Appendix EE Draft Lake Level and Water Management Plan

Taharoa Ironsands Limited

DRAFT Lake Level & Water Management Plan

October 2025

For Fast-track application for Central and Southern Blocks

Review and Version Control

Version	Description	Prepared By	Approved By	Date
1	Appendix E Taharoa CMP	NZSM	NZSM	February 2015
2	Updated for spiral plant	NZSM	NZSM	September 2015
3	Updated for TIL changes	K. Christiansen / J. Ivory	Mine Manager	October 2019
4	Internal annual review	A. Glockner	-	April 2022
5	Review for WRC	A. Glockner		November 2023
6	Review and updates for Fast-track application	Enviser Ltd		October 2025

Contents

1 Introduction

Taharoa Ironsands Limited (TIL) operates the Taharoa alluvial mine site on the West Coast of New Zealand. At Taharoa, ironsand (titanomagnetite) is mined for export.

TIL holds a suite of resource consents from Waikato Regional Council (WRC) authorising a range of activities relating to the operations at the Taharoa mine site. The consents expired in 2020, and a replacement suite of consents are the subject of an application under the Fast Track Approvals Act 2025 (FTAA).

1.1 Document history

As part of the replacement application the previous Water Management Plan (WMP) has been updated. It has been renamed as Lake Level and Water Management Plan (LLWMP) because it now includes additional information about monitoring and managing water levels in Lake Taharoa, among other matters proposed as part of the FTAA application.

This version refers to what is proposed in the FTAA application. It must be reviewed and updated following resource consent decisions, and when there are changes in site operations and management procedures relating to water and discharge permits and activities.

1.2 Objective & contents

The content of this draft LLWMP builds on the previous WMP and the requirements of the proposed consent conditions.[1] This LLWMP sets out procedures:

- To monitor and maintain the residual flow in Wainui Stream.
- To monitor and maintain the fish pass.
- To monitor the effectiveness of the fish pass at providing fish passage.
- For water take and recycling.
- To reduce water abstraction if there are adverse effects on the health of the raupo and flax wetlands on the margins of Lake Taharoa.
- To ensure that all consent requirements regarding the monitoring and measurement of the level of Lake Taharoa are met.
- To manage discharges to land, water and the marine environment, as set out in the consent conditions.

This draft LLWMP has been collated with content provided by technical experts who have prepared advice for the FTAA application, including:

- Williamson Land & Water Advisory – hydrology and hydrogeology
- SLR – freshwater and terrestrial ecology.

2 Scope

This LLWMP applies to the Taharoa Ironsands mining and export operations. It forms part of and should be read in conjunction with the Taharoa Mine Environmental Management Plan. All consents

[1] FTAA application proposed conditions: Schedule 1 – General Conditions 18

proposed as part of the FFTA application, and which are referred to in this LLWMP, are set out in Table 1.

Table 1: Water and discharge consents sought under the FTAA.

Consent type	Proposed consent number	Description of activity
Land Use	142035.01.01	Undertake iron sand mining operations and associated land disturbance activities, including (but not limited to) construction of dredge ponds, stormwater ponds, water supply/storage ponds, access roads, iron sand stockpiles, wetlands and other features for environmental offsetting, compensation, restoration and/or rehabilitation purposes, and ancillary buildings.
Water	142035.02.01	To dam and divert the Wainui Stream for the purpose of creating a water supply reservoir for iron sand mining operations on the Taharoa C Block.
	142035.03.01	To occupy the bed of the Wainui Stream via a rock weir and the associated of diversion of water through a fish pass channel adjacent to the Wainui Stream.
	142035.05.01	To take water from a water supply reservoir created by the damming of the Wainui Stream, for the purpose of ship loading and iron sand mining operations (including the operation of the on-site plant nursery) and for establishment and maintenance of ecological buffer and offset planting wetlands and other features for environmental offsetting, compensation, restoration and/or rehabilitation purposes, including augmentation of flows and water levels in perennial water bodies and wetlands (whether natural or constructed).
	142035.14.01	To divert groundwater in association with ironsand mining operations.
	142035.16.01	To take water from a dredge pond as a result of extraction of sand.
Land use and discharge	142035.18.01	To destroy and/or disturb natural inland wetlands and dewater natural inland wetland by undertaking mining within 100m of a natural inland wetland.
Discharge	142035.06.01	Incidental discharge of settled stormwater and washdown water into the Wainui Stream from the area containing the administration building, stores compound and workshops.
	142035.07.01	To discharge process water into the ground as a result of iron sand mining operations.
	142035.08.01	To discharge mine overburden onto land for the purpose of rehabilitating mined areas.
	142035.12.01	To discharge ship loading water, including freshwater and fine sediment, to water in the Coastal Marine Area during ship loading operations.

	142035.13.01	To discharge stormwater and process wastewater in the Coastal Marine Area.
	142035.15.01	Discharge mining process water and water containing contaminants from a mining dredge into water within a dredge pond.
	142035.17.01	Discharge mining process water and other water potentially containing contaminants into the ground as a result of incidental discharges arising from iron sand mining operations.

All activities currently occurring at the site must be undertaken in general accordance with the documents submitted with the original consent application and previous WMP, until/unless new resource consents are granted. From that point in time, activities must be undertaken in general accordance with the documents submitted with the FTAA application and set out in this LLWMP.

3 Responsibilities

The broad responsibilities and accountabilities under this LLWMP are set out in Table 2.

Table 2: Responsibilities and accountabilities

Responsibility		**Accountability**
Consent Compliance	Water Management Taharoa Mine	Taharoa Mine Manager
	Water Management Ship-loading	Taharoa Port Manager
	Stopping operations when a consent non-compliance is identified until the cause of the non-compliance is investigated and resolved. Operations to restart following approval of Waikato Regional Council or Waitomo District Council.	Taharoa Mine Manager
	Investigating instances of consent non-compliance	Taharoa Management
General Monitoring	Maintain monitoring program	HSE Manager
	Keep monitoring records	HSE Manager
	Collect ballast water samples during ship loading and sending for analysis	Port Manager
Maintenance	Maintain infrastructure and equipment associated with water management (Mine)	Maintenance Superintendent
	Maintain infrastructure and equipment associated with water management (Port)	Taharoa Port Manager
	Maintain Wainui Stream dam, residual stream flows and the fish pass	Maintenance Superintendent
	Maintain monitoring instruments so they are always fit for purpose as required by the consent conditions	HSE Manager

	Quarterly maintenance and cleaning of the dam weir, fish pass intake and outlet	HSE Manager
Fish Pass	Monitoring program and data collection	HSE Manager
	Maintain fish pass clear of weeds	HSE Manager
	Notifying the Production Superintendent when a breach of consent conditions is identified during monitoring	HSE Manager
	Notifying the Maintenance Superintendent when maintenance is required on instrumentation within the fish pass or dam and Mine Manager where additional maintenance is required on the streambed.	HSE Manager
Lake Taharoa	Lake level monitoring	HSE Manager
	Lake margin wetland monitoring	HSE Manager
Wainui Stream	Monitoring water levels in the reservoir at the water intake structure (immediately upstream of the dam structure)	HSE Manager
	Monitoring abstraction from the Wainui Stream (above dam structure)	Maintenance Superintendent/HSE Manager
	Wainui Stream residual flow monitoring (immediately downstream of dam structure)	HSE Manager
	Monitoring the residual flow through the fish pass	HSE Manager
Mitiwai Stream	Mitiwai Stream flow rate monitoring at two locations	HSE Manager
	Discharge of water into Mitiwai Stream (augmentation under certain circumstances)	HSE Manager
Natural Inland wetlands	Monitoring water levels in some natural inland wetlands	HSE Manager
	Discharge of water into natural inland wetlands (under certain circumstances)	HSE Manager
Reporting	Providing data for compilation into an annual report	HSE Manager
Plan review	Ensuring this management plan is reviewed and updated as necessary, at least annually and within 6 months of a change to an associated consent condition.	Mine Manager
	Providing a copy of updated documents to the Waikato Regional Council	Mine Manager

4 Freshwater Environment

4.1 Surface water

Natural water bodies on, or adjacent to the Site include the Wainui Stream, the Mitiwai Stream, the Taharoa Lakes, and Raupo Wetland(s) on the margins of Lake Taharoa. The Tasman Sea is the western boundary of the Taharoa Mine. The hydrology within and adjacent to the site are described in the technical report prepared by WWLA which forms part of the FTAA application.[2]

The Wainui Stream meanders through the centre of the mine, between the Central and Southern Blocks, and is the out-flow from the Taharoa Lakes. This stream runs approximately 3 km from Lake Taharoa, to discharge into the Tasman Sea. TIL is authorised to dam and divert Wainui Stream to create a water supply reservoir for the mine, and to take and use water from the reservoir for mining activities.

Lake Taharoa is a freshwater body of approximately 224 hectares with an extensive wetland area. Two smaller lakes, Numiti and Rotoroa, are interconnected with Lake Taharoa. The main inflows to the lakes are from a scrub, exotic forestry and pasture catchment of approximately 35.5 km^2 (WWC, 1998). Drainage from the three lakes is by the Wainui Stream.

The Mitiwai Stream flows on the northern boundary of the Central Block. The flow rate at two locations on the stream is monitored to ensure that mining activities in the Central Block do not adversely affect stream flow or ecological values in the stream.

Mining activities must provide for the protection of the natural water bodies by ensuring a set-back of 30 m from perennial freshwater systems and 100 m above the coastal margin.

4.2 Groundwater

Taharoa sits in free-flowing alluvial sands that are characterized by their high permeability. The groundwater environment is described in the technical report prepared by WWLA and which forms part of the FTAA application.[3] Most of the rain encountered at the mine settles into the ground water but in high rainfall events surface ponding can result above less permeable clay-rich layers. During the recent drilling campaign groundwater elevation logging has taken place.

TIL has applied for a water permit to take, divert and discharge groundwater in association with ironsand mining operations, as well as permits to dewater wetlands which are hydraulically connected to groundwater and which may be adversely affected by mining activities.

5 Mining Activities

Mining activities occur above and below the water table and water is integral for mine operations. Water is diverted, dammed and taken from Wainui Stream for use in sand extraction, processing and transport (including ship loading), and is discharged to settlement ponds for treatment and re-used back in the mining process. This is achieved via constructed settling ponds across the site. Some of

[2] Taharoa Mine– Hydrology Assessment, 5 September 2025.
[3] Taharoa Mine - Assessment of Groundwater Effects, 17 September 2025.

these ponds are permanently established (like those at the Spiral Separation Plant) and others are more temporary and are established to suit the current mining operations and location.

Information regarding the management practices that are to be implemented to avoid, remedy or mitigate the adverse effects of diverting, damming and taking water from Wainui Stream, on the stream and lake, are included in Sections 6 and 7 of this LLWMP.

5.1 Spiral Separation Plant

The Spiral Separation Plant (SSP) consists of three separate modules which are run in parallel. The process water required to run the plant can vary based on plant settings, feed rate and quality. Concentrate is discharged to the export stockpiles; the tailings are pumped as a slurry to the active tailings disposal areas and excess water is discharged to settling ponds adjacent to the SSP for recycling.

Figure 1. Spiral Plant and SSP Ponds.

Interlocks and alarms are established for pond and recycle water management, as set out in Attachment 2. Water is recirculated from these ponds, as set out in the Citect diagram (Attachment 1). The Citect diagram is visible in the Spiral Control Room and is used to provide real-time information on the water circuits.

5.2 Tailings System

The tailings system is an integral part of the mine water circuits and is therefore relevant to this LLWMP. Tailings are deposited into the worked-out areas of the mine, as a slurry, using a downstream deposition method. There are two operating tailings areas: the south and central areas of the mine. The tailings guns are regularly moved throughout the mine and positioned at the top of embankments in areas where sand extraction has already taken place.

Water seeping from tailings areas percolates to groundwater, as well as flowing to the water reclaim within each tailings facility. This typically comprises a series of collection canals and settlement ponds.

This water can then be pumped back to SSP (Spiral Separation Plant) Ponds, reducing the amount of makeup water introduced into the system.

The tailings settling ponds are unlined and, in some locations, groundwater may enter the ponds and mix with the tailings water. Eventually, this groundwater will return to the ground, via seepage or soakage across the mine.

Water is recirculated from these ponds as set out in the Citect diagram (Attachment 1).

5.3 Concentrate Stockpile

The concentrate stockpile is located adjacent to the main workshop and administration buildings. The filtrate water from the stockpile drains to the recycle ponds adjacent to the Pump Hall. Water is recirculated from these ponds as set out in the Citect diagram (Attachment 1).

5.4 Ship-loading and associated discharge to the CMA

The ship-loading operation is designed to transport the ironsand to a vessel moored at a deepwater mooring buoy 3.5 km offshore. The concentrate is reclaimed from by one of two conveyor systems from the export stockpile and mixed in a constant density feed tank with fresh water pumped from the Wainui Stream (usually via the K1000 storage pond). Banks of seven centrifugal pumps in series, are capable of loading vessels of 157,000 tonne nominal capacity at a combined rate of 2600 tonnes per hour. The titanomagnetite concentrate is pumped through two 318 mm diameter submerged steel pipelines, to a point on the seabed 30 m below the single berth mooring buoy. From the mooring buoy two 305 mm internal diameter hoses connect to marine floating hoses at the large buoy and convey the concentrate product to the moored vessel.

The mooring buoy is 12 m in diameter and is anchored to the seabed by six sets of chains and anchors, each weighing 124 tonnes. It is specifically designed to allow a moored vessel to rotate freely around its circumference in any given set of wind and tide conditions.

During ship-loading, excess water from the transport of ironsand to the ship is discharged into the Tasman Sea. AUTH142035.12.01 provides for up to 75,000 m^3/day and up to 7,500,000 m^3/year of ship loading water to be discharged to the Coastal Marine Area during ship loading operations. The volume of water discharged is monitored daily during ship loading and water quality samples are taken at least annually.

5.5 Other discharges to CMA

Where it is not possible to discharge excess stormwater and process water from the recycle ponds to ground, then AUTH142035.13.01 provides for discharge a maximum of 32,600 m^3 of water per day to CMA (coastal marine area) under the conditions of:

a) Where the discharge of excess stormwater and process wastewater to the CMA is necessary it shall be discharged at the ship loading buoy, coincident with ship loading of mined slurry.
b) There shall be no conspicuous oil, grease, scums or foams present after reasonable mixing.

The consent conditions will allow for stormwater and process water to be discharged into the CMA independently of ship loading events if required.

5.6 Stormwater

Stormwater and washdown water from the mine administration and workshop area (approx. 2 hectares) is directed to the hydrocarbon trap. The petrol facility has its own hardstand area which then directs water into the hydrocarbon trap. There is a catchment area specific for the 100,000-l diesel fuel tank, that catches stormwater and any runoff in case of a spill. From this area, the water is directed to the hydrocarbon trap. The hydrocarbon trap redirects water into the process water system (Figure 5).

To protect stormwater from contamination with fuels and other hazardous substances a Spill Prevention and Response Plan is implemented. This outlines the procedures for preventing and managing spills.

Figure 2. Stormwater management. A) Diesel fuel tank. B) Catchment area for diesel fuel tank. C) Hydrocarbon trap. D) Administration buildings catchment area. F) Petrol facility. Orange lines mark the bunding in place, to avoid runoff to reach the Wainui stream and direct any spills from the diesel tank to the catchment area. Black arrow indicates direction of water from the hydrocarbon trap to the process water system.

6 Wainui Stream

6.1 Water Supply Dam and Wainui Stream residual flow

In the early 1970's NZ Steel constructed a permanent dam across the Wainui Stream to allow water to be extracted for the mining process. The dam is located 500 m from the sea and forms a reservoir that merges with Lake Taharoa. At the dam, the stream passes over a concrete box weir and through two 1.5 m diameter concrete pipes and then across a concrete apron into the lower stream course. Ten metres below this, the stream passes over a 0.5 m high weir and continues through the dune out to sea.

The damming and diversion of water from Wainui Stream is authorised and will continue under consent AUTH142035.02.01.

To provide for sufficient flow in the stream and supply for mining operations, stream maintenance is required. A residual flow of 10 l/s, immediately downstream of the dam structure as measured at the outlet weir in the dam, will be maintained in the Wainui Stream (consent AUTH142035.02.01 conditions 4-6). This excludes the flow running through the fish pass. If the flow in the Wainui Stream is 10 l/s or less for a period exceeding 14 days, as prescribed in the consent conditions, a suitably qualified and experienced ecologist will be engaged to monitor instream ecological values downstream of the dam for a 7-day period, and to report on those values. If the ecologist considers that adverse effects are occurring, measures to address the adverse effect will be implemented and the WRC will be notified of the situation.

When the level in the Wainui Stream reservoir, immediately upstream of the dam drops below 9.36 m RL, augmenting flow through the dam may be required to ensure the residual flow downstream of the dam is being achieved.

Details about structure maintenance are set out in Section 10 of this LLWMP.

6.2 Water Intake and Abstraction

Water is taken from the Wainui Stream reservoir, as authorised, through eight pumps:

- Three pumps are for normal operations.
- Three pumps supply water to the spiral plant, spiral ablution block and laboratory.
- The additional pumps feed into a common manifold during ship loading.

The water intake is directly southeast of the box weir and consists of submerged pipes at a depth of 1.5 m. The pump intake is enclosed in a mesh screen to prevent the uptake of weed and fish.

The limits included as consent conditions (AUTH142035.05.01 conditions 3-5) are:

- 27,200 m^3 per day, as a 28-day rolling average, for operational use;
- 75,000 m^3 per day;
- 3,000,000 m^3 per year.

Water is used efficiently across the site - where possible it is recycled, and excess process water is directed to the Storage Pond for treatment and ship loading.

A 28-day rolling average water take is monitored to ensure compliance.

During ship loading all pumps are required to supply enough water to carry out the loading operations. Concentrations processes may occur concurrently with ship loading. Since October 2015 the Storage Pond (K1000) water, south of the concentrate stockpiles, is used for ship loading.

Process ponds, recycling ponds and tailings settlement ponds sufficiently treat the recovered water to allow it to be reused in the mining processes. Flocculation is used in the pond near TA05 (Tailings Area number 5) called the central pond, where process water is treated with flocculants to speed up the deposition of sediments. Clean water from the central pond is then pumped to K1000 and used for ship loading.

Pump uptake volume is measured, and the information is recorded on a secure database within the pump house. The flow to each plant can be cut off at the uptake pumps and all water can be diverted from this location.

Attachment 1 (Citect diagram) provides an overview of the water balance. Attachment 2 is a diagrammatic representation of control functional description for Ponds 1 & 4, with an explanatory table of the controls. It is important the pond levels are continuously monitored by the operators and recorded on inspection/log sheets.

The Resource Management (Measurement and Reporting of Water Takes) Amendment Regulations 2020 require that all consumptive freshwater water take consents with a water take rate of greater or equal to 20 litres per second telemeter their data to WRC. In June 2023, flow meters were installed on each of the eight pumps to comply with this requirement.

The system is calibrated with recorders maintained to an accuracy of +/- 5 percent. The system must be verified as accurate to +/- 5 percent within 3 months of the granting of consent.

6.3 Fish passage

Wainui Stream is a seasonal migratory route for many of the freshwater species living in lake Taharoa including inanga, eels, grey mullet, and smelt. Fish can swim around the dam via the fish pass (Figure 3). When the water level in Lake Taharoa falls below 9.3 m RL, a residual flow in the fish pass, of between 24 l/s – 34 l/s with a head of approximately 1-3 m, must be maintained. Augmentation, to minimise the risk of fish and aquatic species becoming stranded in the pass, may be required, involving a temporary pumping arrangement. This will allow flexibility in the rare event that pumping water to the fish pass will be required.

Temporary pumping procedures include:

- When in use the pump shall be seated on dry, stable ground.
- The pump must extract water from the reservoir from a distance no less than 3 m from the fish pass entrance. The pipe intake shall be screened to prevent fish access.
- The pump must discharge via a 100 mm flexible pipe into the upstream 1500 mm diameter manhole. The discharge shall be orientated to the manhole wall above the channel to dissipate energy and prevent erosion.
- The pump must operate continuously until such time as the reservoir level increases to 9.3m RL.

The fish pass must be maintained in good working order as per condition 3 of consent AUTH142035.03.01. All maintenance procedures are set out in Section 10 of this LLWMP.

The fish pass will be monitored to confirm its ongoing effectiveness for fish passage (consent AUTH142035.03.01 condition 4). The monitoring programme will be developed with stakeholders and incorporated into this plan.

7 Lake Taharoa water level and lake margin wetlands

Water levels in Lake Taharoa are monitored to manage any potential adverse effects of the damming and diverting of water from Wainui Stream, and of taking water from the reservoir, on the lake ecosystems and health. When the level of Lake Taharoa is:

- at or below 8.53 m RL, the taking of water must cease.
- below 9.3 m RL, the flow in the Wainui Stream must be augmented to ensure there is a residual flow in the fish pass of at least 24 m/s.
- less than 9.6 m RL for a continuous 30-day period, additional measures must be implemented.

The additional measures include:

- reducing as far as practicable the amount of water taken from the Wainui Dam reservoir;
- engaging a suitably qualified ecologist to monitor and report on the extent and health of raupo and flax wetlands on the margins of Lake Taharoa adjoining the Taharoa C Block;
- if monitoring demonstrates adverse effects on the raupo and flax wetlands as a result of mining activities, management measures will be implemented, such as:
    - [the measures to reduce water requirements are being considered and will be incorporated into the final LLWP]
- review this LLWMP and provide a copy to WRC within 30 working days.

See conditions 8-11 of AUTH142035.05.01, and the (draft) Natural Inland Wetland Management Plan for information about the raupo and flax wetland monitoring requirements.

8 Mitiwai Stream

When sand extraction is occurring in the Central Block, there may be a stream depletion effect in Mitiwai Stream (as set out in the hydrogeological assessment prepared by WWLA[4]).

The base flow in Mitiwai stream is monitored at two locations. The flow at the upstream recording site must be maintained at a minimum of 28 l/s during summer months. If the flow rate is less than 28 l/s, augmentation must commence. See consent AUTH142035.14.01.

Augmentation is anticipated to be required very rarely; therefore it is most practical to use portable pumps to pump water into the stream. Similar procedures will be implemented, as per the augmentation of flow in the fish pass, which are set out in the previous section (section 5.3).

Baseline monitoring of temperature, pH, and turbidity at both sites must be undertaken within 3 months of the commencement of the consent and monitored on an ongoing basis.

The relevant consent is AUTH142035.05.01 authorising the taking and use pf water for augmentation in Mitiwai Stream.

9 Natural Inland Wetlands

When mining activities are occurring close to wetlands they are vulnerable to dewatering effects if they are connected to the underlying groundwater.[5] Where groundwater is greater than 3 metres below ground level a wetland is most likely fed from surface water. Where groundwater is less than 1

[4] Taharoa Mine – Assessment of Groundwater Effects, 17 September 2025.
[5] Taharoa Mine– Hydrology Assessment, 5 September 2025

meter below ground level a wetland will be connected to groundwater. Where groundwater is between 1 and 3 metres below ground level a wetland is potentially connected to groundwater.

For wetlands which are to be retained (insert map showing these wetlands following FTAA decision), a 30m setback will be established and water level monitoring in the wetlands, for a 12-month baseline period, will be undertaken. This will form the basis of water level long-term simulation modelling, to define trigger levels for the setting of contingency measures, if water levels in the wetlands drop towards historical lows.

Contingency measures may include:

- Cessation of mining activities in proximity to wetlands during dry periods
- Supplementing water in the wetlands from the mine reservoir or storage ponds.

Detailed information about the monitoring and augmentation is contained in the Natural Inland Wetland Management Plan (Section 3).

The following proposed consents are applicable to the dewatering and augmentation of natural inland wetlands:

- AUTH142035.18.01 – destroy and/or disturb natural inland wetlands
- AUTH142035.05.01 – take and use water for augmentation in natural inland wetlands.

10 Key Controls

The controls that must be in place to ensure compliance with resource consent conditions and to minimise environmental effects are set out in Table 3. Aspects of these controls have been discussed in this Plan, are documented in the associated procedures and where appropriate scheduled into the Taharoa Mine Maintenance Program.

Table 3: Compliance controls, by activity type

Activity	Key controls	Secondary Controls, Contingency
Operations		
Mining Tailings disposal Stockpiling	• Mining and tailings disposal away from natural waterways (30 m from streams, 100 m from coast) • Engineered tailings disposal (drainage, slope angle)	• Riparian planting • Inspection following significant weather event • Decanted containment berms by natural waterways
Slurry pipelines over Stream	• Encased pipe work • Maintenance program to check integrity	• Process monitoring for loss detection
Concentration plants	• Runoff to treatment ponds • Wet Plant Pond spillway • Interlocks and alarms monitored (and preferably automated)	• Continuous monitoring • Decanted containment berms by natural waterways
Over burden Organics disposal	• May be used as mulch in riparian areas with containment berm	• Inspection following significant weather event
Heavy vehicle operation	• Vehicle maintenance • Refueling way from all waterways	• Spill kits • Operators trained in spill response
Process and Recycle water ponds		
Filling	• Interlocks and alarms monitored (and preferably automated) • Pond spillway • Decanted containment berms by natural waterways	• Continuous monitoring (preferably automated) • Enough capacity for likely overflow event • Inspection following significant weather event
Sediment removal	• Sediment removed before pond capacity reduced to <80% • Disposal in tailings area	
Ancillary earthworks		
Forming tracks and access Construction of ponds Installation of drainage Buried pipe work Drill pads	• Adjacent to water ways use silt fences, or other sediment containment devices • Stabilise areas as quickly as possible	• In sensitive areas consider timing of earthworks

Activity	Key controls	Secondary Controls, Contingency
Roads and tracks		
Surface runoff Stormwater	• Roads graded to ensure runoff to controlled drainage • Use of sediment traps, to avoid sediment loss to natural waterways • Maintenance program for open drains and sediment traps	• Riparian planting • Inspection following significant weather event
Stream maintenance		
Sediment and weed removal	• Timing to avoid fish passage • Suitable equipment and experienced operators • Monitoring program • Defined work brief	• Response to monitoring
Instream structure maintenance		
Maintenance of instream structures, including the dam/weir, fish pass and screen, and intake	• Regular inspections • Suitable equipment and methods to minimize disturbance to bed and banks of waterways	• Timing to avoid entrainment of fish
Workshops, stores, car parks, administration areas		
Workshops Stores Yards	• Containment of hazardous substances and oils • Oil traps in drainage system • Waste collection facilities • Housekeeping	• Regular audits of hazardous substance facilities • Spill kits • Operators trained in spill response
Fuel station	• Tank facilities meet regulatory standards • Located well away from natural waterway • Maintenance of filling equipment	• Spill kits • Operators trained in spill response
Laboratory	• Containment of chemicals • Treatment of scrubber effluent and washings • Waste collection facilities	• Spill kits • Operators trained in spill response
Administration Ablutions	• Maintenance program for septic tanks and effluent drainage fields • Waste collection facilities • Housekeeping	• Periodic inspection

11 Maintenance and Inspections

There are multiple structures required for mining activities which must be maintained and inspected, including:

- Instream structures – the Wainui Stream dam and fish pass, and water intake
- Monitoring equipment – measuring the flow rate in the Wainui Stream and Mitiwai Stream, measuring the lake level in Lake Taharoa
- Structures in the CMA – the pipelines and SMB.

Information about maintenance and inspections to ensure structures and monitoring equipment is in good working order, is included in the following sections.

11.1 Wainui Stream fish pass and weir

Parts of the fish pass and weir which may require maintenance from time to time, including the vertical slot plates, the substrate and perturbation boulders which are located throughout the fish pass. The vertical slots should be kept clear of debris. The plates have been designed to allow for corrosion, however if excessive corrosion is observed that is compromising their function, plates may need replacing.

The rock substrate should be maintained at a depth consistent with the construction drawings (generally 100 mm depth). Minor movement of the substrate is expected and acceptable providing the pass remains functional.

The perturbation boulders arrangement should be maintained consistent with the construction drawings (generally 300 mm clear spacing in the open channel at the top of the pass and 85 mm spacing in the culvert). Minor movement of the boulders are expected and acceptable providing the pass remains functional. The sheet pile headwall is designed to allow for corrosion, however if excessive corrosion is observed that is compromising its function, localised patch repairs may be required.

No regular maintenance of the geosynthetic clay liner is necessary under normal operational conditions. Should damage occur to the liner, the damage repair guidelines should be followed (refer manufacturers recommendations).

11.1.1 Routine Inspections

Routine visual inspections of the entire length of the fish pass are undertaken fortnightly by a suitably trained/experienced person. Generally, all exposed surfaces in the close vicinity of the pass should be inspected to check for any signs of new wet patches, springs, settlement and the like, or basically any significant change from the normal condition. Any obvious deterioration of any structure must also be noted.

The visual inspections should also include the condition of the plunge pool, weir rip-rap and low flow channel. Floating debris accumulating on the upstream face of the inlet (in the reservoir) or throughout the pass should be noted, so that it may be removed before it becomes a potential threat to operation.

The visual inspection will include:

- Excessive weed growth in the pass and upstream pool (behind sheet pile wall)
- Removal of foreign objects such as timber, branches from the fish pass
- Check of the safety rails and cages
- Check weed build up on reservoir side of sheet pile wall
- Check condition of fish pass mounts (sheet pile wall)

11.1.2 Inspections after unusual events

Unusual events include the following:

- Extreme rainfall at the dam site
- Earthquakes of a magnitude that they can be felt locally
- Sudden and unexpected deterioration of any structure or surface.

As soon as possible after a felt earthquake, local observers should undertake a close visual inspection of the whole fish pass. Where there are signs of significant deterioration of any structure or surface or there are signs of possible adverse behaviour from earthquake, a specialist consultant should be informed and requested to advise on the matter.

11.1.3 One to Two Yearly Performance Check

Inspections of the fish pass are required every one to two years to confirm satisfactory behaviour or identify deficiencies by a thorough visual examination of the pass. These inspections should be undertaken by an experienced engineer. The inspection would include:

- A visual check on the components of the facility including the reservoir near the dam.
- Discussion with operators on operation and maintenance of the pass and any issues of potential significance.
- Preparation of a brief report discussing:
  - condition and performance,
  - recommendations on any aspects related to safety and asset management.

11.2 Monitoring equipment

All monitoring equipment used across the site, for measuring flow rates and volumes of water taken from Wainui Stream and discharged at various locations, as well as stream flow rates and lake levels, shall be maintained in good working order. All monitoring equipment will be regularly inspected for damage and calibrated as set out in the consent conditions.

12 Monitoring and Reporting

12.1 Overview of requirements

Reference should be made to the resource consents for specific conditions relating to environmental monitoring and reporting. The following sections provide an overview of the requirements. The associated controlled procedures (refer section below) set out monitoring requirements in more detail.

The monitoring programme for the Taharoa mine consists of regular measurement of indicators relating to the damming, diversion, taking and use of water from the Wainui Stream, and discharge of stormwater and process water to the Wainui Stream, onto land, or into the sea as authorised by resource consents. As part of the Fast-track process, additional monitoring, of the flow rate in Mitiwai Stream, and of the health of the Lake Taharoa lake margin wetlands, shall be undertaken. Tables 4 and 5 below include a summary of the monitoring requirements.

The monitoring program must include a system for measuring and maintaining data records and compilation of regular reports and visual display material. Regular compliance reports, based on the

following monitoring program, are to be submitted to Council at the frequency set out in the resource consents.

All instrumentation and equipment are to be always maintained fit for duty, by means of a scheduled maintenance program, and calibrated to ensure accuracy is maintained. Where there is potential for equipment, or instruments, to be unavailable to undertake monitoring then it would be appropriate to maintain a spare of this item.

Monthly report and other specified records, in the format agreed with the HSE Manager. The monthly report, rainfall lake level records and fish pass data must be provided to the Mine Manager by the 5th day of the following calendar month.

Reporting to the WRC includes the automatic delivery of some data via telemetered systems, as well as an Annual Report which includes, among other matters, all monitoring results from the previous 12 month period, to be provided by 1 August each year.

A public website must be established (see condition 44 of Schedule 1 – General Conditions), which reports on the following matters relating to water and discharges:

- Annual monitoring reports
- Details and records of monthly water abstraction from the Wainui Stream
- Details and records of monthly stormwater discharged into the Tasman Sea
- Monthly water levels in Lake Taharoa and rainfall data.

To ensure the integrity of this environmental data, the monitoring must be undertaken at the specified frequencies (tables below) and to the required sampling and analytical standard.

Table 4: Discharge permit monitoring requirements

Sample Location	Frequency	Parameters
Discharge to land	Daily, when discharge occurs	Calculated volume
Discharge at ship loading	Daily volume, when discharge occurs Annual volume Discharge material, at least every six months	The daily volume must not exceed 75,000 m^3/day The maximum volume in any 12-month period must not exceed 7.5 x 10^6 m^3 Discharge composition (grain size composition within the suspension, clay mineralogy, heavy metal concentrations, during the loading cycle, one near the start, one in the middle and one near the end. Location must be as close as practical to the point where the discharge enters the marine environment.
Stormwater to Wainui Stream	Monthly	Turbidity (NTU) 20 m downstream Turbidity (NTU) 20 m upstream Observation of oil and scum

Stormwater and process water to CMA/sea	Daily when discharge occurs Monthly – turbidity analysis	Daily volume must not exceed 32,600 m^3/day Observation of oil and scum and erosion (caused by discharge) Monthly - Measure of the turbidity in NTU/FTU of the stormwater and comparing to the trigger value of 1,280 mg/l. For pH, TSS, metal concentrations

Table 5: Water Permit monitoring requirements

Sample Location	Frequency	Parameters
Pumps - mining and ship-loading	Daily	Monitoring the rate of abstraction and daily volume of water taken for mining and ship-loading
Lake Level and Dam level	Every 15 minutes and provided to WRC daily via telemetered system	RL above sea level in Wainui Stream at the water intake structure immediately upstream of the dam (daily) RL above sea level in Lake Taharoa – trigger levels are 9.6m, 9.3m and 8.53m
Residual flow in Wainui Stream	Daily	Flow rate immediately downstream of the structure of no less than 10 l/s through the outlet weir in the dam
Residual flow in the fish pass	Daily	Residual flow of 24 L/s must be maintained when the dam level is below RL 9.3m
Stormwater and process water to land	Daily when discharge occurs	Observation of oil and scum Erosion (caused by discharge)
Mitiwai Stream at 2 locations	Hourly/daily	Flow rate at 2 locations on the stream, when mining is occurring in the Central block
Water level in natural inland wetlands	Hourly/daily for a 12-month baseline period	See Natural Inland Wetland Management Plan, Section 2

12.2 Lake and dam levels

Water level in Lake Taharoa must be monitored on a continuous basis with 15 minute values of the lake water level provided to the WRC with the water abstraction data (see below). The system must have a reliable calibration and be maintained to an accuracy of +/- 5 millimetres. Calibration information must be provided to the WRC annually, every August.

Water level in the reservoir behind the dam must be monitored daily. The system must have a reliable calibration and must be maintained to an accuracy of +/-5%.

Data is reported in TIL's reporting.

12.3 Water abstraction

The abstraction of water from the reservoir is monitored continuously via a system telemetered to the WRC, which provides a daily report to the WRC. The system must meet the following criteria:

- 15 minute values of take volume
- Daily values of operating use volume
- Daily values of loading use volume
- 15 minute values of Lake Taharoa water level.

12.4 Fish Passage

Monitoring of flows and water levels upstream, downstream and in the pass itself is critical to ensure the ongoing optimum performance for fish passage. This following controls must be achieved:

- The downstream entry to the fish pass is submerged by at least 100 mm at all times
- The flow velocity in the fish pass does not exceed 0.3 m/s
- The pool at the entrance of the fish pass and access to the main channel of the Wainui Stream is kept free of aquatic weeds during the main fish migratory period (July -September)
- A pool depth at the base of the dam overflow chamber, of at least 0.5m, is maintained to provide for the downstream migration of fish species.

The ongoing effectiveness of the fish pass must be monitored (see Section 10.1 above).

The fish trap is deployed weekly, at the top of the fish pass. The trap is left for 24 hrs then recovered and the number of individuals and species is recorded in the spreadsheet. This information on the abundance of species present in the fish pass is provided in the Annual Monitoring Report.

Monitoring task		Routine weekly fish pass monitoring	Intensive survey	Wider catchment survey
Monitoring personnel		NZ Steel staff	Fisheries specialist	Fisheries specialist including possible NZ Steel staff and University involvement
Month (migration season starts in August)	Aug			
	Sep			
	Oct			
	Nov			
	Dec			
	Jan			Jan or Feb
	Feb			
	Mar			
	Apr			
	May			
	Jun			
	Jul			
Sample occurrence		Weekly over migration period	Two surveys (Jan and Oct) annually for five years	One survey each year for the first two years following commissioning of the upgraded fish pass then five years following the two year survey

12.5 Mitiwai Stream

Monitoring will occur at 2 locations on Mitiwai Stream, to provide assurance that the flow regime in the stream is not adversely affected by mining activities in the Central Block. Monitoring will inform a three-tier trigger level system which sets the management response and contingency measures if

an adverse effects from mining is identified. See Section 6.2.1 of the hydrogeology assessment report prepared by WWLA for more detail.

12.6 Lake Margin Wetlands

Monitoring requirements for the lake margin wetlands is set out in Section 2 of the Natural Inland Wetland and Buffer Management Plan and must occur at 12 sites during the months of February and March, every 5 years.

See Section 2 of the Natural Inland Wetland Management Plan for more detailed information about the monitoring requirements.

12.7 Natural Inland Wetlands

Water level monitoring should occur for a 12 month baseline period prior to activities near any natural inland wetlands. See Section 3 of the Natural Inland Wetland Management Plan for more detailed information about the monitoring requirements.

13 Incident Response and Reporting

When any resource consent condition is exceeded (i.e. a legal non-compliance), or other significant environmental incident occurs, the Mine Manager must be notified, and appropriate action taken.

An environmental incident is to be investigated by the Mine Manager or designate. All incident reporting is completed using the MARS database. For a non-compliance an incident report must be prepared and submitted to the HSE Manager within 24 h of it occurring, for notification to the Waikato Regional Council, following advice.

14 Plan Review

This Lake Level and Water Management Plan will be updated periodically, within 6 months of any variation of consent conditions and at least annually. It is recommended that annual reviews are carried out on or before [X] each year.

During the review the following should be considered:

(a) Monitoring data and trends
(b) Reported and investigated incidents
(c) Council compliance reviews and comments
(d) Findings from internal audits.

15 Improvement Strategy

Taharoa Ironsands Limited (TIL) took over the mine from NZ Steel in 2017. TIL is committed to continue identifying and implementing improvements to ensure efficient water use and protection of the natural waterways.

As new equipment and water systems have been commissioned improvements to the water balance and management controls have been identified and progressed. Where incidents have occurred the key outcomes from the incident investigations are assessed to determine where improvements must be made to ensure compliance and to minimize environmental effects.

Other opportunities to improve water efficiency will continuously be pursued.

16 Associated Documents

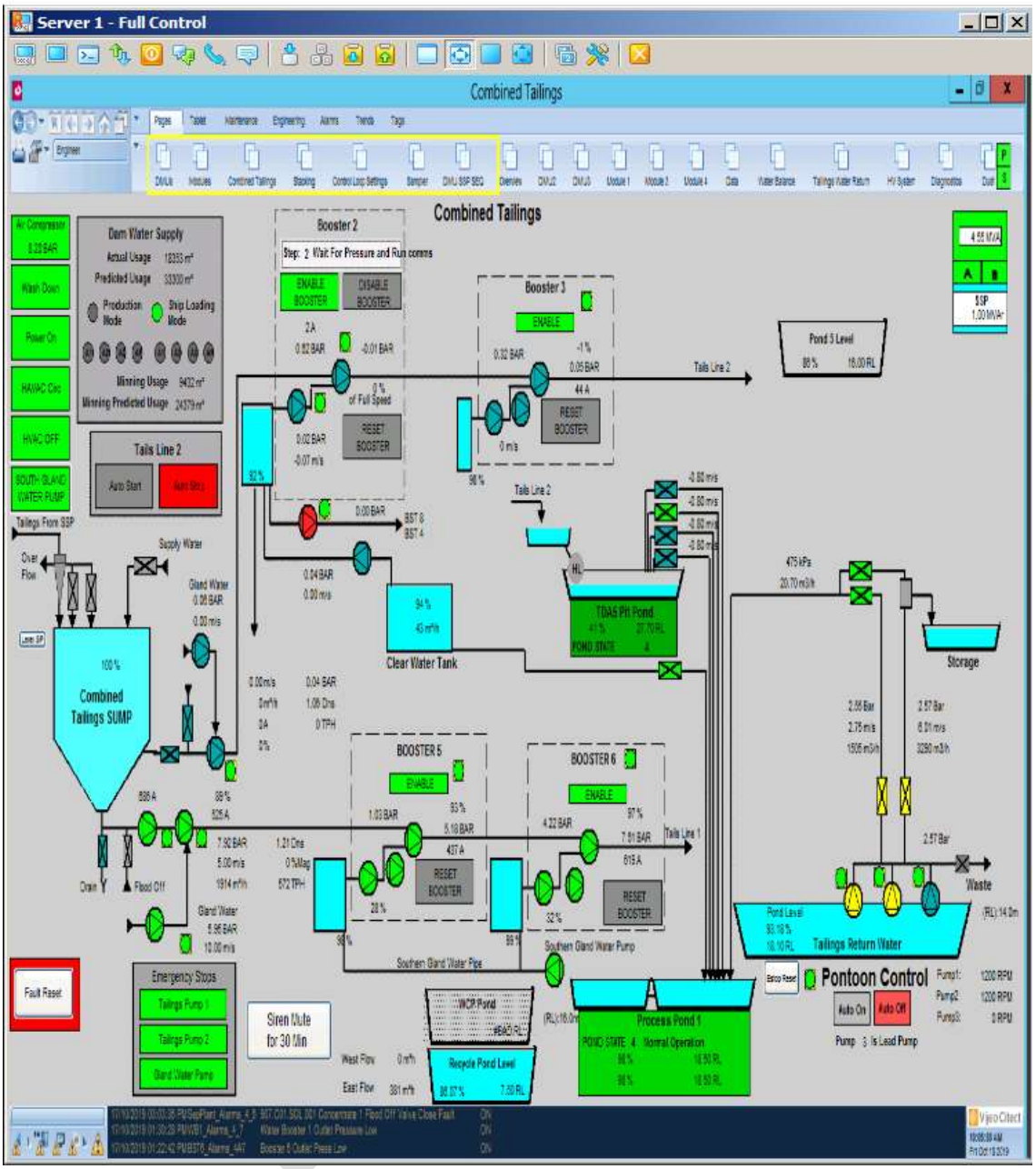
This LLWMP forms part of the Environmental Management Plan and should be read in conjunction with the EMP.

The procedures set out in Table 6 [to insert following FTAA decision] outline key responsibilities and functions for meeting consent requirements.

Table 6: Procedures to ensure compliance with consent conditions

Procedure Name	Issue Status – Revision Date

Attachment 1

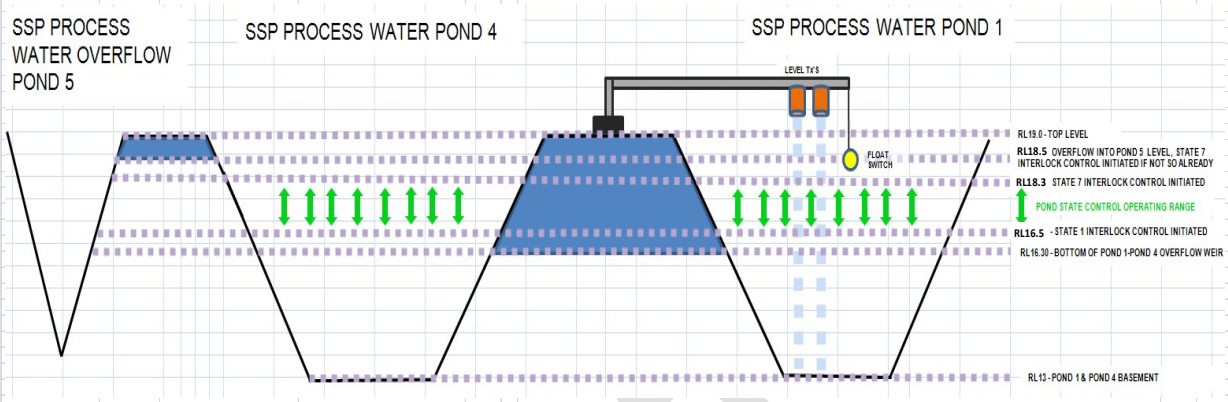


Attachment 2

RUNNING MODULES 1,3 & 4 FROM PONDS 1 & 4- CONTROL FUNCTIONAL DESCRITION

Date: 1/06/2015
Revision: K

Both tails return ponds (central and southern) in operation



Level Description	Level State	Pond 1 Water Level	Action	State
Base level	Basement	RL 13.0m		-
Lowest Water Level	Low-Low	**RL16.5 m - Trigger**	PLANT SHUTDOWN	1
Low Operation Level	Low	**RL16.50m <RANGE< RL16.70m**	SYSTEM ON FLUSH AND WATER SUPPLIES TO PONDS 1 & 4 AT FULL CAPACITY (i.e. stopping BF conveyors) (All Tails Return Water Pumps at southern and central areas running, and Dam Line to Ponds 1 & 4 - Valve fully open, concentrate return water valve open but feed disabled).	2
Approaching Low	Approaching Low	**RL16.70m < RANGE< RL17.4m**	NORMAL OPERATION BUT WATER SUPPLIES TO PONDS 1 & 4 AT FULL CAPACITY ((All Tails Return Water Pumps at southern and central areas running, and Dam Line to Ponds 1 & 4 - Valve fully open, concentrate return water valve open and feed enabled).	3
Normal Operation	Normal	**RL 17.4m < RANGE < 17.7m**	NORMAL OPERATION AND OPTIMUM POND LEVEL	4

State 1 -
All SSP process draw pumps interlocked not to run below RL16.5m level. Result at RL16.5m is plant shut down.

This state is triggered when Ponds 1 & 4 level reaches RL16.5m. All equipment as associated with Module 1, 3 & 4 is immediately crashed stopped. Equipment includes:

BF2, BF1 and water booster, all pond 1 and pond 4 pumps, RSS, all modules sump pumps, combined tailings pumps and booster pumps.

For this state water supplies to Ponds 1 & 4 remain active. This means:

1) All tails return water pumps in southern area running at normal level control.. Southern tails return water line valve fully open and

2) All tails return water pumps at central area running normal level control. Central tails return water line valve fully open and

3) Dam Valve fully open.

4) Concentrate Return Water valve - fully open. Water delivery dependant on available quantity of Concentrate Return Water without compromising wet plant operation.

Operators must wait for healthy pond level to be re-established (RL17.4m) before initiating a new plant start sequence.

Operators must monitor diesel return water pumps in central tails return area.

Operators to co-ordinate with Wet plant operators for availability of Concentrate Return Water.

High priority alarm will be active in the control room.

State 2 -
Will run on flush by dropping feed (i.e. stopping BF conveyors) between RL16.5m to RL16.7m

This state is triggered if Ponds 1 & 4 levels are dropping and a possible plant shut down is looming. Its designed to clear sand out of the system to facilitate a 'soft landing' if plant shut down (State 1 is triggered). No other equipment associated with Modules are affected.

For this state water supplies to Ponds 1 & 4 remain active and more water is required from Dam Line, Concentrate Return water and both Tailings Return supplies. This means:

1) All tails return water pumps in southern area running at normal level control. Southern tails return water line valve fully open and

2) All tails return water pumps at central area running normal level control. Central tails return water line valve fully open and

3) Dam Valve fully open.

4) Concentrate Return Water valve - fully open. Water delivery dependant on available quantity of Concentrate Return Water without compromising wet plant operation.

BF Conveyors are enabled again once Pond 1 level increases past RL16.9m.

Operators to co-ordinate with Wet plant operators for availability of Concentrate Return Water.

High priority alarm will be active in the control room. Operators should warn BF2/BF1 operators as to why conveyor has stopped.

Operators must monitor diesel return water pumps in central tails return area.

Extended duration on flush will cause issues at tailings deposits and concentrate return water pond levels. Operators must monitor conditions and shut down SSP plant if extended flush duration expected due to ponds 1 & 4 serious issues.

State 3 -
All modules equipment operation remains unaffected. Feed is enabled but more water is required from Dam Line, Concentrate Return water and both Tailings Return supplies

For this state water supplies to Ponds 1 & 4 remain active. This means:

1) All tails return water pumps in southern area running at normal level control. Southern tails return water line valve fully open and

2) All tails return water pumps at central area running normal level control. Central tails return water line valve fully open and

3) Dam Valve fully open - 100%.

4) Concentrate Return Water valve - fully open. Water delivery dependant on available quantity of Concentrate Return Water without compromising wet plant operation.

Operators must monitor diesel return water pumps in new central area.

Operators to co-ordinate with Wet plant operators for availability of Concentrate Return Water.

State 4 -
Normal Operation and all modules equipment operation remains unaffected.

For this state water supplies to Ponds 1 & 4 remain active. This means:

1) All tails return water pumps in southern area running at normal level control. Southern tails return water line valve fully open and

2) All tails return water pumps at central area running normal level control. Central tails return water line valve fully open and

3) Dam Valve 35% open

4) Concentrate Return Water valve - fully open. Water delivery dependant on available quantity of Concentrate Return Water without compromising wet plant operation.

No Operator response is required for this state.

Operators must monitor diesel return water pumps in new central area.

Operators to co-ordinate with Wet plant operators for availability of Concentrate Return Water.

Approaching High	Approaching High	**RL17.7m < RANGE < RL18m**	NORMAL OPERATION BUT WATER SUPPLIES TO PONDS 1 & 4 RESTRICTED (Stop all Tails Return Water Pumps at southern area, continue to run tails return water pumps in central location, close Concentrate Return Water valve and close dam line to ponds 1 & 4 supply valve)	5	**State 5 -** All modules equipment operation remains unaffected. Feed is enabled but no water is required from Dam Line, Concentrate Return Water line and Tailings Return supplies in the southern area but we continue to run tails return water pumps in central area. For this state water supplies to Ponds 1 & 4 stop apart from central tails return water. This means: 1)All Tails return water pumps switched off in auto. Also manual interlock introduced so that as long as Southern Tails return valve is closed and pond is above RL13 then all pumps can be run in manual. Also in addition as long as Southern Tails return valve is closed in this state then waste pump can be run locally regardless of south tails pond level (i.e. does not need to be above RL13) Southern tails return water line valve closed and 2) All tails return water pumps at central area running normal level control. Central tails return water line valve fully open and 3) Dam line supply to Ponds 1 & 4 - valve closed. 4) Concentrate Return Water valve - fully closed. Operators will need to monitor southern tailings return water pond level. If southern tailings return water pond high level alarm activated - Operators to divert to forest in manual to manage levels. Operators must monitor diesel return water pumps in central tails return area.
High Operation Level	High	**RL18m< RANGE < RL18.3m**	SYSTEM ON FLUSH AND WATER SUPPLIES TO POND1 RESTRICTED (i.e. stopping BF conveyors) (Stop tails return water pumps in southern and central areas, close Concentrate Return Water valve and close dam line valve to ponds 1 & 4.)	6	**State 6 -** Will run on flush by dropping feed (i.e. stopping BF conveyors) between RL18m to RL18.3m.This state is triggered if Ponds 1 & 4 levels are rising and a possible plant shut down is looming. Its designed to clear sand out of the system to facilitate a 'soft landing' if plant shut down (State 1 is triggered). No other equipment associated with Modules are affected. For this state water supplies to Ponds 1 & 4 stop. This means: 1) All Tails return water pumps switched off in auto. Also manual interlock introduced so that as long as Southern Tails return valve is closed and pond is above RL13 then all pumps can be run in manual. Also in addition as long as Southern Tails return valve is closed in this state then waste pump can be run locally regardless of south tails pond level (i.e. does not need to be above RL13) Southern tails return water line valve is be closed and 2) All tails return water pumps at central area stopped. Central tails return water line valve fully closed and 3) Dam line supply to Ponds 1 & 4 - valve closed. and 4) Concentrate Return Water valve - fully closed. Operators will need to monitor central and southern tailings return water pond levels. If southern tailing return water pond high level alarm activated - Operators to divert to forest in manual to manage levels. If central tails area level is two high then tails line to central area will be stopped (Central tails return FD) BF Conveyors are enabled again once Pond 1 level drops below RL17.70m High priority alarm will be active in the control room. Operators should warn BF2/BF1 operators as to why conveyor has stopped. Extended duration on flush will cause issues at tailings deposits and concentrate return water pond levels. Operators must monitor conditions and shut down SSP plant if extended flush duration expected due to ponds 1 & 4 serious issues.
Highest Water Level	High-High	**RL 18.3 m - Trigger**	ISOLATE ALL PONDS 1 & 4 WATER SUPPLIES -STOP BURIED FEEDERS AND PUMP PONDS 1 & 4 WATER AWAY TO TAILINGS	7	**State 7 -** Stops water supply to buried feeders and stops buried feeders . Runs flush through SSP plant modules to enable Ponds 1 & 4 to be pumped down via pumping water away to south tailings. Operators can restart buried feeders when pond level recovers to healthy level (RL17.6). For this state water supplies to Ponds 1 & 4. This means: 1) All Tails return water pumps switched off in auto. Also manual interlock introduced so that as long as Southern Tails return valve is closed and pond is above RL13 then all pumps can be run in manual. Also in addition as long as Southern Tails return valve is closed in this state then waste pump can be run locally regardless of south tails pond level (i.e. does not need to be above RL13) Southern tails return water line valve is closed and 2) All tails return water pumps at central area switched off. Central tails return water line valve fully closed and 3) Dam line supply to Ponds 1 & 4 - valve closed. 4) Concentrate Return Water valve - fully closed. Operators will need to monitor southern and central tailings return water pond levels. If southern tailing return water pond high level alarm activated - Operators to divert to forest in manual to manage levels. If central tails area level is two high then tails line to central area will be stopped (Central tails return FD) High priority alarm will be active in the control room. Control room operators should warn all operators.
Overtop Level.	High-High	RL 19.0		-	
POWER FAIL AT SSP	-	-	ISOLATE ALL PONDS 1 & 4 WATER SUPPLIES	8	**State 8 -** Loss of power at SSP - Close - Dam Valve, Concentrate Return Water Valve and both central and southern tails return water valves via UPS. Shut down all process plant and equipment. High priority alarm will be active in the control room. Control room operators should warn all operators. Operators must disable Tailings Return system via new screen disable function and must close dam line valve until problem is resolved. Operators must also shut down diesel tails return water pumps in central area.
Lost communications between SSP and BF	-	-	BF2 DROP FEED AND SHUT DOWN	9	**State 9 -** Drop feed and run flush until manual plant shut down . Control room operators to contact BF2 Operators High priority alarm will be active in the control room. Control room operators should warn all operators.
Lost communications between Southern Tails recycle water and SSP	-	-	STOP TAILS RETURN WATER FLOWS	10	**State 10 -** Stop southern tails return water return until manual plant shut down. This means: 1) All Tails return water pumps switched off in auto. Also manual interlock introduced so that pumps can be run in manual to allow operator to pump tails return water to the south pines via local valves - but if flow picked up to SSP Pond s 1 & 4 - the pumps are interlocked to stop pumps in manual until flow dropped off again and local push button fault reset is pushed and then waste water pumping to pines can be restarted. Close southern tails return water valve via UPS. Operators will need to monitor tailings return water pond level locally If tailing recycle water pond high level RL15.5 - Operators to divert to forest in manual to manage levels. High priority alarm will be active in the control room. Control room operators should warn all operators.
Lost communications between Tails Booster and SSP	-	-	BF2 DROP FEED AND SHUT DOWN	11	**State 11 -** Drop feed and run flush until manual plant shut down . Control room operators to contact BF2 Operators Also open combined tailings system sump pump discharge flood off valve. High priority alarm will be active in the control room. Control room operators should warn all operators.
SSP Plant Off	-	-	ISOLATE POND 1 WATER SUPPLIES	12	**State 12 -** Operators must disable both central and southern Tailings Return systems via new screen disable function and must close dam line valve and Concentrate Return Water Valve. Operators must also shut down diesel tails return water pumps in central area. To be added to other plant shut down SOP's.
Lost communications between Central Tails recycle water and SSP	-	-	ISOLATE POND 1 WATER SUPPLIES	13	**State 12 -** Stop central tails return water return pumps. Close central tails return water valve via UPS. Immediately - Alarm for operators to shut down to one module and put other modules onto water for flush period then shut those modules off. 30 Minutes following lost communications - Interlock to shut down central tailings line. High priority alarm will be active in the control room. Control room operators should warn all operators. Must monitor centrals tails return water levels.