RAINY RIVER MINE

OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL

PART III – WATER MANAGEMENT FACILITIES

New Gold Inc.
Rainy River Project
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Version 2024-1

REVIEW AND VISION HISTORY

The OMS Manual shall be reviewed annually and following any significant changes at the site to assess if the document is representative of the current condition and operation of the facilities at the time of the review. Revisions to the manual should be undertaken within six months of changes. It is the responsibility of the Tailings Dam Engineer to initiate the OMS review.

The review team and approval record are provided in Table 1. The version history of the OMS Manual is shown in Table 2 and a change log of the latest revision is provided in Table 3.

Table 1: Review Team

	Name	Company / Department	Position	Signature	Date
Prepared by	Taha Nadeem	Capital Projects	Tailings Dam Planner	DocuSigned by: Taha Nadeem E00F19FECEE0456...	2/12/2024
Reviewed by	Travis Pastachak	Capital Projects	Capital Projects Manager	DocuSigned by: Travis Pastachak 4253A4B16E3D4CA...	2/12/2024
	Gord Simms	Mine Operations	General Manager	DocuSigned by: Gord Simms 3D73B55DFC8F498...	2/12/2024
	Mohammad Taghimohammadi	Mill Operations	Mill Manager	DocuSigned by: Mohammad Taghimohammadi 646B027EC05546A...	2/12/2024
	Derek McKinnon	Site Services	Site Services Superintendent	DocuSigned by: Derek Mckinnon 36E505FF68F74B9...	2/27/2024
	Michael Dabiri	SRK Consulting	Engineer of Record	DocuSigned by: Michael Dabiri	2/27/2024
Approved by	Garnet Cornell	Environment	Environmental Manager	DocuSigned by: 3082DBFCE51B40B...	2/27/2024

Table 2: Version Summary

Revision Number	Details of Revision	Date of Issue	Comment
Rev. A	Issued for Internal Review	2023-03-21	
Rev. B	Issued for EOR Review	2023-03-27	Received on May 4, 2023
Rev. 0	Issued for Use	2023-06-12	
Rev. 1	2024 Updates	2024-01-24	MAC TSM Audit and Operational Criteria Updates

Table 3: Revision 1 Change Log

Section Number	Section Title	Comments
5.5.1	Instrumentation Data Reading Frequency	Updated Stage 5 TARPs report reference
5.5.2	Instrument Thresholds and Action Plan	Updated Stage 5 TARPs report reference

Table of Contents

1.0 INTRODUCTION

1.1. Objective

The operation, maintenance, and surveillance manual (OMS Manual, the Manual) provides procedures and reference for the safe operation of the structures related to tailings, and water management structures at the New Gold Inc. (NGI) Rainy River Mine (RRM), located near Emo, Ontario. For readability, the OMS Manual has been separated into "Parts" as listed below. This is Part III for Water Management facilities.

1.2. Manual Structure

- Part 1: General
- Part 2: TMA
- **Part 3: Water Management Facilities**

  Treated Water
  - WMP: Water Management Pond, a very high to extreme consequence structure, contains the treated water.

  Contacted Water
  - MRP – Mine Rock Pond, a high to extreme consequence structure, contains the contacted water from EMRS and the open pit.
  - WDP – Water Discharge Pond, a low consequence structure, contains the contacted water from SD.
  - SRP – South Runoff Pond, a high to very high consequence structure, contains the contacted water from open pit and MRP, as an interim storage facility for Mill reclaim water.
  - SEDIMENT PONDS – A serial of small, low to significant consequence structures contain the contacted water from WMRS and open pit perimeter runoff.

  Freshwater
  - FRESHWATER DIVERSIONS – A series of structures that collect, store, divert freshwater including WCD, SPD, Teeple Dam, and Clark Creek Dam, Stockpile Pond Diversion, and West Creek Diversion.

  Pipelines and Pumps
  - WATER CONVEYANCE AND DISCHARGE – Site-wide pipelines and pumps for water conveyance and discharge
- Part 4: EPRP

To simplify and condense the OMS Manual, the overall site conditions were removed from the individual structure parts and covered in Part 1 of the OMS Manual. This part is only about the operation, maintenance, and surveillance of the water management facilities.

2.0 FACILITY DESCRIPTION

2.1 Overview of Structure Design and Construction

2.1.1 Water Treatment and Treated-Water Structures

2.1.1.1 Water Treatment Train

The water treatment train is in the northern WMP and consisted of three components: Lime WTP (Water Treatment Plant), Nitrification Cells, and BCR #1 (Biochemical Reactor 1).

Water from the TMA is pumped to the Lime WTP for treatment of TSS (total suspended solids), as well as the metals and metalloids.

After the TSS and these metals and metalloids are removed, the treated water is then discharged into the Nitrification Cell where the microbial process termed ‘nitrification’ is performed for treatment of ammonia. The Nitrification Cell uses microbial nitrification to convert the nitrogen compounds to nitrate. Some amount of manganese is also expected to be removed in the Nitrification Cell. Additional settling of TSS is performed in the first section of the Nitrification Cell.

Water from the Nitrification Cell is then pumped to BCR #1 for nitrate and nitrite treatment through a microbial process termed ‘denitrification’. The outflow from BCR #1 then reports to the WMP (Section 3, Rainy River Mine–Water Treatment Train Design Report, Document # 053_0719_20B, by Alexco and Contango dated July 2019).

2.1.1.2 Water Management Pond

WMP Dam 1 through Dam 5 contain the WMP pond with a crest elevation of 371.5 m for Dam 1, 2 and 3 (homogenous clay fill dams). Dam 4 and Dam 5 (clay core) comprising of West Dam (WD) are being raised annually together with other part of the TMA perimeter dams.

Construction of the WMP dams and ancillary structures under the original LRIA work permit No. FF-2015-04 began in September 2015. Construction of the dams, spillway, and intake channel were completed in early August 2017 followed by completion of the seepage collection system in September 2017. Works were completed in 2017 under amended LRIA work permits FF2015-04A and FF2015-04B based on revised design details.

Suspended construction periods occurred on two separate occasions for WMP Dam 3 due to high porewater pressure detected in the foundation. This occurred on December 15, 2015, and January 26, 2016. This information is documented in WMP As-Built Report (RRP-GEO-REP-030 R1) provided by then-EOR, Amec Foster Wheeler (AFW).

Settlement cracking in WMP Dam 5 was observed in December 2015 and a Stop Work Order was issued by the MNRF in January 2016. A geotechnical investigation was completed, and remedial design measures were implemented. An amended LRIA approval was received in September 2016.

Major design revisions at the WMP included:

- Lowered the dam crest from the original design elevation of 373.0 m to 371.5 m because additional volume of borrow material inside the WMP impoundment area was taken for construction of WMP dams (AFW, RRP-GEO-REP-030 R1).
- Addition of toe berms to WMP Dams 2, 3, 4 and 5 following supplemental geotechnical investigations to satisfy revised design criteria.
- Revised toe-drain details to suit interim 2015/early 2016 As-Built conditions and mitigate potential stability issues.
- Remedial works to the interim clay fill placed in 2015/early 2016 at WMP Dam 3 which included a 14 m wide key trench through the existing crest of the dam.
- Utilization of additional thickness of Zone 8 (Dam 2) and Zone 3 (Dam 4) to address underbuilt or trimmed clay fill slopes to satisfy the neat line geometry.
- Re-alignment of the emergency spillway to avoid in-place infrastructure.

2.1.1.3 Constructed Wetlands

WMP and WDP were intended to discharge to a series of constructed wetlands, which would provide a target 30-day retention time to control water quality. With the construction of BCR2, the wetlands are not required until the end of mine life.

2.1.2 Contacted Water and Sediment Controls

The structures for the contacted water, or sediment controls including the following: MRP, Sediment Ponds, Water Discharge Pond (WDP), and South Runoff Pond (SRP).

2.1.2.1 Mine Rock Pond

The Mine Rock Pond Dam (MRP) is in the remnant of lower Clark Creek and designed to collect runoff and seepage from the East Mine Rock Stockpile (EMRS), Low Grade Ore Stockpile (LGOS), and dewatering from the Open Pit and underground mine. There is no direct discharge to the environment from the MRP.

The MRP is intended to be operated at the minimal pond volume to reduce seepage and improve dam safety. Water collected in the MRP is used for process water in the mill. Excess water from the MRP may also be transferred by pipeline to the TMA, or BCR 2 and then WMP for discharge to environment depending on the water quality.

The MRP design documents are summarized in Table 2- 1.

Table 2- 1: MRP Design Document Summary

Document Title	Reference
Design Brief – Water Management Dams	3098004-004400-A1-ETR-0004-00
Mine Rock Pond Dam – Design Revision and Operating Guidelines	RRP-GEO-REP-007-R0
MRP As-built Report	RRP-GEO-REP-033 R1
Drawing Title	**New Gold Document Number**
Mine Rock Pond Dam General Arrangement Plan	3098004-002590-A1-D70-0002
Mine Rock Pond Dam Profile	3908004-002590-A1-D70-0003
Mine Rock Pond Dam – Typical Cross Section	3098004-002590-A1-D70-0004
Mine Rock Pond Dam Emergency Spillway Plan and Sections	3098004-002590-a1-d70-0005
Interim Mine Rock Pond – Plan, Cross Sections, and Details	3098004-002590-A1-D50-0006

Construction of the MRP commenced in 2015 and was completed in the fall of 2017. Construction of the MRP dams was slowed in July and August of 2017 to allocate resources to the completion of TMA Cell 1.

2.1.2.2 Sediment Ponds

Three sediment ponds have been constructed on the RRM site. Sediment Pond #1, #2, and #3 receive runoff and seepage from the West Mine Rock Stockpile (WMRS). Sediment Pond #1 is located to the north of the WMRS, Sediment Pond #2 to the west, and Sediment Pond #3 to the south.

Sediment Ponds #1 and #2 have been designed to provide a 12-day hydraulic retention time during sustained wet conditions (wettest month of a 100-year wet year) and during the 25-year, 24-hour storm event. Sediment Pond #1 will also receive overflow water from the West Creek Box Culvert Spillway during large storm events exceeding the 10-year return period event. Critical to the function of the sediment ponds is progressive reclamation.

Sediment Pond #3 consists of collection ditches, a sump located in the Marr Creek valley, the WMRS temporary Sump 1, Sump 2, and a containment berm with an emergency overflow spillway. Sediment Pond #3 was designed to collect shallow seepage from the remnant Marr Creek, otherwise maintained in dry condition. Sediment Pond 3 sump was designed to accommodate an EDF of 25-year, 24-hour, and the 25-year, 30-day storm events. The emergency spillway was designed to pass the 24-hour, 100-year return period IDF. The contributing watershed is 1.12 square kilometres. Construction of Sediment Pond 3 occurred between July 14, 2019, and January 26, 2020. Sediment Pond 3 does not discharge to the environment. Water is pumped to Sediment Pond 2, and the pond level in Sediment Pond 3 is maintained as low as possible.

Seepage collection ditches have been constructed around the Overburden Stockpile and WMRS to convey runoff to the sediment ponds. The ditches were constructed to minimize erosion protection requirements where possible. Flows may also be directed to the ponds using roadside ditches.

2.1.2.3 Water Discharge Pond

The Water Discharge Pond (WDP) was originally designed to collect runoff from the natural catchment south of the TMA, as well as seepage from the seepage collection ditch, and bleed flow from the WMP (design rate of 10,000 m³/day). The WDP was intended to discharge to a series of constructed wetlands, which would provide a target 30-day retention time to control water quality. With the construction of BCR2, the wetlands are not required until the end of mine life.

Currently, the WDP collects seepage from the TMA South Dam and local runoff. Water collected in the WDP is pumped back into WMP.

2.1.2.4 South Runoff Pond

South Runoff Pond (SRP) was originally designed to store mine site runoff water but later has been used as a temporary storage facility for open pit water before it is pumped to Mill. Because of the limited storage capacity, overspill occurred a few times in its operation history. A seepage collection and pump back system is located downstream of the SRP to prevent seepage and overflow, as well as flows from the surrounding catchments, from reporting to the open pit.

Details of design and construction are available in documents summarized in Table 2- 2. In many cases, As-Built drawing packages are available, but original design drawings are not.

Table 2- 2: Document Summary

Document Title	Reference
LRIA Work Permit Application Support Document - Sediment Ponds	RRP-GEO-LRIA012 R1
As-Built Report – Sediment Pond #1	RRP-GEO-REP-040 R1
As-Built Report – Sediment Pond #2	RRP-GEO-REP-038 R1
As-Built Report – Sediment Pond #3	BGC-4460-DT00-RPT-0011
Sediment Pond 3 Detailed Design	BGC-4460-DT00-RPT-0002
LRIA Work Permit Application Support Document – Water Discharge Pond and Constructed Wet land	RRP-GEO-LRIA-004D R2
Drawing Title	New Gold Document Number
Temporary Sedimentation and Plan and Details	3098004004430-A1D70-0002
Sediment Pond #2 – Plan, Cross Sections, and Details	3098004-004440-A1-D70-0002
South Runoff Pond Grading Plan	100126-2510-DD10-GRD-0003.001.08.IFC
South Runoff Pond Section and Details	100126-2510-DD10-GRD-0004.001.07.IFC
Water Discharge Pond Dam – As-Built Plan and Typical Cross Sections	3098004-004410-A1-D70-0002

2.1.2.5 Seepage Collection System

A Seepage collection system consisting of ditches and sumps to collect dam seepage and downstream runoff are built for TMA (See Part II), WMP and MRP.

WMP

Seepage collection system is located at downstream toe of WMP dams. The design criterion is to manage a 1:25 year 24h rainfall. WMP seepage involves 2 sumps. They are

- Sump 1 is located downstream of Dam 2, and the storage capacity is 18,200 m^3.
- Sump 2 is located downstream of Dam 3, and the storage capacity is 11,800 m^3.

Because of local topographic highs between Sump 1 and 2, Sump 2 and Sump 3 (downstream south end of North Dam), the seepage collection ditches do not connect. The seepage collection ditch at the toe of Dam 1 reports to Sump 1. The seepage collection ditch at the downstream toe of Dam 3 reports to Sump 2.

Sump water is pumped to WMP.

MRP

MRP is located at a topographic low and is part of seepage collection system for the EMRS. The spillway and its discharge are in the old Clark Creek. No specific seepage collection system was designed for MRP, however, the natural low between the dam toe and Highway 600 becomes a ditch which collects dam seepage and surface runoff which can be pumped back to MRP. Two culverts under the old Highway 600 could drain the ditch water to south without environment concern.

2.1.3 Freshwater Diversions

The freshwater diversions function to reduce inflows to the RRM and provide offsetting habitat for the loss of portions of Loslo, Marr, Clark, and West creeks. Diversion of the non-contact runoff from these catchments reduces the effluent management requirements. All structures support fish habitat. Freshwater diversion is provided by two systems:

- West Creek Diversion includes the Stockpile and West Creek dam, ponds, and diversions.
- Clark Creek Diversion includes the Clark Creek and Teeple dam, ponds, and diversions.

2.1.3.1 West Creek Diversion

The West Creek Diversion system diverts flows from the West Creek and its tributaries around the Open Pit and discharges into the Pinewood River at Loslo Creek. It includes the Stockpile Pond Dam and Diversion Channel, which divert flows around the Plant Site, and the West Creek Pond and Diversion Channel, which diverts flows around the Open Pit. The following sections describe the components of this diversion.

Stockpile Pond and Diversion Channel

The Stockpile Pond is located north of the Primary Crusher and east of the Mill. Blocked by the Stockpile Pond Dam, water in the pond increases until it reaches the Diversion Channel, which conveys the flow around the mine via the West Creek Pond and Diversion.

The objective of the Stockpile Pond is to divert freshwater from natural ground into the West Creek Watershed. The Stockpile Pond Diversion Channel was designed to convey the Probable Maximum Flood (PMF) from the plant site area to the West Creek Pond. The Stockpile Pond Diversion also provides fish habitat compensation. The Stockpile Pond Diversion Channel base width varies from 33 m to 6 m at the tapered inlet, with 4H:1V side slopes. The total length of the diversion channel is about 1,200 m.

The dam height is 9.8 m with overall side slopes of 6.5H:1V (4H:1H without berms), a crest width of 6 m and length of 175 m. The dam crest elevation is 375.5 m, and the diversion channel invert is 372.2 m. NOWL (372.2 m) provides capacity for 93,700 m3 of storage with greater volumes discharges through the 33 m spillway into the diversion channel. The diversion channel is a low (<1%) gradient channel reporting to the West Creek Pond with a typical bottom width of 6 m.

The design brief for the dam is RRP-GEO-REP-003. Construction was completed on the diversion in November 2016 and confirmed by then-EOR (RRP-GEO-MEM-080-R1). Construction of the dam was completed in May 2017 and confirmed by then-EOR (RRP-GEO-MEM-119-R1). The dam was constructed with a central clay core and random fill and or NPAG rock shells.

West Creek Pond and Diversion Channel

The West Creek Pond is located north of the Open Pit and west of the Process Plant at a point that allows for the raising of the pond water level sufficiently to divert flows westerly through a diversion channel and around the Open Pit. The West Creek Dam intercepts all West Creek flows from the north, as well as drainage from two tributaries to the east, diverted through the Stockpile Diversion Channel.

The West Creek Dam is a central clay core with random fill upstream shell and NPAG mine rock downstream shell. It has a crest elevation of 364.9 m (~156,000 m^3), maximum height of 8.9 m, and overall side slopes of 7.9H:1V including rock toe berms (4H:1V without toe berms). The West Creek Pond has been designed to contain the PMF while discharging to the West Creek Diversion Channel.

The first 615 m of the West Creek Diversion Channel acts as the Emergency Spillway of the West Creek Dam and has been designed to convey a PMF event. The spillway invert elevation is 361.0 m and is 8 m wide. This provides a freeboard of 4.0 m at normal water level in the pond.

West Creek Diversion Overflow Structure

The Overflow Structure (or weir) is located at Sta. 0+615 within the Diversion Channel. See Figure 2- 1. A box culvert (62.5 m long by 2.4 m wide/tall) constricts the channel flow such that a side overflow weir may be activated (invert elevation 360 m, width 50 m). The purpose of the overflow structure is to restrict the flow rate discharging from the culvert under high flow conditions. The remaining ~4,000 m of diversion channel is over relatively flat ground with minimal elevation change. The reduced flows through this section of diversion channel allow a much smaller channel excavation.

The overflow structure has been designed such that during a PMF event, the flow rate downstream of the culvert, i.e., in the channel, does not exceed the 100-year flood outflow from the West Creek Pond (26.9 m3/s). The diversion channel upstream of the diversion structure will back up, with excess flows diverted through the side overflow channel into Sediment Pond 1. Containment is provided above the culvert by a berm across the diversion channel with a crest elevation of 363 m. The peak water level in the diversion channel during a PMF event will be 362.5 m, providing 0.5 m of freeboard to the crest of the berm.

The overflow structure will be activated for events greater than the 10-year storm. The peak overflow channel discharge during a PMF event will be 163.8 m3/s. The overflow channel discharges onto a flat, grassy plain south of the West Creek Diversion Channel and north of the ultimate WMRS.

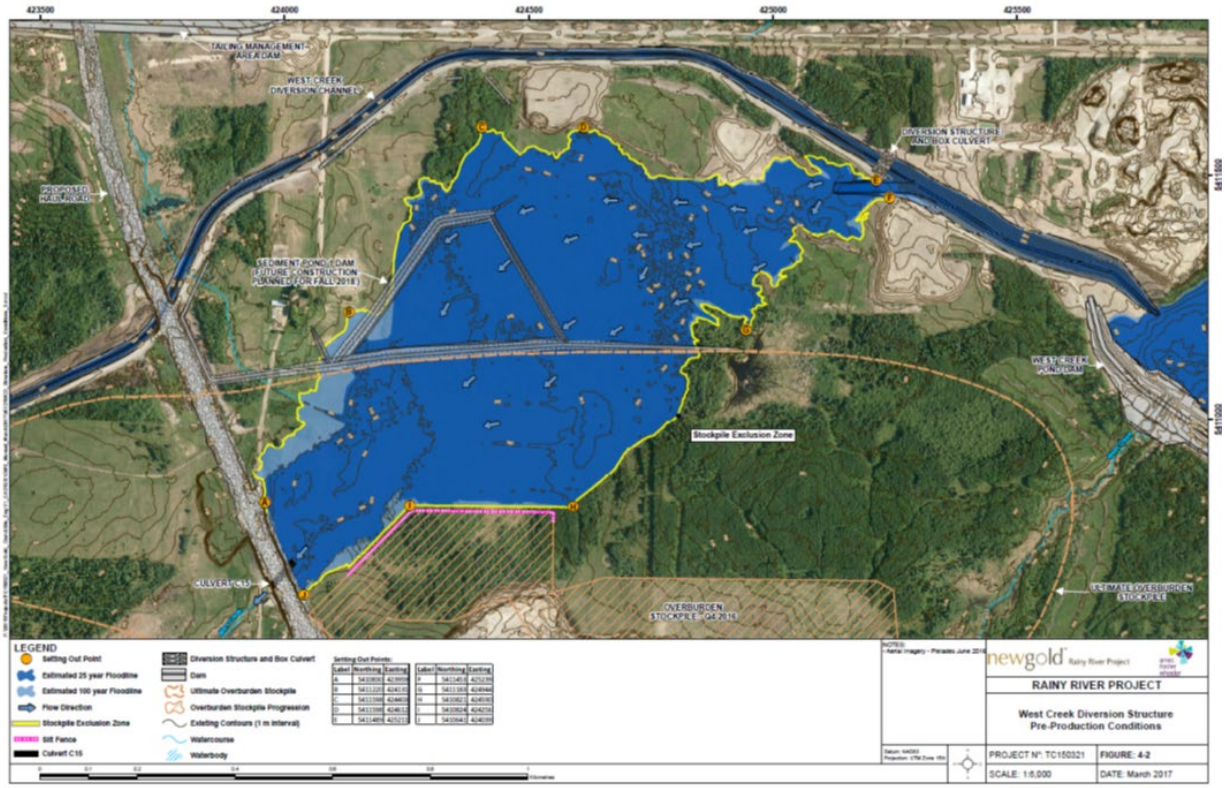


Figure 2- 1: West Creek Diversion Overflow Map

Summary of West Creek Design Features

The design parameter of the West Creek Diversion is summarized in Table 2- 3.

Table 2- 3: Design Parameters for the West Creek Diversion

Design Parameter	Unit	Stockpile	West Creek
Embankment dam crest elevation	m	375.5	364.9
Diversion channel inlet invert elevation	m	372.2	360.9
Diversion channel outlet elevation	m	360.6	344.2
Diversion channel gradient (average)	%	0.85	0.35
Diversion channel side slopes	H: V	4:1*	4:1

*Different (near vertical) at rock section of the channel

2.1.3.2 Clark Creek Diversion

The purpose of the Clark Creek diversion is to divert natural drainage and runoff around the East Mine Rock Stockpile and provide fish habitat offsetting. The Clark Creek Diversion Channel diverts runoff from the Clark Creek upstream of the Clark Creek Dam and the EMRS, through the Clark Creek diversion channel into Teeple Pond and subsequently into Teeple Diversion and to the Pinewood River via a culvert under Teeple Road.

Construction of the Clark Creek Diversion occurred between August 29, 2015, and December 4, 2016, and authorised by LRIA FF-2015-03A and the Fisheries Act approval. There are applicable federal and provincial EA commitments, however as a freshwater diversion there are limited MECP requirements beyond sediment control.

Clark Creek and Teeple Dams were constructed as homogenous clay fill embankments utilizing native clay overburden. The clay fill is protected by gravel and cobble-sized materials, with a layer of geotextile separation, to prevent erosion. Overflow sections are included on the dams to carry storm flows (i.e., activated by 2-year event) and have been designed to manage events more than the 100-year return design flow. Overflow sections are provided to permit the safe passage of water in the event the pond level exceeds the maximum operating water level. There are no active controls on the water flows. Clark Creek Dam features a 20 m wide overflow section and Teeple Road Dam features a 150 m wide overflow section designed to allow water and fish to flow over the structure.

The diversions are designed to convey the 1:100-year flow and are typically 6 m wide (base width) with 4:1 slope. The Clark Creek diversion is 1,200 m and the Teeple Diversion is 580 m long.

Table 2- 4: Design Parameters for the Clark Creek Diversion

Design Parameter	Unit	Clark Creek	Teeple
Embankment dam crest elevation	m	380.0	379.0
Dam overflow section invert elevation	m	379.9	378.7
Diversion channel inlet invert elevation	m	378.75	378.5
Diversion channel outlet elevation	m	377.6	371.5
Diversion channel gradient (average)	%	0.1	1.2
Diversion channel side slopes	H:V	4:1	4:1

Deviations from design occurred for both diversions but are not anticipated to have a negative effect of stability. Examples of deviation include absence of low flow channel, oversized boulders, variances on habitat feature frequency and riffles either not meeting design elevation or being too steep.

2.1.3.3 Loslo and Marr Diversion

A division system with ditches and pipeline located in northern TMA to collect and divert the natural flow from old Loslo Creek and Marr Creek and surface runoff from northern portion of TMA (Loslo portion is called ICS, Inflow Control System) to Pinewood River through West Creek Diversion.

ICS was originally built in a way of cut and fill in 2020 but overtopped during 2022 Spring freshet.

Additional work conducted in Winter 2022/23 to improve the system includes:

- Raised ICS berm crest to elevation 377.5 m
- A 20m wide spillway with invert at 376.9 m was added to ICS
- A pump and pipeline system were installed to direct ICS water to Marr Ditch at east of South Dam (rather than the Marr sump), with an estimated capacity of 680 m^3/hr.
- Part of Marr Ditch was relocated to north end of South Dam.

An as-built drawing is being prepared for those work.

2.1.3.4 Open Pit Diversion

A diversion ditch to divert surface runoff around the north of open pit to Sediment Pond 3 and then Sediment Pond 2 for discharge was constructed in 2022/23 winter according to CAP-RFI-000005-02CAP001767-2023. The diversion has capacity to convey the peak 100-year return period flows.

An as-built drawing is being prepared for those work.

2.1.3.5 Documentation

The freshwater diversion structures have been developed in accordance with the design briefs and as-built reports summarized in Table 2- 5.

Table 2- 5: Supporting Documents for the West Creek and Clark Creek Diversions

Document Title	Reference
Design Brief – Water Management Dams	3098004-RPT-0015 REV 00
Design Update – Clark Creek Pond Dam	MNRF-IPT-0004.008
Stockpile Pond Dam – Design Revision and Operating Guidelines	MNRF-IPT-0005.007
West Creek Dam – Design Revision and Operating Guidelines	MNRF-IPT-0005.006
Clark Creek Diversion – As-built Report	RRP-GEO-REP-027
West Creek Diversion – As-built Report in preparation	RRP-GEO-REP-028 R1
Drawing Title	**New Gold Document Number**

West Creek Pond Dam – Layout and Foundation – Preparation Plan & Details	3098004-002510-A1-D50-0001
West Creek Diversion Channel – Plan and Profile	3098004-002510-A1-D70-0003
West Creek Diversion Plan, Profile, and Section As Built	3098004-002510-A1-D70-0003-2
West Creek Diversion Plan, Profile and Section As Built	3098004-002510-A1-D70-0003-3
West Creek Dam Spillway Plan and Sections	3098004-002510-A1-D70-0004
West Creek Diversion Channel Overflow Diversion Structure Section and Details	3098004-002510-A1-D70-0005
West Creek Diversion Channel Culvert C11 Plan and Section	3098004-002510-A1-D70-0006
West Creek Diversion Channel Culvert C12 Plan and Section	3098004-002510-A1-D70-0007
West Creek Diversion Channel Culvert C13 Plan and Section	3098004-002510-A1-D70-0008
West Creek Diversion Channel Culvert C14 Plan and Section	3098004-002510-A1-D70-0009
Marr Creek Diversion Channel Culvert C15 Plan and Section	3098004-002510-A1-D70-0010
West Creek Diversion Channel Culvert C16 Plan and Section	3098004-002510-A1-D70-0011
West Creek Diversion Channel Temporary Side Spillway Plan, Profile and Sections	3098004-002510-A1-D70-0012
West Creek Pond Dam Temporary Overflow Spillway Typical Section, Profile and Details	3098004-002510-A1-D70-0014
Stockpile Pond Dam – Plan and Typical Section	3098004-002580-A1-D70-0002
Stockpile Pond Dam Layout and Foundation Preparation Plan and Profile	3098004-002580-A1-D70-0003
Stockpile Pond Diversion Channel – Plan and Profile	3098004-002580-A1-D70-0004
Stockpile Pond Plan View	3098004-002580-A1-D50-0001
Stockpile Pond Cross Sections	3098004-002580-A1-D50-0002
Stockpile Diversion Typical Cross Sections in Overburden	3098004-002580-A1-D50-0003
Stockpile Diversion Plan and Profile in Overburden	3098004-002580-A1-D50-0004
Stockpile Diversion Typical Cross Sections in Rock	3098004-002580-A1-D50-0005
Stockpile Diversion Plan and Profile in Rock	3098004-002580-A1-D50-0006
Clark Creek Pond Dam – Plan, Typical Section and Profile	3098004-004400-A1-D70-0001
Clark Creek Pond Diversion Channel – Plan and Profile	3098004-004400-A1-D70-0002
Clark Creek Pond Plan View	3098004-004400-A1-D50-0002
Clark Creek Pond Cross Sections	3098004-004400-A1-D50-0003
Clark Creek Diversion Typical Cross Sections	3098004-004400-A1-D50-0004
Clark Creek Diversion Typical Plan and Profile	3098004-004400-A1-D50-0005
Marr Creek Connection to West Creek Diversion Channel	3098004-002510-A1-D50-0009
Teeple Road Dam – Plan, Typical Section and Profile	3098004-004400-A1-D70-0003
Teeple Road Pond Diversion Channel – Plan and Profile	3098004-004400-A1-D70-0004
Teeple Road Dam Overflow Section Permanent Repairs	3098004-004400-A1-D70-0005
Teeple Road Dam Overflow Section Permanent Repairs	3098004-004400-A1-D70-0006
Teeple Road Dam Non-Overflow Section Permanent Repairs	3098004-004400-A1-D70-0007

2.1.4 Review of Dam Consequence Classification

SRK reviewed the dam consequence classification as part of a comprehensive DSR completed in 2021 (SRK 2021) and found that the consequence justifies the use of a “Very High” classification; however, pending a review of 1) environmental impacts, and 2) consideration for reputational impacts to NGRR, the dam consequence shall remain as “Extreme”. Adopting the more stringent design criteria also ensures that the facility is properly designed to handle CDA closure requirements and is consistent with industry best practice. Note that consequence classifications are under review, as detailed in the Water Management Structure Design Basis Review (SRK, 2023a). Notably, the recommended South Runoff Pond classification was increased from Low to either High or Very High, depending on the presence of workers in the Open Pit. In 2023, SRK understands that backfilling of the Open Pit has commenced and the presence of workers at risk in the potentially impacted areas is minimized or eliminated, in which case the appropriate consequence classification remains Low.

Table 2-1 provides the dam consequence classification of each facility as provided by NGRR. TMA and WMP Seepage Collection Sumps are not classified as dams (Rainy River – 2023 Dam Safety Inspection – CRW3295-4910-BA10-RPT-000).

Table 2-1: Dam Classification for NGRR

Facility	Current Classification
Tailings Management Area (North, West & South Dams)	Extreme
Water Management Pond	Extreme
Mine Rock Pond	Extreme
Water Discharge Pond	Low
Sediment Ponds 1	Low
Sediment Ponds 2	Low
West Creek Pond	Extreme
Stockpile Pond	Extreme
Clark Creek Pond	Low
Teeple Pond	Low
South Runoff Pond	Very High

2.2 Pipelines

The following major pipeline corridors are used to transfer tailings and water around the site. Figure 2- 2 presents the pipeline corridors. According to the types of water/fluid it conveys and usages, the pipeline corridor includes the following. No pipelines are insulated.

- **Tailings Lines (TL)**

From Mill to TMA. At the Y Junction, the tailings line splits into two: One goes along SD through Boster Station to WD and ND. The other goes through NE section of SD to NRR.

The tailings line between Mill and Y Junction is contained within a lined corridor with six emergency dump ponds. The line within additional containment over West Creek and its tributaries. The tailings line beyond Y Junction is installed with valves and spigots for tailings discharge.

- **Mill Makeup Water Lines**
  Mill makeup water comes from various sources:
  - TMA reclaim pond (RC). This reclaim line is contained within a lined corridor along with TL, with six emergency dump ponds. An extension to this line provides the ability to reclaim from the WMP in addition to the TMA.
  - MRP (WT, Wastewater)
  - NRP and SRP (ML, Mill Water)

- **Contact Water Lines**
  These lines connect many ponds.
  - Open Pit to SRP (DT, Dewatering Line)
  - Sed. Pond 1 to TMA RC (DT)
  - WMP to Y Junction (WT): Questionable
  - MRP to TMA along South Ring Road (WT). There is an extension to discharge water directly to the WMP or to the BCR2. A tee valve enables flows from Sed Pond 2 and Sediment Pond 1 to also discharge into this pipeline.
  - Sediment Pond 1 to Sediment Pond 2 (not shown)
  - Sediment Pond 3 to Sediment Pond 2 (WT)
  - WDP to WMP (DT)

- **Treated Water Lines**
  The treated water is pumped from TMA, treated in the water treatment train (WTT), and stored in WMP for discharge to environment, mine facility usage, or mill makeup water.
  - TMA to WTT (WT)
  - WMP to Wash bay, and Other Ming Facilities (FR)
  - WMP to BCR 2 and OB (WP, WAMP Water)
  - WMP to EDL1 (DC, Discharge Water). The line is 10,000 m in length between the Outflow Basin and a diffuser in the Pinewood River, and discharges treated water to the environment.
  - WMP to EDL2 (DC). The line is 2,000 m in length between the Outflow Basin and a diffuser in the Pinewood River and discharges treated water to the environment.

Additional minor pipelines include connections from seepage collection sumps to the TMA or WMP, pipelines within the Water Treatment Train and the WMP, and discharge pipelines from Sediment Pond 1 and 2 to splash pads which discharge to West Creek Diversion and Pinewood River, respectively.

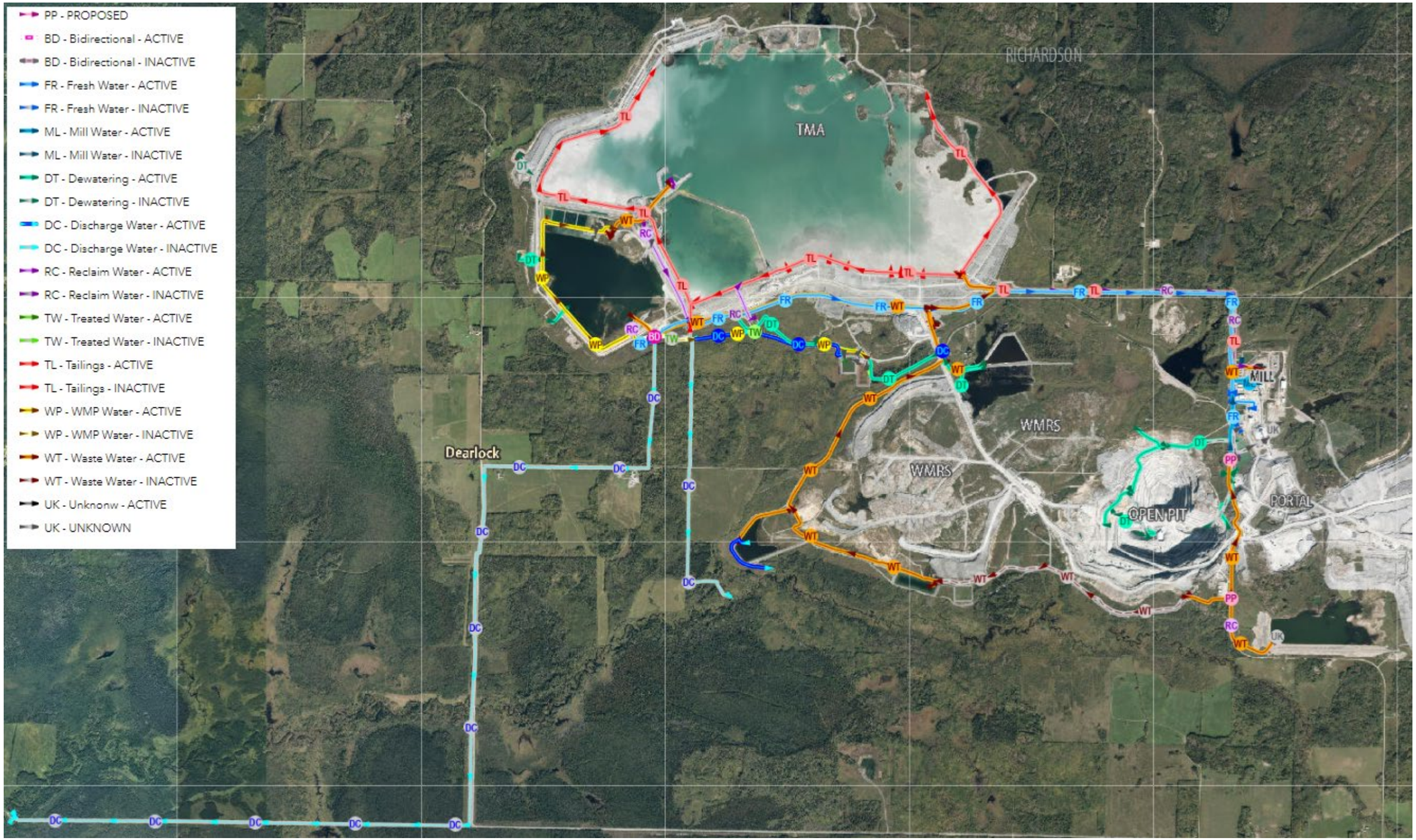


Figure 2- 2: Pipeline Layout (GIS Viewer, Mar. 17, 2023)

2.3 Discharge Locations

There are four provincially and federally permitted locations where discharge from the mine into the environment can occur (Table 2- 6).

Table 2- 6: Permitted Discharge Locations

Type of Water	Discharge Location	Details
Treated Water	Effluent Discharge Location #1 (EDL1)	Consists of a 10 km pipeline and an effluent mixing structure (EMS#1) with two duckbill diffusers and riverbed armoring, downstream of the McCallum Creek and Pinewood River confluence
	Effluent Discharge Location #2 (EDL2)	Consists of a 2 km pipeline and an EMS (#2) with two duckbill diffusers and riverbed armoring, downstream of the Loslo Creek and Pinewood River confluence
Contact Water (WMRS)	Sediment Pond 1	Pumped discharge to a splash pad, downstream of Sediment Pond 1 spillway, which discharges to the West Creek Diversion, then flows into to the Pinewood River at the Loslo Creek confluence
	Sediment Pond 2	Pumped discharge to a splash pad, downstream of Sediment Pond 2 spillway, which discharges to the Pinewood River upstream of the Loslo Creek confluence

The locations of these discharge points are presented in Figure 2- 3.

Each discharge has specific discharge criteria as specified in MECP ECA #7004-BC7KQ5 which must be met prior to discharge. These criteria are described in Section 3.4.5 Discharge Criteria.

At closure, effluent will be discharged through the constructed wetland to the Pinewood River at the Loslo Creek outflow (via lower Loslo Creek).

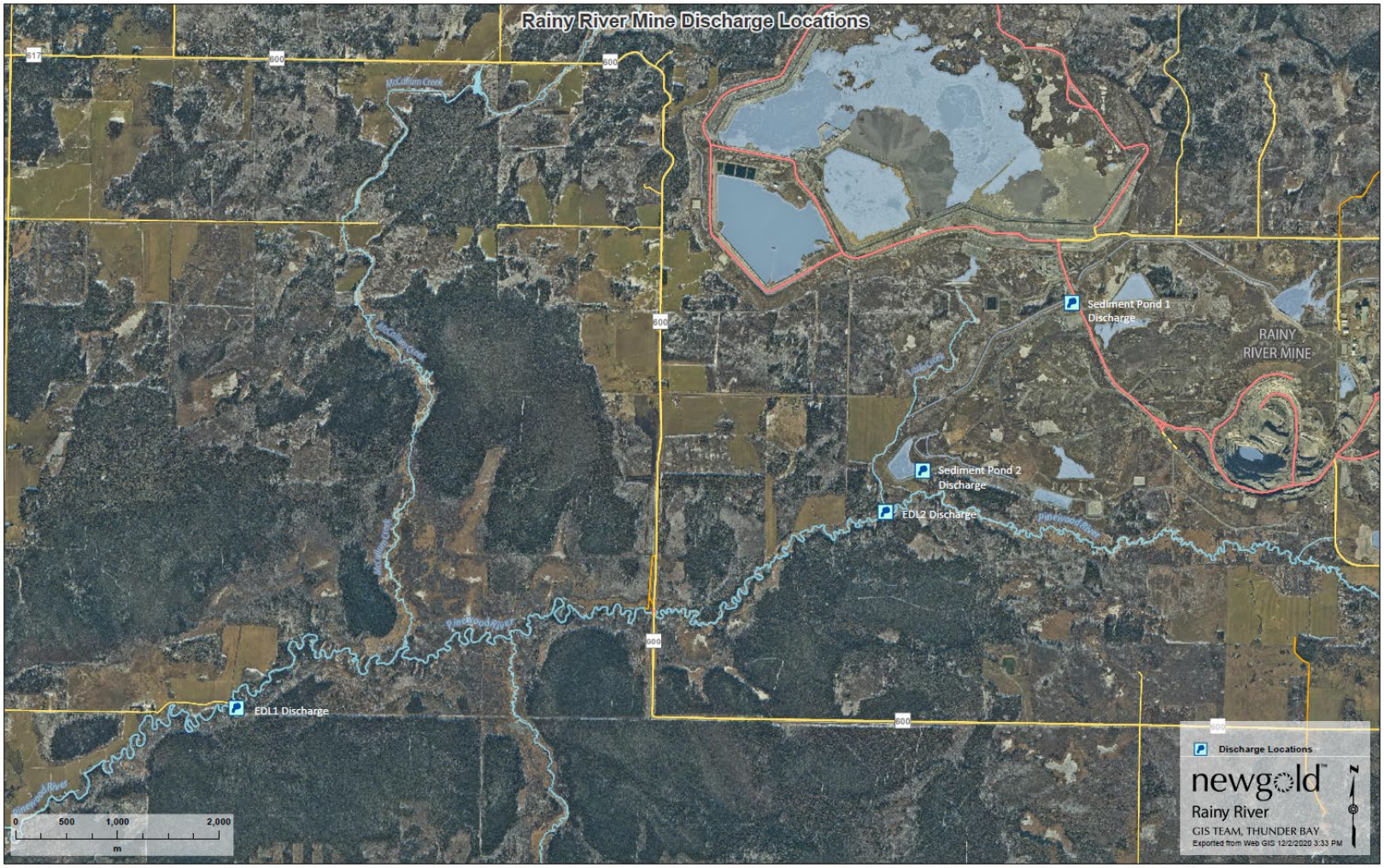


Figure 2- 3: Discharge Locations

2.4 Closure Plan

2.4.1 WMP

The WMP dams will be breached to prevent retention of water once it no longer has a water management function. Upstream dam faces that become exposed will be revegetated.

The constructed wetlands will be left in place as this system is designed to operate passively. It is expected to stabilize as a wetland complex during operations.

2.4.2 MRP

MRP will remain in place to collect runoff and seepage from the EMRS. This will then be directed to the Open Pit for flooding. The water level in all water management structures is to remain within the respective NOWL. Should the NOWL be exceeded, the owner is required to notify the appropriate authority and submit a plan to return to the NOWL within an agreed upon timeframe. At this time, it is undetermined whether the transfer of water to the pit will occur via ditching or pumping.

2.4.3 Open Pit

The open pit will collect overland flow and discharge into the Pinewood River. It is expected that it will take 75 years to fill the pit.

2.4.4 Sediment Ponds

Sediment Ponds will be maintained until the site is recognized as a closed mine and monitoring associated with the Metal and Diamond Mining Effluent Regulation is no longer required. At such time, all Sediment Ponds will be breached, and residual pond sites will be stabilized by infilling with overburden and revegetated.

The closure strategy for the WDP involves collection of WMP and TMA passive outflows and discharging to the constructed wetlands. The current design plans for the constructed wetlands includes five ponds (Pond A, B, C, D, E), and the downstream pond (Pond A) will feature a control structure to stop discharge if the water quality does not meet discharge criteria. If required, water in Pond A would be pumped back to the TMA or WMP. The constructed wetlands will form part of the closure plan and will remain in place permanently. A pilot study is ongoing to test the effectiveness of the constructed wetland system.

The WDP dam will be breached once it no longer has a water management function.

SRP closure plan is undefined.

2.4.5 Freshwater Diversions

Closure of the freshwater embankments will typically involve but is not limited to breaching of embankments to prevent ponding of water and revegetating slopes to reclaim the area. Some

embankment structures, such as SPD, will still have a role during the closure phase, and these will not be breached.

Freshwater diversions and the constructed wetland structures are designed to operate passively and will remain in place at closure.

2.4.6 Constructed Wetlands

The closure strategy for the WDP involves collection of WMP and TMA passive outflows and discharging to the constructed wetlands. The current design plans for the constructed wetlands includes five ponds (Pond A, B, C, D, E), and the downstream pond (Pond A) will feature a control structure to stop discharge if the water quality does not meet discharge criteria. If required, water in Pond A would be pumped back to the TMA or WMP. The constructed wetlands will form part of the closure plan and will remain in place permanently. A pilot study is ongoing to evaluate the effectiveness of the constructed wetland system.

2.4.7 Monitoring

Monitoring requirements are described in the Rainy River Mine Comprehensive Closure Plan Amendment (O'Kane Consultants, 2019). A review of this plan is currently in progress with a planned completion in 2024.

3.0 OPERATION

3.1 Pond Storage Capacity

Estimates of storage capacity with respect to elevations are based on comparison with as-built drawings. Appendix A provides the stage storage capacity for all water management facilities.

The pump inlet elevation at WMP is Elev. 363.0 which corresponds to the minimum operation level and dead storage volume of approximately 1.1 Mm^3.

MRP requires a minimum water storage of 0.1 Mm^3 to ensure underground has sufficient water for operations. It is also the minimum volume for mill reclaim (see Mill Water Reclaim Logic in Part I). It corresponds to minimum operation water level of Elev. 352.0.

3.2 Water Balance Model

A water balance model is under development by SRK and will be documented in the OMS in early 2024. The water balance model documentation provides projected water levels under various hydrometeorological conditions, as well as key operating criteria for water management infrastructure such as target water levels, pumping hierarchies and decision trees. Updated mine site water balance information and forward-looking projections will be reported monthly.

3.3 Pond Level Operation Criteria

3.3.1 Environment Notice Level

The Environment Notice Level (ENL) corresponds to a level at which NGI Environment manager and surface water engineer need to be notified to initiate the Environment Contingency Plan and bring down the pond level if the water quality does not meet discharge criteria.

ENL is assigned to be the same as NOWL.

3.3.2 Environment Incident Level

The Environment Incident Level (EIL) is an abnormal condition with potential spill of the contained tailings to the environment without meeting the water discharge quality requirement by ECA. If it occurs, RRM need to continue the Environment Contingency Plan to bring down the pond level and report to the regulator.

EIL is assigned to be the same as the MOWL (EDF event), i.e., the invert of spillway if there is one, or below the required minimum IDF freeboard depth where there is no spillway.

3.3.3 Dam Safety Notice Level

The Dam Safety Notice Level (DSN) corresponds to a level at which the Tailings Dam Engineer and the Capital Project Manager need to be notified to plan for the increased surveillance or other response.

DSN is assigned to be the same as EIL.

3.3.4 Dam Safety Incident Level

A Dam Safety Incident Level (DSI) is an abnormal condition or performance of the dam (including mis-operation or component failure) with the potential to jeopardize the safety of the dam but that, currently, is not expected to lead to a breach of the dam and NGI need to report to the regulator.

DSI is assigned to be the IDF level. If exceeded, RRM need to report to the regulator and initiate EPRP.

Summary of operation elevation data of water management facilities are shown in Appendix B.

3.4 Water Conveyance and Discharge

3.4.1 Water Treatment and Treated Water Operations

Operations associated with conveyance and discharge of water treatment and the treated water are discussed in the following subsections.

3.4.1.1 Water Treatment

TMA PAW is treated in two facilities: WTT and BCR #2.

Table 3- 1 outlines the expected flow rates entering each component in the treatment train. Inflow water to the Lime WTP is higher than the remainder of the treatment train as clarifier underflow will be returned to the tailings facility as sludge. Inflow rates then remain the same from the Nitrification Cell to BCR 1.

Table 3- 1: Expected Inflow Rates for Each Component of Treatment Train[1,2]

Treatment Train Component	Expected Inflow Rate (m^3/day)
Lime WTP	24,000 (up to 26,400)
Nitrification Cell	20,000 (up to 24,000)
BCR #1	20,000 (up to 24,000)

1) from the original design by Alexco and Contango in July 2019 (Rainy River Mine – Water Treatment Train Design Report, Document # 053_0719_20B).
2) historical flow rates are in the range of 14,000-17,000 m^3/day for the Lime WTP.

Normal operating conditions for the Water Treatment Train requires functional operations of all required equipment. This includes pumps, pipelines, and valves to transport water from the TMA to

the lime water treatment plant (WTP), and the internal infrastructure between the WTP and the individual nitrification cells and BCRs. This process relies on power supply.

Normal conditions also require availability of key personnel to perform monitoring of the treatment process. This includes personnel in the WTP as well as the Environmental Department to collect samples and monitor discharged water to the various cells (nitrification cells and BCR) and to the WMP.

Upset conditions for the Water Treatment Train include flow restrictions or inadequate discharge water quality. Flow restrictions could be caused by build up of debris or sediments preventing water from flowing effectively through each cell, ineffective or blocked pipelines, damaged or non-functioning pumps and valves, lack of key personnel, and lack of required materials as mentioned above.

As the result of excessive PAW in TMA, BCR #2 is converted to treated PAW. Pipeline size and pumping rates, operation criteria etc. to be written by EOR.

3.4.1.2 WMP

Water in WMP is pumped to the mill via a 24” diameter pipeline and to the Outflow Basin via a 24” diameter pipeline.

Water can be discharged to the Outflow Basin when there is sufficient flow in the Pinewood River, which typically occurs between May and October. To facilitate storage of freshet inflows, water levels in the WMP should be drawn down as much as possible for the end of April each year by discharging through ELD1 and EDL2.

Discharge to the Outflow Basin can occur based on the following conditions (MECP ECA #7004-BC7KQ5):

- Treated effluent shall only be discharged to the Pinewood River via EDL1 and/or EDL2 seasonally. No water shall be discharged after December 1st of each year until spring melt when the Pinewood River is largely ice free and meets the minimum flow threshold (Condition 4(8))

- No treated effluent shall be discharged via EDL1 and/or EDL2 or any other means unless the Pinewood River is flowing at 10,000 m³/day or greater as measured at hydraulic station H1 (formerly site 19) unless specified by the District Manager, in writing (Condition 4(9)).

- The Environmental Department is responsible for collecting samples and approving discharge. Samples are also collected during discharge to monitor for approaching and exceedance of effluent criteria. The Environmental Department shall control the combined effluent discharge rate from EDL1 and EDL2 such that at all times the ratio of the combined effluent flow rate to the flow rate of the receiver at hydrometric station H1 (i.e., the flow rate of the Pinewood River downstream of the McCallum Creek confluence) is less than or equal

to 1:1 (i.e. the cumulative flow rate of the effluent must be less than or equal to the flow rate in Pinewood River at station H1) (Condition 4(10))

- The Owner shall ensure that the discharge at EDL2 is prioritized. The Owner shall only discharge from EDL1 if there is not sufficient flow in the receiver (i.e., Loslo Creek) for EDL2. (Condition 4(11)).

- Discharge from the discharge point does not exceed the respective daily and monthly average objectives and limits listed in Section 5.6.2, Table 5-4 (Condition 5 and 6).

- Discharge samples are collected for the effluent parameters at the monitoring frequencies listed Section 5.6.2 Table 5-3 (Condition 8(2) and 8(3))

- The Owner shall operate and maintain the Works such that the effluent is non-acutely lethal to Rainbow Trout and Daphnia magna by ensuring that each Rainbow Trout acute lethality test and each Daphnia magna acute lethality test performed on any grab sample of effluent shall not result in >50% mortality of the test organism in undiluted final effluent (i.e., 100% effluent).

The Mill reclaim priorities are discussed in Section 3.3.2.

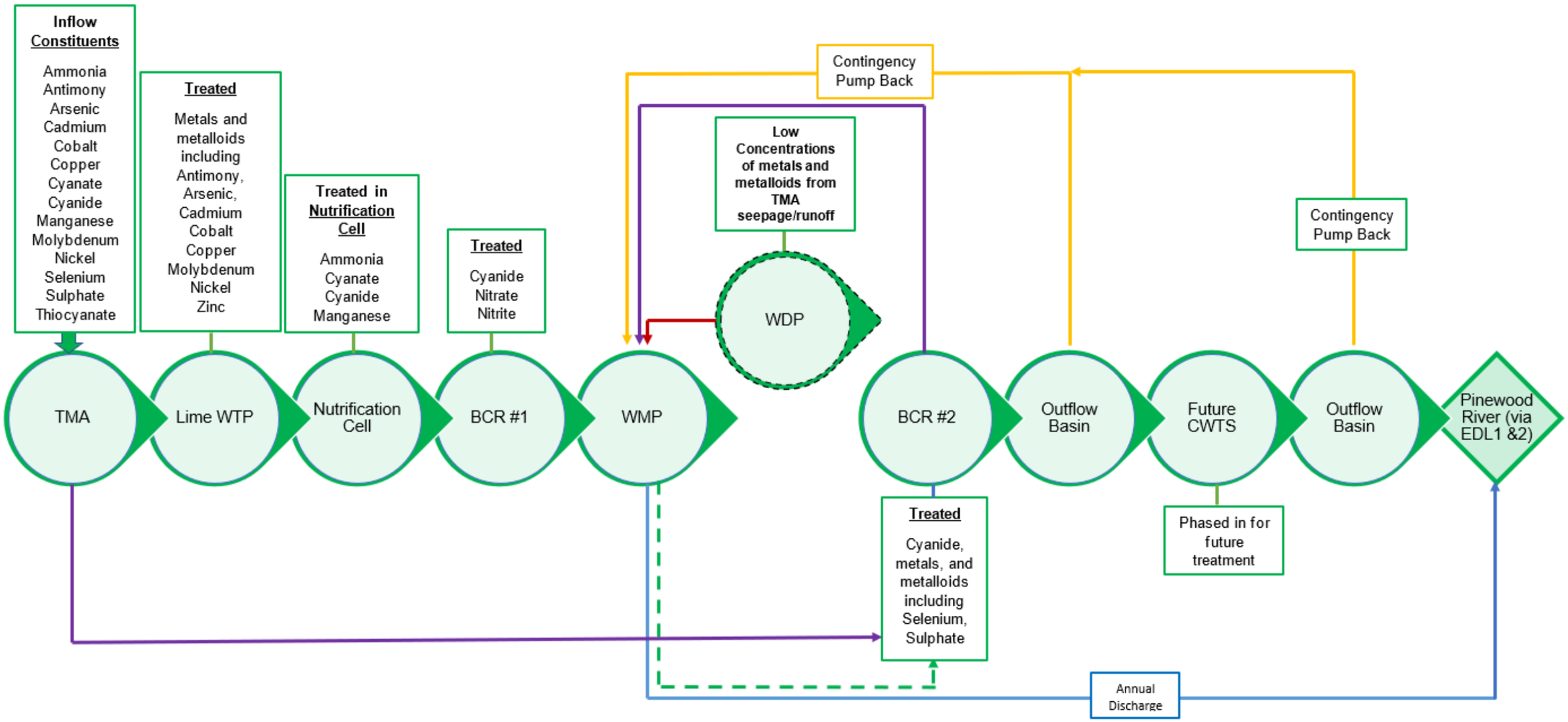
The capacity of the pumping systems from WMP are summarized below:

- Pump from WMP to Outflow Basin at a rate of up to 1,500 m^3/hr.
- Pump from WMP to Mill at a rate of up to 800 m^3/hr.

WMP operation logic is shown in Appendix C.

3.4.1.3 From PAW to Treated Water to Discharge

Water treatment has been constantly adjusted to adapt to the site water storage conditions because of 2022 Spring freshet event. Figure 3- 1 presents the most recent flowchart of water treatment and discharge.



Note: Constituents targeted for treatment are indicated at each treatment step in the water treatment system. This chart is modified from the original design by Alexco and Contango in July 2019 (Rainy River Mine – Water Treatment Train Design Report, Document #053_0719_20B) to reflect the actual operation situation up to date Mar. 17, 2023.

- Green arrow represents annual discharge from BCR #1, while the dotted arrow represents optional bypass of the WDP.
- Brown arrows represent pump back available as a contingency.
- Purple arrows represent regular operation flow process.
- Blue arrow represents WMP direct discharge to Pinewood River
- Red arrow represents current operation of WDP

Figure 3- 1: Water Treatment and Discharge

3.4.2 Mill Makeup Water Operations

Water for use in the mill is collected from the SRP, MRP, NRP, WMP and the TMA. Most flows are pumped as reclaim from the TMA.

The Mill reclaim is prioritized to maintain water levels below the NOWL in the NRP, SRP, MRP, WMP and TMA. The Mill reclaim sources are decided by Mill Operations on a weekly basis, based on current water levels and water balance projections provided by the Environmental Department during the weekly meeting.

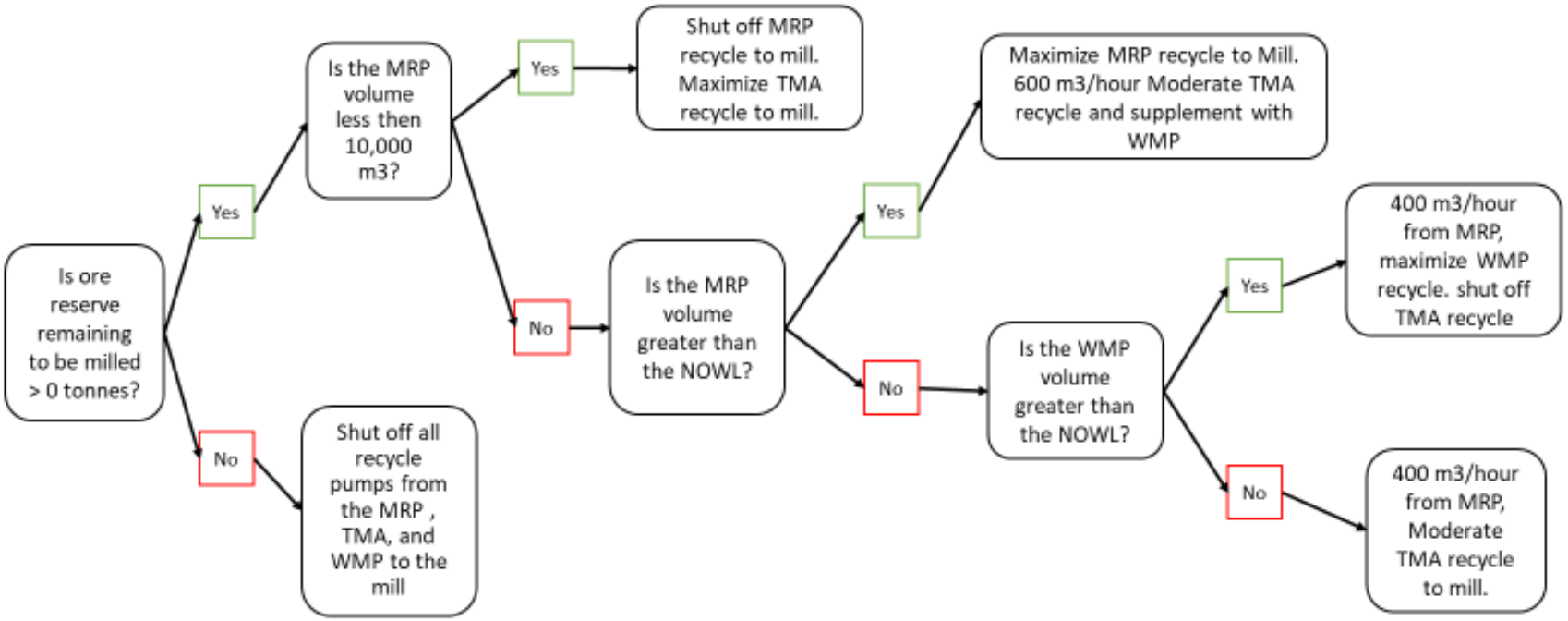


Figure 3- 2: Mill Water Reclaim Logic

Note: This water reclaim logic needs update to reflect the following:

- MRP stops at 100,000 m^3 and not 10,000 m^3. Underground operation requires 100,000 m3 to be available during operations.
- As MRP isn't winterized so is drawn down before winter.
- TMA is prioritized.
- WMP is kept at elevated levels over winter so we can discharge as soon as possible in the spring.

3.4.3 Contacted Water Management

Contacted water operation logic is shown in Appendix C. This section provides details.

3.4.3.1 Sediment Pond 1 Operations

Water in Sediment Pond 1 can be discharged to the West Creek Diversion (via Sediment Pond 1 permitted discharge location) or pumped via a 16" diameter pipeline to either the WMP, or Sediment Pond 2 or the TMA, depending on the quality of water in the pond.

- If water quality does not exceed the respective daily and monthly average objectives and limits listed in Section 5.6.2, Table 5-4, it can be discharged to either the WMP or West Creek Diversion
    - The discharge rate to the splash pad upstream of West Creek Diversion shall be always controlled such that the ratio of the flow rate of the effluent to the flow rate of the receiver (West Creek Diversion) is less than or equal to 1:5 (i.e., the flow rate of the effluent must be less than or equal to 17% of the total flow rate in West Creek Diversion after mixing).
    - All other flows (more than the allowable discharge rate to the splash pad) shall be pumped to WMP.
- If water quality does not meet the discharge limits in Section 5.6.2, Table 5-4, it is pumped to the TMA.
- Discharge samples are collected for the effluent parameters at the monitoring frequencies listed in Section 5.6.2, Table 5-3.
- The Owner shall operate and maintain the Works such that the effluent is non-acutely lethal to Rainbow Trout and *Daphnia magna* by ensuring that each Rainbow Trout acute lethality test and each Daphnia magna acute lethality test performed on any grab sample of effluent shall not result in >50% mortality of the test organism in undiluted final effluent (i.e., 100% effluent).

The capacity of the pumping systems from Sediment Pond 1 are summarized below:

- Pump from Sediment Pond 1 to TMA at a rate of up to 400 m^3/hr
- Pump from Sediment Pond 1 to Sediment Pond 2 at a rate of up to 600 m^3/hr
- Pump from Sediment Pond 1 to WMP at a rate of up to 400 m^3/hr
- Pump from Sediment Pond 1 to West Creek Diversion at a rate of up to 700 m^3/hr.

3.4.3.2 Sediment Pond 3 Operations

Sediment Pond 3 is pumped to Sediment Pond 2.

The capacity of the pumping system from Sediment Pond 2 are summarized below:

- Pump from Sediment Pond 3 to Sediment Pond 2 at a rate of up to 600 m^3/hr.

3.4.3.3 Sediment Pond 2 Operations

Water in Sediment Pond 2 is pumped to the splash pad, which discharges to the Pinewood River, or pumped via a 16" diameter pipeline to either the TMA or the WMP, depending on the quality of water in the pond.

- If water quality does not exceed the respective daily and monthly average objectives and limits listed in Section 5.6.2, Table 5-4, it can be discharged to either the WMP or to the splash pad upstream of the Pinewood River
    - The discharge rate to the splash pad shall be always controlled such that the ratio of the flow rate of the effluent to the flow rate of the receiver (Pinewood River) is less than or equal to 1:10 (i.e., the flow rate of the effluent must be less than or equal to 10% of the total flow rate in Pinewood River after mixing).
        - ***Note that an exception has been granted to the discharge permit to allow the effluent ratio to be 1:1 (i.e., the flow rate of the effluent must be less than or equal to the total flow rate in Pinewood River prior to mixing), as long as water quality meet CCME and PWQG criteria.***
    - All other flows (more than the allowable discharge rate to the splash pad) shall be pumped to WMP.
- If water quality does not meet the discharge limits in Section 5.6.2, Table 5-4, it is pumped to the TMA.
- Discharge samples are collected for the effluent parameters at the monitoring frequencies listed in Section 5.6.2, Table 5-3.
- The Owner shall operate and maintain the Works such that the effluent is non-acutely lethal to Rainbow Trout and *Daphnia magna* by ensuring that each Rainbow Trout acute lethality test and each Daphnia magna acute lethality test performed on any grab sample of effluent shall not result in >50% mortality of the test organism in undiluted final effluent (i.e., 100% effluent).

The capacity of the pumping systems from Sediment Pond 1 are summarized below:

- Pump from Sediment Pond 2 to TMA at a rate of up to 400 m^3/hr
- Pump from Sediment Pond 2 to WMP at a rate of up to 500 m^3/hr
- Pump from Sediment Pond 2 to splash pad upstream of Pinewood River at a rate of up to 500 m^3/hr.

3.4.3.4 Mine Rock Pond Operations

Water in Mine Rock Pond (MRP) is pumped to the mill via a 20" diameter pipeline, or to either the TMA or the WMP via a 16" diameter pipeline.

The capacity of the pumping systems from MRP are summarized below:

- Pump from MRP to TMA at a rate of up to 700 m^3/hr
- Pump from MRP to WMP at a rate of up to 700 m^3/hr
- Pump from MRP to Mill at a rate of up to 800 m^3/hr
- Pump from MRP to BCR2 at a rate of 415 m^3/hr (10,000 m^3/day)

3.4.3.5 South Runoff Pond Operations

Water in the South Runoff Pond (SRP) is pumped via a 10" diameter pipeline to either the mill or the MRP.

The capacity of the pumping systems from SRP are summarized below:

- Pump from SRP to MRP at a rate of up to 700 m^3/hr
- Pump from SRP to Mill at a rate of up to 375 m^3/hr.

3.4.3.6 North Runoff Pond Operations

Water in the North Runoff Pond (NRP) is pumped via an 8" diameter pipeline to the Mill.

The capacity of the pumping system from NRP are summarized below:

- Pump from NRP to Mill at a rate of up to 100 m^3/hr.

3.4.3.7 Open Pit Sumps

Water in the Open Pit is collected in a series of sumps and pumped to either the TMA, the SRP, or the MRP. There are two internal dewatering systems located within the Open Pit (280 Bench and Phase 4) and two external dewatering systems located along the perimeter of the Open Pit (Roen Sump and North Ditch Sump). The 280 Bench system can discharge to the TMA as well as the SRP.

The capacity of the pumping system from the Open Pit are summarized below:

- 310 North tank – TMA : max flow 570-600 m^3/hr
- 310 South tank – TMA : max flow 570-600 m^3/hr
- 280 sump east line – South Pond : 550-580 m^3/hr
- 280 sump west line – South Pond : 550-580 m^3/hr
- Phase 4 – Mine Rock Pond : 350-385 m^3/hr

3.4.4 Pumping Elevations

The elevations to initiate pumping and enhance pumping capacities to avoid spilling at sumps and ponds are presented in Table 3- 2.

Table 3- 2: Pond and Sump Level Monitoring

Type	Location	Status	NOWL	MOWL	TRIGGER	ALERT
Sump	SDSC1	Not installed	353.0	355.5	353.5	354.9
	SDSC2	Not installed	353.5	354.6	354.0	354.3
	NDSC3	Not installed	360.5	363.7	361.0	362.8
	NDSC4	Not installed	366.5	370.2	366.5	369.6
	NDSC5	Installed	368.0	371.0	367.9	370.4
	MRP Ditch	Not installed	TBD	TBD	349.0	349.3
	EDP4	Not installed	355.5	357.0	356.4	357.0
	EDP5	Not installed	358.0	359.5	358.5	358.9
	WMP1	Not installed	359.5	362.1	360.0	361.8
	WMP2	Not installed	358.0	360.2	358.5	359.9
	ICS Sump	Installed	375.0	377.0	374.0	376.1
	WDS	Not installed	368.0	TBD	367.9	369.9
	Sediment Pond 3	Installed	344.6	345.0	342.6	344.1
Pond	South Runoff Pond	Installed	362.8	362.9	361.3	362.0
	TMA	Installed	372.8	373.3	N/A	372.8
	WMP	Installed	369.7	370.5	366.7	369.7
	MRP	Installed	356.8	358.9	353.8	356.8
	Stockpile Pond	Installed	372.2	DSI=375	N/A	375.0
	West Creek Pond	Installed	360.9	DSI=364.5	N/A	364.5
	Sediment Pond 1	Installed	352.7	353.7	351.2	352.7
	Sediment Pond 2	Installed	347.2	348.0	344.2	347.2
	WDP	Installed	352.5	354.2	351.5	353.3
	Clark Creek Pond	Installed	378.75	379.8	N/A	N/A
	Teeple Pond	Installed	378.5	378.6	N/A	N/A

Notes:

- NOWL and MOWL: see CRW3295-4910-DT00-MEM-0007.001 for sumps. See Table 4-2, Part I of this Manual for ponds.
- Trigger Level is the water level to initial pumping if there is. Alert Level is the water level to increase pumping capacity.
- Table is dated May 21, 2023. To be updated after completion of installation.

3.4.5 Discharge Criteria

See Section 4 of ECA (2290) for the operation and maintenance requirements of the Works and related equipment and appurtenances which are installed or used to achieve compliance with the Approval (ECA, 2290) are properly designed, constructed, operated, and maintained.

Section 5.6.2, Table 5-4 presents the respective daily and monthly average concentration objective for effluent discharges from EDL1, EDL2, Sediment Pond 1, and Sediment Pond 2.

3.4.6 Roles and Responsibilities

RRM Environment

See OMS Part 1, Section 3.2, Table 3 for Environment Manager contact information. The Environmental Department is responsible for the following:

- Monitor pond water levels, volumes, and projections.
- Identify need for pond drawdown and inform Mill Operations on reclaim priorities.
- Maintain hydrometric stations and calculate daily Pinewood River and West Creek Diversion flows.
- Monitor site contacted water and treated effluent quality for compliance with daily and monthly average objectives and limits listed in Section 5.6.2, Table 5-4 prior to discharge
- Identify on-site water routing based on water quality (e.g., Sed Pond 1 to TMA or Sed Pond 2; TMA seepage collection sumps to TMA or WMP)
- Notify Environment and Climate Change Canada of planned discharge dates and cessation of discharge.
- Conduct discharge sampling for parameters at the frequencies listed in Section 5.6.2, Table 5-3. Report on daily and monthly average discharge quality and maintenance of records
- Discharge and inter-pond conveyance volume calculations and maintenance of records
- Daily discharge report with allowable discharge volume by final discharge point and cumulative discharge statistics

RRM Mill

- Discharge the allowable volume at final discharge points EDL1 and EDL2 as indicated in the daily discharge report.
- Ensure flow meters and inline temperature and pH probes are always functioning during discharge and make the data available if not accessible.
- During active tailings deposition, the Mill is responsible for inspecting the tailings lines at a frequency established in Table 5- 5, Section 5.8.
- Report any incidents relating to discharge and associated infrastructure to the Environment Department immediately.

Site Services

- Discharge the allowable volume at final discharge points Sediment Pond 1 and Sediment Pond 2 as indicated in the daily discharge report.
- Ensure flow meters are always functioning during conveyance and discharge and provide pumping records.
- Site services is responsible for inspecting the active water lines at a frequency established in Table 5- 5, Section 5.8.
- Report any incidents relating to discharge and associated infrastructure to the Environment Department immediately.

3.5 Operation Changes and Upsets

3.5.1 Summary of Operation Changes

3.5.1.1 MRP to WMP

MRP water to TMA. Excessive water reported to TMA during 2022 Spring freshet generated a need to treat MRP water, and store in WMP before discharge to environment. A pilot project conducted by contractor involving pumping MRP water to BCR #2 for treatment at max. 10,000 m^3/day before sending to WMP was successful and accepted by MCEP in August 2022. NG Environment amended ECA (2290) in winter 2022 to allow this change permanently when needed.

3.5.1.2 TMA to BCR2

One of the water management priorities identified for 2023 is to reduce the TMA pond volume by pumping TMA water to BCR #2 for treatment and then store in WMP before discharge. This operation change was accepted by regulator according to the Limited Operational Flexibility clause in the ECA 2290 as a Pilot Project and will be implemented once BCR #2 is ready for restart.

3.5.2 Operation Upsets

The operations are sensitive to water balance and water quality in discharges. The following are contingencies based on water management and functioning of the diversions.

Two contingency plans have been developed as part of MECP approvals for water treatment:

- Pinewood River Quality Contingency Plan, Version 1 August 2016
- Groundwater and Surface Water Contingency Plan, Version 2 October 2015

Contingency options are to limit discharges, acceleration of TMA dam raises, add water quality treatment, additional monitoring, provision of water to affect areas and increased mixing ratios/improved mixing. The trigger for implementation of contingency in surface water is if protection of aquatic life criteria is not achieved 90 % of the time. The trigger for contingencies in groundwater is if water quality parameters exceed background metals concentrations in groundwater at the mining lease boundary or groundwater wells outside of the zone of influence are affected.

3.6 Reporting

The environmental approvals and permits received from the government are maintained by the New Gold Environmental Department. They should be referred to for details of monitoring, inspection, and reporting requirements. Permitting, reporting, and monitoring information is available on the Environmental Department SharePoint site and is available for all employees to access.

Records are retained consistent with IACC condition 11 for a minimum of 25 years or until decommissioning ends, whichever is longer and kept locally. This exceeds the ECA permit requirement of 5 years. Records include place/date/time of sampling, dates and analysis performed, analytical techniques used, names of persons collecting/analyzing samples and results of analysis.

3.6.1 Routine

Below is a list of routine reporting requirements:

- Submission of as-builts within 3 months of construction for any major part of the ECA permitted Works, i.e., WMP, TMA, MRP, Sediment ponds 1 and 2, etc.
- Monthly performance report including an overview of the success and adequacy of the Works, summary of all non-routine calibration/maintenance procedures, tabulation and description of any bypass/upset conditions, a summary of all effluent monitoring data collected, other relevant information including QA/QC measures and occurrences requiring implementation of an investigation, contingency or remedial action plan, and a summary of all modifications completed as a result of Schedule B of the ECA to MECP
- Quarterly electronic effluent monitoring reports to MECP
- Annual reporting to MECP on March 31 for the previous year, a works performance report, and a surface water monitoring report
- Quarterly electronic effluent monitoring reports to ECCC
- Annual electronic effluent monitoring report and environmental effects monitoring reports to ECCC by March 31

3.6.2 Non-routine

Below is a list of non-routine (event driven) reporting requirements:

- Report all spills as defined in the Environmental Protection Act immediately to spills action centre SAC, follow New Gold Incident Reporting Guidelines, and follow up in writing to MECP within 10 days describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

- In the event an effluent objective is exceeded for two consecutive months as specified in condition 5 of ECA 2290-CAVKGN (stated in Section 3.3), notify the MECP in writing within seven (7) days, and submit to the District Manager, within sixty (60) days, a plan to assess the cause of the exceedance and recommend actions to address potential impact.

- In the event of a non-compliant event, including an exceedance of daily or monthly average limits, pH outside of 6-9.5 or an acute toxicity failure, notify the MECP as soon as reasonably possible, followed by a written report within seven (7) days. Within fifteen (15) days of a toxicity test failure, the Owner shall submit a written report to the District Manager outlining the cause(s) of toxicity and proposed or implemented remedial measures to control toxicity a written report to the District Manager outlining the cause(s) of toxicity and proposed or implemented remedial measures to control toxicity.

- Any observation of sheen/foam/settable solids within the works report immediately to MECP immediately and followed by a written report within 7 days.

- Any exceedance of effluent limits report to SAC immediately, written confirmation to MECP within 7 days

- Notify ECCC immediately if MDMER Schedule 4 limits are exceeded, pH is outside 6-9.5 range or if the effluent is acutely lethal, followed by a written report without delay (when most results are available)

3.6.3 Operation Report

A monthly Water Balance Update Memo is prepared by the Senior Water Resource Engineer or designate. The report includes metrics and information collected as part of normal operation. Examples of information contained in the Operations report include:

- Total monthly tailings deposition tonnage and slurry water volume
- Total monthly reclaim volume
- Pond level and freeboard
- Updated water balance
- Water quality results
- Discharge quantities.

4.0 MAINTENANCE

4.1 Type and Procedure

Preventative Maintenance, also called Routine Maintenance, is the planned, recurring maintenance activities conducted at a fixed or approximate frequency and not typically arising from results of surveillance activities.

Predictive Maintenance is the pre-defined maintenance conducted in response to results of surveillance activities that measure the condition of a specific component against performance criteria.

Event-Driven Maintenance, also called Corrective Maintenance, is in the event of unusual conditions or incidents that require immediate maintenance actions.

Maintenance records are retained by NGI teams who perform the work in accordance with the procedures described in this document. The teams are Site Service, Mill, Environment and Capital Projects. The maintenance flowchart is illustrated in Figure 4- 3.

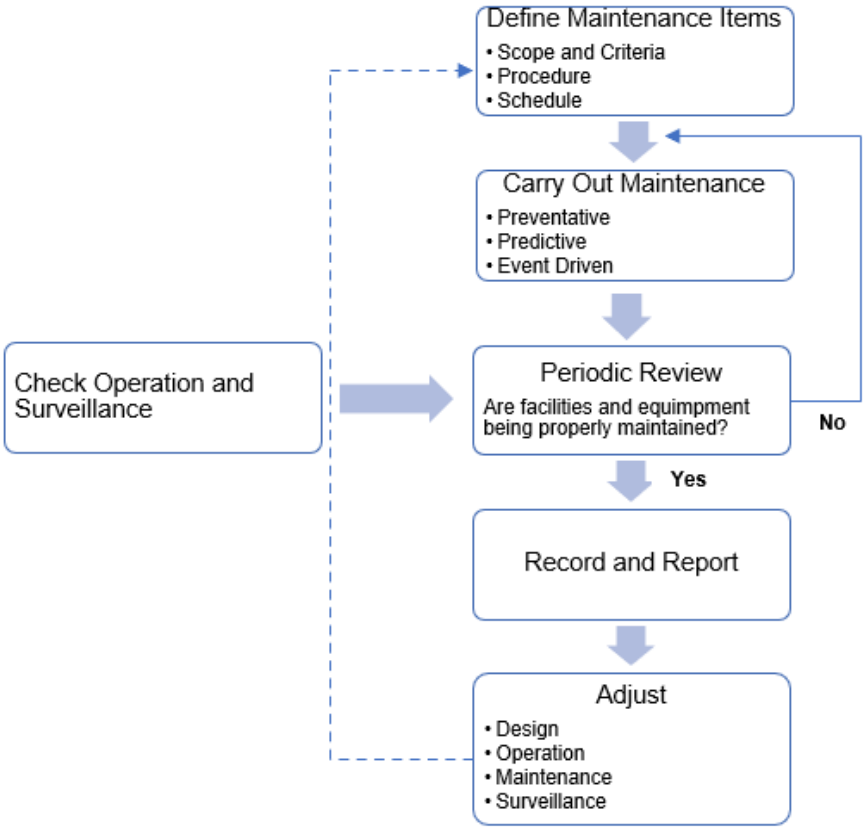


Figure 4- 3: Maintenance Flow Chart

4.2 Preventive and Predictive Maintenance

Preventive and predictive maintenance includes removal of vegetation, beaver dams, ice blockage or sediment accumulation that would otherwise affect the performance of a structure when required.

4.2.1 Pumps

The maintenance of pumps is the responsibility of New Gold Site Services and maintenance records are required to be maintained. Each installation is required to be equipped with spill tray and spill kits. Changes to pumping configurations, ditching, piping, or operating parameters need to be approved by the New Gold Mill Manager, the New Gold Maintenance Manager, and the New Gold Environmental Manager, during normal working hours. This is particularly the case if splash pads need to be altered in any way.

Maintenance of the water discharge pumping systems includes:

- Perform regular performance tests on pumps
- Perform annual calibration and maintenance as required on flow meters
- Remove accumulated debris from valves, reducers and off takes
- Carry out maintenance as recommended by fitting and valve suppliers
- Regularly inspect major wear components
- Maintain and replace system instrumentation as required

Pumps are inspected daily by Site Service.

4.2.2 Discharge Lines

During discharge, active lines including culverts and spillways require daily inspections. All water discharge lines are the responsibility of Site Services to maintain and inspect.

Maintenance of the water discharge lines will include:

- Replace pipe work, bends and fitting components as required.
- Perform regular non-destructive testing, including for example, periodic measurement of pipeline thickness to identify areas of wear and to schedule pipeline replacement if necessary.

Pipelines are inspected daily by Site Services (Site Service to develop the ARSCI for pumps and pipelines).

4.2.3 Dam Inspection and Predictive Maintenance

Repair any deficiencies as noted in the Survey 123 online Dam Safety Inspections by related teams, such as

- Repair erosion gullies, local slumps or slides in the dam face, diversion ditches or spillway channels.

- Clearing vegetation along the diversion channels, seepage collection ditches and sumps.
- Removal of beaver dams along the diversion channels, seepage collection ditches and sumps.
- Re-grade the dam crest, as required, to prevent local ponding and direct surface runoff towards the pond.
- If annual survey determines necessary, correct dam crest, overflow spill way and diversion channel invert irregularities to avoid concentrated runoff or loss of freeboard or flood storage capacity.
- Repair/modify fish habitat features if monitoring determines they are not meeting the success criteria as per Fisheries Act Authorization 15-HCAA-00039, including dam crest/slope. The success criteria are available in Section 7.1, Table 4 of document RRP FA Offset Plan. This document is available on the Environmental Department SharePoint site.

4.2.4 Instruments

Geotechnical instrument calibration by Capital Projects and water monitoring instrument calibration by Environment.

- Periodic calibration of instruments follows manufacturer's recommendations.
- Calibration certificates will be maintained by Mill Maintenance for water monitoring instrumentation. Geotechnical instrumentation records are maintained by the Tailings Dam Engineer
- Malfunctioning or damaged instruments may require repair or replacement per manufacturer guidelines and in consultation with the EOR or approved procedure.
- Real time water level monitoring system was installed for all ponds. Calibration of the system should be carried out after the pond is ice-free.
- In the event of replacement of dam instruments, several overlapping readings of the old and new instrument are required to ensure continuity of the data records.

4.3 Event-Driven Maintenance

In the event of unusual conditions or incidents that require immediate maintenance actions but are not considered an emergency, repairs and replacement of facility components are made as required and activities are documented. RRM staff will provide a means to assess event driven maintenance needs through response action planning. Response planning is based on risk prioritization, maintenance crew mobilization or "call out" procedures, required repairs and replacement material availability. Event driven maintenance actions will follow applicable safety and performance procedures. Normal documentation and maintenance records will be maintained because of any event driven maintenance actions. Unusual conditions that require maintenance are also communicated to maintenance staff as they occur.

4.3.1 Pipeline Leaks or Breaks

In the event of a pipeline leak or break the system in question is de-energized and repaired as follows:

- Report to the Environment Department immediately, by phone call, to initiate sampling and external reporting, when required
- Inspect entire pipeline
- Repair or replace affected components
- Perform opportune and scheduled maintenance
- Repair any collateral damage caused by a leak or break
- Reclaim any disturbed areas
- Follow any spill reporting that may be required pending type of spill and following documentation procedures.

4.3.2 Earthquake Occurrence

After an earthquake, the following are undertaken:

- Notify EoR.
- Repair the damaged roads, collection ditches, emergency spillway, and diversion channels.
- Repair the slumped section of dam rockfill zones.
- Restore dam crest elevation if survey results indicate settlements.
- Clear spill and repair the disturbance to the pipeline and pumps if damage is observed.

4.3.3 Flood Event

Following extreme storms (as defined in Section 5.4.1) the following are undertaken:

- Measure freeboard for compliance with design requirements
- Inspect dam, ditches, spillways, and diversions for signs of excessive erosion and repair if required.
- Inspect seepage return system for adequacy.
- Implement appropriate response based on observations/measurements as defined in this manual.

4.4 Reporting

Maintenance information will be communicated internally through formal and informal meetings, interaction between various levels of the organization (department and/or crew meetings), through information posted at the site and through this OMS Manual.

- Maintenance information is communicated as per related RASCI chart and in accordance with this Manual.
- Equipment logs, manuals and calibration records are maintained for reference and use by responsible staff.
- Maintenance diaries and logs are maintained and accessible for review by other parties.
- Dam inspection checklist is uploaded to SharePoint and the inspection log summarizing the number of inspections carried weekly and monthly will be uploaded to SharePoint as well.

5.0 SURVEILLANCE

5.1 General

The objective of the surveillance program is to provide confirmation of the adequate performance of the facility, including containment, stability, and operational function by observing, measuring, and recording data relative to potential failure modes and specific operational controls.

The surveillance at WMP dams involves:

- Visual Inspections
  - Daily pipeline inspection
  - Monthly dam inspection
  - Drone inspection when needed
  - Annual Dam Safety Inspections
- Instrumentation
- Special Inspections and Increased Levels of Surveillance
- Dam Safety Reviews

5.2 Visual Inspections

5.2.1 Pipeline Inspection

Inspection of water pipeline including pumps is conducted daily by Site Service. ARSCI chart is to be developed.

5.2.2 Dam Inspection

All water management dams are visually inspected every month end. These inspections are conducted by TDTs and other trained site inspectors and are designed to detect / observe conditions that could indicate a concern with the performance or operation of the dam.

TDTs and Trained Site Personnel shall:

- Conduct monthly inspections using Monthly Site Inspection Checklists developed by the TDE. The inspections can be conducted using the appropriate checklist on the Dam Inspection App.
- Notify the TDE of any abnormal or unusual conditions.
- Forward the completed Monthly Site Inspection Checklists to the TDE for timely review.

The TDE shall:

- Prepare and revise the Monthly Site Inspection Checklists as required.
- Review copies of the completed Monthly Site Inspection Checklists.
- Present to results of inspection to the monthly Tailings Management System (TMS) presentation.

A GIS App, Water Dams - Monthly Checklists for Water Dams, has been used for dam inspection and the number of inspections conducted is presented to monthly tailings management meetings.

5.2.3 Dam Safety Inspections

Annual dam safety inspections (DSI) are intended to be part of a more thorough review of the condition of the facility and are conducted by the EOR. The inspections will include the following key items:

- Visual inspection of the facility by the engineer, including taking appropriate photographs of the observed conditions.
- Review of routine inspection records prepared by operating personnel in the past year.
- Review whether recommendations from previous year's inspection(s) have been addressed, and any incidents or actions arising from those previous recommendations.
- Review of instrumentation and monitoring data.
- Review of water management operations of the facility including reconciliation of the annual water and mass balance. Review of pond levels (and depth) and freeboard, and reports of any incidents (and remedial measures) that may have occurred.
- An evaluation and interpretation of the structural performance of the dam and related components and identify any potential safety deficiencies or recommended items that need to be addressed in the coming year.
- Evaluation of the OMS Manual including EPRP to assess the need for updating.

The results of DSI are documented in a report. The 2023 DSI was conducted in the week of June 13. The 2024 DSI is scheduled for June. The TDE is responsible for organizing the DSI. An additional inspection will be conducted by the Dam Safety Review (DSR) consultant in the year of the DSR.

5.3 Dam Safety Reviews

CDA Dam Safety Guidelines (CDA, 2007) recommend a comprehensive dam safety review be conducted every 5 years during operations, prior to decommissioning and following closure, by a qualified 3rd party consultant. The DSR must be completed by a consultant who is free of any conflict of interest that could be caused by prior participation in the design, construction, operation, maintenance, or inspection of the dam under review.

The comprehensive review provides independent verification of:

- Safety and environmental performance of the facility.
- Adequacy of the surveillance program.
- Adequacy of delivery of OMS Manual requirements.
- Design basis with respect to current standards and possible failure modes; and
- Compliance with new engineering standards (including analysis to confirm if necessary).

The first DSR was completed in 2021 by SRK Consulting. Next DSR will be performed in year 2026.

5.4 Special Inspections and Increased Levels of Surveillance

Special and increased site surveillance is required in response to unusual or uncertain performance a structure or element or unusual operating conditions or loading is applied to the water dams. These inspections will be designed to provide a better understanding of the performance of the structure, ensure developing issues are assessed and if required, appropriate actions are taken.

A special inspection may be required by the TDE, when unusual conditions are discovered by routine site surveillance or detected by the instrumentation monitoring system, indicating possible deficient performance of a design element or elements during normal operating conditions. Special inspections are initiated and managed by the TDE. The TDE will coordinate with other resources for arranging the inspections.

Increased site surveillance is normally required when there are unusual changes in loading and operating conditions at the dam (e.g., pond surcharge, spilling) or following the occurrence of natural events (e.g., flood, earthquake). Increased site surveillance can be initiated by TDE and or Capital Project Manager.

When a special inspection and/or increased surveillance is required, the TDE shall:

- Advise the Capital Project Manager.
- Identify requirements for increased surveillance in consultation with the Capital Project Manager.
- Identify the information needed for assessment of dam safety: instrument readings, pond operations, equipment availability, visual observations, etc.
- Document the requirements for increased surveillance.
- TDE to discuss findings with the Engineer of Record.

The Capital Project Manager shall:

- Initiate special inspections and/or increased levels of surveillance during or following any major flood, earthquake, or abnormal behavior or event which may have or could damage equipment, structures or facilities affecting the safety of the dams.
- Initiate increased levels of surveillance whenever indications of potentially unsafe or deteriorating conditions (e.g., seepage, leakage, or deformation) exist.
- Maintain increased surveillance until the condition posing the threat to dam safety has been assessed and/or remediated to an acceptable condition.

Following initiation of a special inspection and/or increased site surveillance, the TDTs and Trained Site Personnel shall:

- Follow the instructions of the TDE and provide complete copies of the inspection checklist.

Appendix E contains Surveillance Response Plan (SRP) for High Pond, Post-EQ, Increase Seepage and Observed Dam Deformation.

5.4.1 Pond Surcharge

High Pond is defined as NOWL or MOWL as shown in Appendix B for all water management ponds. SRP will be initiated if High Pond is reached. The frequency of SRP will be decided by TDE/ CP Manager according to site situations.

See Appendix E1 – Site Inspection Checklist for High Pond.

5.4.2 Earthquakes

The TDE in conjunction with the Capital Project Manager and other teams will confirm the significance of the seismic event and level of response required. If the seismic event is significant, an inspection of the facilities must be conducted.

See Appendix E2 – Site Inspection Checklist for Post-Earthquake Evaluation.

5.4.3 Increased Seepage through the Dams

Unusual leakage from the dam which may indicate damage to the dams. TDE and EOR will determine a specific surveillance (SRP) for the increase seepage through the dams is required.

See Appendix E3 – Site Inspection Checklist for the Increased Seepage.

5.4.4 Observed Dam Deformation

Settlement, sinkhole/depression formation, cracking, offsets, leaking or other signs of substantial distress of the perimeter dams. TDE and EOR together with the Capital Project Manager will determine a specific surveillance (SRP) for the observed dam deformation is required.

See Appendix E4 – Site Inspection Checklist for Observation of Deformation.

5.4.5 Other Unusual Conditions

Other conditions that may require increased surveillance is included in Table 5- 1**Error! Reference source not found.**.

Table 5- 1: Other Unusual Condition for Inspection

Unusual Event	Post – Event Inspection/Surveillance
Rapid snowmelt and/or heavy rainstorms exceeding a 1:1-year, 24 hr rainfall (51 mm)	• Inspect the (visible) slopes and the crests of all the tailings dams looking for areas of concentrated runoff and erosion. • Make note of saturated ground/soft ground conditions at dam slopes and toes. • Examine dam slopes for indications of localized slumping/instability. Inspect all pump stations and pipelines.

Unusual Event	Post – Event Inspection/Surveillance
	• Check the water levels in all ponds/reservoirs against the critical levels and keep checking these levels until the pond/reservoir inflows subside. • Discuss findings with the Engineer of Record. • Check piezometric levels at dam sites if instructed to do so.
Unusually high winds (exceeding 60 kph i.e., 75 % of maximum used in design)	• Check the condition of erosion protection on the upstream slopes of the dams. • Check the instrument data relay device.
Extreme snowpack (170cm cumulative snowfall) (i.e., 120% or greater than normal snowfall at Barwick)	• Check the water levels in all ponds/reservoirs against the critical levels and keep checking these levels until the spring freshet is over. • Evaluate the situation in terms of snowmelt scenarios. • Make predictions as to the expected storage capacity available in ponds/reservoirs. • If deemed necessary, mobilize pumping and mobile treatment equipment to site.

5.5 Geotechnical Instrumentation

5.5.1 Instrumentation Data Reading Frequency

Instrument data reading and report frequency following Operation condition outlined in Table 5- 2 according to the Stage 5 Instrumentation Thresholds for TMA and Water Management Dams CRW3295-4910-DT00-MEM-0008.0001. SRK is working on Stage 5 Instrumentation Thresholds for TMA and Water Management Dams.

Table 5- 2: Data Collection and Submission Frequencies

Instrument/ Elevation	Frequency[1]
Vibrating Wire Piezometers	Online every hour update
Standpipe Piezometers	Monthly
Slope Inclinometers	Four times a year
Settlement Plates	Annually
Pond Elevations	Online every hour update
Effective Crest Elevations [2]	Annually
Effective Spillway/DiversionChannel Invert Elevations [3]	Annually

Notes:

1. Data collection frequencies may be increased or decreased by the EOR based on observed conditions. Data collection frequencies will progress from active construction, to post construction, to operations. Acceptable deviations for monthly readings are up to one-week, acceptable deviation for weekly and biweekly readings is up to one day.
2. The effective crest elevation is the lowest surveyed point along the dam crest.
3. The effective spillway/diversion channel invert elevation is the lowest surveyed elevation along the spillway/diversion channel sill.

5.5.2 Instrument Thresholds and Action Plan

The trigger level threshold indicates a value exceeding those used as a basis for meeting the design criteria. An alert level threshold indicates a more significant magnitude threshold exceedance.

These thresholds are monitored using the following instruments and methods:

- Piezometers, which are used to monitor the PWP within the embankment and foundation materials.
- Slope inclinometers (SI), which are used to monitor soil deformation within the embankment and foundation materials.
- Survey equipment, which is used to monitor effective crest and effective spillway/diversion channel elevations.

5.5.2.1 PWP Thresholds

Trigger levels are assigned to instruments within the Water Management Dams.

Trigger Levels: measured PWP exceeds maximum fill elevation at tip location.

Thresholds for water management dams is same as Stage 5 as presented inCRW3295-4910-DT00-MEM-0008.0001.

5.5.2.2 SI Thresholds

Slope inclinometers have been installed to monitor embankment and foundation soil displacement. The four out six SIs' reading frequency have been reduced four times a year. Deformation thresholds were based on CRW3295-4910-DT00-MEM-0008.0001, dated June 9, 2023.

- Trigger:
  - Rate of total displacement greater than 5 mm/quarter, or
  - Readings indicating the potential of developing discrete shear deformation zone, or
  - Increasing displacement rate over 3 consecutive readings

- Alert: One or more of:
  - Rates of displacement that accelerate above 0.2 mm/day within a discrete deformation zone.
  - Blockage of the slope inclinometer casing due to lateral deformation.
  - Evidence of movement between multiple lateral deformation measurement devices.
  - Unusual visual observations on the dam or buttress including vertical heave, cracking, lateral displacement of rockfill, or other signs of potential instability.

5.5.2.3 Dam Settlement Threshold

Settlement thresholds were developed to monitor the settlement along the dam crest and between the dam crest and spillway invert (CRW3295-4910-DT00-MEM-0008.0001).

- The total settlement trigger level is defined as an effective crest/invert elevation 0.10 m lower than the design elevation.
- The total settlement alert level is defined as an effective crest/invert elevation 0.20 m lower than the design elevation.
- The differential settlement trigger level is defined as a reduction of a crest to invert vertical elevation difference of 0.05 m or more from the design.
- The differential settlement alert level is defined as a reduction of a crest to invert vertical elevation difference of 0.10 m or more from the design.

The dam crest elevations and spillway invert elevations are shown in Part I of this Manual. Survey of the dam crest and spillway is conducted every year in summer season.

5.5.2.4 Action Plan for Threshold Exceedance

The action plan to address exceedance of the SI thresholds is shown in Figure 5- 1. The action plan for dam settlement is same as that for TMA dams as shown in Figure 5-4, Part II.

5.6 Environmental Monitoring

Environment monitoring at RRM includes water level monitoring, flow monitoring and water quality monitoring at rivers and or water conveyance and discharge pipelines.

5.6.1 Pond and Sump Level

Water levels in 11 ponds and 13 sumps have been or will soon be continuously monitored by the installed hydro-static pressure transducers. Pond Warning Levels (newgold.net) presents the view of water levels and updates every hour.

5.6.2 Water License Sampling and Effluent Discharge Limits

RRM site-wide Water License Sampling and Testing program by Environment Department is defined by ECA (2290).

Water quality monitoring includes water sampling at ponds, sumps, wells to monitor background levels and seepage potential. The Environment Department is responsible for water quality monitoring. The water quality data is managed in software AQUARIUS. The water monitoring locations are shown in Figure 5- 2.

Table 5- 3 provides a summary of the sampling parameters and frequency for the four final discharge points.

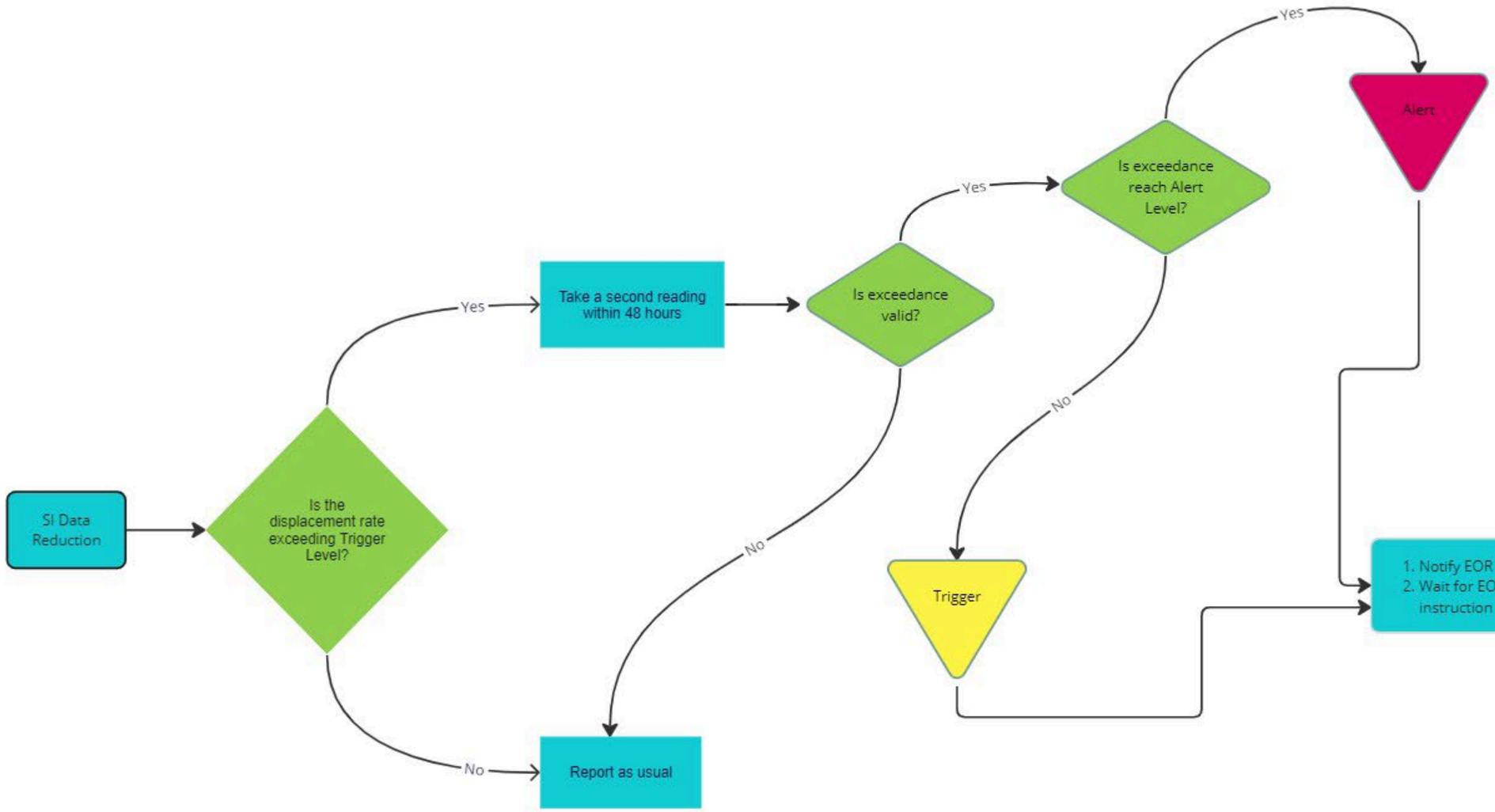


Figure 5- 1: SI Threshold Exceedance Responsibilities Workflow

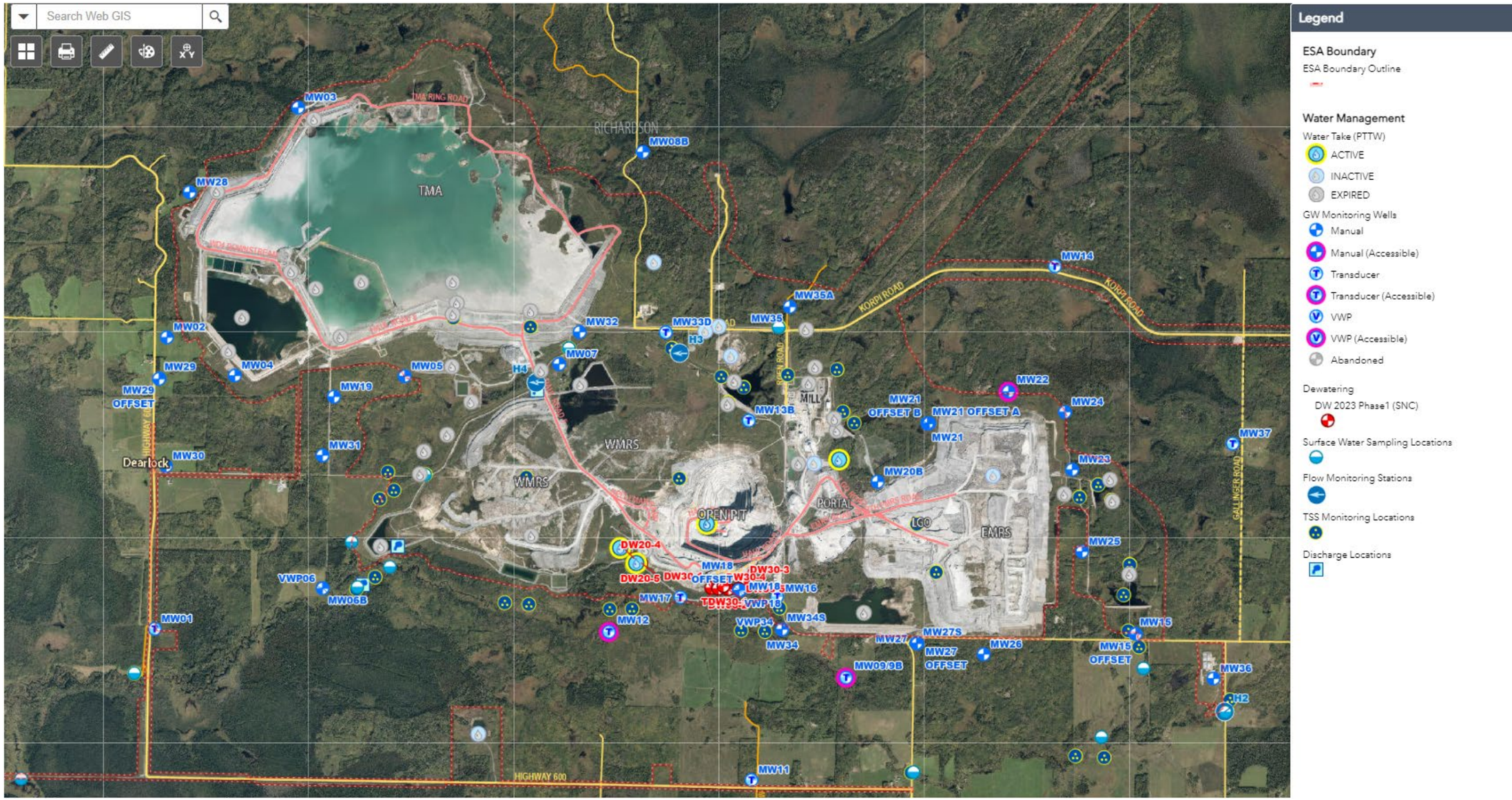


Figure 5- 2: Water Monitoring Map (GIS Viewer page dated Mar. 20, 2023)

Table 5- 3: Discharge Sampling Parameters and Frequency by Final Discharge Point

Effluent Parameter	Frequency	
	EDL1 & EDL2	Sediment Pond 1 & 2
Temperature	Continuous, Weekly	Weekly
pH	Continuous, Thrice Weekly	Weekly
Hardness	Weekly	Weekly
Alkalinity	Weekly	Weekly
Total Suspended Solids	Thrice Weekly	Weekly
Total Dissolved Solids	Weekly	Weekly
Turbidity	Weekly	Weekly
Conductivity	Weekly	Weekly
Chloride	Weekly	Weekly
Sulphate	Weekly	Weekly
Orthophosphate	Weekly	Weekly
Total Kjeldahl Nitrogen	Weekly	Weekly
Total Ammonia	Weekly	Weekly
Nitrate	Weekly	Weekly
Nitrite	Weekly	Weekly
Dissolved Organic Carbon	Weekly	Weekly
Dissolved Oxygen	Weekly	Weekly
CBOD5	Weekly	NA
E. Coli	Weekly	NA
Total Cyanide	Thrice Weekly	Annually
Weak Acid Dissociable Cyanide	Thrice Weekly	NA
Free Cyanide	Thrice Weekly	NA
Thiocyanate	Weekly	NA
Cyanate	Weekly	NA
ICP Metals	Weekly	Weekly
Radium-226 (MDMER)	Weekly	Weekly
Acute Toxicity (*Daphnia* and Rainbow Trout) (*MDMER)*	Monthly	*Monthly/*Quarterly

Table 5- 4 provides a summary of the effluent discharge limits that must be prior to and during discharge to the environment.

Table 5- 4: ECA Effluent Objectives and Limits by Final Discharge Point

Effluent Parameter	Effluent Objectives and Limits (mg/L)			
	EDL1 & EDL2		Sediment Pond 1 & 2	
	Daily Max	Monthly Avg	Daily Max	Monthly Avg
CBOD5		25		25
Cadmium		0.001		0.001
Cobalt		0.0044		0.0044
E. Coli		100/100 mL		100/ 100mL
Total Suspended Solids	30	15	30	15
Unionized Ammonia	0.08	0.04	0.2/0.4	0.1/0.2
Total Phosphorus		0.1		
Total Cyanide	0.1	0.05		
Free Cyanide	0.02	0.01		
Total Arsenic	0.034	0.017	0.034	0.017
Total Copper	0.028	0.014	0.028	0.014
Total Lead	0.03	0.015	0.03	0.015
Total Nickel	0.094	0.047	0.094	0.047
Total Zinc	0.348	0.174	0.348	0.174
Acute Toxicity (Daphnia and Rainbow Trout)	Not greater than 50% mortality in undiluted effluent			
pH	Always maintained between 6.0 and 9.5			
Radium-226 (MDMER)	1.11 Bq/L	0.37 Bq/L	1.11 Bq/L	0.37 Bq/L

To monitor background water chemistry and changes that may occur because of mining activities, the “PLAN” sets out water sampling well frequencies and targets. Should there be risks associated with seepage impacting the Pinewood River, a remediation program will be designed and implemented.

5.7 Other Surveillance

- Densometer on the tailings pipeline monitors the bulk density of tailings and can be viewed in software PARCView. The data are managed by Mill Operations.

- Flow meters on the water conveyance and discharge pipelines. Data collection is automated and managed in PARCView by the Environment Department.

5.8 Summary of Surveillance Frequency

The frequency of surveillance activities including the action owners is summarized in Table 5- 5. A table recording the visual routine inspections over the year is presented in monthly tailings management meeting.

Table 5- 5: Surveillance Frequency

Type of Surveillance		Season/Event	Frequency	Action by	Notes
Visual Inspection	Routine	Dam Inspection	Monthly	TDT, TDE	Use monthly inspection app for water dams
		Tailings line	Per shift	Mill	
		Water line	Per shift	Site Service	
	Special	Pond Surcharge	When needed	TDT, Trained Personnel, TDE	
		Earthquake			
		Seepage			
		Dam Deformation			
		Other Unusual Events			
Instruments	Routine	Daily, Weekly, monthly, annually		TDT, Trained Personnel	
Others	Pond & Sump Level	Summer	Automated Hourly	Environment	
		Winter	Manual Weekly		
	Water Sampling and Testing			Environment	See Table 5-3
	Dam Crest and Spillway Invert	Summer	Annual	Surveyor	

5.9 Reporting

The Mill Manager, Environment Manager or designated responsible party, and Tailings Dam Engineer will review collected data records from facility monitoring and assess the need for maintenance activities or response. Corrective actions will be identified and tracked to closure.

The Environmental Manager is responsible for overseeing sample and data collection and analysis. Reporting will meet MECP requirements and the annual DSI report will also be submitted to the MNDM. Reporting includes:

- An annual report based on the DSI including ECA approval requirements
- Monthly water quality monitoring report
- Annual report shall include:
    - Status of recommendations made in previous annual performance reports
    - Summary of geotechnical instrumentation performance
    - Changes in the facilities/structures from the previous year
    - Dam safety documentation status (i.e., OMS, EPRP, DSR)
    - Record of inspections conducted throughout the reporting period
    - Summary of construction planned for the upcoming year

- Operating problems and corrective actions
- Summary of calibration and maintenance works
- Use of contingency plans
- Surface water and groundwater monitoring reports including water balance
- ML/ARD updates
- Discharge volumes and quality

Additional reporting requirements may be developed as the RRM progresses.

6.0 EMERGENCY PREPAREDNESS AND RESPONSE PLAN

A detailed Emergency Response and Preparedness Plan (ERPP) is outlined in Part IV of the Manual.

APPENDIX A: Stage Storage Capacity of Ponds

Stage Storage Capacity of Ponds

Elevation (m)	Storage Capacity (m^3)										
	WMP	MRP	Sediment. Pond 1	Sediment Pond 2	WDP	Sediment Pond 3	SRP	SPD	WCD	Clark	Teeple
339.0											
339.5						76					
340.0						2,787					
340.5						7,733					
341.0				90		14,073					
341.5				192		21,754					
342.0				329		30,942					
342.5				516		41,770					
343.0				13,124		56,363					
343.5				36,359		74,091					
344.0				60,756		93,357					
344.5				86,316		113,765					
345.0				113,318							
345.5				143,756							
346.0				177,153							
346.5				218,692							
347.0				269,319							
347.5				323,362							
348.0				350,775							
348.5											
349.0											
349.5					94						
350.0			6,306		371						
350.5			32,599		804						
351.0		663	60,145		1,755						
351.5		4,036	88,966		4,971						
352.0		10,586	119,937		11,991						
352.5		23,491	153,181		23,611						
353.0		42,784	184,992		40,704						
353.5		70,008			65,885						
354.0		105,271			99,512						
354.5		150,890									
355.0		211,522									
355.5		292,193									
356.0		394,474									
356.5		518,391									
357.0		667,637									
357.5	23,264	843,452							952		
358.0	40,389	1,041,849					13		5,172		
358.5	71,365	1,263,263					59		13,422		
359.0	124,949						310		26,712		
359.5	196,414						1,655		45,327		
360.0	285,178						4,121		72,037		
360.5	387,609						8,046		112,686		
361.0	502,079						19,343		162,507		
361.5	631,392						32,005		221,529		
362.0	777,359						45,991		291,071		
362.5	940,075						61,292		374,901		
363.0	1,126,879						77,862		475,551		
363.5	1,334,825								589,771		
364.0	1,559,191								713,997		
364.5	1,797,627								847,745		
365.0	2,051,970								991,870		
365.5	2,326,151										
366.0	2,617,395										
366.5	2,922,156										
367.0	3,249,568										
367.5	3,595,409										
368.0	3,956,765										
368.5	4,336,009							1,021			
369.0	4,727,224							4,636			
369.5								11,164			
370.0								19,261			
370.5								29,927			
371.0								43,004			
371.5								58,142			
372.0								75,291			
372.5								97,004			
373.0								119,921			
373.5								145,326			
374.0								173,839			
374.5								207,010			
375.0								246,922			
375.5								295,428			
376.0											
376.5										333	1,480
377.0										816	5,962
377.5										3,724	15,286
378.0										7,814	40,184
378.5										13,328	80,587
379.0										27,526	136,842
379.5										58,833	
380.0										216,399	

APPENDIX B: Water Storage Pond Operation Elevations

Water Storage Pond Operation Elevations

Description	Elevation (m)										
	WMP	MRP	WDP	SRP	Sed. Pond 1	Sed. Pond 2	Sed. Pond 3	SPD	WCD	Clark	Teeple
Dam Crest	371.5	360.2	355.2	363.5	354.0	348.2	345.7	375.5	364.9	380.0	379.0
IDF (Inflow Design Flood, Maximum Flood Level)	371.1	359.0	N/A		353.99	N/A	345.5	375.0(1)	364.5	379.9(2)	378.7(2)
DSI (Dam Safety Incident Level)		N/A	TBD			TBD				N/A	
EIL (Environment Incident Level)	370.5	358.9	354.2	362.9	353.7	348.0	345.0	N/A(3)		379.9	378.7
Sill / Invert of Emergency Spillway											
DSN (Dam Safety Notice Level)											
MOWL (Max. Operation Water Level)											
Pond Level for the Increased Surveillance (High Pond) (4)	369.7	356.8	354.0	362.8	352.7	347.2	344.6	N/A			
ENL (Environment Notice Level)											
NOWL (Normal Operation Water Level)								372.2	360.9	378.75	378.5
Diversion Channel Inlet Invert Elevation	N/A										
Min. Operation Water Level	363.0	352.0	As low as possible before winter								

(1) Assumed to be same as Peak Water Level at Spillway, Table 6 in Appendix C2, AMEC, Detail design, Design Brief – Water Management Dams (3098004-RPT-0015 Rev 00)
(2) Designed to be overflowed via overflow swale on crest.
(3) Designed to store PMF and pass-through diversion channel.
(4) For those designed to be overtopped, such as MRP, and freshwater dams, High Pond for SRP is assigned as MOWL/DSN/Spillway Sill. For the rest, High Pond for SRP is assigned as NOWL.

APPENDIX C: Operation Logic of Water Management Facilities

APPENDIX D: Surveillance Response Plans for Water Dams

D1 – Site Inspection Checklist for High Pond

D2 – Site Inspection Checklist for Post-Earthquake Evaluation

D3 – Site Inspection Checklist for the Increased Seepage

D4 – Site Inspection Checklist for Observation of Deformation

APPENDIX D1: SRP for High Pond

SITE INSPECTOR CHECKLIST
for WMP High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of WMP

SITE INSPECTOR CHECKLIST
for MRP High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

7. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
8. Record weather conditions: _____
9. Record Pond level_____
10. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
11. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
12. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of MRP

SITE INSPECTOR CHECKLIST
for Sediment Pond High Pond

Name:_____

Date: _____Time of arrival: _____

Pond # 1, 2, 3: _____

Inspect the condition of the dams and Spillway

13. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
14. Record weather conditions: _____
15. Record Pond level_____
16. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
17. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
18. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of Sediment Ponds

SITE INSPECTOR CHECKLIST
for WDP High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of WDP

SITE INSPECTOR CHECKLIST
for Teeple Pond High Pond

Name:_____

Date: _____Time of arrival: __

Inspect the condition of the dams and Spillway

19. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
20. Record weather conditions: _____
21. Record Pond level_____
22. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
23. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
24. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of Teeple Pond

SITE INSPECTOR CHECKLIST
for SRP High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

7. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
8. Record weather conditions: _____
9. Record Pond level_____
10. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
11. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
12. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of SRP

SITE INSPECTOR CHECKLIST
for Clark Pond High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

25. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
26. Record weather conditions: _____
27. Record Pond level_____
28. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
29. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
30. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of Clark Pond

SITE INSPECTOR CHECKLIST
for Stockpile Pond High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

Fig 1. Plan View of SPD Dam

SITE INSPECTOR CHECKLIST
for West Creek Pond High Pond

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dams and Spillway

1. From a safe vantage point check that it is safe to approach the dam. Call the Capital Project Manager if the dam is not considered safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment and depressions? YES NO
    a. If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
    a. If yes use seepage checklist to record the details of the observations.
6. Is there damage to the spillway? YES NO
    a. If yes use seepage checklist to record the details of the observations

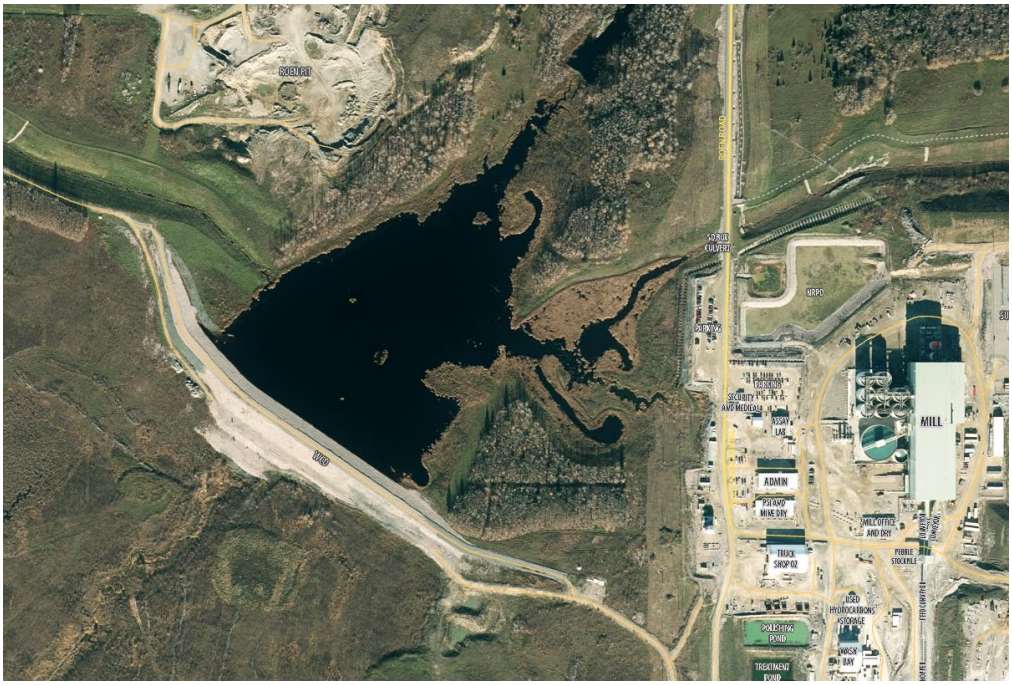


Fig 1. Plan View of WCD Pond

APPENDIX D2: SRP for Post-EQ Evaluation

SITE INSPECTOR CHECKLIST
For WMP Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of WMP Dams

SITE INSPECTOR CHECKLIST
For MRP Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of MRP Dam

SITE INSPECTOR CHECKLIST
For Sediment Pond Dam Post-EQ Evaluation

Name:_____

Date: _____Time of arrival: _____

Pond # 1, 2, 3: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of Sediment Pond Dams

SITE INSPECTOR CHECKLIST
For WDP Dam Post-EQ Evaluation

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of WDP Dam

SITE INSPECTOR CHECKLIST
For SRP Dam Post-EQ Evaluation

Name:_____

Date: _____Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of SRP Dam

SITE INSPECTOR CHECKLIST
For Teeple Dam Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of Teeple Dam

SITE INSPECTOR CHECKLIST
For Clark Dam Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of Clark Dam

SITE INSPECTOR CHECKLIST
For SPD Dam Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damage to the toe? YES NO
8. Is there damage to the side walls? YES NO

Fig 1. Plan View of SPD Dam

SITE INSPECTOR CHECKLIST
For WCD Dam Post-EQ Evaluation

Name:_____ Date: _____

Time of arrival: _____

Inspect the condition of the dam:

1. From a safe vantage point check that it is safe to approach the dam(s). Call the Capital Project Manager if the dam is not safe to approach.
2. Record weather conditions: _____
3. Record Pond level_____
4. Is there any sign of new deformation such as: cracking, slumping, change of alignment (roads, no-post barrier, and fences) and depressions? YES NO
   • If yes use deformation checklist to record details of the observations.
5. Is there any sign of new or increased seepage? YES NO
   • If yes use seepage checklist to record the details of the observations

Inspect the condition of the Spillway:

6. Is there damage to the Sill? YES NO
7. Is there damaged to the toe? YES NO
8. Is there damaged to the side walls? YES NO

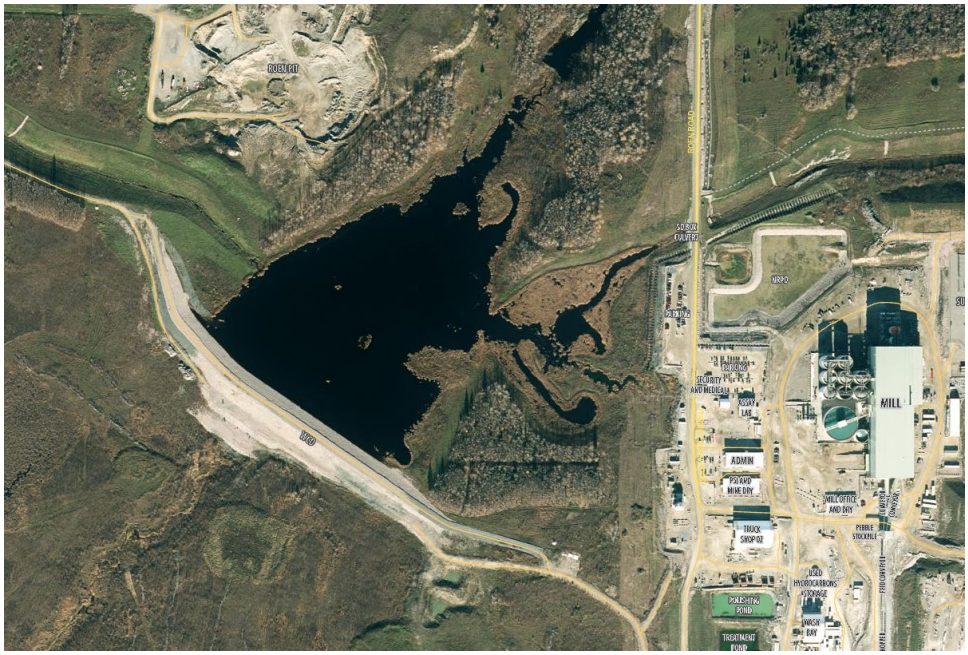


Fig 1. Plan View of WCD Dam

APPENDIX D3: SRP for Increased Seepage

SITE INSPECTOR CHECKLIST

For Increased Seepage at WMP

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of WMP Dams

SITE INSPECTOR CHECKLIST
For Increased Seepage at MRP

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of MRP Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at Sediment Pond Dams

Name:_____

Date: _____Time of arrival: _____

Pond # 1, 2, 3: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of Sediment Pond Dams

SITE INSPECTOR CHECKLIST
For Increased Seepage at WDP Dam

Name:_____

Date: _____Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of WDP Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at SRP Dam

Name:_____

Date: _____Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of SRP Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at Teeple Dam

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of Teeple Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at Clark Dam

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of Clark Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at SPD Dam

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

Fig 1. Plan View of SPD Dam

SITE INSPECTOR CHECKLIST
For Increased Seepage at WCD Dam

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the seepage area.
2. Record location of seepage below and mark on attached plan drawing.
3. Measure / estimate rate of seepage.
4. Check to see if the seepage water is “dirty”.
5. Stake out and measure area where seepage is exiting the dam.
6. Dimensions of Seepage Zone
7. Check for any erosion or sloughing in area where seepage is exiting the dam.
8. Record weather conditions: _____
9. Record pond level_____
10. Photograph seepage area
11. Call details back to Capital Project Manager.

If no further direction given by Capital Project Manager/ TDE, continue with the following:

12. Inspect the rest of the dam using the Routine Weekly Inspection Checklist. Look for signs of deformation such as:
    - Depressions
    - Cracking
    - Sinkholes
    - Changes in the alignment along the crest
13. If anything looks unusual report back to Capital Project Manager immediately.
14. Continue to monitor and record seepage at least every hour and check that there are no changes in the flow or turbidity. Report any changes in the seepage flows to the Capital Project Manager immediately.
15. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.
16. Do not leave site until Capital Project Manager instructs you to do so.

Record of Seepage

Time	Flow (L/min)	Dirty (Y or N)	Time	Flow (L/min)	Dirty (Y or N)

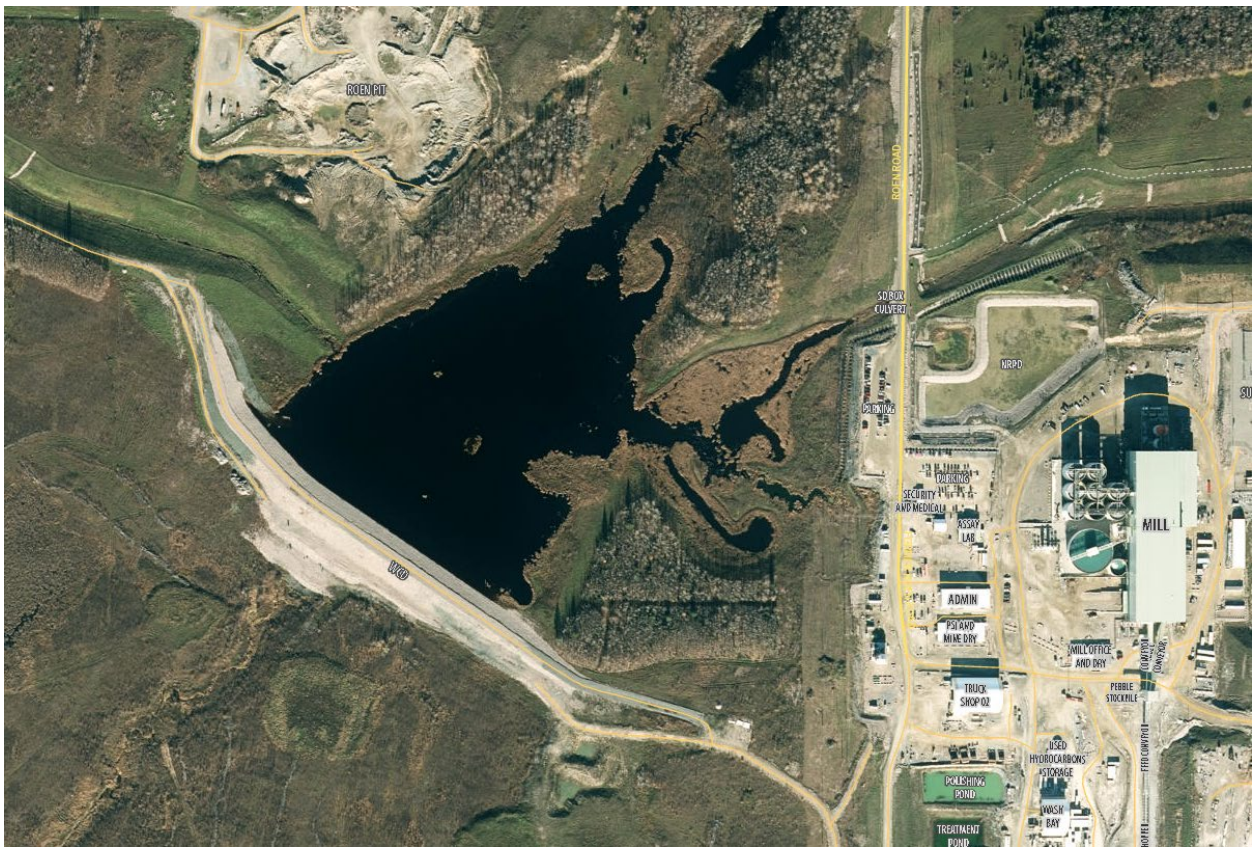


Fig 1. Plan View of WCD Dam

APPENDIX D4: SRP for Observed Deformation

SITE INSPECTOR CHECKLIST
for WMP Dam Deformation

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of WMP Dams

SITE INSPECTOR CHECKLIST
for MRP Dam Deformation

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of MRP Dam

SITE INSPECTOR CHECKLIST
for Deformation of Sediment Pond Dams

Name:_____

Date: _____Time of arrival: _____

Pond # 1, 2, 3: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

_____

_____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.

Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of Sediment Pond Dams

SITE INSPECTOR CHECKLIST
for Deformation of WDP Dam

Name:_____

Date: _____Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____
6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of WDP Dam

SITE INSPECTOR CHECKLIST
for Deformation of SRP Dam

Name:_____

Date: _____Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

_____

_____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of SRP Dam

SITE INSPECTOR CHECKLIST
for Teeple Dam Deformation

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of Teeple Dam

SITE INSPECTOR CHECKLIST
for Clark Dam Deformation

Name:_____ Date: __

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of Clark Dam

SITE INSPECTOR CHECKLIST
for SPD Dam Deformation

Name:_____ Date: __

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

_____

_____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

Fig 1. Plan View of SPD Dam

SITE INSPECTOR CHECKLIST
for WCD Dam Deformation

Name:_____ Date: _____

Time of arrival: _____

1. Check that it is safe to approach the deformed area.
2. Record Pond level_____
3. Estimate Freeboard _____
4. Record location of deformed area below and mark on attached plan drawing.
5. Deformation Type
    a. Cracking or Offset
        i. Along the crest or across the crest
        ii. Length_____Width_____of crack
        iii. Vertical offset _____
        iv. Depth of crack _____
    b. Slumping or Slide
        i. Length_____Width_____of slumped area
        ii. Vertical offset at top of slump_____
        iii. Estimated Volume
    c. Sinkhole
        i. Length_____Width _____
        ii. Depth _____
    d. Other types of deformations describe below:

    _____

    _____

6. Photograph deformed area.
7. Call details back to Capital Project Manager.
8. Once measurements are completed stake area and monitor for further movements.

If no further direction given by Capital Project Manager continue with the following:

9. Inspect the rest of the dam using the Routine Weekly Inspection Checklist.
   Look forsigns of deformation such as:

- New or increased seepage (If observed go to the Increased Seepage SRP)
- Other areas of deformation

10. If anything looks unusual report back to Capital Project Manager immediately.

11. Continue to measure and record the Length, Width etc. every hour and check that there are no changes. Report any changes in the measurements to the Capital Project Manager immediately.

12. Continue to inspect the entire dam every two hours following the Routine Weekly Inspection Checklist.

13. Do not leave site until manger instructs you to do so.

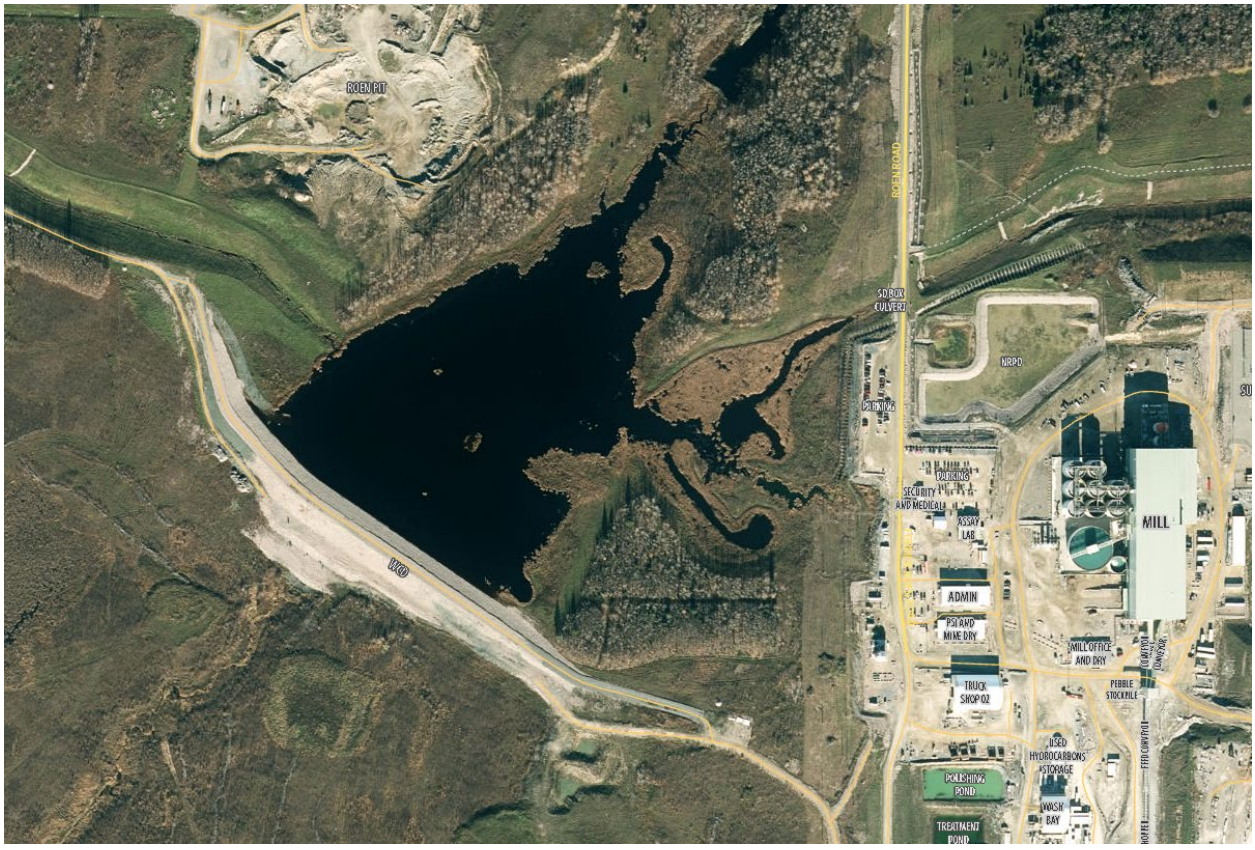


Fig 1. Plan View of WCD Dam