses for Plant Site Catchment [107]

End of Year of Operations	Natural Ground	Disturbed Ground	Surficial Soil	Pond
Plant Site (Total 428,000 m^2)				
-1	130,496	196,394	89,282	11,828
1	130,496	196,394	89,282	11,828
2	130,496	196,394	89,282	11,828
3	130,496	196,394	89,282	11,828
4	130,496	196,394	89,282	11,828
5	130,496	196,394	89,282	11,828
6	130,496	196,394	89,282	11,828
7	130,496	196,394	89,282	11,828
8	130,496	196,394	89,282	11,828
9	130,496	196,394	89,282	11,828
10	130,496	196,394	89,282	11,828

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.

Attachment A-8: Modelled Land Uses for Low Grade Ore Stockpile Catchment [108]

End of Year of Operations	Natural Ground	Disturbed Ground	Low Grade Ore	Pond
Plant Site (Total 858,000 m^2)				
-1	245,200	604,608	0	8,191
1	245,200	96,715	507,893	8,191
2	245,200	96,715	507,893	8,191
3	245,200	96,715	507,893	8,191
4	245,200	96,715	507,893	8,191
5	245,200	96,715	507,893	8,191
6	245,200	96,715	507,893	8,191
7	245,200	96,715	507,893	8,191
8	245,200	96,715	507,893	8,191
9	245,200	96,715	507,893	8,191
10	245,200	96,715	507,893	8,191

Notes:
1 Year -1 value represents land uses at the start of operations.
2 Values were interpolated in GoldSim between years.
3 Low grade ore stockpile assumed to have no ore stockpiled at start of operations, and reaches full areal extend by the end of Year 1.