



Amendment Notice 2

Licence Number	L6820/1993/12
Licence Holder	Robe River Mining Co Pty Ltd
ACN	008 694 246
File Number:	DER2014/000766-1~1
Premises	Mesa J and K Iron Ore Mine Within Mining Lease AML248SA
Date of Amendment	10/07/2019

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Alana Kidd

Manager, Resource Industries

Regulatory Services

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC JOONDALUP WA 6919 info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
DBCA	Department of Biodiversity, Conservation and Attractions
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
GIS	Geographic Information System
Licence Holder	Robe River Mining Co Pty Ltd

m ³	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
mtpa	million tonnes per annum
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>
WWTP	Wastewater treatment plant

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment for Category 54. No other changes to the Licence have been requested by the Licence Holder.

The following guidance statements have informed the decision made on this amendment

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment history

Table 2 provides the amendment history for Licence L6820/1993/12.

Table 2: Licence amendments

Instrument	Issued	Amendment
L6820/1993/12.	18/1/2018	Amendment Notice 1: <ul style="list-style-type: none">• Authorisation of the Mesa J Secondary Sizer constructed under works approval W5634/2014/1;• Addition of TSF5 Stage 2 monitoring bores constructed under W5535/2013/1;• Re-categorisation and expansion of the current Category 63 Inert Landfill to a Category 64 Waste Dump Landfill;• Addition of Category 12 to allow for the use of a Mobile Crushing and Screening Plant; and Other administrative amendments.
L6820/1993/12.	10/07/2019	This amendment notice

Amendment description

The Licence Holder holds Licence L6820/1993/12 for the Mesa J and K Iron Ore Mine located approximately 100km east of Onslow and 10km south-west of Pannawonica in the Pilbara Region.

The Licence Holder is developing a new mine camp and wastewater treatment plant (WWTP) to support the operations workforce for the Mesa J and K mine, as well as the construction workforce for the Mesa H proposal.

The new WWTP and associated sprayfield will be located within Mining Lease AML248SA and within the existing prescribed premises boundary. Figure 1 shows the regional location of the WWTP infrastructure.

A Licence amendment is required as the WWTP fits the description of a prescribed premises, under Category 54. Table 3 below outlines the proposed additional category description on the Licence.

Table 3: Proposed additional prescribed premises category

Additional category	Category description	Category production/design capacity	Proposed design capacity
54	Sewage facility: premises – <ul style="list-style-type: none"> a) on which sewage is treated (excluding septic tanks); or b) from which treated sewage is discharged onto land or into waters 	100m ³ or more per day	186 m ³ per day

Wastewater treatment plant and spray field

Overview

The WWTP will be located adjacent and to the south east of the mine camp within the Prescribed Premises boundary. Treated effluent will be discharged to a new spray field located to the north of the proposed WWTP. The layout and footprint of the WWTP and sprayfield is shown in Figure 2 and Figure 4: WWTP and sprayfield footprint area. The WWTP design capacity will be up to 186 m³ / day.

The WWTP system will be an Activated Sludge Bioreactor designed to treat sewage using aeration and a biological floc (composed of bacteria and protozoa) to achieve effluent suitable for discharge. The system includes the following:

- Influent screening;
- Balance tank mixing;
- Aerobic and anoxic treatment;
- Clarification;
- Bag filtration;
- Effluent chlorination, and;
- Spray field irrigation.

The quality of water discharged from the proposed WWTP will be compared to effluent quality criteria in the National Water Quality Management Strategy (NWQMS), Australian Guidelines for Sewage Systems – Effluent Management (1997).

WWTP Design

The process flow of the system is summarised below as detailed by the Licence Holder. A process flow diagram is provided in Figure 3.

Influent screen

Screening is the first process in wastewater treatment. Screening removes suspended solids from wastewater to prevent damage and clogging in downstream wastewater treatment processes. A stainless steel, front-type mechanical bar screen is used to remove suspended solid matter >2 mm in size. Macerated sewage is pumped into the influent bar screen (which is mounted on the ground next to the pump station). Screened wastewater passes through the bar screen and flows by gravity into the pump station.

Bar screens require cleaning or 'raking' to prevent clogging of the bars. Rake teeth travel between the bars, removing solid matter. Solid matter removed from the bar screen is discharged via a chute to a solids bin.

Pump station

The pump station provides temporary storage for screened wastewater before pumping into the balance tank. The pump station also receives the supernatant water from the sludge tank.

Balance tank

A balance tank is designed with sufficient volume to permit non-uniform wastewater to be retained, mixed and pumped forward through downstream wastewater treatment processes at a more constant rate.

Screened wastewater enters the balance tank via the pump station. The balance tank provides suitable retention of screened wastewater to cater for variations in diurnal flows, storing up to 24 hours of influent volume.

The balance tank also receives mixed liquor return (MLR), a combination of pre-settled wastewater and return activated sludge (RAS), from the bioreactor.

Anoxic zone 1

Between 10% and 30% of balance tank volume is utilised as an anoxic zone to remove some of the nitrate concentration.

The biological reduction of nitrate to nitrogen by specific facultative anaerobic bacteria in anaerobic or anoxic conditions is a process called *de-nitrification*. These bacteria use nitrate as the primary source of oxygen when oxygen levels are depleted. Denitrification generally occurs at oxygen concentrations of less than 0.5 mg/L and ideally less than 0.2 mg/L.

When bacteria break apart nitrate (NO_3) to gain the oxygen (O_2), the nitrate is reduced to nitrogen (N_2). Since nitrogen has low water solubility, it escapes into the air. Free nitrogen is the major component of air (78%), thus its release does not cause any environmental concern.

The de-nitrification process also requires carbon; that is, the presence of sufficient organic matter (in the form of wastewater or supplemental carbon) to drive the denitrification reaction.

The balance tank has an influent mixing pump to ensure wastewater quality is as uniform as possible before it is pumped via an influent feed pump to the bioreactor.

Influent feed pump

An influent feed pump supplies screened, mixed wastewater and mixed liquor to the bioreactor. The operation of the influent feed pump is based on the level inside the bioreactor, automatically turning on/off as required.

Bioreactor

A bioreactor supports a biologically 'active' environment including the bacteria (95%) and other microorganisms (5%) that are responsible for removing organic content, specifically nitrogen, and reducing biochemical oxygen demand (BOD) in wastewater via aerobic and anoxic digestion, and clump together as they do so (flocculation). Flocculated particles readily settle out and can be removed during clarification.

Aerobic zone 1

The screened, mixed wastewater and mixed liquor from the balance tank is pumped to the aerobic tank in the bioreactor where it is aerated with oxygen, allowing bacteria and other microorganisms to thrive. These bacteria and other microorganisms 'digest' suspended organic matter (specifically nitrogen) in wastewater and bind other colloidal contaminants into flocculated particles (suspended organic matter that clump together).

The biological conversion of ammonium to nitrate by facultative aerobic bacteria known as *nitrifiers* in aerobic conditions is a process called *nitrification*. *Nitrosomonas* convert ammonia (NH₄) to nitrite (NO₂) and *Nitrobacter* convert nitrite to nitrate (NO₃) to obtain energy for growth and maintenance, while they convert colloidal contaminants into carbon dioxide and flocculated particles.

Nitrification generally occurs at dissolved oxygen concentrations of 2.0 mg/L or more. To ensure dissolved oxygen concentrations in the aerobic tank of around 2.0mg/L, a dissolved oxygen analyser is installed inside the aerobic tank. Nitrification also requires long retention time, low food to microorganism ratio, high mean cell residence time (measured as MCRT or sludge age), and adequate buffering (alkalinity).

Anoxic zone 2

Nitrate can affect reduced efficiency of biological phosphorus removal. For effective nitrogen (and phosphorus) removal, alternating aerobic and anoxic phases are implemented. There is an anoxic zone located in part of the bioreactor. The mixed liquor is recycled from the aerobic zone to the second anoxic zone for enhanced denitrification and phosphorus release.

The mixed liquor from the anoxic zone in the bioreactor overflows by gravity to the second aerobic zone for enhanced nitrification.

Aerobic zone 2

The second aerobic zone is for enhanced nitrification; for the conversion of any residual ammonium to nitrate and clumping of other colloidal contaminants into flocculated particles that readily settle out and can be removed during clarification.

On a continuous basis, MLR is recirculated from the bioreactor back to the balance tank via the MLR pump.

Clarification

A clarification tank is installed outside the bioreactor. It is designed to have adequate retention time to allow flocculated particles to separate from treated wastewater and settle to the bottom of the tank, producing a clarified liquid that is relatively free from suspended organic material and meets relevant standards for discharge.

The settled material, or 'activated sludge', is either returned to the start of the wastewater treatment process (balance tank) as return activated sludge (RAS) or removed from the process as waste activated sludge (WAS). RAS returned to the balance tank is used to treat new wastewater. WAS is removed from the process in order to keep the ratio of biomass to food supplied in the wastewater in balance. Some particles in the wastewater (such as phosphates and aluminates) will deposit onto sludge particles and are removed from the treatment system with excess sludge.

Clarified wastewater with low suspended material levels from the clarification tank is decanted into the treated effluent tank.

Treated effluent transfer system

The clarified water from the clarification tank is transferred into a treated effluent tank by a treated effluent transfer pump. The clarified water is filtered via bag filtration prior to discharge to the treated effluent tank to ensure that total suspended solids (TSS) are less than 30mg/L.

Chlorination system

The chlorination system introduces chlorine or hypochlorite for the disinfection of microbial pathogens before discharging treated effluent to receiving environments.

A recirculation pump continuously circulates the contents of the treated effluent tank. A chlorine analyser monitors the free residual chlorine and a dosing system controls additional hypochlorite as required to ensure correct free chlorine levels are maintained in the tank at all times for

effective disinfection.

Treated effluent distribution system and sprayfield

Treated effluent will be delivered to a sprayfield via a treated effluent distribution system. A mechanical totaliser is installed to measure the volume of the treated effluent that is discharged.

The sprayfield will consist of a series of above ground sprinklers, designed to distribute effluent evenly and prevent ponding/runoff of discharged effluent.

The sprayfield has been designed for an area of 7.1ha, considering the design capacity of the WWTP and to manage nutrient (nitrogen and phosphorus) application rates. The sprayfield design has considered *Water Quality Protection Note 22 (WQPN22): Irrigation with nutrient rich wastewater (Department of Water, 2008) – Table 2: Nutrient application criteria to control eutrophication risk, Risk Category B.*

To ensure nutrient application rates do not exceed maximum nutrient application criteria (as specified in WQPN22) the Licence Holder has designed the area of the sprayfield to exceed the estimated area required to achieve the nutrient loading criteria. The Licence Holder has estimated a sprayfield size of 4.15ha would be required to meet the guideline requirements and has exceeded this with a sprayfield area of 7.1ha.

Table 5 notes the maximum nutrient application criteria and the Licence Holder's predicted nutrient application rates. Calculations to determine predicted nutrient application rates have been based on the expected treated wastewater (effluent) quality as shown in Table 5, i.e. <11 mg/L for total nitrogen and <1.2 mg/L for total phosphorus.

Table 4: Maximum nutrient application criteria and predicted nutrient application rates

Parameter	Maximum nutrient application criteria*	Predicted nutrient application rates**
Total nitrogen (kg/ha/year)	180	105.2
Total phosphorus (kg/ha/year)	20	11.47

* Source: *Water Quality Protection Note 22 (WQPN22): Irrigation with nutrient rich wastewater (Department of Water, 2008) – Table 2: Nutrient application criteria to control eutrophication risk, Risk Category B.*

** The Licence Holder's calculations to determine predicted nutrient application rates are outlined below:

- Total nitrogen – $(11 \text{ mg/L} / 1,000) = 0.011 \text{ kg/m}^3 \times 186 \text{ m}^3/\text{day}$ (design output) = 2.046 kg/day x 365 days (operating every day of year) = 746.8 kg/year / 7.1 ha = 105.2 kg/ha/year.
- Total phosphorus – $(1.2 \text{ mg/L} / 1,000) = 0.0012 \text{ kg/m}^3 \times 186 \text{ m}^3/\text{day}$ (design output) = 0.223 kg/day x 365 days (operating every day of year) = 81.47 kg/year / 7.1 ha = 11.47 kg/ha/year.

The Licence Holder proposes that the WWTP facility design and predicted nutrient application rates will reduce the eutrophication risk for surface waters (related to the irrigation of treated effluent).

A perimeter fence with notification signage will be installed around the sprayfield to limit public access to the area.

Treated effluent quality

The Licence Holder reports the WWTP is expected to deliver treated effluent quality with parameters as detailed in Table 5 below. The Licence Holder will undertake sampling and analysis of treated effluent and compare resulting data against targets detailed in the *National Water Quality Management Strategy – Australian Guidelines for Sewage Systems (AGSS) –*

Effluent Management (1997) – detailed in Table 5 below.

Table 5 : Expected treated wastewater (effluent) quality against AGSS targets

Parameter	Influent	Treated effluent	AGSS target*
Biochemical Oxygen Demand (mg/L)	150 – 400	<20	5-20
Total suspended solids (mg/L)	150 – 300	<30	5-20
pH (pH value)	6.5 – 8.5	6.5 – 8.5	N/A
Total nitrogen (mg/L)	<50	11	10-20
Total phosphorus (mg/L)	<16	1.2	<2
<i>E.Coli</i> (cfu/100mL)	-	<1	<10 ³

* *National Water Quality Management Strategy, Australian Guidelines for Sewage Systems (AGSS): Effluent Management (1997) – Appendix 6: Typical effluent quality following various levels of treatment (Treatment process categories D and E).*

Construction and commissioning

Construction and commissioning will be undertaken over a 4 month period.

Following completion of construction, the Licence Holder will submit a compliance report to DWER detailing compliance with the WWTP construction requirements. Commissioning of the WWTP will then be undertaken to identify and resolve any design and construction issues, ensure that the WWTP is operating to specification, and to evaluate performance of the wastewater treatment process.

Commissioning will include:

- Testing of electrical and mechanical installation;
- Instrument setting and operations;
- Establishing tank operation levels;
- Fluid transfer between tanks;
- Testing of safety systems;
- Testing for leaks on tanks and piping;
- Testing of irrigation equipment;
- Complete automatic operation of process; and
- Alarms, setting and priming of chemical metering pumps.

On startup, the WWTP will be filled with water to ensure that effluent discharges are diluted. During commissioning, the WWTP will undergo a period of stabilisation.

Monthly monitoring of the effluent quality will be undertaken during commissioning to ensure that the water quality is trending towards stabilisation.

Operation

Operation of the WWTP will include the following:

- Weekly inspection and preventative maintenance of the WWTP.
- The cumulative volume of treated wastewater discharged to the sprayfield will be recorded.
- The quality of the treated wastewater will be monitored quarterly. The results of water quality monitoring will be compared against the *National Water Quality Management*

Strategy, Australian Guidelines for Sewerage Systems (AGSS) – Effluent Management (1997) targets and previous monitoring results.

- Biosolids (sludge) from the WWTP will be disposed of to a licenced landfill facility in accordance with the *Department of Environment and Conservation, Western Australian Guidelines for Biosolids Management (2012)*.

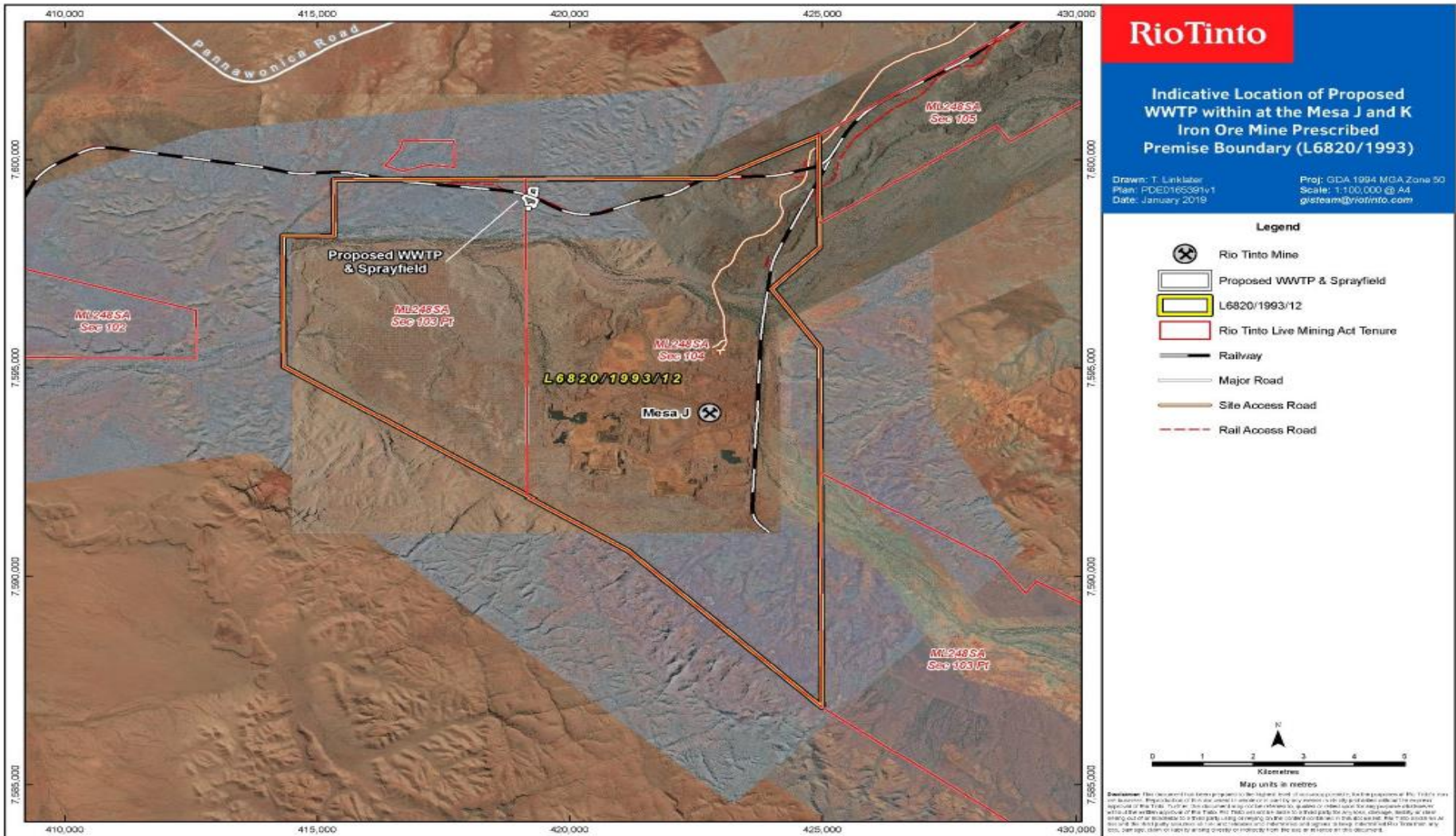


Figure 1: Location of WWTP within the Mesa J and K Mine prescribed premises boundary

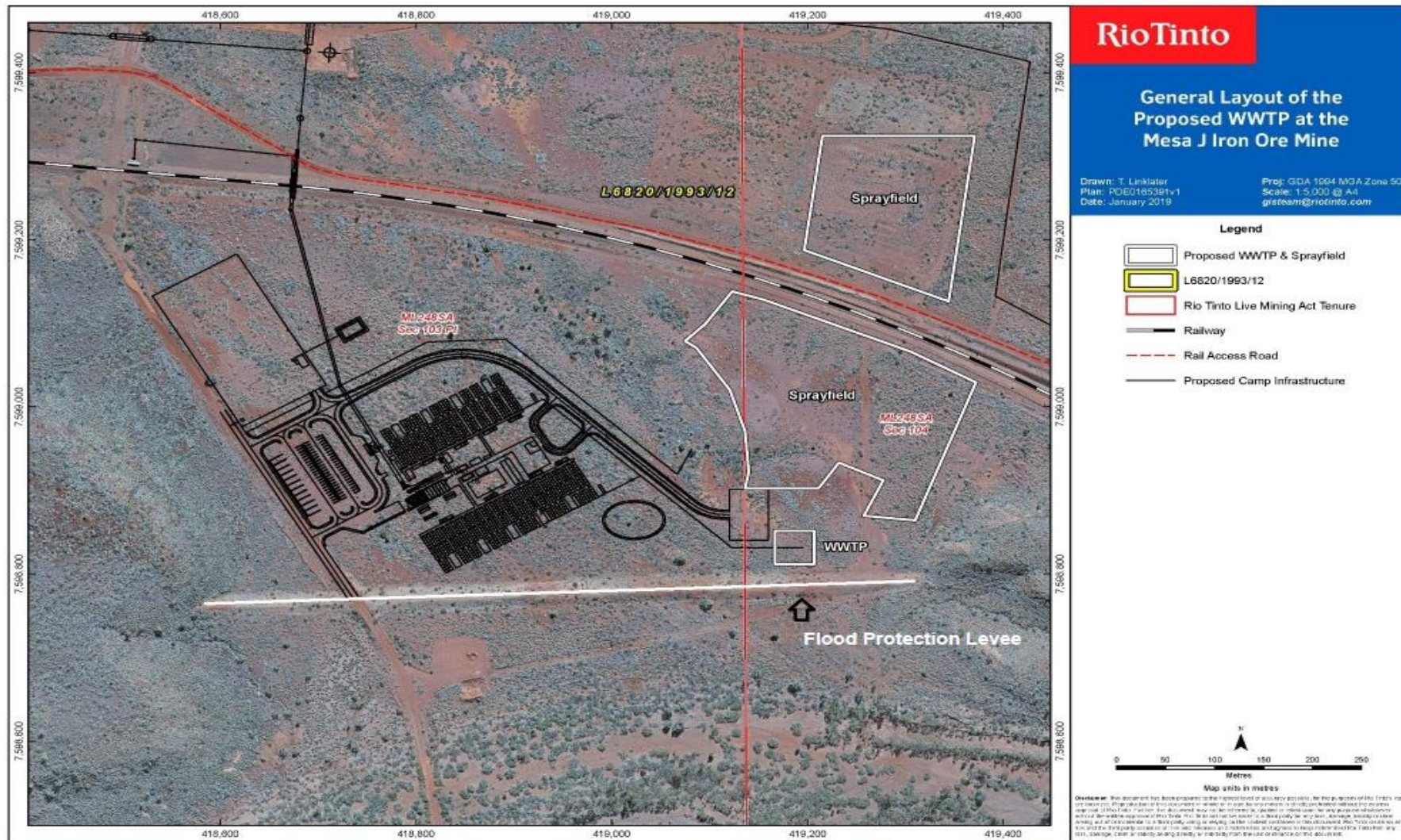


Figure 2: Layout of WWTP and sprayfield

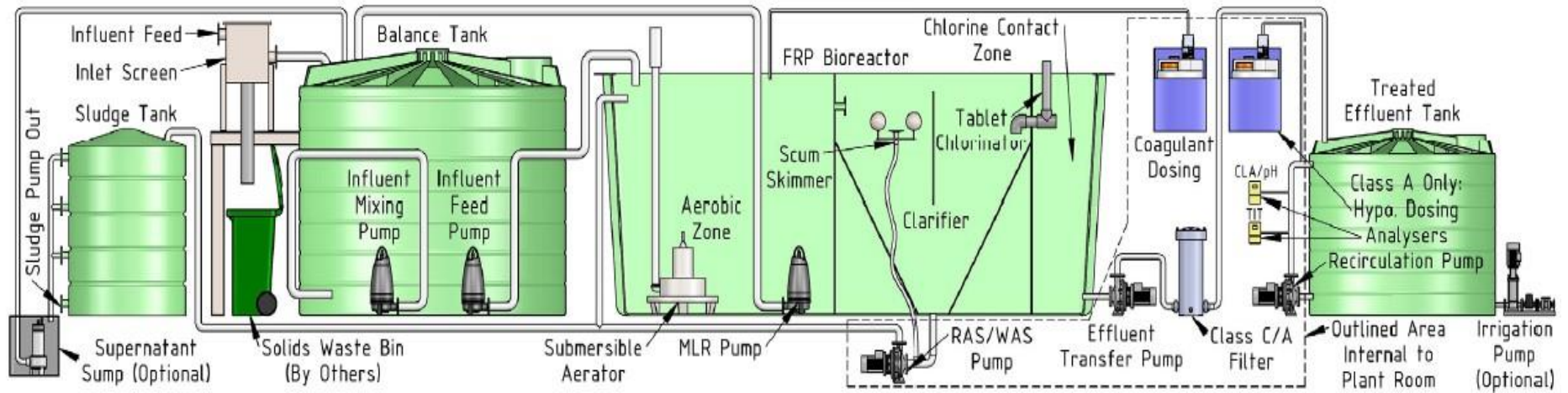


Figure 3: Typical process flow diagram of an Activated Sludge Bioreactor WWTP

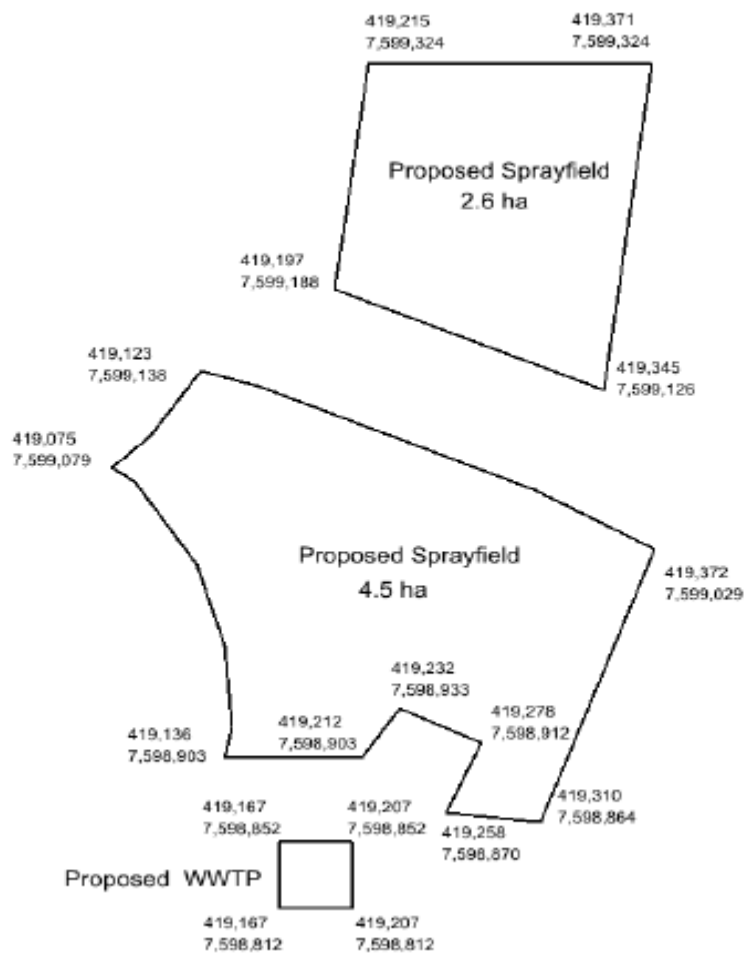


Figure 4: WWTP and sprayfield footprint area

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 6.

Table 6: Relevant approvals

Legislation	Number	Approval
<i>Iron Ore (Robe River) Agreement Act, 1964</i>	AML248SA	The Premises boundary is located wholly within tenure pursuant to the <i>Iron Ore (Robe River) Agreement Act 1964</i> .
<i>Environmental Protection Act 1986 - Part IV</i>	Ministerial Statement 208 (MS208)	Statement that proposal may be implemented – Mesa J Iron Ore Development
<i>Environmental Protection Act 1986 - Part IV</i>	Ministerial Statement 208 (MS776)	Statement that a revised proposal may be implemented – Mesa K remnant mining project
<i>Environmental Protection Act 1986 - Part IV</i>	Assessment number 2121	Mesa H Proposal (Revision to Mesa J Iron Ore Development) – <i>currently under assessment</i> .
<i>Environmental Protection Act 1986 – Part V Clearing</i>	CPS 4397 CPS 5639	CPS 4397 – clearing of up to 750 ha on ML248SA for purposes including construction camp and associated activities. CPS 5639 – clearing of up to 30 ha on ML248SA for purposes including mine support infrastructure and associated works.
Shire of Ashburton	N/A	Approval for the proposed WWTP will be sought from the Shire of Ashburton.

Location and receptors

Table 7 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 7: Receptors and distance from activity boundary

Residential and sensitive premises	Description / distance from the WWTP facility
Yatharla aboriginal community - including community groundwater bores	1.8 km north-west of the WWTP DWER's GIS indicates Yatharla aboriginal community is unoccupied.

Table 8 below lists the relevant environmental receptors in the vicinity of the WWTP facility which may be receptors relevant to the proposed amendment.

Table 8: Environmental receptors and distance from activity boundary

Environmental receptors	Description / distance from WWTP facility
Vulnerable species - Pilbara olive python	1km to the south-west of the WWTP facility, within the Robe River floodplain - DWER's GIS indicates Pilbara

Scientific name - <i>Liasis olivaceus barroni</i>	olive python have been observed at this location.
Priority 1 Ecological Community (buffer area) - Subterranean invertebrate communities of mesas in the Robe Valley region	1km south-east of the WWTP facility Description from DBCA (2019) – A series of isolated mesas occur in the Robe valley in the state's Pilbara Region. The mesas are remnants of old valley infill deposits of the paleo Robe river. The troglobitic faunal communities occur in and extremely specialised habitat and appear to require the particular structure and hydrogeology associated with mesas to provide a suitable humid habitat. Short range endemism is common in the fauna. The habitat is the humidified pisolitic strata.
Priority 1 Ecological Community (buffer area) - Subterranean invertebrate community of pisolitic hills in the Pilbara	875m south-west of the WWTP facility Description from DBCA (2019) – A series of isolated low undulating hills occur in the state's Pilbara Region. The trogloufauna are being identified as having very short range distributions.
Soils and native vegetation	Soils and remnant native vegetation in the WWTP facility area.
Groundwater	Groundwater in the area of the WWTP facility is estimated to be 8 to 9.5m below ground level. Regional groundwater flows are generally expected to be to the north and north-west. The Robe River Alluvium Aquifer occurs within the shallow alluvial sediments underlying and adjacent to the Robe River, located approximately 130 m south of the WWTP facility.
Robe River floodplain and pools	The Robe River is an ephemeral river, located approximately 132m south of the WWTP and 200m south of the WWTP sprayfield. DWER's GIS indicates there may be permanent river pools within the Robe River – the nearest potential pools are located 750m to 1km to the south of the WWTP facility.

Consultation

An invitation to comment on the application was issued to the Shire of Ashburton on 5 April 2019. No response was received.

An additional invitation to comment was issued to the Department of Jobs, Tourism, Science and Innovation (DJTSI) on 8 April 2019. A response was received noting the DJTSI has no comment in regard to the application.

Risk assessment

Table 9 and Table 10 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 9: Risk assessment for proposed amendments during construction

Source/Activities		Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning
		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Category 54 sewage facility	Construction of WWTP and sprayfield	Noise Dust	Yatharla aboriginal community	Air/wind	Health and amenity impacts	N/A	N/A	N/A	Not considered a risk event as Yatharla aboriginal community is understood to be unoccupied. In addition, in the event the community is occupied, given the relatively minor and short term nature of earthworks/construction, and the separation distance between the activity and the community (approx. 1.8 kms), potential noise and dust emissions are not expected to impact residents.
		Fuel/oil spills from construction machinery and vehicles	Soils	Direct discharge via a fuel/oil spill	Soil contamination	Minor	Rare	Low	Construction works for the WWTP facility are considered to include minor and short-term earthworks and installation of the WWTP and sprayfield infrastructure. A fuel/oil spill from associated construction machinery and vehicles is assessed as a potential minor incident and rare event. Impacts to soil and groundwater from such an event are anticipated to be minor localised impacts.
			Groundwater	Infiltration of spilled fuel/oil through soil	Groundwater contamination	Minor	Rare	Low	

Table 10: Risk assessment for proposed amendments during commissioning and operation

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
Category 54 sewage facility	Commissioning and operation of WWTP and sprayfield	Odour	Yatharla aboriginal community	Air/wind	Amenity impacts	N/A	N/A	N/A	<p>Not considered a risk event as Yatharla aboriginal community is understood to be unoccupied.</p> <p>In addition, in the event the community is occupied, DWER has considered:</p> <p>A well-managed WWTP is not expected to generate significant odour emissions. In addition, given the separation distance between the WWTP and Yatharla community (approx. 1.8 kms), potential odour emissions are not expected to impact residents.</p>
		Untreated sewage spilled from the WWTP	Soils and remnant native vegetation in the vicinity of the WWTP	Direct contact Uptake from soil	Elevated levels of salts and nutrients in soils Adverse impact on vegetation condition	Moderate	Rare	Medium	<p>The WWTP is sited away from residential areas, public water supply areas and high conservation value or special significance environmental receptors.</p> <p>The WWTP is designed to be a closed system. A sewage spill is therefore considered to be a rare event.</p>
			Groundwater	Infiltration to groundwater	Elevated levels of pathogens, salts and nutrients in groundwater				<p>To mitigate the risk of sewage spills from the WWTP the Licence Holder will implement the following key measures:</p>

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
		Robe River sediments and riparian vegetation	Overland flow	Elevated levels of salts and nutrients deposited in river sediments (when river is not flowing).				<ul style="list-style-type: none"> Siting of the WWTP as specified; Design and installation of a closed system WWTP. Use of existing flood protection levee south of the WWTP – to act as a physical barrier to sewage flow in the unlikely event of a major spill, mitigating the risk of sewage discharge to the Robe River. <p>The risk event is deemed medium risk and acceptable, subject to regulatory controls.</p>
		Treated effluent discharged at the irrigation sprayfield – effluent containing pathogens, suspended solids, nitrogen and phosphorus	Soils within the sprayfield area	Direct discharge	Minor	Possible	Medium	<p>The WWTP sprayfield is sited away from residential areas, public water supply areas and high conservation value or special significance environmental receptors.</p> <p>To mitigate the risks associated with discharge of treated effluent the Licence Holder will implement the following key measures:</p>
			Groundwater	Infiltration to groundwater	Minor	Unlikely	Medium	<ul style="list-style-type: none"> Operation and maintenance of the WWTP, designed to achieve effluent quality suitable for land application, in line with AGSS guidelines. Design of effluent sprayfield to ensure nutrient application rates do not exceed maximum nutrient application criteria (as

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
								<p>specified in WQPN22)</p> <ul style="list-style-type: none"> Monitoring of effluent quality to verify the WWTP performance. Monitoring the cumulative volume of effluent discharged to support evaluation of nutrient loading rates. <p>The risk event is deemed medium risk and acceptable, subject to regulatory controls.</p>
		<p>Robe River ecosystem</p> <p>Robe River pools</p>	<p>Overland flow following high rainfall events</p>	<p>Elevated levels of salts and nutrients in river flows and pools</p> <p>Eutrophication</p>	N/A	N/A	N/A	<p>DWER notes that the Licence Holder's predicted nutrient application rates are below the maximum nutrient application criteria in WQPN22 (DoW, 2008) to control eutrophication risk - Risk Category B.</p> <p>The potential for mobilisation/leaching of dissolved solids and nutrients from the sprayfield area is also reduced due to the sporadic nature of high rainfall events at the site.</p> <p>Intense flows and flushing at the Robe River following high rainfall events are also expected to be a factor in the prevention of eutrophication at Robe River pools located in the region.</p> <p>Based on the above considerations</p>

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
								DWER does not believe there will be a salinisation or eutrophication impact at the Robe River pools attributable to the assessed activity.
		Groundwater bores at Yatharla aboriginal community	Application of treated effluent at sprayfield, followed by infiltration to groundwater and subsequent groundwater flow through to Yatharla community bores.	Adverse health effects	N/A	N/A	N/A	<p>DWER has considered Yatharla aboriginal community may be unoccupied, however the potential for occupation exists.</p> <p>DWER notes that discharged effluent quality is expected to be in line with the <i>Australian Guidelines for Sewage Systems (AGSS): Effluent Management (1997)</i>. DWER has also considered the application method (above ground sprayfield), climate, depth to groundwater and distance to the Yatharla community bores (~1.6 to 1.8km). Based on these considerations DWER does not foresee a source-pathway-receptor link and risk event.</p>

Decision

DWER has reviewed the information provided by the Licence Holder and completed a risk assessment as detailed herein, including consideration for control measures undertaken and to be implemented by the Licence Holder. DWER has assessed the licence amendment application as Medium risk and acceptable, subject to compliance with the licence conditions, including additional and amended conditions detailed in this Amendment Notice.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 7 June 2019. Comments were received from the Licence Holder on 27 June 2019 and have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

- The Licence is amended by the insertion of the bold text shown in underline below.

PRESCRIBED PREMISES CATEGORY

Schedule 1 of the Environmental Protection Regulations 1987

CATEGORY NUMBER	CATEGORY DESCRIPTION	CATEGORY PRODUCTION OR DESIGN CAPACITY	PREMISES PRODUCTION OR DESIGN CAPACITY
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	13,000,000 tonnes per year
6	Mine dewatering	50,000 tonnes or more per year	30 Gigalitres per year
12	Screening, etc. of material	50,000 tonnes or more per year	10,000,000 tonnes per year
61A	Solid waste facility	100 tonnes or more per year	16,000 tonnes per year
64	Class II inert landfill site	20 tonnes or more per year	2,000 tonnes per year
<u>54</u>	<u>Sewage facility: premises</u>	<u>100m³ or more per day</u>	<u>186 m³ per day</u>

- The Licence is amended by the removal of Condition 15 shown in strikethrough below and the insertion of Conditions 31 to 41 shown in bold text and underlined below.

~~15 — The licensee shall manage and operate the sewage wastewater treatment system in a manner such that:~~

- ~~(i) — uncontaminated stormwater runoff does not enter the wastewater treatment system;~~
- ~~(ii) — there is not discernible seepage loss from the treatment tanks or associated piping;~~
- ~~(iii) — treated wastewater from the plant is discharged to the spray irrigation area; and~~
- ~~(iv) — any sludge removed from the treatment system are disposed of in accordance with the *Western Australian guidelines for biosolids management*, Department of Environment and Conservation (February 2012).~~

3. The Licence is amended by the insertion of bold Conditions 31 to 41 as outlined below:

WWTP CONSTRUCTION

Condition 31 - The Licence Holder shall ensure that each item of infrastructure specified in Table 11 is designed and constructed in accordance with the requirements specified.

<u>Table 11: WWTP facility requirements</u>															
<u>Infrastructure</u>	<u>Requirements (location, design and construction)</u>														
<u>Activated Sludge Bioreactor Waste Water Treatment Plant</u>	<u>Located as depicted in Attachment 5</u>														
	<u>Designed and constructed to treat up to 186 m³/day throughput and with effluent to the following standards:</u>														
	<table border="1"> <thead> <tr> <th><u>Parameter</u></th> <th><u>Treatment specifications</u></th> </tr> </thead> <tbody> <tr> <td><u>Biochemical oxygen demand (BOD)</u></td> <td><u><20mg/L</u></td> </tr> <tr> <td><u>Total suspended solids</u></td> <td><u>≤30mg/L</u></td> </tr> <tr> <td><u>pH</u></td> <td><u>6.5-8.5</u></td> </tr> <tr> <td><u>Total Nitrogen</u></td> <td><u>11mg/L</u></td> </tr> <tr> <td><u>Total Phosphorus</u></td> <td><u>1.2 mg/L</u></td> </tr> <tr> <td><u>E. coli</u></td> <td><u><10³ cfu/100mL</u></td> </tr> </tbody> </table>	<u>Parameter</u>	<u>Treatment specifications</u>	<u>Biochemical oxygen demand (BOD)</u>	<u><20mg/L</u>	<u>Total suspended solids</u>	<u>≤30mg/L</u>	<u>pH</u>	<u>6.5-8.5</u>	<u>Total Nitrogen</u>	<u>11mg/L</u>	<u>Total Phosphorus</u>	<u>1.2 mg/L</u>	<u>E. coli</u>	<u><10³ cfu/100mL</u>
	<u>Parameter</u>	<u>Treatment specifications</u>													
<u>Biochemical oxygen demand (BOD)</u>	<u><20mg/L</u>														
<u>Total suspended solids</u>	<u>≤30mg/L</u>														
<u>pH</u>	<u>6.5-8.5</u>														
<u>Total Nitrogen</u>	<u>11mg/L</u>														
<u>Total Phosphorus</u>	<u>1.2 mg/L</u>														
<u>E. coli</u>	<u><10³ cfu/100mL</u>														
<u>Constructed so that treated effluent is discharged to the irrigation sprayfield.</u>															
<u>WWTP facility sprayfield</u>	<u>Located as depicted in Attachment 5</u>														
	<u>7.1 hectares in size.</u>														
	<u>Sprinklers are spaced to ensure an even distribution of treated effluent across the irrigation sprayfield</u>														
	<u>Surrounded by perimeter fence and suitable signage</u>														

WWTP CONSTRUCTION COMPLIANCE AND COMMISSIONING

Condition 32 The Licence Holder must not depart from the requirements specified in Table 11 except:

- (a) **Where such departures are minor in nature and do not materially change or affect the infrastructure; or**

- (b) Where such a departure improves the functionality of the infrastructure and does not increase the risks to public health, public amenity or the environment.

Condition 33 The Licence Holder shall submit a construction compliance report to the CEO, following construction of the WWTP and sprayfield, and prior to commissioning and operation of the same.

Condition 34 The Licence Holder must ensure that the construction compliance document required by condition 33:

- (a) is signed by a suitably qualified engineer; and
- (b) certifies that each item of infrastructure specified has been constructed in accordance with the conditions of the Licence with no material defects beyond those listed under condition 32.

Condition 35 The Licence Holder shall commission the WWTP for a period not exceeding 4 months.

Condition 36 The Licence Holder shall undertake the monitoring as specified in Table 12 during the commissioning period of the WWTP.

Condition 37 The Licence Holder must submit a WWTP commissioning report to the CEO within 1 month of the completion of commissioning.

Condition 38 The Licence Holder shall ensure the commissioning report for the WWTP includes:

- (a) a summary of the monitoring results recorded under condition 36;
- (b) Any original analysis reports submitted to the Licence Holder from third parties for the commissioning period;
- (c) a summary of the environmental performance of the WWTP as installed, against the design specification set out in the works approval application;
- (d) where design specifications have not been met, measures proposed to meet the design specification and/or works approval conditions, together with timescales for implementing the proposed measures.

WWTP EFFLUENT MONITORING

Condition 39 The Licence Holder shall undertake the monitoring as specified in Table 12 during the commissioning and operational period for the WWTP as specified.

Table 12 : WWTP effluent monitoring requirements (commissioning and operational periods)

<u>Parameter</u>	<u>Units</u>	<u>Averaging period</u>	<u>Frequency^{2,3}</u>	<u>Standards - Sampling & Analysis</u>
<u>pH¹</u>	<u>pH units</u>	<u>Spot sample</u>	<u>Monthly (during commissioning period)</u> <u>Quarterly (during post-commissioning operational period)</u>	<u>AS/NZS 5667.10</u> <u>Samples submitted to and tested by a laboratory with current NATA accreditation</u>
<u>E. coli</u>	<u>cfu/100ml</u>			
<u>Biochemical oxygen demand</u>	<u>mg/L</u>			
<u>Total suspended solids</u>	<u>mg/L</u>			
<u>Residual free chlorine</u>	<u>mg/L</u>			
<u>Total Phosphorous</u>	<u>mg/L</u>			
<u>Total Nitrogen</u>	<u>mg/L</u>			
<u>Effluent flow rate</u>	<u>kL/day</u>	<u>24 hours</u>	<u>Continuous</u>	-

Note 1: For pH, in-field non-NATA accredited analysis is permitted.

Note 2: Monthly monitoring shall be undertaken at least 15 days apart.

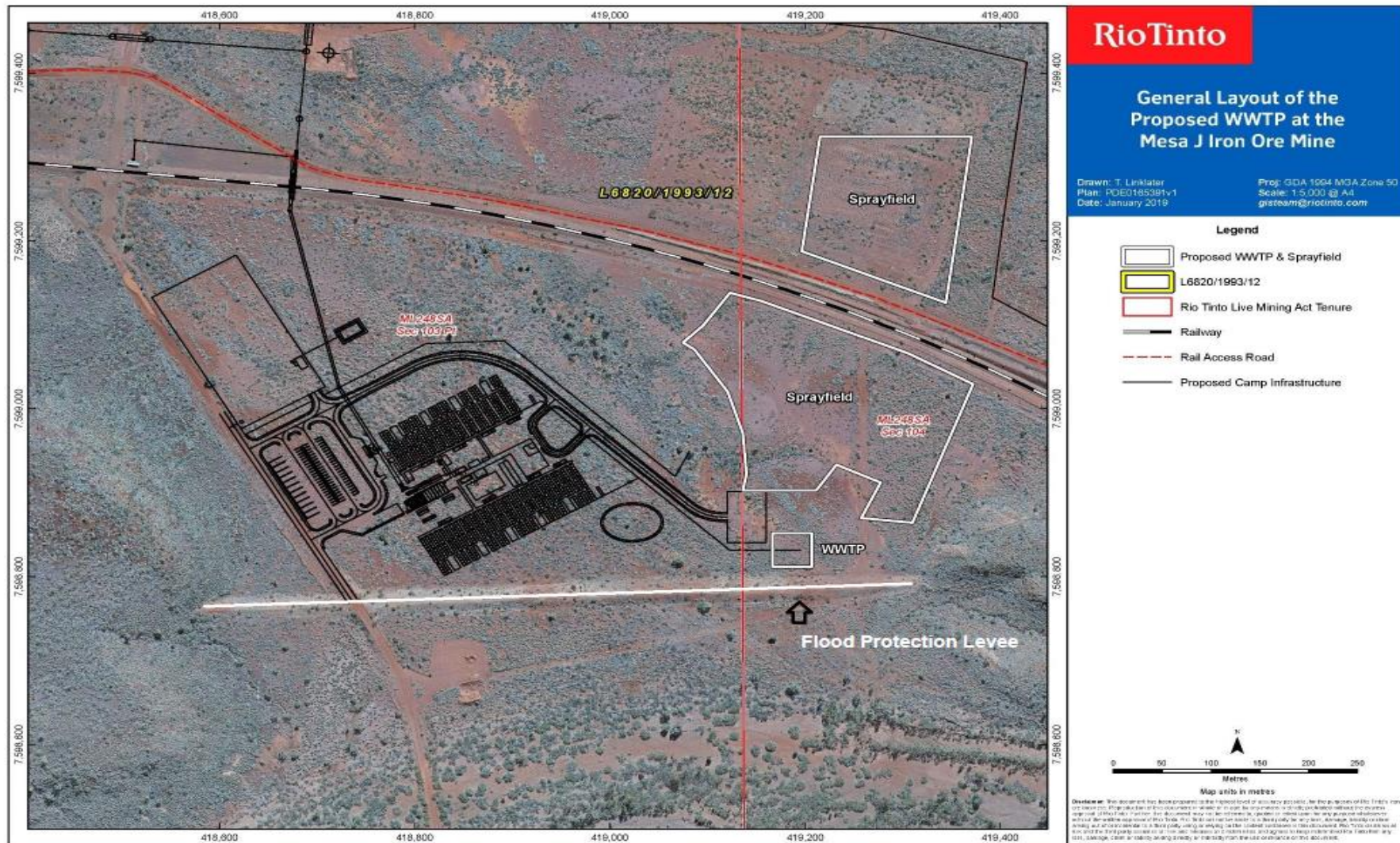
Note 3: Quarterly monitoring shall be undertaken at least 45 days apart.

WWTP – GENERAL

Condition 40 The Licence Holder shall ensure that all effluent discharged from the WWTP consists only of treated wastewater and is only discharged to the sprayfield areas depicted in Attachment 5.

Condition 41 The Licence Holder shall ensure any sludge removed from the WWTP is disposed of in accordance with the *Western Australian guidelines for biosolids management*, Department of Environment and Conservation (February 2012).

Attachment 5 Layout of WWTP and sprayfield



Appendix 1: Key documents

Document title	In text ref	Availability
<p>Application for amendment to Licence L6820/1993/12 including:</p> <ul style="list-style-type: none"> - Signed application form, dated 22 February 2018. - Supporting document, dated February 2019. 	Application	DWER records number DWERDT137341
National Water Quality Management Strategy – Australian Guidelines for Sewage Systems (AGSS) – Effluent Management (1997).	AGSS	http://waterquality.gov.au/guidelines/sewage-systems#effluent-management
Water Quality Protection Note 22: Irrigation with nutrient rich wastewater. Department of Water, 2008.	WQPN22	https://www.water.wa.gov.au/
Priority Ecological Communities for Western Australia, Version 28 - Department of Biodiversity, Conservation and Attractions, dated 17 January 2019.	N/A	https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Priority%20ecological%20communities%20list%20_Jan%202019.pdf
Applicant comments on draft Amendment Notice 2 – received 27 June 2019	N/A	DWER records number – DWERDT172287

Appendix 2: Summary of Licence Holder comments

Decision report section or Condition	Summary of Licence Holder comment	Summary DWER response
Amendment 1 Category 54 design capacity	The Licensee requests that the Premises Production or Design Capacity for Category 54 (Sewage facility) be corrected to 186 m ³ per day	Typographical error corrected, confirming assessed design capacity for Category 54 is 186 m ³ per day
WWTP Construction – Condition 31 <i>Constructed for inbuilt emergency storage of XX days (number of days to be specified)</i>	<p>The proposed WWTP includes storage capacity of 450,000 litres (or approximately 3 days) of treated wastewater prior to discharge to the irrigation sprayfield</p> <p>The Licensee requests that ‘requirements’ for emergency storage be removed from the Licence conditions.</p> <p>The WWTP will be designed to provide sufficient storage capacity to contain treated effluent in storage tanks during wet weather or other events. The Licensee requests that the volume of emergency storage is not a requirement of the Licence condition, consistent with other Licences managed by the Licensee with a similar risk profile.</p>	<p>Request endorsed – the WWTP emergency storage volume is not required to be specified as a Licence condition.</p> <p>The risk rating attributed to a spill of untreated sewage from the WWTP is Medium. The Licence Holder is required to treat sewage with a suitably designed closed system WWTP; and to prevent discharge of untreated sewage to the environment. No additional controls/conditions are required for the nominated risk event.</p>
WWTP Construction – Condition 31 <i>XX above ground sprinklers spaced to minimise pooling (number of sprinklers to be specified)</i>	<p>The Licensee requests that the ‘requirements’ for sprinklers be revised as follows: <i>Sprinklers are spaced to ensure an even distribution of wastewater across the irrigation sprayfield.</i></p> <p>The indicative sprayfield design includes at least 45 above ground sprinklers (radius 24 m), evenly covering 4.5 ha of the southern sprayfield. The same design principles will be applied to evenly cover the 2.6 ha of the northern portion. The Proponent commits that the spray irrigation system will be appropriately designed (including number, type, diameter, flow rate and spacing of sprinklers) to</p>	Request endorsed – Condition 31 updated as proposed by the Licence Holder. The Licence Holder is required to ensure even distribution of treated effluent across the irrigation sprayfield, to support achievement of predicted nutrient application rates.

Decision report section or Condition	Summary of Licence Holder comment	Summary DWER response
	<p>distribute treated water to the sprayfield evenly to prevent ponding and ensure that nutrient application rates do not exceed maximum nutrient application criteria.</p> <p>The Licensee requests that the License conditions allow for the sprayfield design to be optimised during operation, for example, to determine the appropriate number of sprinklers dependant on actual volumes of treated wastewater or performance of the system.</p> <p>The Licensee instead requests that the Licence condition reflect outcomes to protect environmental values (<i>to ensure an even distribution of wastewater across the irrigation sprayfield</i>), consistent with other Licences managed by the Licensee with a similar risk profile.</p>	
<p>Condition 35 – <i>The Licence Holder shall commission the WWTP for a period not exceeding 3 months.</i></p>	<p>The Licensee requests a four month commissioning period (rather than three months), consistent with other recently approved Licence conditions for WWTPs, to allow enough time for sufficient monitoring data to be obtained to ensure commissioning targets are met and operation of the WWTP can commence per condition 37.</p> <p>Condition 37 of the Draft Licence Amendment requires that '<i>The Licence Holder must submit a WWTP commissioning report to the CEO within 1 month of the completion of commissioning</i>'. In order that the commissioning period does not exceed three months, and that operation of WWTP can commence following commissioning, the commissioning report will be required to be submitted with only two months of monitoring data. Water quality during commissioning is expected to be highly variable, and may occasionally exceed specified criteria.</p> <p>Based on only two months of monitoring data, treated wastewater</p>	<p>Request endorsed – Condition 35 amended to authorise a 4 month period for commissioning of the WWTP.</p> <p>The Licence Holder is further required to submit a WWTP commissioning report following commissioning, including details on the environmental performance of the WWTP against design specifications (as per Conditions 37 and 38).</p>

Decision report section or Condition	Summary of Licence Holder comment	Summary DWER response
	<p>quality is expected to trend towards stabilisation but is not expected to consistently meet specified water quality criteria. A four month commissioning period will allow that the commissioning report be submitted with three months of monitoring data and is expected to demonstrate that treated wastewater meets specified water quality criteria, allowing operation of the WWTP to commence.</p> <p>The Licensee instead requests a four month commissioning period, consistent with other Licenses managed by the Licensee with a similar risk profile.</p>	
Conditions 37 and 38	<p>The Licensee requests inclusion of a condition which specifies that operation of the WWTP facility is approved as follows:</p> <p><i>Subject to treated effluent meeting emission standards specified in Table 11 during commissioning, the Licensee is authorised to operate the WWTP in accordance with the Conditions of this Licence.</i></p> <p>The Licensee requests that a condition be included (after Condition 38) which specifies that the Licensee is authorised to operate the WWTP following commissioning, consistent with other Licenses managed by the Licensee.</p>	<p>Licence Amendment Notice 2 incorporates Prescribed Premises Category 54 for the WWTP. This effectively authorises construction and operation of the WWTP, subject to compliance with all Licence conditions.</p> <p>In brief, Conditions 37 and 38 require the Licence Holder to submit a WWTP commissioning report, including details of the environmental performance of the WWTP against the design specifications. In the event design specifications have not been met, measures and timeframes proposed to address this are required to be submitted for DWER's review.</p> <p>The Licence Holders proposed condition is considered to be addressed by Amendment Notice 2 and Conditions 37 and 38.</p>

Decision report section or Condition	Summary of Licence Holder comment	Summary DWER response
		<p>Conditions 37 and 38 are considered to be suitable controls commensurate with the associated risks.</p>
<p>Condition 40 <i>The Licence Holder must undertake weekly inspections of the WWTP and undertake any preventative maintenance as required</i></p>	<p>The Licensee requests that that the requirement for inspections and maintenance be revised as follows:</p> <p><i>The Licensee shall ensure that all effluent discharged from the WWTP consists only of treated wastewater and is only discharged to the irrigation areas depicted in Attachment 5.</i></p> <p>The Licensee will undertake regular inspections and preventative maintenance (as required) as part of the standard operating of the proposed WWTP. However, the current condition requires administrative records to demonstrate compliance.</p> <p>The Licensee instead requests that the Licence condition reflect outcomes to protect environmental values (<i>to ensure that all effluent discharged from the WWTP consists only of treated wastewater and is only discharged to the irrigation areas</i>), consistent with other Licenses managed by the Licensee with a similar risk profile. Any unplanned discharges or spills (including those resulting from poor inspections and maintenance) would represent non-compliance with the proposed condition.</p>	<p>Request endorsed. Condition 40 has been amended as proposed by the Licence Holder.</p> <p>The risk rating attributed to a spill of untreated sewage from the WWTP is Medium. The Licence Holder is required to treat sewage with a suitably designed closed system WWTP; and to prevent discharge of untreated sewage to the environment.</p> <p>No additional controls/conditions are required for the nominated risk event.</p>
<p>Treated effluent distribution system and sprayfield</p>	<p>A three strand cattle proof perimeter fence (no barb wire) will be installed to limit access to the sprayfield. A graded access road will be established around the perimeter of the sprayfield to allow for visual inspections. Appropriate signage will also be installed to limit access, outlining that treated effluent is being sprayed within the area (<i>Correspondence provided 4 June 2019</i>).</p>	<p>Condition 31 on the Licence requires the installation of fencing and suitable notification signage around the sprayfield to limit public access.</p>