Futura Resources

Fairhill Coal Project

Water Management Plan

Version: 003

1. Table of Contents

Document History

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2. Introduction

The Fairhill Coal Project (FHCP) is situated in the Bowen Basin region of Queensland, approximately 55 km north-east of Emerald, and is located on Mining Leases (ML) 700043. The FHCP operates under Queensland Environmental Authority (EA) number BRID0071 which requires the development and implementation of a Water Management Plan (WMP) The area authorised for disturbance by the EA is shown on **Error! Reference source not found.**.

Fairhill Coking Coal Pty Ltd (the EA holder), a wholly owned subsidiary of Futura Resources Limited, is required to actively manage surface water at the FHCP in accordance with the EA.

This WMP has also been developed by an appropriately qualified person, which meets the requirements of BRID0071.

3. Purpose and Scope

This WMP examines and addresses all issues relevant to the importation, generation, use, and management of water on a mining project in order to minimise the quantity of water that is contaminated and released by and from the FHCP. It addresses the construction, operation, and decommissioning phases of the FHCP and will be implemented for the duration of the mine life. The WMP will also identify the potential risks of environmental harm to natural waterways posed by mining activities, and the management actions that will effectively minimise these risks.

To achieve this, the WMP includes the following components:

- A list of environmental values and water quality objectives;
- A study of the source of contaminants;
- An updated detailed water balance model for the site;
- A list of water management infrastructure;
- A water management system for the site;
- Contingency procedures for emergencies; and
- A program for monitoring and review of the effectiveness of the WMP.

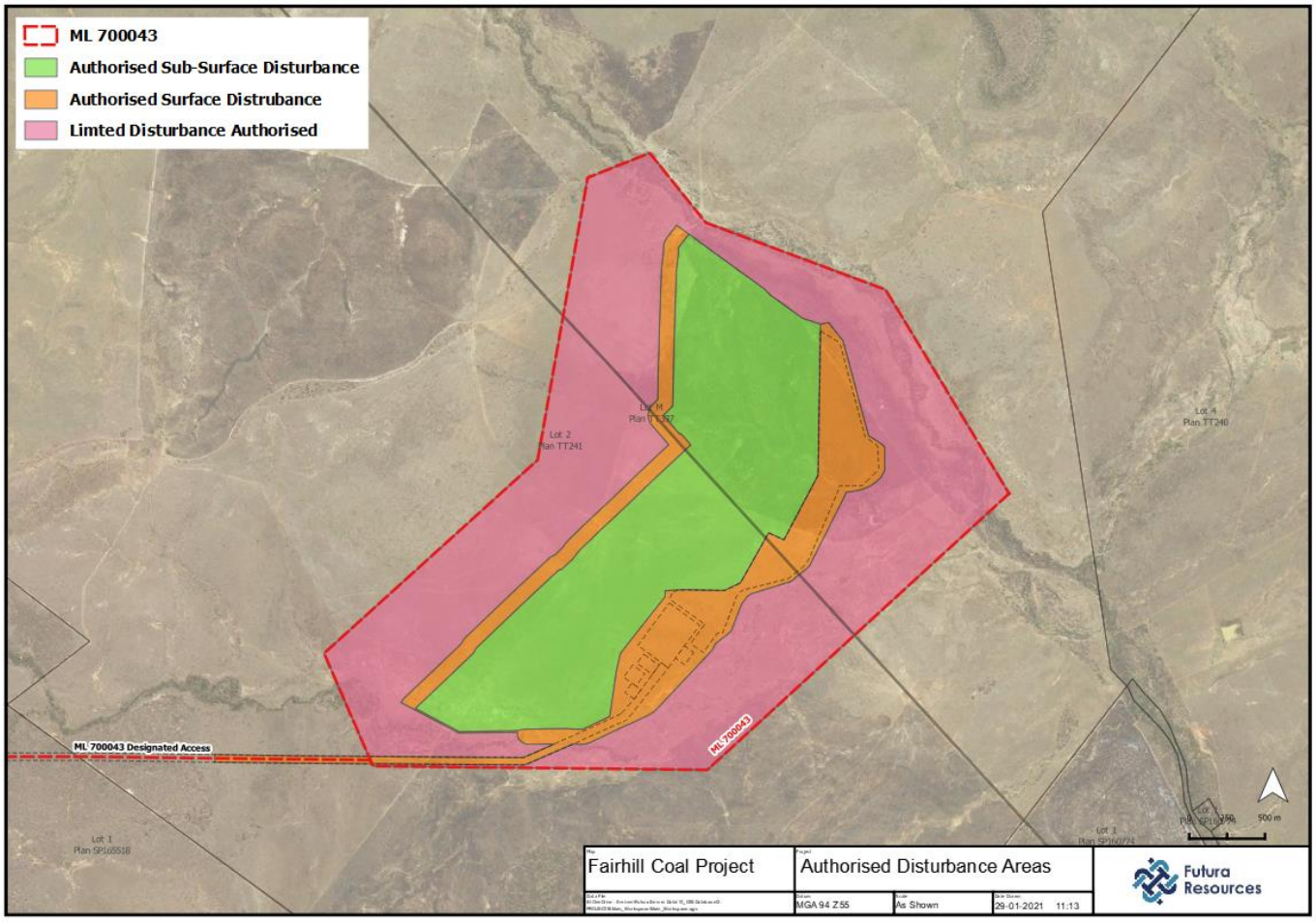

Figure 1 FHCP Authorised Disturbance

4. Statutory Requirements

This WMP has been compiled in accordance with conditions A11, C28, C29, of BRID0071 issued by the Department of Environment and Science (DES), and the DES guideline: Preparation of Water Management Plans for Mining Activities (ESR/2016/3111).

4.1 EA Conditions

The EA conditions relevant to the FHCP, and where they are addressed in this WMP, are presented below in **Table 1.**

Table 1: EA Requirements and Document References.

Condition	EA Requirement (EA EA0002046)	WMP Section
A11	Management Plans and Reports Management plans and reports required under any condition of this environmental authority must be developed by an appropriately qualified person.	This WMP
E30	Water Management Plan	Section 1

Condition	EA Requirement (EA EA0002046)	WMP Section
	A Water Management Plan must: (a) be developed prior to commencing mining activities; and (b) implemented for the duration of mining activities.	
E31	The Water Management Plan required by condition **E30** must include: (a) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and	Section 5
	(b) be developed in accordance with administering authority's guideline Preparation of Water Management Plans for Mining Activities (ESR/2016/3111) and include: (i) a study of the source of contaminants; (ii) a water balance model for the site; (iii) a water management system for the site; (iv) measures to manage and prevent saline drainage; (v) measures to manage and prevent acid rock drainage; (vi) contingency procedures for emergencies; and (vii) a program for monitoring and review of the effectiveness of the water management plan.	Section 2, Section 5, Section 6, Section 7 and Section 8
E32	The Water Management Plan must be reviewed annually to assess the adequacy of the plan, ensure actual and potential environmental impacts are managed, identify any necessary amendments to the plan and submitted with the annual return.	Section 8.3

4.2 DETSI Guideline (ESR/2015/1837)

The development of this WMP is a requirement of condition **E30** of the EA and aligns with the primary purpose of a Water Management Plan in '*Application requirements for activities with impacts to water*' ESR/2015/1837. The DES guideline lists the generic elements of a Water Management Plan, and all of the relevant requirements are included herein. As the WMP is being implemented specifically for the FHCP site, the contents do not match the order of the guidance in all respects, and some sections have been combined. The sections of this report are compared to the required elements listed in the guidelines in **Table 2.**

Table 2: DES Guideline Requirements and Document References

DES Guideline Requirement	WMP Section
Environmental Values and Water Quality Objectives	Section 4
Contaminant Source Study	Section 5
Site Water Balance	Section 7
Impacts, including: Through accumulation of salts and metals Through drawdown on aquifers Cumulative effects	Section 4 & 5
Water Management Infrastructure, including; Catchment Map Storages Pumping equipment	Section 6
Water Management System, including; Minimisation of generation of contaminated water Minimisation of contaminants discharged Minimisation of impact of release	Section 6
Emergency and Contingency Planning	Section 8
Assignment and Communication of Responsibilities	Section 10
Arrangements for Review	Section 9

4.3 Other Statutory Obligations

There are a number of legislative frameworks that are relevant to water management at the FHCP that require consideration during planning, including, but not limited to:

- *Environmental Protection Act 1994;*
- *Environmental Regulation 2019;*
- *Environmental Protection (Water) Policy 2009;*
- *Environmental Protection (Water and Wetland Biodiversity) Policy 2019;*
- *Water Act 2000;2502*
- *Queensland Water Quality Guidelines 2009 (DEHP, 2013);*
- *Australian and New Zealand Guidelines for fresh and marine water quality (ANZECC & ARMCANZ, 2000); and*
- *Best Practice Erosion and Sediment Control guidelines (IECA, 2008).*

4.4 Related Documents

The Water Management Plan has been developed as a reference document and provides a summary of the key areas and risks for water management for FHCP. There are a number of detailed studies and assessments, which have determined the strategies for the WMP. These documents provide further information in relation to the various components of the water management and monitoring system at FHCP and include:

- *Wet Season 2018 Aquatic Ecology Reporting – Fairhill, March 2018 NRC*
- *Fairhill Coal Project Water Management Assessment, Report Number: 112108-04R001 July 2019, ATC Williams*
- *Fairhill Coal Project GoldSim Water Balance Model, July 2019, ATC Williams*
- *Fairhill Coal Project Overburden and Potential Coal Reject Characterisation Report, November 2019 NRC*
- *Wet Season 2019 Aquatic Ecology Reporting – Fairhill, March 2019 NRC*
- *Fairhill Coal Project: Underground Water Impact Report, May 2019 SLR*
- *Receiving Environment Monitoring Program*
- *Erosion and Sediment Control Plan*
- *Rehabilitation Management Plan*

5. Environmental Values and Water Quality Objectives

This section of the WMP describes the regional drainage characteristics in the vicinity of the FHCP. The environmental values (EVs) as defined by the various environmental protection policies and guidelines and regulations relevant to these waterways are also described.

5.1 Regional Drainage Network

Regionally, the FHCP is located within the Fitzroy River Basin (***Figure 2***). The Fitzroy River catchment covers an area of 142,665 square kilometres, making it the largest river catchment flowing to the eastern coast of Australia. The catchment stretches from the Carnarvon Ranges in the west to the river mouth in Keppel Bay, near Rockhampton. It is bounded to the north by the Burdekin River catchment area and to the south by the Burnett River catchment area.

In terms of the nearest major watercourse to the FHCP, the Nogoa River rises on the Carnarvon Range in the Carnarvon National Park in Central Queensland and flows in a north easterly direction. The Nogoa River originates at an elevation of RL 501m AHD and drops around 361m in elevation over its 569km length. The river ends where it meets the Comet River, north of Comet, where it becomes the Mackenzie River. The Mackenzie River continues for a length of 275km before forming the Fitzroy River at a confluence with the Dawson River at Duaringa. The start of the Fitzroy River is at an elevation of RL 58.4m and travels 335km before it reaches Keppel Bay.

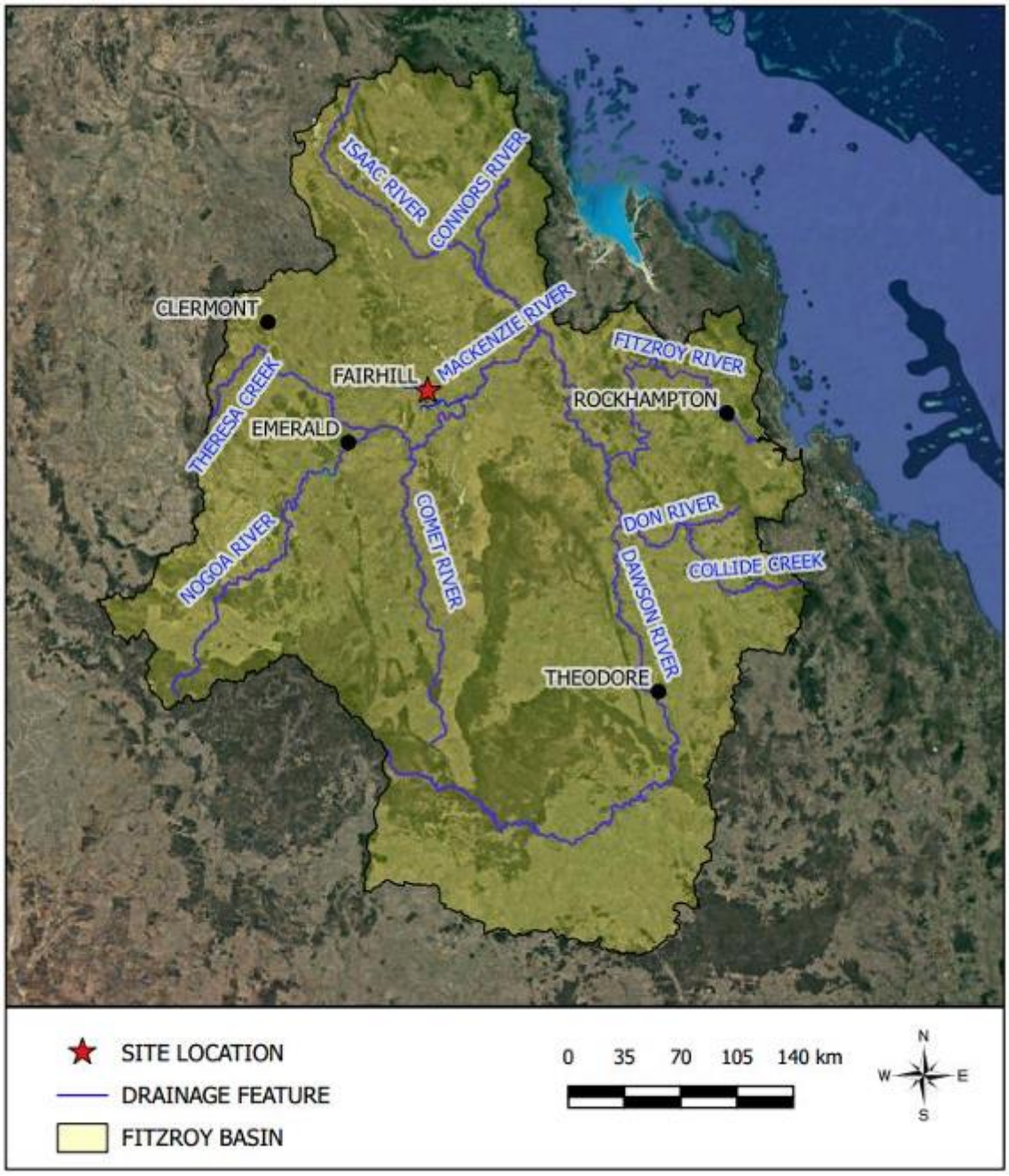

Figure 2: Regional Drainage

5.2 Local Hydrology

The FHCP site is elevated at between RL140m and RL170m with an upstream catchment of some 400ha. Cooroora Creek flows to the south-east past the northern extents of the project site. At RL220m, this creek is formed some 15km to the west of the site, from a number of unnamed drainage lines. Cooroora Creek flows approximately 51km before joining the Mackenzie River, dropping some 100m elevation over its length.

Sandy Creek, formed at approximately RL190m from a number of unnamed drainage lines, flows along the southern boundary of the project site. This creek flows in an easterly direction to join Cooroora Creek some 2km downstream of the project site, at approximately RL150m. The drainage lines flowing through the project site itself are ephemeral with flow occurring only in response to rainfall events and expected to be of short duration. Drainage paths within the proposed project site are shown in *Error! Reference source not found.*.

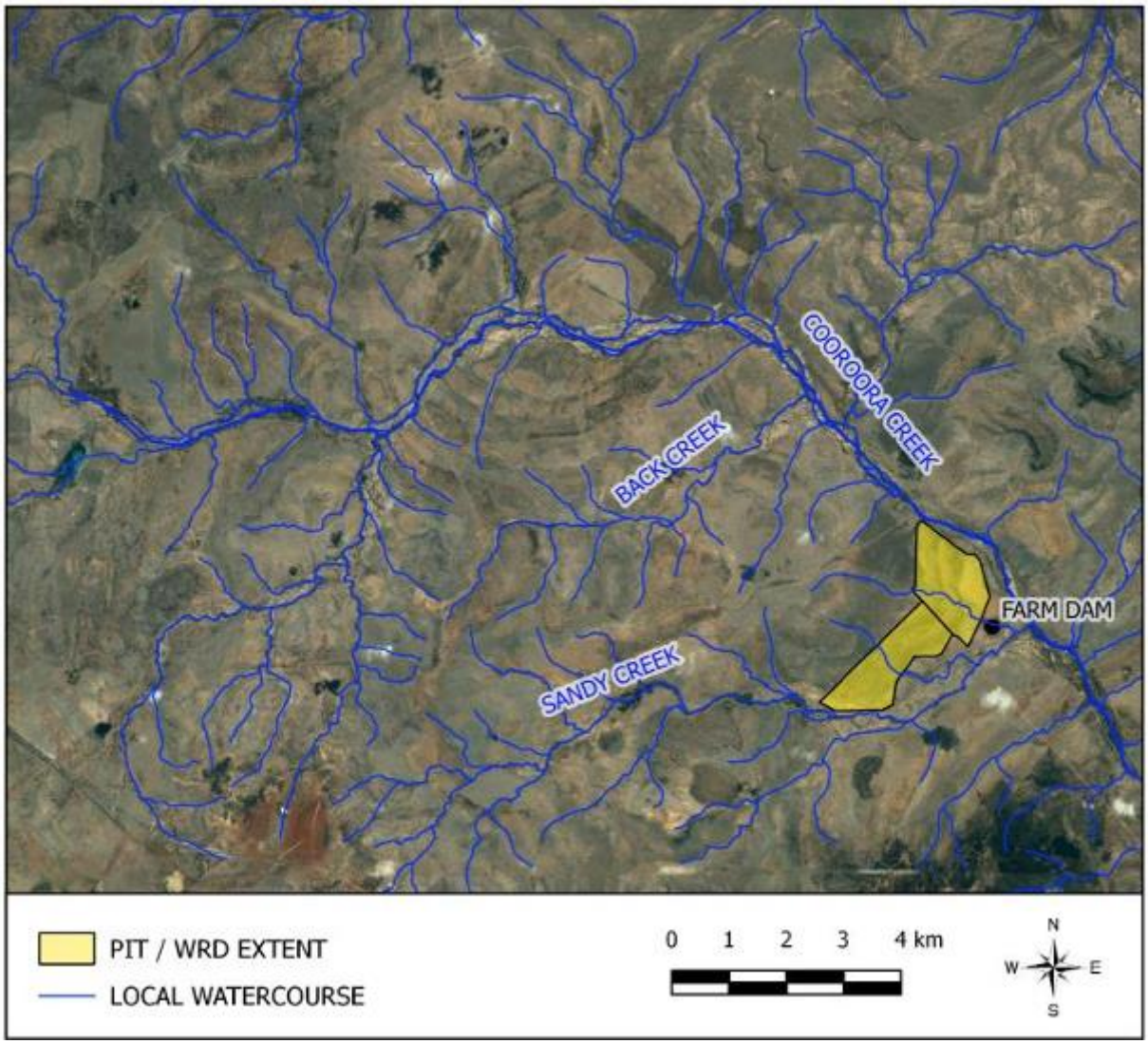

Figure 3 Local Drainage

5.3 Environmental Values

The FHCP site is situated in a rural landscape where agriculture, primarily low-intensity cattle grazing, **is** the predominant land use in terms of land disturbance area. Water for agricultural use (stock water**)** is primarily sourced from local surface water impoundments.

Several open-cut and underground coal mining operations exist in the region, including Ensham, Gregory Crinum, Kestrel, and Oaky Creek Coal. The FHCP area and its surroundings are largely cleared of native vegetation.

Surface water flows through the FHCP site via both overland flow and two ephemeral drainage lines. A small surface water storage (farm dam) is located downstream of the site.

The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP Water), which is subordinate to the Environmental Protection Act 1994 (EP Act), documents the waters to which the legislation applies and which require enhancement or protection. Schedule 1 of the EPP Water states that the FHCP lies within the Mackenzie River Sub-basin, with the relevant environmental values (EVs) and water quality objectives (WQOs) outlined in the Environmental Protection (Water) Policy 2009 Mackenzie River Sub-basin Environmental Values and Water Quality Objectives document.

The FHCP is located within the 'Mackenzie north-western tributaries' area of the Mackenzie River Sub-basin. Under the EPP Water, the following EVs are nominated for this area:

- *Aquatic ecosystems;*
- *Stock Water;*
- *Human consumption;*
- *Primary recreation;*
- *Secondary recreation;*
- *Visual recreation;*
- *Drinking water;*
- *Industrial use; and*
- *Cultural and spiritual values*

The WQOs to protect aquatic ecosystem EVs have been developed for moderately disturbed waters, consistent with the nature of the FHCP site which can be defined as a slightly to moderately disturbed ecosystem. These WQOs are displayed in **Table 3.**

Table 3: Mackenzie River Sub-basin Surface Water Quality Objectives

Parameter	Water Quality Objectives to Protect Aquatic Ecosystem Environmental Values
Ammonia (N)	<20 µg/La
Oxidised (N)	<60 µg/La
Organic (N)	<420 µg/La
Total Nitrogen (TN)	<775 µg/La

Parameter	Water Quality Objectives to Protect Aquatic Ecosystem Environmental Values
Filterable Reactive Phosphorus (FRP)	<20 µg/La
Total Phosphorus (TP)	<160 µg/La
Chlorophyll a	<5 µg/La
Dissolved Oxygen	85% - 110% saturation
Turbidity	<50 NTUa
Suspended Solids	<110 mg/Lb
pH	6.5-8.5b
Conductivity (EC) base flow	<310 µS/cm
Conductivity (EC) high flow	<210 µS/cmb
Sulfate	<10 mg/Lb

[a] and [b]: As per Table 2 in the EPP Water 2009 for the Mackenzie River Sub-basin WQO's.

5.4 Cumulative Effects

Studies conducted in the area identify that releases from mining activities have the potential to cause environmental harm due to accumulation of salts and metals. These impacts may also cause problems for:

- *Human health;*
- *Livestock health;*
- *Fauna including fish migration and spawning and macro-invertebrates; and*
- *Other biota including flora impacts.*

A Study of the Cumulative Impact on Water Quality of Mining Activities in the Fitzroy Basin (April 2009), identified the risk of cumulative effects based on the Electrical Conductivity flow frequency and volume of the release. A summary of the predicted risk of cumulative impact from the study is presented in Error! Reference source not found. below.

The site is currently not authorised to release Mine affected water. Potential discharges from site are discussed in Section 8.

Table 4. Cumulative Risk Assessment Matrix used to Assess the Mine Discharges in the Fitzroy Catchment.

Frequency/Volume (ML/y)			Electrical Conductivity (µS/cm)			
			Very Low	Low	Medium	High
			< 720	<1250	<2500	>2500
Very Low	zero/small	<100	Very Low	Low	Low	Medium
Low	few releases/ infrequent	<1,000	Low	Low	Medium	Medium
Medium	frequent	<10,000	Low	Medium	Medium	High
High	Continuous, some dry weather	<100,000	Medium	Medium	High	Very High
Very High	Continuous, months	>100,000	Medium	High	Very High	Very High

5.5 Groundwater

The Groundwater Technical Report (2018) prepared by NRC, concluded that:

- The hydrologic cycle at the FHCP site is dominated by low rainfall, high evaporation rates and limited infiltration to groundwater, which largely occurs uniformly over the landscape. As such, the groundwater quality measured at the FHCP site is saline to very saline and is generally not suitable or used for stock watering or irrigation. There are no known private groundwater bores within the FHCP site (other than FHCP monitoring bores), due to the groundwater generally being too saline for stock.
- Groundwater levels throughout the FHCP site indicate that groundwater/surface water interaction is very limited.
- Groundwater at the QCP can be found in Permian sedimentary rocks but limited to fracture zones, weathering/fresh boundaries, contact between different rock types and within coal beds. As well as alluvial aquifers associated with Cooroora Creek.
- Influence of regional groundwater flow is considered to be negligible at FHCP. Potential drawdown is limited to within 200m of pit edges.
- Flows into the pit are estimated to total up to 9.6m^3/day.

6. Contaminant Source Study

Potential environmental contamination sources, likely contaminants, and control measures to manage runoff from each source are summarised in Section 6 below.

6.1 Site Operating Activities

Disturbance at FHCP comprises**:**

- Open cut pit;
- ROM pad;
- Out-of-pit spoil dump;
- Topsoil stockpiles;
- Access tracks and Haul road;
- Temporary diversion drains;
- Mine infrastructure area (MIA) and Workshop:
- Erosion and sediment control structures; and
- Water Storage dams.

Activities associated with these disturbance types are likely to determine the source and nature of contaminants that have the potential to negatively impact on the EV's of Water.

6.2 Water Categorisation

The surface water types indicated below categorise the water based on the likely contamination from the mining activities:

- **Clean water** – Runoff derived from areas upstream of the mine development footprint or stabilised/rehabilitated surfaces within the footprint. This water is considered unaffected by mine operations and therefore remains clean.
- **Sediment laden water** – Runoff coming into contact with disturbed earth surfaces associated with cleared areas ahead of active strip mining or rehabilitated surfaces where vegetation has not yet established. Contact with these surfaces mobilises sediments, so this water requires sediment capture, as outlined in the site's Erosion and Sediment Control Plan, before entering the clean water system.
- **Mine affected water** –Pit water. Rainfall runoff that has been into contact with areas disturbed by mining and which have not yet been rehabilitated or the ROM area. Groundwater from the mines dewatering activities, if produced.

6.3 Sources of Contaminants

Water contamination varies depending on the source of contamination, the exposure period, and climatic factors such as rainfall and temperature.

The FHCP is located in the upper reaches of the catchment. Therefore, there is little catchment area upstream of the mining pits that is disturbed or drains through a disturbed area, which minimises the potential for contaminants from mine-affected waters to enter the downstream catchment.

The FHCP implements a progressive rehabilitation strategy to minimise the generation of contaminants. It segregates undisturbed and disturbed catchments using small bunds and catch drains, which divert runoff from undisturbed areas around the mine footprint.

6.3.1 Pit & ROM Runoff Water

Rainfall that occurs over the pit area drains to the low point or sump within the pit and is stored for reuse. The primary source of contamination is water that stands in mine pits for extended periods (more than a week). Salinity levels in these water bodies increase due to the mobilisation of salt from the in-pit spoil and coal seams and concentrate further over time because of evaporation.

Pit water may interact with groundwater as indicated by the 2018 study from NRC.

The ROM dam captures runoff that travels across the ROM surface. Evaporation of water detained in the ROM dam for extended periods causes a potential increase in salinity concentrations.

6.3.2 Run-off from disturbed Areas

FHCP EA Condition E34 states that:

Stormwater, other than mine affected water, is permitted to be released to waters from;

(a) Erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan, required by condition E33; and
(b) Water management infrastructure that is installed and operated, in accordance with a Water Management Plan (this document) that complies with conditions E30 – E32, for the purpose of ensuring water does not become mine affected water.

Areas, including mine haul roads, pre-strip areas and overburden emplacements, will produce sediment laden runoff due to the exposed nature of the surface material.

6.3.3 Run-off from Hardstand Areas

Hardstand Area may produce oil or be chemical-affected

6.4 Assessment of Overburden and Reject Materials

Overburden, coal and waste material has the potential to contaminate surface water that infiltrates the area potentially leaching salts from it (FHCP Waste Rock Characterisation Report, NRC 2017). In addition, some types of overburden have the potential to affect the salinity and pH of surface water runoff from the site. Overburden material will be placed in both in pit and out of pit dumps. Runoff from overburden areas will be captured in the pit or in temporary storage sumps and prevented from running off site

6.4.1 Acid Forming Materials

Waste rock geochemistry has been assessed in the FHCP Waste Rock Characterisation Technical Report (NRC 2019). This technical assessment identified that;

- A total of 100% of waste rock overburden and coal reject material associated with the planned mine operations are classified as non-acid forming. Some sandstones and siltstones have large acid neutralising capacity, which further limits the potential for acid production.

- Metalliferous runoff/seepage will not pose a problem to the receiving environment. The mobility of metals is greatly reduced by the alkaline conditions present within the overburden.

7. Surface Water Management

7.1 Water Management Objectives

The key water management objectives are as follows:

- Limit disturbance and progress rehabilitation as early as possible;
- Minimise the use of water and the need to import water;
- Limit the accumulation of mine affected water;
- Recycle sediment laden water;
- Prevent mine-affected water release;
- Ensure there is sufficient water available for operation during dry periods;
- Minimise the potential impacts on the receiving environment including groundwater resources;
- Ensure contingency measures are in place to address emergency scenarios
- Provide adequate review of the water management plan
- Ensure separation of clean and dirty water. The specific objectives for each water type are:
    - **Clean water:** Separate clean water from mine-affected and surface water systems, allowing it to flow uninterrupted down the catchment.
    - **Sediment-laden water:** Maintain water quality leaving erosion and sediment control structures as close to background levels as reasonably possible.
    - **Mine-affected water:** Prevent uncontrolled discharges during wet periods and maintain adequate water supplies for site demand during dry periods.
- Protect mine workings from flood inundation
- Ensure regulatory compliance

7.2 Water Management Strategy

To ensure the fullest separation possible of clean, sediment laden and mine-affected water runoff, three specific types of water will exist in relation to the FHCP: clean, sediment laden and mine affected. These are described in Error! Reference source not found. along with their overall management approach.

Table 5. Water Types and Management Approach

Water Type	Description	Management Approach
Clean water	Runoff derived from areas: • upstream of the mine development footprint or • stabilised/rehabilitated surfaces within the footprint. This water is considered to be unaffected by mine operations and therefore clean.	Direct off-site release via diversion drains, bunds and / or clean water sump and pump systems to defined discharge locations without causing excessive erosion of the receiving environment and sediment discharge.

Water Type	Description	Management Approach
Sediment laden water	Runoff coming into contact with disturbed earth surfaces associated with cleared areas ahead of active strip mining. Incomplete rehabilitation, where vegetation is still establishing. Contact with these surfaces is considered likely to mobilise sediments and therefore requires capturing of the sediments prior to release to the clean water system.	Minimise extent of disturbed surfaces. Divert runoff from these surfaces to sediment basins for capture and settlement/treatment (flocculation if required) of sediments prior to release by transfer or release to the clean water system and the receiving environment.
Mine affected water	Runoff coming into contact with • disturbed/unstabilised earth surfaces located within the open cut pits or • unstabilised surfaces of the overburden dumps. • ROM Pad Contact with these surfaces is considered to increase the potential for mobilisation of sediments and other diffuse source contaminants and as such is considered to be 'mine affected'. While not anticipated, this would include any groundwater that reports to the mine pits.	Minimise extent of areas of disturbance. Prevent release off site and reduce volume by utilising for dust suppression. Further settlement/treatment (including flocculation) of sediments or other contaminants (including salinity) might be required prior to release to the receiving environment. Enhanced evaporation may also be required to remove water.

7.3 Minimisation of the Generation of Mine Affected Water

Disturbance is limited to the approved mine disturbance footprint only, and vegetation and topsoil clearing occur immediately prior to mining. Overburden is placed into the final landform shape so that dump areas progress to rehabilitation immediately after out-of-pit dumping. This minimises the generation of mine-affected and sediment-laden water.

The catchment area draining into and through the operational area of the mine is limited to prevent the unnecessary capture of rainfall runoff. Runoff is directed around pits and other areas where the water could become mine-affected. The mine layout supports this approach, as the highwall advances in a south-westerly direction and topsoil and overburden are generally deposited behind the operations to the north-east. Runoff from undisturbed and cleared catchments upstream of the pit is directed around the pit and off-site to natural waterways.

The mine is managed to segregate different pollutant-generating sources. Water from the pit generally has higher salinity concentrations, so water from catchments draining into the pit is reduced as much as possible to minimise the volume with the potential to become contaminated. Runoff from the outer batters of overburden dumps is generally directed away from the pit and collected according to the ESCP; otherwise, these areas drain internally.

This segregation of areas minimises the volumes managed in the water management system. Water balance modelling shows that, in average years, the mine water system is in deficit — meaning rainfall

runoff over the mine catchments does not supply enough water for operational demands, such as dust suppression. Water application for dust suppression is carefully controlled, ceases during rainfall, and is never applied at a rate that would cause runoff.

The project includes a haul road that crosses several clean water catchments. Coal spillage is managed to prevent water in this area from becoming mine-affected. Erosion is controlled in accordance with the site's ESCP, maintaining the clean water status of these catchment areas.

Limiting the locations of chemical and fuel storage areas and manage the areas in accordance with relevant specifications of AS1940 Storage and Handling of Flammable and Combustible Liquids (AS1940);

7.4 Strategies to Reduce Risk of Contamination

The site prioritises the use of poor-quality water over higher-quality water. Surface water runoff with high sediment concentrations is retained and reused onsite whenever possible. If reuse is not feasible, the water is released in a controlled manner in accordance with the Erosion and Sediment Control Plan (ESCP).

Mine-affected water (MAW) stored in the system contains varying salt concentrations depending on its source. For example, water pumped from the pits into the ROM Dam typically has higher salinity than water collected from spoil areas. Water from the mine pit will be extracted and utilised for dust suppression within mine affected water Catchments, which will reduce the standing time and effects of evaporation. Water from the ROM Dam will be dewatered to the Pit in accordance with the sites Water Management TARP. Pit water is used for dust suppression and is prioritised over other water sources for this purpose. This approach reduces the volume of saline water in the system by removing it at the point of use.

Hardstand areas known to produce oil- or chemical-affected runoff are bunded so that runoff can be treated in isolation to remove specific contaminants and kept separate from clean flows. Clean flows are directed to the Mine Water Dam, where the water is reused onsite.

7.5 Preventing Release of Mine Affected Water

A Water Management Trigger Action Response Plan (TARP) is in place to monitor dam levels and ensure sufficient storage is available prior to significant rainfall events. This minimises the risk of uncontrolled discharges. Further details on contingency planning are provided in Section 7.

Mine-affected water (MAW) is managed within a closed system and will only be released from site in a controlled manner when conditions allow. Releases must occur in accordance with the Environmental Authority (EA) conditions, from one of two designated release points listed in Table E1 of the EA. Any release must comply with the contaminant limits specified in Table E2 of the EA.

Water quality characteristics—such as electrical conductivity, pH, suspended solids, and sulphate—are regulated to protect downstream environmental values.

EA conditions E2 to E21 govern the volume and quality of water released from MAW storages to ensure protection of these downstream values. EA Condition 34 specifically covers the controlled release of water from sedimentation dams during rainfall events that exceed design criteria. These dams are designed in accordance with the Department of Environment and Heritage Protection (DEHP) guidelines to provide adequate settling capacity for a 1-in-10-year, 24-hour storm event.

7.6 Protection of Mine Workings

DETSI have requested additional groundwater studies be undertaken as part of the PRCP Application. These studies are currently underway asn will further inform the protection of mine workings design

The FHCP will Implement flood mitigation works, if required, to ensure the pit is protected from events with a minimum of 0.1% annual exceedance probability (AEP).

7.7 Water Management System

The FHCP water management system provides appropriate treatment or containment for each water source according to the nature of the potential contaminants. The components of the system are detailed below.

The water catchment delineation is shown in Figure 4. Figure 5, provides a schematic of the water management system as described above.

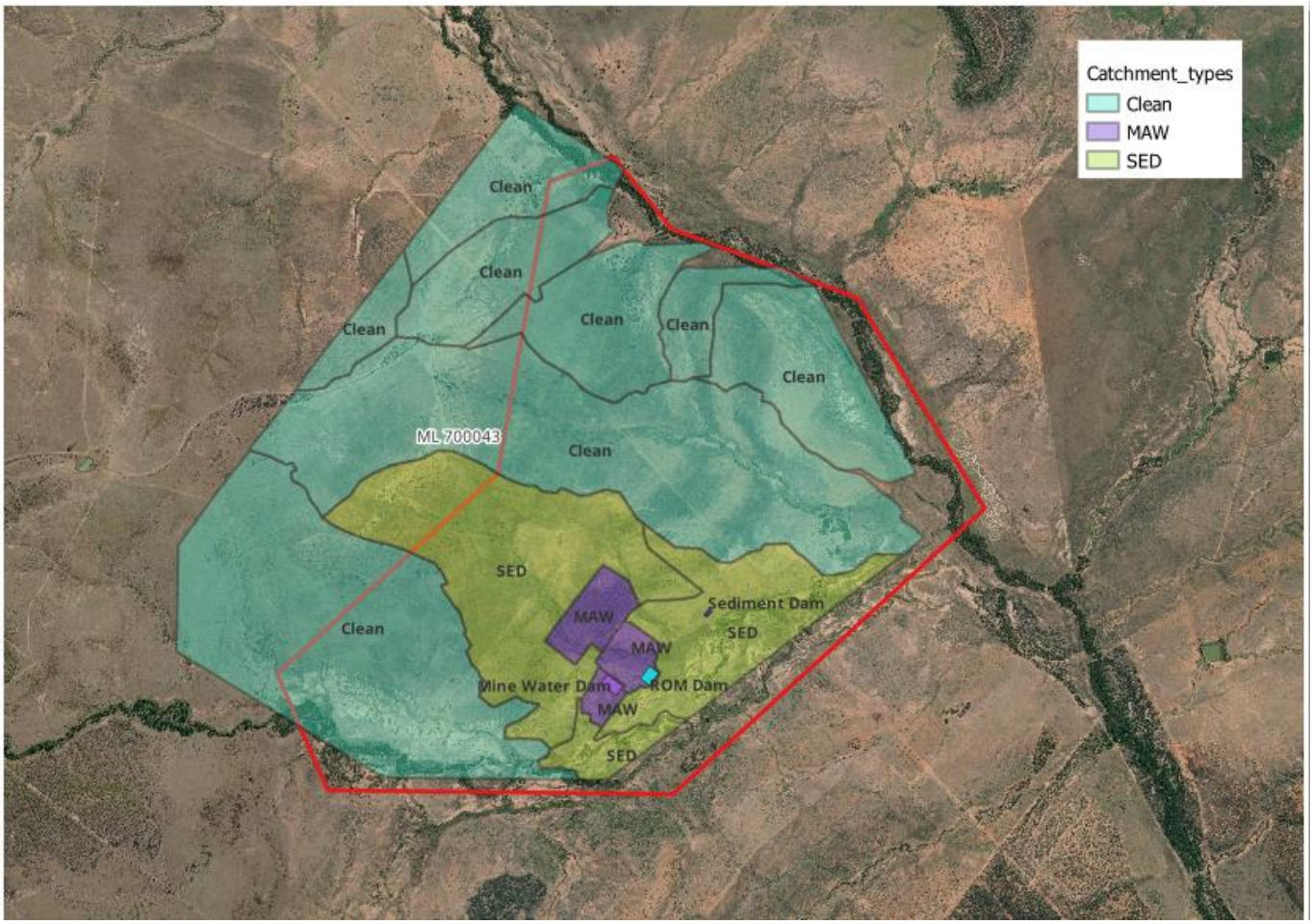

Figure 4. Water Catchments (to be updated as mining progresses)

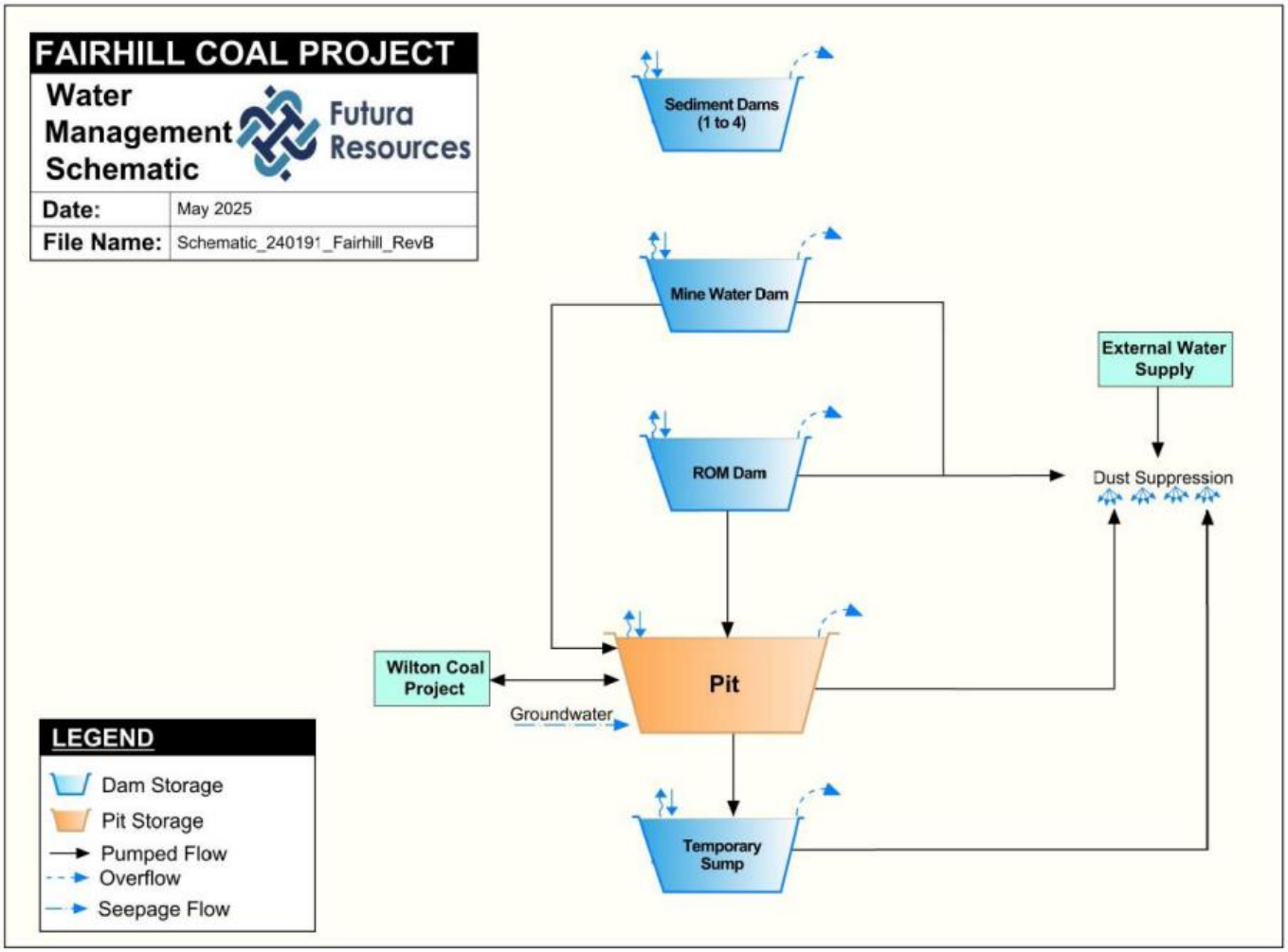

Figure 5. Schematic of Water Management System

7.7.1 Storages

Details of the key water management storages are provided in **Table 5.** Catchment areas for each storage is provided in **Appendix A**.

Table 5: Water Management Infrastructure Storages

Storages	Easting (GDA94)	Northing (GDA94)	Volume (ML)
Run-of-Mine Dam (ROM Dam)	666895	7428780	18
Mine Water Dam	666668	7428728	23.9
Pit Sump	Various with mine plan		50*

*Pit sump will overflow into the pit which has a capacity in excess of 1000 ML

The Consequence Category Assessment completed in 2025 classifies all storages as “low”.

7.7.2 Upstream Runoff Infrastructure

Drains prevent clean runoff from upstream catchments from entering the pit and convey sediment-laden runoff to sediment dams. The location and alignment of the drains change as mining progresses.

The drains are sized to convey the peak discharge from a 10% Annual Exceedance Probability (AEP) 24-hour storm event. They typically have batter slopes of 1 vertical to 4 horizontal (1V:4H) and widths that keep flow depths below 2 meters.

8. Site Water Balance Model

A fundamental component of the FHCP water management system and Water Management Plan (WMP) is the Site Water Balance Model (WBM). FHCP establishes a WBM that provides the mine with a flexible, predictive tool to analyse current and future water requirements, develop water management procedures, and manage mine-affected water storages.

The current WBM, compiled by ATC Williams (2025), applies to the current mine life of four years.

The full water balance model report is available in Appendix A. The following is a summary of the model and its findings.

8.1 Water Balance Model

The performance of the mine site's water management system is assessed using the modelling software GoldSim. GoldSim is a software package developed by the GoldSim Technology Group to model continuous systems and track the movement of water using time-based inputs and operating rules.

8.2 Mine Water Balance Results

The following section provides a summary of the water management results for the FHCP. The objective of the water balance model is to ensure an adequate water supply for mine operations and prevent uncontrolled discharges.

Figure 6 summarises the inflows and outflows for a median year. It shows that there is no risk of spill, but the current infrastructure does not capture enough water to meet dust suppression demand. Therefore, water will be required from an external supply arrangement.

Runoff	Ground-water	WCP Supply	External Supply	Evaporation	Dust Suppression	Transfer to WCP	Spill Discharge
Inflows (ML/year)				Outflows (ML/year)			
674.5	3.5	0.5	132.0	257.8	427.9	8.7	13.3
Inflows (%)				Outflows (%)			
83%	1%	<0.1%	16%	36%	60%	2%	2%

Figure 6: Median WBM Results

Figure 7 summarises the inflows and outflows for a 95th percentile year. It shows that a spill is expected from the project. Most of this spill comes from the sedimentation pond, with only a small portion from the mine water dam. Additional controls for the mine water dam are implemented during extreme wet seasons. In this scenario, the site infrastructure does not capture enough water to meet dust suppression demand.

Runoff	Ground-water	WCP Supply	External Supply	Evaporation	Dust Suppression	Transfer to WCP	Spill Discharge
Inflows (ML/year)				Outflows (ML/year)			
1,414.8	3.5	0.0	30.5	550.0	430.9	0.5	152.1
Inflows (%)				Outflows (%)			
98%	0%	0%	2%	49%	38%	<0.1%	13%

Figure 7: 95th Percentile WBM Results

8.2.1 Pit Inundation

The pit inundation statistics indicate the likelihood that the volume of water in the pit impacts mining operations. The pit is considered inundated when water volumes exceed the sump capacity of 50 ML. Pit inundation occurs when the pump system cannot keep up with inflows during a large event or when there is insufficient storage volume in the mine water dam (MWD) to receive pit water.

The pit inundation statistics indicate 1375 days of inundation over the 7-year simulation period.

8.2.2 Storage Inventory

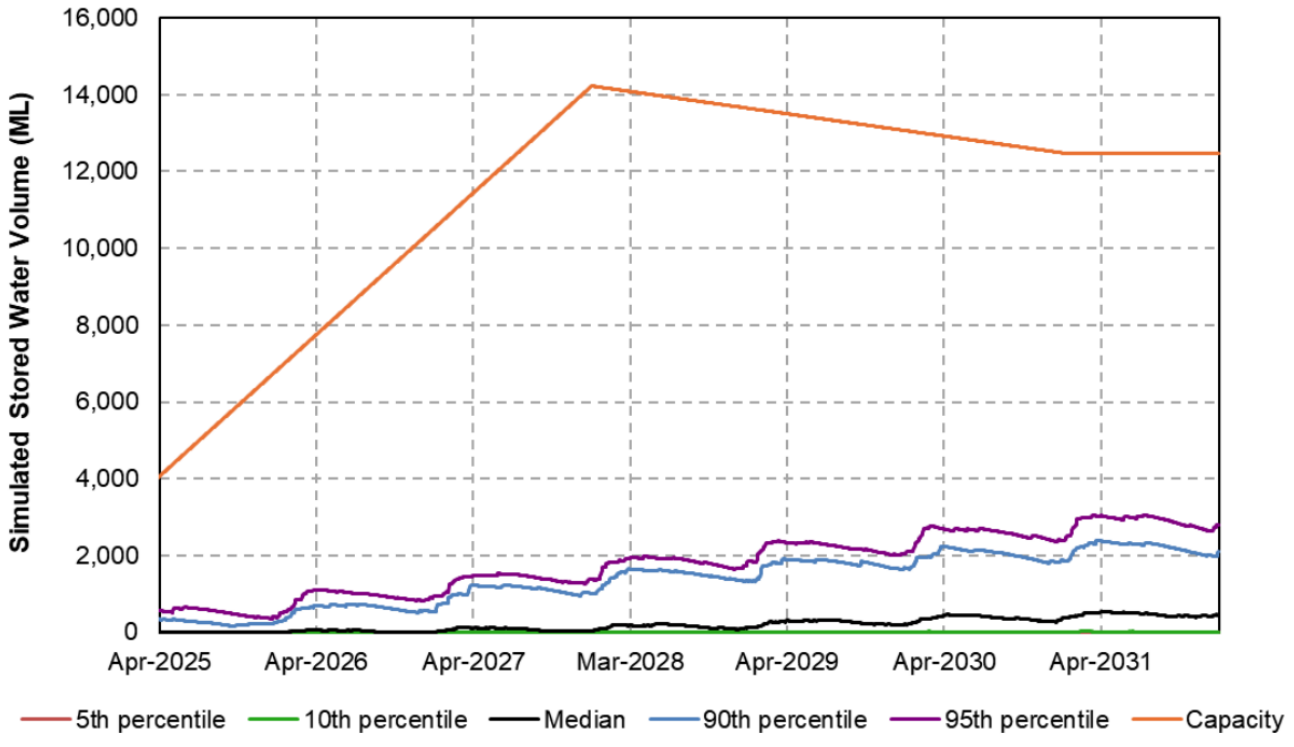

Figure 8. Open Cut Predicted Inventory

The predicted storage inventory for each storage is presented below. The model does not predict any scenario where the inventory exceeds the available capacity.

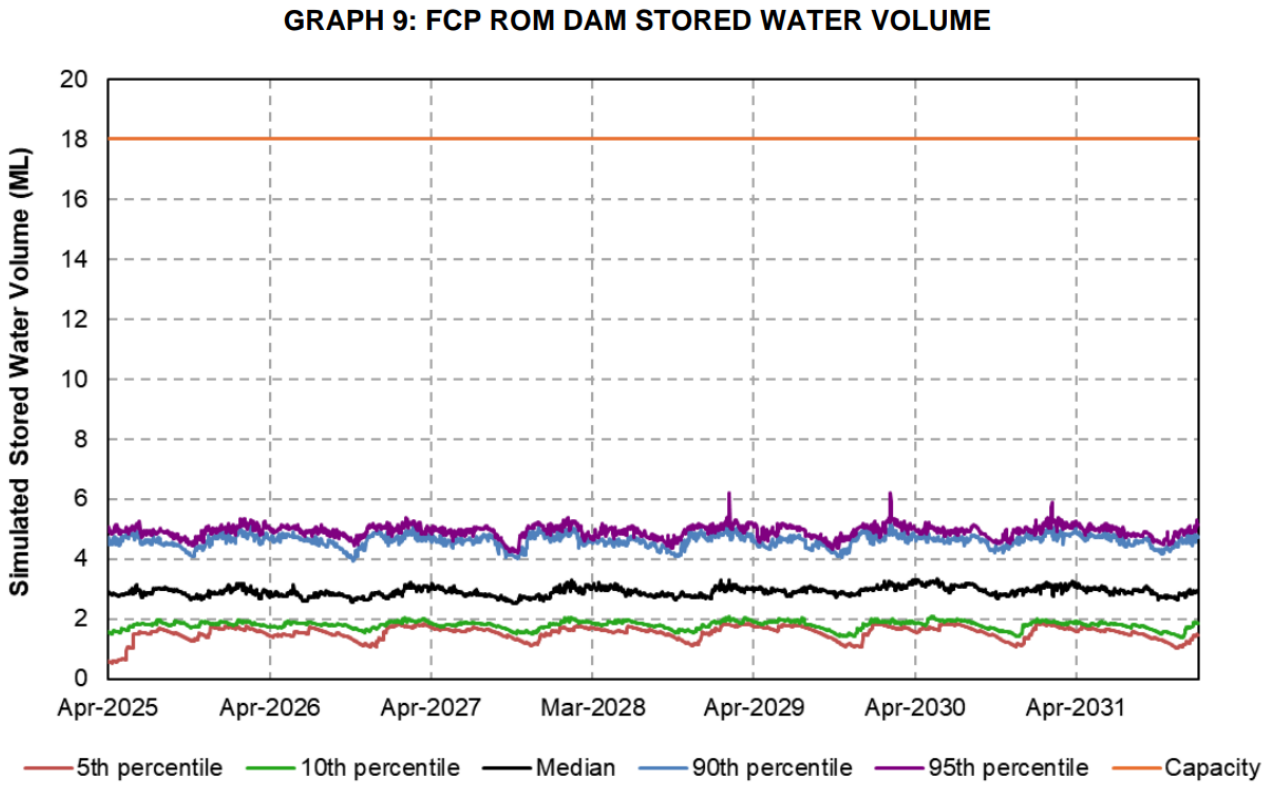

Figure 9: ROM Dam Storage Inventory

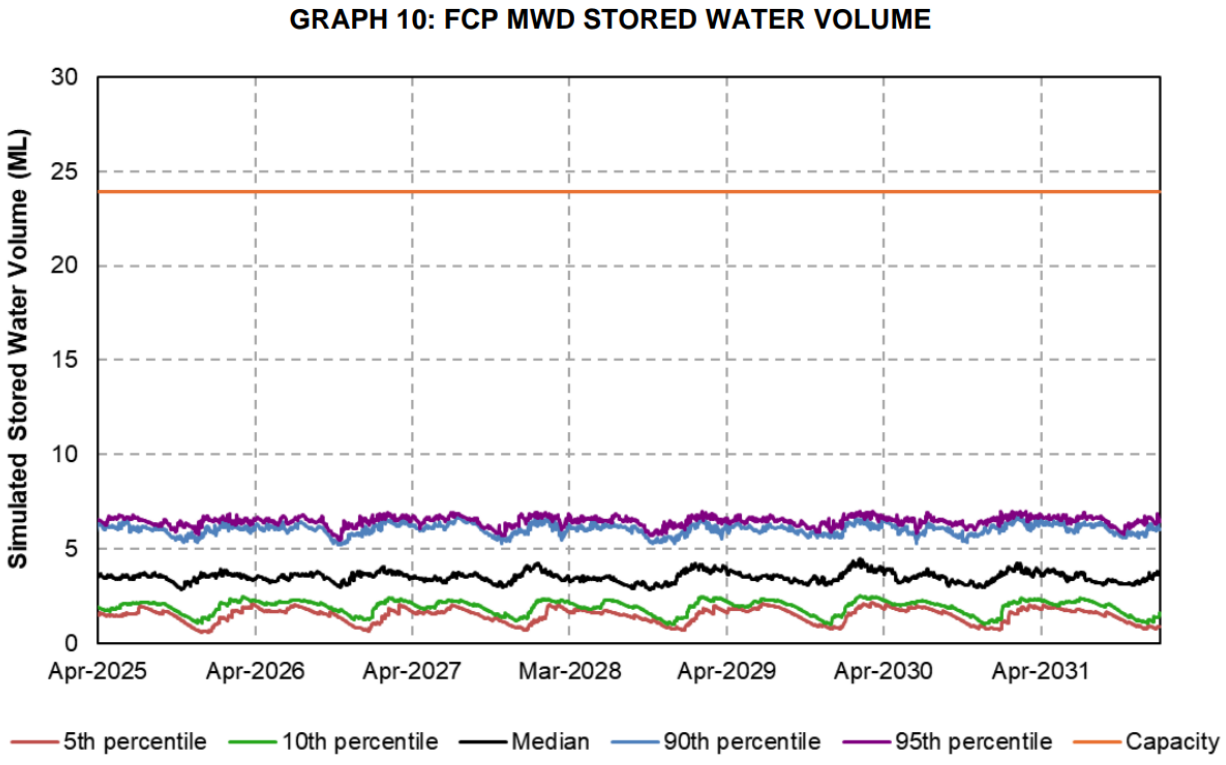

Figure 10: MWD Predicted Inventory

9. Emergency and Contingency Planning

Several emergency situations may arise during the life of the FHCP. Drought emergencies occurs slowly and can be forecast months in advance, allowing adequate measures to be put in place. In contrast, a flood emergencies happens rapidly with little warning, and response measures differ accordingly.

9.1 Flood Preparation

As detailed in Section 5, the site does not experience flooding from regional or local sources. Its location in the upper catchment presents a low flood risk. However, flash flooding in local gullies can occur, causing high-speed water flow through drains or overtopping mining access roads. These areas are avoided during intense rainfall.

Pit pumping is required to ensure continued operations. Testing of pit flood pumps occurs before each wet season, and the pumps remain in locations that are accessible during flood events and protected from flooding.

9.2 Dam Inspections & Monitoring

All storages onsite at FHCP are excavations, not embankments.

Dam water levels are monitored monthly, and a Trigger Action Response Plan (TARP) manages water before rain events to ensure sufficient freeboard to accommodate rainfall.

If a storage is constructed with an embankment, the following measures apply:

- Embankments of all dams are monitored annually before the wet season, as well as during and after flow events, to ensure they operate satisfactorily and have not been damaged by erosion.
- If a dam becomes damaged, the stored water is pumped to a suitable storage facility to minimise the risk of uncontrolled release to downstream waterways.
- The Environmental Coordinator is responsible for communicating with regulators. A suitably qualified person inspects the dam, and repair work occurs as soon as practicable after damage.

9.3 Pump and Pipeline Maintenance

The pumps at FHCP run on their own diesel-fuelled generators, so they are not affected by power failures.

Two pumps are always on-site, and they are selected from well-known manufacturers to ensure spare parts are available locally. These pumps undergo regular maintenance to reduce the chance of failure and minimise any downtime. Weekly maintenance inspections are carried out to keep them in good working condition.

All pipelines carrying worked water are inspected during use to ensure no leaks occur. If any discharges or leaks are identified, they are reported immediately to the Mine Site General Manager, and pumping stops immediately.

9.4 Drought Planning

The mine water balance shows that, in average years, the mine's water needs for dust suppression exceed the volume of water collected on site from rainfall runoff in mine-affected catchments. To ensure water security and meet these needs, the site imports mine-affected water from external sources, reducing reliance on rainfall. Water trucks deliver this water when needed.

The mine water balance undergoes regular review to assess system reliability for the upcoming season and to identify opportunities for efficiency improvements. This process provides enough time to develop alternative strategies and apply water-use minimisation techniques.

Drought planning includes monitoring and reviewing current water use. Data analysis helps identify inefficiencies in the system, which future plans aim to reduce.

9.5 Action Plans

The relevant Trigger Action Response Plan (TARP) for severe weather events, both wet and dry, is HST-TAR-0107 Severe Weather TARP. In addition, the site develops a separate Water Management TARP for storage-related triggers.

9.6 Reporting

In the event of an uncontrolled release, the administering authority is contacted according to the conditions of the FHCP Environmental Authority (EA), as follows:

- **A14** – The holder must notify the administering authority in writing within twenty-four (24) hours after becoming aware of any emergency or incident that results in the release of contaminants not in accordance, or reasonably expected to be not in accordance, with the conditions of this environmental authority.
- **A15** – Within fourteen (14) days following the notification in accordance with condition A14, further written advice must be provided to the administering authority, including:
  (a) results and interpretation of any samples taken and analysed;
  (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and
  (c) proposed actions to prevent a recurrence of the emergency or incident.

Because FHCP operates in accordance with EA issued under the *Environmental Protection Act 1994*, Pollution incidents are reported to the Queensland Government 24/7 Pollution Hotline.

10. Implementation of the Water Management Plan

10.1 Operational Monitoring and Review

10.1.1 Monitoring

Water Monitoring of surface and groundwater is undertaken in accordance with the environmental authority. The EA outlines monitoring locations, parameters to be monitored and frequency.

In addition to this Water Management Plan the EA requires a Receiving Environment Monitoring Program (REMP) and Groundwater Monitoring Program (GMP) to be implemented as well as annual water monitoring reporting. These monitoring programs are designed to:

- Ensure compliance with the EA;
- Ensure that no unacceptable impacts to receiving surface and groundwater systems are occurring as a result of activities;
- Ensure that any regulatory non-compliance is detected and managed in accordance with procedures and regulatory requirements;
- Assess current and cumulative impacts on the environment;
- Meet corporate and regulatory reporting requirements; and
- Maintain environmental inspection procedures.

Outputs of some of this monitoring will be used in updating the water balance model and the WMP so that the modelling tool can be thoroughly calibrated and be used as a predictive tool for mine water management operations.

10.1.2 Water Balance

Water balance updates are undertaken following any significant changes to the mine plan to ensure the model accurately represents the operating system. This approach also enables the water balance model to function as a predictive tool. The water balance is reviewed regularly, or whenever significant changes occur to the water management system.

Monitoring is essential to the success of these updates. Calibration data is collected for use in future updates.

10.1.3 Review

In accordance with EA Condition E32, this Water Management Plan (WMP) is reviewed annually (by 30 November each calendar year) or as needed, eg. after any event involving the uncontrolled release of water to the environment. The review considers the adequacy of the plan, ensures actual and potential environmental impacts are managed, accounts for any updates to the system, and identifies any necessary amendments to the plan.

10.2 Performance Measurement

The key items that will be used to gauge performance of the water management plan will include:

- Evidence of inspections of segregation of the three categories of water;
- Evidence of water quality monitoring;
- Regular inspections water storages;

- Dam levels are within appropriate limits;
- Releases to receiving waterways is prevented or controlled in line with the EA; and
- Appropriate actions have been taken when problems are detected, which may include situations such as structural issues detected in dams, water quality levels exceeding set levels or water levels in dams are greater than set limits.
- Evidence of an ongoing cycle of evaluation, review and improvement

10.3 Continual Improvement

Improvement of the water management system is essential to reduce the risk of the mine water management system being unable to meet demands or having uncontrolled releases. Strategies for improvement in water use will form part of the water balance reviews.

11. Roles and Responsibilities

The roles and responsibilities in the design operation and maintenance of the site water management at the FHCP are outlined in **Table 6.**

Table 6: Roles and Responsibilities

Item	Responsibility	Frequency
Develop objectives and targets that will drive improvements in site water management.	General Manager & Mining Superintendent	Ongoing
Assess current site water requirements and identify future needs. Test water efficiency targets and provide a forward forecast of mine water operation.	Environmental Coordinator, Mining Superintendent and Technical Services Manager	Annually
Maintain knowledge of the quality and quantity (including resource demands) of the surface waters in the mine lease area and communicate this to the Mining Superintendent and inform effective decision-making regarding water management.	Environmental Coordinator and Projects Superintendent	Monthly
Develop and maintain a site water balance water inputs, uses and outputs.	Environmental Coordinator & Projects Superintendent	Annually
Identify requirements for new surface water management control structures (including bunding, sediment control, etc.) and determine If appropriate water management structures exist.	Mining Engineers, Environmental Coordinator, Mining Superintendent	Annually
Ensure budget allows for water control structures so that timely construction can occur.	Mining Engineers and Mining Superintendent	Annually
Identify and obtain necessary approvals where interaction may exist with natural surface	Environmental Coordinator	As required

Item	Responsibility	Frequency
water systems prior to implementation.		
Notify the administering authority in writing within twenty-four (24) hours after becoming aware of any emergency; or incident that results in the release of contaminants	Environmental Coordinator	As required
Within fourteen (14) days following the notification emergency or incident, further written advice must be provided to the administering authority, including the following: (a) results and interpretation of any samples taken and analysed (b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and (c) proposed actions to prevent a recurrence of the emergency or incident	Environmental Coordinator	As required
Water management initiatives communicated to all personnel and externally communicated to relevant stakeholders.	Environmental Coordinator	As Required
The water management system will be maintained and operated in accordance with the requirements and procedures outlined in the Water Management Plan.	Environmental Coordinator, Mine Manager and Mining Superintendent	As specified for each item.
Establish a water monitoring program that will periodically sample water on and adjacent to the mining lease.	Environmental Coordinator	Quarterly

Item	Responsibility	Frequency
Review the monitoring program to ensure its performance is consistent with the long-term water management objectives.	Environmental Coordinator	Annually

12. References

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13. APPENDIX A

Current Water Balance Model Report