MATAKANUI

GOLD LIMITED

Water Management Plan

23/10/2025

DOCUMENT CONTROL

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Contents

1. INTRODUCTION

1.1. Purpose

The purpose of the Bendigo-Ophir Gold Project (BOGP) Water Management Plan (WMP) is to manage all aspects of water during the construction and operational phases of the mine, and during the active- and post- closure phases of the project.

This management plan is a *living document* that will evolve over the life of the BOGP, and reflects the changing nature of risk, design assumptions, and operational knowledge. Adaptive management is a key component of this management plan which will be supported by performance monitoring and ongoing review.

This plan outlines key elements of the water management system at the BOGP including:

- A brief description of each water class and the water management features / infrastructure contained within each water class;
- An explanation of how water moves around the site in each phase, where environmental discharges occur, and where water is retained on site;
- A description of water quality limits and other associated consent requirements, including monitoring to ensure compliance with the consent requirements; and
- A discussion on risk management at the BOGP in relation to water management.

1.2. Key Environmental Factors

Key environmental factors that have been identified through various technical studies (e.g., MWM, 2025a) indicate that mining of the BOGP will affect waters within the project area, including:

- Elevated total suspended solids (TSS) in surface waters.
- Neutral metalliferous drainage (NMD) that may have elevated potential constituents of concern (PCOC) such as arsenic (As), sulfate (SO_4), and trace metals.
- Nitrate-rich drainage due to the use of ammonium-nitrate fuel oil (ANFO) based explosives.
- Cyanide (CN) within the tailings water.

1.3. Description of Facilities

The BOGP site is located approximately 20 km northeast of Cromwell in the Dunstan Mountains of Central Otago New Zealand, within the Central Otago District Council (CODC) and Otago Regional Council (ORC). The Rise and Shine (RAS) and Come in Time (CIT) gold deposits are located within a ridge between Shepherds Creek to the northeast and Rise and Shine Creek to the southwest. The Srex (SRX) gold deposit is located on the southern slopes of Rise and Shine Valley. Watercourses in both valleys flow from a divide in the southeast to outlets in the northwest.

The BOGP involves mining the identified gold deposits at RAS, CIT, SRX and Srex East (SRE). Both open pit and underground mining methods will be utilised within the project site to access the gold deposits. Infrastructure to support the project will be constructed in the lower Shepherds Creek Valley with non-operational infrastructure located on the adjoining Ardgour Terrace. The BOGP also involves the taking of groundwater from the Bendigo Aquifer for use in mining-related activities and the realignment of Thomson Gorge Road via Ardgour Station; see Figure 1.

The proposed BOGP will include the following components, as relevant to this WMP:

- Open pits, targeting the RAS, SRX, SRE, and CIT deposits.
- An underground mine targeting the RAS deposit.
- Three ex-pit engineered landforms (ELFs) – Shepherds ELF, Western ELF (WELF) and SRE ELF.
- Two in-pit landforms (backfill) – CIT and SRE[1].
- Plant and processing area, where CIL[2] extraction technologies will be used as part of the ore recovery process. This includes the Shepherds Creek Fill.
- A tailings storage facility (TSF) and TSF Embankment.
- Other ancillary support services / structures (e.g., roads, water management infrastructure, water treatment plants, etc.).

These facilities will be placed in the catchments of Shepherds and Bendigo creeks.

[1] SRE Pit is backfilled by the SRX ELF.
[2] CIL = carbon-in-leach processes that uses cyanide as the lixiviant.

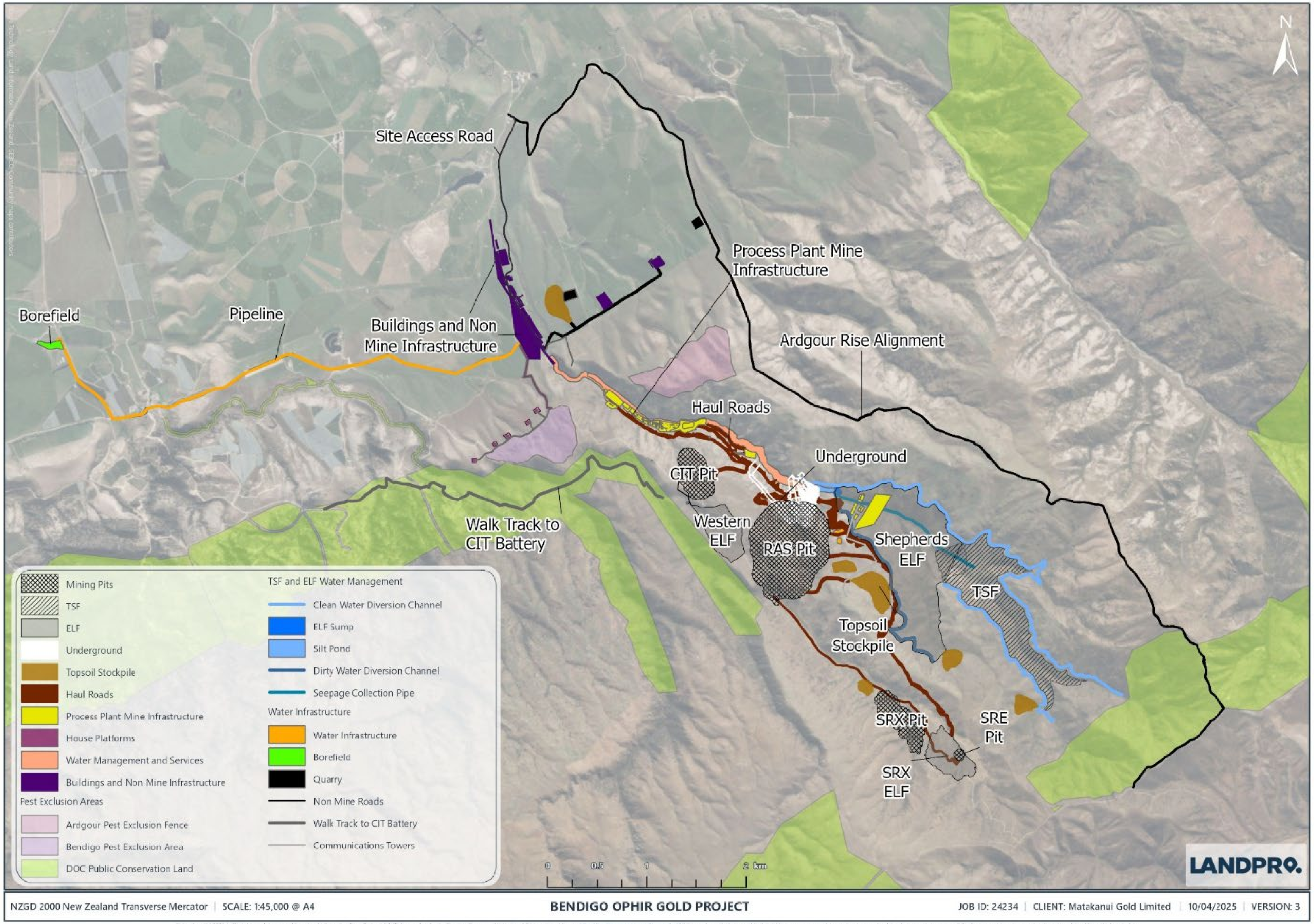

Figure 1: Bendigo-Ophir Gold Project and supporting infrastructure.

1.3.1. Surface Water

The project area covers several catchments and sub-catchments (Figure 2), including:

- **Shepherds Creek:** This creek runs permanently through the project area and then intermittently from the Ardgour Terrace towards the Lindis River. An irrigation water take on Shepherds Creek (RM17.301.15) downstream of SC01 monitoring site has the ability to take surface water in normal flow conditions. There is potential for groundwater to flow past this point via a thin layer of alluvial gravels along the creek bed.
- **Jean Creek:** This creek is an intermittent tributary to Shepherds Creek.
- **Rise and Shine Creek:** This creek joins Clearwater Creek south-east of the Come in Time Battery and flows into Bendigo Creek.
- **Clearwater Creek:** Flows into Bendigo Creek and is considered a control site for the BOGP.
- **Bendigo Creek:** Several irrigation water-takes are in place on this creek (RM20.079.01 and RM20.079.02).

Surface waters within the BOGP include sections of either ephemeral, intermittent, or perennial streams, supporting varying ecological values. Significant sections are degraded from historical land uses such as agriculture and mining (Ryder, 2025). The site has been divided into surface water monitoring locations and their upstream catchment areas (see Figure 3). This division assists with visualising upstream mining activities with potential for influence on the downstream resource consent compliance monitoring locations at SC01 and RS03.

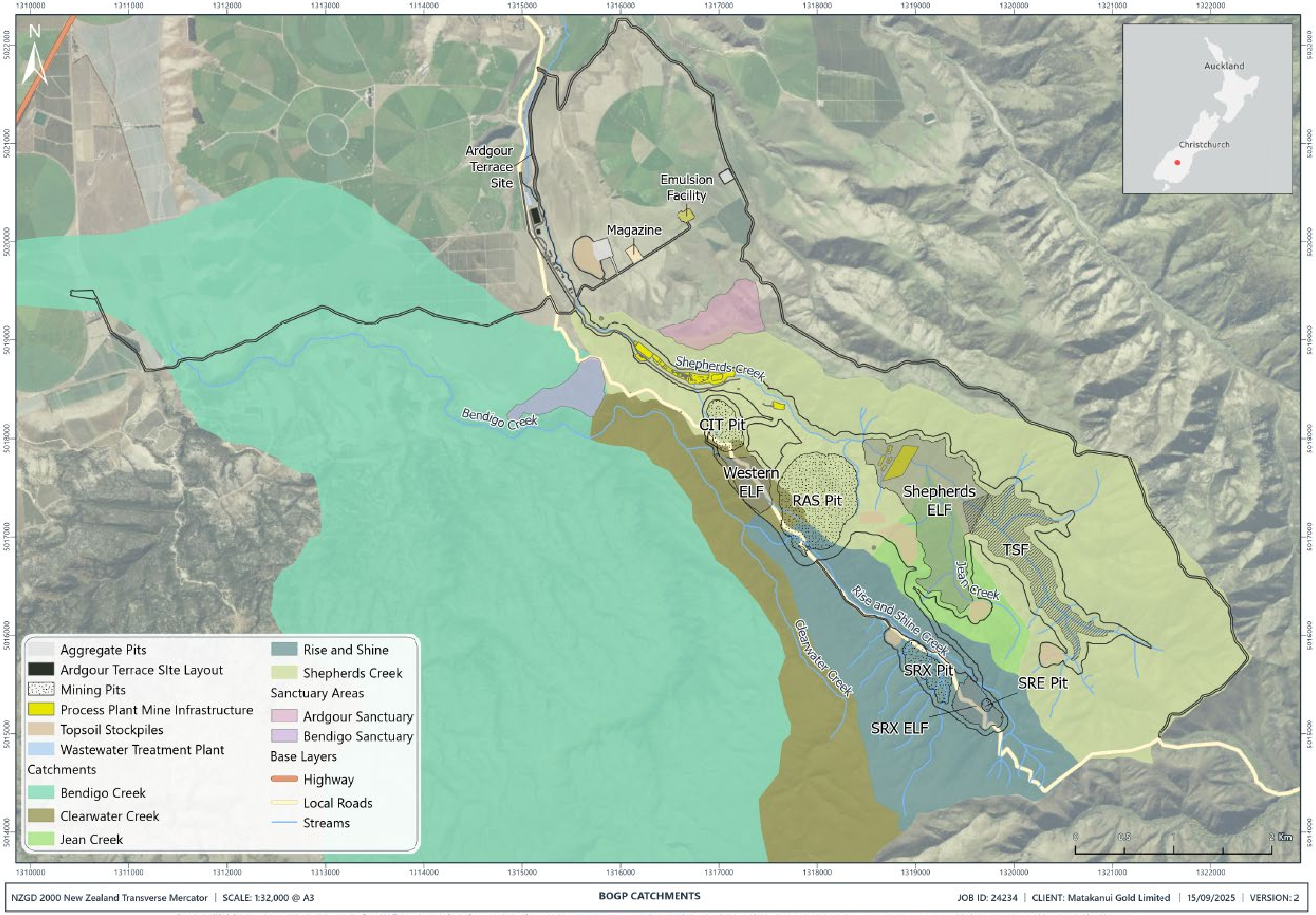

Figure 2: BOGP Regional Surface Hydrology, including surface water catchments and key drainage lines.

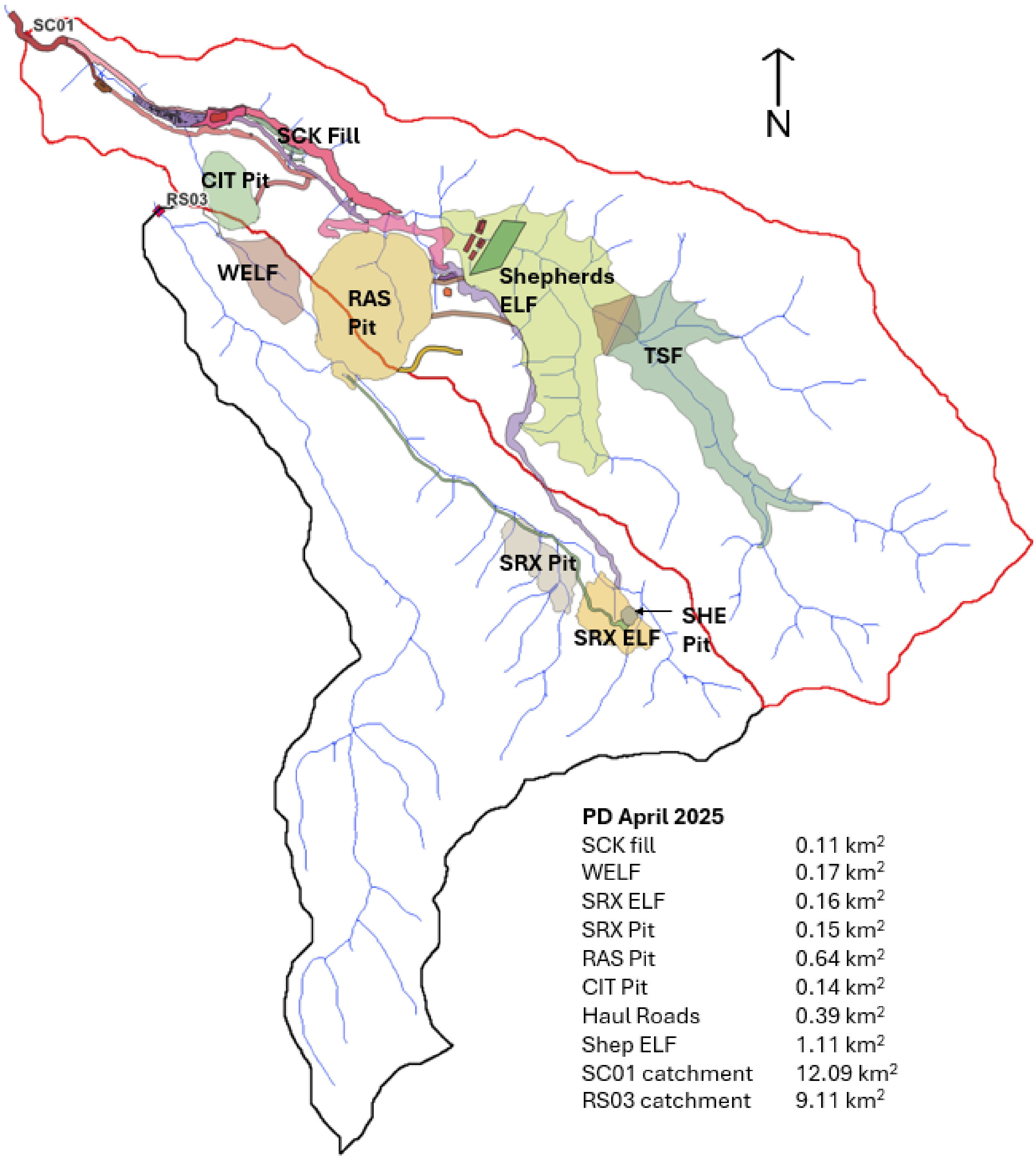

Figure 3: Location and areas of key mine domains within SC01 and RS03 catchments (MWM, 2025b).

1.3.2. Groundwater

Groundwater within the Bendigo district is divided into two key domains:

- Saturated consolidated rocks, generally schist basement; and
- Alluvium or outwash sediments, generally coarse sandy gravels.

Bendigo Aquifer has a measured average depth of 33 m (210 m to 195 m above mean sea level), and an average depth to water table of 12 m. This aquifer has some of the highest yields of aquifers in Otago Region, of up to 120 L/s and is primarily outwash sediments (cobble, gravel, sand and silt sized grains, largely devoid of densely packed silt or clay that otherwise constrains alluvial hydraulic conductivity) (Rekker, 2025a).

Groundwater for the BOGP is sourced from two bores located in the Bendigo Aquifer Borefield with a total abstraction rate of 110 L/s and is pumped to the Ardgour Terrace Site where potable water treatment and wastewater treatment plants will be located. These facilities will service BOGP from the mine construction phase through to mine closure.

Bendigo and Shepherds creeks alluvium have higher permeability and porosity. Low flows in Bendigo and Shepherds creeks result in a loss of surface water flow when the creek water soaks into the alluvium. Higher- and flood- flows in the creeks allow visible creek flow to extend further downstream, with subsurface flow continuing underground (Rekker, 2025a).

1.3.3. Water Management Climatic Context

The inland Otago region, in which the BOGP is located, is the driest region in the country and the valley floors of the Bendigo-Tarras districts among the driest in Otago. Dry periods of more than two weeks occur frequently in the area.

Temperatures are on average lower than the rest of New Zealand, with frosts and snowfalls occurring frequently over autumn – winter – spring. In summer and early autumn, temperatures exceed 30 °C (Rekker, 2025b).

Figure 4 summarises the average monthly climate setting for the synthetic dataset that was derived by MWM (2025b), showing a strong water deficit in the summer months and a slight water surplus in the winter months based on rainfall and potential evapotranspiration.

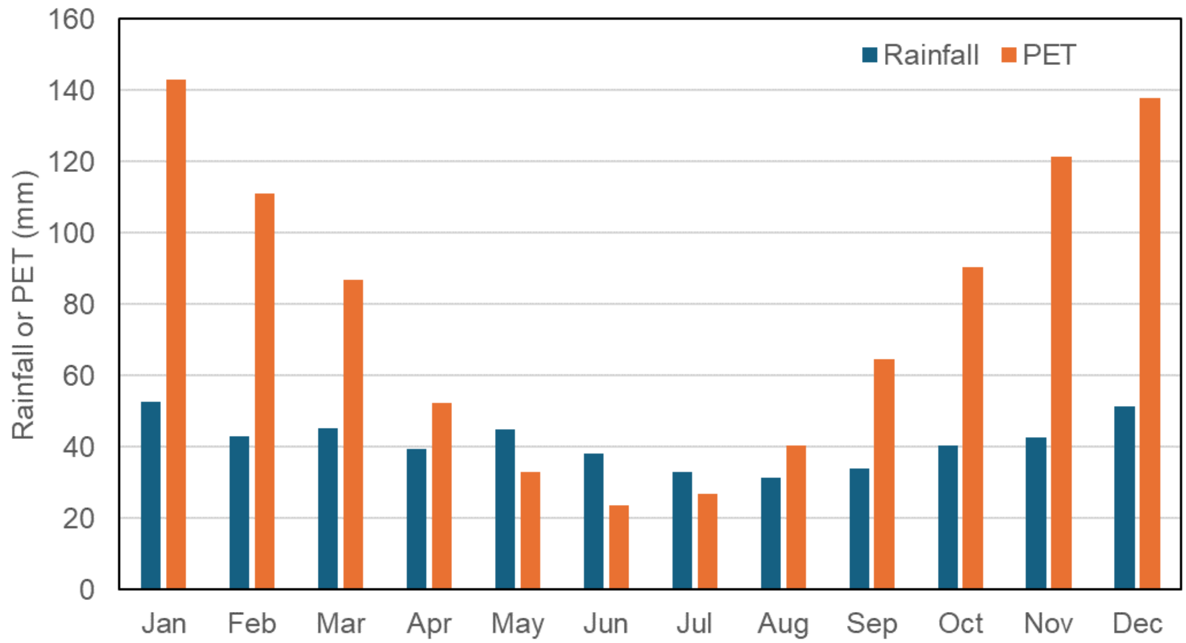

Figure 4. Average monthly synthetic climate data summary (From MWM, 2025)

1.4. Projected Water Supply

Water balance calculations (MWM, 2025b) suggest that the site will be in a water deficit condition up to Year 8. After this point, dewatering from satellite pits (i.e., SRX and to a lesser extent CIT) may push the site to a water surplus condition for the last few years of mine life without additional controls. Engineering controls (e.g., construct the water treatment plant prior to closure) are available to manage potential water surpluses, and can be evaluated during detailed design phases. Ongoing site water balance reconciliation for the BOGP will be required to confirm water balance conditions remain in a water deficit condition.

During wetter years, recycled / reuse water use will be prioritised over groundwater abstraction where possible to reduce groundwater dependency.

A total peak supply of 110 L/s from the Bendigo Aquifer has been estimated for the BOGP (Rekker, 2025a). At project start-up water use will consist of Processing Plant make-up water, dust control for the haul roads and ELFs, and other uses. Within several years of Processing Plant operations and increasing use of recycled water from the mine circuit water (i.e., TSF decant water return), the new water demand is expected to reduce as dewatering rates increase with mine development.

2. MANAGEMENT OBJECTIVES

2.1. Key Objectives of the Water Management Plan

The overarching objective of the BOGP WMP is to ensure that water is managed in a way that protects the environment, supports operational needs, and meets regulatory requirements. The key objectives of the WMP are to:

- Identify roles and responsibilities for MGL personnel to ensure this management plan achieves its objectives.
- Protect the receiving environment by ensuring any water discharges do not cause adverse effects.
- Explain the water quality limits set out in resource consents and relevant guidelines.
- Manage water sustainably across all phases of the project, including construction, operations, closure, and post-closure.
- Classify and manage water appropriately based on its source and quality (e.g., clean water, mine impacted water (MIW), aquifer water).
- Design and implement infrastructure that supports effective water capture, diversion, treatment, and discharge.
- Monitor water quality and quantity to inform adaptive management processes and ensure compliance.
- Support closure outcomes by ensuring water management infrastructure and practices align with long-term rehabilitation goals.
- Identify and manage risks associated with water quality and quantity through a structured risk management framework.

2.2. Key Outcomes the Water Management Plan will Achieve

Implementation of the WMP will result in the following key outcomes:

- Reliable water supply to the BOGP Processing Plant.
- Effective water availability and distribution across the site to support mining and associated activities.

- Controlled movement and storage of various water classes.
- Water discharges within compliance limits.
- Proactive monitoring and adaptive management processes.
- Long-term sustainability of water use in a water-deficit environment.
- Zero release of untreated MIW from mine circuit water during operations and construction phases (except surficial MIW run-off from haul roads and engineered landforms).
- Successful transition to closure.

2.3. BOGP Phase Objectives

Each phase of the BOGP – from pre-construction detailed design of water management infrastructure though to post-closure management of the project – has a set of objectives to guide the project accordingly. These are summarised by mine phase:

- **Design Management:** design all water related infrastructure, including surface drainage, seepage drainage, collection sumps, diversion drains, retention ponds etc to ensure water is managed onsite as per consent conditions, thereby ensuring no unauthorised environmental discharge occurs, and water is managed throughout the life of mine to achieve closure outcomes.
- **Construction Management:** undertake, monitor, and review water management during the Start-Up and Project Development Phases to ensure:
  - Sediment and erosion is appropriately managed;
  - Clean water is directly discharged from site when possible;
  - MIW is pumped to the TSF for storage until treatment infrastructure is in place; and
  - Zero release of MIW from mine circuit water during this phase (except surficial MIW run-off from haul roads and engineered landforms).

- **Operational Management:** manage water throughout operations to ensure clean water discharges are maximised, while MIW is wholly contained on site within the mine circuit water, thereby enabling BOGP to achieve environmental and closure outcomes. During operations the following work also needs to be undertaken:
  - Validate water quality and quantity models using observational data to improve water quality and quantity estimates.

  - Ensure studies are undertaken using empirical site data to develop the water treatment plant that are validated by water treatability studies.
  - Ensure studies are undertaken using empirical site data to develop passive treatment systems to confirm treatment processes and efficiencies.
- **Decommissioning / Closure and Post-Closure Management:** plan for and achieve a rehabilitated landform that is sustainable and long lasting. Manage and treat MIW so that the mine circuit water inventory reduces to zero via:
  - Active water treatment.
  - Passive water treatment.

3. ROLES AND RESPONSIBILITIES

The responsibility for water lies with the Consent Holder.

Key roles and responsibilities that are required for the management of water at BOGP are summarised in Table 1.

Table 1: Roles and Responsibilities

Role	Responsibilities
General Manager	• Protection of people and the environment. • Obtain and maintain resource consents for the BOGP.
Site Environmental Manager and team	• Responsible for the implementation and enforcement of this plan. • Authorise any personnel to perform any duties of this plan and ensure that they are competent to complete their duties. • Ensure that the consent conditions related to water management of the site are complied with. • Inform a Compliance Officer of the Consent Authority immediately if a breach of Consent Condition(s) takes place, or when they believe that a breach may take place. • Environmental monitoring and reporting. • Supervision of expert support (surface water, groundwater, geochemistry, contaminated site, rehabilitation specialists) and the associated studies and management plans. • Ensure additional studies are undertaken to ensure operational and closure water quality objectives can be achieved. • WMP updates.
Site Technical Services Manager and team	• Annual summary register and location plan of all mine domains including volumes and tonnages. • Annual summary register of planned and actual rehabilitation materials for closure. • Staging of mine domains (TSF, ELFs, pits, etc). • Design and documentation. • Management of civil works and sub-contractors. • Review of civil sub-contractors' quality assurance. • Review of material placement – scheduling. • Construction monitoring and records. • As-built survey and drawings. • Operation, maintenance, and surveillance documentation (shared with Site Mining Manager).

Role	Responsibilities
	• Management of drainage, silt ponds and final surface rehabilitation. • Obtaining construction completion approval. • Maintain the BOGP risk register.
Site Mine Manager and team	• Ensure that all personnel that enter the mining operation areas comply with this plan. • Ensure that all pre-start inspections and checklists are being completed. • Ensure any changes to this plan are communicated to all relevant personnel when they occur. • Mine material characterisation. • Mine material scheduling. • Operation, maintenance, and surveillance documentation (shared with Site Technical Services Manager). • Management of mine fleet. • Management of material placement. • Record keeping (volumes). • Achieve surface water management objectives. • Dust control. • Maintain the BOGP risk register.
Professional Engineer (PEng)	• Professional engineering services for specific geotechnical and civil design of water management features including: ○ Design report, drawings, specification and construction monitoring and inspection schedule. • Review of construction monitoring and as-built records. • Approval of design and final constructed profile by a Chartered Professional Engineer experienced in geotechnical and civil engineering.

4. WATER MANAGEMENT CLASSIFICATION AND FEATURES

Water management is an integral part of BOGP and encompasses all aspects of water capture, storage, supply, distribution, use, disposal, and monitoring.

4.1. Water Classes

Water at BOGP is classified based on water quality, typically consistent with the catchment they originate from. These include:

- **Clean water:** water that has not been in contact with mine circuit water and is suitable for immediate discharge into the environment.
- **Mine Impacted water (MIW):** is made of two key sub-categories:
    - **Surficial MIW:** run-off from mining areas that may be high in sediments and may be affected slightly by PCOC but does not require any additional treatment beyond short periods of settlement to allow for sediments to drop out.
    - **Mine Circuit Water:** all water that has come in contact with the mining circuit or could be elevated in PCOC. It includes ELF seepage, TSF seepage and decant water, pit sumps, arsenic-rich topsoil runoff/seepage, Processing Plant and infrastructure area runoff, and underground workings.
- **Aquifer water:** water pumped from the Bendigo Aquifer. Water is used as service water, for dust suppression and potable water supply.
- **Treated water:** applicable only during the closure phases:
    - Active water treatment will be initially applied to all cumulated mine circuit water.
    - Passive water treatment will occur once PCOCs have reduced and water can then achieve the agreed water quality objectives.

Each water class is managed using suitable water management infrastructure, such as diversion channels, transfer pipes, retention ponds etc. These features are discussed in greater detail throughout this WMP.

4.2. Clean Water

Clean water is water that falls on catchments within the mine footprint via rainfall or run-on. This water does not require treatment of any sort prior to discharge into the environment via Shepherds Creek, Shepherds Fill Creek and Rise and Shine Creek.

Clean water diversion is part of the overall water management philosophy including minimising water ingress into the engineered landforms that can mobilise PCOC (MWM, 2025a). Clean water will be diverted away from mining disturbance areas wherever possible to reduce the volumes affected, therefore requiring treatment.

During the active closure and post closure phases (see Section 9), water that has passed through either the active or passive water treatment methods will be suitable for discharge into the environment, and will therefore be classified as ‘clean water’ at this point in time.

4.2.1. Clean Water Stream Diversions

Clean water stream diversions will be established around key mine infrastructure to maximise the amount of water that is suitable for immediate discharge, thereby minimising the amount of water requiring treatment and active management (i.e., MIW). Clean water stream diversions include:

- **Shepherds TSF Diversion Channel:** includes the northern (~6.2 km long) and southern diversion channels, diverting water around the TSF and Shepherds ELF. The southern diversion channel will convey clean water via a pipe to the northern diversion channel.
- **Shepherds ELF Diversion Channel:** as with the Shepherds TSF Diversion Channel, a clean water diversion channel will be constructed around the north and south sides to minimise flows into the ELF.
- **Shepherds Creek Clean Water Diversion Channel:** ~3.1 km of Shepherds Creek will be permanently realigned and diverted to allow for the Shepherds Service Corridor to be constructed (this includes the Processing Plant and supporting infrastructure). Minor retention ponds along haul roads, ROM[3] Pad etc, will also be directed to this diversion. This diversion channel will be bunded to prevent infill runoff or dirty water entering the channel. Clean water is managed the full length of the creek, before exiting via the Shepherds Creek gorge and flows onto the Ardgour Terrace
- **SRX ELF Clean Water Diversion Channel:** Upstream runoff will be diverted around the SRX ELF via clean water diversion channels to the Rise and Shine Creek.

These diversions (and other water management infrastructure) are shown throughout the various BOGP development phases in the sections that follow, see Figure 5 to Figure 12.

[3] Run-of-mine (ROM) ore stockpile

4.3. Mine Impacted Water – Overview

Mine Impacted water (MIW) includes all water that has been in contact with mined materials, or is involved in, the processing process. As discussed in Section 4.1, the mine circuit water is made up of two categories:

1. **Surficial MIW:** includes run off from:
    - Haul roads.
    - Topsoil stockpiles (low arsenic-bearing).
    - General infrastructure areas.
    - ELF surfaces.
2. **Mine circuit water:**
    - ELF seepage.
    - TSF seepage and decant water.
    - Pit water (i.e. pit sump water, pit lake water).
    - Run-off/seepage from arsenic-rich soil stockpiles.
    - Underground water.
    - Processing Plant and Infrastructure Area.

4.4. Surficial MIW

Suspended sediment concentrations may be present in runoff from haul roads, the infrastructure area, low-arsenic topsoil stockpiles, and ELF surfaces. Surficial MIW may also be affected slightly by PCOC. It is assumed that sediment will be managed by routing runoff from these sources through sediment control structures, enabling periods of settlement for sediments to drop out of suspension. Treatment is not expected for the PCOC load, and performance monitoring will validate this expectation.

4.4.1. Surficial MIW Characterisation

Surficial MIW has the potential to impact the surrounding environment through erosion and sediment generating activities if not well managed. This water is characterised by a high sediment load, which through efficient and effective use of silt ponds and other retention structures, as described below, will ensure devices are installed and operating correctly.

See Section 7.4.2 for further detail on performance monitoring of these structures, as well as the Erosion and Sediment Control Management Plan (MGL, 2025a).

4.4.1. Dirty Water Stream Diversion

A dirty water diversion channel will be established along the southwestern extent of the Shepherds ELF. It will collect sediment laden water from the surface of the ELF, haul roads and wider catchment area and convey flows to downstream silt and retention ponds.

4.4.2. Silt Ponds

The purpose of a silt pond is to capture coarse sediment and debris from stormwater runoff, thereby slowing the water flow and allowing sediment to settle out. This in turn enables improved water quality prior to discharging off site, without the need for active treatment (i.e., directing through a water treatment plant etc.). The following silt ponds are present at BOGP, designed to detain peak flows and sediment retention from 1 in 10 year storm events (MWM, 2025b):

- **Shepherds Silt Pond:** captures stormwater from Shepherds ELF before being discharged into the receiving environment via Shepherds Creek Clean Water Diversion Channel. It will be located immediately downstream of the Shepherds Seepage Collection Sump, providing a contingency option if the seepage sump becomes full.
    - The pond will permanently hold ~35,000 m^3 of contingency water to allow mining operations to continue if water supply from Bendigo Aquifer Borefield is interrupted. The silt pond will be designed like a water storage earth embankment dam with a decant tower to control outflow rates from the pond. Water that is directed to the Shepherds Silt Pond will undergo sediment retention and then be discharged to Shepherds Clean Water Diversion Channel.
- **Western ELF (WELF) Silt Pond:** provides sediment retention control of the surface water runoff from the WELF and the catchment to the edge of the RAS Pit, as well as water storage for dust suppression. Water from this silt pond will be discharged into the Clearwater Creek Catchment. The silt pond allows for a catchment area of 27.5 ha.

Additional silt ponds may be constructed throughout the life of the BOGP. The need for these structures will be included in Site Specific Erosion and Sediment Control Plans (see MGL, 2025a for further information).

4.4.1. Sediment Retention Ponds

Surface water runoff from the Shepherds Service Corridor area will be captured in a sediment retention pond(s) sized for a 10 year ARI event (with emergency spillway for 100 year ARI flow at a minimum).

Other retention ponds will be located around the project to ensure sediment-laden water is captured and allowed to settle out prior to discharge into the environment. SRX ELF will also have a sediment retention pond for surface water, with any overflow water during a high rainfall event directed into the SRX Open Pit located immediately downstream, rather than any discharges offsite. This arrangement will be in place for both operations and closure and will be included in Site Specific Erosion and Sediment Control Plans (see MGL, 2025a for further information).

4.5. Mine Circuit Water

Mine circuit water has the potential to cause significant environmental effects if not retained within the mine footprint. As such, all mine circuit water will be cumulating throughout operations and re-circulated until such time that operations cease and active water treatment commences to remove PCOC in preparation for closure (see Section 9).

The BOGP water and load balance model (WLBM) and other studies indicate that the BOGP needs to focus on the management and treatment of MIW that will contain PCOC (MWM, 2025a). Specifically, this will include:

- Water management to minimise the amount of water that requires treatment during the closure phases.
- Treatment of MIW by an active water treatment plant (WTP) within the Shepherds Creek catchment during the active closure phase until passive treatment systems (PTS) can be successfully established after a number of decades (~ 50 years).
- Partial passive treatment of the SRX Pit Lake overflow in the Rise and Shine catchment.
- Retention of PTS until compliance with water quality objectives can be achieved without passive treatment. The PTS are likely to be operational for many decades once installed.

4.5.1. Mine Circuit Water Characterisation

The following PCOC may require treatment by the WTP and PTS to achieve the proposed water quality limits for the BOGP (MWM, 2025a) including:

- Nitrogenous compounds (N) that include nitrate (NO_3) and ammoniacal-N (Amm-N).
- Sulfate (SO_4).
- Metals and metalloids that may include Aluminium (Al), arsenic (As), cadmium (Cd), cobalt (Co), copper (Cu), chromium (Cr), iron (Fe), manganese (Mn), molybdenum (Mo), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), strontium (Sr), uranium (U), and zinc (Zn).
- Cyanide (CN) within the tailings water.

Order of magnitude studies indicate that active and passive water treatment can achieve closure water quality objectives (MWM, 2025a), although further feasibility studies are required to confirm treatment performance and the ability to transfer from active to passive treatment (refer to Section 9).

To appropriately manage MIW, six management steps are undertaken as a holistic approach to the management of sulfide-bearing materials, which is based on international best practice guidance (e.g., INAP, 2014; DFAT, 2016):

1. Set Closure Goals (i.e., water quality objectives – defined by Ryder (2025)).
2. Predict (managed by the ELF Management Plan (MGL, 2025c)).
3. Prevent (managed by the ELF Management Plan (MGL, 2025c)).
4. Minimise (managed by the ELF Management Plan (MGL, 2025c)).
5. Control and Treat (this plan).
6. Monitor Performance (this plan).

'Control and Treat' engineering controls are an important step in managing the effects of MIW on the receiving environment. This step is discussed further throughout the three phases of mine life:

- Construction Management (Section 5)
- Operations (Sections 6)
- Closure / Post Closure (Section 9).

The 'Monitor Performance' management step includes performance monitoring, which should be conducted regularly to evaluate how MIW management techniques are performing openly and objectively. Performance monitoring is further detailed in Section 7.4.

A risk assessment process has been used to develop site-specific operational controls to manage water management holistically at the BOGP, see Section 10.5 for details. The MIW Overview Report (MWM, 2025c) also provides a comprehensive summary on MIW at BOGP, including investigations completed as part of the assessment of effects for the BOGP.

4.5.1. ELF Seepage

ELF seepage collection points are located at the base of each ELF to capture toe seepage, through engineered underdrains:

- **Shepherds Seepage Collection Sump:** captures seepage from the TSF and Shepherds ELF. Seepage is collected through basal drains to the HDPE lined ~4,500 m^3 Shepherds Creek Collection Sump, where it is then recirculated back into the process water circuit, or to the TSF.
- **WELF Seepage Collection Sump:** seepage is collected via a seepage underdrain and reports into a small seepage collection sump located on the downstream toe of the WELF Silt Pond where it will be directed to the Processing Plant during mining operations, for eventual transfer to the TSF (EGL, 2025).
- **CIT Seepage Collection Sump and SRX Seepage Collection Sump:** minor surface flows will be captured in a seepage collection sump and directed to the Processing Plant.

4.5.2. Shepherds TSF

Tailings generated from the Processing Plant will be pumped to a TSF located in the upper reaches of the Shepherds Valley, immediately upstream of the Shepherds ELF. The total disturbance area of the TSF will be approximately 61 ha.

During operations, the TSF will be a fully contained, no release facility with no dedicated spillway, with all supernatant (decant) water managed onsite and contained within the mine circuit water. The TSF has been designed to provide adequate freeboard for a 1 in 1,000 PMP rainfall event.

Two categories of water are associated with the TSF:

- **TSF Decant Water:** also referred to as 'supernatant' water, decant water will be managed on top of the tailings within the decant pond. During operations, the TSF will operate as a 'zero-release' facility with sufficient freeboard to manage both operational water and the expected inflows during a flood event without discharge.

Water on the TSF will be lost via evapotranspiration or reused by being pumped to the Processing Plant. However, if performance monitoring indicates that a site water surplus is expected then a WTP can be constructed during the operational phase of the BOGP to treat MIW, as well as investigating the use of evaporation cannons to increase evaporative losses.

- **TSF Seepage:** During operations, seepage from the TSF will be collected in the Shepherds Seepage Collection Sump (see Section 4.5.1). The seepage sump will have a volume of approximately 4,500 m^3 and will pump tailings seepage either back to the TSF or to the Processing Plant for reuse.

4.5.3. Pit Sump Water

Sumps will be present within each pit (CIT, RAS, SRE, and SRX pits), with incidental rainfall landing in the pits directed to these pit sumps.

Water model calculations suggest that later in the mine life, pit sump water solute concentrations (e.g., sulfate) will increase as pit wall exposures increase (MWM, 2025b). As such, the use of pit sump water for dust suppression has the potential to cause exceedance of water quality limits due to the presence of high solutes (PCOC) in the water so pit sump water will not be used for this activity, except for specific controlled circumstances; refer to Section 6.5.

When PCOC are elevated in pit sumps later in the project life, the water will therefore be directed to the TSF and mine circuit water.

The collection of pit sump water will continue until:

- Mining of the resource is complete; and
- A decision is made for pit lake filling (with rock or water) to commence (refer to Section 9.3).

4.5.4. Arsenic-rich Topsoil Stockpiles

Arsenic-rich topsoil will be stripped during ELF construction and pit development and will be stored in dedicated stockpiles, determined by the mining schedule. Stockpiles will be located as close as possible to where the arsenic-rich topsoil is being stripped (temporary stockpiles) or within ELF footprints (permanent stockpiles). Further details are provided in the Soil Management Plan (MGL, 2025d).

Seepage and runoff from these stockpiles will be captured in existing ELF seepage collection sumps and will be directed to the mine circuit water.

4.5.5. Underground Water

Due to the low rainfall in the area (see Section 1.3.3) and the low hydrological conductivity of the schist rock in the project area, groundwater quantities are not expected to pose an issue for the underground operation at BOGP.

RAS Underground will be the only underground operation at BOGP, which extends to ~150 mRL. Although dewatering is not expected to pose an issue, a dewatering system will be installed. Water from the RAS Underground will be pumped to the TSF for use in the mine circuit water and in the Processing Plant.

4.5.6. Processing Plant and Infrastructure Area

Water generated within the Processing Plant area will be directed to the mine circuit water as it may be impacted by the activities associated with Processing Plant.

4.6. Aquifer Water

Aquifer water will be used at the BOGP for:

- Processing Plant make-up water.
- Dust suppression.
- Drinking water supply, including ablutions and safety showers.
- Other uses that may include the augmentation of surface water flows in Shepherds Creek (Section 4.8) to other water users in the region (see Section 1.3.1) and the supplementation of water in wetlands within the project site.

Aquifer water is sourced from two production bores (with one associated monitoring bore) in the Bendigo Aquifer Borefield with a total abstraction rate of 110 L/s and pumped to the Ardgour Terrace Site where potable water treatment and wastewater treatment plants will be located. These facilities will service BOGP from construction through to closure.

Potable water will be sent around site via a series of pipelines and tanks. Non-potable water from the borefield will also be sent to the Processing Plant via a separate pipeline. Potable water controls are discussed in Section 6.4.

Wastewater from the various ablution facilities and offices throughout the project site will be directed to a wastewater treatment plant for treatment, with treated effluent then discharged into an irrigation disposal field. The discharge of treated wastewater (effluent) to land will be undertaken as per consent RM25.259.01.

As the mine develops, and the retained mine circuit water volume increases, borefield water requirements will be substantially reduced over time.

4.7. Treated Water

Water treatment is an integral part of BOGP's water management system and infrastructure. Treated water is water that has passed through either:

- An active water treatment plant (WTP), or
- A passive treatment system (PTS).

Active water treatment at the BOGP will involve treatment of all cumulated mine circuit water. Active closure of the BOGP is estimated to commence post-Year 11 with final rehabilitation of mine domains and transition from water storage and reuse to water treatment by an active WTP, thereby treating all water collected within the mine circuit water. Active WTPs will be required for ~50 years in the Shepherds Creek catchment until such time that PCOC loads (SO_4, Mo, and Sb) have reduced enough to enable passive water treatment to achieve water quality objectives (MWM, 2025b). PTS will be required following active water treatment ~Year 50 and beyond for many decades. Partial passive treatment of the SRX Pit Lake overflow is required before discharge to the Rise and Shine Creek.

Once treated, these water streams are then classified as clean water and are suitable for discharge into the environment. Refer to Sections 9.4 and 9.5 for further detail on these processes.

4.8. Creek Flow Augmentation

To ensure there is no derogation of creek flow as a result of the BGOP, the creek flows will be augmented by discharging Aquifer Water at the headwaters (i.e., upstream of potential affected areas) of Shepherds Creek and Rise and Shine Creek. Potential creek flow reduction may increase over time when mine domains become active and drawdown influences expand. As a result, augmentation flows will increase over time as needed to match any potential flow reduction. See HGG (2025a) for further details.

A number of uncertainties exist that could change the actual augmentation rates required, such as model assumptions and real world complexity of groundwater-surface interactions (HGG, 2025a). Adaptive management supported by performance monitoring will therefore be required to confirm that augmentation flow rates remain appropriate and are not too high nor too low relative to observed creek flows.

In addition, potential drawdown effects may impact wetland hydrological function without additional controls (HGG, 2025b). The swamp and marsh wetlands located in the Rise and Shine valley bottom are interpreted to be dominantly surface water fed, however further investigation will be undertaken to confirm this. Assuming these wetlands are dominantly surface water fed systems, it is likely that creek flow augmentation will also provide augmentation to these wetlands. Performance monitoring and adaptive management will allow for the augmentation approach to be proactively modified if it is not sufficient for maintaining wetland hydraulic function.

5. CONSTRUCTION PHASE WATER MANAGEMENT

5.1. Start-up Phase

Water management during the Start-up Phase of the project will focus on clean water diversion, erosion and sediment control (refer to MGL, 2025a), and creek flow augmentation (see HGG, 2025a). The following activities will be undertaken:

- Temporary sediment retention ponds will be established for erosion and sediment control during earthworks until the surface can be stabilised.
- Release of Surficial MIW via sediment management structures.
- Groundwater abstraction will commence during this time, including construction of associated pumping and supply infrastructure, making water available for dust suppression.
- Flow in Shepherds Creek and Rise and Shine Creek will be augmented with groundwater from the Bendigo Aquifer to mitigate potential creek flow reduction and wetland drawdown as a result of the BOGP.

Where it is practicable and appropriate, clean water will be released directly from the project area. Figure 5 provides further details on water management infrastructure that will be installed during the Start-up Phase.

5.1.1. Water Related Risk Management

The principal risks to water quality during the Start-up Phase include:

- Elevated TSS in discharge waters: This will be managed during the start-up phase by installing sediment traps and sediment retention ponds as soon as practicable as explained in the Erosion and Sediment Control Management Plan (MGL, 2025a).
- Elevated arsenic in discharge waters due to the salvage of soils and subsoils that are elevated in arsenic: This will be managed during the Start-up Phase by the Soil Management Plan (MGL, 2025d).

5.1.2. Water Management Planning

Detailed water management is required during the Operational stages of the BOGP when the potential risks associated with Surficial MIW and mine circuit water increase due to larger volumes of rock movement, tailings generated, and stored water. Hence, detailed staged WBLMs for years 1-13 of the BOGP will be developed using GoldSim during the project Start-up Phase. This will provide an operational tool for MGL to effectively manage water during operations.

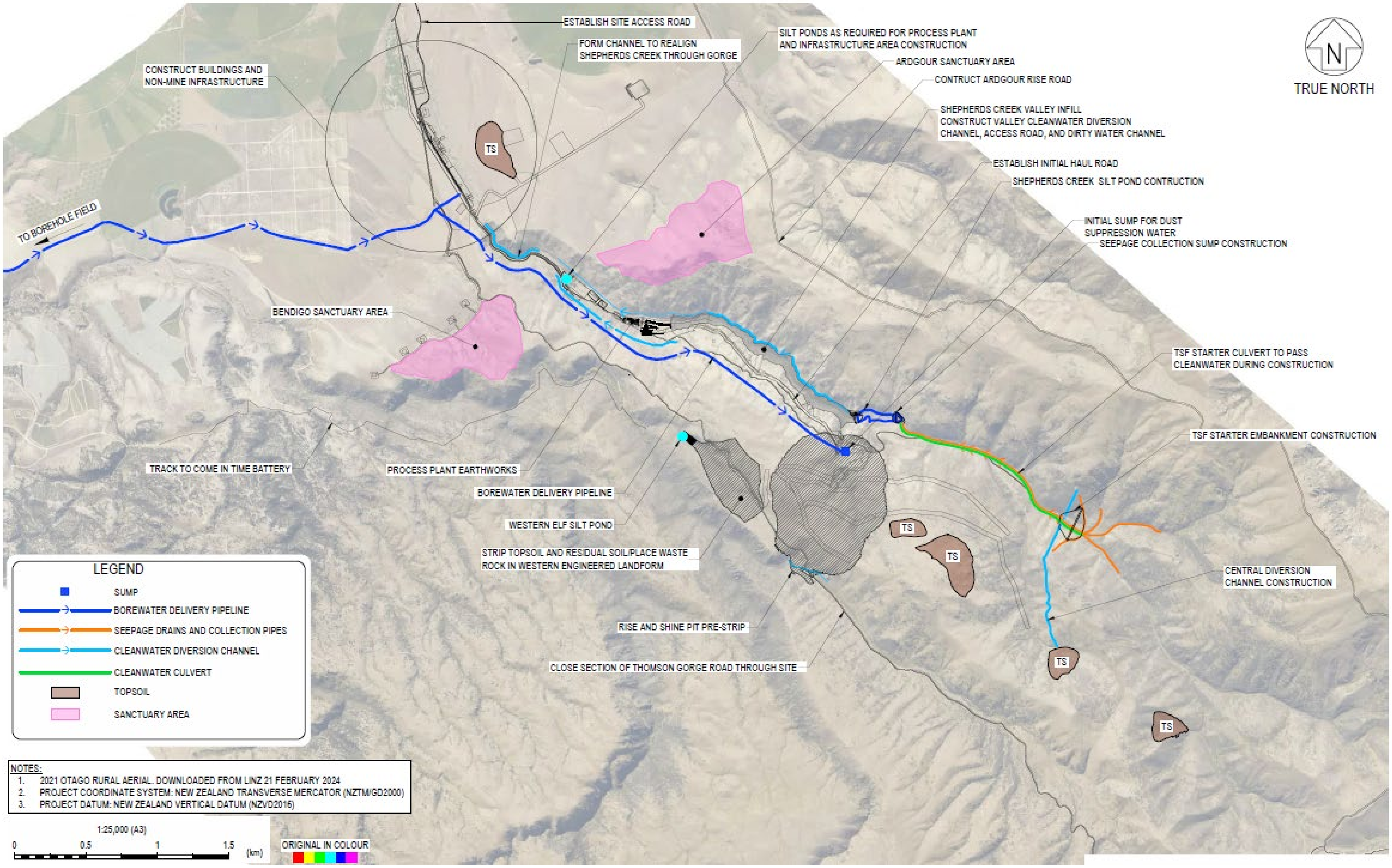

Figure 5: Start-up Phase water management infrastructure.

5.2. Project Development Phase

The Project Development Phase is the main construction phase, which will also include some Start-up Phase activities, and will include the construction of the Processing Plant and supporting infrastructure and buildings, TSF embankments, seepage collection sumps, silt ponds, and diversion channels.

Water management during the Project Development Phase will include the development of an operational MIW management system, including:

- Clean water diversion and release from the project area.
- Sediment and erosion control (refer to MGL, 2025a).
- Release of Surficial MIW via sediment management structures.
- Management of mine circuit water (e.g., seepage from the ELF) by control and pumping of water to the TSF impoundment.
- Zero release of untreated mine-impacted water during this phase.
- Continuation of creek flow augmentation.

Water management infrastructure during the Project Development Phase is shown in Figure 6.

5.2.1. Water Related Risk Management

The principal risks to water quality during the Project Development Phase include:

- Elevated TSS in discharge waters: This will be managed by installing sediment traps and sediment retention ponds as soon as practicable as explained in the Erosion and Sediment Control Management Plan (MGL, 2025a).
- Elevated arsenic in discharge waters due to the salvage of soils and subsoils that are elevated in arsenic: This will be managed by the Soil Management Plan (MGL, 2025d).
- Elevated PCOC in mine circuit water: Managed by this plan.

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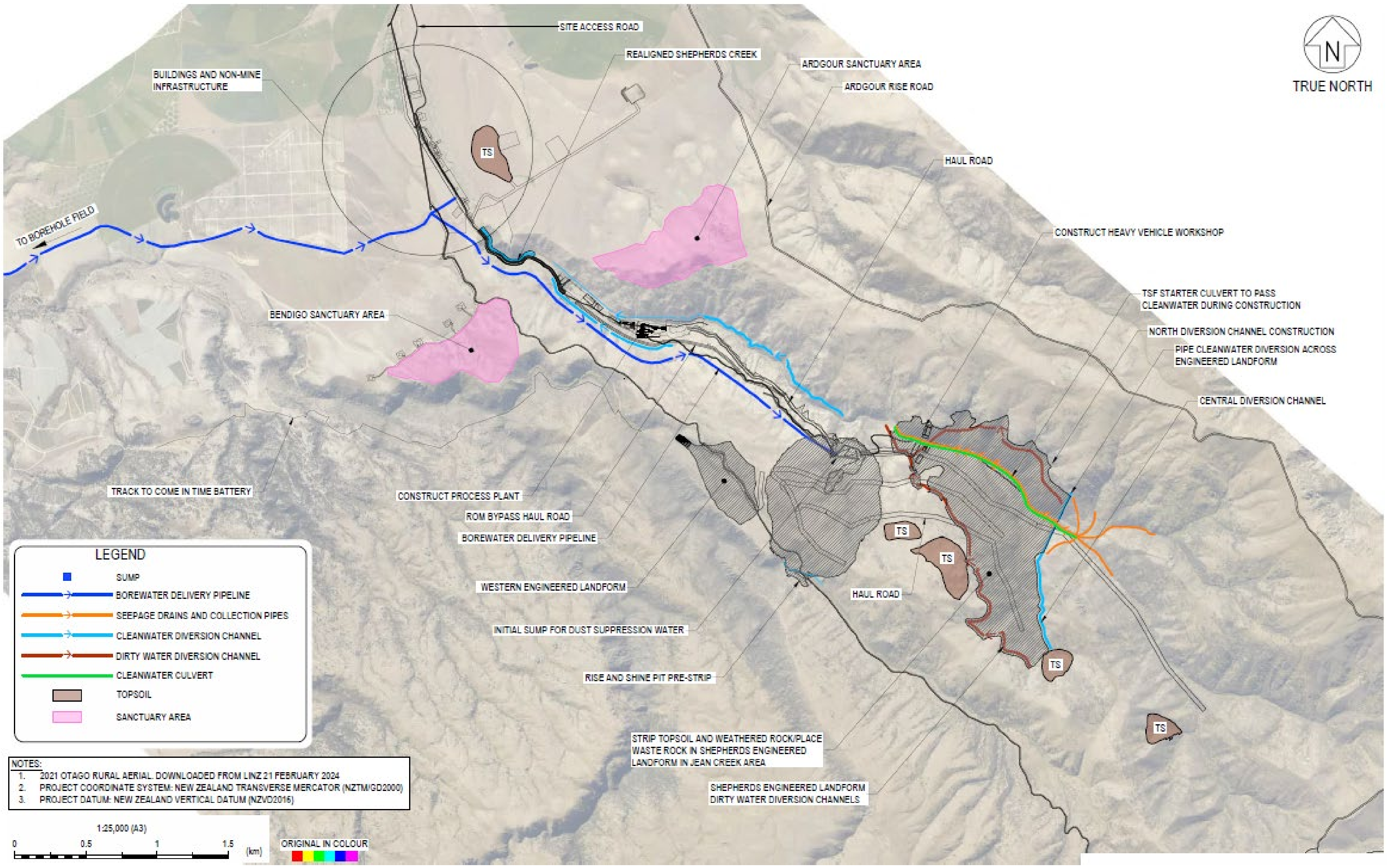

Figure 6: Project Development Phase water management infrastructure.

5.3. Construction Phase Monitoring

During the Start-up and Project Development Phase, monitoring will have a significant focus on erosion and sediment control. This is detailed in the Erosion and Sediment Control Management Plan (MGL, 2025a) and includes aspects such as:

- Post construction monitoring of retention ponds to confirm the effects are managed and systems are operating as expected (e.g., visual observations and maintenance of observation records).
- Water quality monitoring as soon as practicable to assess the performance of the erosion and sediment control measures, as well as reviewing the quality of water being discharged from site associated with Surficial MIW.
- Pre- and post-rain event inspections will also take place where specific rainfall events are forecasted, to ensure management systems are accurate and working, and any post-event maintenance is proactively identified.

Monitoring of flows at SC01 and RS03 will also be required to evaluate potential creek flow changes and associated augmentation flow rates.

6. OPERATIONAL PHASE WATER MANAGEMENT

6.1. Operational Phase

Once ore production commences and other facilities are established, water management will include:

- Clean water diversion and release from the project area including:
  - Surface water runoff from haul roads.
  - Infrastructure areas.
  - ELFs via sediment control structures during higher rainfall periods.
- Sediment and erosion control.
- Release of Surficial MIW via sediment management structures.
- Management of mine circuit water by control and pumping of water to the TSF impoundment or the Processing Plant.
- Zero release of untreated mine circuit water during this phase.
- Continued creek flow augmentation, potentially increasing over time as mine facilities become active and potential creek flow reductions increase.

The strategy of zero-release of mine circuit water is supported by the relatively low rainfall environment, high potential evaporation rates, a shortage of process water, and the significant water storage capacity of the TSF.

Figure 7 depicts the different water classes and where each will be directed during mine operations, with descriptions of each feature described above in Section 4. Clean water and Surficial MIW will be directed to the downstream environment and discharged, whilst mine circuit water will be retained within the mine circuit water. This mine circuit water will be treated during the Closure Phase (see Section 9.4).

Figure 8 to Figure 12 shows how the BOGP will be developed during the operational phase, with water management infrastructure progressively installed.

6.2. Water Management Planning

Staged WBLMs for the BOGP (using GoldSim) will be updated if the mine plan changes. Changes to the staged WLBM will be provided as part of the annual reporting process.

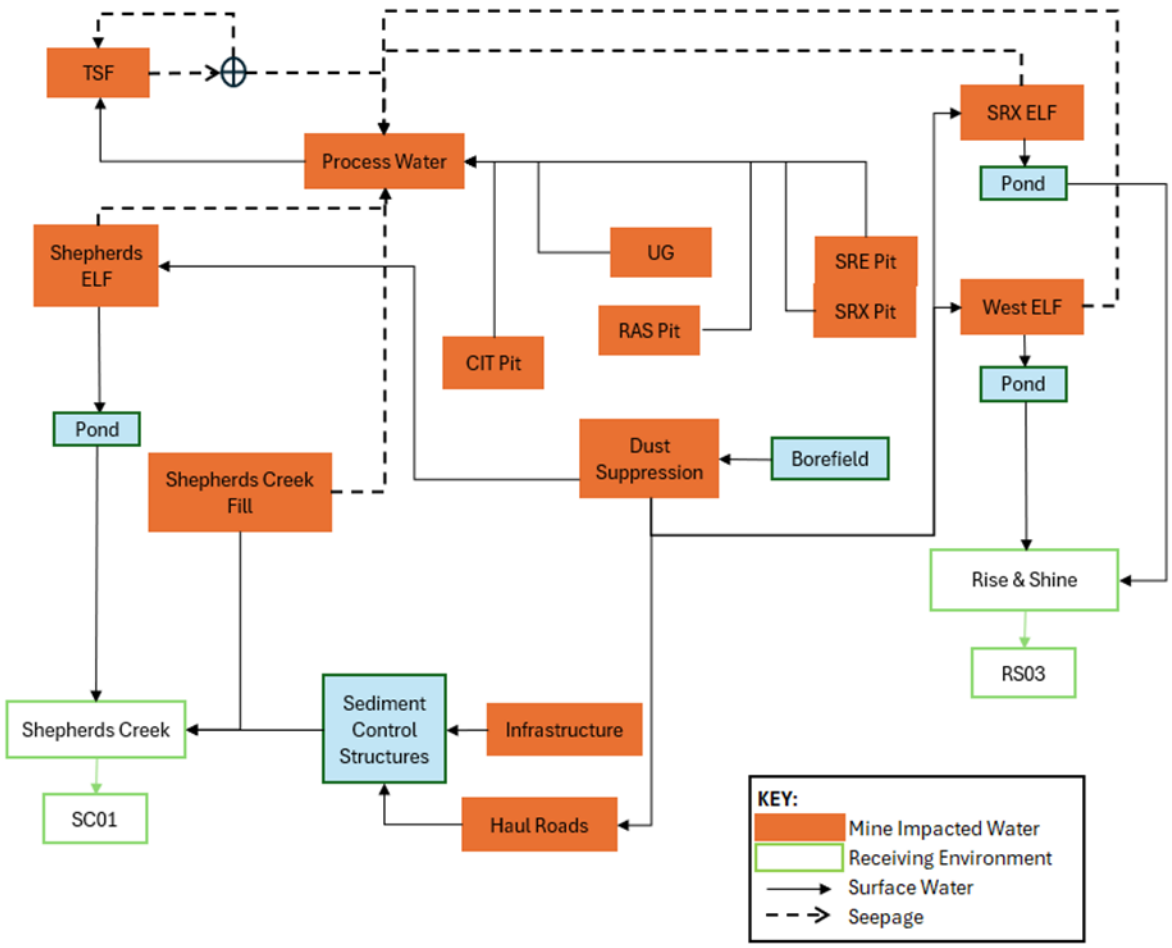

Figure 7: Operational Phase water management. Separation of MIW (red-infilled) and clean water (green outlined).

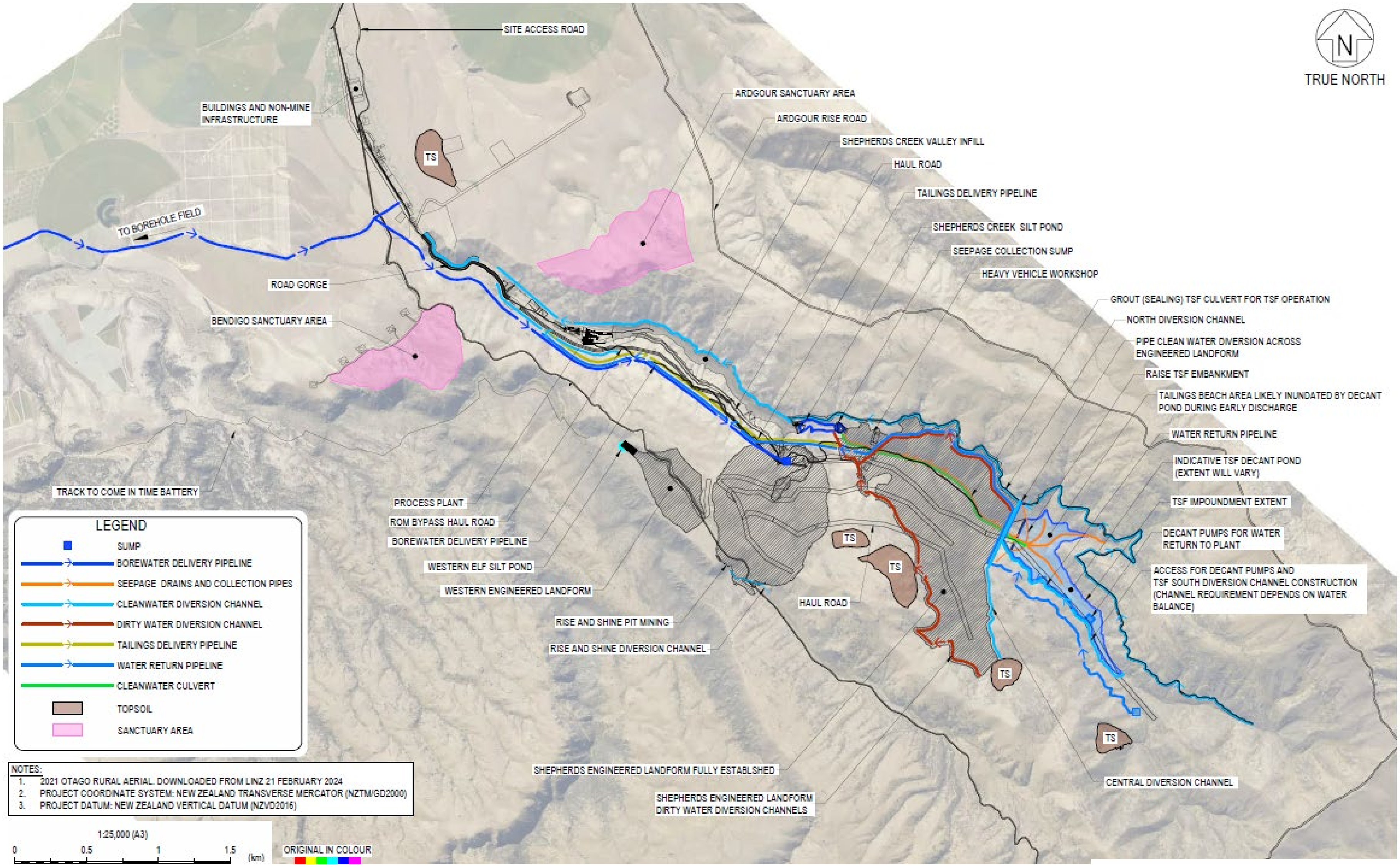

Figure 8: Operational Phase water management infrastructure - RAS Pit

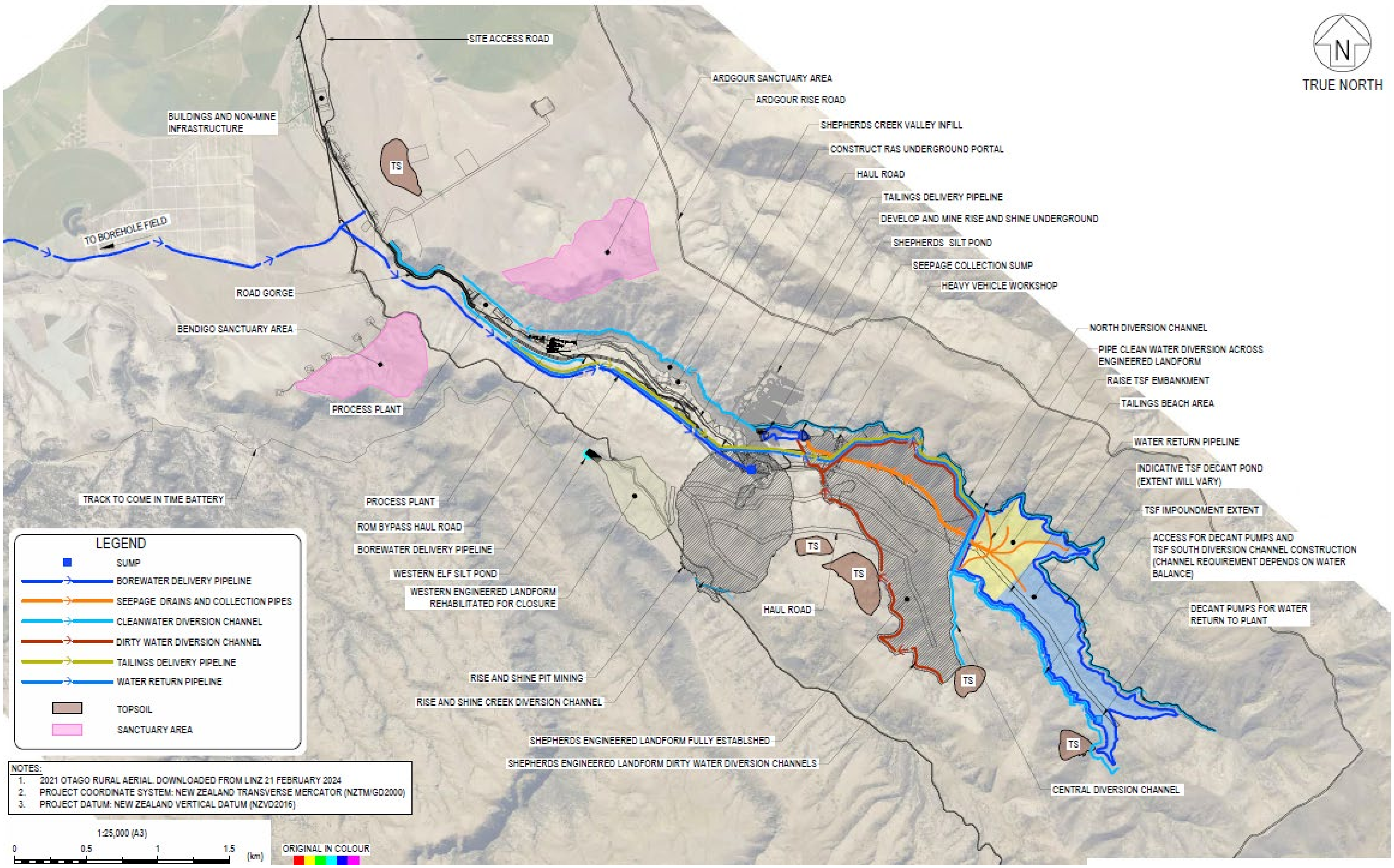

Figure 9: Operational Phase water management infrastructure - RAS Pit / RAS Underground

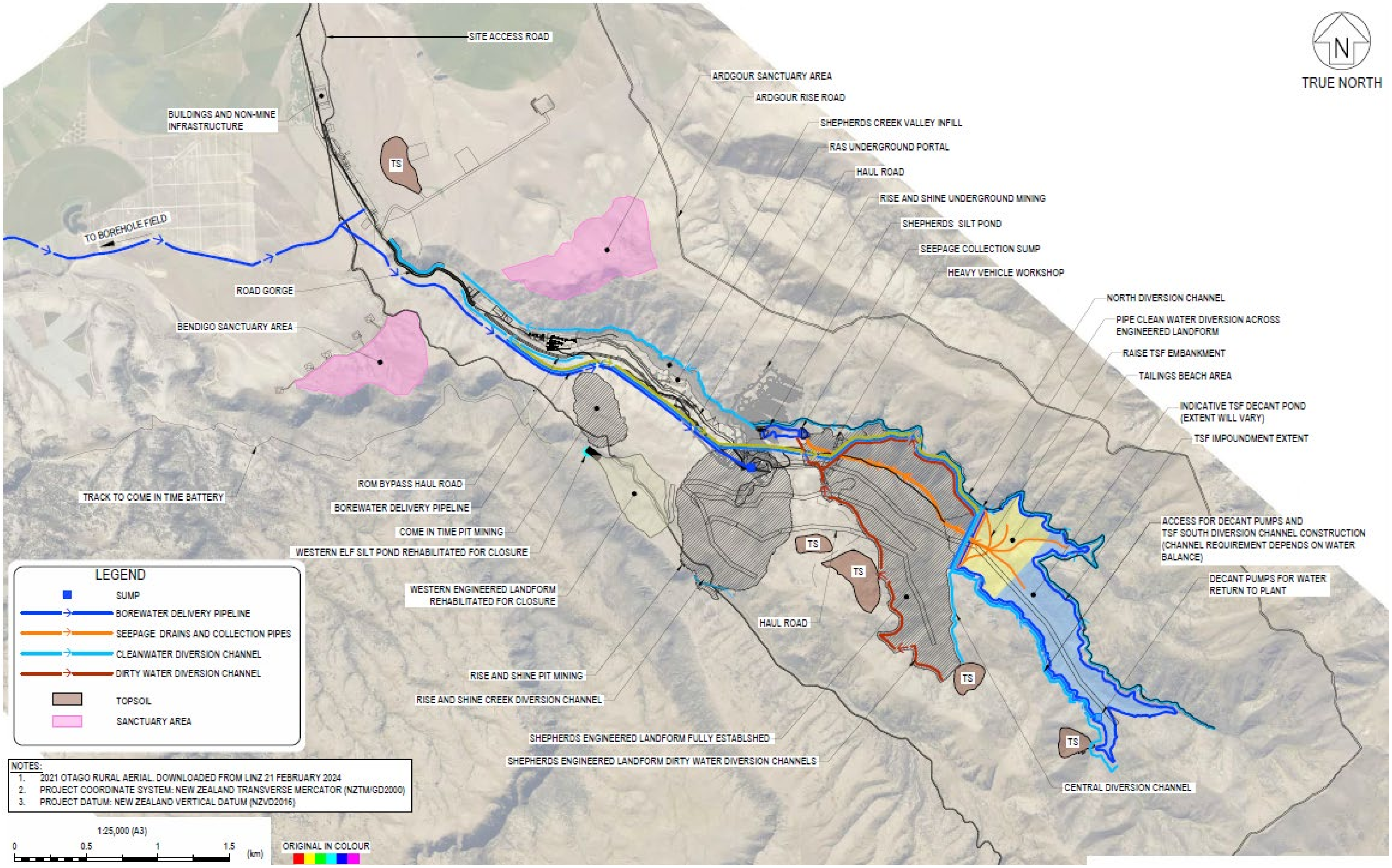

Figure 10: Operational Phase water management infrastructure - RAS Pit / RAS Underground / CIT

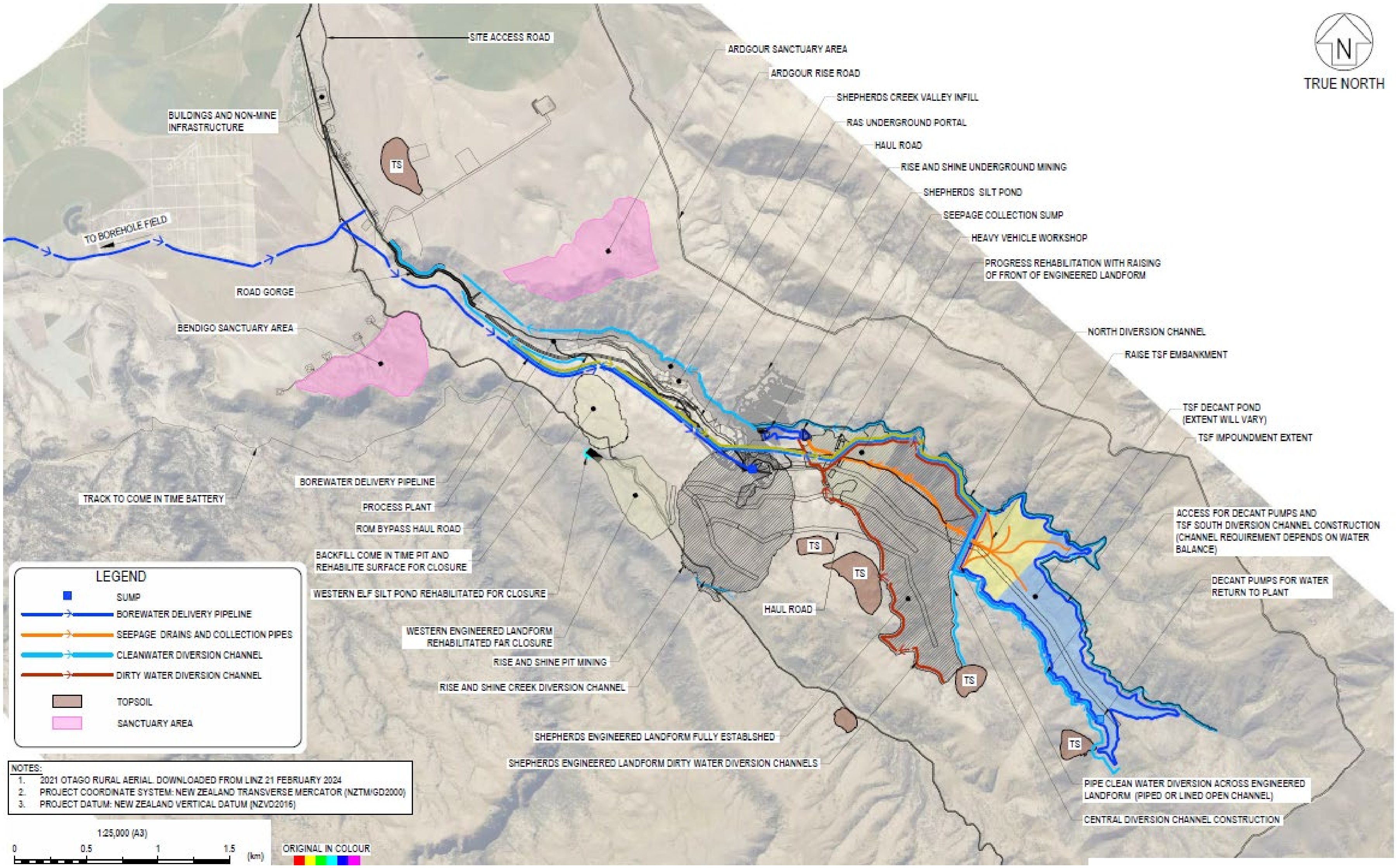

Figure 11: Operational Phase water management infrastructure - RAS Pit / RAS Underground / CIT Pit Backfilled

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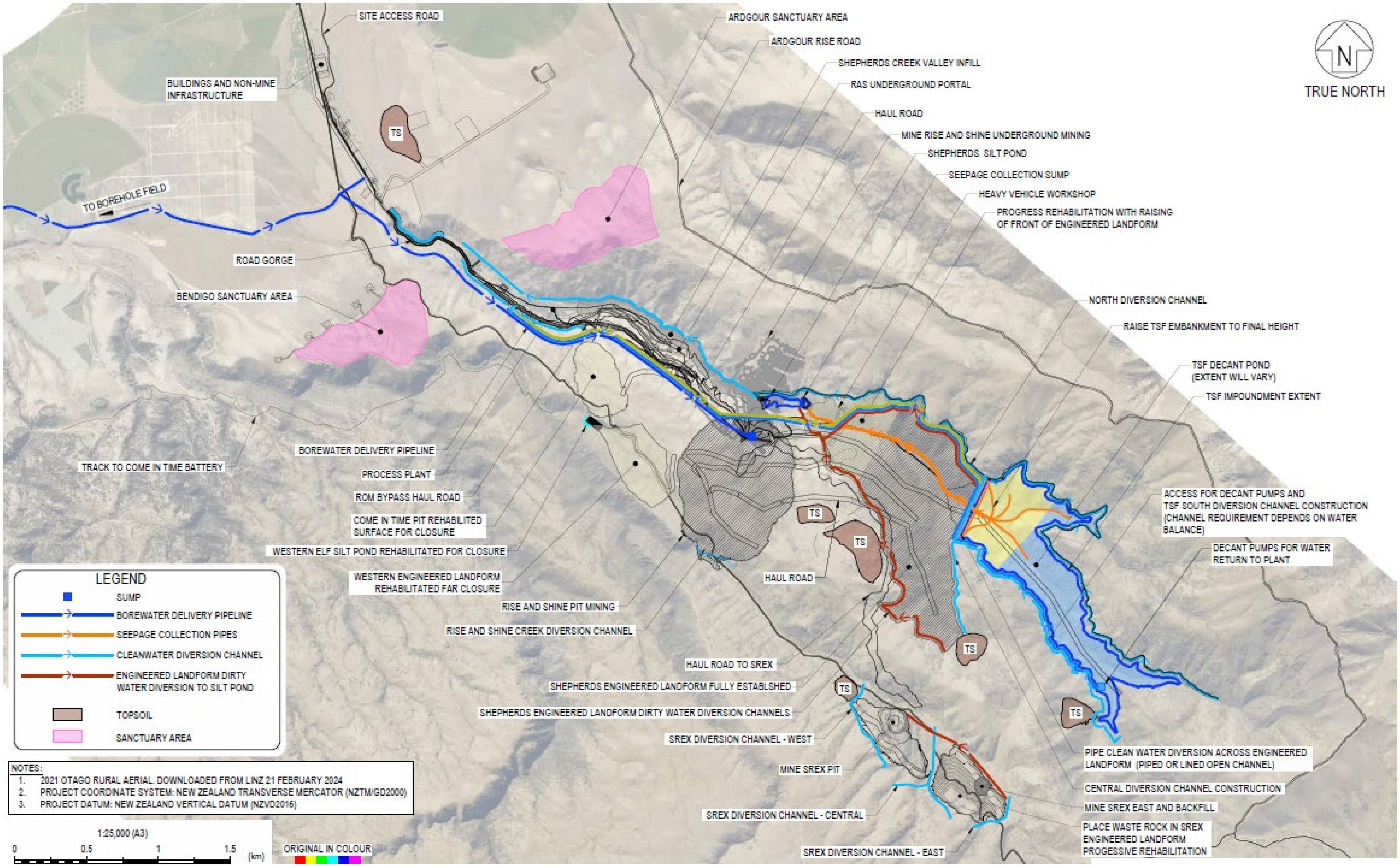

Figure 12: Operational Phase water management infrastructure - PAS Pit / RAS Underground / CIT Pit Backfill / SREX Pit

6.3. Silt and Retention Ponds

Silt and retention ponds are used to retain sediment-laden water to allow for sediments to drop out, thereby improving water quality prior to discharge (see Section 4.4.1). No additional treatment will occur.

To ensure pond capacity is retained, routine sediment removal and desilting will be required throughout operations (MGL, 2025b). This will be undertaken on an as required basis. Collected sediment will be disposed of in the closest nearby ELF.

Emergency spillways will be maintained to ensure they are clear of debris and other obstructions such as pipelines, to ensure they are able to perform as designed should they be engaged during high rainfall events (MGL, 2025b).

Record keeping will be undertaken to ensure documentation is available and that regular inspections are completed.

6.4. Aquifer Water

Aquifer water is split into potable and non-potable water.

To prevent contamination of the potable water systems by other water systems precautions will be undertaken at the BOGP such as the use of colour-coded and clearly labelled pipes during construction activities, installation of non-return valves at all potable water outlets etc. Additional controls include:

- Ensuring potable water lines are not connected to other water class infrastructure.
- Ensuring potable water connection fittings remain incompatible with other service connection fittings to avoid accidental connection to other water class infrastructure.
- Isolating potable water outlets no longer required, with appropriate demarcation applied.

6.5. Dust Suppression

Dust suppression will be undertaken across the operations on haul roads and other unsealed roads, ELF surfaces, and various other locations with bare ground and to achieve project air quality limits set out in the Air Quality Management Plan (MGL, 2025e).

Dust suppression water will primarily be sourced from Aquifer Water. However, management processes will be developed to ensure the use of pit sump water for dust suppression is suitable, including defining what water quality is deemed appropriate. This proactive use of pit sump water for dust suppression reduces the reliance and abstraction from the Bendigo Aquifer Borefield, whilst maximising the use of water that would otherwise be sent to the mine circuit water.

7. ENVIRONMENTAL MONITORING AND COMPLIANCE

7.1. Compliance Monitoring

Water monitoring at the BOGP is designed to ensure compliance with proposed consent conditions and to support adaptive management through performance monitoring. This section outlines the compliance monitoring framework for both surface water and groundwater, including the relevant monitoring sites and associated water quality limits.

7.2. Surface Water Compliance Monitoring

Surface water compliance monitoring has been nominated at three key locations:

- **SC01 – Shepherds Creek Compliance Site:** Located downstream of the project area, this site monitors water quality and flow from the Shepherds Creek catchment.
- **RS03 – Rise and Shine Creek Compliance Site:** This site monitors water quality and flow from the Rise and Shine Creek catchment, which receives runoff from the SRX, SRE, and the WELF mine domains.
- **CC01 – Clearwater Creek Control Site:** A control site used to provide baseline data for comparison. It is located upstream of any mining influence and serves as a reference for natural background water quality.

Surface water compliance monitoring parameters and locations are defined in Table 2 and surface water proposed compliance limits in Table 3. Locations are shown in Figure 13.

Quantity is also measured, to inform load models and to understand effects on flow.

The discharge of treated wastewater (effluent) to land will be undertaken as per consent RM25.259.01. The monitoring required under this consent is shown in Table 2, with water quality discharge standard limits presented in Table 4.

Table 2: Surface water compliance monitoring locations

Site ID	Location	Description	Monitoring Purpose	Monitoring	Water Quality Monitoring Frequency
SC01	Shepherds Creek Compliance Site	Located downstream of the project area, this site monitors water quality and flow from the Shepherds Creek catchment, which receives flows from infrastructure in this catchment (ELF, TSF, Processing Plant, underground, SCK Fill).	Potential impact site	- Quality [1] Continuous: - Flow meter or Water level. - EC	Monthly
RS03	Rise and Shine Creek Compliance Site	This site monitors water quality and flow from the Rise and Shine Creek catchment, which receives runoff from the SRX, SRE, WELF, mine domains and associated pits	Potential impact site	Quality [1] Continuous: - Flow meter or Water level. - EC	Monthly
CC01	Clearwater Creek Control Site	A control site used to provide baseline data for comparison. It is located upstream of any mining influence and serves as a reference for natural background water quality.	Control site	Quality [1] Continuous: - Flow meter or Water level. - EC	Monthly
-	Treated Wastewater Discharge Point	Monitoring point for the discharge of treated domestic wastewater from a mine construction workers camp and mine operation facility.	Treated wastewater to land	Quality [2]	Quarterly

1. Surface water quality monitoring will include but is not limited to: in-situ general parameters (temperature, EC, pH, dissolved oxygen etc.), all parameters listed in Table 3, TSS (as NTU), hardness, major cations and anions, ionic balance.

2. Treated wastewater quality must be in accordance with consent RM25.259.01, condition 5 and will include: carbonaceous biochemical oxygen demand ($CBOD_5$), TSS, faecal coliforms, E.coli, total nitrogen and total phosphorus (see Table 4).

Table 3: Surface water compliance parameters and limits

PARAMETER (units are mg/L unless stated otherwise)	**SURFACE WATER Recommended compliance limit(s)**
pH (unitless)	6.5 - 9.0
Turbidity (NTU)	5 (over a 5-year rolling period, 80% of samples, when flows are at or below median flow, are to meet the limit)
Ammoniacal-nitrogen (NH_3-N)	≤0.24 (annual median) <0.4 (annual 95th %) See Appendix A for adjustments
Nitrate-nitrogen (NO_3-N)	<2.4 (annual median) <3.5 (annual 95th %)
Cyanide (CN)	0.011 (un-ionised HCN, measured as [CN], ANZG 2018) See Appendix A for adjustments
Sulfate (SO_4)	A. If hardness is <100 mg/L ($CaCO_3$), the sulfate compliance limit = 500 mg/L. B. If chloride is <5 mg/L, the sulfate compliance limit = 500 mg/L C. If the hardness is 100–500 mg/L AND if chloride is 5–<25 mg/L, the sulfate compliance limit is (in mg/L): [-57.478 + 5.79*(hardness mg/L $CaCO_3$) + 54.163*(chloride mg/L)] * 0.65 D. If hardness is between 100 and 500 mg/L AND if chloride is between ≥25 and ≤500 mg/L, the sulfate limit is (in mg/L): [1276.7+5.508*(hardness mg/L $CaCO_3$) +1.457*(chloride mg/L)] * 0.65 A minimum of 12 samples must be collected over any rolling 12-month period. For compliance limits in A to D, no more than 20% of samples collected over a rolling 12-month period may exceed the relevant compliance limit. E. An acute compliance limit = 1,000 mg/L averaged over 4 days and not to be exceeded more than once in a one-year period, OR in more than 10% of samples over a one-year period.
Aluminium (Al) (dissolved)	≤0.08
Antimony (Sb) (total)	0.074 (chronic) 0.250 (acute) See below
Arsenic (As(V)) (dissolved)	≤0.042
Cadmium (Cd) (dissolved)	≤0.0004 See below for adjustment algorithm
Chromium (Cr) (dissolved)	≤0.0033 (CrIII) ≤0.006 (CrVI) See below for adjustment algorithm
Cobalt (Co) (dissolved)	0.001 (chronic) 0.11 (acute, not to exceed) See below for adjustment algorithm
Copper (Cu) (dissolved)	≤0.0018
Molybdenum (dissolved)	≤0.034
Zinc (Zn) (dissolved)	0.015 See below for adjustment algorithm
Adjustments	
Cd (dissolved)	HMTV = TV $(H/30)^{0.89}$, where hardness-modified trigger value (HMTV) = (µg/L), trigger value (TV) (µg/L) at a hardness of 30 mg/L as $CaCO_3$; H, measured hardness (mg/L as $CaCO_3$) of a fresh surface water.

PARAMETER (units are mg/L unless stated otherwise)	**SURFACE WATER** **Recommended compliance limit(s)**
Cr (dissolved)	HMTV = TV $(H/30)^{0.82}$, where hardness-modified trigger value (HMTV) = (µg/L), trigger value (TV) (µg/L) at a hardness of 30 mg/L as $CaCO_3$; H, measured hardness (mg/L as $CaCO_3$) of a fresh surface water.
Co (dissolved)	Cobalt (µg/L)= exp{(0.414[ln(hardness $CaCO_3$ mg/L)] – 1.887}
Sb (total)	(chronic) the average of 5 (monthly) samples over a 5-month period (acute) not to be exceeded at any time
Zn (dissolved)	HMTV = TV $(H/30)^{0.85}$, where hardness-modified trigger value (HMTV) = (µg/L), trigger value (TV) (µg/L) at a hardness of 30 mg/L as $CaCO_3$; H, measured hardness (mg/L as $CaCO_3$) of a fresh surface water.

Table 4: Treated wastewater discharge standard limits

Parameter	**Unit**	**Discharge Standard**
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	g/m^3	20
Total Suspended Solids (TSS)	g/m^3	30
Faecal Coliforms	MPN/100 mL	10^4
Escherichia coli (*E. coli*)	MPN/100 mL	10^4
Total nitrogen (TN)	g/m^3	50
Total phosphorus (TP)	g/m^3	18

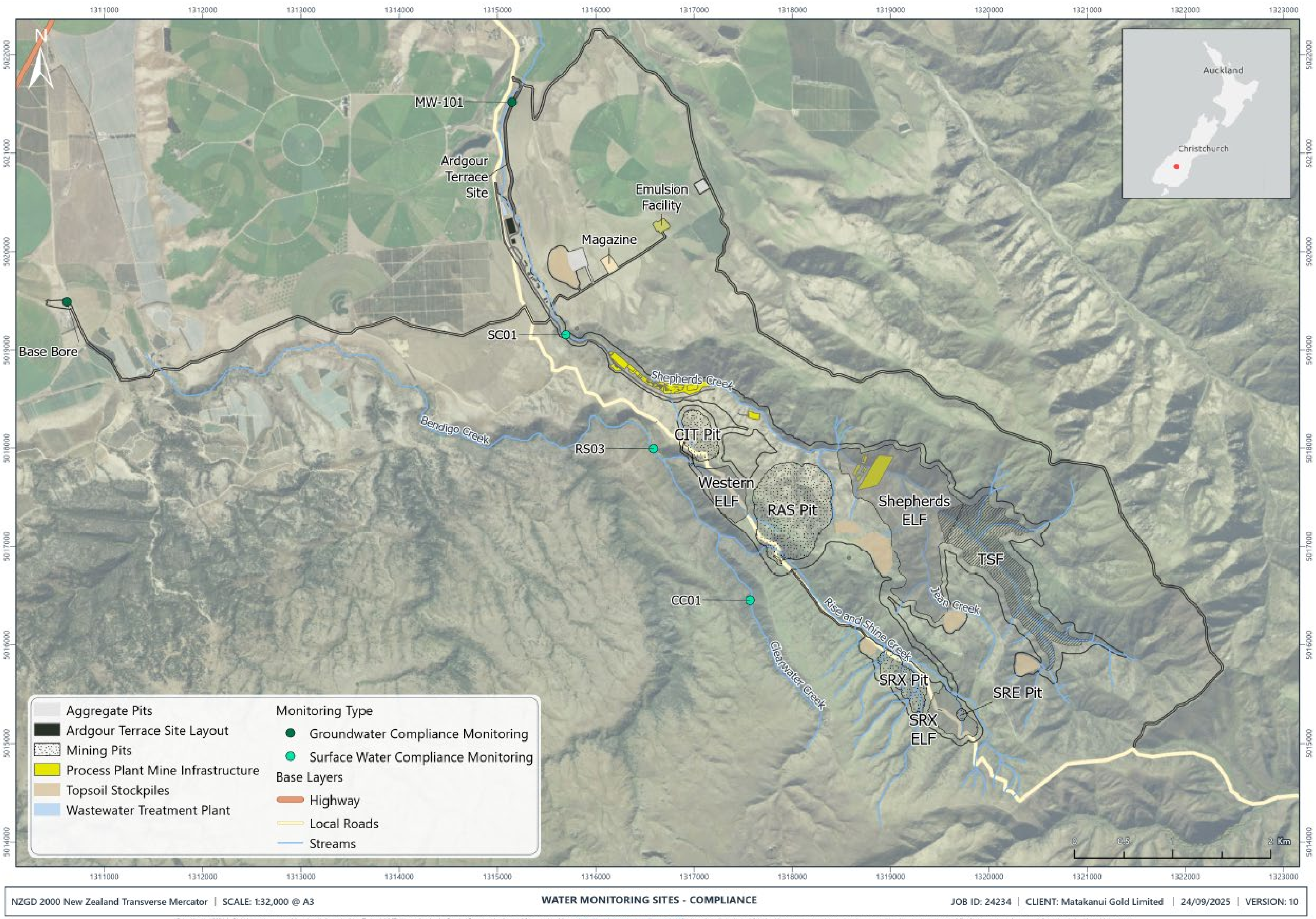

Figure 13: Surface water and groundwater compliance monitoring sites.

7.3. Groundwater Compliance Monitoring

Groundwater compliance monitoring is nominated at two bore locations:

- **MW-101 – Compliance Bore (Ardgour Station):** located near Shepherds Creek, this bore monitors groundwater quality and levels in the Shepherds Creek alluvium and Ardgour Valley Aquifer. It is used to assess potential impacts from mining activities on downstream groundwater users.
- **Base Bore – Production Bore (Abstraction Borefield):** located within the Bendigo Aquifer Borefield, this bore monitors groundwater abstraction rates and quality for operational use. It ensures compliance with consented abstraction limits and drinking water standards.

Groundwater compliance monitoring parameters and locations are defined in Table 5 and groundwater compliance limits in Table 6. Locations are shown in Figure 13.

Table 5: Groundwater compliance monitoring

Site ID	Location	Description	Monitoring	Water Quality Monitoring Frequency
MW-101	Ardgour Station Compliance Bore	Located near Shepherds Creek, this bore monitors groundwater quality and levels in the Shepherds Creek alluvium and Ardgour Valley Aquifer. It is used to assess potential impacts from mining activities on downstream groundwater users.	- Quality [1] Other: - Groundwater level	Monthly
Base Bore	Abstraction Borefield – Production Bore	Located within the Bendigo Aquifer Borefield, this bore monitors groundwater abstraction rates and quality for operational use. It ensures compliance with consented abstraction limits and drinking water standards.	- Quality [1] Other: - Groundwater level - Flow meter - Pumping records	Monthly

1. Groundwater quality monitoring will include but is not limited to: in-situ general parameters (temperature, EC, pH, dissolved oxygen etc.), all parameters listed in Table 6,major cations and anions, hardness, ionic balance.

Table 6: Groundwater compliance parameters limits

PARAMETER (units are mg/L unless stated otherwise)	**GROUNDWATER Recommended compliance limit(s)**
Nitrate-nitrogen (NO_3-N)	11.3 (MAV)*
Cyanide (CN-)	0.6 (MAV)
Sulfate (SO_4)	≤250 (taste threshold)
Aluminium (Al)	1 (MAV)
Antimony (Sb)	0.02 (MAV)
Arsenic (As(V))	0.01 (MAV)
Cadmium (Cd)	0.004 (MAV)
Chromium (Cr)	≤0.05(MAV)
Cobalt (Co)	<1 (livestock drinking water)
Copper (Cu)	≤0.5
Iron (Fe)	≤0.3
Lead (Pb)	0.01 (MAV)
Manganese (Mn)	0.4 (MAV)
Molybdenum (Mo)	<0.01
Strontium (Sr)	4
Uranium (U)	0.03 (MAV)
Zinc (Zn)	≤1.5

** MAV = Maximum acceptable value – From NZ drinking water standards*

7.4. Performance Monitoring

Performance monitoring at the BOGP is designed to assess the effectiveness of water management infrastructure and operational practices. It complements compliance monitoring by providing early warning of potential issues and informs adaptive management processes.

7.4.1. Purpose

The objectives of performance monitoring as related to this WMP are to:

- Evaluate the effectiveness of water management infrastructure (e.g., silt ponds, seepage collection systems, active treatment systems, passive treatment systems).
- Identify trends in water quality and quantity that may indicate emerging risks.
- Support adaptive management by providing data to refine operational practices.
- Inform closure planning and long-term water treatment requirements.

It is anticipated, following a comprehensive review of the monitoring results, that performance monitoring as presented in Table 7 and Table 8 below will reduce over time, following an annual review period. This will include:

- A review of monitoring site selection to ensure performance monitoring is providing the most informative results.
- A review of monitoring frequencies for suitability.
- A review of water quality monitoring parameters, including flow measurements, which may also be amended.

7.4.2. Surface Water Performance Monitoring

Surface water performance monitoring will be undertaken at key operational infrastructure locations, including:

- Seepage collection points at ELFs and TSF.
- Mine circuit water components (e.g., pit sumps).
- Sediment and retention ponds.
- Arsenic-rich topsoil stockpiles.
- Treatment systems (active and passive) – discussed in Section 9.4.3.
- Treated effluent from wastewater treatment.
- Potable water systems.

Monitoring frequencies vary by site and are detailed in the surface water performance monitoring table, see Table 7. Locations are shown in Figure 14.

Table 7: Surface Water Performance Monitoring

Site ID	Location / Description	Water class	Monitoring Purpose / Objective	Monitoring	Water Quality Monitoring Frequency
SW01	Shepherds ELF underdrain	Mine Circuit Water	Monitor ELF seepage quality and quantity	- Quality[1] - Metals and Metalloids <u>Continuous:</u> - Flow meter / stage height / Pumping records - EC	Monthly
SW02	Shepherds TSF Decant	Mine Circuit Water	Monitor TSF supernatant water quality and quantity	- Quality[1] <u>Continuous:</u> - Pumping records - EC	Monthly
SW03	WELF underdrain	Mine Circuit Water	Monitor ELF seepage quality and quantity	- Quality[1] <u>Continuous:</u> - Flow meter / stage height / Pumping records - EC	Monthly
SW04	CIT backfill seepage	Mine Circuit Water	Monitoring seepage at surface following completion of backfill.	- Quality[1]	Monthly
SW05	RAS Pit Sump	Mine Circuit Water	Determine suitability for use as dust suppression.	- Quality[1] <u>Continuous:</u> - Pumping records	Monthly
SW06	SRX Pit Sump	Mine Circuit Water		- Quality[1] <u>Continuous:</u> - Pumping records	Monthly
SW07	CIT Pit Sump	Mine Circuit Water		- Quality[1] <u>Continuous:</u> - Pumping records	Monthly
SW08	WELF As-rich topsoil stockpile	Surficial MIW	Understand water quality from As-rich stockpiles and influence on mine circuit water (quality and contribution)	- Quality[1] <u>Continuous:</u> - Pumping records	Monthly
SW09	Shepherds Silt Pond discharge	Clean	Confirm silt and retention ponds are effective in reducing sediment loads.	- Quality[1] - In-situ turbidity inflows vs outflows <u>Continuous:</u> - Flow meter - EC	Inspected as per rainfall trigger event [2] Sample to be taken if discharging.
SW10	WELF Silt Pond discharge	Clean		- Quality[1] - In-situ turbidity inflows vs outflows <u>Continuous:</u> - Flow meter - EC	As per rainfall trigger event [2] Monthly NTU, water level
SW11	SRX ELF silt pond discharge	Clean		- Quality[1] - In-situ turbidity inflows vs outflows <u>Continuous:</u> - Flow meter - EC	As per rainfall trigger event [2] Monthly NTU, water level

[1] Surface water quality performance monitoring will include but is not limited to: in-situ general parameters (temperature, EC, pH, dissolved oxygen etc.), TSS (as NTU), hardness, major cations and anions, metals and metalloids, ionic balance.

[2] Water quality monitoring to be undertaken during rainfall trigger event (>15mm of rain within a 24-hour period), see Erosion and Sediment Management Plan, section 8.2 (MGL, 2025a).

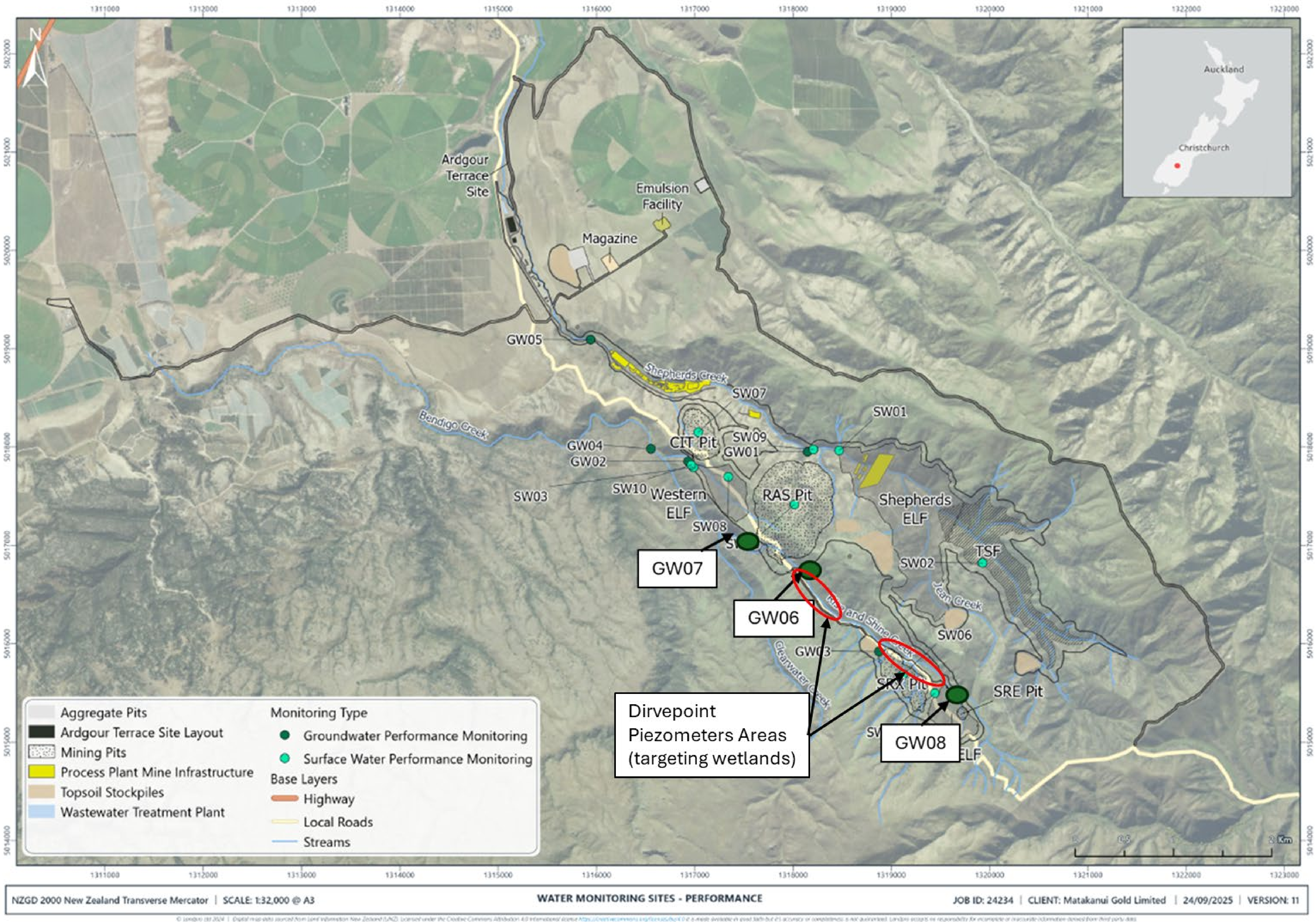

Figure 14: Surface water and groundwater performance monitoring sites.

Additional performance monitoring to be undertaken to ensure the effective operation of the silt and retention ponds is captured in the Erosion and Sediment Control Management Plan (MGL, 2025a). It will cover aspects including, but not limited to:

- Assessment of inflows vs outflows to ensure sediment is dropping out of suspension as predicted.
- Water sampling following significant rainfall events (>15 mm of rain within a 24-hour period).

7.4.3. Groundwater Performance Monitoring

In addition to compliance monitoring, performance monitoring is proposed for groundwater located near key mine infrastructure. These include:

- GW01 – Downstream of the Shepherds Sediment Pond
- GW02 – Downstream of the Western ELF (WELF)
- GW03 – Downstream of the SRX Pit
- GW04 – Next to RS03
- GW05 – Lower Shepherds Creek
- GW06– Between RAS Pit and Rise and Shine Creek
- GW07– Between RAS Pit and Rise and Shine Creek
- GW08– Between SRX ELF and Rise and Shine Creek
- Drivepoint Piezometers – 5 to 10 piezometers installed into the swamp/marsh wetlands associated with Rise and Shine Creek.

Exact locations will be field fit subject to access constraints.

These bores are monitored to:

- Detect any bypass of seepage collection systems.
- Assess groundwater levels changes (e.g., drawdown) and seasonal fluctuations.
- Identify potential migration of contaminants from upgradient mine domains.

Groundwater performance monitoring is shown in Table 8. Locations are shown above in Figure 14.

Table 8: Groundwater Performance Monitoring

Site ID	Location / Description	Monitoring Purpose / Objective	Monitoring	Frequency
GW01	10-50 m downstream of the Shepherds Sediment Pond	Monitors bypass of seepage collection systems. Monitors for RAS Pit or underground related drawdown.	Quality Groundwater level	Quality: quarterly Level: continuous (pressure transducer)
GW02	10-50 m downstream of the WELF	Monitors bypass of seepage collection systems Monitors for CIT Pit or underground related drawdown.	Quality Groundwater level	Quality: quarterly Level: continuous (pressure transducer)
GW03	10-50 m downstream of the SRX Pit	Monitors for SRX Pit related drawdown.	Groundwater level	Level: continuous (pressure transducer)
GW04	Adjacent to surface water monitoring site RS03	Monitor for potential sub-surface contamination load bypass at compliance site.	Quality Groundwater level	Quarterly (both quality and level)
GW05	Lower Shepherds Creek		Quality Groundwater level	Quarterly (both quality and level)
GW06	Between RAS Pit and Rise and Shine Creek	Monitors for RAS Pit related drawdown.	Groundwater level	Level: continuous (pressure transducer)
GW07	Between RAS Pit and Rise and Shine Creek	Monitors for RAS Pit related drawdown.	Groundwater level	Level: continuous (pressure transducer)
GW08	Between SRX ELF and Rise and Shine Creek	Monitors bypass of seepage collection systems	Quality Groundwater level	Quality: quarterly Level: continuous (pressure transducer)
Drivepoint Piezometers	Within Rise and Shine Creek wetlands.	Monitors for RAS and SRX Pit related drawdown.	Groundwater level	Level: continuous (pressure transducer)

7.4.4. Review and Adaptive Management

Performance monitoring data will be reviewed:

- Annually, to assess trends and refine monitoring programmes.
- Following significant rainfall events, to evaluate infrastructure performance (>15 mm of rain within a 24-hour period; see Erosion and Sediment Management Plan, section 8.2 (MGL, 2025a)).
- In response to exceedances or anomalies, to trigger adaptive management actions (see Section 10.6).

Monitoring results will inform updates to the WMP, risk register, and adaptive management processes.

7.5. Future Monitoring Programs

Compliance monitoring for certain PCOC is recommended once passive treatment commences. Anaerobic passive treatment system (PTS) can generate secondary PCOC including ammoniacal nitrogen, BOD5, and sulfide. Monitoring of these PCOC is not required until an operating PTS is installed (noting baseline conditions should be established). A monitoring program will be developed once the PTS technology is selected.

8. MONITORING METHODS AND QUALITY ASSURANCE

This section outlines the procedures and protocols used to ensure water monitoring data collected at the BOGP are accurate, reliable, and defensible. It applies to both compliance and performance monitoring programs.

8.1. Sampling Methods

8.1.1. Surface Water Sampling

- **Field measurements:** Temperature, pH, electrical conductivity (EC), dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be collected in situ.
- **Sample collection:** Water samples will be collected using a sample pole, where required, to minimise contamination of the sample by personnel.
- **Turbidity monitoring:** In-situ turbidity measurements will be taken at inflow and outflow points of sediment and silt ponds.

8.1.2. Groundwater Sampling

- **Low-flow purging:** Groundwater bores will be purged using low-flow techniques to minimise disturbance.
- **Stabilisation:** Sampling will commence once field parameters stabilise, indicating representative aquifer water.
- **Field measurements:** Same as surface water, with additional water level readings (potentially, for critical monitoring sites, a piezometer could be installed).

8.2. Field Instrument Calibration

- Instruments will be calibrated according to manufacturer specifications.
- **Daily calibration:** Water quality meters will be calibrated at the start of each sampling day and at the elevation of sampling being undertaken.
- **Weekly calibration:** Continuous EC loggers will be calibrated in the field weekly.
- **Annual calibration:** Instruments will be sent for manufacturer calibration annually.
- Calibration records will be maintained for each instrument.

8.3. Sample Preparation and Handling

- **Containers:** Samples will be collected in laboratory-specified containers.
- **Preservation:** Acid preservation will be applied where required (e.g., for dissolved metals).

- **Labelling:** All samples will be clearly labelled with site ID, date, time, and sampler initials.
- **Transport:** Samples will be placed on ice immediately and shipped in insulated boxes to the laboratory within holding times.
- **Chain of custody:** Forms will accompany each shipment and be submitted electronically.

8.4. Decontamination Procedures

- All sampling equipment will be decontaminated between sites using deionised water.
- Non-preserved bottles will be rinsed with sample water prior to collection.
- Latex gloves will be worn by staff to minimise contamination.

8.5. Field Quality Control samples

8.5.1. Rinsate Blanks

- Collected when non-dedicated equipment is used.
- Deionised water is run over cleaned equipment to confirm decontamination effectiveness.
- Analysed for key PCOCs (e.g., sulfate, arsenic).

8.5.2. Field duplicates

- Blind duplicates collected at a rate of 1 in 20 samples.
- Sent to the primary lab to assess repeatability.
- Inter-laboratory duplicates sent to a secondary lab to assess consistency.
- Relative Percent Difference (RPD) will be calculated to assess variability.

8.5.3. Trip Blanks and Trip Sikes

- Included if volatile compounds (e.g., TRH) are monitored.
- Used to assess contamination during transport.

8.6. Laboratory Analysis and QA/QC[4]

- Laboratories must be IANZ-accredited.
- Limits of Reporting (LORs) will be stated for all results.
- QA/QC procedures include method blanks, spikes, and lab duplicates.

[4] Quality Assurance / Quality Control

- Annual reports will include a QA/QC summary and corrective actions for any non-conformances.

8.7. Review of Water Management Practices

The Technical Services Manager and Mining Manager shall review the environmental monitoring reports relevant to water management at the BOGP.

Adaptive management processes will be developed over time to ensure water management practices achieve environmental outcomes and compliance is maintained, which is also captured as part of the Performance Monitoring review process.

9. DECOMMISSIONING / CLOSURE AND POST-CLOSURE MANAGEMENT

9.1. Closure Outcomes and Philosophy

Planning for closure commences well before an operation commences operations.

Closure outcomes are overarching outcomes that are being sought in relation to mine closure and the post mining landscape. They are typically high level in nature, whilst closure completion criteria that underpin each outcome provide clarity and detail on how each will be measured and met. Closure outcomes continue to be refined throughout the life of mine as new information, changes to stakeholder expectations, evolving industry standards and changes in risk profiles occur.

Operational water quality objectives (Section 7.1), for example, actively progress an operation towards achieving set closure completion criteria, and therefore the overarching closure outcomes. Ongoing monitoring against these outcomes, through both compliance and performance monitoring, will ensure the operation achieves its long-term closure goals.

For more information on closure, refer to the Mine Closure Plan (MCM, 2025).

9.2. Closure Phase Management Approach

At the completion of mining, water management will transfer from internal management to discharge from site. Figure 15 depicts how water will be managed during the Closure Phase, according to water classes and final destinations.

Creek flows are anticipated to increase from baseline, thus flow augmentation will no longer be required.

Two pits (SRX and RAS) and underground operations will be allowed to fill with water, forming pit lakes to varying degrees. Monitoring of the filling rates will be obtained to validate the water balance model.

An active WTP will be constructed at the end of operations to commence treatment of the mine circuit water inventory that has built up over the course of the operations, as well any ongoing seepage from the TSF and ELFs.

Following active water treatment in the Shepherds Creek catchment, passive water treatment options will be established to enable treatment of water. These are discussed in subsequent sections of this plan. Partial passive treatment of SRX Pit Lake overall will be undertaken to ensure water quality objectives are achieved.

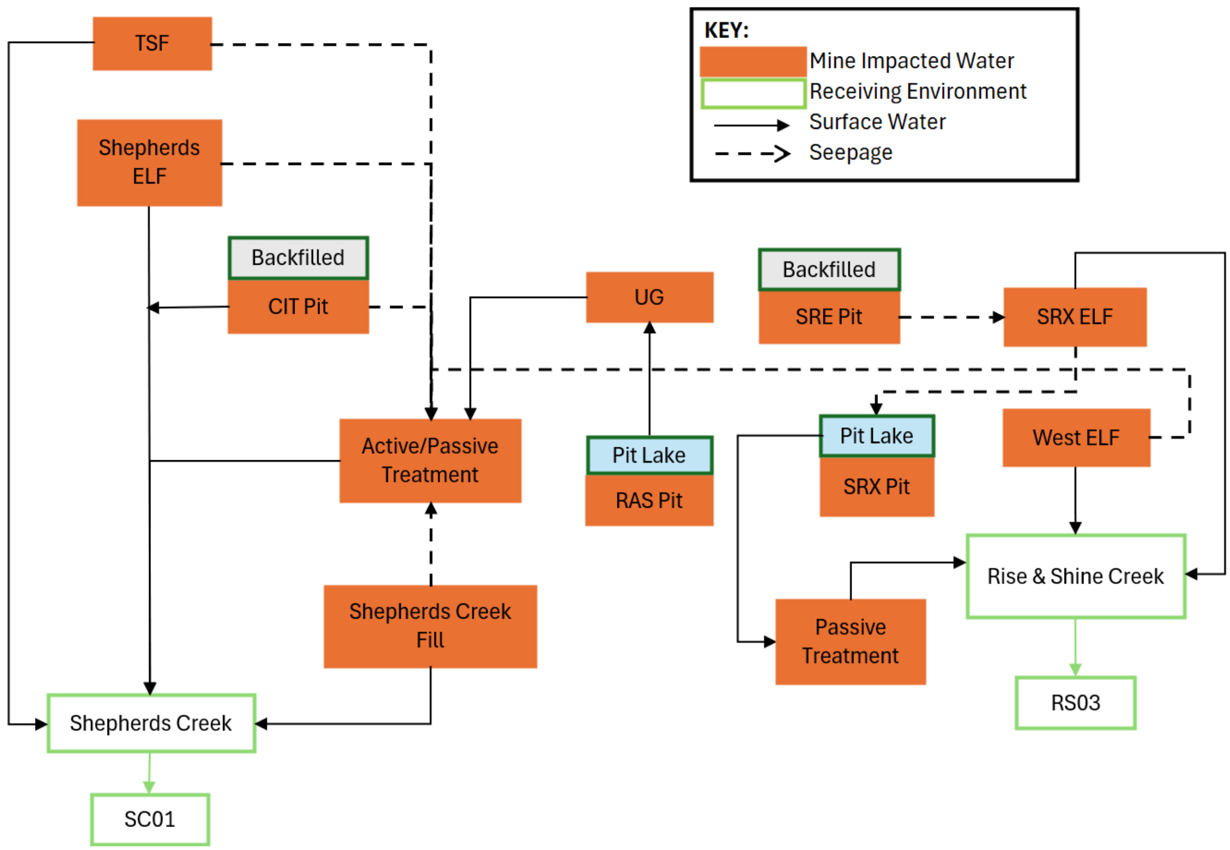

Figure 15. Closure Phase water management.

9.3. Final Pit Voids / Pit Lake

Pit lakes will be allowed to form in the two pits: SRX and RAS.

- **SRX Pit:** This includes pit void water and SRX ELF seepage and will have partial passive treatment within the pit prior to discharging into the Rise and Shine Creek.
- **RAS Pit:** The crown pillar will be removed separating the RAS Pit from the RAS Underground workings. This will allow the RAS pit to drain into the underground workings with eventual discharge via the RAS Underground portal. This water will be collected and treated via the water treatment system (WTP and PTS).

The pit lakes will have the following controls and considerations including:

- Fencing around the crest perimeter, preventing inadvertent access.
- Closure to ensure they are made safe, stable, and will meet closure criteria.
- A viewing area will be created so that public can safely view the final pit void at closure.

9.4. Active Closure Phase: Active Water Treatment

Active water treatment at the BOGP will involve treatment of all mine circuit water cumulated water. Active treatment within the Shepherds Creek catchment is currently predicted to commence in Year 11 and will be required for ~50 years (MWM, 2025b) until such time that PCOC loads (SO_4, Mo, and Sb) have reduced sufficiently such that passive water treatment to achieve water quality objectives can be undertaken.

The active WTP will be located in the Processing Plant footprint where there is access to power, water and storage for reagents within Shepherds Creek and will include the following processes:

- Surge sump.
- Pontoon mounted pumps for plant feed.
- Metal hydroxide precipitation and settling.
- Gypsum precipitation and settling.
- Ettringite precipitation and settling.
- Carbonation and pH trimming.
- Treated water sump.
- Sludge management.

On completion of active water treatment, the plant and associated infrastructure will be removed. Other processes that will likely be needed in addition to the active WTP are:

- Cyanide destruct on the Shepherds TSF influent stream.
- Potential additional nitrate removal after WTP via biological processes.

Other management options have been assessed for the BOGP to reduce the quality and quantity of MIW that requires treatment. Diverting Shepherds ELF and TSF seepage to the RAS Pit Lake for dilution was assessed as one possible management option. Results indicate that at closure of the BOGP, the proposed water quality limits can be achieved without active treatment (if net percolation rates of 20% can be achieved through design of the ELF encapsulation system). The exception to this is molybdenum. Active treatment is required until molybdenum decreases to a concentration that can be managed by passive treatment technologies (after ~ 50 years).

Active water treatment system designs will be completed within the first few years of the mine commencing so that the technology is ready for operation and closure. Figure 16 shows the proposed layout of water management infrastructure during the Active Closure Phase.

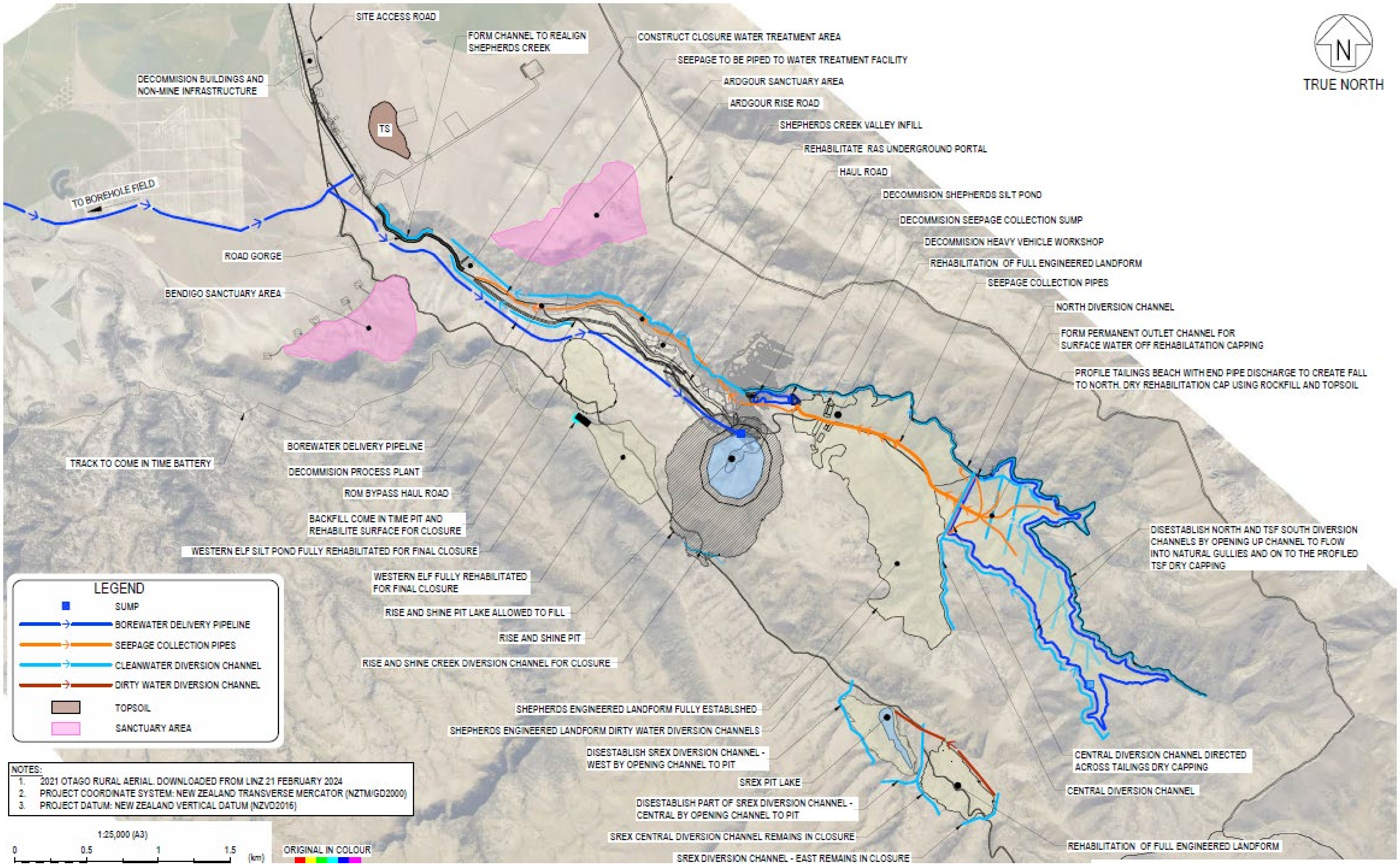

Figure 16: Active Closure water management infrastructure

9.5. Post-Closure Phase: Passive Water Treatment

Passive water treatment will be required in the Shepherds Creek catchment following active water treatment ~Year 50 and beyond. It is expected that as water quality improves on the site in time, seepage will be able to be discharged directly into the environment.

It is assumed that PTS will be required for many decades after active treatment. PTS will ensure water quality meets the appropriate water quality guidelines before being discharged into the Shepherds Creek Clean Water Diversion Channel.

Partial passive treatment is required for SRX Pit Lake overflow to ensure water quality objectives for surface water and groundwater are met at RS03.

PTS will be designed once the project is operational using actual water quality results from the project mine domains, to better inform passive treatment design. At this stage, two PTSs are proposed for the BOGP (MWM, 2025a):

- In Shepherds Creek, before SC01; and
- Within SRX Pit to partially treat SRX ELF seepage and SRX Pit water (up to 8 L/s).

Based on the identified PCOC at the BOGP a multi-stage PTS is expected. This would include:

- Sediment management to mitigate any residual sediment and prevent the passive treatment system from being overwhelmed with sediment.
- Oxidation to encourage iron hydroxide ($Fe(OH)_3$) precipitation and adsorption of metals such as arsenic and vanadium.
- Anaerobic treatment to remove nitrate, reduce sulfate concentrations, and precipitate metals as sulfides.
- A polishing pond to remove secondary contaminants generated in the anaerobic treatment stage (e.g., sulfide (HS-), ammoniacal nitrogen, and low dissolved oxygen).

The water management infrastructure in place during the Post-Closure Phase is shown in Figure 17.

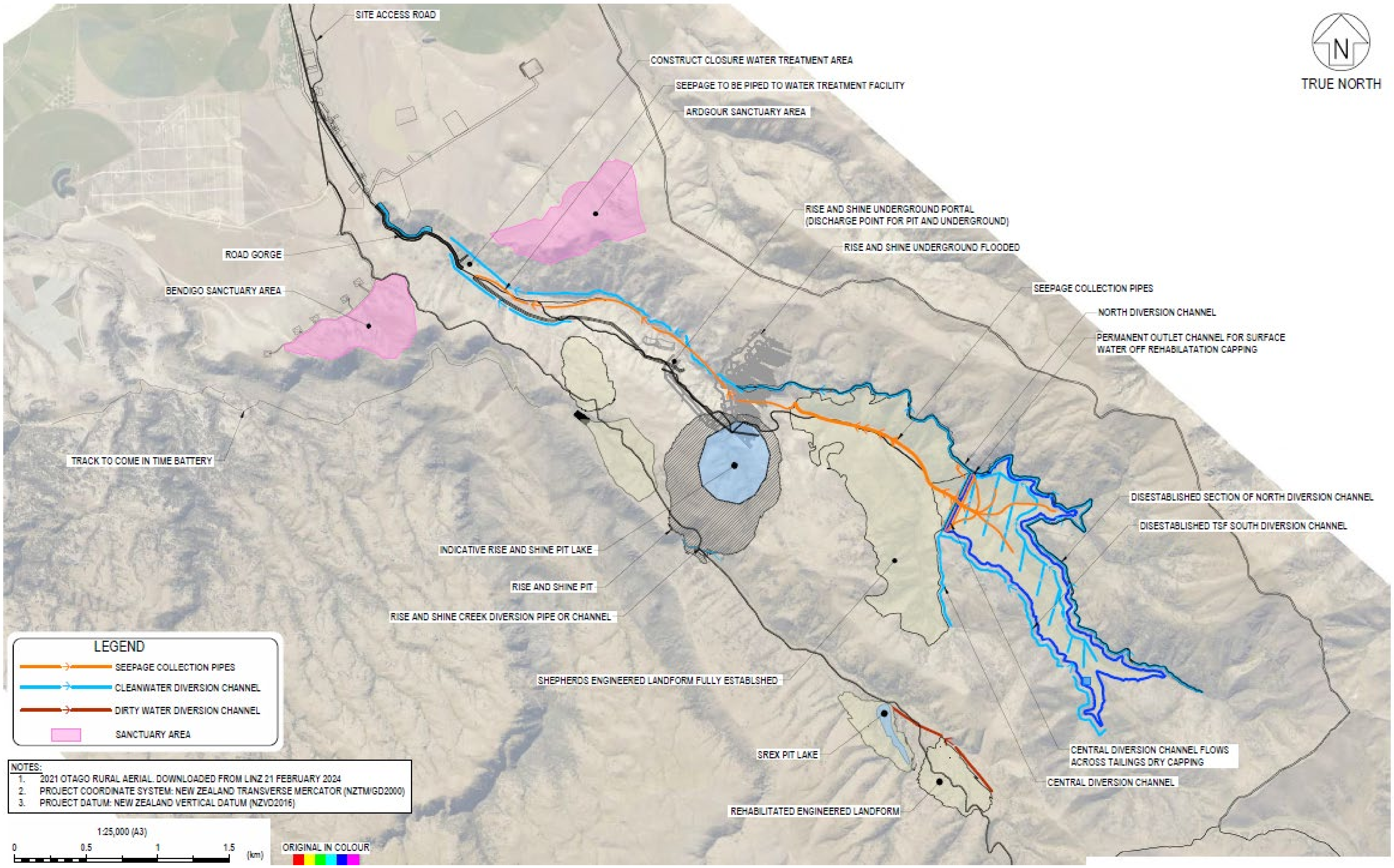

Figure 17: Passive Closure water management infrastructure

9.6. Sludge Disposal

Sludge, a by-product of active and passive water treatment will be created. Further studies need to be completed to determine the quantity and quality of water treatment residues (sludge) and identify appropriate disposal locations. The sludge should be disposed offsite at a suitable facility or studies should be undertaken to confirm suitable onsite management options.

9.7. TSF

As closure, the TSF will be fully dry capped and rehabilitated, with the tailings contoured directing surface flow towards the northwest corner of the TSF. A shallow amount of water will be allowed to pond on the dry capping at the northwest corner of the TSF to attenuate flood flows and form a wetland. Water will flow from the PTS into the northern diversion channel and then into the Shepherds Creek Clean Water Diversion Channel below the Shepherds ELF.

Diversion channels will be reprofiled and rehabilitated, to allow surface water runoff from the catchment to drain towards the rehabilitated TSF surface.

Seepage from the TSF and Shepherds ELF will continue to collect in the underdrainage network and the seepage collection sump at the toe of the Shepherds ELF. The seepage will either be conveyed to the active water treatment plant or passively treated before being discharged into the Shepherds Clean Water Diversion Channel.

Overall, the proposed design of the TSF will provide a safe and robust tailings storage solution for both operation and post closure of the site.

9.8. Silt Ponds, Retention Ponds, and Water Diversions

Following rehabilitation of the ELFs and as vegetation becomes established, the risk of sediment laden water will be mitigated. At this time, the Shepherds Silt Pond and other silt ponds and retention ponds throughout the BOGP will be decommissioned. Seepage from the TSF and the ELFs will continue to be collected in the underdrains and at the toe of the various ELFs. This seepage will either be sent to a WTP or PTS before being discharged to the Shepherds Creek Clean Water Diversion Channel.

One proposed rehabilitation approach is for minor seepage to be collected within the (reduced) Shepherds Seepage Collection Sump, with the surrounding retention pond to be transformed into a PTS, thereby allowing various ways in which existing operational water management infrastructure can be used during the Closure and Post-closure Phases.

Clean water diversion channels will be naturalised at closure, with water allowed to exit bunds at multiple places to enhance plant growth. In particular:

- The northern diversion channel will be opened at natural creek lines to allow flows within the catchment to drain towards the rehabilitated surface of the TSF;
- The diversion channels around the Shepherds ELF will be naturalised over the mine life and become permanent creeks at closure, draining the TSF and delivering surface water from the upper Shepherds Valley catchment downstream; and
- The southern clean water diversion channel will be opened to allow water to flow into the TSF, with the channel reprofiled and rehabilitated.

9.9. Closure Monitoring

Closure monitoring will be developed and fine-tuned throughout the operational phase of the BOGP, taking into consideration adaptive management processes triggered during this time and how these apply to closure of the BOGP. Planning for closure has however been considered, as summarised in the following sections.

9.9.1. Compliance Monitoring

In line with the Operational Phase (see Section 7.1), compliance monitoring will continue throughout the Closure and Post-closure period. Data will be reviewed against closure outcomes and associated completion criteria.

It is anticipated that the frequency of closure related compliance monitoring will reduce with a risk-based approach taken, in line with observations made during operations.

9.9.2. Pit Lake Monitoring

Pit lake monitoring will be undertaken during the Closure and Post-closure Phases. It will include aspects such as:

- Routine water quality sampling of the pit lake. Sampling will be undertaken at a frequency whereby stratification can be understood throughout the seasons.
- Water sampling of any spill / discharges into nearby creeks.
- Water level monitoring to measure the rate at which the pits are filling, and to determine seasonal flux once full.
- Groundwater monitoring (water level and quality) in nearby bores to measure groundwater rebound, as well as groundwater quality in the immediate vicinity.

9.9.3. Active and Passive Water Treatment Monitoring

The active water treatment process relies on effective, instantaneous monitoring to ensure treatment limits are achieved. The following performance monitoring is proposed for both the active WTP and the PTS:

- Influent and effluent flow rates.
- Influent and effluent water quality.
- Treatment efficiencies.
- Monitoring of sludge generation rates.
- Monitoring of secondary contaminants (odour, gas, secondary PCOC).

A surge pond will be located at the front of the active WTP, which allows for water capture and recirculation in the case of out-of-spec treated water. Throughout operations as work on the design of the active WTP progresses, investigations will be undertaken to determine whether a suitable arsenic: electrical conductivity relationship can be determined, thereby enabling instantaneous responses to out-of-spec water quality observations.

10. RISK MANAGEMENT – WATER

The objective of the risk management framework is to identify, assess, manage, and monitor risks associated with all aspects of water management during operations and closure of the BOGP.

A source-pathway-receptor assessment is primarily used to assess source hazards, pathways, and potential risks on receptors associated with MIW, however the approach was also used to identify risks related to all aspects of water management at BOGP. This process ensures all potential effects caused by poor water management effects are identified and mitigated, safeguarding the receiving environment and demonstrating compliance with regulatory requirements (see Water Quality Objectives, Section 7.1).

10.1. Risk Management Requirements

The Consent Holder shall establish a risk management process that includes:

- Identification of risks (and opportunities).
- Assessment of likelihood and consequence (or outcome).
- Risk classification (e.g., High, Medium, Low) using the MGL risk assessment guidance.
- Documentation of existing controls and mitigation strategies.
- Implementation of additional controls where risk levels are deemed unacceptable.

10.2. Risk Register

The Technical Services Manager and Mining Manager shall maintain a live risk register for the BOGP. This register shall:

- Be updated with ongoing development of the BOGP.
- Be reviewed and updated annually or when there is significant change to mine plans and/or any effects.
- Include a summary of each risk, associated controls, and residual risk rating.

10.3. Critical Controls

Each high-priority risk shall have defined critical controls. The Technical Services Manager and Mining Manager shall:

- Establish performance standards and monitoring methods for critical controls.

- Implement a verification process to confirm that controls are effective.
- Develop adaptive management processes where exceedance of critical control performance triggers specific actions.

10.4. Integration with Site-Wide Risk Systems

The water management risk management process shall be integrated into the broader site and corporate risk management frameworks. This ensures that:

- Water management risks are visible to senior management and the Board.
- Duplication of controls is minimised.
- Lessons learned from other facilities are incorporated into local risk management.

10.5. Water Management Risk Assessment

Higher-priority water management related risks, associated with the control and treatment of water, have been identified for the BOGP. Other risks associated with prediction, prevention, and minimisation of MIW are discussed in the ELF Management Plan (MGL, 2025c). Key Control and Treat risks (as articulated through the six management steps, see Section 4.5.1) identified to have the potential to influence the closure objectives for the BOGP are:

- **MIW01:** Uncontrolled discharge of MIW surface waters during the operational phase leading to non-compliance.
- **MIW02:** Uncontrolled discharge of MIW seepage waters during the operational and closure phases leading to non-compliance.
- **MIW03:** ELF and TSF seepage rates (flow) higher than expected.
- **MIW04:** ELF and TSF seepage quality poorer than expected.
- **MIW05:** Shepherds Seepage Collection Sump (4,500m^3) spills.
- **MIW06:** Active water treatment plant cannot achieve water quality limits.
- **MIW07:** Passive water treatment system cannot achieve water quality limits.
- **MIW08:** Potable water supply becomes contaminated and does not meet drinking water guidelines.
- **MIW09:** Retention Ponds and Silt Ponds do not reduce sediment load.

These risks are further described in Table 9 below. The MIW Overview Report (MWM, 2025c) also provides a comprehensive summary on MIW at BOGP, including investigations undertaken to understand the potential effects on water quality and quantity.

Table 9: Key water management control and treatment risks

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
MIW01	Uncontrolled discharge of MIW surface waters during the Operational Phase leading to non-compliance.	Elevated PCOC in surface runoff.	• Immediate non-compliance for surface water quality compliance limits. • Potential long-term impacts to the Bendigo Aquifer (groundwater).	High	• Development of a detailed water balance modelling by mine stage. • Detailed groundwater modelling as part of detailed design for the TSF/ELFs. • Development of adaptive management processes to manage potential effects (see Section 10.6). • Use bore water rather than pit water for dust suppression beyond the pit shell. Pit water may be suitable for use within the pit shell, see Section 6.5 for control specifics. • Increase water storage capacity. • Install evaporation systems to reduce water budget. • Install the active water treatment plant to treat MIW during the Operational Phase to reduce water budget. • Performance monitoring.	Low
MIW02	Uncontrolled discharge of MIW seepage waters during the operational and closure phases leading to non-compliance.	Loss of MIW seepage water from the water management system	• Non-compliance for water quality (surface and groundwaters). • Potential impacts to the receiving streams (at SC01 and RS03) and the Bendigo Aquifer.	Moderate	• Development of a detailed water balance modelling by mine stage to understand Net Percolation rates. • Detailed groundwater modelling as part of detailed design for the TSF/ELFs to understand effects on seepage rates. • Robust construction QA/QC required to ensure ELF Design Criteria are achieved (MGL, 2025a). • Construction QA/QC for seepage control systems (underdrains, toe bunds, sumps, etc)	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					• Record keeping of 'as built' designs (Building (Dam Safety) Regulations 2022) • Install the active water treatment plant to treat MIW seepage during the Operational Phase of the project. • Develop passive treatment systems for sub-surface seepage (e.g., permeable reactive barrier technologies) • Performance monitoring. • Development of adaptive management processes (see Section 10.6).	
MIW03	ELF and TSF seepage rates (flow) higher than expected.	• ELF construction approach unsuitable. • ELF cover system not performing to design criteria.	• Non-compliance for water quality. • Potential impacts to the receiving streams (at SC01 and RS03) and the Bendigo Aquifer.	High	• All materials placed within the ELF undertaken in alignment with BOGP ELF Design Criteria (MGL, 2025c). • Robust construction QA/QC required to ensure ELF Design criteria are achieved (MGL, 2025c). • Cover system trials completed in the first few years of the BOGP operational phase (e.g., lysimeters) to confirm net percolation into the ELFs and TSF. • Development of a detailed water balance modelling by mine stage. • Active treatment phase (WTP) to be run for longer (contingency). • Performance monitoring. • Development of adaptive management processes (see Section 10.6).	Low
MIW04	ELF and TSF seepage quality poorer than expected.	• ELF construction approach unsuitable.	• Non-compliance for water quality. • Potential impacts to the receiving streams (at SC01 and RS03)	High	• Validate water quality source terms and update • All materials placed within the ELF undertaken in alignment with BOGP ELF Design Criteria (MGL, 2025c).	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
		• ELF cover system not performing to design criteria.	and the Bendigo Aquifer.		• Robust construction QA/QC required to ensure ELF Design Criteria are achieved (MGL, 2025c). • Cover system trials completed in the first few years of the BGOP operational phase (e.g., lysimeters) to confirm net percolation into the ELFs and TSF. • Active treatment phase (WTP) to be run for longer (contingency). • Performance monitoring. • Development of adaptive management processes (see Section 10.6).	
MIW05	Shepherds Seepage Collection Sump (4,500m^3) spills	Gravity feed pipeline to Processing Plant fails or Processing Plant is not operating and cannot receive water	• TSF and Shepherds ELF seepage water will build up in the sump and this could spill to the Shepherds Silt Pond (30,000 m^3) and then discharge to Shepherds Creek	High	• Flow monitoring at the Processing Plant – influent to identify if water transfer is not working. • Shepherds Seepage Collection Sump has 48 hours capacity based on estimated flows of 25 L/s. • Ability to turn seepage valves off from the TSF and ELF to stop flow to the sump. • Water can be pumped to the TSF if required. • Development of adaptive management processes (see Section 10.6).	Low
MIW06	Active WTP cannot achieve water quality limits	Higher flow rates and/or poorer water quality.	• Non-compliance for water quality. • Potential impacts to the receiving streams (at SC01 and RS03) and the Bendigo Aquifer.	Moderate	• Development of a detailed water balance and load model that is updated as better data becomes available. • Complete prefeasibility study and WTP design during the first few years of operation, optimising design and ensure selected technology is proven and reliable. • Complete feasibility study within ~5 years of BOGP starting. This allows the plant to be constructed early if required (e.g., risks associated with MIW01 and MIW02).	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					• Provide adequate contingency in the WTP based on estimated flows derived from trials (e.g., net percolation trials) and measured flow rates. Consider modular design to increase capacity quickly. • Sludge disposal to be an offsite facility. • Performance monitoring. • Development of adaptive management processes (see Section 10.6).	
MIW07	Passive water treatment system cannot achieve water quality limits	• Higher flow rates and/or poorer water quality. • Limited ability to increase passive treatment system capacity quickly once built.	• Non-compliance for water quality. • Potential impacts to the receiving streams (at SC01 and RS03) and the Bendigo Aquifer.	High	• Development of a detailed water balance and load model that is updated as better data becomes available. • Complete prefeasibility study and PTS design within 5 years of the BOGP starting (i.e., when suitable water is available for site-based trials), optimising design options available for various closure scenarios. • Run the active WTP for longer. • Ensure sufficient surface area is available for the PTS. • Desludging and sludge disposal to an offsite facility. • Performance monitoring • Development of adaptive management processes (see Section 10.6).	Low
MIW08	Potable water supply becomes contaminated and does not meet drinking water guidelines	MIW enters potable water supply system	• Contamination of drinking water supply	High	• Use of colour-coded pipes throughout the BOGP. • Chlorine dosing systems in place prior to potable water supply provision. • Non-return valves installed at all potable water outlets.	Low

Risk no.	Risk Description	Cause	Consequence	Risk Rating	Control (mitigation measures)	Residual Risk Rating
					• Potable water lines will not be connected to other water class infrastructure. • Performance monitoring. • Water supply immediately ceased and alternative drinking water supply (e.g. disposable water bottles) made available until primary source meets drinking water quality guidelines again.	
MIW09	Retention Ponds and Silt Ponds do not reduce sediment load	• Retention Pond and Silt Pond construction approach unsuitable. • Higher rainfall than predicted.	• Immediate non-compliance for surface water quality compliance limits. • Potential impacts to the receiving streams (at SC01 and RS03) and the Bendigo Aquifer.	Moderate	• Retention ponds and silt ponds built as per Design Criteria (MGL, 2025a). • Pond overflows directed to pits etc rather than discharging offsite. • Performance monitoring. • Development of adaptive management processes (see Section 10.6).	Low

10.6. High Level Adaptive Management Processes

Adaptive management processes will be developed and refined throughout the operational phase; a tool which links potential environmental issues / triggers to predefined actions to rectify the trigger or help to bring the trigger back on track, ensuring a consistent and effective response.

A review of developed adaptive management processes will regularly occur, particularly following an adaptive management response being initiated, thereby ensuring the adaptive management tool remains relevant and suitable for the scenario encountered.

Adaptive management processes, which will be developed throughout the course of the BOGP operations, may include a response to the following:

- Uncontrolled discharge of MIW surface and seepage waters.
- ELF and TSF seepage rates higher than expected.
- ELF and TSF seepage quality poorer than expected.
- Turbidity levels of retention and silt ponds not reducing.
- Collection sumps, retention pond or silt pond spills.
- Active water treatment plant cannot achieve water quality limits.
- Passive water treatment system cannot achieve water quality limits.
- Pit sump water used for dust suppression.
- Creek flow augmentation rate either too high or too low.

11. REPORTING

11.1. Annual Reports

The following **annual** reporting that relates to water management is to be undertaken, with dates for submission detailed within the Consent:

- Annual Operational Plan report.
- Annual Monitoring Report.

11.2. Report Content

The annual monitoring reports will be prepared by a suitably qualified and experienced person and submitted to ORC for review. The report will include:

1. A summary of the monitoring undertaken over the preceding 12 months. The summary will:
    a. Reference the specific consent conditions under which the monitoring has been undertaken to show how the conditions have been complied with.
    b. Provide tables, graphs and summary data of water quality, flow and water level monitoring.
2. Discussion and evaluation of the monitoring data in relation to the relevant consent conditions including a summary of compliance with conditions.
3. Discussion of QA/QC results (see Section 8).
4. A summary of the actions that have been undertaken in response to any action thresholds.

Reporting against performance monitoring will also include similar content to the compliance monitoring requirements above, including a detailed review of changes made to the annual program.

12. CHANGE MANAGEMENT

12.1. Change Management Process and Approvals

A formal change management process is required to evaluate and document any modifications to the water management design, operation, or monitoring systems at the BOGP.

Changes shall be assessed against the resource consents granted. Changes may require amendment to the resource consent.

Changes within this WMP shall be recorded in Table 10.

Table 10: WMP Change Management Record

Item	Section	Summary of change	Reason for change	Complexity of change	Date
1.				☐ Minor ☐ Moderate ☐ Major	
2.				☐ Minor ☐ Moderate ☐ Major	
3.				☐ Minor ☐ Moderate ☐ Major	
4.				☐ Minor ☐ Moderate ☐ Major	

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APPENDIX A: Compliance Limit Adjustments as per Ryder (2025)

Table A1. Conversion ratios for pH adjustment of ammonia concentrations.

Sample pH	Ratio
6.0	2.86
6.1	2.84
6.2	2.82
6.3	2.80
6.4	2.77
6.5	2.73
6.6	2.70
6.7	2.64
6.8	2.59
6.9	2.51
7.0	2.42
7.1	2.32
7.2	2.21
7.3	2.09
7.4	1.94
7.5	1.79

Sample pH	Ratio
7.6	1.63
7.7	1.47
7.8	1.31
7.9	1.14
8.0	1.00
8.1	0.87
8.2	0.73
8.3	0.62
8.4	0.53
8.5	0.44
8.6	0.38
8.7	0.32
8.8	0.27
8.9	0.23
9.0	0.20

Table A2. Calculated percentages of un-ionised hydrogen cyanide in aqueous cyanide solutions [HCN + CN^-]. (source: ANZG 2018)

Temp	**pH**																									
(°C)	**6.5**	**6.6**	**6.7**	**6.8**	**6.9**	**7.0**	**7.1**	**7.2**	**7.3**	**7.4**	**7.5**	**7.6**	**7.7**	**7.8**	**7.9**	**8.0**	**8.1**	**8.2**	**8.3**	**8.4**	**8.5**	**8.6**	**8.7**	**8.8**	**8.9**	**9.0**
10.0	99.9	99.9	99.9	99.8	99.8	99.7	99.6	99.5	99.41	99.3	99.1	98.8	98.5	98.2	97.7	97.1	96.4	95.5	94.4	93.1	91.4	89.4	87.0	84.2	80.9	77.1
12.5	99.9	99.9	99.8	99.8	99.7	99.7	99.6	99.5	99.3	99.2	99.0	98.7	98.4	97.9	97.4	97.8	96.0	95.0	93.8	92.3	90.4	88.3	85.7	82.6	79.0	75.0
15.0	99.9	99.9	99.8	99.8	99.7	99.6	99.5	99.4	99.3	99.1	98.8	98.5	98.2	97.7	97.1	96.4	96.5	94.4	93.0	91.4	89.4	87.0	84.2	80.9	77.0	72.7
17.5	99.9	99.8	99.8	99.7	99.7	99.6	99.5	99.3	99.2	99.0	98.7	98.4	97.9	97.4	96.8	96.0	95.0	93.7	92.3	90.4	88.3	85.7	82.6	79.0	75.0	70.4
20.0	99.9	99.8	99.8	99.7	99.6	99.5	99.4	99.3	99.1	98.8	98.5	98.2	97.7	97.1	96.4	95.5	94.4	93.1	91.4	89.4	87.0	84.2	80.9	77.1	72.8	68.0
22.5	99.8	99.8	99.7	99.7	99.6	99.5	99.3	99.2	99.0	98.7	98.4	98.0	97.4	96.8	96.0	95.0	93.8	92.3	90.5	88.3	85.7	82.7	79.1	75.1	70.5	65.5
25.0	99.8	99.8	99.7	99.6	99.5	99.4	99.3	99.1	98.8	98.5	98.2	97.7	97.1	96.4	95.6	94.5	93.1	91.5	89.5	87.2	84.4	81.1	77.3	73.0	68.2	63.1
27.5	99.8	99.7	99.7	99.6	99.5	99.4	99.2	99.0	98.7	98.4	98.0	97.5	96.8	96.0	95.1	93.9	92.4	90.6	88.5	85.9	82.9	79.4	75.4	70.9	65.9	60.5
30.0	99.8	99.7	99.6	99.5	99.4	99.3	99.1	98.9	98.6	98.2	97.8	97.2	96.5	95.6	94.6	93.2	91.6	89.7	87.4	84.6	81.4	77.6	73.4	68.6	63.5	58.0

Table A3. Calculated percentages of un-ionised hydrogen sulphide in total aqueous sulphide solutions. (source: ANZG 2018)

Temp (°C)	**pH**																				
	6.5	**6.6**	**6.7**	**6.8**	**6.9**	**7.0**	**7.1**	**7.2**	**7.3**	**7.4**	**7.5**	**7.6**	**7.7**	**7.8**	**7.9**	**8.0**	**8.1**	**8.2**	**8.3**	**8.4**	**8.5**
10.0	82.4	78.8	74.7	70.1	65.0	59.6	54.0	48.2	42.5	37.0	31.8	27.1	22.8	19.0	15.7	12.9	10.5	8.52	6.89	5.55	4.46
12.5	81.0	77.2	72.9	68.2	63.0	57.5	51.8	46.0	40.4	35.0	29.9	25.3	21.2	17.6	14.5	11.9	9.69	7.85	6.34	5.10	4.10
15.0	79.7	75.7	71.2	66.3	60.9	55.3	49.6	43.9	38.3	33.0	28.1	23.7	19.8	16.4	13.5	11.0	8.96	7.25	5.84	4.70	3.77
17.5	78.3	74.1	69.5	64.4	58.9	53.3	47.5	41.8	36.4	31.2	26.5	22.3	18.5	15.3	12.5	10.2	8.30	6.71	5.40	4.34	3.48
20.0	76.9	72.5	67.7	62.5	57.0	51.3	45.5	39.9	34.5	29.5	25.0	20.9	17.3	14.3	11.7	9.51	7.71	6.22	5.01	4.02	3.22
22.5	75.5	71.0	66.0	60.7	55.1	49.3	43.6	38.0	32.8	27.9	23.5	19.6	16.3	13.4	10.9	8.87	7.13	5.78	4.65	3.73	2.98
25.0	74.1	69.4	64.3	58.9	53.2	47.4	41.8	36.3	31.2	26.4	22.2	18.5	15.3	12.5	10.2	8.28	6.69	5.39	4.33	3.47	2.78
27.5	72.7	67.8	62.6	57.1	51.4	45.7	40.0	34.6	29.6	25.1	21.0	17.4	14.4	11.8	9.56	7.75	6.26	5.03	4.04	3.24	2.59
30.0	71.3	66.3	61.0	55.4	49.7	43.9	38.4	33.1	28.2	23.8	19.9	16.5	13.5	11.1	8.98	7.27	5.86	4.71	3.78	3.03	2.42