Operational Phase Site Wide Water and Load Balance Model

Bendigo-Ophir Gold Project

17 August 2026

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MINE WASTE MANAGEMENT
GREENROAD GROUP

MATAKANUI
GOLD LIMITED

Operational Phase Site Wide Water and Load Balance Model

Bendigo-Ophir Gold Project

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EXECUTIVE SUMMARY

This report describes the development of an Operational Phase site-wide water and load balance model (WLBM) for the Bendigo-Ophir Gold Project (BOGP) for Matakanui Gold Limited (MGL) to support the assessment of environmental effects (AEE) for the project.

Objectives of this Study

The primary objectives of the modelling exercise were as follows:

- Represent site wide water balance and flow paths (e.g., unrecovered seepage).
- Represent water management demand and source logic expected operationally.
- Forecast stream water quality at the proposed resource consent compliance locations as compared to proposed water quality limits for the Operational Phase.
- Represent stream flow augmentation.

Key model predictions of interest were:

- Tailing storage facility pond water volume.
- Process plant water makeup source use.
- Water quality at proposed surface water compliance locations (SC01 and RS03).

Findings

The BOGP Operational Phase site wide WLBM results suggest the following:

- Water balance calculations suggest that the site will be in a water surplus condition as a result of MIW generation exceeding losses from the system through entrainment of water in tailings and evaporation. An engineering control of incorporating evaporation cannons has been introduced into the model to managed excess water. With this control, TSF pond volume typically stays within the 300,000 to 400,000 m3 range, with volumes less 700,000 m3 simulated. These volumes are understood to be achievable within TSF design constraints.
- Additional engineering controls are available to further manage these potential water surpluses. Ongoing site water balance reconciliation of the site will be required to confirm water balance conditions remain in a water surplus condition.
- Being in a water surplus, the process plant will only require additional raw water to meet demand for the first 2 years of mine life on average.
- Surface water quality at RS03 will remain below the proposed compliance limits.
- In contrast, concentrations at SC01 are projected to exceed compliance limits, with nitrogen (N) exceeding thresholds in 2038 (Year 11) and antimony exceeding thresholds in 2037 (Year 10). Additional engineering controls may be required to adaptively manage these risks.

To mitigate these projected exceedances, it is recommended that a water treatment plant be designed and integrated into the operational schedule to allow for operational readiness should it be required. The treatment system should be specifically engineered to target the removal of nitrogen species and antimony to ensure downstream water quality remains in compliance with environmental limits. However, ongoing performance monitoring data should be analysed prior to verify whether treatment deployment is required, and to adjust the schedule (e.g. bringing forward or postponing implementation) based on ongoing water quality monitoring datasets. The reader is directed to Section 6.4 in the main body of the report for further recommendations.

The Assessment of Environmental Effects indicate:

- The predicted water quality suggests a low risk of adverse ecological effects. Exceedances are generally limited to maximum concentrations and are not reflected in median conditions, indicating that aquatic communities would not be exposed to prolonged concentrations above ecological guideline values. Consequently, based on the predicted surface water quality for the operational period of the mine, the ecological integrity of receiving environments is expected to be maintained within the project area, at the compliance points, and in the downstream surface water receiving bodies including Bendigo Creek, and the Lindis River (and by extension the Clutha River).
- The water quality discharged to the environment during the Operational Phase is predicted to have a negligible impact on the beneficial use of surface water and groundwater resources downstream of the BOGP.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

This report describes the development of an operational phase site-wide water and load balance model (WLBM) for the Bendigo-Ophir Gold Project (BOGP) for Matakanui Gold Limited (MGL) to support the assessment of environmental effects (AEE) for the project.

Previous WLB[1] modelling completed for the BOGP (MWM, 2025a) assessed (i) the Operational Phase with screening level calculations and (ii) GoldSim based modelling for the Closure/Post-closure Phase. The modelling reported herein updates this previous assessment of the Operational Phase with a GoldSim based WLBM. The previous Closure/Post-closure Phase remains unchanged.

1.1 Modelling Objectives

The primary objectives of the modelling exercise were as follows:

- Represent site wide water balance and flow paths (e.g., unrecovered seepage).
- Represent water management demand and source logic expected operationally.
- Forecast stream water quality at the proposed resource consent compliance locations as compared to proposed water quality limits for the Operational Phase.
- Represent stream flow augmentation.

Key model predictions of interest were:

- Tailing storage facility pond water volume.
- Process plant water makeup source use.
- Water quality at proposed surface water compliance locations (SC01 and RS03).

[1] *Water and Load Balance*

2 PROJECT DESCRIPTION

MGL is proposing to establish the BOGP, which comprises gold mining operations, processing operations, ancillary facilities and environmental mitigation measures on Bendigo and Ardgour Stations in the Dunstan Mountains of Central Otago. The project site is located approximately 20 km north of Cromwell and will have a maximum disturbance footprint of 610 hectares.

2.1 Project Background

The total Mineral Resource Estimate for the BOGP using a 0.5 g/t cut-off for open pit and 1.5 g/t for underground is 34.3 Mt at 2.1 g/t for 2.34 M oz (MGL, 2025). The Bendigo-Ophir resources occur in four deposits: Come in Time (CIT), Rise and Shine (RAS), Srex (SRX), Srex East (SRE). The majority of identified mineral resources are located within the RAS deposit. Three primary geological units are recognised at site:

- RSSZ – Rise and Shine Shear Zone.
- TZ3 – Lower Greenschist facies Textural Zone 3 rocks of the Otago Schist.
- TZ4 – Upper Greenschist facies Textural Zone 4 rocks of the Otago Schist.

The resources will be mined by open pit methods at each deposit within the project site, with underground mining methods also proposed to be utilised at RAS to access the deeper gold deposits. The majority of the mining activities, ancillary facilities and associated infrastructure will be located in the Shepherds 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.

The following mine facilities are proposed (Figure 1):

- 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, SRX ELF, and Western ELF (WELF).
- Two in-pit landforms (backfill) – CIT and SRE[2].
- Plant and processing area, where CIL[3] extraction technologies will be used as part of the ore recovery process. This includes the Shepherds Creek Fill (SCK Fill).
- A Tailing Storge 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 catchment of Shepherds and Rise and Shine creeks.

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[2] *Note: SRE Pit is backfilled by the SRX ELF. The SRE Pit have not been modelled*

[3] *Carbon-in-Leach*

2.2 Mine Plan

The mine plan for the BOGP is outlined in Table 1. The schedule describes the timing of construction of different mine-site infrastructure and water-management components (illustrated in Figure 1), and subsequent mining operations. The schedule is also used to inform development of operational phase water-management plan.

Table 1: BOGP Mine plan schedule.

MONTH	YEAR	MINING PHASE	DESCRIPTION OF PHASE
		Pre-startup	Detailed design phase
0 to 6	0 to 0.5	**Startup**	Pioneering / RAS Pre-Strip, Initial Jean Creek Silt Pond, earthworks at process plant.
6 to 24	0.5 to 2	**Project Development**	Construction of process plant, TSF, Shepherds Silt Pond, North Diversion Channel, Commissioning, mining RAS pre-strip (Pre-strip ends month 19). Construction of the WELF begins.
		Operations	
25 to 54	2 to 4.5	RAS pit mining on its own	Operations (pit ore production in month 20. UG Development begins month 54). WELF construction complete.
54 to 72	4.5 to 5	RAS pit with UG development	Operations (UG Ore production begins month 70)
72 to 132	6 to 11	RAS pit plus RAS UG	Operations (UG Ore production months 70 to 150)
		RAS Pit plus RAS UG plus CIT Pit	Operations (CIT Pit mined months 102 to 114)
		RAS Pit plus RAS UG, plus CIT backfilled, plus SRX	Operations (SRX Pit mined months 145 onwards)
120 - 160	10 to 13.3	RAS UG continues on its own with CIT and SRX open pit feeds	Operations (all mining halted month 160)
		Closure	
160 - 372	11 to 31	**Active Closure** [1]	All mining halted. Active closure of pits, TSF, and wider site, plus setup of active water treatment plant (option).
372 -	31 onwards	**Post-Closure**	Passive treatment and maintenance

UG = Underground

1. Presented as two decades as part of the Pre-feasibility Mine Plan.

Source: BOGP_high_level_schedule_PFSconsent.xlsx provided by MGL.

For modelling purposes and based on information provided by MGL, the Operations Phase was represented in the model as shown in Table 2. (Note that SRE was not included in the model due to the limited size and extent relative to other mine domains and because it is backfilled by SRX ELF).

Key BOGP domains are illustrated in Figure 1 and their footprint area are summarised in Appendix A. Table 3 provides the productions rates used in the model with an arbitrary start date of 2027 representing Year 1.

Table 2: Operational Phase representation in the WLBM.

YEAR	MAJOR MILESTONES	DESCRIPTION OF PHASE
	Operations	
1 to 14	RAS pit mining on its own	Operations. Shepherds ELF construction from Year 1 to 14 while progressively rehabilitated. WELF construction from Year 1, complete in Year 2, and rehabilitated in Year 3.
7 to 14	RAS pit with underground development and operations	Operations
12 to 13	CIT Pit mining	Operations. CIT backfilled in Year 14.
13 to 14	SRX Pit mining	Operations. SRX ELF construction from Year 13 to 14.

Table 3: Modelled production rates.

YEAR	PRODUCTION (tonne)
2027	1,130,000
2028	1,200,000
2029	1,200,000
2030	1,200,000
2031	1,200,000
2032	1,200,000
2033	1,228,000
2034	1,176,000
2035	1,196,000
2036	1,201,000
2037	1,201,000
2038	1,198,000
2039	1,200,000
2040	849,000

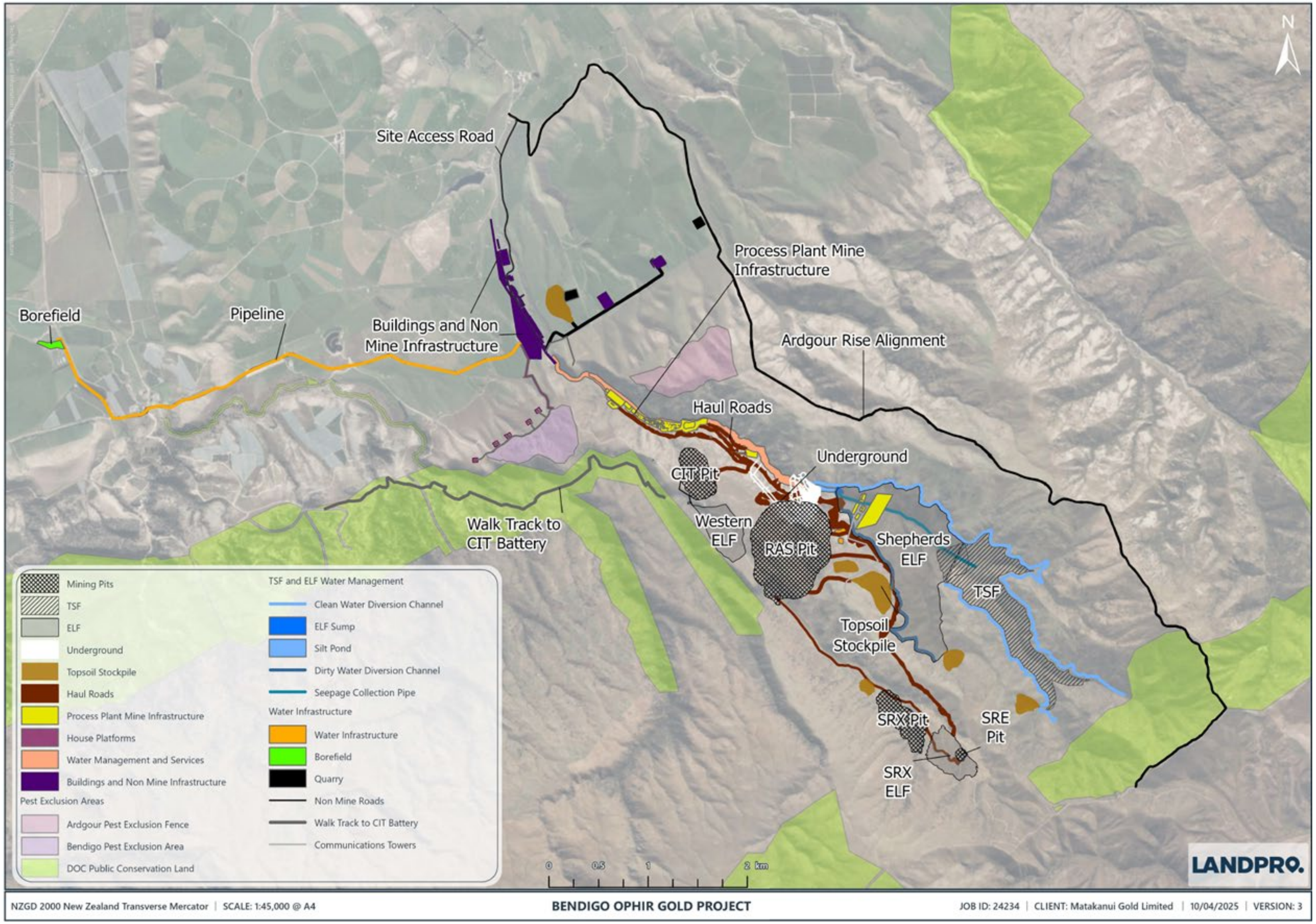

Figure 1: BOGP mine domains.

2.3 Mine Water Management

To help understand the origin and quantity of rainfall and runoff being derived from different infrastructure areas and domains, the site is divided into surface water monitoring locations and their upstream catchment areas (Figure 2). Surface water quantity and quality are referenced with respect to the proposed downstream resource consent compliance monitoring locations at SC01 and RS03. These catchments are shown in Figure 2.

The water management strategy for the BOGP is also divided into operational and closure/post-closure phases. This report focuses on the Operational Phase where most mine impacted water (MIW) will be retained on site for use (e.g., for process water, dust suppression, etc.), with the only discharge from disturbed areas being surface runoff from haul roads, the infrastructure area, and ELFs via sediment control structures and unrecovered seepage from mine waste storage facilities (MWSF) such as the TSF and Shepherds ELF.

The mine water management flow sheet the WLBM is based on is provided in Figure 3. The water management system is designed to direct all MIW to the Processing Plant either via the Seepage Pond (through to the Process Plant Feed Pond) or the Environmental Plant Sumps. If there is insufficient MIW reporting to the Seepage Pond and Environmental Plant Sumps, this is supplemented with water from the TSF Pond, where TSF Pond water is decanted to the Seepage Pond. Should the system not have enough internal MIW required to supply the Processing Plant, the water is supplemented using water from the Shepherds ELF Silt Pond; similarly, if there not be enough water in the Silt Pond, water is taken from the Raw Water Tank Farm, which receives water from the bore field. If MIW is found to exceed the capacity of the seepage pond, excess is directed to the TSF.

The water management approach for each key mine domain element (that has potential to produce MIW) are summarised in Table 4. These descriptions form the basis of the water quality and water balance calculations in subsequent sections of this report.

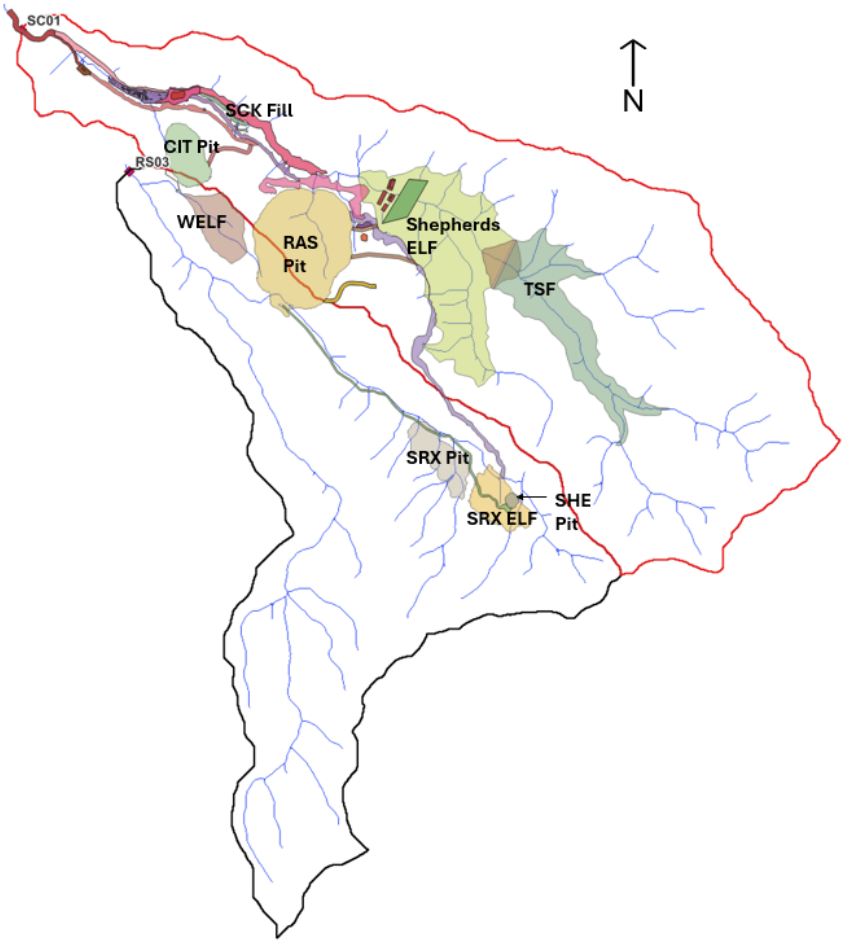

Figure 2: Location and areas of key mine domains within SC01 and RS03 catchments.

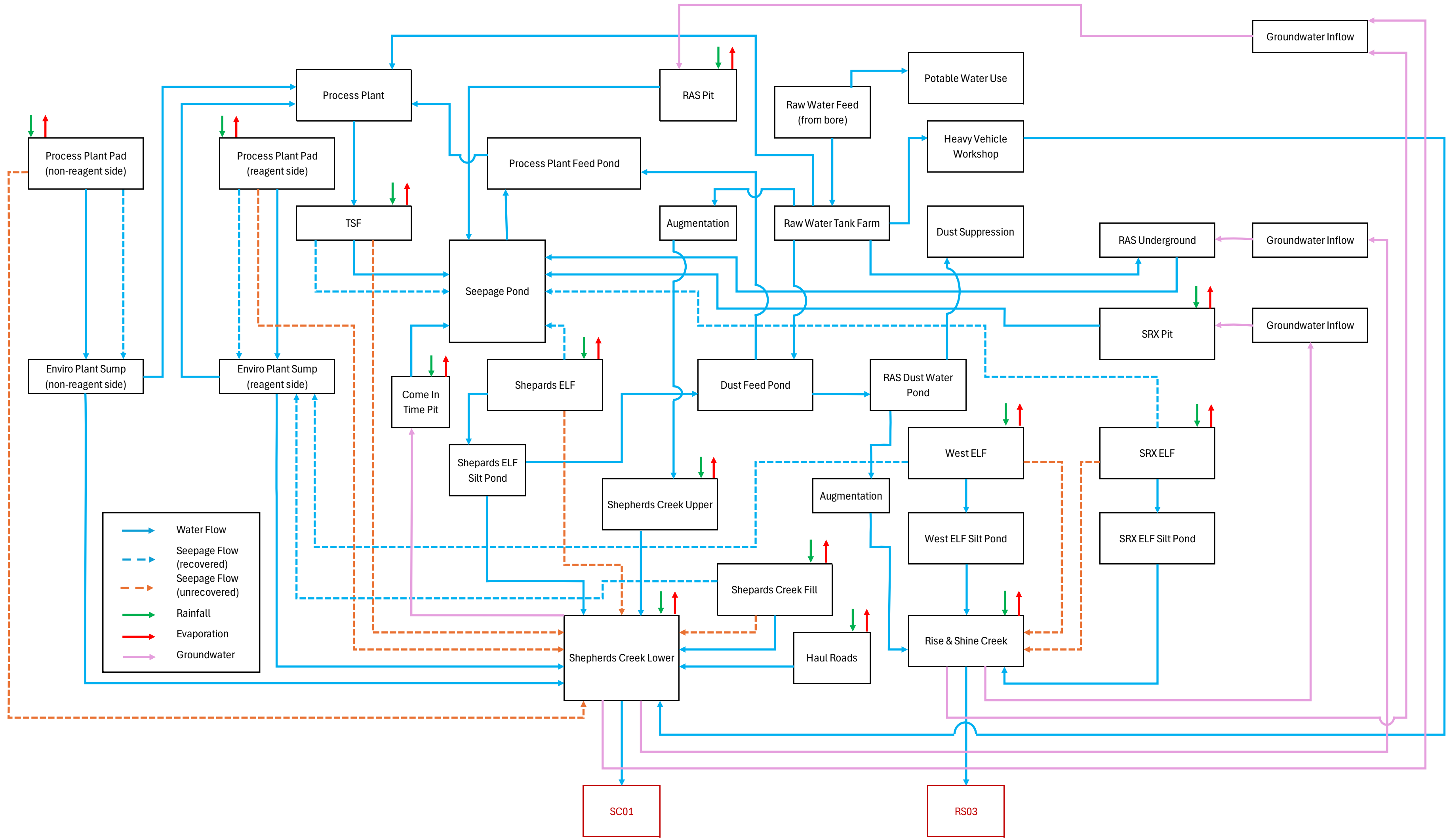

Figure 3: Operational Phase water management flowsheet at the BOGP site.

Table 4: MIW management approach for the Operational Phase.

MINE DOMAIN	DESCRIPTION	MANAGEMENT
TSF	Condition	Active tailings deposition.
	Surface Runoff	Runoff retained within facility. Diversion channels established to minimise run-on.
	Seepage	TSF seepage collected in the Seep Pond and used for process water. Small proportion is unrecovered and reports to SC01.
Shepherds ELF	Condition	Active mine rock placement.
	Surface Runoff	Runoff sheeted to sediment pond and then discharged to Shepherds Creek Diversion channels established to minimise run-on.
	Seepage	ELF seepage collected directed to the Seep Pond and used for process water. Seepage collection system in place. Small proportion is unrecovered and reports to SC01.
RAS Pit Void	Condition	Active dewatering of pit.
	Surface Runoff	Rise and Shine Creek diverted around pit extent. Collected in pit sumps and pumped to the Seep Pond for use as process water.
	Seepage	None.
Underground Workings	Condition	Workings actively dewatered. Paste backfilling of stopes.
	Surface Runoff	None.
	Underground water	Dewatering of underground workings directed to the Seep Pond to be used for processing.
CIT Pit Void	Condition	Pit void actively dewatered.
	Surface Runoff	Collected in pit sumps and pumped to the Seep Pond for use as process water.
	Seepage	None.
WELF	Condition	Active mine rock placement.
	Surface Runoff	Runoff sheeted to local sediment pond. Discharged to Rise and Shine Creek (RS03).
	Seepage	Collected and directed to the Process Plant Environmental Plant Sump (reagent side) for use as process water. Small proportion is unrecovered and reports to RS03.
Process Plant / Infrastructure Area	Condition	Area operational.
	Surface Runoff	Diversion in place to limit run-on. Runoff collected in environmental control sumps and used within mine water circuit.

MINE DOMAIN	DESCRIPTION	MANAGEMENT
	Seepage	Seepage collection system in place. Small proportion is unrecovered and reports to SC01.
Shepherds Creek Valley Fill	Condition	Lower gorge has to be filled, to create sufficient width for services (e.g., infrastructure). Shepherd channel designed to take a 1% AEP event
	Surface Runoff	Clean water diversions that bypass the TSF and ELF drop into new channel in Shepherds Creek valley until past the mine infrastructure.
	Seepage	Seepage collection system in place. Small proportion is unrecovered and reports to SC01.
SRX Pit Void	Condition	Pit void actively dewatered.
	Surface Runoff	Collected in pit sumps and pumped to the Seep Pond for use as process water. Diversions in place to minimise run-on.
	Seepage	None.
SRX ELF	Condition	Active mine rock placement.
	Surface Runoff	Runoff sheeted to local sediment pond. Discharged to Rise and Shine Creek Diversion channels established minimise run-on where practicable.
	Seepage	ELF seepage collected directed to the Seep Pond and used for process water. Seepage collection system in place. Small proportion is unrecovered and reports to RS03.
Haul Roads	Condition	Haul roads operational.
	Surface Runoff	Diversion in place to limit run-on. Runoff sheeted to local sediment ponds and discharged to receiving environment.
	Seepage	No significant seepage expected and is not modelled.

2.4 Proposed Compliance Limits

Proposed compliance limits are described in the Revised proposed Water Quality Limits and tabulated below for monitoring locations at Shepherds Creek SC01 and Rise and Shine Creek RS03 (Table 5). These limits were used to screen model results against in Section 6.

Table 5: Proposed surface water compliance limits.

WQ MONITORING PARAMETER	UNITS	TOTAL / DISSOLVED	SW COMPLIANCE MONITORING	
COMPLIANCE MONITORING LOCATIONS			**SC01**	**RS03**
REFERENCE AND PERFORMANCE MONITORING LOCATIONS			**CC01, SC02, SC03, JC01**	**RS01, RS02, RS04, RSB, RSA1, LBA**
pH	unitless	NA	6.5 - 9.0	6.5 - 9.0
Turbidity	NTU	NA	5	5
Total suspended solids (TSS)	mg/L	NA	50	50
Ammoniacal nitrogen (NH3-N)	mg/L	Total	0.24	0.24
Ammoniacal nitrogen (NH3-N)	mg/L	Total	0.4	0.4
Nitrate nitrogen (NO3-N)	mg/L	Total	1.1	1.1
Cyanide (CN)	mg/L	Total	0.007	0.007
Sulfate (SO4)	mg/L	Dissolved	250	500
Aluminium (Al)	mg/L	Dissolved	0.055	0.055
Antimony (Sb) - chronic	mg/L	Total	0.02	0.074
Antimony (Sb) - acute	mg/L	Total	0.02	0.25
Arsenic (As V)	mg/L	Dissolved	0.013	0.042
Boron	mg/L	Dissolved	0.94	0.94
Cadmium (Cd)	mg/L	Dissolved	0.0002	0.0002
Chromium (Cr)	mg/L	Dissolved	0.001	0.001
Cobalt (Co) - chronic	mg/L	Dissolved	0.0014	0.0014
Cobalt (Co) - acute	mg/L	Dissolved	0.11	0.11
Copper (Cu)	mg/L	Dissolved	0.0014	0.0014
Molybdenum (Mo)	mg/L	Dissolved	0.01	0.034
Selenium (Se)	mg/L	Total	0.005	0.005
Zinc (Zn)	mg/L	Dissolved	0.008	0.008

3 CLIMATIC SETTING

This section summarises the climatic data for the BOGP, which provides key inputs to the WLBM.

The site is situated within the Otago semi-alpine region. As a result, the climate is strongly seasonal, comprising of frosts and snow between Autumn and Spring, and dry and hot summer months (with temperatures frequently exceeding 30° C). Rainfall in the region varies spatially, typically decreasing with increasing distance from the Southern Alps (KSL, 2025a). At the BOGP, three meteorological stations have been installed since 2022:

- Lake Clearview (340 m above sea level, asl).
- Come in Time (475 m asl).
- Srex, formerly Shreks Met (753 m asl).

The location of these stations and regional stations is shown in Figure 3.

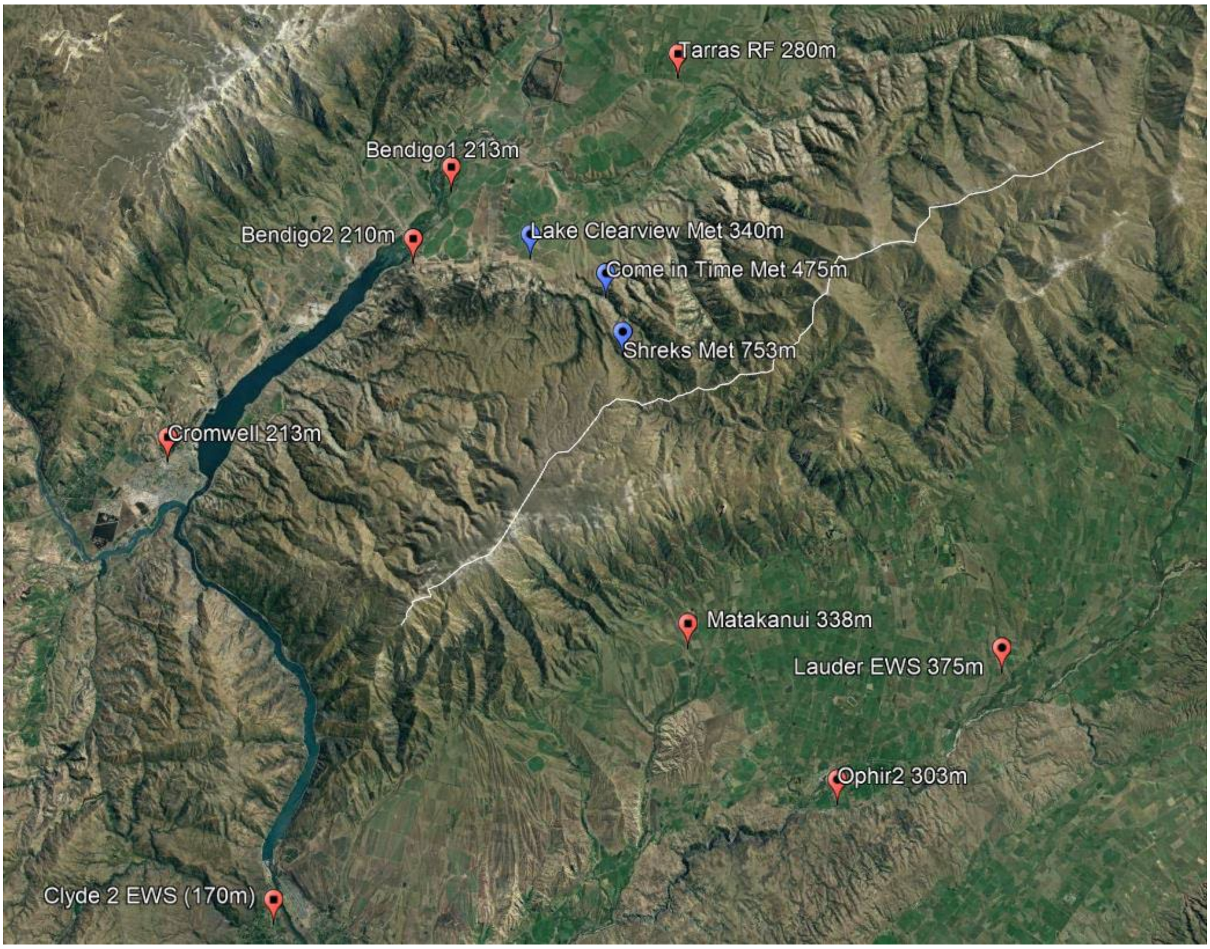

Figure 4 Location of meteorological stations.

Source: Chater (2024a).

Notes: BOGP stations shown in blue, regional stations shown in red. Shreks is now referred to at SRX.

Synthetic climate datasets were developed by Chater (2024a, 2024b) and MWM (2025b). Those same data are adopted as inputs for the Operational Phase WLBM.

Annual totals of the synthetic rainfall and PET datasets are shown in Figure 5 and Figure 6, respectively. On average, annual, PET (~930 mm/year) is close to twice that of rainfall (~500 mm/year). The wettest year was 1995, where ~760 mm of rain fell. The average annual synthetic PET compares well with evaporation pan data from NIWA climate stations Bendigo 2, Clyde Dam, and Cromwell 2, multiplied by a typically used conversion factor of 0.7 (average of ~1010 mm/year).

Figure 7 summarises the average monthly climate setting for the synthetic dataset, showing a strong water deficit in the summer months and a slight water surplus in the winter months.

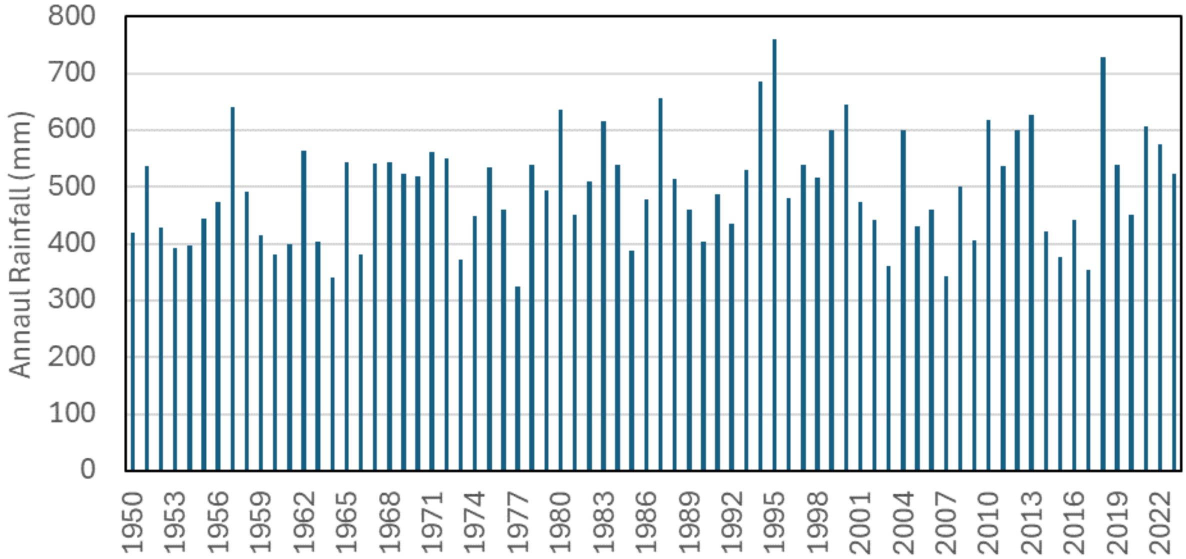

Figure 5: Annual rainfall totals of synthetic rainfall dataset.
Source: MWM (2025a).

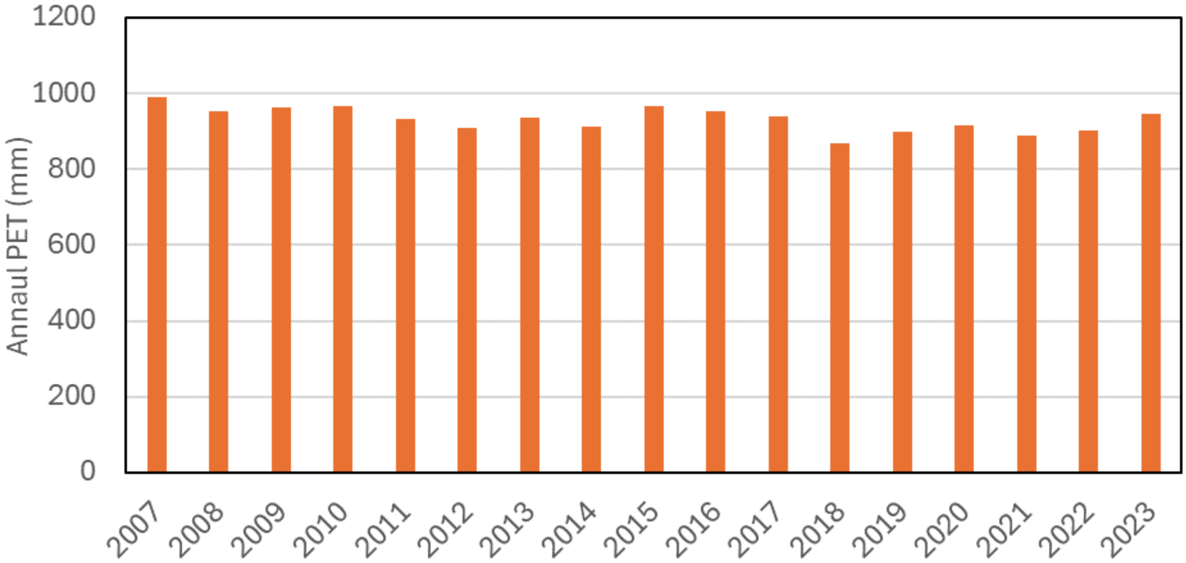

Figure 6: Annual PET totals of synthetic rainfall dataset.
Source: MWM (2025a).

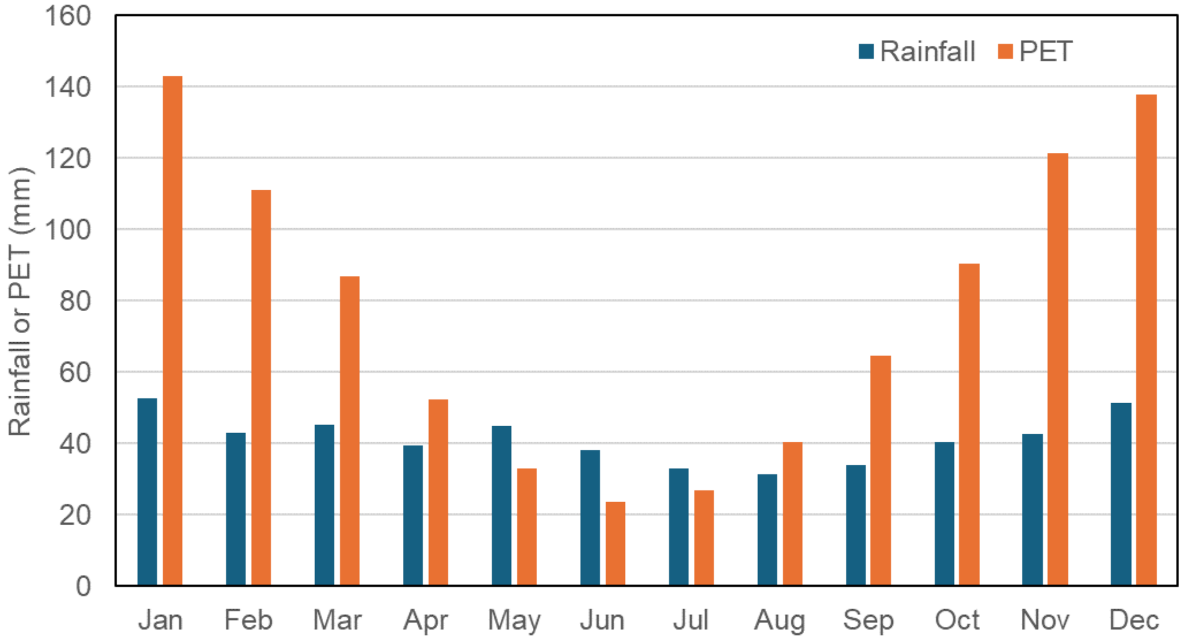

Figure 7: Average monthly synthetic climate data summary.

Source: MWM (2025a).

4 MODEL INPUTS

The objective of the WLBM is to mechanistically model the water management system at the BOGP. Inputs to the model are based on reported or derived values; some inputs were derived empirically. Hydrological, geochemical, and operational processes that influence water quantity and quality on site are represented in the model and calibrated to existing monitoring data. The model is built to simulate future water management scenarios and predict factors and behaviours that will inform decision making for the Operational Phase.

The BOGP WLBM was developed using GoldSim dynamic system modelling software used for simulation of mine water and load balances (Version 15). The water balance uses a daily precipitation timeseries generated with a stochastic climate generator based on statistics from long-term climate data series (as described in Section 3).

The model was divided into two surface water catchments: Shepherds Creek and Rise and Shine Creek. Daily precipitation rates were applied to each catchment area to estimate overland runoff flow volume. A runoff coefficient based on montane landcover and topography was then applied to this volume to account for a proportional loss of water to evapotranspiration and infiltration to groundwater.

The load balance is based on a mass balance approach. It calculates loading rates by assigning source term concentrations to the flows determined in the water balance and generates water quality projections for both onsite and downstream locations. Source terms are applied as constant concentration (where concentration is assumed to remain the same over time), or constant load (where concentration is estimated based on dividing a constant load), and the flow rate for that day. The latter means that at low flow rates the concentration is higher, and at higher flows, there is more dilution, hence, less concentrated waters.

The model is run on a daily time step. Results can be provided as monthly mean or median values to align with proposed water quality consent conditions. The selection of model output as monthly projections is therefore considered adequate to inform water management decisions. 200 realisations of stochastic climate time series were used with an arbitrary start date of 2027 representing Year 1.

4.1 Water Balance Model

4.1.1 Climate Inputs

The Operational Phase WLBM adopted the same climatic input timeseries as those reported in MWM (2025a). Table 6 compares statistical summaries of the synthetic data series with the forward climate realisation developed by MWM (2025a), showing a close agreement between annual totals for rainfall and PET.

Table 6: Synthetic vs projected climate summaries.

STATICITICAL DESCRIPTIOR	YEARLY RAINFALL (mm)		YEARLY PET (mm)	
	SYNTHETIC DATA SERIES	FORWARD PROJECTION	SYNTHETIC DATA SERIES	FORWARD PROJECTION
Mean	498	505	932	935
Median	493	508	938	933
Standard Deviation	96	108	33	29

Source: MWM (2025a).

Climate data was retrieved for the project for the SSP2-4.5 scenario, for the 1995-2014 base period and for projections for 2080-2099 (https://map.climatedata.environment.govt.nz/ (accessed 20/01/2025). Annual climate change factors were applied to the projected climate data to account for changes in future climate as follows:

- Rainfall factor 1.07 (+7% annual rainfall).
- PET factor 1.045 (+4.5% annual PET based on an annual daily average air temperature increase of 1.8 °C applied to the Penman [1946] method).

The factors were applied to increase linearly from 1 at the start of the model to fully reach the above defined factors after 65 years of simulation time, approximately representing 2080-2099. Beyond this period the factors remained the same as per MWM (2025a).

4.1.2 Catchment Delineation

Complete catchment breakdowns were provided by MGL on an annual basis (see Appendix A); this included mine area footprints (such as pits, ELFs, and the TSF), infrastructure areas, and undisturbed areas. Areas of topsoil deposits were included within the undisturbed footprints. Surface areas were calculated based on areal footprints. Figure 8 illustrates the breakdown of catchment areas for year 1 of mining, which has been incorporated into the model.

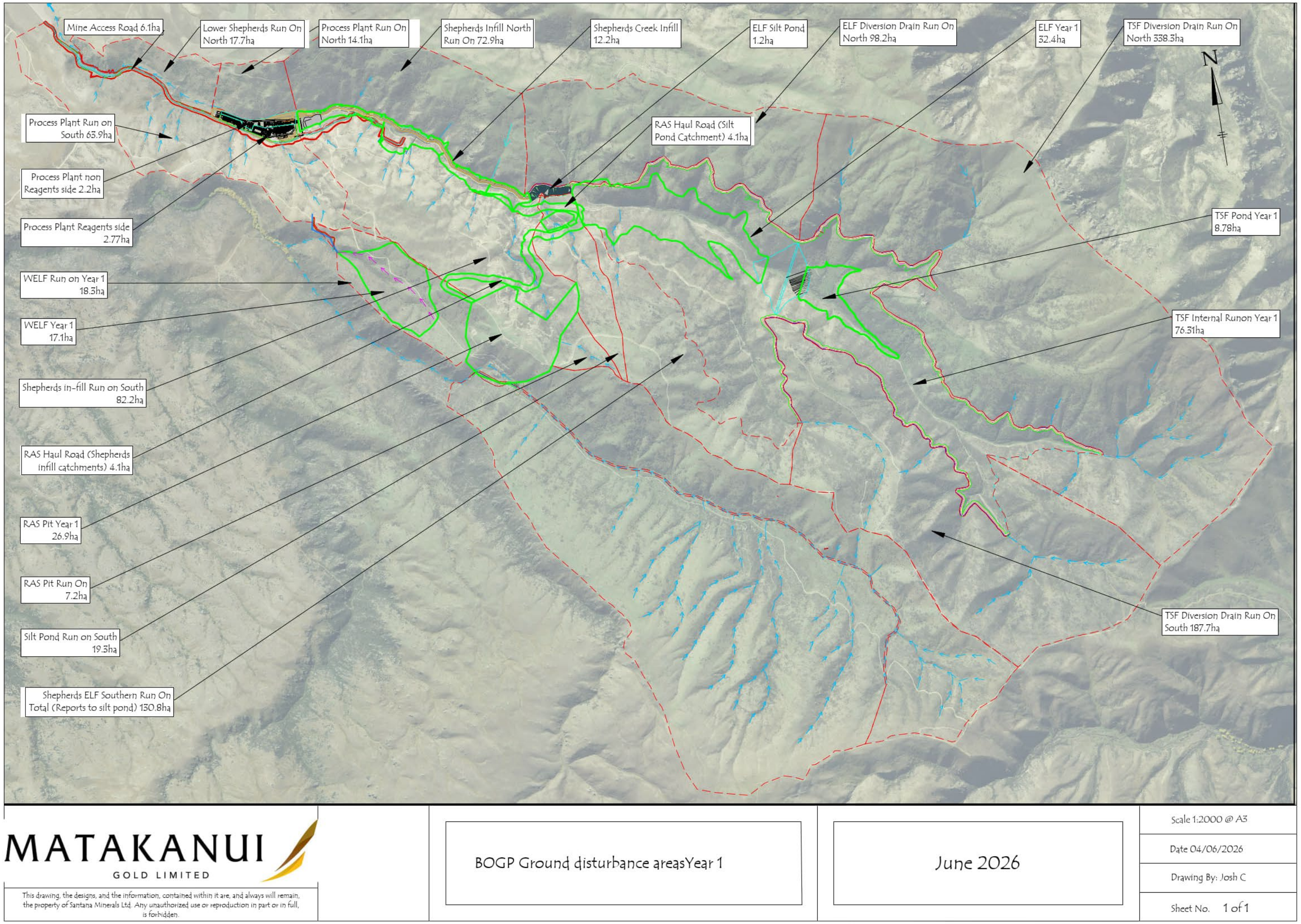

Figure 8: BOGP ground disturbance areas, Year 1

4.1.3 Runoff Model

The Runoff Model utilised for generating flows from undisturbed surface water the same as used by MWM (2025a). Daily discharge (runoff) is calculated by superimposing daily rainfall on calculated recession and baseflow using the following equation:

$$Q_{n+1} = C \times R \times A \times (1 - k_{n-1}) + Q_n \times k_{n-1}$$

Where:

- *Q* is the average daily discharge.
- *C* is the runoff coefficient.
- *R* is the rainfall contributing to runoff.
- *k* is the recession coefficient.
- *A* is the area of the catchment.

The runoff and recession coefficient input parameters are summarised in Table 7, with the runoff coefficient varying by month. Selection of parameters was based on professional judgment and attaining a reasonable fit with observed flows at SC01 (see MWM, 2025a for full calibration details).

Table 7: Runoff coefficients for the water balance model.

PARAMETER		VALUE
Runoff Coefficient (C)	January	0.02
	February	0.02
	March	0.03
	April	0.04
	May	0.08
	June	0.15
	July	0.3
	August	0.3
	September	0.12
	October	0.06
	November	0.06
	December	0.03
Recession Coefficient (k)		0.955

Source: MWM (2025a).

4.1.4 Pit Voids

Pit voids were represented in the model as pool elements, accounting for inflows and outflows. Model inputs are summarised in Table 8.

Table 8: Pit void model inputs.

MODEL FEATURE	DESCRIPTION
Water Balance Logic	Pits have been modelled such that the provided pit areas (Appendix A) have rainfall runoff and groundwater inflows directed into a reservoir element (pit sump) for each respective pit. Pit sumps are pumped to the Seepage Pond. Evaporation is applied to any available water in the sumps based on assumed surface areas noted below. CIT Pit has been modelled as backfilled in the final year of operations, with the backfill saturating over time.
Pit wall runoff	Daily climatic water balance (rainfall-PET) suggested 80% of rainfall was available to generate runoff, while at a monthly scale, only 25% was available (MWM, 2025b). Given the pit walls of exposed rock are likely to have little capacity for infiltration or water storage that can be evaporated at a future time, a runoff coefficient of 50% of rainfall was adopted as the approximate mid-point between the daily and monthly available rainfall. This value was applied uniformly in time, with no differentiation between winter vs summer given insufficient data to define such seasonal variation.
Pit sump evaporation	Pit sumps have evaporation modelled using the forward PET projection as described in Section 4.1.1. Sump water surface areas have been simplistically modelled based on the following areas: • RAS Pit: 12,800 m^2. • SRX Pit: 4,800 m^2. • CIT Pit: 12,800 m^2. These areas have been based on nominal sump volumes.
Pit sump pumping	Pit sumps have a pumping rate of 20 L/s applied.
Run-on from undisturbed upstream sources	Modelling assumes no run-on from upstream areas, with diversions in place and functioning.
Groundwater inflow	The following rates of groundwater inflow into pits was modelled: • RAS Pit: 1.2 L/s to 2.3 L/s (KSL, 2024) was adopted based on pit progression. • SRX Pit: 2.3 L/s. • CIT Pit: 3.5 L/s.
Groundwater outflow	Only relevant for CIT in the final operational year when the backfill begins to flood. Calculation based on Darcy's Law as per (MWM, 2025a)

4.1.5 Engineered Landforms

ELF represented in the model included the:

- Shepherds ELF.
- SRX ELF.
- Western ELF.
- CIT backfilled pit void.

The SCK Fill was also represented. From near the top of the valley, clean water diversions will be used to allow clean water to bypass the TSF and Shepherds ELF. The diversions will drop onto a constructed channel in the lower SCK Fill that will extend to the Run of Mine (ROM) at least (the natural creek may need to be lifted past the process area). Areas below the ROM where there is minimal ore exposure will be channelled via silt retention ponds to Shepherds channel (or possibly the natural creek). The lower gorge has to be filled to create sufficient width for services. The Shepherd channel shall be formed through this section to take a 1% AEP event (D. Stretch, MGL, personal communication, 16 April 2025).

Run off from the Shepherds ELF is directed to the Shepherds Silt Pond and is then discharged through a decant to the Shepherds channel after settling. In a large storm event, the silt pond can discharge directly by spill way to the Shepherds channel. Run off from the valley below the silt pond shall also be captured in sediment treatment ponds and discharged into Shepherds channel.

Mechanistically, the EFLs were represented in a similar manner, with runoff being calculated as a proportion of daily rainfall, net percolation into the facility also calculated as a proportion of daily rainfall, and seepage out of a facility calculated as a function of water storage within the facility with a reservoir element. Model inputs are summarised in Table 9.

Table 9: ELFs operational model input parameter summary.

<table>
<tr><th>MODEL FEATURE</th><th>DESCRIPTION</th></tr>
<tr><td>Runoff from disturbed surfaces</td><td>Defined as a proportion of daily rainfall, with runoff coefficients increasing as rainfall depth increased, as follows:
<table>
<tr><th>DAILY RAINFALL</th><th>RUNOFF COEFFICIENT</th></tr>
<tr><td><10 mm</td><td>0</td></tr>
<tr><td>≥ 10 mm but < 50 mm</td><td>0.05</td></tr>
<tr><td>≥ 50 mm but < 90 mm</td><td>0.15</td></tr>
<tr><td>> 90 mm</td><td>0.4</td></tr>
</table>
Modified from previous work at Macraes Mine (Golder, 2011) to achieve an average runoff yield similar, but slightly lower, than Shepherds Creek yield of ~10% of average rainfall. The values adopted achieved a yield of ~7% of average rainfall.
Applies to all EFLs.</td></tr>
<tr><td>Net percolation (NP) from disturbed surfaces</td><td>50% of rainfall, lower end of the range provided by MWM (2025b) given relatively dry climate.
Applies to all ELFs.</td></tr>
<tr><td>Recession Coefficient (k, -)</td><td>Recession equation: MWSF Storage Volume x (1-k). Set to 0.995 to achieve a relatively stable seepage rate but represents longer term seasonal changes (i.e., higher seepage rates in winter compare with summer).</td></tr>
<tr><td>Seepage recovery</td><td>Seepage recovery from all ELFs was modelled as 95% recovery, where the remaining 5% reports to downstream receiving environment at SC01, except for WELF and SRX ELF which report to RS03.</td></tr>
</table>

Progressive rehabilitation of the Shepards Creek and Western ELFs has been modelled. Areas for both disturbance and rehabilitation are detailed in Appendix A. Net percolation and runoff coefficients for rehabilitated areas are modelled based on parameters described in MWM (2025a).

4.1.6 Underground Mine

Dewatering from the underground mine was set at a fixed rate of 4 L/s based on MWM (2025a) which takes into account (i) drawdown and effective stress influences and (ii) ventilation losses. The model does not included underground service water, as it is assumed this will be taken from the mine water circuit, with losses accounted for within the ventilation losses.

4.1.7 Tailings Storage Facility

Modelling of the TSF has been undertaken dynamically based on interpolation of stage-area-volume relationships for different TSF stages (provided by Engineering Geology Limited). This approach estimates how the TSF pond volume evolves over time based on tailings production rates accounting for complex interrelationship between tailings slope and valley geometry.

Pond volumes have been calculated as described in Table 10, and tailings accumulation is based on the production rates described in Table 3 and entrained water.

Table 10: TSF operational model input parameter summary.

<table>
<tr><th>MODEL FEATURE</th><th>DESCRIPTION</th></tr>
<tr><td>Runoff from exposed tailings</td><td>Area is dynamically calculated based on an increasing TSF volume and modelled pond area. A runoff coefficient has been defined as 70% of daily rainfall based on previous work at Macraes Mine (Golder, 2011).</td></tr>
<tr><td>Run-on from undisturbed area</td><td>Area is dynamically calculated based on an increasing TSF volume and modelled pond area. Runoff is calculated based on the runoff model described in Section 4.1.3.</td></tr>
<tr><td>Direct rainfall to TSF Pond.</td><td>Area is dynamically calculated based on an increasing TSF volume and modelled pond area. A runoff coefficient of 1.0 is applied to the pond surface area (which is calculated dynamically).</td></tr>
<tr><td>Tailing slurry water</td><td>Calculated based on the annual production rate (see Table 3, Section 2.2) and slurry concentration of 41.8 % solids (w/w).
Entrainment of water in tailings pore space is modelled based on a consolidated tailings density of 1.25 tonne/m^3, resulting in 31% of the tailings slurry water reported as being lost to entrainment.</td></tr>
<tr><td>Pond evaporation</td><td>Evaporation is applied to the pond surface area based on the climatic input timeseries and dynamically calculated based on the modelled pond area.</td></tr>
<tr><td>Evaporation by use of Evaporation Cannons</td><td>Evaporation cannons have been incorporated into the model to manage the TSF pond water level. The below table details the rates applied in the model on an annual basis, where rates are interpolated between years not detailed. Cooler periods (April through September) have been assumed to have a lower evaporation potential and have been limited to 20% of drier periods (October through March) based on relative differences in PET. These rates are limited in the model to drawing the TSF ponded water down to 300,000 m^3 and therefore may not be applied throughout the nominated period.

<table>
<tr><th>YEAR</th><th colspan="3">EVAPORATION RATE (L/S)</th></tr>
<tr><th></th><th>OCT- MAR</th><th>APR-SEP</th><th>AVERAGE</th></tr>
<tr><td>2033</td><td>21</td><td>4.2</td><td>12.6</td></tr>
<tr><td>2034</td><td>21</td><td>4.2</td><td>12.6</td></tr>
<tr><td>2037</td><td>27</td><td>5.4</td><td>16.2</td></tr>
<tr><td>2038</td><td>54</td><td>10.8</td><td>32.4</td></tr>
<tr><td>2039</td><td>90</td><td>18</td><td>54</td></tr>
<tr><td>2040</td><td>75</td><td>15</td><td>45</td></tr>
</table></td></tr>
<tr><td>Process plant reclaim</td><td>Where the Processing Plant cannot receive enough water from the Seepage Pond or the Environmental Plant Sumps to match its needs, this is supplemented with water from the TSF Pond.</td></tr>
<tr><td>Seepage</td><td>Seepage rate of 14 L/s adopted based on EGL (2025). Modelled as being removed from the TSF ponded water. Recovered seepage is modelled as being captured in the Seepage Pond.</td></tr>
<tr><td>Seepage recovery</td><td>TSF seepage recovery was modelled as 95% recovery, where the remaining 5% reports to downstream receiving environment at SC01.</td></tr>
</table>

4.1.8 Process Plant

4.1.8.1 Runoff

The model adopts process plant footprints of 27,723 m^2 for the reagent side and 21,898 m^2 for the non-reagent side, as provided by MGL. A rainfall-based runoff coefficient is applied, with runoff coefficients increasing as rainfall depth increased as described in Table 11. Surface runoff is modelled as being captured by environmental plant sumps, where the reagent side and non-reagent side each have a sump and evaporation applied to each sump.

Table 11: Runoff coefficient for infrastructure areas and haul roads.

DAILY RAINFALL	RUNOFF COEFFICIENT
<10 mm	0
≥ 10 mm but < 50 mm	0.05
≥ 50 mm but < 90 mm	0.15
> 90 mm	0.4

Source: Golder (2011).

Seepage from the process plant areas is modelled the same as ELFs, as described in Table 9, and is collect by the sumps. The reagent side pond collects seepage from the Western ELF and SCK Fill to then direct this to the process plant.

The water retained in the sumps is directed to the plant as a priority to ensure the sumps don't spill[4]. The maximum rate is calculated as the make-up requirement less the raw water use.

4.1.8.2 Make-Up Water Logic

The process plant is modelled to require make-up water consistent with the outgoing tailings slurry water content, which is a function of slurry concentration and annual production rates. These flows are presented in Table 12. The priority of sources to make up this water are as follows, from highest priority to lowest:

1. Raw water, assumed to be 14% of the make-up water requirement.
2. Process Plant environmental sumps.
3. Seepage Pond.
4. TSF Pond.
5. Shepherds Creek ELF Silt Pond.
6. Bore Water.

[4] Model results suggest on an average daily basis maximum simulated sump volume was ~1,000 m^3. Actual sump sizing should take into account high frequency rain events than the daily average runoff simulated by the WLBM.

Table 12: Process plant water demand

	MAKE-UP FLOW RATE (L/s)
Year 1	49.9
Year 2	52.9
Year 3	52.9
Year 4	52.9
Year 5	52.9
Year 6	52.9
Year 7	54.2
Year 8	51.9
Year 9	52.8
Year 10	53.0
Year 11	53.0
Year 12	52.9
Year 13	52.9
Year 14	37.5

Based on production rate and a tailings slurry concentration of 41.8 % solids (w/w).

4.1.9 Haul Roads

Runoff from haul roads is calculated using a rainfall-based runoff coefficient, with runoff coefficients increasing as rainfall depth increased as described in Table 11 (Section 4.1.8.1) and consistent with studies at Macraes Mine (Golder, 2011).

4.1.10 Bore Water Usage

Bore water (sourced from the Bendigo Aquifer) is planned to be used on site for the following activities at the given average rates:

- Heavy vehicle workshop: 15 L/s. Assumed to report to Shepherds Creek at SC01.
- Potable water: 2 L/s. Assumed lost to groundwater downstream of SC01 (i.e., a sink in the model).
- Processing plant raw water supply: 14% of slurry water plus any make needed. Water enters the mine water circuit.
- Dust suppression: 52 L/s during warm months (October through March); 5 L/s during cool months (April through September). Assumed lost to atmosphere (i.e., a sink in the model).

4.2 Load Balance Model Inputs (Source Terms)

Source terms have been developed to represent mine impacted surfaces, such as pit walls, ELF Runoff, Haul Roads, ELF Seepages, and also for representing the background concentrations for surface and groundwater areas. Source terms for baseline surface water and mine impacted surfaces, groundwater, rainfall, and underground workings are tabulated in Table 13. The following is noted:

- The TZ4/RSSZ source term is considered to be conservative since hauls roads and most ELF surfaces will be TZ3, which is a lower geochemical risk material as described in MWM (2025c). This source term is applied to runoff from Haul Roads and ELFs, etc.
- Two primary groundwater source terms are defined within the model.
  - The first is represented by production bore CB13/0215, which provides the makeup water utilized for augmentation and is pumped on demand from the Raw Water Tank.
  - The second source term is characterized by borehole MDD015, which defines the water quality entering the pits as inflow. A comparative evaluation indicates that, relative to production bore CB13/0215, water from borehole MDD015 contains significantly elevated concentrations of arsenic, iron, sulfate, and various other metals.
- The pit wall source term was defined using publicly available water quality data from the Golden Bar Pit Lake at Macraes (MWM, 2025c), which serves as a natural analogue site for the BGOP. This source term, which is considered conservative, is applied to the pit walls across the project area. Furthermore, the dataset was refined using results from column leach tests to populate unmonitored parameters via established relationships with sulfate concentrations.
- Pit sump water is anticipated to increase in solute load (e.g., sulfate) over time as the pit wall exposure increases (therefore the flow rate associated with those source terms increases and hence the load). The pit wall source term used was from Macraes for the Golden Bar Pit Lake (MWM, 2025c). By contrast, if groundwater from a dedicated water supply bore is used for dust suppression, then dissolved concentrations in runoff will be lower. Groundwater source terms for dust suppression scenarios are therefore used in the model to provide a range of resulting surface water quality.
- The source terms for mine impacted surfaces with bore water dust suppression had elevated components such as iron, which are not generally mobile in neutral/alkaline oxidised conditions. This source term was therefore run through PHREEQC[5] with equilibrium phases to provide a more realistic source term.

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[5] *A computer program for speciation, batch-reaction, one-dimensional transport, and inverse geochemical calculations. US geological survey techniques and methods, 6(A43), 497 (Parkhurst, D. L., & Appelo, C. A. J., 2013).*

Table 13: Source terms used for the Water and Load Balance Operational model.

PARAMETER	BASELINE SW SC01	BASELINE SW RS03	TZ4 / RSSZ MINE IMPACTED SURFACES - BORE DS[1]	BORE WATER	GROUNDWATER INFLOW (MDD015)	PIT WALL RUNOFF	RAINFALL	RAS UNDERGROUND
Report reference	J-NZ0475-001-R-Rev2 Table 3	J-NZ0475-001-R-Rev2 Table 4	J-NZ0475-001-R-Rev0 Table 20 run with PHREEQC equilibrium phases	Test Production Bore CB13/0215 (KSL, 2025b)	J-NZ0475-001-R-Rev2 Table 6	Modified from MWM (2024)	J-NZ0475-001-R-Rev2 Table 2	J-NZ0475-001-R-Rev2 Table 18
Alkalinity (mg $CaCO_3$/L)	216	39.1	140.5	42	201.6	572.5	0.81	191.4
pH (pH units)	8.11	7.42	8.4	7.8	8.1	-	5.2	6.8
EC (µS/cm)	488.9	86.4	1,037	9.8	-			-
Ca	60.8	11.1	90.4	10.8	38.9	190.3	0.11	130
Cl	6.08	1.33	20	2.2	9.42	15.6	0.31	10
F	0.103	0.057	0.83	0.08	0.162	0.21		1.27
Mg	21.3	1.99	76.42	2.5	16.2	186.4	0.09	28
Na	20.3	39.5	59	5.3	43.6	32.4	0.32	20.02
K	2.01	0.578	7.1	0.8	1.44	11.2	0.88	10.8
TOC	2.08	1.75	-	0.7	0.3	0		1.4
Al	0.00454	0.00756	0.00016	0.0015	0.0061	0.114		0.114
As	0.00239	0.0085	0.005	0.0005	0.024	0.409		4.1
B	0.03304	0.0188	0.104	-	0.0331	0.046		0.046
Cd	0.0001	0.0001	0.0001	0.000025	0.00008	0.0001		0.0003
Co	0.00026	0.00025	0.0005	-	0.00019	0.0005		0.0007
Cr	0.00056	0.00059	0.0005	0.00025	0.0005	0.0005		0.00187
Cu	0.00055	0.00046	0.0005	0.00025	0.0003	0.001		0.00126
Fe	0.011	0.0375	0.005	0.01	0.0147	0.065		0.196
Mn	0.00265	0.0095	0.039	0.0007	0.0068	0.014		0.101
Mo	0.00051	0.00033	0.045	-	0.0004	0.22277		0.042

PARAMETER	BASELINE SW SC01	BASELINE SW RS03	TZ4 / RSSZ MINE IMPACTED SURFACES - BORE DS[1]	BORE WATER	GROUNDWATER INFLOW (MDD015)	PIT WALL RUNOFF	RAINFALL	RAS UNDERGROUND
Ni	0.00035	0.00035	0.003	0.00025	0.0003	0.0009		0.00122
Pb	0.00025	0.00025	0.003	0.00005	0.0002	0.0003		0.0007
Sb	0.00053	0.0005	0.027	-	0.0004	0.008		0.027
Se	0.0025	0.0025	0.00025	-	0.0018	0.00025		0.0074
Sr	0.947	0.136	1.84	-		0.91		2.03
Tl	0.00023	0.00023	0.00025	-	0.0003	0.00025		0.00052
U	0.0051	0.00012	0.016	-	0.001	0.0106		0.092
V	0.0005	0.0005	0.0005	-	0.0005	0.0005		0.01
Zn	0.0017	0.00229	0.007	0.0005	0.0015	0.005		0.006
Sulfate	40.5	1.57	320	3.2	10.3	718.9	0.18	120
Ammoniacal-N	0.0103	0.0092	0.012	-	0.0051	40		0.0061
Nitrate-N	0.083	0.0088	0.094	0.46			0.06	0.2141

Notes:

All units in mg/L unless otherwise stated.

Green data were <LOR and are included in the source term as '0'.

SW = surface water

*Mean of all column leach test data (CLT) data for TZ3 and TZ4 (as of 17-2-25) where **red data** are identified as a maximum and are applied to the source term for RAS underground.*

***Orange data** Obtained by relations of sulfate and the element from the CLT data*

4.2.1 TSF Source Term

The TSF decant pond source term was developed to consider operational water management processes where all mine circuit waters are returned to the process plant and/or TSF.

In the model, process water quality is incorporated into the process plant outflow using an 'add-to-current concentration' approach, meaning process water concentrations (Source Term) are superimposed onto all other plant inputs (e.g., runoff and recovered seepages, silt ponds, and recirculated water from the TSF). While this method ensures all source term constituents are captured, it artificially inflates the modelled TSF water quality. Consequently, adjustment is required to align the model with the target TSF decant water quality source term.

To establish the initial water quality within the first year and achieve the operational TSF decant source term (e.g., an SO4 concentration of approximately 450 mg/L), both global and parameter-specific adjustment factors were applied. A global adjustment factor of 0.38 was implemented achieving a suitable fit with the previously proposed operational TSF Water Quality (see Table 14 for results). Additional parameter-specific adjustments factors were required:

- Se: 0.76
- U: 071
- V: 0.69

The target concentration for operational TSF decant water quality is shown in Table 14, along with the achieved median concentration in the second year (2028, for water quality to stabilise). In addition, the closure concentration of the TSF is shown in Table 14 for comparative purposes. Graphs showing the evolution of several water quality parameters are shown in Figure 9 and Figure 10.

The model concentrations are dependent on several processes within the process plant to treat any acidity due to ferric chloride treatment for the removal of arsenic using lime (CaO), and cyanide destruct that requires Cu. This results in the following fixed model outputs:

- As: 1 mg/L
- Cu: 0.2 mg/L
- Fe: 1 mg/L
- SO_4: 1,800 mg/L (capped to account for gypsum solubility after lime treatment).

Table 14: TSF Process water quality and relevant outputs.

PARAMETER	DETECTION LIMIT	PROCESS WATER QUALITY[1]	OPERATIONAL TSF DECANT QUALITY (REFERENCE)[1]	OPERATIONAL TSF DECANT QUALITY (MODEL)	CLOSURE TSF SEEPAGE WATER QUALITY (MODEL)
			Target concentration	Median Achieved Concentration after 1 year (model)	Median Achieved Concentration at last year (model)
Alkalinity (mg/L as $CaCO_3$)	5	310	34.6	178	660
pH (pH units)	0.01	7.86	6.41	-	-
EC (µS/cm)	2	2,500	1,948	-	-
Ca	0.5	140	140	180	443
Cl	1	380	380	413	747
F	0.1	0.913	0.913	1.101	4.421
Mg	0.5	19	47 [3]	64	184
Na	0.5	400	400	455	1,013
K	0.5	24	24	28.6	182.0
TOC	-	-	-	0.4	1.1
Al	0.01	0.72	<0.01	0.0092	0.05231
As	0.001	0.12	0.97 [5]	0.91	1.81
B	0.02	0.39	0.39	0.44	1.02
Cd	0.0001	0.0001	0.0001	0.00015	0.00044
Co	0.001	0.025	0.025	0.027	0.074
Cr	0.001	0.0068	0.003	0.004	0.007
Cu	0.001	1	0.001	0.0013	0.0031
Fe	0.01	2.1	7.24	0.95	1.93
Mn	0.001	0.28	0.28	0.307	0.736
Mo	0.001	0.12	0.066	0.074	0.377
Ni [9]	0.001	0.32	0.32	0.343	0.604
Pb	0.001	0.013	0.013	0.014	0.025
Sb	0.0001	0.085	0.085	0.099	0.734
Se	0.001	0.0014	0.0014	0.0015	0.0220
Sr	0.001	2.1	2.1	0.18138	7.11
Tl	0.001	0.001	0.001	0.00014	0.00065
U	0.001	0.013	0.013	0.014	0.057
V	0.001	0.0018	0.0018	0.0021	0.016
Zn	0.001	0.014	0.014	0.016	0.034
Cyanide - WAD	0.01	47	0.47	0.302	0.203
Sulfate	1	450	450	495	1,269
Ammoniacal-N	0.005	2	2	2.32	25.60
Nitrate-N	0.005	<0.0050	0.005		

Data from MWM (2025c).

Note: Green data are LOR and are included in the source term as '0'

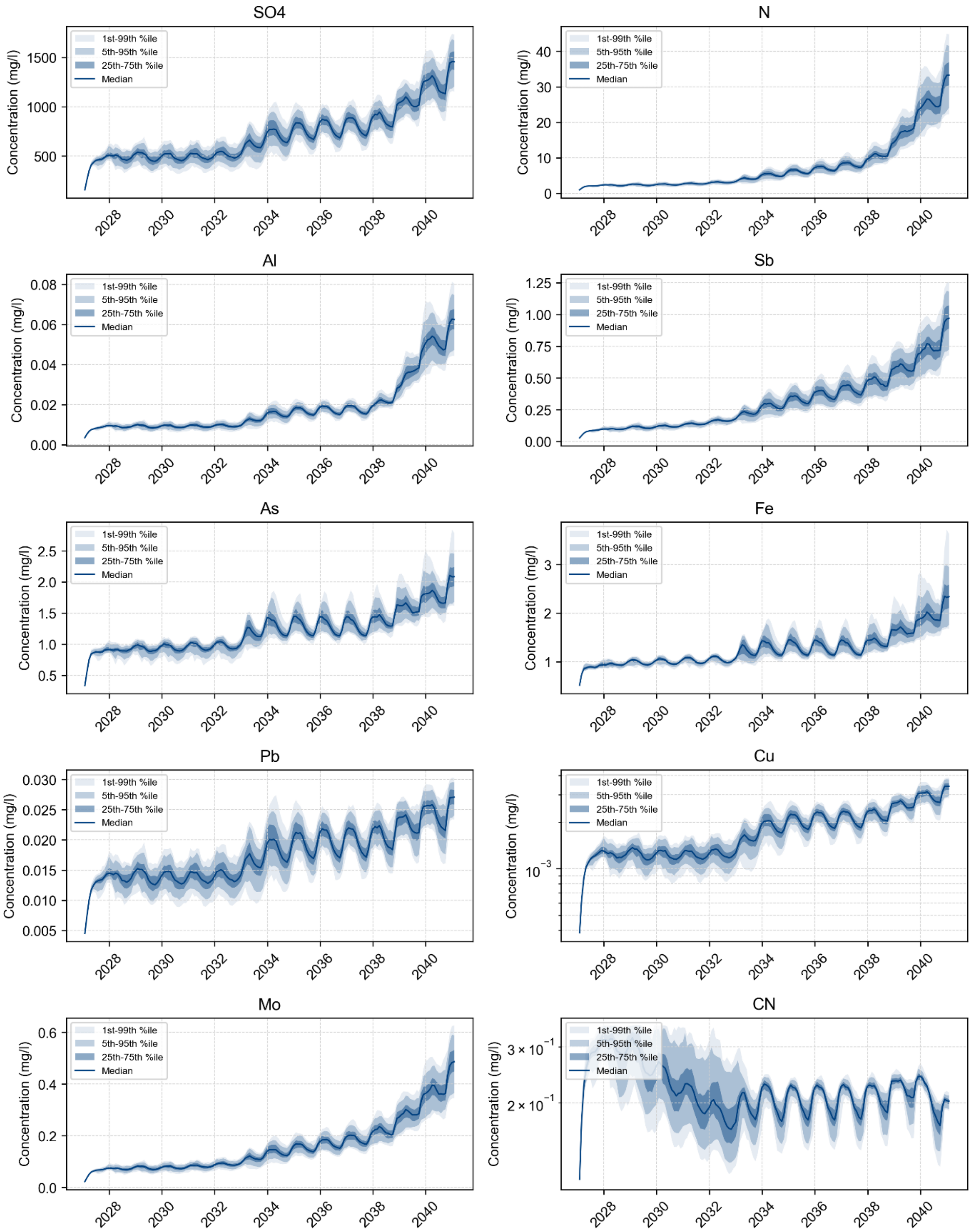

Figure 9: Predicted TSF Pond and decant water quality at the BGOP (1 of 2).

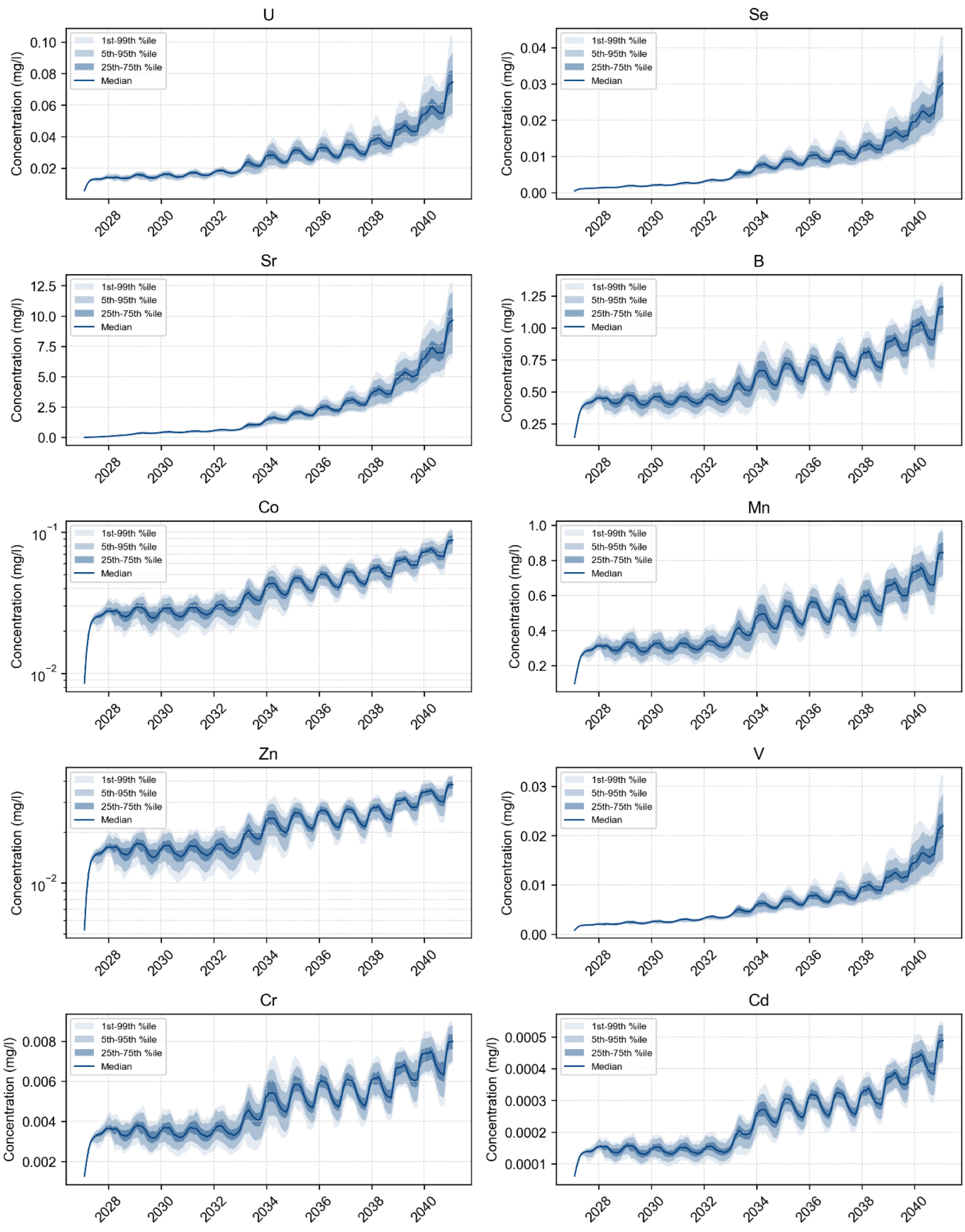

Figure 10: Predicted TSF Pond and decant water quality at the BGOP (2 of 2).

4.2.2 Unrecovered Seepage Attenuation

Craw and Pope (2017) and Craw and Nelson (2000) evaluated TSF seepage infiltration into groundwater at the Macraes Gold Mine, identifying natural attenuation within the Otago Schist of up to six orders of magnitude for As and four orders of magnitude for Fe. Based on these findings, it is assumed that similar attenuation processes will occur at the BGOP site providing attenuation over the operational model period.

Unrecovered TSF seepage is expected to infiltrate the groundwater to reach SC01, subject to dilution in groundwater, natural retardation, and dispersion effects. Although dilution, retardation, and dispersion mechanisms are not simulated in the current model, geochemical attenuation at the groundwater-rock interface is applied to the unrecovered seepage for specific metals (As, Fe, Cu, and Mo) that are expected to attenuate, whereas conservative solutes such as SO_4 and nitrate are expected to have no attenuation (e.g., Craw and Pope (2017); Craw and Nelson (2000)) and best represent potential effects of unrecovered seepage. The applied reduction for As was 2 orders of magnitude and 1 order of magnitude for the other elements (Fe, Cu, and Mo). This will require validation under site-specific conditions.

5 MODEL EVALUATION

The WLBM was reviewed as part of internal QA/QC[6] and this included the following steps:

- Checking that data sources are documented.
- Verification that storages, inflows, and outflows are correctly located and allocated to the right source and sink.
- Cross checking of flows to ensure they are not duplicated or missed.
- Verification of model functions and expressions to ensure they are working as intended.
- For the calibration period, predictions were evaluated through comparison to monitoring data.
- Using professional judgement and experience to evaluate if results reflect the understanding of the project and model inputs.

Model calibration of undisturbed runoff (e.g., Section 4.1.3) is reported in MWM (2025a).

5.1 Model Limitations

5.1.1 Water Balance

As noted by MWM (2025a):

- The Runoff Model did not provide a strong match to high or (daily average) peak flow conditions. In addition, peak flows typically occur at a finer temporal scale than the modelled daily time step. As such, the Runoff Model, and by extension the wider Water Balance Model results are not appropriate to inform engineering design criteria that are sensitive peak flows.
- The Runoff Model was history matched to SC01 flows, which spatially average flow generation over the entire catchment. However, higher elevation sub-catchments (e.g., area reporting to SC03) are known to have higher unit flow yields (KSL, 2025a). As such, the Runoff Model may not be reliable at forecasting flows at smaller, lower elevation portions of the Project area.
- Model inputs and outputs to the mine domain components of the WLBM were not calibrated and typically informed by experience at mine sites in similar settings (e.g., Macraes Mine, etc.). Performance monitoring during operations will be essential to confirm model results are reasonable.

In addition, unrecovered seepage reports to downstream surface water (e.g., SC01 or RS03).

5.1.2 Load Balance

Load balance limitations are outlined below:

- **Conservative transport assumption:** The model primarily assumes that all parameters are transported downstream without accounting for geochemical reactions. This means that processes such as precipitation (e.g., formation of hydroxy-sulfates) and adsorption are not

[6] *Quality Assurance / Quality Control*

represented. To prevent unrealistic overestimation, concentrations are managed through three specific mechanisms: simulated water treatment at the process plants, the application of solubility constraints to cap thermodynamically unlikely concentrations, and empirical attenuation factors for select elements (i.e., As, Fe, Cu, and Mo; see Section 4.2.2). However, all parameters not covered by these controls are transported conservatively. As a result, trace metals that lack applied constraints (e.g., Al, Zn) cannot precipitate from solution in the model, meaning their downstream concentrations are likely overestimated.

- **Nitrogen:** Nitrogen speciation is not modelled (e.g., ammoniacal nitrogen, nitrite, nitrate). Total nitrogen concentrations are used in the model, however it is assumed nitrogen is present as Nitrate-N, as this is the predominant nitrogen species in typical oxic MIW.
- **pH:** pH is expected to remain neutral to alkaline in this load balance. To account for "pH transport," the hydrogen ion concentration (estimated from the source terms using the equation $pH = -\log_{10}[H^+]$) is used instead. It remains relatively stable, but this does not account for carbonate speciation, which is likely to control and buffer pH at neutral levels due to the high alkalinity expected from the dissolution of carbonate minerals in the schists.
- **Source terms assumptions:** The model applies average water quality conditions across the simulation period. This limits its ability to capture short-term water quality variability, such as the ones caused by storm events, seasonal dry periods, which can influence contaminant mobility and concentrations. As more information becomes available, additional processes, such as decaying concentrations of pit walls or load contributions from rehabilitated areas, can be incorporated.
- **Water Reservoirs full mixing approach:** The model does not simulate physical processes such as density-driven stratification or mixing within pit lakes or water bodies. In reality, thermal stratification can influence redox conditions, nutrient cycling, and the timing and depth of contaminant release (e.g. from bottom layers). The current approach assumes full mixing of the reservoirs.
- **No biogeochemical processes**: Other biologically mediated processes (e.g., sulfate reduction, organic matter degradation, iron reduction) are not explicitly represented. These processes can significantly influence redox-sensitive elements (e.g. Fe, Mn, U, As) and could result in either attenuation or remobilisation depending on conditions.
- **Attenuation of unrecovered seepages**: The model does not dynamically simulate the complex, natural attenuation processes that occur as unrecovered seepage migrates through subsurface soils (a process that can take years), bedrock, or groundwater pathways. Geochemical mechanism, such as dynamic adsorption onto soil/rock matrices, co-precipitation with secondary minerals (e.g., iron hydroxides), and chemical retardation, are not explicitly calculated via geochemical reactions. Additionally, localised dilution from groundwater mixing along the subsurface flow path is excluded. To account for this lack of mechanistic modelling and prevent overly conservative (overestimated) downstream concentrations, static, literature-based attenuation factors have been applied to specific reactive elements (i.e., As, Fe, Cu, and Mo), as detailed in Section 4.2.2. Parameters without these applied factors remain fully conservative.

6 MODEL RESULTS

This section assesses the potential effects to the receiving environment during the Operational Phase of the mine.

6.1 Water Balance

6.1.1 Mine Impacted Water

Results from the water balance are presented graphically below. Figure 11 and Figure 12 represent annual average results (mean of all realisations) of the TSF water balance and processing plant water make-up sources respectively. Figure 13 represents the daily statistical spread of the TSF ponded water volume. Model results suggest the following:

- The MIW circuit shows a water surplus condition. Therefore, management of TSF volume by way of evaporation cannons is required from Year 7.
- TSF decant water is used through the life of the mine, however, not enough is required to detract the need for evaporation cannons.
- There are notable increases in MIW at Year 7 and Year 12, related to commencing of underground operations and satellite pit operations, respectively.
- The majority of MIW is a result of ELF and TSF seepage, with a strong representation of groundwater into pits and underground workings from Year 7.
- TSF pond water volumes are expected to be typically managed between 300,000 m^3 to 400,000 m^3, with the potential to accumulate up to 700,000 m^3. Increased pond volumes are expected to occur in winter months where evaporation rates are lower. These volumes are understood to be achievable within TSF design constraints.

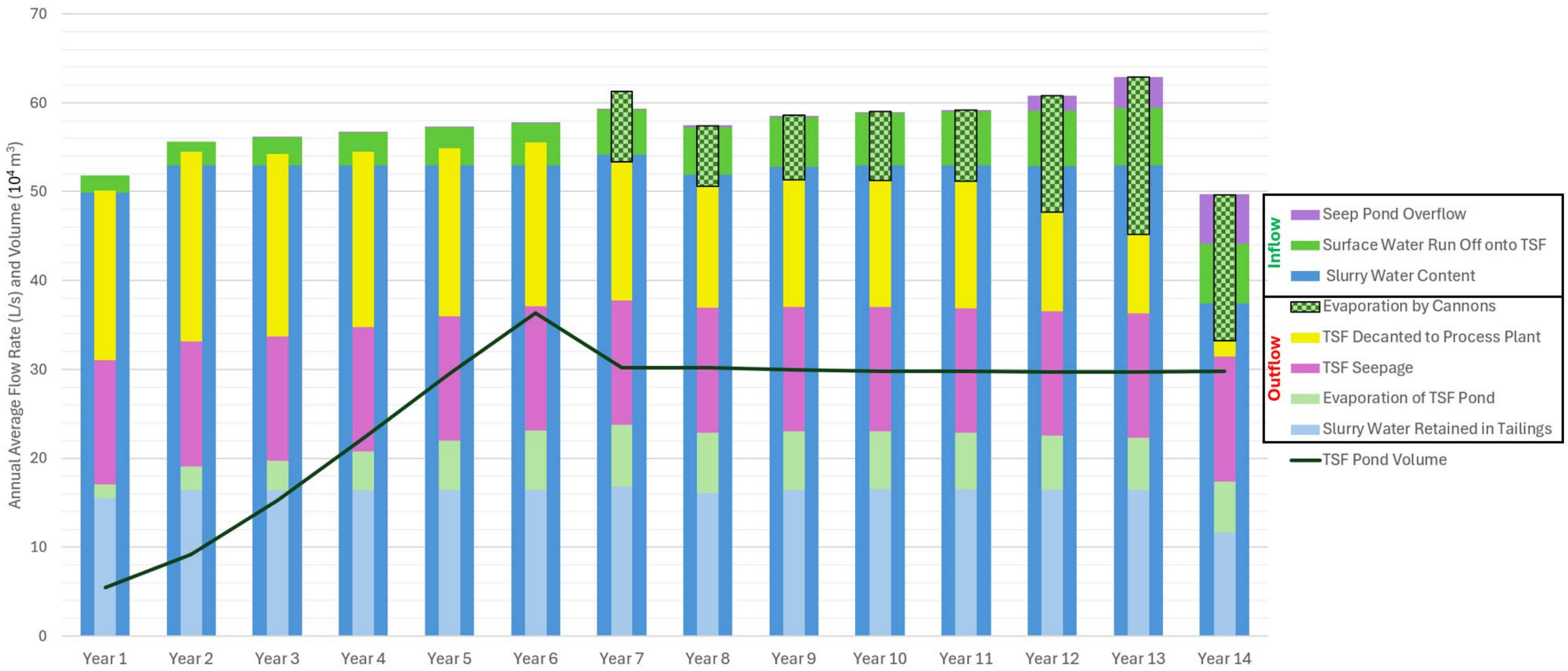

Figure 11: TSF Water Balance.

Annual average TSF inflow rates (wide bars) and outflow rates (thin bars) and end of year TSF pond volume (line).

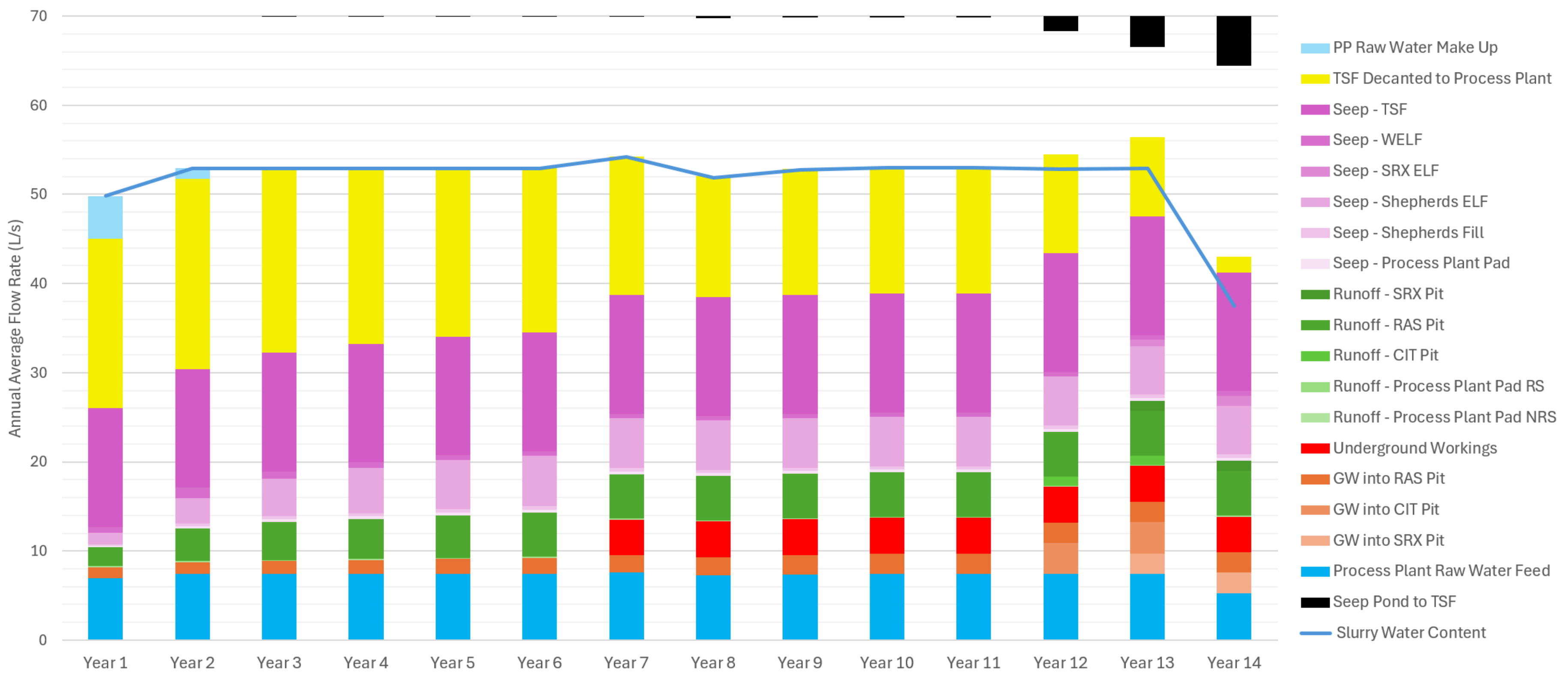

Figure 12: Processing plant makeup sources.

Annual average results are presented

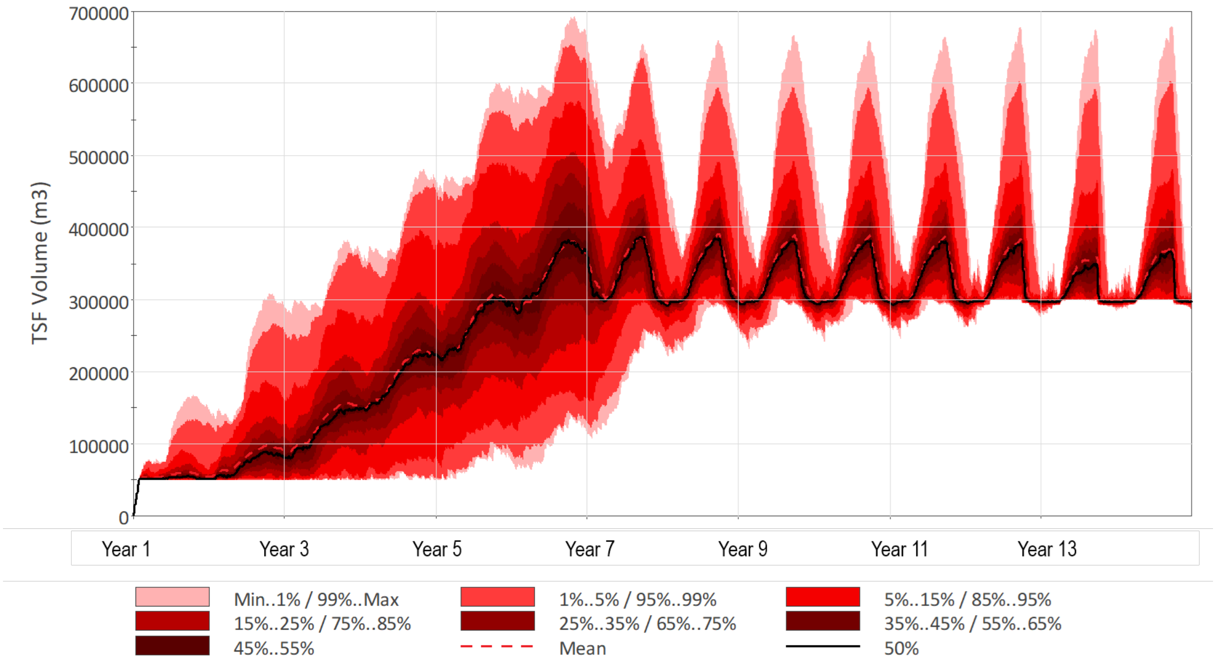

Figure 13: TSF ponded water volume.

Under a water surplus condition, the following engineering controls are considered to manage the additional water:

- Use of evaporation cannons to increase evaporative losses (as modelled).
- Increase water storage capacity on site for additional water storage prior to an active water treatment plant being commissioned.
- Commission the water treatment plant during operations rather than at closure to allow discharge of water surpluses.

Model results for seepage flow rates (before partitioning to recovered and unrecovered) from the ELFs and TSF are shown in Figure 14, and suggest:

- Average flow rates for the Shepherds ELFs of approximately 6 L/s, with flow rates typically varying between 4 and 8 L/s from Year 4, noting the ELF undergoes progressive rehab over its construction.
- Seepage flow rates for the WELF are less than 2 L/s in the initial years of construction and are less than 1 L/s post rehabilitation.
- SCK Fill seepage rates are modelled at less than 1 L/s. During the model period, the fill is assumed rehabilitated.
- Process Plant Pad seepage is fractionally less than the SCK Fill seepage rates.
- SRX ELF seepage flows are less than 2 L/s during construction of the ELF.
- TSF seepage is modelled at a constant rate of 14 L/s during operations (a direct model input).

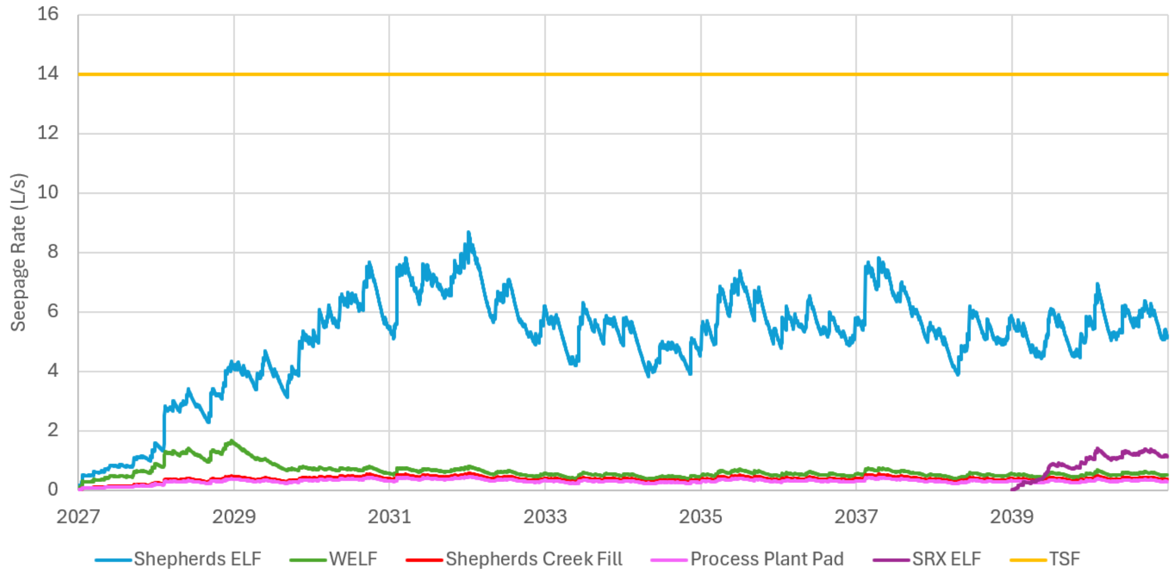

Figure 14: ELF and TSF seepage flow rates.

Note, Shepherds Creek Fill seepages rates are fractionally larger than the Process Plant Pad seepage rates, hence the limited visibility of the results displayed.

6.1.2 Augmentation

Augmentation of Shepherds Creek and Clearwater Creek has been estimated based on modelled flow past SC01 and RS03 and the simulated baseline. The average annual augmentation is presented in Table 15. It is noted that SC01 augmentation is not required until Year 7, with an annual average augmentation rate of 2.0 L/s being modelled by Year 14. RS03 augmentation is noted as being required from Year 1, with a maximum average rate of 3.7 L/s in Year 13 and 14. These rates are less than previously calculated by HGG (2025) dues to the less conservative groundwater losses from dewatering adopted in the WLBM.

Table 15: Annual average augmentation rates

	SC01 (L/s)	RS03 (L/s)
Year 1	0.0	0.7
Year 2	0.0	0.7
Year 3	0.0	0.7
Year 4	0.0	0.8
Year 5	0.0	0.8
Year 6	0.0	0.9
Year 7	0.6	0.9
Year 8	0.6	1.0
Year 9	0.6	1.0
Year 10	0.7	1.1
Year 11	0.7	1.1
Year 12	1.9	1.1
Year 13	1.9	3.7
Year 14	2.0	3.7

Note: augmentation rates are based on the full flow profile (low through high flows), and have not been limited to, instead, focusing on maintaining baseflows.

6.1.3 Bore Water Usage

Monthly average simulated Bendigo Aquifer water usage drawn from the Borefield is shown in Figure 15. The highest usage is in the first year (~100 L/s) but drops down to range between approximately 80 L/s in summer and 30 L/s in winter.

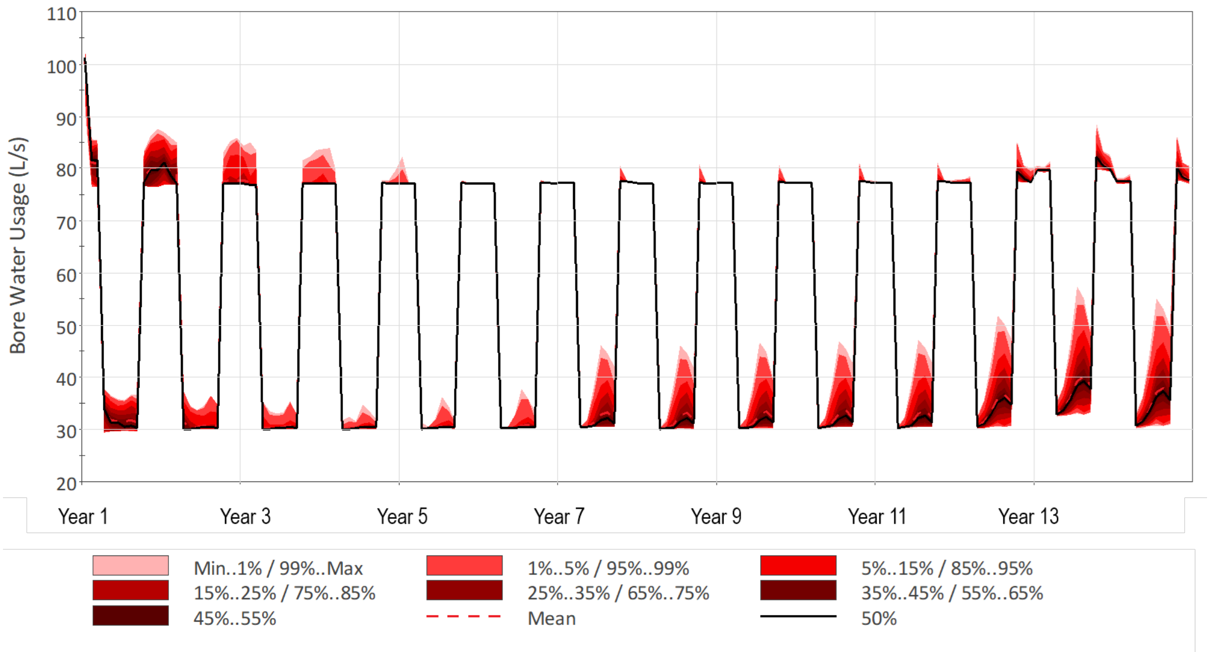

Figure 15: Bore water usage

6.2 Load Balance Results

This section shows the results for the load balance model, which includes the resulting water quality at SC01 and RS03.

6.2.1 Approach

The Load Balance model uses a conservative solute mixing model (i.e., no geochemical reactions such as mineral precipitation) to assess water quality during the Operational Phase. However, some reactivity is included by assuming attenuating factors, solubility limits, or concentration limits at some key model notes to ensure the model is not overly conservative. The models include solutes associated with runoff from background catchments, haul roads and infrastructure areas, ELF runoff surfaces and seepages, and TSF seepage. The model was run at daily time steps using the 14-year period Montecarlo synthetic rainfall record period, to account for the influence of climatic variability. The number of realisations was 200.

Results are shown in 2 figures per monitoring location, that show the projected results for SO_4, N, Al, Sb, As, Fe, Pb, Cu, Mo, and CN, in the first figure, and U, Se, Sr, B, Co, Mn, Zn, V, Cr, and Cd for the second figure. The graphical outputs for each parameter define the median expected concentration bounded by multiple percentile confidence intervals (1st - 99th, 5th - 95th, and 25th - 75th), assessed against recommended compliance threshold (denoted as SC01 and RS03 respectively).

6.2.2 Results at SC01

The results of the probabilistic water quality modelling for the 2027 – 2040 simulation period are presented in Figure 16 and Figure 17. The data shows a periodic oscillation in the projected concentrations across most constituents, indicative of seasonal variations. Furthermore, while the stochastic modelling indicates that the majority of parameters will remain well below their respective SC01 regulatory limits throughout the simulated lifecycle, critical deviations are observed; notably, N and Sb demonstrate significant positive concentration gradients that are projected to intercept or exceed the SC01 threshold during the latter stages of the modelled timeframe.

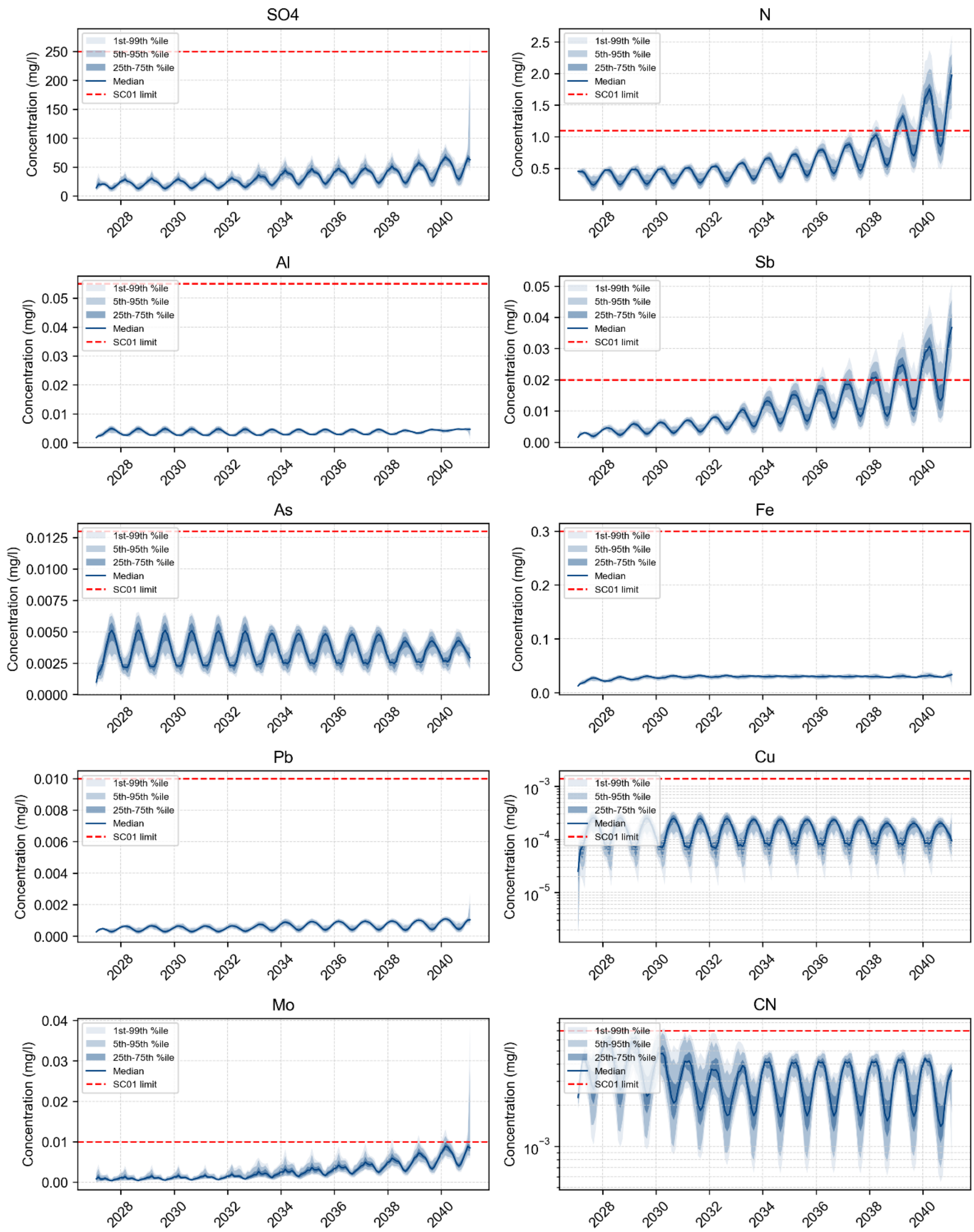

Figure 16. Predicted water quality at SC01 (1 of 2).

Percentiles based on monthly averaged data.

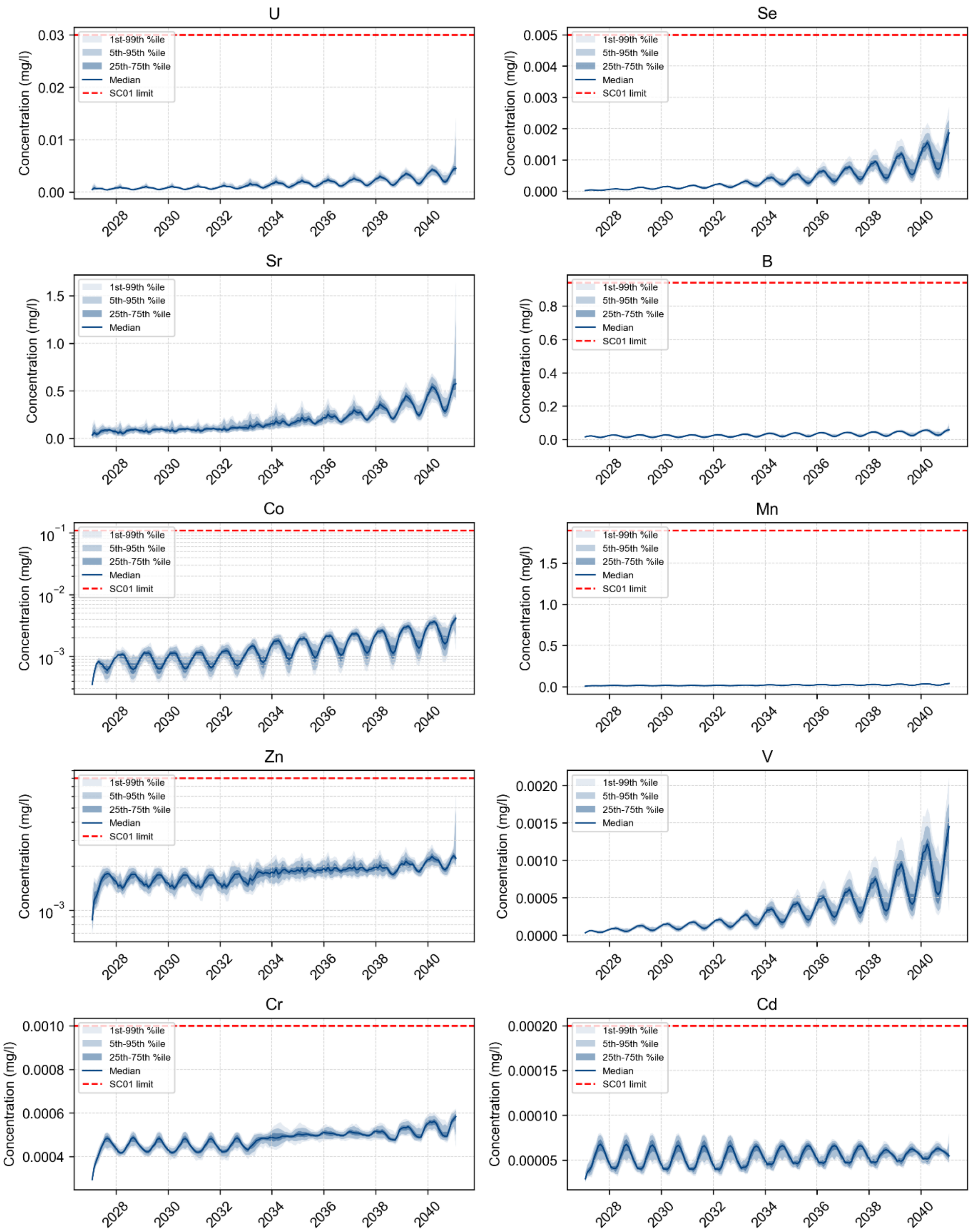

Figure 17. Predicted water quality at SC01 (2 of 2).

Percentiles based on monthly averaged data.

A statistical summary of the modelled operational results for SC01 is presented in Table 16. The summary details the central tendency and distributional range of the predictions, including the mean, maximum, and key percentiles (99th, 95th, 75th, 50th [median], 25th, 5th, and 1st percentiles).

Table 16: Summary statistics for modelled monitoring location SC01, during operations.

PARAMETER	MAX	MEAN	P99	P95	P75	P50	P25	P05	P01
Acidity (mg/l)	32.2	11.6	27.2	22.8	16.2	10.9	6.4	2.8	1.2
Al (mg/l)	0.006	0.004	0.006	0.005	0.004	0.004	0.003	0.002	0.002
Alkalinity (mg/l)	155	40	99	62	47	39	30	20	14
As (mg/l)	0.0071	0.0035	0.0062	0.0054	0.0043	0.0034	0.0025	0.0018	0.0014
B (mg/l)	0.114	0.028	0.074	0.052	0.035	0.025	0.018	0.011	0.007
CN (mg/l)	0.0077	0.0032	0.0067	0.0055	0.0042	0.0032	0.0022	0.0012	0.0008
Ca (mg/l)	99.0	19.9	60.4	29.5	21.7	18.0	15.7	13.4	12.5
Cd (mg/l)	0.00009	0.00005	0.00008	0.00007	0.00006	0.00005	0.00005	0.00004	0.00003
Cl (mg/l)	39.5	17.2	32.8	29.1	21.9	16.5	12.1	7.3	5.3
Co (mg/l)	0.0056	0.0014	0.0039	0.0031	0.0019	0.0012	0.0009	0.0006	0.0004
Cr (mg/l)	0.0006	0.0005	0.0006	0.0005	0.0005	0.0005	0.0004	0.0004	0.0003
Cu (mg/l)	0.0005	0.0001	0.0003	0.0003	0.0002	0.0001	0.0001	0.0000	0.0000
F (mg/l)	0.906	0.111	0.529	0.250	0.131	0.082	0.058	0.050	0.033
Fe (mg/l)	0.045	0.029	0.036	0.034	0.032	0.030	0.027	0.020	0.014
Hg (mg/l)	0.000033	0.000008	0.000025	0.000020	0.000012	0.000005	0.000003	0.000001	0.000001
K (mg/l)	18.6	3.8	11.9	9.2	5.1	2.9	1.9	1.2	1.0
Mg (mg/l)	83.4	6.8	45.5	13.2	6.7	5.2	4.2	3.2	2.8
Mn (mg/l)	0.0475	0.0179	0.0370	0.0316	0.0221	0.0158	0.0126	0.0104	0.0086
Mo (mg/l)	0.0490	0.0028	0.0266	0.0083	0.0031	0.0013	0.0006	0.0002	0.0001
N (mg/l)	2.78	0.61	1.84	1.37	0.74	0.51	0.39	0.24	0.16
Na (mg/l)	70.5	35.5	57.3	50.9	39.4	33.7	30.3	26.9	20.1
Ni (mg/l)	0.030	0.013	0.025	0.022	0.016	0.012	0.008	0.005	0.003
Pb (mg/l)	0.0033	0.0006	0.0020	0.0011	0.0008	0.0006	0.0004	0.0002	0.0001
SO4 (mg/l)	349	31	194	65	35	24	17	10	7
Sb (mg/l)	0.055	0.010	0.034	0.026	0.015	0.008	0.004	0.002	0.001
Se (mg/l)	0.00291	0.00040	0.00168	0.00123	0.00057	0.00026	0.00011	0.00004	0.00002
Sr (mg/l)	2.01	0.19	1.14	0.50	0.23	0.12	0.08	0.04	0.02
TOC (mg/l)	1.53	0.98	1.40	1.29	1.11	0.97	0.84	0.73	0.44
Tl (mg/l)	0.000034	0.000008	0.000026	0.000020	0.000012	0.000006	0.000004	0.000002	0.000001
U (mg/l)	0.0174	0.0015	0.0098	0.0040	0.0018	0.0010	0.0006	0.0004	0.0003
V (mg/l)	0.00227	0.00033	0.00131	0.00097	0.00045	0.00022	0.00011	0.00005	0.00003
Zn (mg/l)	0.0077	0.0018	0.0048	0.0024	0.0018	0.0017	0.0015	0.0013	0.0011

6.2.3 Results at RS03

The results of the probabilistic water quality modelling for the 2027 – 2040 simulation period are presented in Figure 18 to Figure 19. The data shows a periodic oscillation in the projected concentrations across most constituents, indicative of seasonal variations. The stochastic modelling indicates that all parameters will remain well below their respective RS03 recommended limits throughout the simulated lifecycle. While gradual positive concentration gradients are observed in certain constituents such as N, Sb, Se, and V leading up to approximately 2038, these trends subsequently stabilise or decline, and no parameters are projected to intercept or exceed the RS03 threshold at any point during the modelled timeframe.

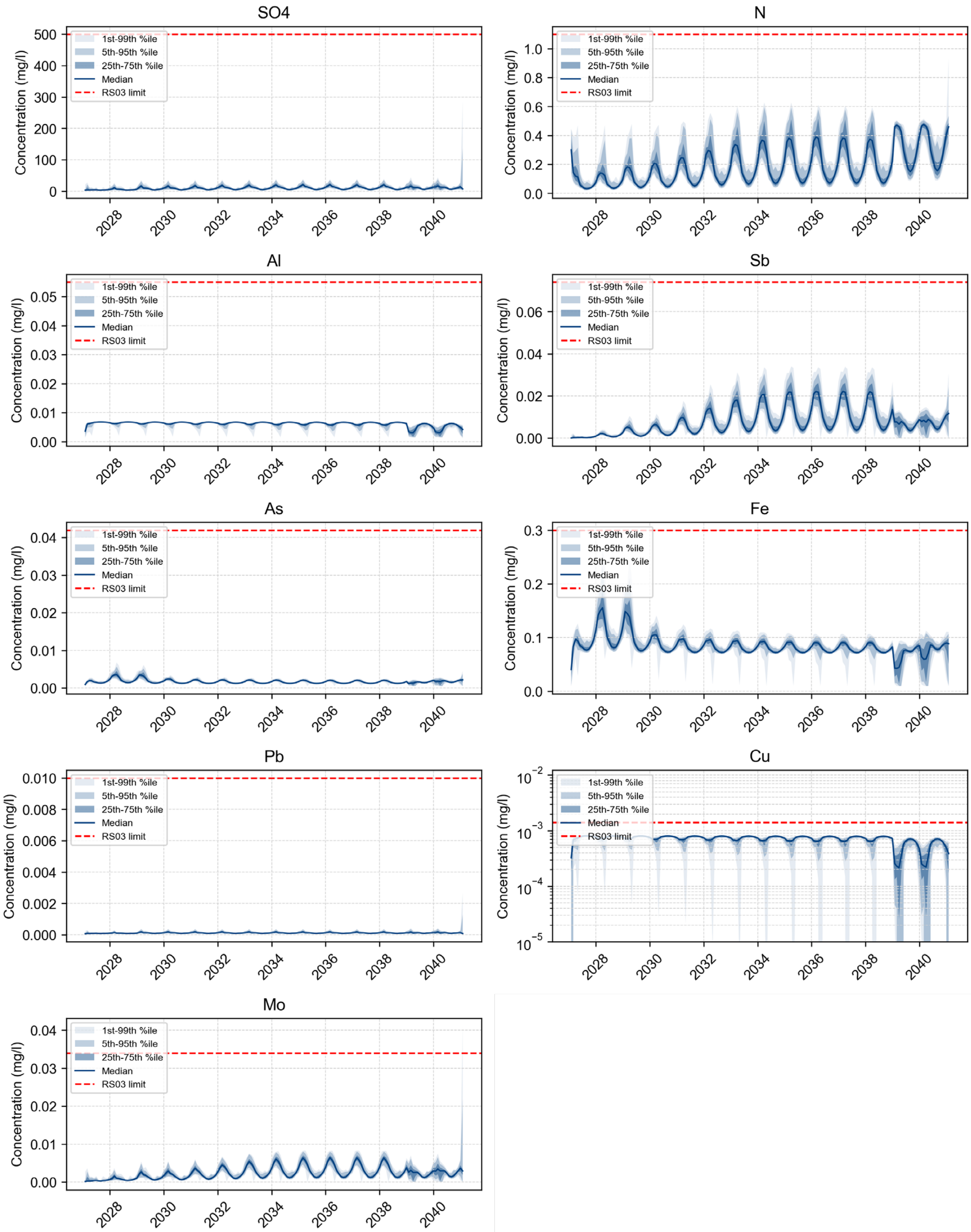

Figure 18. Predicted water quality at RS03 (1 of 2).

Percentiles based on monthly averaged data.

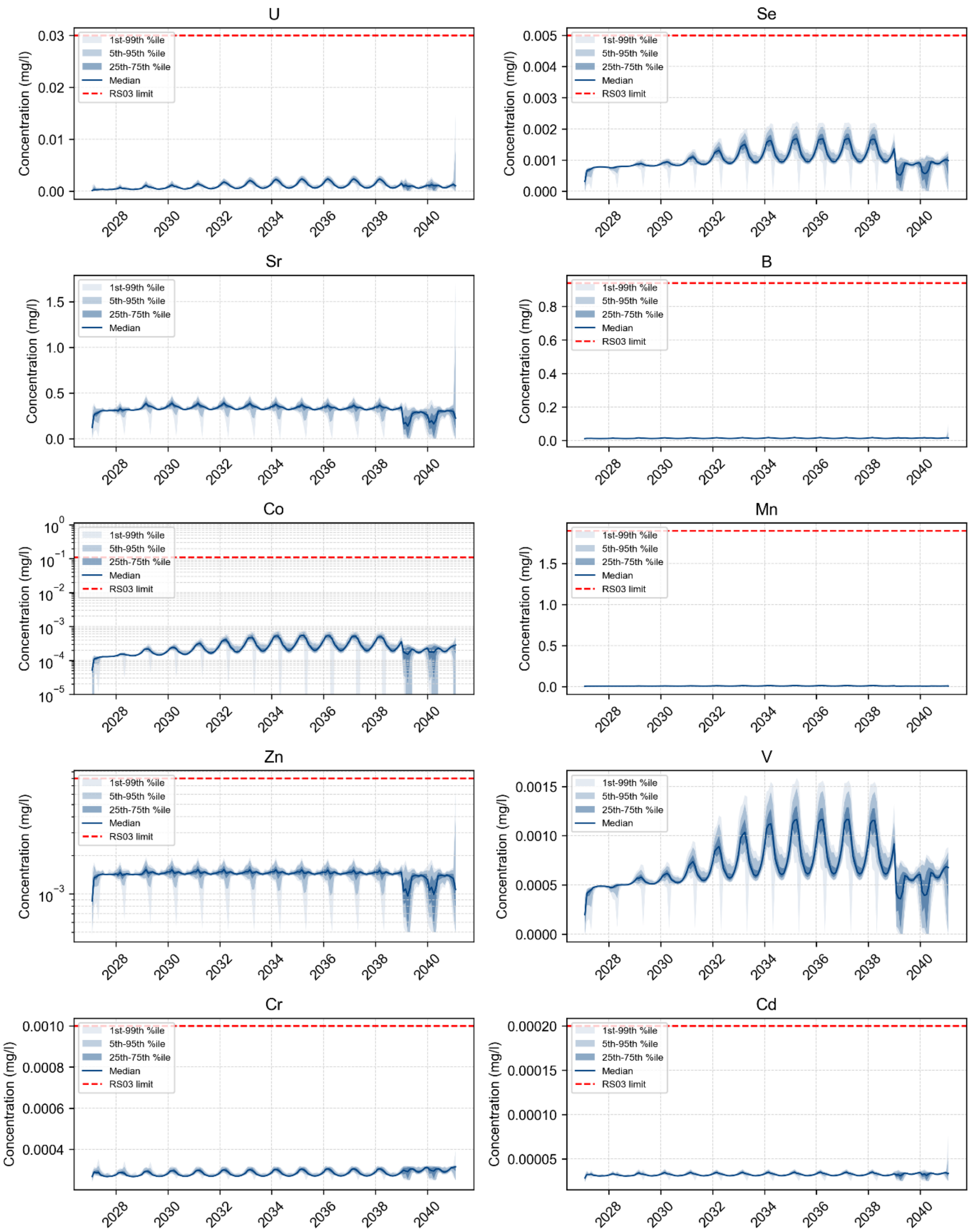

Figure 19. Predicted water quality at RS03 (2 of 2).

Percentiles based on monthly averaged data.

A statistical summary of the modelled operational results for SC01 is presented in Table 17. The summary details the central tendency and distributional range of the predictions, including the mean, maximum, and key percentiles (99th, 95th, 75th, 50th [median], 25th, 5th, and 1st percentiles).

Table 17: Summary statistics for modelled monitoring location RS03, during operations.

PARAMETER	MAX	MEAN	P99	P95	P75	P50	P25	P05	P01
Acidity (mg/l)	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Al (mg/l)	0.007	0.006	0.007	0.007	0.007	0.006	0.006	0.004	0.002
Alkalinity (mg/l)	209	73	103	78	74	74	73	67	42
As (mg/l)	0.0100	0.0017	0.0044	0.0029	0.0019	0.0015	0.0013	0.0011	0.0005
B (mg/l)	0.154	0.014	0.051	0.018	0.013	0.012	0.012	0.011	0.010
CN (mg/l)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ca (mg/l)	134.3	23.4	51.8	27.0	23.2	23.2	22.8	19.2	10.8
Cd (mg/l)	0.00015	0.00003	0.00006	0.00004	0.00003	0.00003	0.00003	0.00003	0.00003
Cl (mg/l)	29.7	2.5	9.7	3.3	2.5	2.3	2.1	2.0	2.0
Co (mg/l)	0.0013	0.0003	0.0007	0.0005	0.0003	0.0002	0.0002	0.0001	0.0000
Cr (mg/l)	0.0007	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Cu (mg/l)	0.0010	0.0007	0.0008	0.0008	0.0008	0.0008	0.0007	0.0004	0.0000
F (mg/l)	1.232	0.074	0.401	0.112	0.072	0.064	0.059	0.044	0.000
Fe (mg/l)	0.331	0.084	0.174	0.120	0.092	0.081	0.074	0.065	0.010
Hg (mg/l)	0.000108	0.000092	0.000108	0.000107	0.000105	0.000100	0.000089	0.000044	0.000000
K (mg/l)	14.5	2.8	7.7	6.1	3.4	2.3	1.6	1.2	0.8
Mg (mg/l)	113.5	4.9	34.4	8.1	4.0	3.9	3.8	3.8	2.5
Mn (mg/l)	0.0579	0.0074	0.0223	0.0113	0.0080	0.0067	0.0061	0.0052	0.0007
Mo (mg/l)	0.0668	0.0023	0.0211	0.0064	0.0026	0.0014	0.0007	0.0002	0.0000
N (mg/l)	1.50	0.19	0.62	0.48	0.26	0.14	0.07	0.04	0.03
Na (mg/l)	87.6	8.2	30.2	13.4	8.8	7.0	6.0	5.4	5.3
Ni (mg/l)	0.004	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000
Pb (mg/l)	0.0045	0.0001	0.0013	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001
SO4 (mg/l)	475	10	139	23	7	5	4	3	3
Sb (mg/l)	0.063	0.008	0.031	0.023	0.010	0.005	0.002	0.000	0.000
Se (mg/l)	0.00277	0.00103	0.00205	0.00174	0.00117	0.00095	0.00084	0.00068	0.00000
Sr (mg/l)	2.73	0.32	1.00	0.42	0.32	0.32	0.31	0.19	0.00
TOC (mg/l)	2.76	2.46	2.72	2.71	2.68	2.61	2.45	1.57	0.70
Tl (mg/l)	0.000049	0.000042	0.000049	0.000049	0.000047	0.000045	0.000040	0.000020	0.000000
U (mg/l)	0.0238	0.0010	0.0076	0.0024	0.0011	0.0007	0.0004	0.0003	0.0000
V (mg/l)	0.00198	0.00068	0.00144	0.00121	0.00078	0.00062	0.00053	0.00044	0.00000
Zn (mg/l)	0.0104	0.0014	0.0038	0.0017	0.0014	0.0014	0.0013	0.0011	0.0005

6.3 Summary

Water balance calculations suggest that the site will be in a water surplus condition as a result of MIW generation exceeding loses from the system through entrainment of water in tailings and evaporation. An engineering control of incorporating evaporation cannons has been introduced into the model to managed excess water. Additional engineering controls (e.g., construct the water treatment plant prior to closure, earlier lifts of the embankment to manage additional water storage, etc) are available to further manage these potential water surpluses, and can be evaluated during detailed design phases or in the initial years of operations once the WLBM can be validated; the model suggests engineering controls may not be required until Year 7. Ongoing water balance reconciliation of the site will be required to confirm the WLBM inputs and results.

Interpretation of the model results suggests that surface water quality at RS03 will remain below the proposed compliance limits. In contrast, concentrations at SC01 are projected to exceed compliance limits, with nitrogen (N) exceeding thresholds in 2038 (Year 11) and antimony exceeding thresholds in 2037 (Year 10). To mitigate these projected exceedances, it is recommended that a water treatment plant be designed and integrated into the operational schedule. Ongoing performance monitoring data should be analysed prior to verify whether treatment deployment is required, and to adjust the schedule (e.g. bringing forward or postponing implementation) based on ongoing water quality monitoring datasets.

6.4 Recommendations

The following recommendations are provided:

- A site water balance reconciliation be completed regularly (e.g., annually or more frequent) to confirm water balance model results are appropriate, and/or make model updates to improve confidence in model results projected into the future.
- Review and optimisation of additional engineering controls after reconciliation of the WLBM, should the site be identified as being in surplus water the second half of operations.
- Review and optimise MIW for use as dust suppression in pits, to reduce the surplus of water. Use bore water for dust suppression has been modelled to lower the risk of sulfate load buildup at surface available for transport via runoff from site.
- Implement targeted water quality monitoring at the inflow and outflow of the process plant to evaluate whether treatment (such as lime dosing or ferric chloride addition to control parameters like arsenic or sulfate) needs to increased/adjusted.
- Conduct comprehensive water quality monitoring at the TSF seepage drains, pond, ELF silt ponds, the seepage pond, and the seepage of every individual ELF.
- Measure flow rates at these monitoring points wherever possible and log pumping rates whenever they occur.
- Monitor groundwater below and downstream of the TSF and ELFs to quantify any potential plume and estimate the attenuation of metals.
- Monitor water quality during rainfall events to quantify the catchment dilution capacity for ongoing calibration and adjustments to the water balance to improve future predictions.
- Monitor runoff water quality from impacted sites to improve source terms definition and perform equivalent water quality monitoring for underground workings outflow.
- Advance design of active water treatment to provide operational readiness for efficient deployment if needed.
- Discharge of runoff and SCK and the Processing Plant pad seepage will be monitored with contingencies in place.

Adaptive management processes need to be developed to proactively manage and respond if performance and/or compliance monitoring suggests these discharges provide risk of non-compliance. Contingencies could include for example:

- Collect and contain runoff and seepage within the mine water circuit.
- Increase water storage capacity on site, for example within the TSF.
- Commission the water treatment plant during operations rather than at closure.
- Storage of water within pits or other purpose designed infrastructure.

7 ASSESSMENT OF ENVIRONMENTAL EFFECTS

This section provides an assessment of effects to surface water and groundwater environmental values and resources during the operational mining phase.

7.1 Environmental Values

The assessment of effects has adopted an environmental values and beneficial resources approach to evaluate relevant ecotoxicological risks. Table 18 summarises the environmental values for the key surface and groundwater receptors and resources.

Table 18: Environmental values of water resources.

WATER RESOURCE	ENVIRONMENTAL VALUES
SURFACE WATER RESOURCES	
Shepherds Creek	Shepherds Creek is a perennial headwater stream that drains the western slopes of the Dunstan Mountains. The upper reaches support moderate to high ecological values, with relatively intact stream habitat and aquatic communities representative of Central Otago hill-country streams. Ecological values decline downstream due to historical modification including water abstraction, impoundment, stock access, and channel alteration. The creek provides habitat for aquatic invertebrates and native fish and contributes to downstream ecological connectivity. The creek also fully infiltrates to the underlying groundwater system, reporting to the Ardgour Aquifer. Beneficial creek water uses include support of freshwater aquatic ecosystems, stock water supply, cultural values, landscape amenity and contribution to downstream water quality and flow regimes.
Rise and Shine Creek	Rise and Shine Creek comprises a network of ephemeral, intermittent and perennial streams. Ecological investigations identified a gradient of habitat quality from high-value headwater reaches to more modified downstream sections impacted by historical mining activities. The catchment supports freshwater aquatic invertebrate communities and native fish habitat, although surveys did not record any fish present within the project area. The creek provides freshwater habitat diversity and contributes flow to the wider catchment. Beneficial uses include maintenance of aquatic ecosystems, provision of stock water, natural drainage functions and support of downstream water resources.
Bendigo Creek	Bendigo Creek is the primary receiving waterbody for runoff and tributary inflows from Rise and Shine Creek. It functions as an important ecological corridor within the upper Clutha catchment and supports aquatic ecosystems typical of Central Otago streams. The creek also has recreational, landscape and cultural significance and contributes to downstream water quality and habitat connectivity. The creek discharges to Bendigo Aquifer. Beneficial uses include aquatic ecosystem protection, stock and agricultural water use, sediment and nutrient transport functions, and maintenance of downstream river health.
Lindis and Clutha Rivers	The Lindis River and the Clutha/Mata-Au River are regionally significant receiving environments. The Lindis River ultimately discharges to the Clutha, New Zealand's largest river by flow. These rivers support nationally important aquatic ecosystems, recreational fisheries, indigenous biodiversity, cultural values and extensive downstream abstraction for agriculture and communities. Beneficial uses include ecosystem support, irrigation supply, recreation, cultural values, hydroelectric generation, stock water and maintenance of regional water quality. Protection of these downstream environments is a key consideration in the project's water management and contaminant risk assessments.
GROUNDWATER RESOURCES	
Ardgour Aquifer	The Ardgour Aquifer is a shallow groundwater system underlying parts of Ardgour Station and hydraulically connected with local surface-water features. Its principal values are as a groundwater resource supporting baseflow to streams, sustaining terrestrial and riparian ecosystems and providing water supply opportunities for agricultural activities. Beneficial uses include stock and farm water supply, maintenance of groundwater-dependent ecosystems and contribution to surface water flows through groundwater discharge.

Bendigo Aquifer	The Bendigo Aquifer underlies the Bendigo Valley and represents an important local groundwater resource. The aquifer contributes to stream baseflow, supports terrestrial vegetation and may provide groundwater for rural and agricultural use. The FTAA[7] assessments recognise the importance of maintaining groundwater quantity and quality because of its connectivity with surface waters. Beneficial uses include agricultural water supply, stock water, support of groundwater-dependent ecosystems and maintenance of connected surface-water systems.

7.2 Comparison of Predicted Water Quality to Assessment Criteria

In order to assess potential ecotoxicological risks to terrestrial and aquatic species, and human health during the operational mining phase, predicted water quality has been compared to the ANZG (2026) source protection levels (SPLs) for ecosystems and water quality criteria protective of beneficial uses of water including drinking water (human health) (NZG, 2022), livestock drinking water (LDWG) (ANZECC, 2000), and long-term irrigation water (LIW) (ANZG, 2024). Toxicological risks are further considered for those elements that are predicted to exceed relevant guidelines. Table 18 presents the predicted water quality with respect to the assessment criteria.

With respect to the protection of ecosystems, only the following water quality exceedances were predicted:

- Maximum concentrations of antimony (Sb) were predicted to exceed the ANZG 80% SPL (17 μg/L) at both SC01 (55 μg/L) and RS03 (62.9 μg/L). At SC01 the mean concentration (10.3 μg/L) also marginally exceeded the 95% SPL (9 μg/L), however the median concentration was below the 95% SPL indicating that exceedances are temporally limited and therefore unlikely to represent a chronic risk to receptors. Both the mean and median were below the 95% SPL.
- Maximum concentrations of molybdenum (Mo) at both SC01 (49 μg/L) and RS03 (66.8 μg/L) exceeded the 95% SPL however both the mean and median were substantially below the 95% SPL indicating that potential exceedances are temporally limited and therefore unlikely to represent a chronic risk to receptors.
- Maximum, mean, mean and median concentrations of uranium (U) were predicted to exceed the generic SPL (0.5 μg/L). The uranium SPL has a lower reliability than other metals and its bioavailability is dependent on several factors including pH and alkalinity, and concentrations of bicarbonate/carbonate, dissolved organic carbon and calcium. Consequently, the generic SPL may either overestimate or underestimate risk depending on local water chemistry, noting that the toxicity database for uranium is not sufficient to derive a reliable bioavailability adjustment factor. Qualitatively, uranium bioavailability may be lower than would be assumed from dissolved uranium concentration alone because uranium forms carbonate complexes in relatively hard, alkaline and moderately to highly buffered water quality conditions, like those observed in the BOGP project area.
- The maximum concentrations of lead (4.45 μg/L) and zinc at RS03 (10.4 μg/L), marginally exceeded the 95% SPLs (3.4 and 8 μg/L, respectively) at RS03, however the mean and median concentrations were approximately an order of magnitude lower than the maximum values

[7] *Fast-track Approvals Act 2024*

suggesting that any water quality exceedances would be temporally sporadic and therefore unlikely to represent a chronic risk to receptors.

Table 19: Predicted water quality during operational mine phase.

ANALYTE	UNITS	ASSESSMENT CRITERIA						PREDICTED SC01 WQ			PREDICTED RS03 WQ		
		ECOLOGICAL PROTECTION			BENEFICIAL USE								
		ANZG 80%	ANZG 90%	ANZG 95%	DW MAV	LDWG	LTIW	Max	Mean	Median	Max	Mean	Median
Al	µg/L	150	80	55	1000	--	5000	6.44	3.70	3.69	6.84	6.09	6.48
Alkalinity	mg/L	--	--	--	--	--	--	155	40.1	39.3	209	73.4	73.6
As	µg/L	140	42	13	10	200	100	7.13	3.46	3.38	9.97	1.69	1.52
B	µg/L	2500	1500	940	2400	5000	700	114	27.6	25.0	154	13.7	12.3
Ca	mg/L	--	--	--	--	--	--	99.0	19.9	18.0	134.3	23.4	23.2
Cd	µg/L	0.8	0.4	0.2	4	10	10	0.093	0.054	0.053	0.149	0.032	0.031
Cl	mg/L	--	--	--	--	4000	106	39.5	17.2	16.5	29.7	2.54	2.25
Co	µg/L	1.4	1.4	1.4	--	1000	50	5.62	1.44	1.20	1.25	0.26	0.22
Cr	µg/L	40	6	1	50	1000	100	0.63	0.48	0.48	0.74	0.28	0.28
Cu	µg/L	2.5	1.8	1.4	2000	500	200	0.46	0.15	0.14	1.01	0.70	0.76
DOC	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
F	µg/L	7400	3400	1700	1500	2000	--	906	111	82.3	1232	74.0	63.9
Fe	µg/L	730	430	280	--	--	5000	44.8	29.0	29.9	330.6	84.4	80.8
Hg	µg/L	5.4	1.9	0.6	7	10	2	0.033	0.008	0.005	0.108	0.092	0.100
K	mg/L	--	--	--	--	--	--	18.6	3.84	2.94	14.5	2.75	2.30
Mg	mg/L	--	--	--	--	--	--	83.4	6.80	5.22	113	4.89	3.91
Mn	µg/L	3600	2500	1900	400	--	20	47.5	17.9	15.8	57.9	7.43	6.71
Mo	µg/L	34	34	34	--	50	10	49.0	2.76	1.34	66.8	2.35	1.40
NO3-N	mg/L	--	--	--	11.3	440	30	2.78	0.61	0.51	1.50	0.19	0.14
Na	mg/L	--	--	--	--	--	--	70.5	35.5	33.7	87.6	8.16	7.01
Pb	µg/L	9.4	5.6	3.4	10	100	5000	3.29	0.60	0.55	4.45	0.12	0.08
Sb	µg/L	17	13	9	20	--	--	55.0	10.3	7.79	62.9	7.59	5.41
Se	µg/L	34	18	11	40	50	20	2.91	0.40	0.26	2.77	1.03	0.95
SO4	mg/L	500	--	--	--	1000	--	349	31.0	23.6	475	9.61	4.76
Sr	µg/L	--	--	--	--	--	--	2005	188	125	2732	321	315
Tl	µg/L	--	--	--	--	--	--	0.03	0.01	0.01	0.05	0.04	0.05
TOC	mg/L	--	--	--	--	--	--	1.53	0.98	0.97	2.76	2.46	2.61
U	µg/L	0.5	0.5	0.5	30	--	--	17.4	1.52	0.99	23.8	1.01	0.68
V	µg/L	6	6	6	--	--	100	2.27	0.33	0.22	1.98	0.68	0.62
Zn	µg/L	31	15	8	--	24000	2000	7.66	1.78	1.72	10.4	1.42	1.39

With respect to the beneficial uses of groundwater, it is assumed that simulated surface water quality at SC01 and RS03 are representative of resultant groundwater in the Ardgour and Bendigo Aquifer, respectively (i.e., assumes no dilution of infiltrating surface water with native groundwater). Note that modelling assumes all contaminant load leaving the BOGP reports via surface water (which then reports to groundwater, although that process is not represented the WLBM).

Even with this conservative assumption, no exceedances of the LDWG or LIW were predicted for any analyte at either SC01 or RS03. Only maximum concentrations of antimony exceeded the DW MAV (20 µg/L). Both the mean and median uranium concentrations were at least 5x lower than the DW MAV suggesting that any water quality exceedances would be temporally limited and therefore unlikely to compromise the beneficial use of the surface water resources.

7.3 Assessment of Environmental Effects

Predicted operational MIW discharges to Shepherds Creek (through SC01) and Rise and Shine Creek (through RS03) are expected to predominantly meet water quality criteria protective of ecosystem values and the beneficial use of groundwater as a drinking water. The assessment indicates a low level of risk to both freshwater ecosystems and downstream water users, with relatively few exceedances predicted and most being limited to infrequent peak concentrations rather than sustained exposures.

7.3.1 Assessment of Effects to Freshwater Ecosystems

The ecological risk assessment indicates that the majority of analytes are predicted to remain below applicable ANZG SPLs with predicted exceedances limited to antimony, molybdenum, uranium and, to a lesser extent, lead and zinc.

Antimony appears to be endemic to the area and has been noted (MWM, 2025c) to be elevated in association with the natural geology in the project area. Although maximum antimony concentrations exceeded the ANZG 80% SPL at both SC01 and RS03, median concentrations remained below the applicable guideline values at both locations. This pattern indicates that elevated antimony concentrations are likely to occur only during episodic periods rather than as persistent conditions. Consequently, antimony-related effects on terrestrial and aquatic biota are expected to be infrequent and short-term with limited potential for chronic ecological impacts.

Similarly, maximum molybdenum concentrations exceeded the 95% SPL at SC01 and RS03, and maximum lead and zinc concentrations exceeded the 95% SPL at RS03. However, mean and median concentrations remained substantially below the guideline, indicating that exceedances are driven by short-duration peak events rather than sustained concentrations. On this basis, although acute exceedances may infrequently occur during operations, these metals are considered unlikely to pose a chronic risk to aquatic communities.

Predicted uranium concentrations exceeded the generic ANZG SPL under maximum, mean and median conditions. While this suggests a potential ecological risk under a conservative screening assessment, the significance of this exceedance is uncertain, particularly as uranium concentrations appear to be elevated in surface water throughout the Shepherds Creek and Rise and Shine Creek catchments. Additionally, uranium toxicity is strongly influenced by water chemistry. The receiving waters within the BOGP area are typically moderately hard, alkaline and well buffered, conditions that favour the formation of uranium-carbonate complexes and generally reduce uranium bioavailability. Accordingly, it is considered likely that application of the generic uranium SPL overestimates ecological risk under site-specific conditions. While some uncertainty remains, the potential for significant ecological effects associated with uranium is considered low.

Overall, the predicted water quality suggests a low risk of adverse ecological effects. Exceedances are generally limited to maximum concentrations and are not reflected in median conditions, indicating that aquatic communities would not be exposed to prolonged concentrations above ecological guideline values. Consequently, based on the predicted surface water quality for the operational period of the mine, the ecological integrity of receiving environments is expected to be maintained within the project area, at the compliance points, and in the downstream surface water receiving bodies including Bendigo Creek, and the Lindis River (and by extension the Clutha River).

7.3.2 Assessment of Effects to Beneficial Use of Water Resources

Conceptually, surface water discharge from the site has the potential to impact the beneficial use of surface water via direct discharge to downstream creeks, streams, and rivers. Additionally vertical migration of surface water into the underlying Ardgour and Bendigo alluvial aquifers, particularly within the Shepherds Creek catchment where the Shepherds Creek where the Shepherds Creek is a losing stream whereby surface water recharges the underlying aquifer through a permeable stream bed. This provides a potential direct pathway for surface water discharges to potentially compromise the beneficial use of water resources. Within the Rise and Shine Creek, recharge to the Bendigo Aquifer occurs via vertical leakage from the stream to the aquifer.

The water quality discharged to the environment during the Operational Phase is predicted to have a negligible impact on the beneficial use of surface water and groundwater resources downstream of the BOGP on the basis that:

- Predicted concentrations of all analytes remained below thresholds considered protective of livestock health and productivity. Accordingly, the beneficial use of surface water and groundwater resources for stock drinking water is expected to be maintained throughout operations. No adverse effects on livestock health, growth, reproduction or agricultural productivity are anticipated as a result of predicted water quality changes.
- No exceedances of long-term irrigation water (LIW) criteria were predicted for any assessed analyte at SC01 or RS03. The assessment indicates that predicted water quality would remain suitable for sustained irrigation use, with no anticipated risks relating to phytotoxicity, soil accumulation of trace elements, or degradation of soil quality. Consequently, the beneficial use of groundwater and surface water resources for irrigation is expected to be maintained over the long term.
- Although peak antimony concentrations exceed the drinking water MAV, the exceedances are predicted to be infrequent and transient rather than representative of prevailing water quality conditions. Any seepage from affected surface waters to groundwater would be expected to undergo dilution through mixing with background groundwater and recharge waters, resulting in lower concentrations than those observed in source waters. Consequently, while localised short-term exceedances cannot be entirely discounted immediately adjacent to seepage pathways, the potential for sustained groundwater concentrations exceeding drinking water criteria is considered low, and the beneficial use of water resources for potable supply is unlikely to be materially compromised. The overall risk to human health is therefore considered low,

particularly where normal drinking water treatment and source management practices are applied.

8 SUMMARY

The BOGP Operational Phase site wide WLBM results suggest the following:

- Water balance calculations suggest that the site will be in a water surplus condition as a result of MIW generation exceeding losses from the system through entrainment of water in tailings and evaporation. An engineering control of incorporating evaporation cannons has been introduced into the model to managed excess water. With this control, TSF pond volume typically stays within the 300,000 m^3 to 400,000 m^3 range, with volumes less 700,000 m^3 simulated. These volumes are understood to be achievable within TSF design constraints.
- Additional engineering controls are available to further manage these potential water surpluses. Ongoing site water balance reconciliation of the site will be required to confirm water balance conditions remain in a water surplus condition.
- Being in a water surplus, the process plant will only require additional raw water to meet demand for the first 2 years of mine life on average.
- Surface water quality at RS03 will remain below the proposed compliance limits.
- In contrast, concentrations at SC01 are projected to exceed compliance limits, with nitrogen (N) exceeding thresholds in 2038 (Year 11) and antimony exceeding thresholds in 2037 (Year 10). Additional engineering controls may be required to adaptively manage these risks.

To mitigate these projected exceedances, it is recommended that a water treatment plant be designed and integrated into the operational schedule to allow for operational readiness should it be required. The treatment system should be specifically engineered to target the removal of nitrogen species and antimony to ensure downstream water quality remains in compliance with environmental limits. However, ongoing performance monitoring data should be analysed prior to verify whether treatment deployment is required, and to adjust the schedule (e.g. bringing forward or postponing implementation) based on ongoing water quality monitoring datasets. The reader is directed to Section 6.4 for further recommendations.

The assessment of environmental effects indicate:

- the predicted water quality suggests a low risk of adverse ecological effects. Exceedances are generally limited to maximum concentrations and are not reflected in median conditions, indicating that aquatic communities would not be exposed to prolonged concentrations above ecological guideline values. Consequently, based on the predicted surface water quality for the operational period of the mine, the ecological integrity of receiving environments is expected to be maintained within the project area, at the compliance points, and in the downstream surface water receiving bodies including Bendigo Creek, and the Lindis River (and by extension the Clutha River).
- The water quality discharged to the environment during the Operational Phase is predicted to have a negligible impact on the beneficial use of surface water and groundwater resources downstream of the BOGP

9 LIMITATIONS

Attention is drawn to the document "Limitations", which is included in Appendix B of this report. The statements presented in this document are intended to provide advice on what the realistic expectations of this report should be, and to present recommendations on how to minimise the risks associated with this project. The document is not intended to reduce the level of responsibility accepted by Mine Waste Management, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in doing so.

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APPENDIX A ADOPTED CATCHMENT AREAS

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14
SC01 - Catchment areas														
Area														
Process Plant Pad														
Enviro Plant Sump reagent side (m2)	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00	27,723.00
Environmental sump non reagent side (m2)	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00	21,898.00
Process Plant Feed Pond (m2)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Reagent Sump at Process Plant	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
Environmantal silt pond at Process Plant	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
Process Plant Run on South Side (Clean) (m2)	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	639,593.00	558,986.00	558,986.00	639,593.00
Process Plant Run on North Side (Clean) (m2)	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00	141,882.00
Shepards Creek Lower Process plant Down run on North (m2) (N1)	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00	177,786.00
Tailings Storage Facility														
TSF total Inpoundment area below Stormwater Cut off drains (m2) (A)	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00	850,903.00
TSF Lake tailings area at year end (m2) (B)	87,811.00	132,033.00	179,749.00	222,987.00	260,976.00	277,137.00	311,023.00	346,458.00	374,429.00	393,643.00	425,001.00	446,433.00	479,409.00	502,417.00
Undisturbed area below Stormwatwer cut off drains (m2) =(A-B)	763,092.00	718,870.00	671,154.00	627,916.00	589,927.00	573,766.00	539,880.00	504,445.00	476,474.00	457,260.00	425,902.00	404,470.00	371,494.00	348,486.00
Northern TSF diversion Drain run on (m2)	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00	3,383,412.00
Southern TSF diversion Drain run on (m2)	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00	1,877,359.00
Haul Roads														
Rise and Shine Haul Road Total	94,624.00	64,257.00	57,072.00	57,072.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00	43,967.00
RAS Haul Road (m2) within shepherds infill catchment	53,684.00	23,317.00	16,132.00	16,132.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00	3,027.00
RAS Haul Road (m2) within siltpond catchment **(E)**	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00	40,940.00
Heavy Vehicle Workshop (m2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mine access road (Shepherds Gorge) (m2)	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00	61,696.00
Eaten up by RAS Pit extention		30,367.00	7,185.00	-	13,105.00	-	-	-	-	-	-	-	-	-
RAS PIT														
RAS Pit (m2)	269,676.00	467,990.00	546,112.00	570,761.00	611,313.00	634,772.00	634,772.00	634,772.00	634,772.00	634,772.00	634,772.00	634,772.00	634,772.00	634,772.00
RAS Pit Run ON (m2)	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00	72,633.00
RAS Pit Silt Pond (Within Pit) (m2)														
Come IN Time Pit														
Come In Time Pit (m2)	-	-	-	-	-	-	-	-	-	-	-	139,337.76	139,337.76	-
Clean Run off to Rise and Shne creek outside of Calculated areas												13,438.00	13,438.00	
Check areas Match (Josh)														
Shepherds Infill														
Shepherds Creeek Infill (m2)	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00	121,689.00
Shepherds Creek Infill Run On North (m2)	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00	729,269.00
Shepherds Creek Infill Run On South (m2)	821,699.00	673,685.00	623,529.00	597,350.00	575,755.00	553,548.00	553,548.00	553,548.00	553,548.00	553,548.00	553,548.00	508,230.00	508,230.00	553,548.00
Shepherds Creek Infill Run on South Minus Haul Roads	768,015.00	650,368.00	607,397.00	581,218.00	572,728.00	550,521.00	550,521.00	550,521.00	550,521.00	550,521.00	550,521.00	505,203.00	505,203.00	550,521.00
Shepherds ELF	**RL 610**	**RL640**	**RL 670**	**RL 700**	**RL 730**	**RL 760**	**RL 780**	**RL 780**	**RL 780**	**RL 780**	**RL 780**	**RL 780**	**RL 780**	**RL 780**
Shepards ELF disturbed area (m2)	324,362.00	499,524.00	729,651.00	877,290.00	970,067.00	1,110,104.00	1,110,104.00	1,110,104.00	1,110,104.00	1,110,104.00	1,110,104.00	1,110,104.00	1,080,978.00	1,080,978.00
Shepards ELF Exposed for Tipping (M2)	282,515.00	432,927.00	589,618.00	611,544.00	594,951.00	500,245.00	456,766.00	456,766.00	456,766.00	456,766.00	456,766.00	456,766.00	456,766.00	456,766.00
Shepards ELF Rehabilitated area (m2)	41,847.00	66,597.00	140,033.00	265,746.00	375,116.00	609,859.00	653,338.00	653,338.00	653,338.00	653,338.00	653,338.00	653,338.00	624,212.00	624,212.00
Shepherds Elf Southern Run on (To total area BDY)	1,307,783.00	1,132,621.00	902,494.00	754,855.00	662,078.00	522,041.00	522,041.00	522,041.00	522,041.00	522,041.00	522,041.00	522,041.00	522,041.00	522,041.00
Silt Pond Run On South (Inc Haul Road) **(D)**	246,874.00	237,903.00	209,482.00	209,482.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00	191,023.00
Silt Pond Run On South (=D-E)	205,934.00	196,963.00	168,542.00	168,542.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00	150,083.00
SRX Haul Road Rise and shine catchment (m2)													29,126.00	29,126.00
PONDS														
Shepards ELF Silt Pond (M2)	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00	12,591.00
ELF Seepage Pond (m2)	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00	2,098.00
Dust Feed Pond (m2)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
RAS Dust Water Pond (m2)	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00	1,830.00
RC03 - Catchment areas														
Area			**WELF Rehabilitated from year 3 onwards**											
WELF disturbance Area	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00	171,272.00
West ELF Silt Pond (Assumed)	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
WELF Run On (m2)	152,103.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00	110,752.00
SRX pits														
SRX Pit (m2)	0	0	0	0	0	0	0	0	0	0	0	0	144,821.00	144,821.00
SRX ELF (m2)	0	0	0	0	0	0	0	0	0	0	0	0	160,123.00	160,123.00
RAS Creek Catchment North	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	1,269,456.00	935,386.00	935,386.00
RAS Creek Catchment South	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00	2,885,713.00
SRX Haul Shepherds Creek catchment (m2)	0	0	0	0	0	0	0	0	0	0	0	0	32,697.00	32,697.00

APPENDIX B LIMITATIONS

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MINE WASTE MANAGEMENT

GREENROAD GROUP