**RAINY RIVER MINE**

# OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL

## PART I - GENERAL

**New Gold Inc.**
**Rainy River Mine**
**5967 Highway 11/71, P.O. Box 5**
**Emo, Ontario**
**P0W 1E0**

**January 2024**
**Version 2024-1**

## Review and Revision History

The OMS Manual shall be, at a minimum, 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 dam at the time of the review. Changes of this degree would include introduction of new surveillance equipment, and monitoring processes, changes in key personnel, engineering design, water management plan, or tailings deposition plan etc. Revisions to the manual should be undertaken within six months of changes and minimum of one per year. It is the responsibility of the Tailings Dam Engineer to initiate the OMS review.

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

**Table 1 - Review Team**

| Role | Name | Company/ Department | Position | Signature | Date |
|---|---|---|---|---|---|
| **Updated By** | Taha Nadeem | Capital Projects | Tailings Dam Planner | Taha Nadeem (Jan 31, 2024 06:30 CST) | Jan 31, 2024 |
| **Reviewed By** | Travis Pastachak | Capital Projects | Capital Projects Manager | Travis Pastachak (Jan 31, 2024 07:41 CST) | Jan 31, 2024 |
| | Garnet Cornell | Environment | Environment Manager | | Jan 31, 2024 |
| | Calvin Boese | SRK Consulting | TMA Engineer of Record | | Jan 31, 2024 |
| | Michael Dabiri | SRK Consulting | WMS Engineer of Record | | Feb 14, 2024 |
| **Approved by** | Mohammad Taghimohammadi | Mill Operations | Mill Manager | Taghimohammadi | Feb 14, 2024 |

**Table 2 – Revision Summary**

| Revision Number | Details of Revision | Date of Issue | Comment |
|---|---|---|---|
| Rev. A | Issued for Internal Review | 2023-03-14 | |
| Rev. B | Issued for EOR Review | 2023-03-27 | Received on May 4, 2023 |
| Rev. 0 | Issued for Use | 2023-05-23 | |
| Rev. 1 | 2024 Updates | 2024-01-24 | MAC TSM Audit and Operational Criteria Updates |

**Table 3 – Change Log**

| Section Number | Section Title | Comments |
|---|---|---|
| 2.2 | Figure 2- 1: Organization Chart for Tailings and Water Management | Updated Org. Chart personnel for 2024:<br>*Tailings Dam Engineer – Vacant (Hiring)*<br>*Deputy Engineer of Record – Kyle Scale (Geotech)*<br>*Tailings Dam Technician – Sawyer Barton*<br>*Tailings Dam Technician – Dominic Kabinga*<br>*Water Resources Engineer – Emily O'Hara (Acting)* |
| 2.2 | Table 2- 1: Responsibilities for Named Individuals | Updated contact information as per updates to Org Chart. |
| 4.2.1 | Summary of Dam Characteristics | Removed Stage 4 operational criteria for TMA. |
| 4.2.1 | Table 4- 2: Summary of Pond Characteristics | Removed Stage 4 operational criteria for TMA. |
| 4.2.3 | Table 4- 4: Minimum Freeboard | Removed Stage 4 minimum freeboard. |
| 4.2.3 | Table 4- 5: Normal Freeboard | Removed Stage 4 normal freeboard. |
| 4.2.4 | Table 4- 7: Construction Record Reports | **Included Stage 5 Construction Records Report reference number (to be finalized). |
| 4.3.3 | Tailings Distribution System | Updated Tailings Deposition Plan document reference number. |

# Acronyms and Abbreviations

| Term | Definition |
|---|---|
| BCR1 | Biochemical Reactor #1 |
| BCR2 | Biochemical Reactor #2 |
| CDA | Canadian Dam Association |
| DSI | Dam Safety Inspection |
| DSR | Dam Safety Review |
| ECA | Environmental Compliance Approval |
| EDF | Environmental Design Flood |
| EDMS | Electronic Document Management System |
| EMRS | East Mine Rock Stockpile |
| EOR | Engineer of Record |
| EPRP | Emergency Preparedness and Response Plan |
| IDF | Inflow Design Flood |
| LRIA | Lakes and Rivers Improvement Act |
| MECP | Ministry of the Environment, Conservation and Parks |
| MNDM | Ministry of Northern Development, Mines, Natural Resources and Forestry |
| MRP | Mine Rock Pond |
| NAG | Non-Acid Generating |
| NGI | New Gold Inc. |
| NOWL | Normal Operating Water Level |
| OMS | Operation, Maintenance, and Surveillance |
| PAG | Potential-Acid Generating |
| PMF | Probable Maximum Flood |
| PMP | Probable Maximum Precipitation |
| PTTW | Permits to Take Water |
| RASCI | Responsible, Accountable, Supportive, Consulting, Informed |
| RRM | Rainy River Mine |
| SOP | Standard Operating Procedure |
| TDE | Tailings Dam Engineer |
| TDT | Tailings Dam Technician |
| TMA | Tailings Management Area |
| TSM | MAC's Towards Sustainable Mining initiative |
| TSS | Total Suspended Solids |
| WDP | Water Discharge Pond |
| WMP | Water Management Pond |
| WMRS | West Mine Rock Stockpile |
| WTP | Water Treatment Plant |
| WTT | Water Treatment Train |
| MAC | Mining Association of Canada |
| ECCC | Environment and Climate Change Canada |
| MMER | Metal Mining Effluent Regulations |
| CEAA | Canadian Environmental Assessment Act |

# Table of Contents

# 1.0 INTRODUCTION

## 1.1 Objective

The objective of this document is to provide procedures for the operation, maintenance, and surveillance (OMS) at the New Gold Inc. (NGI) Rainy River Mine (RRM), located near Emo, Ontario. This OMS Manual (the Manual) also serves as a reference for the safe operation of tailings and water management facilities.

## 1.2 Limitations

The Manual intent is to provide a comprehensive understanding of the procedures required for the operation, maintenance, and surveillance of RRM facilities. However, the Manual cannot contain all information relevant to the operation, maintenance, and surveillance of the RRM facilities. The Manual must be read in conjunction with other relevant site materials such as Plans, Guidelines, and Standard Operating Procedures which provide greater detail on their specific areas of application. These relevant documents can be found on New Gold SharePoint Document Control.

## 1.3 Manual Structure

The Manual has been separated into "Parts" based on the functions and consequence classification of the structures. Those parts are listed as below:

- **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 serial 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 (Emergency Response and Preparedness Plan)

This is Part 1: General. It describes the basic site conditions, overall facility conditions and common process of the Manual.

## 1.4 Manual Revisions

RRM is in the ongoing construction and operation stage of the life cycle of a mine. The Manual shall be a living document reviewed and updated annually by qualified persons to coincide with the annual TMA Stage Raise Letter of Conformance (LoC) at a minimum or following any significant changes on site to reflect the current condition of the tailings and water management facilities. The changes may include, but are not limited to:

- Changes to the milling process, and or mining methods,
- Design of annual TMA dam raise,
- Update of tailings management plan including deposition plan,
- Modification to existing water management facilities or procedures,
- Change of mine closure plans,
- Changes in personnel or roles referred to in the Manual, and
- Other changes that need to be addressed prior to the next scheduled review of the Manual.

Significant updates included in this revision of the OMS are as follow:

- Update to Organizational Chart and Responsibilities of Roles,
- Policy updates to include Whistleblower Policy,
- Risk Assessment and Management section added to Part II – TMA as identified in Tailings Management Area Failure Modes and Effects Analysis (FMEA) report,
- Update to Dam Classifications from 2023 Dam Safety Inspection,
- Update of Part II – TMA to link with TARPs within Part IV – EPRP (Still required),
- Post-Incident Analysis added.

Revisions to the Manual have been undertaken by NGI's RRM teams. It is the responsibility of the Tailings Dam Engineer to initiate the regular review of the Manual in a timely manner. The

review team and approval record are given in signature page of the Manual. The revision history of the Manual is shown in Table 1-1.

**Table 1- 1: OMS Manual Revision History**

| Document Number | Date | Comments | Prepared by |
|---|---|---|---|
| OMS-4000-DT00-MAN-0001 | Mar. 2016 | Final for Pre-Production | AFW |
| OMS-4000-DT00-MAN-0002 | Mar. 2017 | AC, for Operation | AFW |
| OMS-4000-DT00-MAN-0002.002 | Jul. 2017 | Issue for use for Pre-Production | AFW |
| OMS-4000-DT00-MAN-0003 | Aug. 2017 | Update based on ITRB comments and MNRF conditions for MRP and Cell 2 and 3 | NGI |
| OMS-4000-DT00-MAN-0004 | Nov. 2018 | Annual review and update including ITRB comments | NGI |
| OMS-4000-DT00-MAN-0005 | Jan. 2019 | Split to eight parts | NGI |
| OMS-4000-DT00-MAN-0006 | Feb. 9, 2021 | 2021 Issued for Review | NGI |
| OMS-4000-DT00-MAN-0007 | 2022 | • Change of tailing dam team<br>• Change of EOR<br>• Stage 4 dam raise<br>• 2022 Issued for Review | NGI |
| OMS-4000-DT00-MAN-0008 | 2023 | • Stage 5 dam raise<br>• 2023 work on water management facilities | NGI |
| OMS-4000-DT00-MAN-0009 | Dec. 2023 | • Update of OMS to reflect works completed in 2023 | SRK / NGI |

## 1.5 Regulatory Requirements

The Manual was prepared pursuant to the *MAC guidelines for Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities* (MAC, 2021, Version 2.1).

As a MAC member New Gold maintains a Tailings Management System which includes an annual internal audit review and external audit and verification process to support performance evaluation and provide opportunity for continuous improvement and feedback to inform future OMS updates. The RP is accountable for completing.

Numerous Federal and Provincial environmental approvals are required to construct, operate, and eventually reclaim the sites. Key Provincial legislation related to the RRM includes:

- Ontario Water Resources Act.
- Environmental Protection Act.

- Endangered Species Act.
- Mining Act.
- Public Lands Act and Planning Act.
- MNDMNRF Lakes and Rivers Improvement Act.

The Ministry of Natural Resources and Forestry (MNRF) historically provided oversight and permitting for the TMA dams at RRM. Regulatory oversight for mining dams (defined as offline structures) in Ontario transferred to MNDMNRF (Ministry of Northern Development, Mines, Natural Resources and Forestry) in 2021. In addition to transferring regulatory oversight, changes to the Ontario Mining Act stipulate that offline mining structures follow the Canadian Dam Association (CDA) guidelines for mining dams.

From the Federal perspective, the Fisheries Act and the associated Metal Mining Effluent Regulation are the primary regulatory instruments related to the RRM.

The primary approval(s) for construction of the various tailings and water management facilities at RRM are as follows:

- Work Permits from Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF), under the Lakes and Rivers Improvement Act (LRIA).
    - These permits approve the design of the dams and appurtenances, in accordance with the provided design drawings and report.
    - LRIA approvals are required for each annual dam raising campaign.
- Discharge of effluent (e.g., from the TMA, Tailings Management Area of RRM) is governed by the Environmental Compliance Approvals (ECAs) for Industrial Sewage Works issued under the Environmental Protection Act by the Ontario Ministry of the Environment Conservation and Parks (MECP).
    - The ECAs dictate the quality and quantity of effluent allowed to be discharged to the environment as well as other measures intended to ensure the environment is protected, as well as the overall design of the facility.
- A Closure Plan has been filed with the MNDMNRF under the Mining Act, which describes the planned development and operation of the RRM, the proposed approach to closure of the RRM, and outlines the associated financial assurance related to closure aspects.
    - This Closure Plan will be amended as required, such as any changes to the proposed operation of the TMA, or other changes to the RRM.
    - The Closure Plan primarily focuses on the physical and chemical stability of the site post-closure or during a temporary shutdown scenario.
    - Planning to date has assumed long term cover of the potentially acid generating (PAG) tailings to inhibit oxidation.

In addition to these and other regulatory approval requirements, several commitments were made regarding the RRM through the Federal and Provincial environmental assessment processes.

These commitments are maintained and tracked by the Environmental Department as the Rainy River Mine Commitments Registry.

## 1.6 Policy and Commitment

New Gold is committed to excellence in management of tailings by adopting internationally recognized standards and the Mining Association of Canada (MAC) guidelines. A copy of the New Gold Tailings, Heap Leach and Waste Rock Facilities Management Policy is provided in Appendix A. Although there is not a heap leach facility at the RRP, it is included in the corporate commitment for other New Gold sites (Site-Wide Commitment List) which have heap leach facilities.

New Gold is committed to working with local communities of interest (COI) including municipalities, neighbors, and Indigenous communities. The Rainy River Project Commitments Registry is available to all employees on the Environmental Department SharePoint site.

New Gold is committed to ensuring the safety of the tailings facility in all its stages and has ensured the protection of employees for reporting and addressing concerns through the New Gold Code of Ethics and Whistleblower Policy. A copy of the Code of Ethics and Whistleblower Policy is available to all employees (Whistleblower Policy). New Gold has implemented hotlines for making a whistleblower complaint at the following:

In Writing:

Personal & Confidential
The Chair of the Audit Committee
181 Bay Street, Suite 3320
Toronto, Ontario
Canada M5J 2T3

Hotline toll free numbers:

- Canada and United States: (833) 627-1041
- Mexico: 001-800-613-2737

Hotline online portal: https://newgold.ethicspoint.com

## 1.7 Supporting Document and Document Control

Controlled Documents are kept on the Document Control site on SharePoint in the “Controlled Documents” library and monitored by the site Document Control Specialist. This library is accessible to all New Gold employees.

All drawings from the original Engineer of Record (EOR) AMEC Foster Wheeler (AMECFW) are kept in the “AMEC E&I Drawings” library on SharePoint and on InEight Document Team Binder, which is New Gold’s electronic document management system (EDMS).

All documents and drawings from the current EOR, SRK Engineering (SRK), are kept on InEight Document Team Binder.

Processes to manage change are captured within the Management of Change Process (SAF-MOC-PRO-0001) to maintain the integrity of the tailings facility and management system.

The supporting documents for this revision of the Manual are listed in Table 1- 2. Each revision as contains its own list of supporting documents.

**Table 1- 2: Supporting Documents for 2024 Update**

| Facility | Document Title | Consultant | Document Number |
|---|---|---|---|
| TMA | Stage 5 Raise Design Basis | SRK | CRW3295-4910-DT00-RPT-0002.002 |
| TMA | Stage 4 and 5 Detailed Tailings Deposition Plan | SRK | CRW3295-4910-DT00-MEM-0004.002 |
| TMA | Stage 5 Raise Detailed Design Report | SRK | CRW3295-4910-DT00-RPT-0001.002 |
| TMA | 2023 Instrumentation Threshold Update for TMA | SRK | CRW3295-4910-DT00-MEM-0008.001 |
| Site-Wide | TMA and Water Management Dam Instrumentation Report-2022 | SRK | CRW3295-4910-DT00-RPT-0005.001 |
| TMA | Risk Assessment Report | SRK | To Be Updated |
| WMF | Water Management Facility Design Basis Review | SRK | CRW3295-4910-DT00-RPT-0006.001 |
| TMA | TMA Seepage Collection System Review | SRK | CRW3295-4910-DT00-MEM-0007.001 |
| TMA | Tailings Management Area Failure Mode and Effects Analysis | SRK | CRW3295-4910-DT00-RPT-0001 |
| Site-Wide | 2023 Dam Safety Inspection | SRK | CRW3295-4910-BA10-RPT-0005 |

# 2.0 Roles and Responsibilities

## 2.1 Organization Chart and Responsibility

An organization chart identifying the parties involved with the construction and operation of the tailings and water management facilities at the RRM and the chain of command is presented in Figure 2- 1. Key staff for the owner, consultants, and external advisors are included. Responsibilities for named individuals are presented in Table 2-1.

The ownership of the tailings and water management facilities is divided as below:

- Mine Operations is the owner of Sediment Pond 1, Sediment Pond 2, and Sediment Pond 3. Sediment Pond 3 dam is declassified as a dam and classified as a sump according to Water Management Facility Design Basis Review by SRK (CRW3295-4910-DT00-RPT-0006.001). Capital Projects Site Services is delegated by Mine Operations to operate and maintain the three ponds with the support of Environment for water quality.
- Mill Operations is the owner of TMA, MRP (Mine Rock Pond), WMP (Water Management Pond), WDP (Water Discharge Pond), SRP (South Runoff Pond), and North Runoff Pond (NRP, a sump).
- Capital Projects is delegated by Mill Operations to construct and monitor the TMA dams, with support of Environment for water management.
- Environment is the owner of freshwater diversion structures including Teeple Pond, Clark Creek Pond, West Creek Pond, and Stockpile Pond, as well as West Creek Diversion Channel, and Stockpile Pond Diversion Channel. Capital Projects supports Environment on maintenance for the structures.

The Dam Monitoring team is responsible for the monitoring and surveillance work of the tailings and water management facilities with the support of Capital Projects and Site Service for maintenance work.

Multi-departments participate in the management of site-wide dams and ponds. A RASCI (Responsible, Accountable, Support, Consulted and Informed) chart is developed as shown in Table 2- 2. This table is reviewed as part of the update of the Manual.

## 2.2 Training Requirements

Training will be provided to employees to ensure responsible personnel are competent. RRM, in conjunction with the EOR, will provide training on the use of the Manual, and the Standard Operating Procedures (SOPs). It will be the responsibility of the managers to ensure all responsible parties have undergone the mandatory trainings. Table 2- 3 outlines mandatory training requirements. Training completed by personnel to be documented with sign in sheets and signed SOPs where required.

The mandatory training on SOPs is related to technical procedures and occupational health and safety.

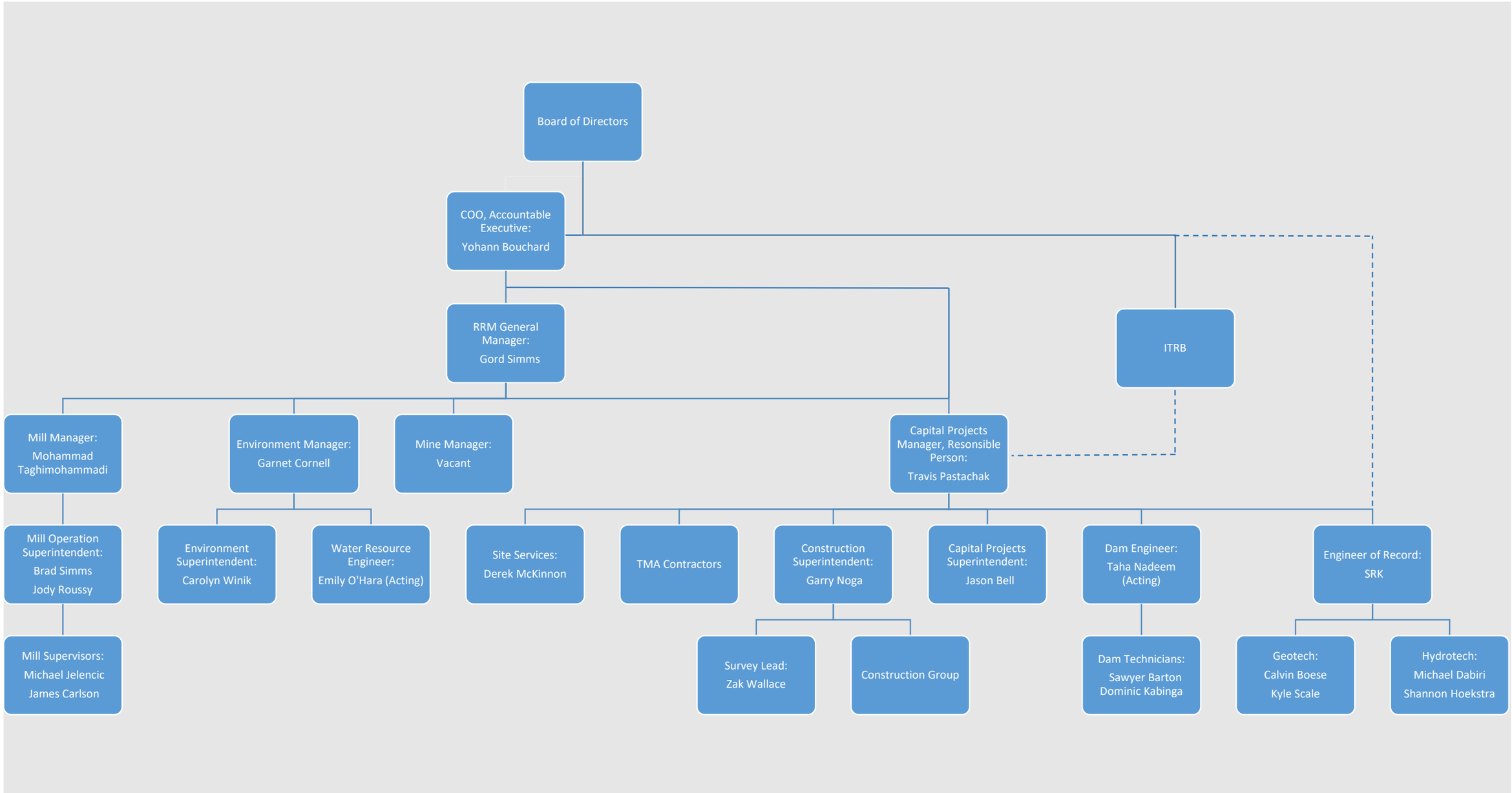


Figure 2- 1: Organization Chart for Tailings and Water Management

**Table 2-1: Responsibilities for Named Individuals**

| Role | Name/ Alternative | Company/ Department | Responsibilities | Phone # | Email |
|---|---|---|---|---|---|
| **Board of Directors** | | NG Corporate | • Has accountability related to tailings management, including the corporate "Tailings, Heap-Leach and Waste Rock Facilities Management Policy" (Included as Appendix A).<br>• Responsible at a governance level of the company for which the highest-level of corporate decisions are made, particularly regarding organizational and financial resources. | | |
| **COO and Accountable Executive (AE)** | Yohann Bouchard | NG Corporate | • Has accountability for the corporate "Tailings, Heap-Leach and Waste Rock Facilities Management Policy" (Included as Appendix A).<br>• Has accountability to report concerns related to tailings management and that all concerns are followed up.<br>• Ensures that there is a process in place to report concerns related to tailings management, and for following up with those concerns.<br>• Takes ultimate responsibility for the entire operation including dam safety.<br>• Aware of key outcomes of tailings facility risk assessments and how these risks are being managed. Holds corporate accountability for the operations of Rainy River Mine (RRM).<br>• Accountable to ensure proper qualifications for RP, EOR, and ITRB.<br>• Accountable for establishing appropriate management structure.<br>• Accountable for development and implementation of site-specific tailings management systems.<br>• Delegates responsibility and authority for tailings management to RP.<br>• Demonstrates to the Board of Directors/Governance Level whether tailings are managed responsibly.<br>• Responsible for the process for reporting and addressing concerns and implementing whistleblower protections.<br>• Accountable for ensuring development of any required plans for emergency preparedness.<br>• Accountable for development and implementation of training needed for responsible tailings management. | (416) 645 7283 | Yohann.Bouchard@newgold.com |
| **General Manager** | Gord Simms | NG RRM | • Provide support for the implementation of tailings and water management plan.<br>• Ensure resources are available for the management of water quality and effluent release.<br>• Ensure that all dam design and operation meet the Canadian Dam Association Dam Safety Guidelines<br>• Submit annual dam safety reports to the chief inspector.<br>• Ensures that the TDE, EoR, and Independent Reviewers have the appropriate competencies, experience, and resources commensurate with risk level and characteristics of the facility. | (807) 707 5308 | Gord.simms@newgold.com |

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|---|---|---|---|---|---|
| | | | • Ensures that a process is in place for personnel to be able to report concerns related to tailings management, and for following-up on those concerns | | |
| **Mill Manager** | Mohammad Taghimohammadi | NG Mill | • Owner of the TMA, WMP, MRP, WDP and SRP<br>• Accountable for the safe operation of TMA, WMP, MRP, WDP and SRP<br>• Delegate TMA dam construction responsibility to Capital Projects Department<br>• Review and approve OMS Manual for TMA, WMP, MRP, WDP and SRP | (807) 707 1050 | Mohammad.Taghimohammadi@newgold.com |
| Mill Operation Superintendent | Jody Roussy<br>Bradley Simms | NG Mill | • Responsible for TMA, WMP, MRP, WDP and SRP operation | (807) 707 7341<br>(807) 708 6367 | Jody.Roussy@newgold.com<br>Brad.simms@newgold.com |
| **Site Service Superintendent** | Derek McKinnon | NG SS | • Accountable for operations fleet and dewatering maintenance<br>• Responsible for maintenance of tailings and water pipelines<br>• Responsible for operation of BCR 1 and BCR2 | (807) 708 4381 | Derek.McKinnon@newgold.com |
| Site Services Supervisor | Jay Albright<br>Chris Woods | NG SS | • Responsible for maintenance, relocation of HDPE pipelines | (807) 709 3197<br>(807) 709 3207 | Jay.Albright@newgold.com<br>Chris.Woods@newgold.com |
| **Environment Superintendent** | Garnet Cornell<br>Carolyn Winik | NG Environment | • Accountable for regulatory compliance<br>• Owner of and accountable for the freshwater diversion structures<br>• Review and approve OMS Manual for the freshwater diversion structures | (807) 276 0106<br>(807) 709 0115 | Garnet.Cornell@newgold.com<br>carolyn.winik@newgold.com |
| Water Resource Engineer | Emily O'Hara (acting) | NG Environment | • Responsible for monitoring and reporting water balance and pond levels.<br>• Responsible for communicating requirements of maintaining water balance.<br>• Responsible for compliance testing and sampling.<br>• Responsible for the quantity and quality of water discharge when needed. | (778) 694 2423 | Emily.O'Hara@newgold.com |

**Table 2- 1: Responsibilities for Named Individuals Continued**

| Role | Name | Company/ Department | Responsibilities | Phone # | Email |
|---|---|---|---|---|---|
| **Mine Manager** | Gord Simms | NG Mine Operations | • Owner and account for the sediment ponds.<br>• Review and approve OMS Manual for the sediment ponds<br>• Accountable for supplying required/available rock (NAG/PAG) for TMA construction | (807) 707 5308 | Gord.simms@newgold.com |
| **Capital Projects Manager, Responsible Person (RP)** | Travis Pastachak (RP) / Jason Bell | NG Capital Projects | • Responsible for all Capital Projects<br>  ○ Identifying the scope of work and budget requirements (subject to final approval) for tailings management.<br>  ○ ensuring that a site-specific organizational structure is in place, with documented roles and responsibilities.<br>  ○ developing (where one does not currently exist) and implementing a site-specific tailings management system.<br>• Responsible for the establishment of a change management system to ensure.<br>  ○ the management system and associated plans, processes, systems are developed and implemented, commensurate with the risk profile, characteristics, and life cycle phase of the tailings facility. | (306) 250 3500<br>(807) 707 4758 | Travis.Pastachak@newgold.com<br>Jason.Bell@newgold.com |

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|---|---|---|---|---|---|
| | | | ○ tailings management performance is evaluated.<br>○ management reviews for continual improvement are conducted.<br>○ recommendations and action plans arising from management reviews are implemented, including reviewing/revising plans, processes, and systems.<br>• Accountable for the integrity of the tailings facilities.<br>• Responsible for liaising with the EOR, Operations, Planning, Regulatory affairs, social performance, and environment teams.<br>• Responsible for civil maintenance work at dams, ponds, sumps and ditches etc.<br>• Report to the Accountable Executive regarding the status and performance of the dams.<br>• Accountable to review, or delegate Risk Assessments as outlined in Risk Assessment and Management in Part II – TMA. | | |
| Tailings Dam Engineer (TDE) / Tailings Dam Planner | Taha Nadeem (Interim) | NG Capital Projects | • Responsibility of the TDE to fall to RP until position is filled.<br>• Responsible for the monitoring system and communication of the results to the EOR, including performance reviews.<br>• Responsible for development, maintenance, training, and application of the OMS manuals and EPRP.<br>• Implement training programs for tailings and water management activities.<br>• Implement the surveillance, inspection, monitoring, and surveillance device maintenance plan as outlined in the OMS manual.<br>• Implement TARPs for operational and maintenance activities in the OMS.<br>• Provide the EOR with operating, surveillance, and monitoring data in a timely manner.<br>• Advise the EOR of potential modifications to the dams, pond water management, surveillance, site conditions and/or instrumentation, and include the EOR in decision process related to any substantial modifications.<br>• Responsible for directing day-to-day tailings deposition. | (780) 660 8380 | Taha.Nadeem@newgold.com |

**Table 2- 1: Responsibilities for Named Individuals Continued**

| Role | Name | Company/ Department | Responsibilities | Phone # | Email |
|---|---|---|---|---|---|
| Tailings Dam Technicians (TDT) | Mauricio Alarcon<br>Sawyer Barton | NG Capital Projects | • Responsible for instrument data acquisition.<br>• Responsible for data reduction and reporting.<br>• Responsible for instrument maintenance including instrument raise.<br>• Report data and instrument issues to TDE.<br>• Support new instrument installation.<br>• Support other OMS activities assigned by TDE. | (807) 707 3509 | rr.damtech@newgold.com |
| Project Coordinator Supervisor | Brent McFarlane | NG Capital Projects | • Coordinate contracts and projects related to dam construction and maintenance | (807) 707 3433 | Brent.McFarlane@newgold.com |
| Construction Superintendent | Garry Noga | NG Capital Projects | • Responsible for upstream and downstream buttress construction on the TMA<br>• When needed, responsible for TMA core and filter construction, including abutments | (807) 707 2015 | Garry.Noga@newgold.com |

| | | | | | |
|---|---|---|---|---|---|
| Senior Surveyor | Zak Wallace | NG Capital Projects | • Provides survey support for construction team.<br>• Responsible for survey of tailings beach elevations.<br>• Develop as-built drawings, supported by Tulloch Engineering. | (807) 707 7485 | Zak.Wallace@newgold.com |
| **Consultants** | | | | | |
| Engineer of Record (EOR) | Calvin Boese / Kyle Scale<br>Michael Dabiri / Shannon Hoekstra | SRK | • Documenting the design basis for the TMA and water management dams.<br>• Designing and design reporting for subsequent TMA dam raises and other appurtenant works related to the TMA or water management dams.<br>• Completing construction CQA and performance reviews.<br>• Responsible, with the RP/delegates, for construction record reporting.<br>• Regularly review and interpret dam safety instrumentation and communicate conclusions to the TDE.<br>• Support dam raise permitting.<br>• Support the TDE with development of the OMS manual and EPRP.<br>• Complete tasks to achieve the requirements of the responsibilities. | (306) 370 0549<br>(306) 715 2549<br><br>(604) 868 9953<br>(587) 315 7306 | cboese@srk.com/<br>kscale@srk.com<br><br>mdabiri@srk.com/<br>shoekstra@srk.com |
| TMA Construction Contractor(s) | Varies | Varies | • Responsible for TMA core and filter construction, including abutments | | |
| Survey and Drafting Support | Josh Smith | Tulloch Engineering | • Provides QA survey services<br>• Provides drafting support as required | (705) 255 2649 | Josh.Smith@tulloch.ca |
| Independent Technical Review Board (ITRB) | Bryan Watts<br>Leslie Smith<br>Stephen Day | Varies | • Review of the design, construction, risk assessments, governance systems and other risk management matters that can affect the TMA and water management structures, ensuring that the required expertise and skill sets are involved.<br>• Review of the adopted external loading design criteria and measures to reduce the risk of failure of existing structures to as low as reasonably practicable.<br>• Review of the alternatives analysis, design, construction, risk assessments, governance systems and other risk management matters that can affect the TMA and water management facilities.<br>• Review the TMA Design Basis Report. | (604) 251 8444<br>(604) 271 2799<br>(604) 601 8421 | bwatts@bdwconsultingvan.com<br>sday@srk.com<br>lsmith@eos.bc.ca |

## Table 2-2: Dam Safety Governance Roles for Tailings Storage Facility

| Dam Safety Governance Roles | | | | | |
|---|---|---|---|---|---|
| **Task** | **Board of Directors** | **Accountable Executive** | **Responsible Person** | **Engineer of Record** | **ITRB** |
| Annual Budget | C | A | R | | |
| Permitting | I | A | R | I | I |
| Design | I | I | A | R | I |
| Instrumentation and Surveillance | I | I | A | S | I |
| Water Management | I | A | R | I | I |
| Annual DSI | I | I | A | R | I |
| DSR | I | I | A | S | I |
| Annual TSF Audit | I | I | A | I | I |
| ITRB Meetings | I | A | R | S | S |

| | | |
|---|---|---|
| A | Accountable | Has final decision-making authority and accountability for complete. Only 1 per task. |
| R | Responsible | Assigned to complete the task or deliverable |
| S | Support | Provides support and assistance to the responsible role |
| C | Consulted | An adviser, stakeholder, or subject matter expert who is consulted before a decision or action |
| I | Informed | Must be informed after a decision or action |

## Table 2-3: Dam Safety Management Roles and Responsibilities

**Dam Safety Management Roles and Responsibilities**

| Facility | Task Level 1 | Task Level 2 | Mill Ops | Mine Ops | Capital Projects | Environment | Site Service | Consultants | Dam Safety |
|---|---|---|---|---|---|---|---|---|---|
| TMA | | | A | | | | | | |
| | Annual Dam Raise | Design | I | I | R | S | I | R | S |
| | | Construction | I | S | R | I | I | S | I |
| | Tailings and Reclaim Water Line (BS+PH included) | | R | | S | I | S | I | I |
| | Tailings Deposition | Planning | S | | R | I | I | C | S |
| | | Schedule | S | | I | | I | I | R |
| | | Execution | R | | S | | S | I | I |
| | Water Management | | S | | S | R | S | C | I |
| | Maintenance | Pipelines | S | | S | | R | I | I |
| | | Civil | I | | R | | | C | S |
| | | BS+PH | R | | I | | S | I | I |
| | Surveillance | | I | | S | | | I | R |
| WMP, MRP, WDP, SRP | | | A | | | | | | |
| | Water Management | | S | | S | R | S | C | S |
| | Maintenance | Pipelines | S | | S | | R | I | I |
| | | Civil | I | | R | | | C | S |
| | Surveillance | | I | | S | | | I | R |
| SEDIMENT PONDS | | | | A | | | | | |
| | Water Management | | | S | S | R | S | C | I |
| | Maintenance | Pipelines | | I | | S | R | I | I |
| | | Civil | | I | R | | | C | S |
| | Surveillance | | | I | S | | | I | R |
| FRESHWATER DIVERSIONS | | | | | | A | | | |
| | Water Management | | | | S | R | S | C | I |
| | Maintenance | Civil | | | R | I | | C | S |
| | Surveillance | | | | S | I | | I | R |

| | | |
|---|---|---|
| A | Accountable | Has final decision-making authority and accountability for complete. Only 1 per task. |
| R | Responsible | Assigned to complete the task or deliverable |
| S | Support | Provides support and assistance to the responsible role |
| C | Consulted | An adviser, stakeholder, or subject matter expert who is consulted before a decision or action |
| I | Informed | Must be informed after a decision or action |

**Table 2-4: Mandatory Training Requirements**

| Mandatory Trainings | Chief Executive Officer | Senior VP Operations | General Manager | Mill Manager | Mill Supervisor | Mill Maintenance Superintendent | Electrical Supervisor | Mechanical Supervisor | Mobile Maintenance Manager | Site Services Superintendent | Environment Manager | Water Resource Engineer | Mine Manager | Capital Projects Manager | Construction Manager | Tailings Dam Engineer | Tailings Dam Technician | Project Coordinator | Construction Superintendent | Surveyor & Drafting Support | Engineer of Record | TMA Construction Contractor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OMS – Part 1, General | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| OMS – Part 2, TMA | | | | X | X | X | X | X | | X | X | X | | X | X | X | X | | | | X | X |
| OMS – Part 3, WMP | | | | X | X | X | X | X | | X | X | X | | | X | X | X | | | | X | |
| OMS – Part 4, MRP | | | | X | X | X | X | X | | X | X | X | | | X | X | X | | | | X | |
| OMS – Part 5, Sediment Controls | | | | X | X | X | X | X | | X | X | X | | | X | X | X | | | | X | |
| OMS – Part 6, Freshwater Diversion | | | | | | | | | | X | X | X | | | X | X | X | | | | X | |
| OMS – Part 7, Water Discharge | | | | X | X | X | X | X | | | X | X | | | X | X | X | | | | X | |
| OMS – Part 8, EPRP | X | X | X | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | | X | X |
| ENV-SOP-0001, Spill Reporting | | | | X | X | X | X | X | | X | X | X | | X | X | X | X | X | X | X | X | |
| ENV-SOP-0008, Water Elevation Survey | | | | X | | | | | | | | X | | | X | | | | X | X | | |
| MIL-BCR-SOP-0004, BCR 2 Operation | | | | X | X | | | | | | X | X | | | | | | | | | | |
| MIL-CND-SOP-0009, Line Inspections | | | | X | X | | | | | X | | | | | X | X | | | | X | | |
| MIL-GEN-SOP-0043, Switching Pumps | | | | X | X | | | | | | | | | | | | | | | | | |
| MIL-WTP-SOP-0002, Response to Upset | | | | X | X | X | | | | | | | | | | | | | | | | |
| MIL-WTP-0010, Nitrification Cell Op. | | | | X | X | | | | | | | | | | | | | | | | | |
| MIL-WTP-SOP-0014, Bio. Treatment Op. | | | | X | X | | | | | | | | | | | | | | | | | |
| CST01-4340-M03-0001.001 WTP Op & Maintenance Manual | | | | X | X | X | X | X | | | | | | | | | | | | | | |
| SAF-SOP-0008, Risk Assessment and MOC | | X | X | X | X | X | X | X | | X | X | X | | X | X | X | | X | X | | X | X |
| SAF-SOP-0011 Incident Management Procedure | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | | X | X |
| SAF-SOP-0045 Working Around Water | | | | | X | | | | | X | X | X | | | X | X | X | X | X | X | X | X |
| Multi DAM SOPs Reading Geotech Instruments | | | | | | | | | | | | | | | | X | X | X | X | X | X | |
| Dam Safety Inspection | | | X | X | | | | | | X | X | X | | X | X | X | X | X | X | | X | |

# 3.0 Site Baseline Conditions

## 3.1 Site Location and Tenure

The site is in the Township of Chapple, approximately 70 km by road northwest of Fort Frances in Northwestern Ontario. New Gold has 100% interest in the lands forming the RRM through direct ownership or option agreement, however surface rights are not owned throughout the site boundary.

The RRM is located within lands used by Indigenous Groups for traditional and ceremonial purposes. NGI has regulatory requirements and/or bipartisan agreements to engage with the communities including, but not necessarily limited to those listed in Section 3.9: Communities of Interest (COI).

Road access to the site is by provincial Highway 600 and Highway 71 and Korpi Road (east access road). A site location map is provided in **Figure 3- 1**. The mine is serviced by local municipal infrastructure.

Refer to Land Use Management Plan developed by NG Environment for details.

## 3.2 Site Access

Site access is authorized through the issuance of electronic key cards following verified completion of pre-access training requirements. Site access is controlled by two main gates located at the Plant Site and Marr Site. Gate access requires an authorized and active key card and is monitored by an on-site security team. SAF-PRO-0046 Site Access Process provides further information.

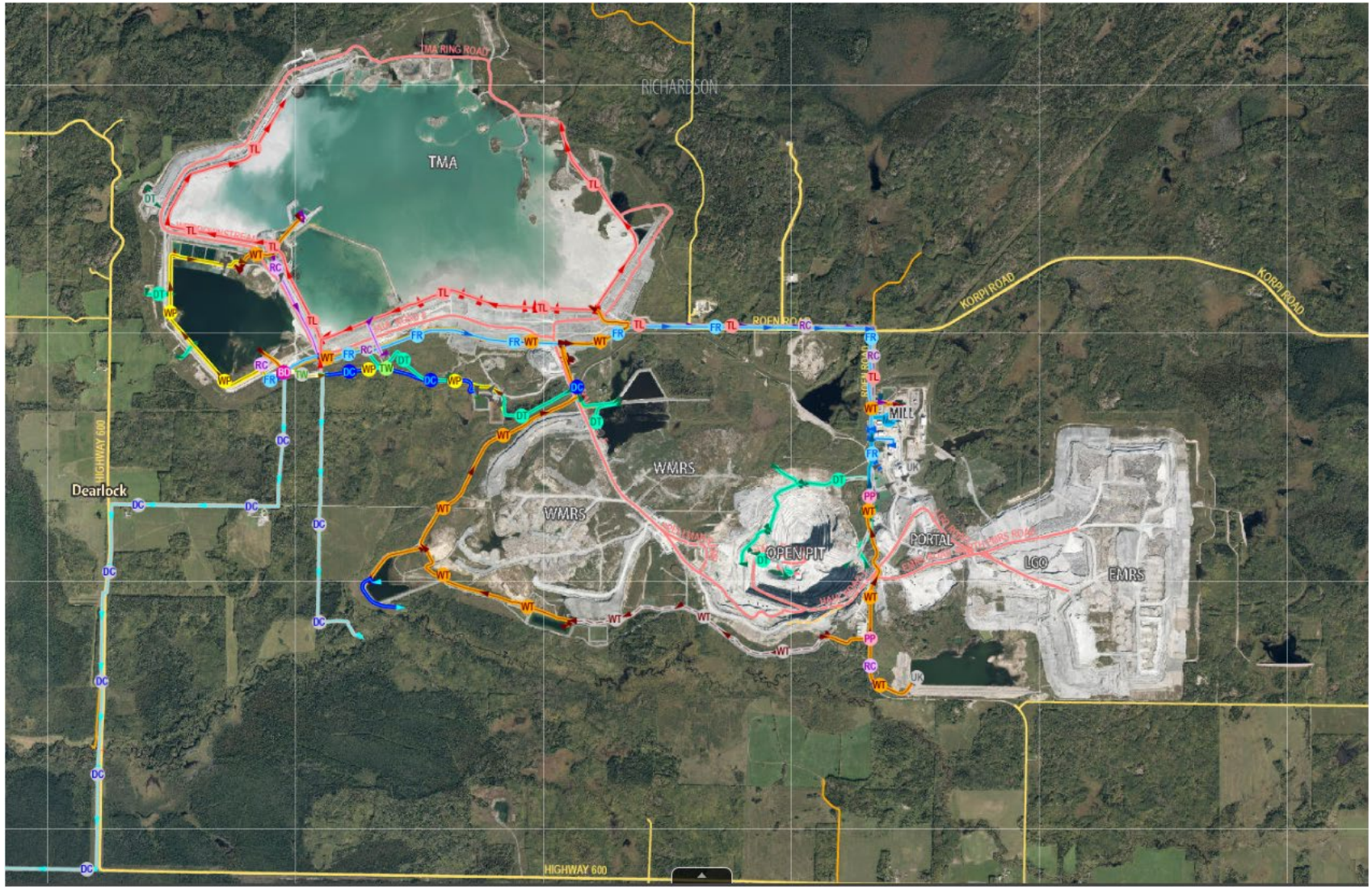
## 3.3 Climate and Climate Change

During the summer months (April to October), the climate of the RRM area is affected by warm, moist air systems from the Gulf of Mexico interacting with dry air masses from central Canada. During the winter months (November to March), extended periods of clear, cold weather are a result of cold, dry Arctic air masses flowing from the north.

Based on 1981 to 2010 Canadian Climate Normal data from the Barwick weather station approximately 30 km south of the RRM site, daily temperatures range from as low as - 21.1°C in January to as high as 25.2°C in July, with recorded extremes of -49.0°C and 36.5°C. Daily average mean temperatures are below 0°C from November to March.

The mean annual precipitation is 710 mm (rain and snow) with the majority being rainfall. Monthly mean rainfall ranges from 30 mm to 125 mm in the summer months, and monthly mean snowfall ranges from 190 mm to 370 mm in the winter months (Environment Canada, 2020). Pond evaporation occurs from May until October with a cumulative annual evaporation of approximately 540 mm.

Average annual precipitation for the 1951-1980 period was 656 mm. Climate change projections published by https://climatedata.ca suggests that under a high emissions scenario, this is projected to be 6% higher for the 2021-2050 period, 5% higher for the 2051-2080 period and 10% higher for the last 30 years of this century.




| Department: | Review Frequency: | Approval Date: | Status: | Revision: | Author: |
|---|---|---|---|---|---|
| Capital Projects | Annual | | | | W. Ding |

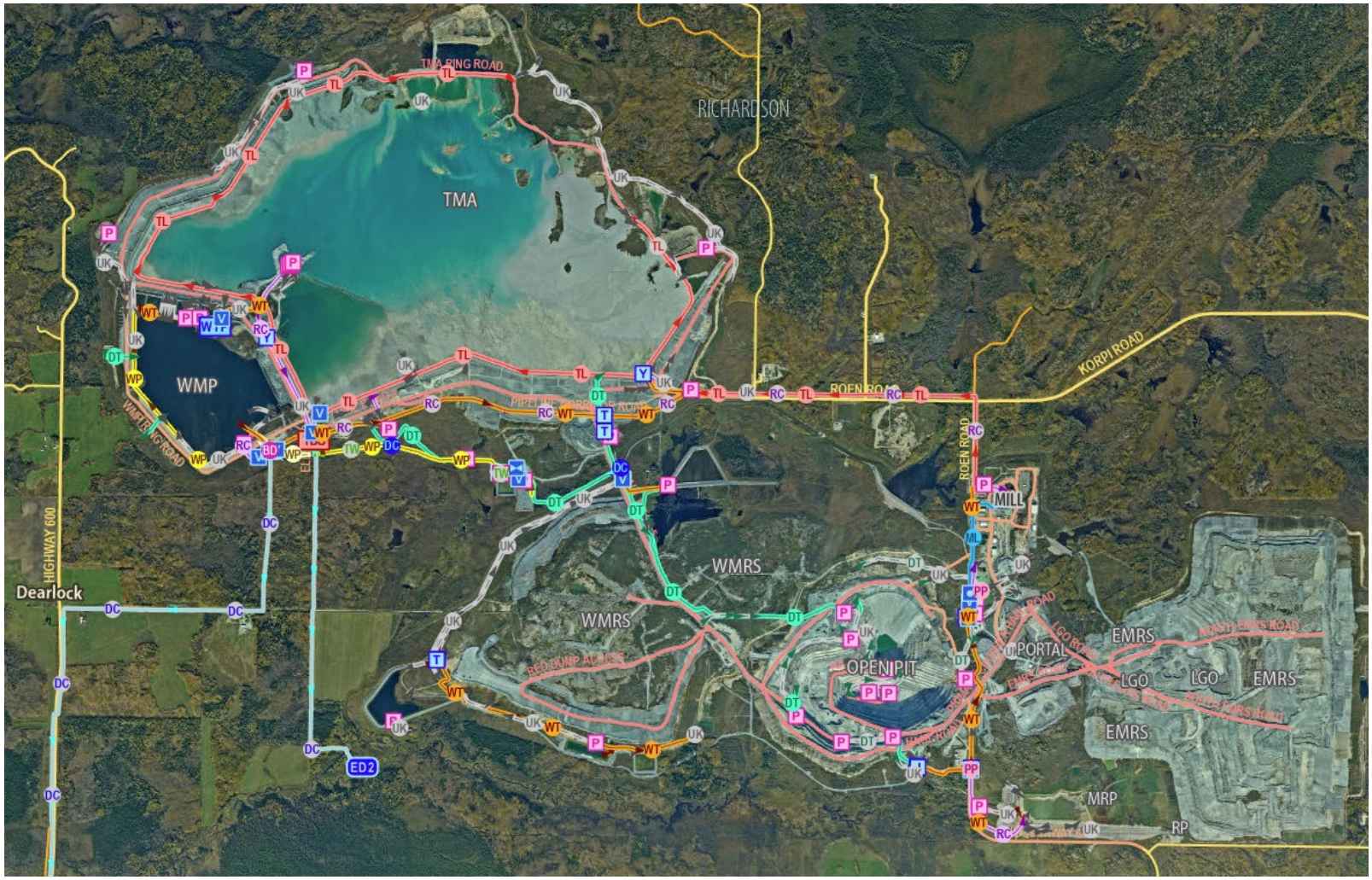



**Figure 3- 1: Site Map (**Rainy River Web GIS Viewer (newgold.net), Sept. 2022**)**

## 3.4 Topography and Geology

The site is situated within the Severn Upland of the Canadian Shield physiographic region, characterized by recently deglaciated crystalline bedrock with variable drift thickness. The specific site setting is a lowland area with variable to thick glacial overburden and sporadic bedrock outcrops. Available terrain mapping classifies the site as a glaciolacustrine plain with low, undulating, rolling or plain relief. The plain dominates the southwest portion of the site, giving way to shallow or exposed bedrock in higher topography areas along the northeast portion. The relief of bedrock outcrops above the plain is less than 20 m. Drainage passes through the lowland via dendritic systems of creeks. Broad peat deposits are common throughout the lowland and tend to inhibit drainage (BGC-2580-DT00-MEM-0001.001).

The area has been influenced by several cycles of glaciation and in some areas is overlain by glacial deposit thicknesses up to 40 m. At the mine site, the stratigraphic sequence (upwards starting from the lowest elevation above bedrock) consists of:

- Whiteshell Till, sand and gravel
- Wylie Formation, glaciolacustrine silts and clays
- Whitemouth Lake Till, glaciolacustrine silty clay
- Brenna Formation, glaciolacustrine silts and clays
- Poplar River Formation, fluvial sand
- Sherack Formation, glaciolacustrine.

In general, the controlling units for stability are the Whitemouth Lake Till and high plasticity faces of the Brenna Formation. A detailed description of the site geology is provided in the sitewide geological model report (BGC-2580-DT00-MEM-0001.001). A description of the Rainy River TMA foundation characterization is provided by BGC (BGC-4910-DT00-RPT-0019.008).

The RRM site is underlain by bedrock comprising the Wabigoon sub-province of the Superior Province of the Precambrian Shield. The Wabigoon sub-province is characterized by Archean metavolcanic bedrock with plutonic rock intrusions and northwest-trending diabase dikes estimated to be of Proterozoic age.

## 3.5 Hydrology and Hydrogeology

The RRM site on the north side of the Pinewood River is drained by four small creek systems, which include from east to west: Clark Creek (Teeple Drain), West Creek, Marr Creek and Loslo Creek (Cowser Drain). Major portions of the Clark Creek, Marr Creek and Loslo Creek basins have been overprinted by RRM developments, principally the TMA and mine rock stockpiles. West Creek is currently diverted around the pit and flows to Loslo Creek via the West Creek Diversion.

Regional groundwater flow is towards the west in the Pinewood River watershed. Artesian conditions within the shallow bedrock and Pleistocene lower granular deposits are common along the stream corridors.

## 3.6 Groundwater Quality

Groundwater quality is typical calcium magnesium-bicarbonate type water with most sampling points having total dissolved solids exceeding 500 mg/L. Sampling of groundwater since 2007 has indicated metal concentrations above application guidelines. Then-EOR, AFW defined the threshold limit for each metal in in the 2016 contingency plan for groundwater according to the guideline B-7 of the MOEE groundwater Management Activities (1994a), since that year just Arsenic, Lithium, magnesium, manganese, and strontium consistently exceed the threshold limit in several wells.

## 3.7 Biodiversity

Refer to Biodiversity Management Plan developed by NG Environment for details.

### 3.7.1 Fish

The fish community proximal to the RRM is dominated by baitfish and forage fish species with sportfish (e.g., Walleye and Northern Pike) in the lower Pinewood River below the Pinewood Pumphouse. Presently the lower reaches of Marr and Loslo Creek remain fish bearing after the headwaters have been cut off by the TMA construction. West Creek and Clark Creek are former tributaries to the Pinewood River and have been offset for by the Clark Creek and West Creek Diversion structures which are offsetting habitat and support all life history stages of baitfish and forage fish species.

The freshwater diversions are fish bearing waters and subject to protection under numerous permits and legislation e.g., Fisheries Act. Cowser Drain (Loslo Creek) and the Pinewood River are also fish bearing. Water quality discharges into these areas must meet MNDMNRF and ECA permit requirements. The discharge threshold limits are set to avoid fish damage. ECA requested weekly samples during discharge for mercury, sulfate, and ammonia, if the criteria were not met, NG cannot discharge to the environment, affecting the water balance and TMA operations subsequently.

### 3.7.2 Vegetation

The RRM is within Ecoregion 5S (Agassiz Clay Plain) and there are no published “Significant Wildlife Habitat Ecoregion Criteria Schedules” for this ecoregion. Aspen-Birch hardwood forest is the dominant (46.6 %) forest type proximal to the mine, followed by coniferous swamp / wetland (29.4 %). Agricultural lands are present across 8% of the area proximal to the mine, primarily along roads and in areas of well drained clays. No records of rare vegetation communities or rare plants were identified during the Environmental Assessment.

Based on the ecoregion, the growing season length is 180-190 days with mean annual temperatures of 1.5 to 3.0ºC. The frost-free period is ~125 days from mid-May to mid/late September (Ministry of Agriculture; 1976-2005).

### 3.7.3 Wildlife

Key wildlife aspects influencing the OMS manual include the presence of:

- Species at risk including but not limited to Eastern Whip-poor-will and Bobolink which require consideration of limits of disturbance, timing of works, noise mitigation and dust management.

- Snapping turtles, for which measures must be taken to prevent them entering the TMA, process water and water treatment facilities.
- Migratory birds requiring noise mitigation measures, reduced light pollution, timing windows on clearing, deterrents to prevent use of the TMA and monitoring for use of the TMA.
- Deer, which along with other wildlife require that a fence be to be constructed around the active tailings deposition areas.
- Bears, which along with other wildlife need to be managed through controlling wildlife-human interactions including reporting, no harassing of wildlife, no fishing or hunting on the mine site, speed restriction and waste management to exclude wildlife.

## 3.8 Seismic Setting

The seismic setting of the RRM is described in BGC-4910-DT00-RPT-0019-001. RRM is located within the stable Canadian Shield region within the North American Plate, which has a low level of seismic activity.

Based on a catalog of historical seismicity from the National Earthquake Database (NRCan 2018), 341 earthquakes were recorded within 200 km of RRM since 1985, 247 of which were less than magnitude M 2.0, and none greater than magnitude M 3.2. The nearest earthquake occurred 35 km from the mine. The estimated peak ground accelerations associated with the 1:2,475 and 1:10,000-year seismic events are 0.05 g and 0.11 g, respectively, for overburden conditions corresponding to the 2003 National Earthquake Hazards Reduction Program (NEHRP) site classification system Site Class D (Stiff Soil).

## 3.9 Other Hazards

Beyond earthquake, other natural hazards to the RRM are limited to weather related hazards e.g., flooding, drought, extreme cold or high winds and forest fires. Other natural hazards e.g., volcanic activity, subsidence, avalanches, and landslides are not expected to affect the mine given surrounding geology and topography. Responses to natural hazards are considered as part of the site EPRP. Potential natural hazards relating to the OMS are discussed here and refer to EPRP for the preparedness and response plans to the hazards.

- Forest Fire: there is potential for forest fires to affect operations of the mine, with the cycle in the RRM being 63 to 210 years. The RRM has a fire prevention and preparedness plan (June 2017) developed with the MNRF
- Flooding: the precipitation between winter 2021 and spring 2022 is equivalent of 1:50 to 1:100 AEP rainfall event. Failure of ICS in northern TMA during the major rainstorm in late April and early May 2022 resulted in additional millions of cubic meters of water stored in TMA. The scale and intense rainfall plus the limited infrastructure capacity at the site can turn a major rainfall event into a flood hazard.
- The water treatment capacity of water treatment facilities including BCR1 has a limit of flow of up to 24,000 $m^3$/day through the WTP without it overflowing. In a wet year, this water treatment capacity may not be sufficient and results in storing too much water in TMA which is an operation constraint.

- Drought: drought conditions may result in a reduction in water availability for processing and limit allowable offsite discharge to the Pinewood River. Drought conditions for processing are mitigated through the design of the WMP and water storage structures. In the event of a 5$^{th}$ percentile low flow fall, only 1.53 Mm$^3$ could be discharged offsite. However, this is managed through capacity in the TMA, WMP and water treatment. The water balance model is regularly updated and reviewed by RRM management.

## 3.10 Community of Interest

NGI continues to inform and consult Communities of Interest which include:

- Local Indigenous communities of Big Grassy River First Nation, Anishinaabeg of Naongashiing, Ojibways of Onigaming First Nation, Naotkamegwanning First Nation, Naicatchewenin First Nation, Rainy River First Nations, Buffalo Point First Nation, and the Sunset Country Métis community (as represented by Métis Nation of Ontario Region 1 Consultation Committee), Mitaanjigamiing First Nation, Couchiching First Nation, Lac La Croix First Nation, Nigigoonsiminikaaning First Nation, Seine River First Nation, Northwest Angle #33 First Nation, Northwest Angle #37 First Nation and Anishinabe of Wauzhushk Onigum (in accordance with consultation requirements and/or communication protocols established through Agreements as modified over the life of the project).
- Those local indigenous communities can be found in the attached Figure 3- 2: Treaty 3 Map.
- Site neighbors.
- Local townships include the Township of Chapple and Morley Township.

Refer to Community Management Plan developed by NG Rainy River Community team for details.

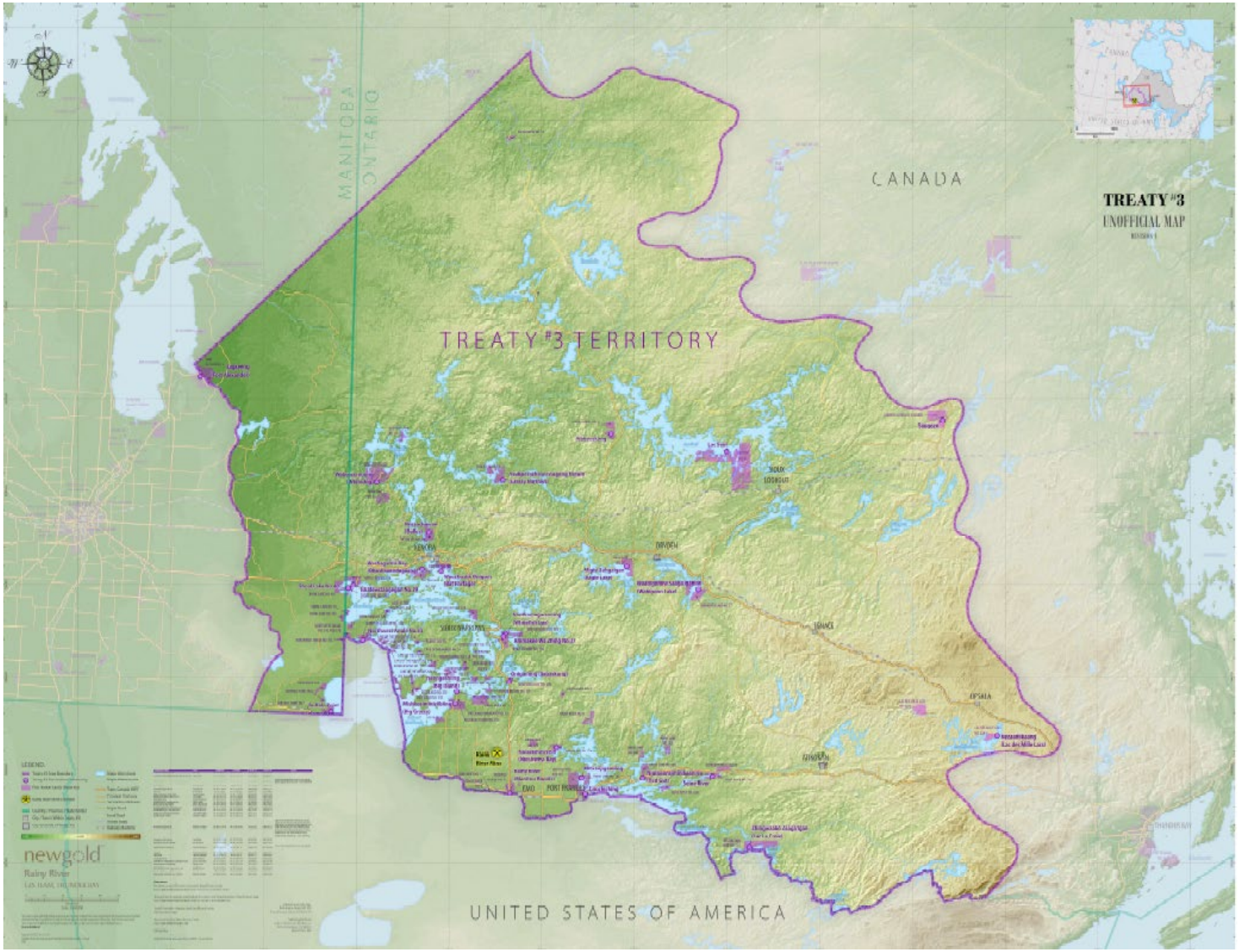



**Figure 3- 2: Local Indigenous Communities in Treaty # Map**

# 4.0 Facility Characteristics

## 4.1 Facility Overview

The components of the RRM relative to the scope of the OMS include various tailings and water management facilities. They are grouped as:

- Tailings Management Facility
  - Tailings Management Area (TMA)
    - South Dam
    - West Dam (Dam 4 and Dam 5)
    - North Dam including an emergency spillway
    - North Ring Road, the natural topographic highs
    - Tailings Pond (Cell 1, Cell 2, and Cell 3. Merge to one cell in Stage 4)
    - Decant Pond, part of the tailings pond in the SW corner
  - TMA ancillary structures include
    - Seepage and Runoff Collection Ditches and Sumps
    - North Catchment Area Diversion including ICS (Inflow Control Structure) at Loslo Creek, and a sump and ditch at Marr Creek
    - Tailings Pipeline System (Mill to TMA including a booster station)
    - Reclaim Water Pipeline System (Decant Pond to Mill)
    - Water Transfer Pipelines (TMA to Lime WTP, and TMA to BCR #2)
    - Sludge Transfer Pipeline (Lime WTP to TMA)
- Water Management Facilities
  - Treated-Water Management
    - Water Management Pond (WMP) including WTT (Water Treatment Train)
      - WMP Dam 1 including a spillway
      - WMP Dam 2
      - WMP Dam 3
      - Settling Pond Dam
      - WTT (Nitrification Cells, BCR #1 and Lime WTP)
      - Seepage and Runoff Collection Ditches and Sumps (Sump 1 for Dam 1 & 2, Sump 2 for Dam 3)
      - Water Discharge Pipeline System
        - WMP to EDL1, EDL2
        - BCR #2 to WMP
  - Freshwater Management
    - Marr and Loslo Creek Diversion Ditches / Sumps and Pumps (ICS)
    - Clark Creek Diversion
      - Clark Creek Pond and Dam
      - Clark Diversion Ditch
      - Teeple Creek Pond and Dam
      - Teeple Diversion Ditch

        - West Creek Diversion
            - Stockpile Pond and Dam
            - Stockpile Pond Diversion Ditch
            - West Creek Pond and Dam
            - West Creek Diversion Ditch
    - Sediment Control / Contact Water Management Structures
        - Water Discharge Pond and Dam (WDP), BCR #2 and Constructed Wetland (CW, to be constructed at closure )
        - East Mine Rock Stockpile (EMRS) Pond and Dam (Mine Rock Pond, MRP)
        - West Mine Rock Stockpile (WMRS)
            - Sediment Pond 1 and Dam including collection ditch
            - Sediment Pond 2 and Dam including collection ditch
            - Sediment Pond 3 and berm including two sumps and Open Pit diversion ditch
        - Plant Site Ponds
            - North Runoff Pond, technically a sump
            - South Runoff Pond and Dam
- Utilities
    - Power to the plant site is provided by 230 kV transmission lines connected to Hydro One northwest of the site at a Switching Station.
    - The main 230 kV Substation is near the concentrator building to power the process equipment via underground supply lines. Power to the remainder of the site is provided by a network of overhead power lines fed from the main substation; and
    - Site telecommunications and Process Control are distributed via fiber optic lines.

Figure 4- 1 to Figure 4- 5 presents the plan view of the faculties based on the RRM GIS Base Map dated September 8, 2022.


**Figure 4- 1: Plan View of WMP, TMA and Associated Structure (Dec. 2023)**

**Figure 4- 2: Plan View of Clark Creek Division (Dec. 2023)**


**Figure 4- 3: West Creek Division and Plant Site Ponds (Dec. 2023)**


**Figure 4- 4: Mine Rock Pond and Dam (Dec. 2023)**


ROEN ROAD
BUTTRESS
FRANK'S PAD
ROEN PIT
Sediment Pond 1
BCR-2
CONSTRUCTED WETLAND
WMRS
WMRS
OPEN PIT
Sediment Pond 2
Sediment Pond 3
DIFFUSER 2
SOUTH LOOKOUT
SOUTH RING ROAD


**Figure 4- 5: Sediment Controls (Dec. 2023)**

## 4.2 Facility Design and Construction

### 4.2.1 Summary of Facilities

- Summary of the RRM dam characteristics is presented in Table 4-1
- Summary of the RRM pond characteristics is presented in Table 4-2.

**Table 4- 1: Summary of Dam Characteristics**

| Purpose & Facility | Dam Name | Type of Dam | Construction Stage | Crest Elev. (m) | Max. Dam Height (m) | Dam Length (m) | Crest Width (m) | Slopes (_H:1V) | Spillway Invert Elev. (m) | Spillway Width (m) | Normal Freeboard (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tailings Management Dams** | | | | | | | | | | | |
| **Tailings Management Area (TMA)** | North Dam | Central core | Stage 5 | 377.1 | 14 | 2,450 | 26.6 | 9:1 (U/S)<br>13:1 (D/S) | 375.3 | 20 | 1.8 |
| | South Dam | | | | 24 | 3,550 | | 4:1 (U/S)<br>20:1 (D/S) | | | |
| | West Dam 4 | | | | 14 | 910 | | 4:1 (U/S)<br>12:1(D/S) | | | |
| | West Dam 5 | | | | 14 | 690 | | 9:1 (U/S)<br>13:1 (D/S) | | | |
| **Treated Water** | | | | | | | | | | | |
| **Water Management Pond (WMP)** | WMP Dam 1 | Homogeneous clay fil | Final | 371.5 | 4.2 | 850 | 10 | 4.0 | 370.5 | 8.4 | 3.6 |
| | WMP Dam 2 | | | 371.5 | 9.5 | 800 | 10 | 5.5 | | | |
| | WMP Dam 3 | | | 371.5 | 13.3 | 750 | 10 | 9.2 | | | |
| | Settling Pond Dam | | | 371.5 | | 550 | 5 | 4.0 | n/a | | 3.6 |
| **Freshwater Diversion** | | | | | | | | | | | |
| **Clark Creek Diversion** | Clark Creek | Homogeneous clay fill | Final | 380.25 | 4.0 | 285 | 6 | 5.5 | 379.9 | 6 | 1.3 |
| | Teeple Road | Homogeneous clay fill | Final | 379.0 | 7.0 | 465 | 6 | 6.0 | 378.7 | 6 | 0.5 |
| **West Creek Diversion** | Stockpile Pond Dam | Central core | Final | 375.5 | 9.8 | 380 | 6 | 6.5 | 372.3 | 20 | 3.2 |
| | West Creek | Central core | Final | 364.9 | 8.9 | 750 | 10 | 7.9 | 360.9 | 8 | 3.9 |
| **Contacted Water** | | | | | | | | | | | |
| **Mine Rock Pond** | Mine Rock Pond Dam | Central core | Final | 360.2 | 13.0 | 1655 | 10 | 11.0 | 358.9 | 80 | 3.4 |
| **Water Discharge Pond** | Water Discharge Pond Dam | Homogeneous clay fill | Final | 355.2 | 2.2 | 350 | 6 | 4.0 | 354.2 | 5 | 1.0 |
| **Mine Rock Stockpile** | Sediment Pond #1 | Central core | Final | 354.0 | 3.8 | 1750 | 6 | 4.0 | 353.7 | 60 | 0.8 |
| | Sediment Pond #2 | Homogeneous clay fill | Final | 348.2 | 5.2 | 1460 | 6 | 4.0 | 348 | 115 | 2.2 |
| | Sediment Pond #3(1) | Central core | Final | 345.7 | 1.0 | 344 | 6.4 | 4.0 | 345.0 | 30.3 | 0.7 |
| **Plant Site Ponds** | North Runoff Pond(1) | None - excavated | n/a | 365.0 | 3.4 (internal) | n/a | 4.0 | 2-3 | n/a | n/a | n/a |
| | South Runoff Pond | Homogeneous clay fill | Final | 363.5 | 6.5 | 420 | 4.0 | 4.0 | 362.9 | 40.0 | 0.6 |

(1) To be declassified as a dam by EOR

**Table 4- 2: Summary of Pond Characteristics**

| Purpose & Facility | Dam/Pond Name | Catchment Area ($km^2$) | Inflow Design Flood (event/flow) | Peak IDF Inflow ($m^3/s$) | Peak IDF Water Level (m) | Peak IDF Outflow ($m^3/s$) | Minimum Freeboard Available(1) (m) | Environmental Design Flood (event/volume) | Normal Operating Water Level (m) | Impounded Volume to NOWL ($Mm^3$) | Maximum Operating Water Level (2) (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tailings Management Area (TMA Stage 5 Operation) (1) | TMA Dam and Pond (3) | 10.2 | Spring PMF (24-hour Spring PMP + 100-year Snow + 100-year Temperature Sequence for Stage 5) | 653 | 375.9 | 15.0 | 1.2 m above IDF level (Stage 5). Maintain a minimum of 0.4 m crest elevation above tailings surface. | 100-year 30-day storm (2.79 $Mm^3$) | 374.8 | 54 (Up to spillway invert) | 375.3 |
| Water Management Pond (WMP) | WMP Dam 1 | 1.0 | Summer PMF | a141 | 371.0 | 3.3 | 0.36 | 100-year 30-day storm (320 mm) | 369.7 | 5.2 | 370.5 |
| | WMP Dam 2 | | | | | | | | | | |
| | WMP Dam 3 | | | | | | | | | | |
| | Settling Pond | | | Not specified | | | | | | | |
| Mine Rock Pond | Mine Rock Pond | 5.43 | Summer PMF | 225 | 360.0 | 134 | 0.0 | 100-year 30-day storm (320 mm) | 356.8 | 0.603 | 358.9 |
| Clark Creek Diversion | Clark Creek | 3.0 | 100-year Summer Storm | 4.9 | 379.5 | 2.6 | 0.37 | No EDF. Ponds store freshwater | 378.75 | Not available | None specified |
| | Teeple Road | 0.85 | | 8.3 | 378.8 | 5.7 | 0.22 | No EDF. Ponds store freshwater | 378.5 | Not available | None specified |
| West Creek Diversion | Stockpile Pond | 2.85 | Summer PMF | 78 | 373.9 | 67 | 1.52 | No EDF. Ponds store freshwater. | 372.2 | 0.937 | None specified |
| | West Creek | 2.2 | | 222 | 363.9 | 186 | 0.89 | No EDF. Ponds store freshwater. | 360.9 | 0.156 | None specified |
| Water Discharge Pond (WDP) | Water Discharge Pond | 0.69 | 100-year Summer Storm | 22.7 | 354.1 | 4.7 | 0.91 | Not specified | 352.5(3) | 79,000 | 354.2 |
| Mine Rock Stockpile | Sediment Pond #1 | 0.65 | 100-year Summer Storm | 10.3 | 353.7 | 1.0 | 0.25 | 25-year 24-hour storm (110 mm) without pumping, or 25-year 30-day rainfall (24 mm) with pumping | 352.7 | 0.167 | 353.7 |
| | Sediment Pond #2 | 1.35 | 100-year Summer Storm | 6.7 | 348.0 | 6.5 | 0.19 | | 347.2 | 0.29 | 348 |
| | Sediment Pond #3 | 1.12 | 100-year Summer Storm | 16.7 | 345.5 | 15.3 | 0.19 | | 344.6 | 0.115 | 345 |
| Plant Site Ponds | North Runoff Pond | 0.17 | 100-year, 24-hr Summer Storm | 7.0 | 364.0 | 0.0 | 0.39 | Not specified | Not specified | 0.015 | 363.1 |
| | South Runoff Pond | 0.65 | 2/3 between the 1,000-year and the PMF | 20.1 | 363.27 | 13.0 | 0.0 | Not specified | 362.8 | 0.068 | 362.8 |

(1) Freeboard based on lowest surveyed crest elevation, from 2022 ground surveys. Some crest settlement has occurred since construction.
(2) Typically, equivalent to spillway invert elevation.
(3) Previously 354, changed to 35.7 according to CRW3295-4910-DT00-MEM-0007.001

### 4.2.2 Dam Consequences Classification

The current dam consequence classifications for each facility at RRM are listed in the 2020 DSI (BGC-4910-DT00-RPT-0017.001) performed by then-EOR except for Sediment Ponds 1 to 3. Table 4- 3 lists consequence classifications for the dam structures as provided by then-EOR and 2021 Dam Safety Review (DSR) consultant (SRK).

Current-EOR, SRK, is preparing design basis for site-wide water management dams and ponds. The dam classification are updated accordingly. Note that further work is required to confirm the classifications of some structures, and it is recommended that they be treated according to the higher potential classification in the meantime.

**Table 4- 3: Dam Consequence Classifications (CDA Equivalent)**

<table>
<tr><th colspan="2" rowspan="2">Facility</th><th colspan="2">Dam Classification</th></tr>
<tr><th>BGC (BGC, 2020)*</th><th>2023 Design Basis</th></tr>
<tr><td colspan="2">TMA Dams<br>(North, West, South)</td><td rowspan="5">Extreme</td><td rowspan="4">Very High to Extreme</td></tr>
<tr><td colspan="2">WMP Dams (Dam 1 to 3)</td></tr>
<tr><td colspan="2">Stockpile Pond Dam</td></tr>
<tr><td colspan="2">West Creek Dam</td></tr>
<tr><td colspan="2">MRP Dam</td><td>High to Extreme</td></tr>
<tr><td rowspan="3">Sediment Pond Dams</td><td>Dam 1</td><td rowspan="3">Unclassified</td><td>Low</td></tr>
<tr><td>Dam 2</td><td>Low to Significant</td></tr>
<tr><td>Dam 3</td><td>Declassified</td></tr>
<tr><td colspan="2">Clark Creek Dam</td><td rowspan="4">Low</td><td rowspan="2">Low</td></tr>
<tr><td colspan="2">Teeple Dam</td></tr>
<tr><td colspan="2">Water Discharge Dam</td><td>Low</td></tr>
<tr><td rowspan="2">Plant Site</td><td>South Runoff Pond Dam</td><td>High to Very High</td></tr>
<tr><td>North Runoff Pond Dam</td><td>Declassified</td></tr>
</table>

*SRK Stage 5 Design (CRW3295-4910-DT00-RPT-0002.002) and Design Basis Review(CRW3295-4910-DT00-RPT-0006.001)

### 4.2.3 Design Criteria

The TMA is designed to provide sufficient storage for the projected tailings storage requirements and operational pond volume.

The water management facilities are designed to collect, divert, and store surface runoff and seepage from dams, and provide water storage for mill water reclamation.

#### 4.2.3.1 IDF

IDF (Inflow Design Flood) is designed to pass through the emergency spillway without impacting the integrity of the dams.

For the TMA, an IDF equal to the full probable maximum flood (PMF) has been selected (corresponding to the CDA "Extreme" consequence classification).

The IDF event selected corresponds to the critical PMF event, which is the 24-Hour Spring PMP + 100-year Snow + 100-year critical temperature sequence, resulting in the highest PMF peak flow of 653 $m^3/s$.

The hydrotechnical parameters IDF event including IDF inflow, outflow and IDF water level for the TMA (Stage 5 operation) and water management facilities are presented in Table 4- 2.

#### 4.2.3.2 EDF

EDF (Environmental Design Flood) is the most severe flood that can be managed without release of untreated water to the environment. This volume is maintained below the emergency spillway invert.

EDF is defined as a deterministic storm event corresponding to a flood event return period of 1:100 years and 30-day duration rainfall event for the TMA with a volume of 2.79 $Mm^3$ for Stage 5.

The TMA dam raise schedule assumes that the EDF water level (EDFL, equivalent TMA spillway invert elevation) must be at or above the projected 99th percentile pond level. This would provide a minimum annual probability of discharge through the spillway of 1% or less, which is equivalent to a return period of approximately 1:100 years.

The EDF event for the water management facilities is presented in Table 4- 2.

#### 4.2.3.3 NOWL

Normal Operating Water Level (NOWL) is defined as the elevation below the EDFL to contain inflow from the EDF between the min. operating water level (corresponding to 5th percentile pond level) and the EDFL. For TMA, NOWL is spillway invert elevation minus the EDF (rounded to 0.5 m).

NOWL for the TMA (Stage 5) and water management facilities is presented in Table 4- 2..

#### 4.2.3.4 Freeboard

**Minimum Freeboard**

According to CDA 2007 Hydrotechnical Bulletin, minimum freeboard is defined as the difference in elevation between lowest elevation of the top of the dam and the maximum still pool reservoir level that would results should the IDF occur. Min. freeboard is selected to ensure no overtopping by 95% of waves caused by the most critical wind, as dictated by the dam classification, during the IDF event. Table 4-4 summarizes the minimum freeboard of TMA for Stage 5.

**Table 4- 4: Minimum Freeboard**

| Dam Raise | Required Freeboard (1) (m) | Available Freeboard (2) (m) | Excess Freeboard (3) (m) | Reference |
|---|---|---|---|---|
| Stage 5 | 0.7 | 1.2 | 0.5 | CRW3295-4910-DT00-MEM-0001.002 |

(1) Based only on wind and wave action.
(2) The vertical distance between dam crest and max. reservoir elevation during pass of IDF.
(3) The difference between available freeboard and required freeboard.

**Normal Freeboard**

Normal Freeboard is defined as the difference in elevation between the lowest elevation of dam crest and the maximum normal reservoir operating level (MOWL), which in this case is the spillway invert. The normal freeboard ensures that the structure is protected against the most critical of the following cases:

- No overtopping by 95% of the waves is caused by the most critical wind with a frequency of 1000-year when the reservoir is at its MOWL.
- Thickness of the material covering the impervious core is sufficient to avoid freezing of the core in winter.

Table 4- 5 summarizes the normal freeboard of TMA for Stage 5.

**Table 4- 5: Normal Freeboard**

| Dam Raise | Required Freeboard (1) (m) | Available Freeboard (2) (m) | Excess Freeboard (3) (m) | Reference |
|---|---|---|---|---|
| Stage 5 | 0.2-0.6 | 2.3 | 1.7-2.1 | CRW3295-4910-DT00-MEM-0001.002 |

(1) Based only on wind and wave action.
(2) The vertical distance between dam crest and spillway invert/ 99$^{th}$ percentile pond elevation (BGC) or NOWL (SRK).
(3) The difference between available freeboard and required freeboard.

Minimum freeboard for the Stage 5 TMA operation and water management facilities is presented in Table 4- 2.. The normal freeboard for all dams is presented in Table 4-1.

### 4.2.3.5 Spillway

An emergency spillway is designed to pass IDF while maintaining minimum freeboard required to accommodate wind setup and wave run-up without discharge.

TMA spillway invert elevation is 1.8 m below dam crest for the stages as shown in Table 4-1. The TMA emergency spillway location is maintained at TMA North Dam Sta. 0+850 or Sta. 0+950 throughout remaining operations and then relocated to the TMA West Dam (Dam 4) at closure.

The geometry of spillway and the invert elevations of all dams (Stage 5 for TMA spillway) is presented in Table 4- 2..

#### 4.2.3.6 Physical Stability

The stability criteria including loading conditions and minimum factor of safety adopted for the TMA design are summarized in Table 4- 6 and are in accordance with the CDA guidelines.

Dam construction is staged such that the minimum FoS (Factor of Safety) is 1.5 throughout construction and at the End of Construction for each crest raise.

The rapid drawdown scenario is assessed for the downstream slopes of the TMA West Dam (Dam 4), considering rapid drawdown of the BCR#1 (Biochemical Reactor 1) pond, and for the TMA West Dam (Dam 5), considering rapid drawdown of the WMP.

**Table 4- 6: Minimum Factor of Safety Adopted for TMA Stage 5 Design**

| Loading Condition | Minimum Factor of Safety | Slope | Reference |
|---|---|---|---|
| End of construction – Static | 1.5 | Downstream and upstream | CDA 2019 |
| Full or partial rapid drawdown – Static | 1.2 | Downstream where applicable | CDA 2019 |
| Pseudo-static – Seismic | 1.0 | Downstream and upstream | CDA 2019 |
| Post-peak (regardless of trigger) | 1.1 | | CDA 2019, ANCOLD 2019 |

#### 4.2.3.7 Seismic Design Criteria

For the TMA, an earthquake design ground motion (EDGM) with a 1/10,000 AEP (Annual Exceedance Probability) has been selected (corresponding to the “Extreme” consequence classification) (CDA, 2013).

Ground motions are discussed in greater detail in the Updated Ground Motion Evaluation Report (BGC-4910-DT00-RPT-0004.001). For the design of the TMA, it is recommended to use the Site Class D response spectrum including a PGA of 0.14 g (0.11g according to SRK) corresponding to a 10,000-year mean return period, as well as specifying the maximum magnitude of M 6.0 for the design earthquake at a site-to-source distance of approximately 50 km.

The maximum allowable permanent seismic displacement for the TMA dams is 0.3 m, with a percentage exceedance of this threshold of 50%.

Tailings are assumed to liquefy (i.e., zero shear strength). Analyses of CPT data completed as part of TMA Stage 2 raise design indicate that the TMA foundation soils are non-liquefiable.

The cohesive foundation soils are assumed to undergo a 20% reduction in shear strength as result of earthquake loading.

The seismic design criteria for the water management dams are not summarized.

### 4.2.4 Brief Dam Construction History

Summary of the construction of RRM onsite dams and ancillary structures is referenced in Table 4- 7.

**Table 4- 7: Construction Record Reports**

| Structure | Reference |
|---|---|
| **Clark Creek Diversion System** | RRP-GEO-REP-027 |
| **Water Management Ponds** | RRP-GEO-REP-030 |
| **TMA Cell 1** | RRP-GEO-REP-032 |
| **West Creek Diversion System** | RRP-GEO-REP-028 |
| **Mine Rock Pond** | RRP-GEO-REP-033 |
| **TMA Cell 2** | RRP-GEO-REP-035 |
| **TMA Cell 3** | RRP-GEO-REP-039 |
| **Sediment Pond 1** | RRP-GEO-REP-040 |
| **Sediment Pond 2** | RRP-GEO-REP-038 |
| **Water Discharge Pond** | RRP-GEO-REP-037 |
| **TMA Stage 2 Raise** | BGC-4910-DT00-RPT-0011 |
| **Sediment Pond 3** | BGC-4460-DT00-RPT-0011 |
| **TMA Stage 3 Raise** | BGC-4910-DT00-RPT-0014.001 |
| **TMA Stage 4 Raise** | CRW3295-4910-DT00-RPT-0004.001 |
| **TMA Stage 5 Raise** | Document in Draft (To be finalized) |

## 4.3 Tailings Management

### 4.3.1 Tailings Characterization

#### 4.3.1.1 Ore and Ore Processing

- Type of ore: Pyrite, Pyrrhotite, Chalcopyrite
- Ore processing method including reagents used: Leaching process using cyanide
- Ore processing rate： 24,000-30,000 tpd
- Treatments applied to tailings before transported to TMA: Inco $SO^2$/Air detoxification of cyanide.

#### 4.3.1.2 Tailings Deposition Parameters

Design Basis Report (SRK 2022, CRW3259-4910-DT00-RPT-0002.002) presents the following tailings deposition parameters.

- Non-plastic, predominantly silt-sized particles
- Specific gravity: 2.78

- In-situ dry density: 1.35 t/m$^3$
- PAG with an expected lag time to net acidic conditions of approximately 30 years.
- Metal leach from subaerial and subaqueous tailings and greater source of loading from subaerial.
- Tailings beach slope: above water: 0.5%, below water: 0.9% (beach far from dam) to 1.5% (beach close to dam).

### 4.3.2 Tailings Production

Mill start-up: August 9, 2017

Table 4- 8 provides the life of mine tailings production including the projected total tailings tonnage and actual tailings production up to end of 2022.

**Table 4- 8: Life-of-Mine Tailings Production**

| Description | Open Pit (incl. Stockpiles, ton) | Underground (ton) | Total (Mt) | |
|---|---|---|---|---|
| | | | Projected (1) | Actual (2) |
| Up to end of 2021 | - | - | | 34.8 |
| 2022 | | | | 9.1 |
| 2023 | 9,543,879 | 311,121 | 9.855 | |
| 2024 | 9,195,029 | 659,971 | 9.855 | |
| 2025 | 8,404,106 | 1,450,894 | 9.855 | |
| 2026 | 7,992,969 | 1,862,031 | 9.855 | |
| 2027 | 7,894,511 | 1,960,489 | 9.855 | |
| 2028 | 5,216,358 | 1,784,294 | 7.0 | |
| 2029 | | 1,643,071 | 1.643 | |
| 2030 | | 1,625,515 | 1.626 | |
| 2031 | | 1,212,232 | 1.212 | |
| LOM (Life of Mine) Total: | 48,246,852 | 12,509,618 | 60.756 | 43.9 |

(1) According to Table 16.39 (P370, NI43-101, dated March 31, 2022)
(2) From Mill production

### 4.3.3 Tailings Distribution System

The tailings deposition plan is developed annually and in conjunction with the corresponding year's dam raise schedule. Deposition plans are available in New Gold's document control system, In Eight Team Binder.

2024 tailings deposition is based on Stage 5 tailings deposition plan developed by the EOR ( CRW3295-4910-BA10-MEM-0005).

Tailings is transported in a slurry state with approximately 47% solid content by mass and pumped through 24" HDPE pipeline from the mill to the TMA.

Tailings pipelines sit on upstream rockfill zone, Zone 2/2A, and permanently positioned off the dam core, Zone 1/1A. Before reaching TMA, tailings pipeline is placed in a lined collection trench.

Tailings can discharge to the TMA pond through spigots along perimeter dams and end-dumping along North Ring Road (NRR) and Y Junction.

## 4.4 Water Management

### 4.4.1 Types of Water

RRM site manages four types of water, based on the type of infrastructure or processes that the water encounters and its associated quality. Table 4- 9 presents the types of water.

**Table 4- 9: Types of Water at RRM Site**

| Type of Water | Definition | Management Approach |
|---|---|---|
| **Process-Affected Water (PAW)** | Water used in the mill, which is influenced by reagents and process chemistry | Discharged to the TMA with tailings solids. |
| **Treated Water** | Treated effluent from the water treatment train which meets discharge criteria | Stored in WMP.<br>Discharged to Pinewood River via EDL1 or EDL2 |
| **Contacted Water** | EMRS: Water that has been in contact with mine waste rock and ore from the East Mine Rock Storage (EMRS) area, or the Open Pit | Collected in storage MRP and SRP.<br>Used for mill makeup water or pumped to TMA. |
| | WMRS: Water that has been in contact with waste rock or overburden from the West Mine Rock Storage (WMRS) area | Collected in sediment ponds (Sediment Pond 1, 2 and 3).<br>Discharged off-site via Sediment Pond 1 or Sediment Pond 2 |
| | Sumps: Water that contains some TMA dam seepage and has been in contact with Zone 3 of TMA perimeter dams | Collected in seepage collection system sumps including WDP.<br>Discharged to WMP or TMA depending on the locations |
| **Freshwater** | Water that has not been in contact with mine infrastructure and is conveyed around the site | Collected in series of dams and ditches.<br>Discharged to Pinewood River via West Creek Diversion or Teeple Pond Outlet channel |

### 4.4.2 Treated Water

Facilities that convey treated water include the Water Management Pond (WMP) and the associated discharge infrastructure to Pinewood River.

The WMP collects treated water from the water treatment train and direct precipitation from its catchment. Water is then discharged to the Outflow Basin, where it can pump to Pinewood River via EDL1 or EDL2.

EDL2 is the primary discharge and will be prioritized over EDL1. Discharge through EDL1 can be greater than EDL2, however. The rationale for using two separate discharge locations derives from the need to achieve effective water quality treatment while minimizing adverse flow effects on the Pinewood River, under varying hydrologic operating conditions. EDL2 is located further upstream on the Pinewood River and will help to maintain flow in the Pinewood River but has a lower assimilative capacity. All effluent from the water management pond not discharged to EDL2 will be discharged by pipeline to EDL1 downstream of McCallum to take advantage of increased river assimilative capacity.

Additional details on the operations of the WMP are described in OMS Part III.

### 4.4.3 Process-Affected Water

Facilities that manage PAW include the mill, the TMA, BCR2 and the water treatment train.

#### 4.4.3.1 Mill

The Mill uses water, which becomes PAW once it leaves the Mill and is deposited with tailings into the Tailings Management Area (TMA). Mill operations and details are not described herein; however Section 3.3.2 in OMS Part II presents reclaim water sources for mill use.

#### 4.4.3.2 TMA

Water collected in the TMA includes process affected water from the Tailings Pipeline, direct precipitation and runoff in the TMA catchment, pumped inflows from seepage collection systems around the TMA, and pumped contact water from across the site. Details on the TMA operations are described in OMS Part II.

Seepage and runoff from the TMA and WMP are collected in a series of seepage collection sumps and ditches (NDSC Sumps 1 to 5, SDSC Sump 1 and 2, Emergency Dump Pond 4, and the Water Discharge Pond) and are pumped back to the TMA or, if water quality permits, the WMP.

The TMA has been designed to optimize natural degradation processes to provide further water treatment, by ensuring there is sufficient retention time to allow these reactions to occur. The natural degradation processes are most effective during warm weather conditions when biophysical activity is optimal and are also augmented by exposure to sunlight. Effluents that are planned for discharge to the environment will be held for a sufficient period under warm weather conditions, to maximize the effects of natural degradation. Such effluent aging will take place in the summer months (June through mid-September) in both the TMA and WMP.

#### 4.4.3.3 Water Treatment Train

The Water Treatment Train consists of Lime WTP (water treatment plant), Nitrification Cells, and BCR #1 (Biochemical Reactor 1). It treats the process- affected water from the TMA. The treated water is stored in WMP before discharge to Pinewood River vis EDL1 and EDL2.

### 4.4.4 Contacted Water

Facilities that manage TMA, WMRS, EMRS, open pit and mine facility area contacted water include TMA seepage collection system, sediment ponds, MRP, SRP and NRP

The design criteria, objectives and operations of the sediment ponds are described in Part III of the Manual.

#### 4.4.4.1 Sediment Pond 1

Sediment Pond 1 is designed to collect runoff from the WMRS/ Overburden Stockpile but does not currently do so. Sediment Pond 1 is currently used as a transfer station for pit dewatering and other contact water flows to the TMA and WMP, or to Sediment Pond 2 for discharge if water quality allows.

#### 4.4.4.2 Sediment Pond 2

Runoff from the WMRS is collected in Sediment Ponds 2 and 3 (which is then pumped to Sediment Pond 2). Water from Sediment Pond 2 is treated for total suspended solids by way of mechanical settling and is discharged to a splash pad located between the pond and the Pinewood River, if water quality allows, or is pumped to the TMA. This system is described in Part III of the Manual.

#### 4.4.4.3 Sediment Pond 3

Sediment Pond 3 collects surface runoff from the WMRS and overflows from Temporary Sump 2, which collects water from the open pit dewatering wells and open pit diversion. Sediment Pond 3 water is pumped to Sediment Pond 2.

#### 4.4.4.4 Mine Rock Pond

EMRS runoff is collected within the MRP and is either used for mill process, where it is used for tailings slurry and discharged to the TMA, or directed to the TMA directly, and follows the same treatment procedures for PAW, The MRP has a seepage collection pond which returns any collected seepage and runoff to the MRP. This system is described in Part III. Under the 2022 pilot program, water from the MRP can be directed directly to Biochemical Reactor (BCR) #2 at a rate of 10,000 $m^3$/day for discharge to the Pinewood River. This pilot program was put on hold and switched to treat TMA water in BCR 2. See Part II and III of the Manual for more information.

#### 4.4.4.5 South Runoff Pond

Currently used for sediment control and mill water supply.

#### 4.4.4.6 North Runoff Pond

Currently used for dust suppression and mill water supply

#### 4.4.4.7 Open Pit Water Management

Dewatering from the Open Pit is considered contact water, and is pumped either to the MRP, South Runoff Pond for use in the mill process, or directly to the TMA.

Two deep groundwater dewatering wells are located to the south-west of the Open Pit. Water pumped from these wells reports to Temporary Sump 2, which flows by gravity to Sediment Pond 3.

A diversion ditch was completed in Winter 2023 to divert surface runoff from the north of open pit to Sediment Pond 3.

#### 4.4.4.8 Water Discharge Pond and Constructed Wetlands

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 $m^3$/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 the TMA.

### 4.4.5 Freshwater Water

Existing creeks and smaller water bodies are diverted through the mine with a system of dams and ditches called non-contact runoff. Three major systems are:

- Clark Creek originates north-east of the mine and flows towards the south-west, originally passing through the East Mine Rock Stockpile (EMRS) and MRP footprints. Clark Creek is diverted away from the EMRS and MRP by the Clark Creek Dam, Clark Creek diversion channel, Teeple Dam, and Teeple Pond Outlet channel.

- The West Creek system originates northeast of the mine and flows south, originally passing through the Open Pit, plant site, and crusher. The Stockpile Pond Dam (SPD) and West Creek Dam (WCD) were constructed to divert water into the West Creek diversion channel, which travels south of the TMA and discharges into the Pinewood River via Loslo Creek.

- Loslo Creek and Marr Creek historically passed through the TMA footprint but have been diverted towards the east of the TMA as Loslo and Marr Diversion Ditches, entering the WCD.

The Freshwater Diversion system includes:

- Marr and Loslo Creek diversion ditches

- Clark Creek diversion including the Clark Creek and Teeple dam structures
- West Creek diversion including the Stockpile and West Creek dam and diversions structures.

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 and TMA pond water treatment reduces the water treatment and effluent management requirements and helps reduce pressure on the water treatment plant. All structures support fish habitat except for Marr and Loslo diversion ditches.

Note that operations, maintenance, and surveillance are discussed in OMS Part III: Water Management Facilities. No further details on the non-contact water systems are presented herein.

# 5.0 Instrumentation

The following sections provide an overall description of the instrumentation used at site and the processes that are used. Specific instrument locations and thresholds will be discussed in detail in the relevant Parts of the OMS manual.

## 5.1 Types of Instruments

Instrumentation measurements, along with visual inspections, serve as the primary mechanisms for performance monitoring of the TMA and Water Management facilities.

- Slope Inclinometers (SI) – A vertical PVC pipe installed through the ground typically into bedrock that measures horizontal deformation.
- Vibrating Wire Piezometers (VWP) – A pressure transducer and polyurethane coated wire that measures the pore water pressure within the dam core and foundation clay units.
- Standpipe Piezometers – A vertical PVC pipe with a perforated or screened section for measuring water levels and collecting water samples, typically in coarse foundation units.
- Settlement Plates – A base plate is installed at some depth with a riser pipe extending to surface to measure settlement of soils.
- Magnetic Extensometers – Installed as a series of magnetic rings, either around corrugated PVC tubing or slope inclinometer casing within the foundation units to monitor vertical consolidation-induced settlement.
- Survey Monuments – A bar of steel is driven into the ground and the top of the bar is surveyed to monitor displacement.
- Shape Array - Series of sensors or markers that are installed at different depths within the slope inclinometer casing. These sensors are designed to measure displacements or deformations in multiple directions unlike slope inclinometers.

Details are available in then-EOR's instrumentation reports (BGC-4910-DT00-RPT-00.001) produced by then-EOR twice a year for the assessment of instrument performance. The locations of the instruments can be viewed in NG's proprietary, GIS Viewer.

## 5.2 Data Collection and Storage

All instrumentation data is manually collected, except for VWPs and Shape Arrays. The VWPs are connected to dataloggers which record hourly readings of the instrument. These readings are then transmitted by radio frequency to Hubs (4 in total) located at the Marr site and the E-House at the intersection of WD4 and WD5. The Hubs transmit the collected data which is then stored on NG server. These files are located at: \\pcs01-yag\Campbellsci\LoggerNet.

Data collection frequency including processing and submission is to provide timely instrument response to internal factors such as construction activities, tailings deposition, and external factors such as precipitation etc. The reading frequency for all the automated instruments, such as VWPs, Shape Arrays, and weather station, is every hour. For the instruments requiring manual reading, such as SIs and

settlement plates and Magnetic extensometers, the reading frequency is assigned in the instrumentation threshold report for TMA and water management dams by EOR. DAM-SOP-0001 through –00014 provide additional detail on data collection and reading of instrumentation.

| Instrument Type | Reading Frequency | |
|---|---|---|
| | During Construction | Post Construction |
| Vibrating Wire Piezometer | 1 hour | 1 hour |
| Shape Array | 1 hour | 1 hour |
| Manually Read Instrumentation | | |
| Slope Inclinometer | 7 days | 14 days / 30 days |
| Standpipe Piezometer | 30 days | 30 days |
| Settlement Plate | 30 days | 30 days |
| Magnetic Extensometer | 30 days | 30 days |

Note: Reading frequency of Slope Inclinometers is subject to change based on movement rate and can be less than 7 days based on construction activity in the given area.

## 5.3 Data Visualization and Reporting

Instrumentation data gathered from SIs and VWPs is reported to the EOR through the Bi-Weekly Instrumentation Reports on Mondays and Thursdays. Furthermore, the recent integration of MEs, SPs, and PZs data into the GIS SQL database ensures seamless accessibility for the EOR at any given time. DAM-SOP-0006 provides additional detail on reporting.

## 5.4 Weather Stations

The RRM weather stations were installed at the Barron Site in September 2016, and Marr Site in early 2022 (later relocated TMA WTP site in late 2022, station name: Marr) and are maintained by the Environment Department and Capital Projects, respectively.

The data collected by the Barron weather station is hosted by Campbell Scientific, and the data is updated twice per day at 09:00 and 16:00. In Q4 2020, the Barron weather station was upgraded to include an all-weather precipitation gauge, snow depth sensor, evaporation pan and newer models of existing instruments.

The Marr Site station collects wind, precipitation, and air temperature data. It can be accessed in this link: Bulletin: Rainy River Mine - Marr (weatherlink.com)

## 5.5 Other Instruments

Additional instrumentation to support the OMS manual and management of water includes:

- Densometer on the tailings pipeline.
- Flow meters on the Pinewood River and water management pipelines including from the Pinewood River, tailings reclaim lines, MRP line and freshwater line from the WMP.

  Pond automating project implemented in 2023 during which all dams, ponds, and sumps were automated. Water level transducers were installed in each structure which report hourly to the

SQL database. Additionally, a new GIS dashboard was also implemented to track water levels with appropriate TARPs for each structure (Water Levels).

This instrumentation provides continuous recording, which is collected during routine inspections and included.

# 6.0 Regulatory

## 6.1 Approval Summary

Approvals for permits as well as Environmental Assessment (EA) commitments can be found on the Environment SharePoint webpage at:

https://newgold4.sharepoint.com/sites/yag_environment/SitePages/Home.aspx

## 6.2 Commitment Tracking

All Regulatory requirements are tracked in the Intelex software application. A link can be found on the Environment webpage

https://newgold4.sharepoint.com/sites/yag_environment/SitePages/Home.aspx

The Environmental Management System framework is found in the EMS Manual ENV-MAN-EMS-0001 draft.

# Appendix A

newgold™

**Tailings, Heap Leach and Waste Rock Facilities Management Policy**

New Gold Inc. and its subsidiaries (together ''New Gold") are committed to excellence in the management of tailings, heap leach and waste rock storage facilities. We will accomplish this by adopting internationally recognized standards including the Mining Association of Canada's Towards Sustainable Mining Tailings Management protocol wherever applicable.

New Gold makes the following commitments at all its operations and projects:

- Identifying, assessing, and controlling risks associated with tailings, heap leach and waste rock storage facilities.
- Ensuring that all aspects of our tailings, heap leach and waste rock storage facilities comply with regulatory requirements, sound engineering practice and company standards through regular inspection, program review and external audit.
- Locating, designing, constructing, operating, decommissioning, and closing our tailings, heap leach and waste rock storage facilities so that all structures are stable and that all solids and water within the designated areas are managed to minimize or prevent pollution.
- Training our employees to enable them to carry out their responsibilities regarding tailings, heap leach and waste rock storage facilities management.
- Communicating with Communities of Interest to consider their concerns and considerations regarding tailings, heap leach and waste rock storage.

New Gold believes that by adopting these commitments, the safe storage of tailings, ore and waste rock will be achieved, and future Communities of Interest will not be adversely impacted by their existence.

Renaud Adams

President and CEO

# PART I - GENERAL_Rev1

Final Audit Report 2024-02-14

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