Appendix J

Site-Wide Management Plan

Crawford Nickel Project:
Site-Wide Water Management Plan

Prepared for:

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1.0 Introduction

The Crawford Nickel Sulphide Project (the Project) is a planned open pit nickel mine development owned by Canada Nickel Company (CNC). The project is located approximately 42 kilometres (km) north of Timmins, in northern Ontario. The project will involve the development of an open pit mining area, a process plant, as well as waste rock impoundment, ore stockpiles, overburden storage areas, and tailings management facilities. Ausenco was retained by CNC to develop an overall water management strategy for the site, which is described in this document.

2.0 Water Management Objectives

Water management requires consideration of the water between facilities and the associated catchment areas. Surface water runoff that comes into contact with disturbed areas of the mine (contact water) will require management prior to release to the receiving environment. The principal objectives of the site water management are:

- Provide water for mining operations (milling/processing, dust suppressant), including reuse of collected water to the extent feasible.
- Reduce potential flood effects to local receivers by controlling flooding on site and attenuating effluent discharge.
- Reduce water quality impacts on receivers by providing mine water sedimentation control and treatment.
- Reduce erosion and sedimentation with appropriate erosion and sedimentation controls.
- Maintain existing flows to the receivers to the extent feasible.
- Reduce site contact water as much as possible by incorporating surface water/overland flow diversion.

3.0 Water Management Design Criteria

The Water Management Design Criteria (**Appendix A**) outlines the basis and inputs to the water management planning for the site. The following provides the key criteria.

3.1 Quantity Controls

- A 100-year, 24-hour storm event will be internally managed through pond storage and controlled release to the open pits from all contact areas. All collection ditches have been sized to convey the design storm with freeboard considerations. Ponds will have spillways directed towards the Pits that will convey flows for events up to the 100-year, 24-hour storm. These features will be used to maintain onsite control of higher storm events. In the event of an extreme flood event (i.e. excess of a 100-year event) Pond will have secondary emergency overflow spillways to direct flow to the receiving environment in a controlled manner.
- Gravity collection/conveyance ditches have been incorporated where feasible, including overflows from settling ponds to the pits.
- Erosion-susceptible zones in drainage ditching, pond inlets, outlets and discharge ditches will be protected through use of vegetation controls and/or stabilization with stone resistant to erosive forces.

3.2 Quality Controls

- Sediment ponds will be sized to remove particles above 10 micrometers through conventional settling. Ponds will have a permanent pond volume to promote settling and have a pre-settling forebay with cleanout access.
- Based on soil samples collected at the site where mine works construction will occur, clay (<5 µm) made up 20 to 30% the sampled material. Jar test work for a limited synthetic groundwater sample indicated that the material is highly settable; however, laboratory testing will be carried out on representative water samples to confirm the settleability of the material. This test work will be used to verify retention time of the ponds and identify if other additional treatment requirements may be required (e.g., flocculants).
- Settling ponds will be sized to function for up to a 10-year, 24-hour storm; however, the ponds have sufficient storage capacity to retain the full 10-year storm without release in the event of an upset condition.
- Collected mine water will be treated for constituents of concern via modular treatment plants near each pond prior to discharge to the receiver. Water treatment requirements will be based on geochemical testing and predictive modelling along with effluent criteria determine though a receiving water assessment/assimilative capacity study (to be determined).
- Climate change projections have been incorporated into both the design storms (100-year and 10-year) and the daily precipitation to account for potential increases in runoff and seepage.
- Erosion and sediment controls will be implemented during construction and closure. While these are still being developed, it is envisioned that these will consist of typical best management practices such as silt fencing, check dams, and scarfing.

4.0 Water Management Strategy

Surface water runoff that comes into contact with disturbed areas of the mine (contact water) will require management prior to release to the receiving environment. Collection ditches will capture contact water from the Rock Impoundment Facility, Low Grade Stockpiles (LG), Tailings Management Facility (TMF) and the Process Area and convey it to settling ponds. Auxiliary treatment, if required to meet desired discharge criteria, will be done using modular treatment plants near each pond. Pit groundwater and surface runoff from haul roads and the pits will be pumped to the Tailings Facility Ponds (Northwest and Northeast Ponds). As per mining best practice, perimeter collection ditching will be constructed to intercept shallow groundwater seepage at the toe of stockpiles and dams. Ditches and pond geometry and volumes are presented in **Appendix B**.

Non-contact water will be diverted around mine infrastructure to reduce the amount of water needing to be managed and to maintain existing flow to the adjacent watercourses to the extent possible.

The general site wide water management strategy is shown in **Figure 4.1**.

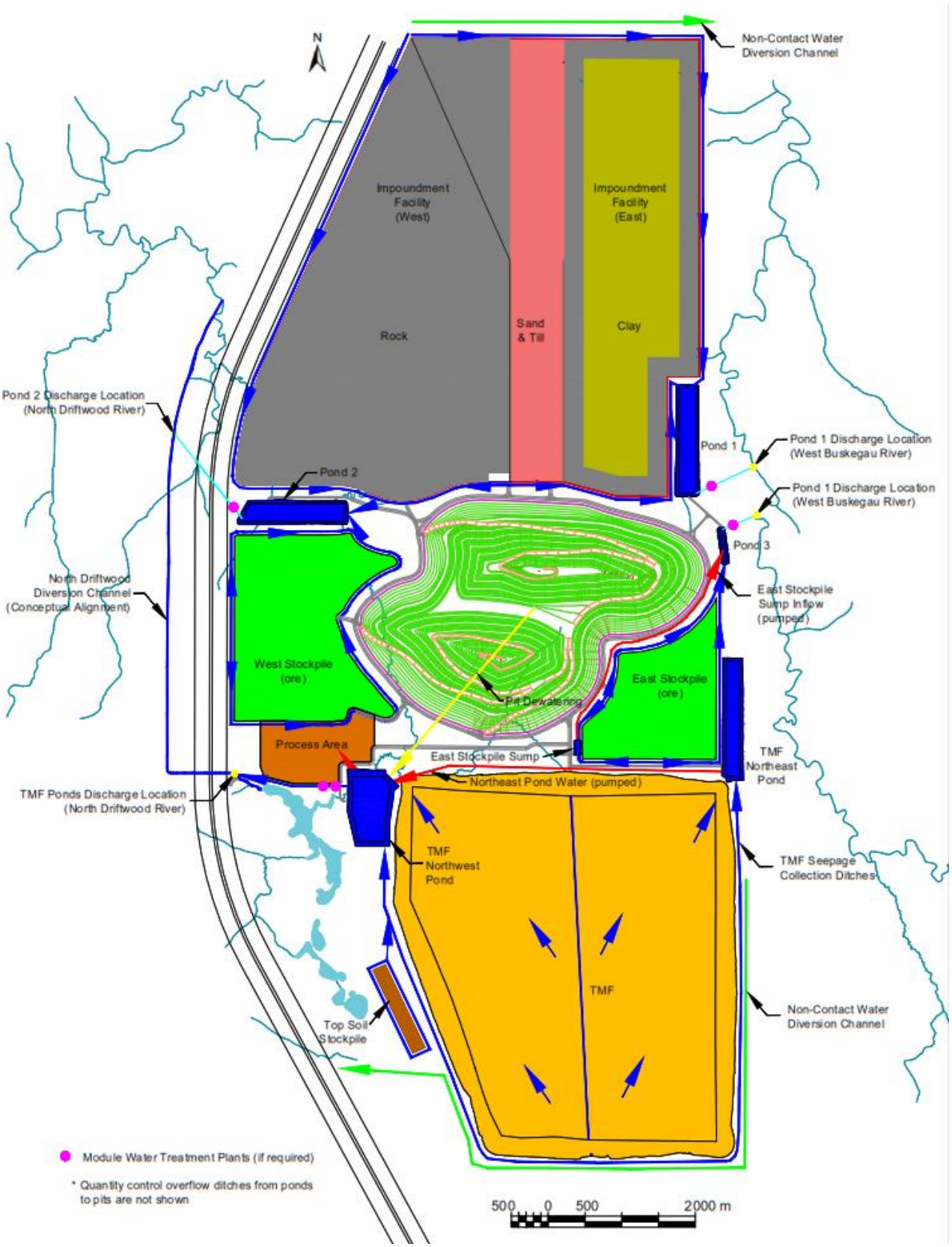


Figure 4.1 Site Wide Water Management Strategy Schematic

4.1 Water Management Infrastructure

Major site infrastructure for the purposes of water management consists of the following:

- Open Pits (East Zone (EZ) and Main Zone (MZ))
- Impoundment Facility (inclusive of rock, sand & till, and clay impoundments)
- East Stockpile (ore) and West Stockpile (ore)
- Process Plant Area
- Tailings Management Facility (TMF).

4.1.1 Collection Ponds

4.1.1.1 Pond 1

Contact water from the Rock Impoundment Facility (Clay Impoundment: eastern portion of the Facility and Sand and Till Impoundment: central portion of the Facility) will be conveyed via gravity ditches to collection Pond 1.

4.1.1.2 Pond 2

Once the Highway 655 realignment is completed and the western extent of the Impoundment Facility is disturbed, Pond 2 will be constructed to manage runoff from the western portion of the Rock Impoundment: western portion of the Facility. Pond 2 will also serve to manage water from the West Stockpile and Process Area.

4.1.1.3 Pond 3

Contact water from East Stockpile will be collected in perimeter diches and conveyed to Pond 3. Due to topographic constraints, capturing runoff from the entire stockpile into a single pond utilizing gravity is not feasible. An excavated sump at the southwest corner of the East Stockpile will be required to capture runoff from a portion of the facility. A pumping system will convey accumulated runoff to Pond 3.

4.1.1.4 Northwest Pond (TMF)

Water from the TMF (runoff and decanted process/tailings water) is collected in two ponds adjacent to the TMF. The Northwest Pond will receive half of the water from the TMF along with dewatered flows from pit operations. Water required for processing/mill operations will be sent back to the process plant by a pumping system in order to recycle tailings decant water and to supply water process demands. Excess water remaining will be treated via modular treatment plants prior to being discharged to the environment.

4.1.1.5 Northeast Pond (TMF)

The Northeast Pond will receive half of the water from the TMF. This water will be pumped to the Northwest Pond for reclaim or treatment.

4.1.2 Water Treatment

Based on a review of the geochemical characterization (carried out by others), runoff from site has the potential to have elevated Total Suspended Solids (TSS). This is compounded by the fact that the overburden is predominately clay, which will be stored as part of the Rock Impoundment Facility.

Laboratory testing will be carried out on representative water samples to confirm the settleability of the material. This test work will be used to verify retention time of the ponds and identify if other additional treatment requirements may be required (e.g., flocculants).

Effluent water quality predictions and criteria are under development with source term development and water quality modelling, to be incorporated into an assimilative capacity assessment. The source terms incorporate available baseline surface and ground water quality data from Stantec, and geochemical testwork completed through February 2024 by WSP Golder.

It is anticipated that effluent will be near or lower than Metal and Diamond Mining Effluent Regulations (MDMER) and any treatment requirements will reflect that.

4.1.3 Impoundment Facility

The impoundment Facility will store Rock (not used for mining/construction activities) along with Clay and Sand and Till material excavated as part of mining operations. The water generated at the Impoundment Facility will be conveyed to its respective collection ponds (east to Pond 1 and west to Pond 2). Pond 1 and Pond 2 are wet ponds and will discharge water to the environment or to modular treatment plants, depending on water quality.

4.1.4 Ore Stockpiles

The water generated at the West Stockpile will be conveyed via excavated perimeter ditches to Pond 2. Runoff from the East Stockpile will be conveyed via excavated perimeter ditches to Pond 3.

4.1.5 Process Plant Area

The Process Plant Area will be graded towards the north-east to direct runoff towards the LG-West perimeter ditching which will convey flow to Pond 2. Until Pond 2 is constructed a temporary collection pond is planned to capture and attenuate runoff from this area.

4.1.6 Organic Stockpiles

Organic material will be stockpiled for future use during closure. It is envisioned that these stockpiles will be vegetated as soon as possible to reduce sediment loading. Any sediment laden runoff will be managed by typical construction methods including silt fencing and scarfing to reduce runoff velocities until the ultimate vegetation cover is established.

The overall site water management strategy incorporated these stockpiles and runoff from these stockpiles will be collected via perimeter ditches and conveyed to the closest water management pond.

4.1.7 TMF

Water management for the TMF was designed by WSP Golder (2022a). WSP Golder (2022a) considers two collection ponds to manage all water from the TMF. Runoff from the TMF, together with slurry water and bleed water released from the tailings, will be conveyed by gravity within the TMF, and will pass through internal TMF service spillways into the adjacent external TMF water management ponds (Northwest Pond and Northeast Pond). Seepage and runoff from the downstream shell of the TMF perimeter dam will be collected in perimeter contact water ditches and will be directed to the TMF Ponds. Each pond conveys water to the Process Plant by a pumping system to recycle tailings decant and to supply water process demands. Excess TMF water remaining will be treated at modular treatment plants located near the Northwest Pond.

4.1.8 Sewage Treatment

Domestic sewage waste will be limited as there will not be a permanent accommodations complex on site. Waste will be generated from office and administrative buildings, as well as the mine dry. During the construction and operation phases of the project, domestic sewage will be treated by an appropriately sized method, such as a sewage treatment plant. Effluent discharged from the facility will be treated to meet regulatory requirements and either directed to a pond on site or discharged into the environment. Following closure, the sewage treatment facility will be demobilized from site.

4.1.9 Non-Contact Water Diversions

There are a number of small lakes within the site property that drain through proposed mine infrastructure. Non-contact diversions will be required to divert these flows away from mining activities. An excavated channel is proposed as a new outlet for Martin Lake to divert flow along the re-aligned highway and tie back into North Driftwood River further downstream. A diversion berm will also be required to cut off the existing outlet of the lake which flows through the proposed TMF Northwest Pond and the pits.

A combination of berming and an excavated channel will be required at the north end of the Impoundment Facility to re-direct non-contact water around the facility and back into the West Buskegau River. A diversion channel is proposed around the southern extent of the TMF to intercept and re-direct non-contact water around the facility toward the North Driftwood River.

4.2 Erosion and Sedimentation Controls

4.2.1 Construction and Operations

During the construction and operations phases, ponds will be excavated to provide sediment and flood control. While the construction staging details of the project are on-going, it is envisioned that ponds will be constructed prior to site other activities (e.g. pit excavation, stockpile placement). Collection ditches will be hydroseeded or vegetated with native species to resist erosion. Given the flat topography of the site and ditch lengths, steep ditch sections requiring extensive revetment are not anticipated. Additional erosion and sediment control best management practices such as deploying rock or straw check dams, silt fencing (during construction) will be utilized.

Pond inlet and outlets will be riprap lined where higher velocities are anticipated, particularly at spillway or pipe discharge locations. Pond sidewalls will be vegetated to reduce sidewall erosion and riling. It is envisioned that coconut mats or similar cover will be provided during construction activities until vegetation has taken hold.

4.2.2 Closure

Once infrastructure is no longer required for mining operations, it will be reclaimed and naturalized as much as possible, including naturalizing ponds and revegetating impoundment facilities. Cover material will be placed and slopes will be contoured where required to reduce erosion and provide a stable reclaimed landform.

4.3 Mine Water Demands

The anticipated water required for milling/processing is outlined in Appendix A. As much water as possible will be decanted and reclaimed from tailings deposition. The remaining required water, including high quality water, will be taken from the pit via dewatering operations. Make-up water from other sources, including the Impoundment Facility and Stockpile ponds is not anticipated to be required at this stage.

Similarly, based on the groundwater and surface water modelling to date, it is estimated that pit dewatering and water reclaimed from the tailings will be sufficient to supply the milling/processing operations through all seasons, including winter months.

As noted, the construction staging details of the project are on-going and work is being carried out to examine the sources of water during the mine startup phase, until consistent recycling of water from the TMF is established. At this stage the potential sources of process plant startup water being considered are:

- Groundwater, particularly from pit dewatering activities or depressurization wells within the footprint of the ultimate pit shell.
- Construction of a bund dike in the TMF area to collect/store water prior to process plant start-up.
- Construction of a portion of the TMF East Pond prior to process plant start-up to collect/store water.

4.4 Tailings Deposition

Once ore processing operations commence (year 1 of operations), tailings will be deposited in the TMF; this will continue until year 18. During this time, the TMF Ponds (Northwest and Northeast) will collect water from the TMF (both decanted tailings water and surface runoff) for circulation back to processing operations or treatment/release to the environment.

Once the Main Zone open pit has been mined out (anticipated by Year 18 of operation), tailings will stop being deposited into the TMF and will be placed in the MZ Pit. Water reclaim for process will be drawn from the available tailings bleed water within the MZ pit. It is anticipated that mining EZ pit will cease by year 30 and tailings produced from processing the ore stockpiles will be deposited in EZ pit from approximately year 30 until end of mining operations.

4.5 Open Pit Mining

Development of the open pits will commence during the construction phase (starting at approximately year - 3). Water reporting to the pits, including groundwater, precipitation (surface runoff) from its footprint and immediate adjacent area, will be dewatered via staged pumping and report to the TMF Northwest Pond for process water reclaim or treated/released to the environment. A large sump (approximately 400,000 m^3), cut into the lower benches of the pit, will be required to provide additional water storage capacity from the surface ponds in the event of upset conditions or a larger storm event (i.e. up to a 100-year, 24-hour storm event). The MZ pit is anticipated to be mined out by year 18 and will begin to be infilled will tailings.

Pit dewatering will continue up until year 30 when the EZ pit will no longer be actively mined. At this stage, dewatering will only occur as required to satisfy process water requirements. Once milling/processing operations cease at the end of the mine life, no active inflows or outflows will occur (i.e. pits will be influenced by precipitation and groundwater only).

4.6 Water Management During Active Closure

Once infrastructure is no longer required from mining operations, it will be reclaimed and naturalized as much as possible. The objective of active closure is to restore the flow regime to as close to pre-mining conditions as possible, eliminate any active treatment (sediment or other constituents of concern) and create stable, naturalized landforms. The below outlines the key infrastructure and active closure timeline and activities related to water management. At this stage, a five year closure timeframe has been assumed for reclamation activities prior to fully decommissioning / closing water management structures.

Infrastructure	Closure Activity
Ponds	• Naturalized (revegetated if needed, recognizing they will have been there for a number of years already) • New spillways constructed to discharge to receiving environment. • Overflow spillway to pits removed/infilled. • Pre-mining flow paths reinstated as much as possible
TMF	• Vegetated • Runoff directed to North Driftwood River • Seepage collection ditches infilled (possible passive treatment)
West and East Stockpiles (ore)	• Vegetated and collection ditches removed • Pre-mining flow paths reinstated as much as possible
Impoundment Facility	• Covered/vegetated • Collection ditches infilled (possible passive treatment for seepage). • Pre-mining flow paths reinstated as much as possible

4.7 Pit Lake (Closure)

EZ pit will stop active mining at year 30. By this time, the MZ pit is expected to be largely backfilled with tailings. Dewatering from the pits will be reduced to the volumes required to supply the process plants only.

Once processing operations cease at the end of mine life, the pits will be left to infill naturally via groundwater and precipitation on the pit itself and immediate areas reporting to the pit. To maintain flow in the adjacent watercourses, diversions or re-direction of additional catchments (i.e. from the Impoundment Facility or West Stockpile) are not planned.

At the end of mining operations, tailings deposition into the pits will stop; it is estimated that the top of the tailings will be approximately 150 m (MZ Pit) and 280 m (EZ Pit) below the surface of the pits.

Once the water level in the pits has reached the surface (approximately 1.2 billion m^3 of water will be infilled to the pit post closure) they will be left as lake features. Outlet spillways will be constructed to divert excess water to the receiving environment. As the pits sit on both the North Driftwood River and West Buskegau River watersheds, two spillways will be constructed to divert flow to each river. The size and conveyance capacity of the spillways will be sized to mimic pre-mining flow to each watercourse as much as possible. Based on the site topography, both spillways will be located at the north end of the pit and have a design outlet elevation of 268 m. The west spillway will convey flow into Collection Pond 2 via an excavated ditch and ultimately to the North Driftwood River. The east spillway will discharge into the West Buskegau via an excavated ditch.

5.0 Water Management Sequencing

Throughout the life of mining operations there are several key changes pertaining to water management requirements for the site. The general sequencing is described below and schematic of the water management for key years is shown in **Figure 5.1** to **Figure 5.7**.

5.1 Construction (years -3 to -1; Figure 5.1)

- The east portion of the Rock Impoundment Facility is constructed; disturbance is limited to the West Buskegau River watershed. Collection ditches and Pond 1 will be constructed.
- Excavation of the pits starts. Overburden and waste rock are placed in the Impoundment Facility. Disturbed area will be limited to immediate vicinity of the active pits and water will be managed via pit sumps or best management practices for temporary construction works (i.e. silt fencing, temporary ponds). The objectives are to limit the disturbed area and maintain existing flows as much as possible.
- East Stockpile (ore) will be constructed and begin to store ore. The accompanying collection ditches, Pond 3 and sump will be constructed. It is envisioned that Sump 3 will also serve as temporary water control structure for the primary crusher and other similar infrastructures.
- The Phase 1 process plant area will be constructed. A temporary stormwater management pond (Construction Pond 1) will be constructed to control runoff from this area and act as a sediment pond for erosion control.
- All disturbed areas will employ best management practices for erosion and sediment control.

5.2 Process Plant start-up and TMF deposition (years 1 to 3; Figure 5.2)

- Ore processing (milling) will commence in year 1 and tailings will be deposited into the TMF.
- While deposition planning is on-going, based on the topography of the site, tailings will be deposited into a low lying area within the West Buskegau River watershed in the earlier years. A small Northeast Pond will be constructed down gradient to capture shallow seepage from the deposited tailings.
- Non-contact TMF diversions along the south and eastern extent of the full TMF footprint will direct non-contact water around the TMF towards the West Buskegau River watershed.

5.3 Highway Re-alignment and Continued TMF deposition (years 4 to 18; Figure 5.3)

- Highway 655 is re-aligned towards the west and non-contact diversions are constructed to divert flow towards North Driftwood River.
- Tailings continue to be deposited in the TMF. The TMF expands to its full footprint and the perimeter ring dykes are progressively raised. Seepage collection ditches are constructed and convey flow to the TMF Ponds.
- The TMF Northwest Pond is constructed.

- The west portion of the Rock Impoundment Facility is constructed. Accompanying collection ditches and Pond 2 will be constructed.
- The West Stockpile is constructed along with its collection ditches. The process area temporary pond (Construction Pond 1) is removed and runoff from the process area is tied into the West Stockpile collection ditch.
- The pits are further excavated.

5.4 Post TMF closure and pit deposition (years 19 to 29; Figure 5.4)

- The TMF reaches its design capacity by year 18 and is progressively reclaimed (specific closure planning is on-going and will be reported separately); at this stage a 5-year reclamation timeline has been assumed at which time water quality will be suitable for direct discharge. Internal ditches will be constructed to convey runoff from the eastern side of the TMF towards the west. Western dykes will be breached and all runoff from the TMF will report to the North Driftwood River.
- The TMF Northeast Pond will no longer receive inflow from mining operations and will be naturalized. A spillway will be constructed to direct flow east toward the West Buskegau River.
- Passive treatment systems for seepage treatment (if required) will be implemented.
- Tailings will be deposited into MZ Pit. Decanted tailings water will continue to be reclaimed for ore processing purposes (decanted from the Pit rather than a Pond). Dewatering of EZ pit will continue and will report to the process plant as make-up water or be pumped to the Northwest Pond for treatment prior to release to the environment.

5.5 Impoundment facility closure and post active pit mining (year 30 to 41;Figure 5.5)

- Mining of EZ pit will cease around year 30. Dewatering of the pits will cease, except for water required for ore processing operations. Accordingly, the Northwest Pond will be naturalized and a spillway constructed diverting flow west towards the North Driftwood River.
- Operations will continue to process the stored ore in the two East and West Stockpiles and tailings will be deposited into the EZ Pit.
- As active pit mining has ceased, the Impoundment Facility will no longer be required and will be reclaimed. The facility will be vegetated and contoured; pre-mining flow paths will be reinstated as much as possible. The southern ditches will remain active to divert flow away from the Pits and will be modified to by-pass Pond 2.
- Pond 1 will be naturalized and a spillway constructed to convey flow towards the West Buskegau River.
- Pond 2 will remain active to capture and treat runoff from the West Stockpile and the Process Area. Pond 3 will continue to capture and treat runoff from East Stockpile.
- Passive treatment systems for seepage treatment (if required) will be implemented within the Impoundment Facility collection ditches.

5.6 Post processing operations and active closure (year 42 to year 47; Figure 5.6 and Figure 5.7)

- Ore reserves have been exhausted and mining operations cease.
- Pond 2 will be naturalized and spillways will be constructed towards the North Driftwood River. West Stockpile ditches will remain active to capture and divert runoff away from the Pits; flow will continue to report to the North Driftwood via Pond 2.
- Pond 3 will be naturalized and spillways will be constructed. East Stockpile ditches will remain active to capture and divert runoff away from the Pits; flow will continue to report to the West Buskegau River via Pond 3.
- The East Stockpile sump will be naturalized and its catchment area will naturally flow into the pit.

5.7 Pit Lake Development and Long-Term Closure (Figure 5.8)

- The pits will fill naturally with groundwater and precipitation until a single pit lake is formed.
- Outlet spillways will be constructed to divert excess water to the receiving environment. As the pits sit on both the North Driftwood River and West Buskegau River watersheds, two spillways will be constructed to divert flow to each river. The size and conveyance capacity of the spillways will be sized to mimic pre-mining flow to each watercourse as much as possible.

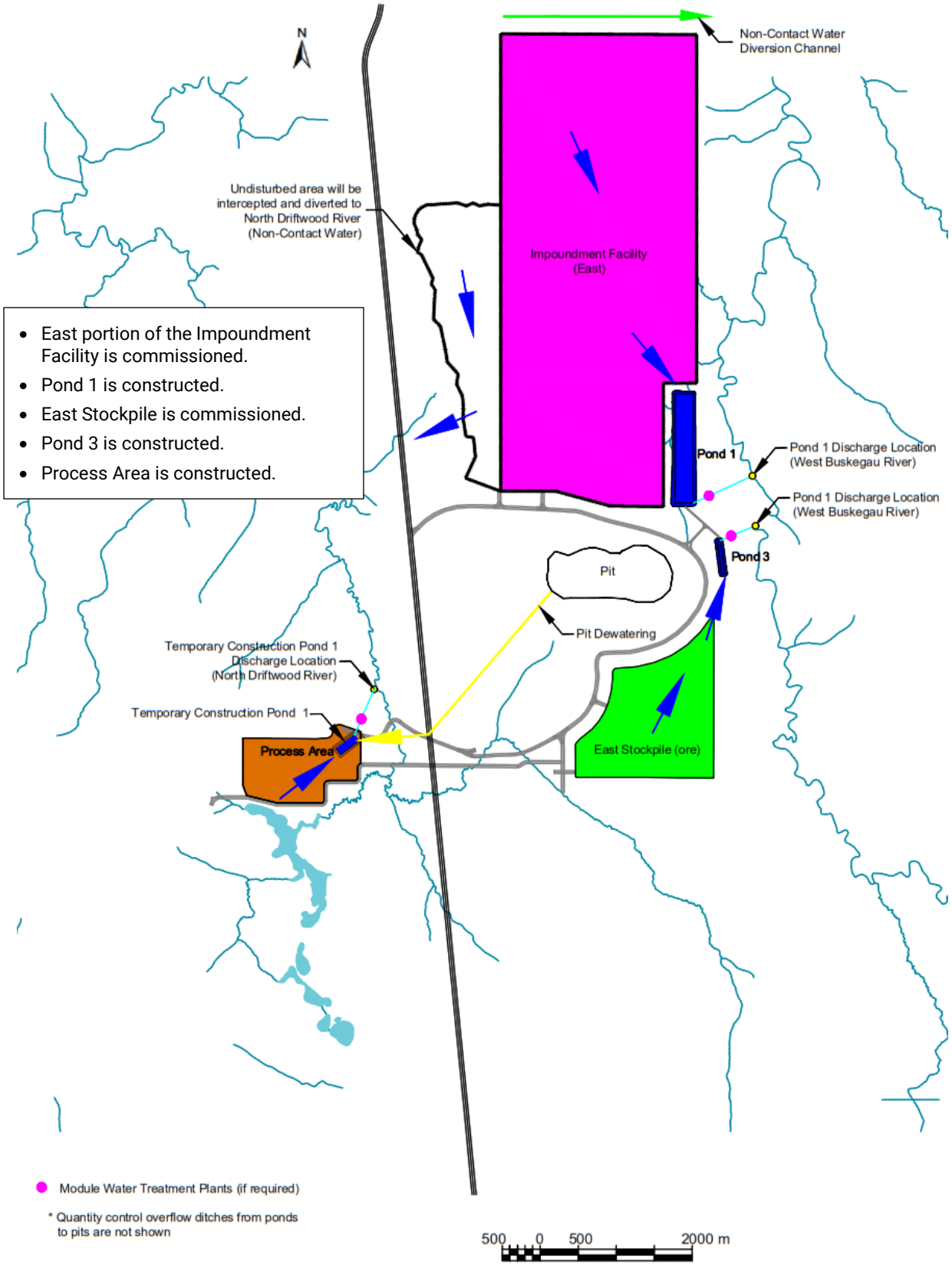


Figure 5.1 Construction (Year -3 to Year -1) Water Management Schematic

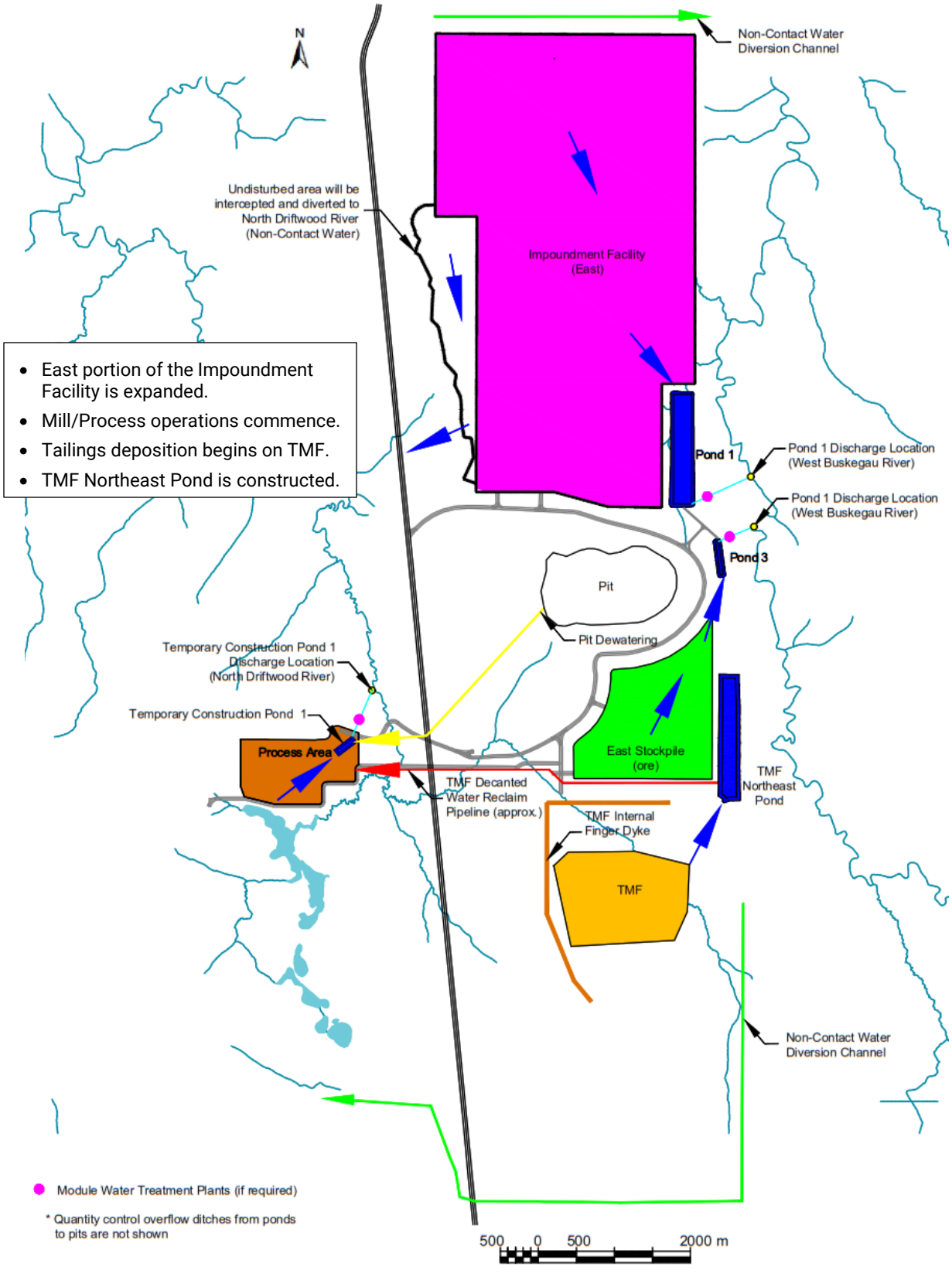
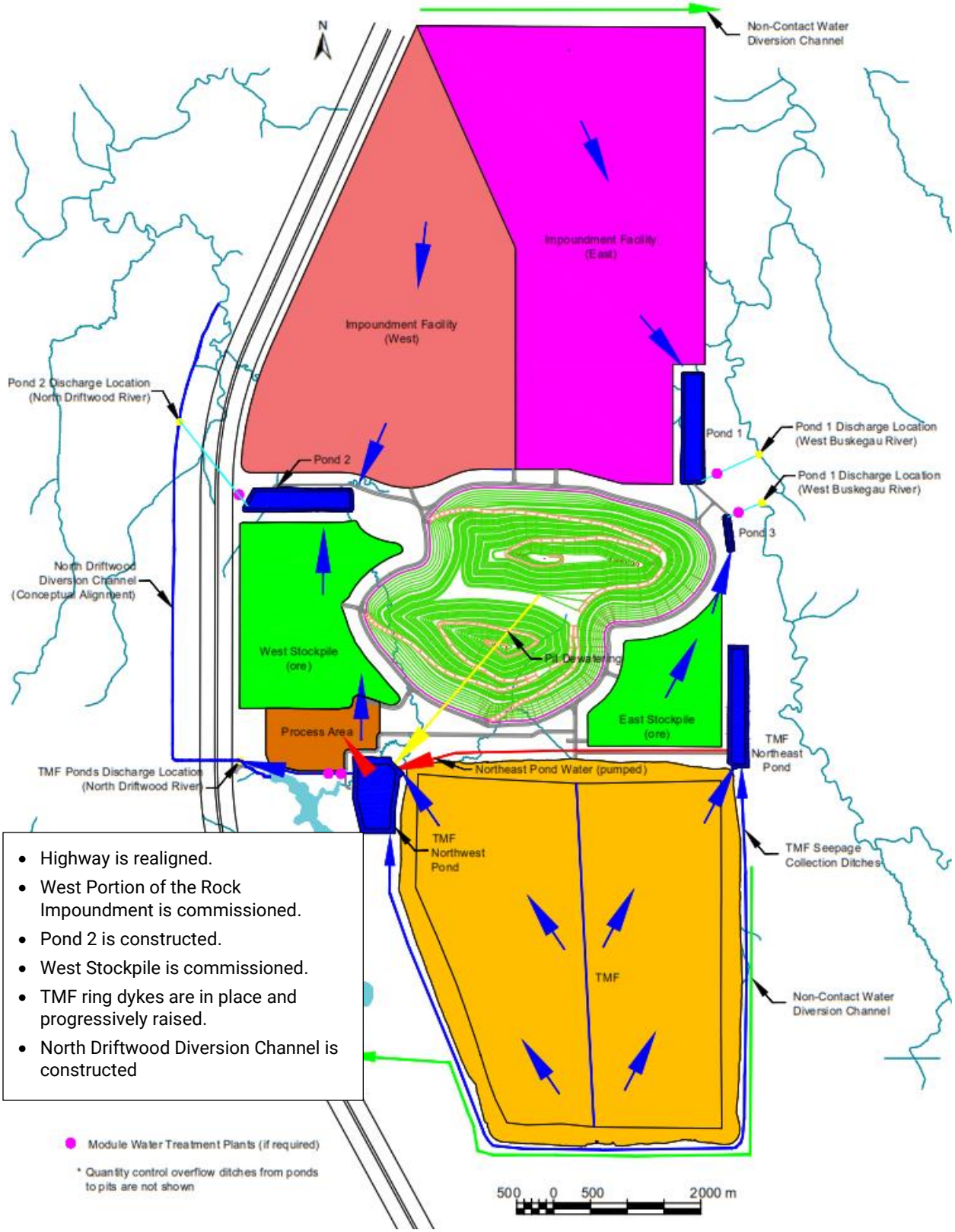
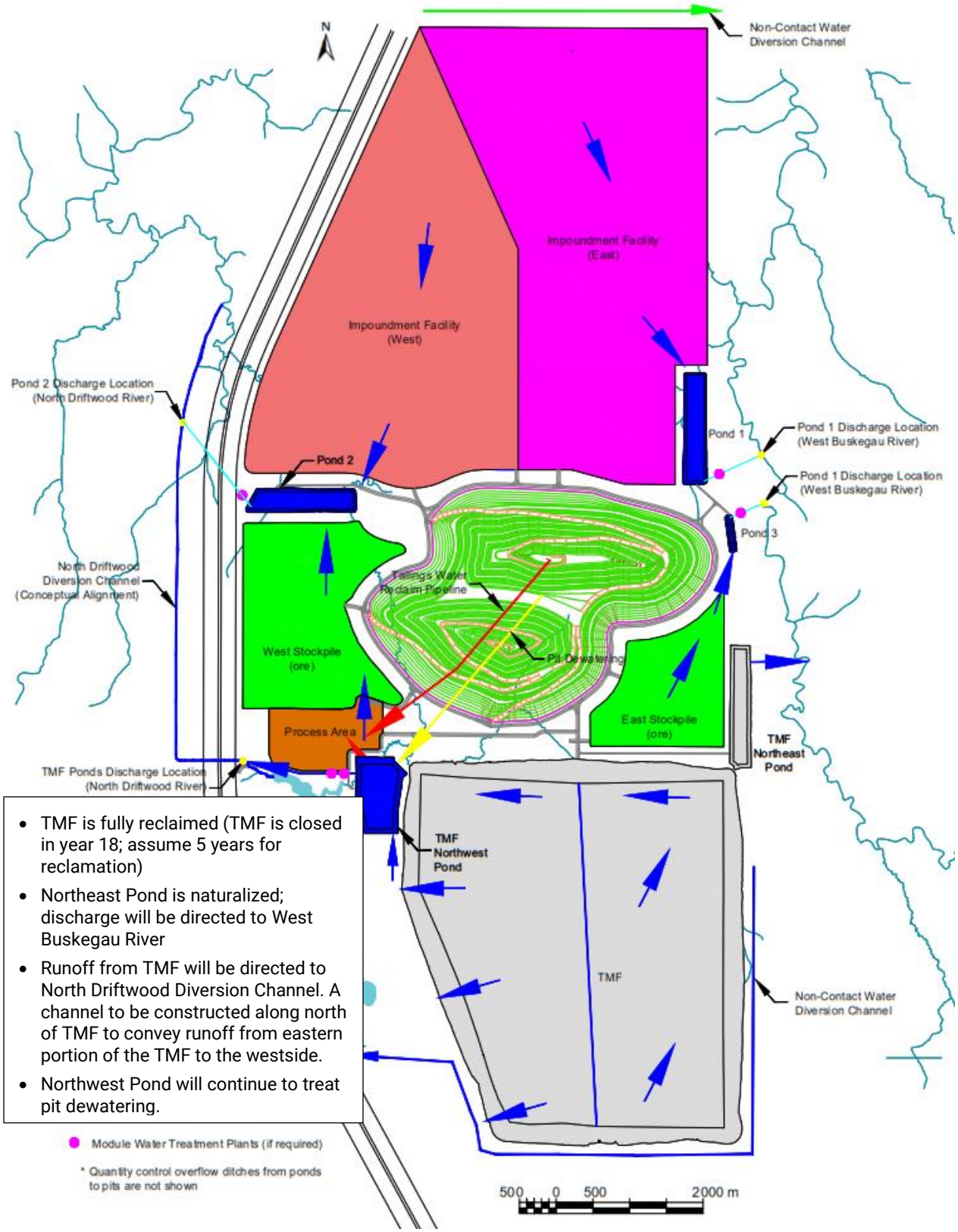


Figure 5.2 Operations (Year 1 to Year 3) Water Management Schematic



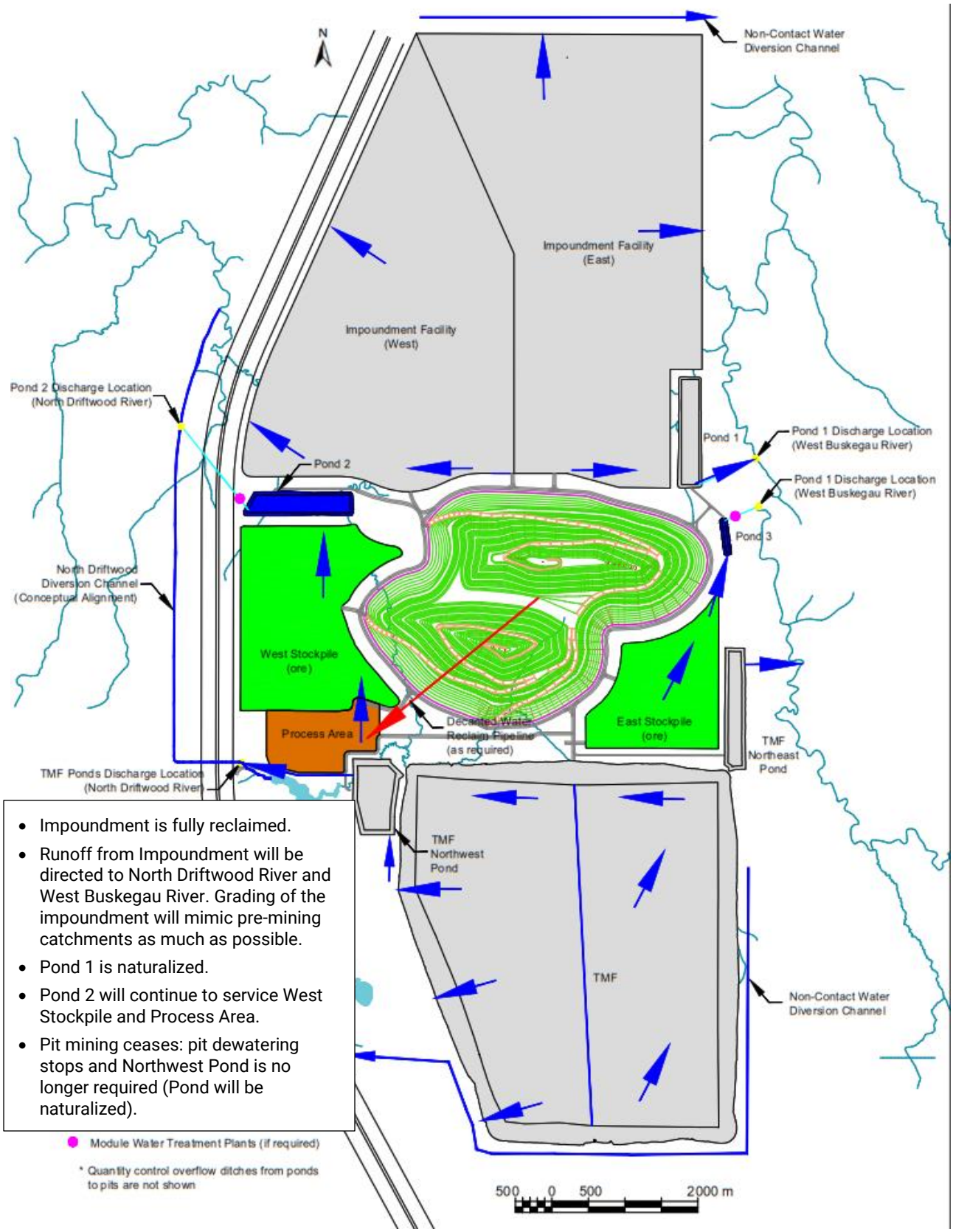
- Highway is realigned.
- West Portion of the Rock Impoundment is commissioned.
- Pond 2 is constructed.
- West Stockpile is commissioned.
- TMF ring dykes are in place and progressively raised.
- North Driftwood Diversion Channel is constructed

Figure 5.3 Operations (Year 4 to Year 18) Water Management Schematic



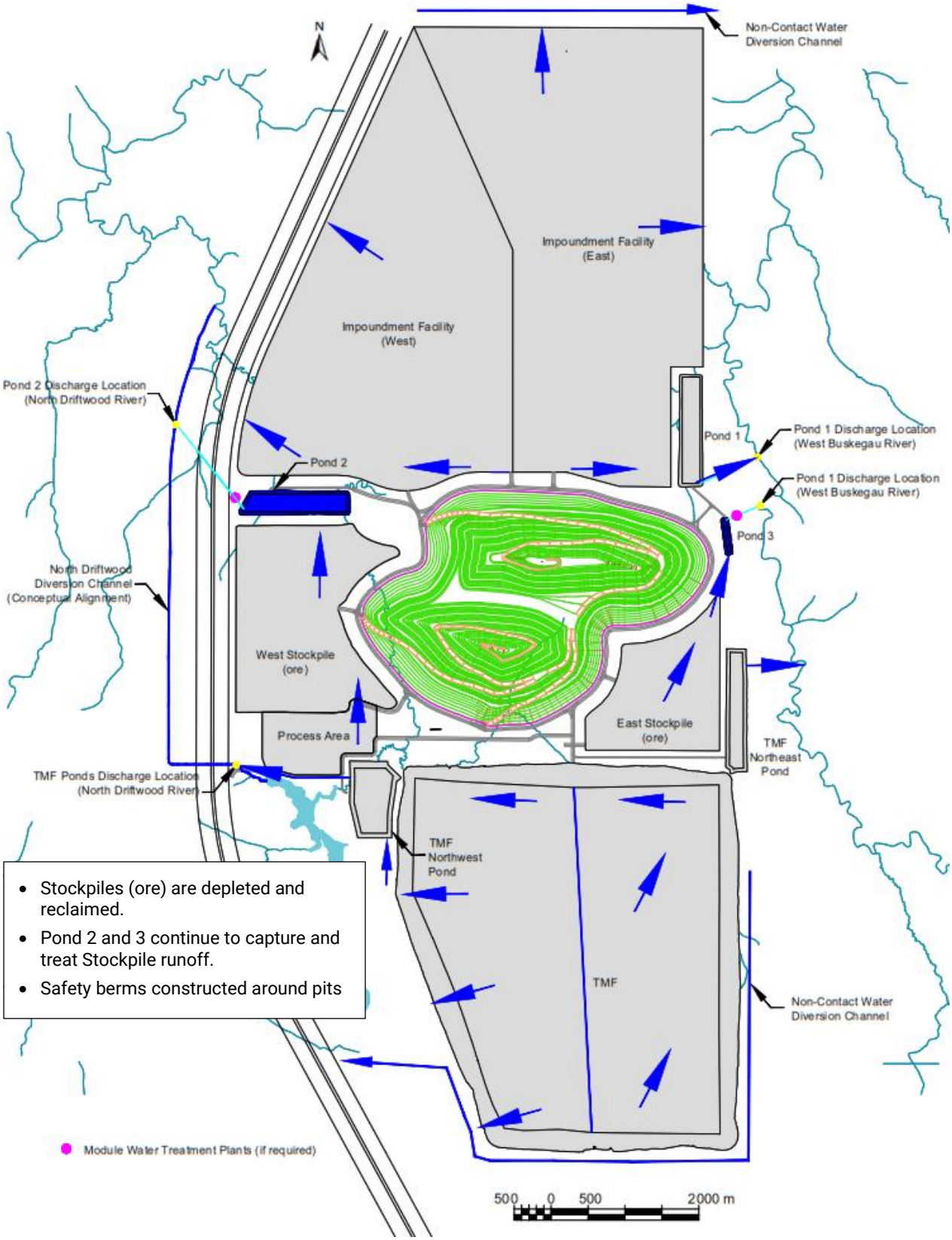
- TMF is fully reclaimed (TMF is closed in year 18; assume 5 years for reclamation)
- Northeast Pond is naturalized; discharge will be directed to West Buskegau River
- Runoff from TMF will be directed to North Driftwood Diversion Channel. A channel to be constructed along north of TMF to convey runoff from eastern portion of the TMF to the westside.
- Northwest Pond will continue to treat pit dewatering.

Figure 5.4 Operations (Post- TMF Closure Years 23) Water Management Schematic



- Impoundment is fully reclaimed.
- Runoff from Impoundment will be directed to North Driftwood River and West Buskegau River. Grading of the impoundment will mimic pre-mining catchments as much as possible.
- Pond 1 is naturalized.
- Pond 2 will continue to service West Stockpile and Process Area.
- Pit mining ceases: pit dewatering stops and Northwest Pond is no longer required (Pond will be naturalized).

Figure 5.5 Operations (Rock Impoundment Closure; Year 35) Water Management Schematic



- Stockpiles (ore) are depleted and reclaimed.
- Pond 2 and 3 continue to capture and treat Stockpile runoff.
- Safety berms constructed around pits

Figure 5.6 Closure (Year 42) Water Management Schematic

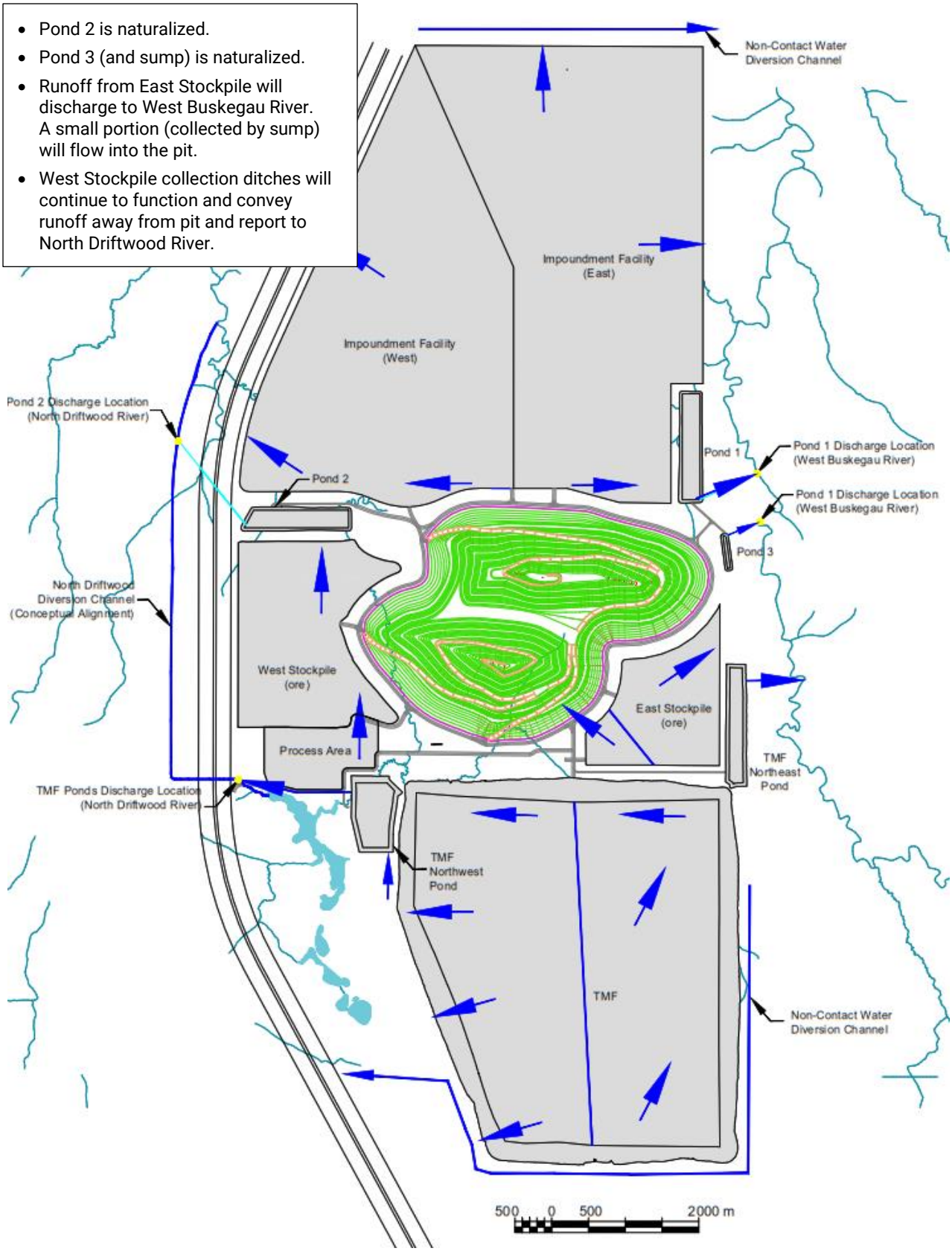
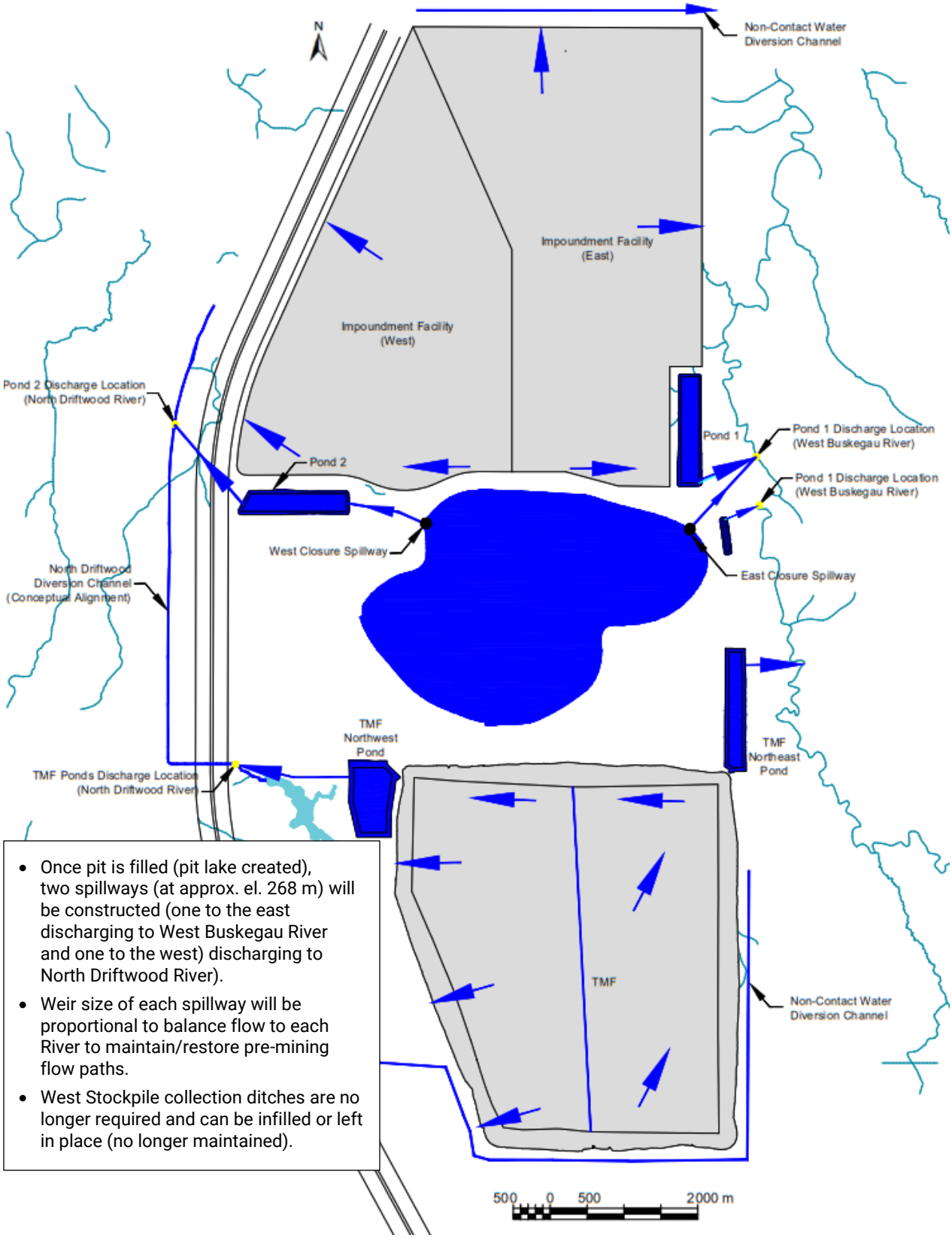


Figure 5.7 Post-Closure Water Management Schematic



- Once pit is filled (pit lake created), two spillways (at approx. el. 268 m) will be constructed (one to the east discharging to West Buskegau River and one to the west) discharging to North Driftwood River).
- Weir size of each spillway will be proportional to balance flow to each River to maintain/restore pre-mining flow paths.
- West Stockpile collection ditches are no longer required and can be infilled or left in place (no longer maintained).

Figure 5.8 Long-Term Closure Water Management Schematic

6.0 Closure

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions.

Report prepared by:
Ausenco Sustainability ULC

ORIGINAL SIGNED
AND STAMPED

Jonathan Cooper, M.Sc., P.Eng.
Senior Water Resource Engineer

This document represents an electronic version of the original hard copy document, sealed, signed and dated by Jonathan Cooper, M.Sc., P.Eng. and retained on file. The content of the electronically transmitted document can be confirmed by referring to the original hard copy and file. This document is provided in electronic format for convenience only. Ausenco Sustainability ULC shall not be liable in any way for errors or omissions in any electronic version of its report document

Appendix A

Water Management Design Criteria

Crawford Nickel Project –
Site Water Management Design Criteria

Prepared for:

Canada Nickel Company Inc.
130 King St W, Suite 1900
Toronto, ON M5X 1E3

Project No. 104945-05

August 29, 2024

Prepared by:

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Table of Contents

List of Tables (Within text)

1.0 Scope

This document provides general site information and design criteria that will be used by Ausenco to progress and complete the water management infrastructure design for the Crawford project.

2.0 Design Conditions

The water management and balance will be developed and progressed from the Feasibility Study water balance based on design criteria compiled from CNC and Stantec. The outcomes of the water management and water balance are influenced by a combination of design criteria, operational strategy, and climate parameters. **Table 2.1** presents the design criteria for settling ponds, collection ditches, water balance, and other relevant design considerations.

Table 2.1 Design Criteria

Item	Design Considerations		Source	Updates for Permitting
1.0	**General**			
1.1	Mine Life	41 years	NI 43-101 Technical Report and Feasibility Study	Construction phase (year -3 to -1) Operations phase (year 1 to 41) Closure (year 42 to 47) Post Closure (year 47+)
1.2	Design Standards	• Canadian Dam Association - Dam Safety Guidelines and supporting technical bulletins. • Lakes and River Improvements Act – Administrative Guide	Canadian Dam Association: The Dam Safety Guidelines,, 2007 (Revised 2013) Ministry of Natural Resources: Lakes and Rivers Improvement Act Administrative Guide Ontario, August 2011	
1.3	Topography	• LiDAR ground surface elevation reading (point layer, converted to raster) – Acquisition date: 2021 • Drainage direction and catchments will be delineated using GIS spatial analysis methods	Provided by Canada Nickel Company, data representative of year 2021and 2022)	
1.4	Meteorological Data	• Precipitation, including Intensity-Duration-Frequency values and additional climate data from Environment Canada Stations: ▫ Timmins A ▫ Timmins Victor Power A	Environment and Climate Change Canada	To include Climate Change considerations based on: Stantec Consulting Ltd. 2024. *Crawford Nickel Project: Technical Data Report – Surface Water Resources.* Prepared for Canada Nickel Company
1.5	Contact Water	• Defined as all runoff from disturbed areas, including: ▫ Pit dewatering ▫ Pits berm ▫ Ore stockpiles ▫ Rock impoundment facilities ▫ Ore process plants ▫ Collection system (ditches and ponds)	NI 43-101 Technical Report and Feasibility Study	
1.6	Non-contact water	• Defined as runoff from undisturbed areas, including: ▫ Roadways ▫ Laydown area	NI 43-101 Technical Report and Feasibility Study	
2.0	**Pond and Water Management**			
2.1	Flood Management	• For the purposes of this study, a 1/100 year, 24-hour event will be internally managed through pond storage and controlled release to the open pits from all contact areas. • Gravity feed systems from the settling ponds to the pits to be incorporated. • In future, CNC to incorporate this into their operational procedures (i.e. to ensure safe work practices and infrastructure protection to allow the pit to partially flood) • Storage requirements and estimated drawdown time from the pits and ponds to be reviewed. • Settling ponds to have emergency outlets to convey discharge from larger events (i.e. excess of the 1/100 year, 24-hour event) to the receiving environment to avoid excess flows to the pits. Spillways will be sized for a 1/200 year event.	NI 43-101 Technical Report and Feasibility Study	To include Climate Change considerations based on: Stantec Consulting Ltd. 2024. *Crawford Nickel Project: Technical Data Report – Surface Water Resources.* Prepared for Canada Nickel Company

Item	Design Considerations		Source	Updates for Permitting
2.2a	Treatment Ponds	• Treatment Ponds (settling ponds) shall be sized to remove sediment from a typical monthly precipitation as well as a 1/10 year, 24-hour event. • A permanent pond volume will be provided to facilitate settling. It is envisioned that this depth will be 2 m. • From available soil samples collected at the site, clay (<5 µm) makes up 20 to 30% of each sample. Based on Stokes Law, the retention time for a 1 um particle size is estimated to be around 28 hrs. The pond will be sized for to provide this for typical monthly inflows. As noted above, the ponds will be sized to fully contain the 1/10 year, 24-hour event without discharge in the event of upset conditions.	Ausenco recommendation – Standard procedures or in-house data (2022) Ministry of the Environment, Conservation and Parks (MECP): Stormwater Management Planning and Design Manual, (2003) BC Ministry of Environment: Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining, (version 1.0; 2015)	Stantec Consulting Ltd. 2024. Crawford Nickel Project: Soils and Terrain Baseline Report Final Report. Prepared for Canada Nickel Company.
2.2b	Sediment Management	• Settling ponds have a design performance of 80% TSS removal. Sediment clean would be triggered by a performance reduction to 75%. Settling pond shall provide 1 m of additional storage for sediment accumulation to account for the 5% performance reduction.	Ausenco recommendation – Standard procedures or in-house data (2022) Ministry of the Environment, Conservation and Parks (MECP): Stormwater Management Planning and Design Manual, (2003)	Additional sediment loading provided by CNC Jar Test Results from 3 Nov 2023.
2.3	Sediment Operations	• A pre-sediment (forebay) and/or pre-sediment conveyance channels with rock check dams with cleanout access will be provided to manage sediment accumulation. • Access for periodic clean-out shall be incorporated	Ausenco recommendation – Standard procedures or in-house data (2022) BC Ministry of Environment: Assessing the Design, Size, and Operation of Sediment Ponds Used in Mining, (version 1.0; 2015)	
2.4	Dimensions	• No preference for pond shape noted. Pond dimensions will be set with considerations for solids settling performance and site spatial restrictions. • British Columbia guideline suggests a minimum 5:1 (Length: Width) ratio to promote settling.	Ausenco recommendation – Standard procedures or in-house data (2022) Ministry of the Environment, Conservation and Parks (MECP): Stormwater Management Planning and Design Manual, (2003)	

2.5	Freeboard	• The settling pond will be completely excavated and not require berms or dams to contain the design events.
		• Freeboard will be provided to better control fugitive release from wind and wave action on the excavated ponds and ditches but will not be required from a dam safety perspective.
		  ▫ 0.5 m above the routed high water level
		  ▫ 0.3 m above the design water level in ditches
			Ausenco recommendation – Standard procedures or in-house data (2022)	

2.6	Pond Normal Water Level	• To be determined based on settling pond criteria and dimensions • Consideration will be given for winter operations and ice build up	NI 43-101 Technical Report and Feasibility Study	
2.7	Ditching	• Ditching and surface water requirements to be confirmed by geometric design. • Ditches and channels will be designed to safely convey the 1:100Y 24-hour peak flow (safely= water levels below the freeboard limit). • Wherever possible gravity drainage will be utilized. • Riprap or other revetment requirements will be provided/sized wherever flow extreme velocities exceed 3 m/s or where design flow velocities may cause erosion over native ditch soils.	Ausenco recommendation – Standard procedures or in-house data (2022)	To include Climate Change considerations based on: Stantec Consulting Ltd. 2024. *Crawford Nickel Project: Technical Data Report – Surface Water Resources.* Prepared for Canada Nickel Company
2.8	Discharge Locations	• Multiple discharge locations considered. • Reference FDP locations, including temporary ponds during construction phase	NI 43-101 Technical Report and Feasibility Study	Discharge locations developed as part of the WMP preparation, and avoided discharging directly into water bodies within or tributaries of the North Driftwood River and West Buskegau River.

Item	Design Considerations		Source	Updates for Permitting
3.0	**Water Balance**			
3.1	Climate	• Typical (average) conditions based on Environment and Climate Change Canada and adjusted to a 2071 to 2100 climate normal by Stantec, will be used to size/design water management infrastructure. • Additional scenarios will be incorporated as a sensitivity analysis and to assess the impact assessment (future scope): ▫ Average wet/dry years ▫ Climate change considerations	Environment and Climate Change Canada and Stantec	To include Climate Change considerations based on: Stantec Consulting Ltd. 2024. *Crawford Nickel Project: Technical Data Report – Surface Water Resources.* Prepared for Canada Nickel Company
3.2	Open pits	• Groundwater inflows rates for Main Zone (MZ) and East Zone (EZ) pit will be considered along mine life. • Storage capacity will be estimated with the footprint areas of each PIT along mine life.		Groundwater inflows revised by Stantec; email dated May 2, 2024. Formal report pending
3.3	Consumptive use	• Dust control from April to September from pit dewatering.	NI 43-101 Technical Report and Feasibility Study	
3.4	Runoff	• Footprint areas for each facility will be considered. • Runoff coefficients will be considered to estimate runoff for each facility.	NI 43-101 Technical Report and Feasibility Study	
3.5	Process flows (Phase 1)	• Clean make up water (524 m^3/hr).	Ausenco Process Plant Mass and Water Balance, 104945-ER-00000-22223-001	
3.6	Footprint Sequencing	• Sequential footprint over the construction and early operations. • Ponds and accompanying ditches to be constructed ahead of or in conjunction with disturbed areas.	NI 43-101 Technical Report and Feasibility Study	Footprint sequencing and reclamation activities to be reviewed as part of the WMP preparation.

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Appendix B

Pond and Collection Ditch Geometry

Channel Configurations and Parameters

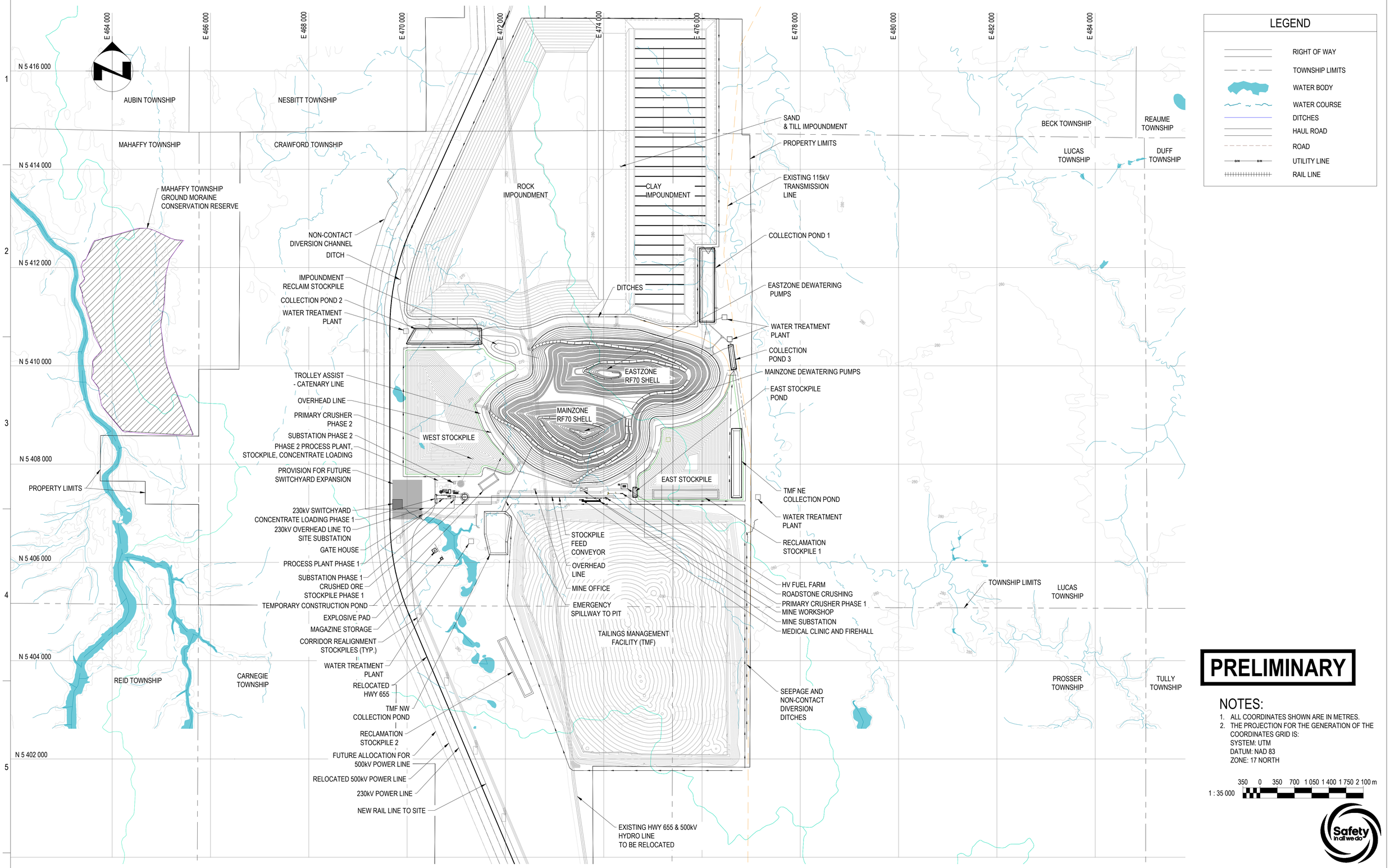
Channel	Side Slopes (H:V)	Base Width (m)	Channel Length (m)	Channel Slope	Cut (m^3)	Fill (m^3)	Avg. Depth (m)
Impoundment Facility							
Pond 1 North Collection Ditch	2:1	2	7,392	-0.12%	239,659	20,815	1.93
Pond 1 South Collection Ditch	2:1	2	3,832	-0.22%	66,778	11,427	1.26
Pond 2 North Collection Ditch	2:1	2	9,767	-0.10%	724,022	54,522	3.23
Pond 2 South Collection Ditch	2:1	2	2,623	-0.33%	102,077	1,277	2.13
Stockpiles (ore)							
Pond 2 East Collection Ditch	2:1	2	5,428	-0.10%	84,584	11,661	1.13
Pond 2 West Collection Ditch	2:1	2	4,969	-0.12%	202,723	317	2.21
Pond 3 East Collection Ditch	2:1	1.5	4,398	-0.05%	15,427	35,613	0.85
Pond 3 West Collection Ditch	2:1	1	2,448	-0.13%	1,681	13,185	0.58
Pond 3 Sump North Collection Ditch	2:1	1	996	-0.20%	10,228	0.00	1.11
Pond 3 Sump South Collection Ditch	2:1	1	621	-0.32%	3,422	136	0.70
Non-Contact Diversion							
North Driftwood Diversion Channel	Will be designed as a part of fish offsetting plan						

Pond Configurations and Parameters

Pond	Side Slopes (H:1V)	Length (m)	Width (m)	Design Depth (m)	Approx. Volume (m^3)	Forebay	Permanent Water Depth (m)
Temporary Construction Pond	5:1	400	170	5	300K	N	1.5
Pond 1	5:1	1500	300	6	3.05 M	Yes	2
Pond 2	5:1	1500	300	6	3.24 M	Yes	2
Pond 3	5:1	500	100	6	240 K	Yes	2
Pond 3 Sump	5:1	200	80	5	80 K	Yes	2
TMF Northwest Pond	6:1	700	600	6.8	3.4 M	Yes	2
TMF Northeast Pond	6:1	1400	200	6.8	2.5 M	Yes	2

Appendix C

Feasibility Study Site Layout



PRELIMINARY

NOTES:

1. ALL COORDINATES SHOWN ARE IN METRES.
2. THE PROJECTION FOR THE GENERATION OF THE COORDINATES GRID IS:
   SYSTEM: UTM
   DATUM: NAD 83
   ZONE: 17 NORTH

1 : 35 000

350 0 350 700 1 050 1 400 1 750 2 100 m

Safety in all we do

CANADA NICKEL COMPANY

DRAWING No.	REFERENCE DRAWING TITLE	No	BY	DATE	REVISION DETAILS	CHKD	ENG	APPR
		H	HL	18JUN2024	ISSUED FOR INTERNAL REVIEW	SB	GS	GS
		G	HL	08DEC2023	ISSUED FOR STUDY	SB	GS	GS
		F	HL	27OCT2023	ISSUED FOR STUDY	SB	GS	GS
		E	HL	06OCT2023	ISSUED FOR STUDY	SB	GS	GS
		D	HA	16NOV2022	RE-ISSUED FOR STUDY	JM	RW	JM
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104945-GX-02000-31345-001	ORE CRUSHING AND RECLAIM - PLAN AND SECTION	A	HL	21JAN2022	PRELIMINARY	-	RW	JM

DRAWN	H.LIANG	01SEP2021
CHECKED	S.BOUGIE	18JUNE2024
DESIGNED	H.LIANG	18JUNE2024
DES. APPR	S.DUMONT	18JUNE2024
PROJ APPR	G. STERLING	18JUNE2024

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