



<b>Licence Number</b>	L4328/1989/10
<b>Licence Holder</b>	Wodgina Lithium Pty Ltd
<b>ACN</b>	611 488 932
<b>File Number:</b>	DER2013/001044-1
<b>Premises</b>	Mining tenements M45/50, M45/381, M45/382, M45/923, M45/925 and M45/1252  Mining tenements M45/50, M45/381, M45/382, M45/923, M45/925 and M45/1252
<b>Date of Amendment</b>	23 October 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
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	refers to this document
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality <a href="http://www.waterquality.gov.au/anz-guidelines">http://www.waterquality.gov.au/anz-guidelines</a>
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 <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
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
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
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
GL	gigalitre(s)
kL	kilolitres

Licence Holder Licensee	Wodgina Lithium Pty Ltd
L/s	litres per second
m	metre(s)
m <sup>3</sup>	cubic metre(s)
m <sup>3</sup> /d	Cubic metre(s) per day
mg/L	milligrams per litre
MW	megawatt(s)
µS/cm	microsiemens per centimetre
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>
t/y	tonnes per year

## 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.

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: Decision Making (June 2019)*
- *Guidance Statement: Risk Assessment (February 2017)*

## Amendment description

Wodgina Lithium Pty Ltd (WLPL) is currently approved for the following prescribed premises categories:

Category 5 – Processing or beneficiation of metallic or non-metallic ore

Category 52 – Power generation

Category 54 – Sewage facility

Category 89 – Putrescible landfill

### Reverse Osmosis Plant

During construction of Beneficiation Plant Train 1, authorised under Works Approval W6132/2018/1, WLPL constructed a three train Reverse Osmosis (RO) plant to reduce the concentration of dissolved silica, calcium and magnesium from borefield sourced groundwater. The RO plant was built without approval under W6132/2018/1.

As the Department cannot issue retrospective approvals, WLPL were advised that a licence application may be submitted for the RO plant. On 22 May 2019, WLPL submitted an application to amend licence L4328/1989/10 to:

- incorporate the RO plant infrastructure to the prescribed premises;
- add prescribed premises category 85B to the licence with a production or design capacity of 0.5GL per year or more; and
- authorise discharge of RO plant wastewater to land for dust suppression.

The RO plant is 75% efficient and will produce up to 409,968m<sup>3</sup> of wastewater per year, per train. Only two of the three RO plant trains will be used at one time, as the third will be used as a standby unit in case of failure in one of the other trains, or during servicing.

### Gas Power Station and landfill expansion operation

On 21 June 2019, Wodgina Lithium Pty Ltd (WLPL) submitted another application to amend licence L4328/1989/10 to bring the 64 MW gas fired station and the putrescible landfill expansion under the licence L4328/1989/10. The documentation submitted was related to the landfill expansion compliance report and the 64MW gas power station compliance and commissioning reports.

The increase in number of workers at Wodgina camp site, requires an extension of the landfill area. The new landfill facility is adjacent to the current putrescible landfill area, located wholly on M45/925.

The 64MW gas power station, located on Mining Lease M45/381, has been constructed to accommodate the operational power requirements of the site. The power plant has been constructed adjacent to the existing 11 MW plant, which will be decommissioned in 2019.

Table 2 below outlines the proposed changes to the Licence.

**Table 2: Proposed design capacity changes**

Category	Current design capacity	Proposed design capacity	Description of proposed amendment
52 - Electric power generation	13MW temporary diesel power station	64MW gas fired power station	Include gas power station to the licence
85B – Water desalination plant	-	0.82GL per year of waste water	Include RO plant to the licence and authorize RO waste water discharge to land
89 - Putrescible landfill site	3,350 tonnes per annual period	unchanged	Include new areas for disposal of putrescible waste to the landfill area.

## Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 2.

**Table 3: Relevant approvals**

Legislation	Number	Approval
<i>Mining Act 1978</i>	Registration ID 74361	Wodgina Infrastructure Expansion Mining Proposal
<i>Rights in Water and Irrigation Act 1914</i>	GWL154570(18)	North and Breccia borefields (annual entitlement 3,150,000 kL).

## Amendment history

Table 3 provides the amendment history for L4328/1989/10.

**Table 4: Licence amendments**

Instrument	Issued	Amendment
L4328/1989/10	12/12/2013	Licence amendment to amend submission date for Annual Environmental Report
L4328/1989/10	02/06/2016	Licence amendment for tyre disposal area
L4328/1989/10	07/02/2017	Licence transferred from Global Advanced Metals Wodgina Pty Ltd to Wodgina Lithium Pty Ltd. Administrative amendment undertaken in accordance with Departmental reform
L4328/1989/10	18/08/2017	Amendment Notice 1: Amendment to construct a new tyre disposal area and to increase the Category 89 capacity from 1,850 tonnes per annum to 3,350

		tonnes per annum
L4328/1989/10	12/03/2018	Amendment Notice 2: Construction and operation of secondary fixed processing plant and 3 mobile crushing and screening plants
L4328/1989/10	25/01/2019	Amendment Notice 3: Addition of category 52, amendment crushing and screening locations, increase in tyre disposal from 200 to 500 tpa and expansion of the current disposal facility area, administrative correction to add an additional surface water monitoring point at the fixed screening plant; and Commissioning Plan for a Lithium Beneficiation Plant, TSF3 expansion and Gas Power Station.
L4328/1989/10	10/06/2019	Amendment Notice 4: Extension of operational period of the Temporary 13MW Diesel Power Station  Inclusion of TSF3 MB Ext to the groundwater monitoring program.
L4328/1989/10	23/10/2019	Amendment Notice 5: Addition of categories 85B, landfill expansion area, 64MW gas power station and use of RO wastewater from Base Case for dust suppression.

## Location and receptors

Table 4 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

**Table 5: Receptors and distance from activity boundary**

Residential and sensitive premises	Distance from Prescribed Premises
Altura Mine Site camp subject of licence L8610/2011/1)	Distance to the following site infrastructure: <ul style="list-style-type: none"> <li>Putrescible landfill - more than 2 km.</li> <li>Power station – more than 6 km.</li> </ul>

Table 5 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

**Table 6: Environmental receptors and distance from activity boundary**

Environmental receptors	Distance from Prescribed Premises
Threatened/Priority Flora	There is priority 2 flora located on M45/381 with one located approximately 2000m from the RO plant.
Threatened/Priority Fauna	There are numerous threatened and priority fauna located within the Premises boundary.
Two water courses, non-perennial	390m west of RO plant
Groundwater	Depth to groundwater level is between 10 and 26 meters (WLPL groundwater monitoring data, June 2019).

## Risk assessment

Table 6 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. This table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

**Table 7: Risk assessment for proposed amendments during operation**

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
<b>Cat 52</b> Electric power generation	Burning of gas for the generation of power	Air emissions	No residences in proximity. The closest sensitive receptor is a mine camp located 6 km to the northeast.	Air / wind dispersion	Health and amenity impacts	N/A	N/A	N/A	<p>Impacts to the ambient air quality at the Altura Mine camp located 6 km to the northeast are not anticipated due to the significant distance from stack emission points.</p> <p>DWER notes that nitrogen oxides from the power station may not satisfy NEPM criteria at the Wodgina Camp located approximately 600 m away.</p> <p>However, onsite accommodation villages are not considered to be sensitive receptors for the purpose of a Part V risk assessment as they can be regulated under different legislation.</p> <p>A Commissioning report has been submitted including stack testing to demonstrate emissions are in accordance with those predicted. While there are no receptors, WLPL should ensure emissions remain within committed specifications. Data will also be required to be report to the National Pollution Inventory (NPI).</p>
	Leaks and spills of hydrocarbons	Contaminated stormwater runoff	Surface water and riparian vegetation adjacent to the power station	Stormwater runoff	Soil and groundwater contamination inhibiting vegetation growth and survival	Moderate	Rare	Medium	<p>The power station is sited within local drainage and creek lines presenting a possible direct pathway to the environment.</p> <p>Culverts along the northern perimeter provide protection against a 1 in 5 year flood event.</p>



									There will be no discharge of treated wastewater or potentially contaminated stormwater from the facility.  The <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> are also applicable.
<b>Cat 85B</b> Water desalination plant	Bore water filtration	Waste water from RO plant	Native vegetation	Spray of water with elevated metals and metalloids	Poor vegetation health or death from waste water spray	N/A	N/A	N/A	RO reject water will be used as dust suppression across the prescribed premises on pre-disturbed areas and not on vegetation.  <i>No further assessment required</i>
			Groundwater with beneficial use Surface water Dependent Ecosystem	Soil infiltration	Decline of surface water and groundwater quality	Minor	Possible	Medium	See discussion
<b>Cat 89</b> Landfill	Operation of expanded putrescible landfill	Dust/odour	No residences or other sensitive receptors in close proximity	Air/wind dispersion	Amenity impacts	N/A	N/A	N/A	The closest sensitive receptor is the Altura mine camp being located more than 2 km from the putrescible landfill. No sensitive receptor is likely to be impacted by landfilling activities.  <i>No further assessment required</i>
		Noise	No residences or other sensitive receptors in close proximity	Air/wind dispersion	Amenity impacts	N/A	N/A	N/A	
		Seepage to groundwater	Underlying groundwater	Infiltration through to groundwater	Degradation of groundwater quality limiting the beneficial uses.	N/A	N/A	N/A	The Landfill extension will be operated in accordance with current licence conditions (1.32 to 1.35).  Landfill construction compliance documentation submitted outlines the landfill extension to be fenced and constructed in accordance with design specifications.  <i>No further assessment required</i>

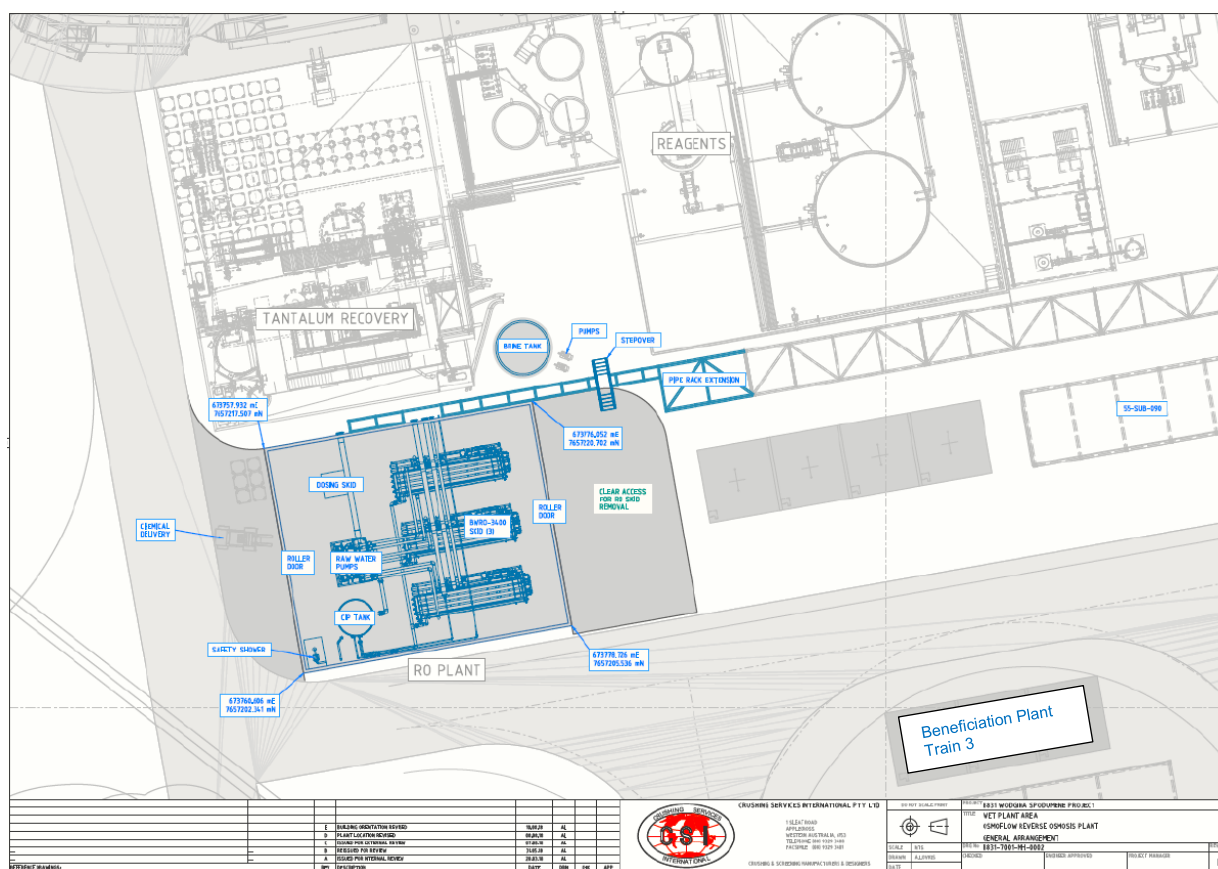
## Discussion

### Use of RO plant waste water for dust suppression

The RO plant was constructed within the disturbance footprint of the beneficiation plant. The beneficiation plant trains are serviced by the RO plant. The RO plant uses a thin-film high-rejection membrane to produce high quality water. Figure 1 shows the location and design of the Wodgina RO plant.

The RO plant was designed and manufactured by Osmoflo Water Management Pty Ltd (Osmoflo). The plant consist of three trains:

- BWRO 3400 – Train A
- BWRO 3400 – Train B
- BWRO 3400 – Train C



**Figure 1:** RO plant in relation to key infrastructure

The RO plant is fed at a rate of 111 litres per second (L/s) from the beneficiation plant raw water tank. Raw water is sourced from the Wodgina bore network including Breccia, TDNE, Old, North and Airstrip borefields.

The by-product of RO desalination process is rejected wastewater. The RO plant is expected to produce up to 26 L/s of wastewater (two RO trains in operation and one in standby). It will equate to 2,284m<sup>3</sup> of wastewater per day or 833, 660m<sup>3</sup> per year. The process flow diagram for the RO plant is presented in Figure 2.

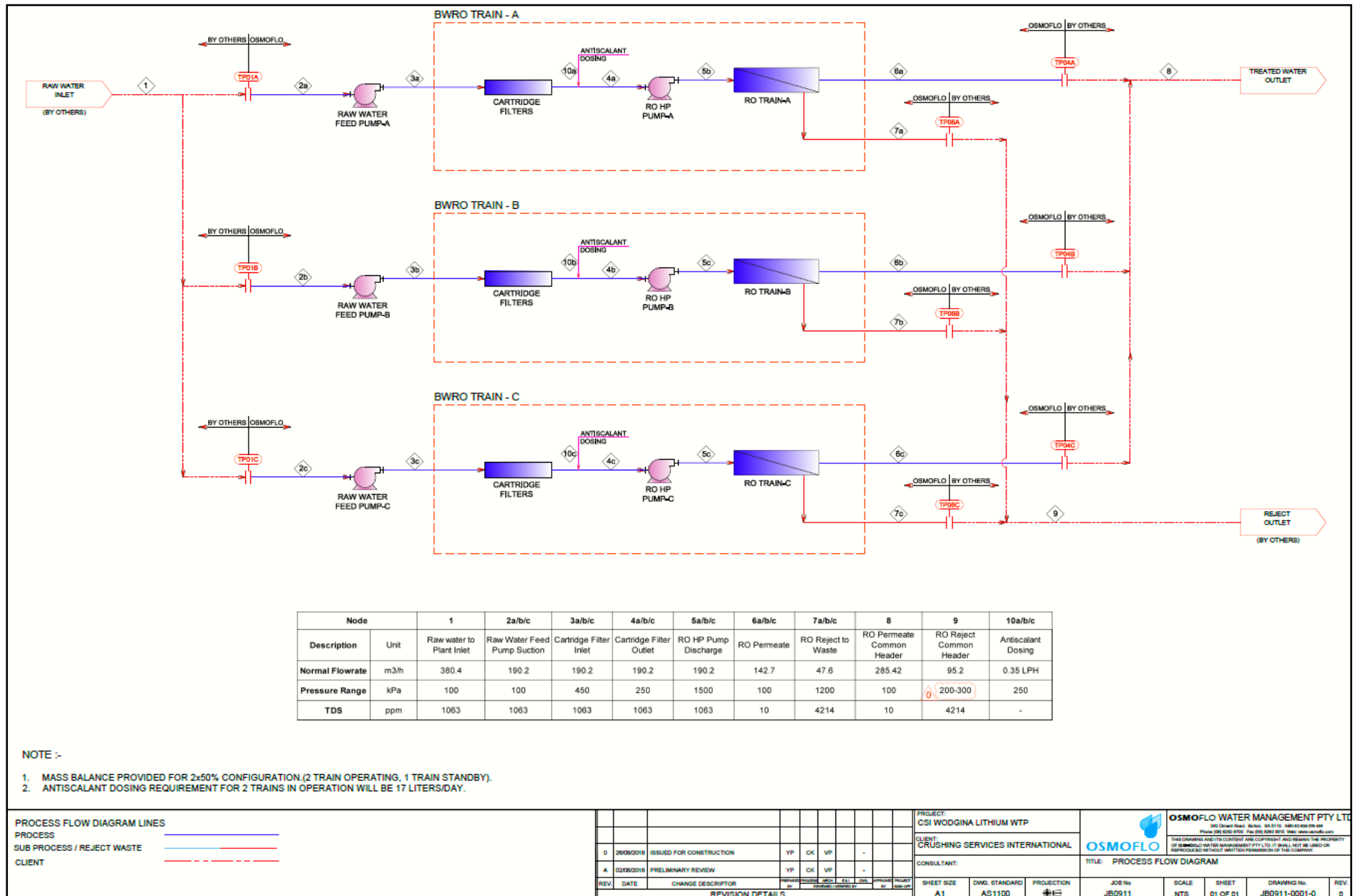


Figure 2: Flow diagram for Wodgina Lithium Project RO plant.

The key infrastructure associated with the RO plant is presented on Table 8.

**Table 8: RO plant key infrastructure**

Infrastructure/ Equipment	Design and construction
RO Plant	<ul style="list-style-type: none"> <li>• Raw water pumps</li> <li>• Clean-in-place skid (tank and dosing pump)</li> <li>• 3 x Brackish Water Reverse Osmosis (BWRO) plant trains (two operational, one standby) <ul style="list-style-type: none"> <li>- 52 L/s per train maximum throughput</li> <li>- 13 L/s per train wastewater production</li> </ul> </li> </ul>
Reject water tank	<ul style="list-style-type: none"> <li>• 38m<sup>3</sup> coated steel tank with cyclonic dome roof <ul style="list-style-type: none"> <li>- 27m<sup>3</sup> effective capacity</li> <li>- 4.60m diameter; 2.31m high (wall height)</li> </ul> </li> <li>• Transfer pumps</li> </ul>

The plant manufacturer, Osmoflo, has tested the RO wastewater for each borefield and from different borefield mixtures (Simulation 1 and Simulation 2). The representative ratio of borefield composition is detailed in Table 9.

Osmoflo advised that running the RO plant on 100% TDNE3 water was not feasible due to the conductivity and iron content of the water. A maximum 16% mix of TDNE3 water would be permissible for a short period of time but not advised. As such, this option would represent the operationally poorest case in so far as predicted water quality from the RO plant.

**Table 9: Raw water make-up**

Borefield	Simulation 1	Simulation 2
Breccia	45.3%	45.3%
Old	9.6%	9.6%
North	23.6%	23.6%
Airstrip	21.5%	5.5%
TDNE3	-	16.0%

Wastewater from the RO plant will feed the mining tank and the haulage tank. From these tanks, standpipes will be used to supply the mine's fleet of watercarts. A flow diagram of the dust suppression delivery system is shown in Figure 3. Wastewater for dust suppression will be used on pre-disturbed locations throughout the prescribed premise including haul roads, access roads, ROM pads and waste dumps associated with the mine and crushing plant, and construction areas.

Lithium concentration in the wastewater from Simulation 2 prediction is above the site interim trigger value of 1.5mg/L (MBS, February 2019). Simulation 2 predictions also indicate potential exceedance of site specific trigger values for Chromium, Fluoride, Zinc and Thallium and potential exceedance of ANZECC Guideline values (Livestock drinking Water) for Total Dissolved Solids and Sulphate concentrations.

The RO plant is already operational and a brine sample was analysed in July 2019. Two RO wastewater predictions, RO wastewater sample analysis and mining tank wastewater sample analysis are presented on Table 10 and compared against ANZECC Guidelines.

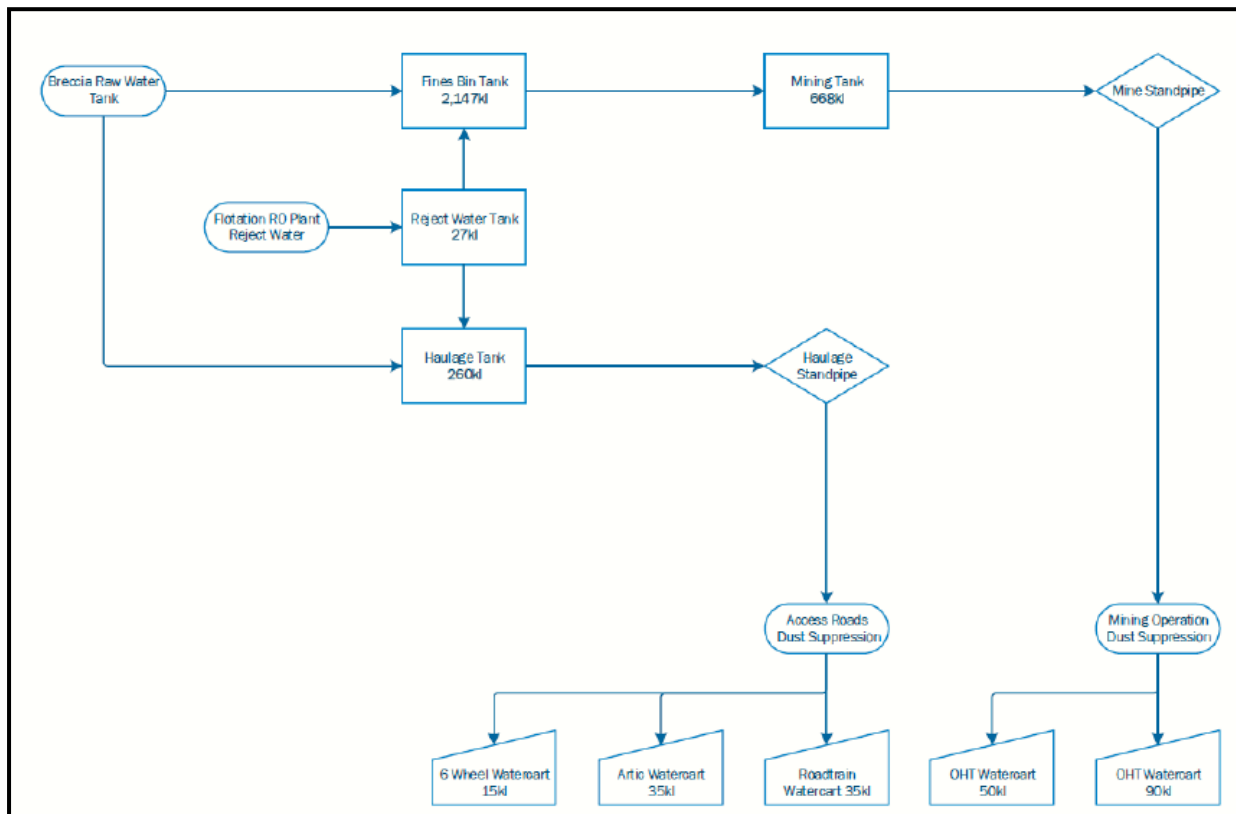
**Table 10: Raw water make-up, wastewater prediction and RO brine sample result.**

Parameter	Unit	Simulation 1		Simulation 2 (Worst case 16% TDNE3 water in feed)		RO Brine Sample	Mining tank standpipe sample
		Feed	Brine (Predicted)	Feed	Wastewater (Predicted)	230158-6	231374
pH	-	7.460	7.800	7.500	7.700	8	8.1
Conductivity (EC)	uS/cm	1368	5332	1769	6909	5200	5300
Total Dissolved Solids	mg/L	1026	3999	1327	5182	3900	3700
Aluminium (Al)	mg/L	0.010	0.038	0.010	0.038	<0.1	<0.01
Arsenic (As)	mg/L	0.017	0.063#	0.017	0.064#	0.11#	0.1#
Boron (B)	mg/L	0.413	0.900	0.470	1.030	1	1.1
Bromide (Br)	mg/L	0.657	2.524	0.785	3.016	2.8	5
Caesium (Cs)	mg/L	0.001	0.004	0.006	0.023	0.003	0.003
Cadmium (Cd)	mg/L	0.000	0.000	0.000	0.000	0.0001	0.0002#
Chromium (Cr)	mg/L	0.002	0.007*	0.002	0.007*	0.003*	0.003*
Cobalt (Co)	mg/L	0.001	0.004	0.001	0.004	<0.001	<0.001
Copper (Cu)	mg/L	0.001	0.004	0.001	0.004	<0.001	0.002
Fluoride (F)	mg/L	0.496	1.920	0.656	2.530*	2.2*	2.4*
Iron (Fe)	mg/L	0.010	0.038	0.012	0.045	<0.01	<0.01
Lead (Pb)	mg/L	0.001	0.004#	0.001	0.004#	<0.001	0.001
Lithium (Li)	mg/L	0.035	0.125	1.289	4.640*	0.19	0.19
Manganese (Mn)	mg/L	0.005	0.021	0.005	0.020	<0.005	<0.005
Mercury (Hg)	mg/L	0.000	0.000	0.000	0.000	<0.00005	<0.00005
Nickel (Ni)	mg/L	0.001	0.004	0.004	0.016	0.003	0.005
Rubidium (Rb)	mg/L	0.003	0.012	0.014	0.050	0.017	0.018
Selenium (Se)	mg/L	0.002	0.009#	0.002	0.009#	0.011#	0.01
Silicon (Si)	mg/L	30.27	120.40	29.63	117.80	120	110
Sulphate (SO <sub>4</sub> <sup>2-</sup> )	mg/L	74.7	296.8	275.0	1092.0	400	350
Tin (Sn)	mg/L	0.001	0.004	0.001	0.004	<0.001	<0.001
Uranium (U)	mg/L	0.012	0.044	0.011	0.040	0.043	<0.01
Zinc (Zn)	mg/L	0.086	0.331*	0.088	0.336*	0.006	0.033
Thallium	mg/L	0.001	0.004*	0.001	0.004*	<0.001	<0.001

Note: Values in red indicate exceedance of ANZECC (2000) - Livestock drinking water quality

# indicates ANZECC toxicant guidelines value (default) as applicable for 95% Freshwater species protection

\* Value above site specific Interim trigger values as adopted by Licence Holder (See W6132/2018/1, Amendment Notice 5-Table 6: Proposed interim trigger values for Wodgina).



**Figure 3:** Dust suppression delivery flow chart.

## Decision

Approval to incorporate ongoing operation of the 64 MW gas fired station and the putrescible landfill expansion under the licence L4328/1989/10 is granted. The construction and commissioning of these facilities has been undertaken in accordance with the intended design. The location and layout of the gas power station and extended putrescible landfill have been included in Schedule 1 Maps.

Approval is granted to incorporate the Reverse Osmosis (RO) plant infrastructure for operation within the prescribed premises and to include prescribed premises category 85B onto the licence.

During normal operations of the RO plant, feed composition as indicated in Table 9 for Simulation 1 is used. The reject water sample analysed from the RO plant, which is currently operational, has indicated that ANZECC guideline values are not likely to be exceeded during normal operation of the RO plant. As such use of this wastewater stream for dust suppression is authorised subject to Conditions of this licence.

Simulation 2 (worst case scenario) indicates that aluminium and sulphate concentrations in the RO brine may exceed ANZECC guidelines. The Delegated Officer has given regard to the following aspects:

- RO brine is not proposed to be directly discharged to the environment. It forms a component of the total water mix that is stored in the Mining (approximately 4% based on capacity) and Haulage tanks (approximately 10% based on capacity) from where water is sourced for dust suppression and as such contaminant concentrations are expected to be further diluted;
- Use of this wastewater stream for dust suppression is not expected to result in discharge of volumes which would lead to long-term pooling/ ponding and as such likelihood of any fauna relying on this water for drinking is considered low. So potential short term

exceedance of ANZECC trigger values is not likely to cause significant impacts on local fauna;

- The Licence Holder has committed to use RO feed water composition, as per Simulation 2, only as contingency measure so the frequency of elevated contaminant concentrations forming part of the discharge stream is expected to be low; and
- The current licence has conditions to monitor and manage potential impacts on groundwater quality on account of premises operations.

Given the above factors, the Delegated Officer has authorised use of this wastewater stream for dust suppression subject to Conditions of this Licence.

## Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 6 September 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

In providing comments on the draft, the Licence Holder advised that predicted wastewater quality data previously presented to the Department, on 22 August 2019, for Simulation 2 (worst case) scenario was inaccurate as the RO plant manufacturer did not complete simulation as per the feed water composition proposed in the licence amendment application. Updated data was provided to the Department on 16 September 2019.

The Licence Holder also requested authorisation to continue to use RO wastewater for dust suppression even if the RO feed water composition was as predicted in Simulation 2. The Licence Holder proposed additional conditions to be included on the licence amendment to manage this discharge.

## Amendment

1. The Prescribed Premises category is amended by the insertion of the bold text shown in underline below:

Category Number	Category description	Category production or design capacity	Approved premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes per year	8,750,000 t/y
52	Electric power generation  <b><u>Gas power station</u></b>	10 megawatts or more in aggregate (using fuel other than natural gas)  <b><u>20 megawatts or more in aggregate (using natural gas)</u></b>	13 MW temporary diesel power station  <b><u>64MW gas power station</u></b>
54	Sewage facility	100 cubic metres or more per day	210m <sup>3</sup> /d
<b><u>85B</u></b>	<b><u>Water desalination plant</u></b>	<b><u>0.5 gigalitres or more per year</u></b>	<b><u>0.82GL</u></b>
89	Putrescible landfill site	More than 20 but less than 5,000 tonnes per year	3,350 tonnes per year

2. Condition 1.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

1.3.1 The Licensee shall ensure that where wastes produced on the Premises are not taken offsite for lawful use or disposal, they are managed in accordance with the requirements of Table 1.3.1.

<b>Table 1.3.1 Management of Waste<sup>1</sup></b>			
<b>Facility</b>	<b>Waste type</b>	<b>Process(es)</b>	<b>Requirements</b>
Putrescible Landfill site <u>and Landfill extension</u> (as depicted on Premises map in Schedule 1)	Inert Waste Type 1	Receipt, handling and disposal of waste by landfilling	All waste types No more than 1650 tonnes of waste shall be disposed of at the putrescible landfill per annual period.
	Putrescible Waste		Disposal of waste by landfilling shall only take place within the landfill areas shown on the Premises Map in Schedule 1.
	Clean Fill		The separation distance between the base of the landfill and the highest groundwater level shall not be less than 2 m
Inert Waste Type 2	No more than 500 tonnes of waste tyres shall be disposed of at the tyre disposal areas per annual period. Tyres shall only be landfilled:		
Eastern Waste Landform tyre disposal area	Inert Waste Type 2 (Tyres only)		i) in batches separated from each other by at least 100 mm of soil and each consisting of not more than 40 m <sup>3</sup> of tyres reduced to pieces; or ii) in batches separated from each other by at least 100 mm of soil and each consisting of not more than 1000 whole tyres
Eastern Waste Landform	Inert Waste Type 1 only		No more than 1500 tonnes of Inert Waste Type 1 to be disposed within the 5 metre compacted base layer of the Eastern Waste Landform within tenements M45/923 and/or M45/383
Wastewater treatment plant	Sewage	Biological and physical treatment	No more than 210 m <sup>3</sup> /day
<u>Reverse Osmosis (RO) Plant</u>  <u>Osmoflo plant consisting of three trains as depicted in Schedule of Premises Map.</u>	<u>RO brine</u>	<u>Storage in Fines Bin Tank/ Reject Water Tank/Mining Tank/haulage Tank for ultimate disposal to land via dust suppression</u>	<u>No more than 0.82GL/y to be used for dust suppression within disturbed areas and vegetation avoided</u>  <u>RO brine not to be directly discharged to the environment.</u>  <u>TDNE3 borefield water to not constitute more than 16% of the RO Feed Water composition.</u>

Note 1: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the Environmental Protection (Controlled Waste) Regulations 2004.

**Note 2: Concentration of TDNE3 borefield water in Total RO feed water composition to not exceed 16%.**



3. The Licence is amended by the insertion of the following Condition 2.2.3 as shown below in bold underline:

**2.2.3 The Licence Holder must ensure that RO wastewater is only used for dust suppression on pre-disturbed locations throughout the prescribed premise including haul roads, access roads, ROM pads and waste dumps associated with the mine and crushing plant, and construction areas.**

4. Condition 2.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

2.3.1 The Licensee shall ensure that where waste is emitted to air from the emission points in Table 2.2.2 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

<b>Table 2.2.2 Point Source emissions to air</b>	
<b>Emission point reference and location on Map of emission points</b>	<b>Source including abatement</b>
13 MW temporary power station	Seventeen (17) containerised Cummins C1250 D2R diesel generator, or similar
<b><u>64MW gas power station</u></b>	<b><u>Thirty two 2MW natural gas generators</u></b>

5. Condition 3.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

3.3.1 The Licensee shall undertake the monitoring specified in Table 3.3.1 **according to the specifications in that table.**

<b>Table 3.3.1 Monitoring of inputs and outputs</b>				
<b>Input/ Output</b>	<b>Parameter</b>	<b>Units</b>	<b>Averaging period</b>	<b>Frequency</b>
Waste Inputs into the landfill facility	Inert Waste Type 1, Inert Waste Type 2, Putrescible Waste and Clean Fill	Tonnes or (where no weighbridge is present) m <sup>3</sup>	N/A	Each load arriving at the landfill
Waste inputs to tyre disposal areas	None specified	Tyres only	N/A	Monthly
<b><u>Wastewater discharged from Mining Tank and Haulage Tank</u></b>	<b><u>pH</u></b>	<b><u>=</u></b>	<b><u>Spot sample</u></b>	<b><u>Monthly</u></b>
	<b><u>Conductivity</u></b>	<b><u>µS/cm</u></b>		
	<b><u>Total Dissolved Solids (TDS)</u></b>	<b><u>mg/L</u></b>		
	<b><u>Aluminium</u></b>	<b><u>mg/L</u></b>		
	<b><u>Arsenic</u></b>	<b><u>mg/L</u></b>		

<b><u>Boron</u></b>	<b><u>mg/L</u></b>		
<b><u>Bromide</u></b>	<b><u>mg/L</u></b>		
<b><u>Caesium</u></b>	<b><u>mg/L</u></b>		
<b><u>Cadmium</u></b>	<b><u>mg/L</u></b>		
<b><u>Chromium</u></b>	<b><u>mg/L</u></b>		
<b><u>Cobalt</u></b>	<b><u>mg/L</u></b>		
<b><u>Copper</u></b>	<b><u>mg/L</u></b>		
<b><u>Fluoride</u></b>	<b><u>mg/L</u></b>		
<b><u>Iron</u></b>	<b><u>mg/L</u></b>		
<b><u>Lead</u></b>	<b><u>mg/L</u></b>		
<b><u>Lithium</u></b>	<b><u>mg/L</u></b>		
<b><u>Manganese</u></b>	<b><u>mg/L</u></b>		
<b><u>Mercury</u></b>	<b><u>mg/L</u></b>		
<b><u>Nickel</u></b>	<b><u>mg/L</u></b>		
<b><u>Rubidium</u></b>	<b><u>mg/L</u></b>		
<b><u>Selenium</u></b>	<b><u>mg/L</u></b>		
<b><u>Silicon</u></b>	<b><u>mg/L</u></b>		
<b><u>Sulphate</u></b>	<b><u>mg/L</u></b>		
<b><u>Tin</u></b>	<b><u>mg/L</u></b>		
<b><u>Tungsten</u></b>	<b><u>mg/L</u></b>		
<b><u>Thallium</u></b>			
<b><u>Uranium</u></b>	<b><u>mg/L</u></b>		
<b><u>Zinc</u></b>	<b><u>mg/L</u></b>		

6. Condition 4.2.1 and Condition 4.2.2 of the Licence is amended by the insertion of the bold text shown in underline below:

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 120 days after the Anniversary Date. The report shall contain the information listed in table 4.2.1 in the format or form specified in that table.

**Table 4.2.1: Annual Environmental Report**

Condition or table (if relevant)	Parameter	Format or form <sup>1</sup>
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 3.2.1	Monitoring of emissions to land data	None specified
Table 3.3.1	Monitoring of inputs to landfills data	None specified
<b><u>Table 3.3.1</u></b>	<b><u>Monitoring of water quality data for wastewater discharged from Mining Tank and Haulage Tank</u></b>	<b><u>None specified</u></b>
Table 3.4.1	Monitoring of ambient groundwater quality data	None specified
Condition 4.1.3	Compliance	Annual Audit Compliance Report (AACR)
Condition 4.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:

- (a) an assessment of the information contained within the report against previous monitoring results and Licence limits;
- (b) an assessment and comparison of the monitoring data from, Tailing Storage Facility 3 bores, required by condition 3.4.1 against the *ANZECC, 2000- Livestock drinking water quality guidelines*; and
- (c) **an assessment and comparison of the wastewater quality monitoring data required by condition 3.3.1 against the ANZECC, 2000- Livestock drinking water quality guidelines and any site-specific trigger values adopted for groundwater quality; and**
- (d) a list of any original monitoring reports submitted to the Licensee from third parties for the annual period and make these reports available on request.

7. Conditions 5.1.1 to 5.1.9 of the Licence is amended by the deletion of the text shown in strikethrough below:

**~~8. Commissioning~~**

~~5.1.1 The Licensee must notify the CEO, at least 7 days prior to, the commencement date of Commissioning of the 62MW gas power station.~~

~~5.1.2 The Licensee must not Commission the 64MW Gas Power Station for a period exceeding 8 months from the date advised in 5.1.1.~~

5.1.3—Within 60 days of the end of the Commissioning Period, a Commissioning Report shall be submitted to the CEO detailing environmental performance during the period. A summary of all environmental incidents and resulting corrective actions shall be included in the Commissioning Report.

5.1.4—The Licence Holder must ensure the report required by Condition 5.1.3 includes:-

- (a) a list of any original monitoring reports prepared by third parties for the Commissioning period;-
- (b) a summary of the environmental performance of the all plant and equipment as installed, including but not limited to:-
  - (i) pipelines and pump system functions testing.
  - (ii) commissioning of the process control system.
- (c) a review of performance against the manufacturer's design specification; and
- (d) where they have not been met, measures proposed to meet the manufacturer's design specification and/or Conditions of this Licence, together with timescales for implementing the proposed measures.

5.1.5—Stack sampling of the off-gas streams listed in Schedule 2, shall be completed in accord with the requirements in that Schedule, during the Commissioning Period. All non-continuous sampling and analysis shall be undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.

5.1.6—The results of the stack sampling shall be compared to the emission design criteria as detailed in Column 2 of Table 5.1.1 and submitted to the CEO with the Commissioning Report. Any results that do not meet the design criteria must have a corresponding action plan for achieving compliance, with a timeframe for achieving compliance detailed.

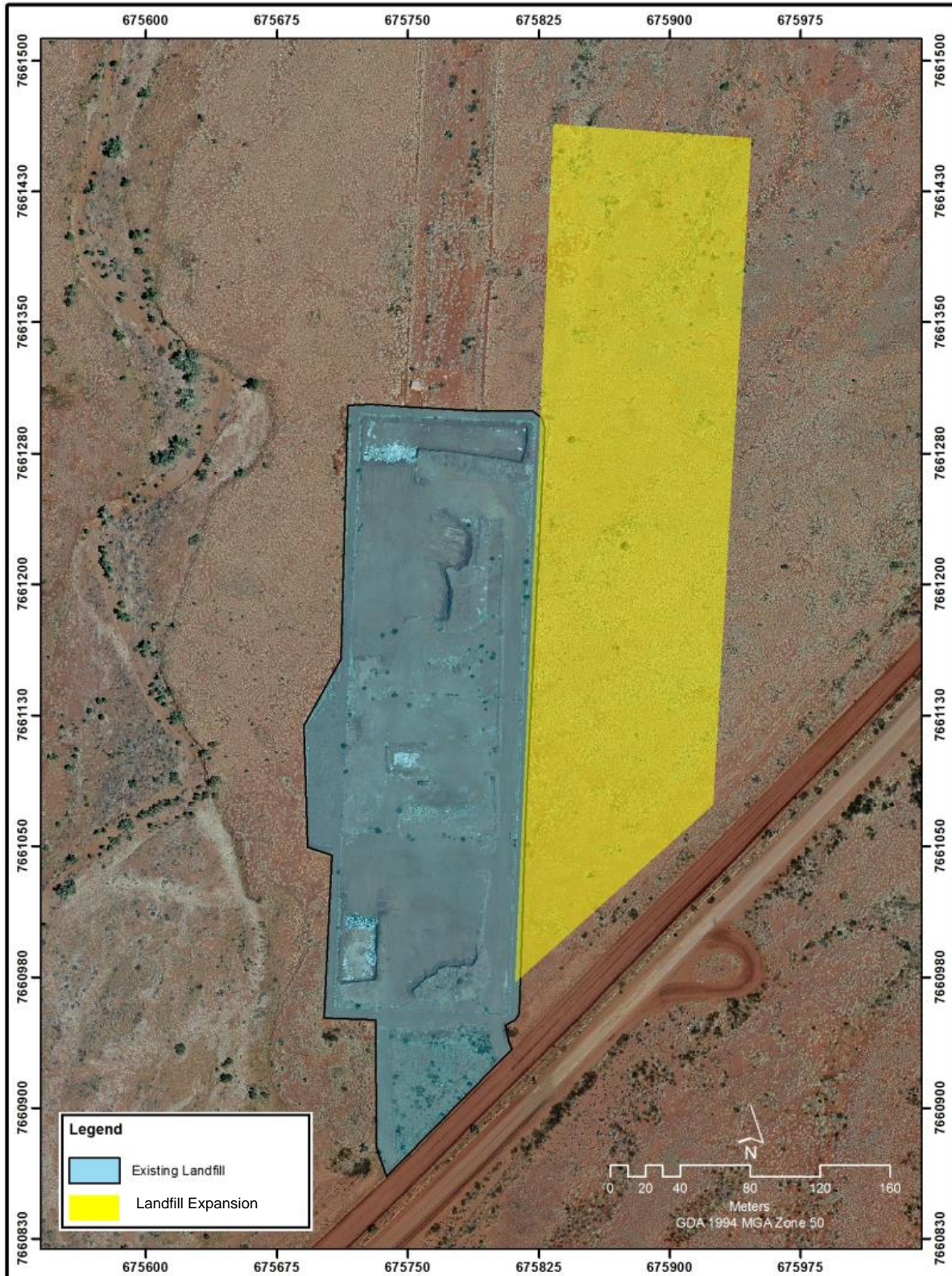
Table 5.1.1: Gas Power Station Estimated Emissions

Column 1	Column 2	Column 3
<b>Emissions- (90% rated load at 5%O<sub>2</sub>)</b>	<b>Per-generator</b>	<b>Total Annual Emissions from 32 operating generators (64 MW)</b>
Nitrogen oxides (NO <sub>x</sub> )	500 mg/Nm <sup>3</sup>	60,401 kg/annum
Total hydrocarbon content	1,293 mg/Nm <sup>3</sup>	156,196 kg/annum
Methane (CH <sub>4</sub> )	1,035 mg/Nm <sup>3</sup>	125,030 kg/annum
Non-methane hydrocarbons-	215 mg/Nm <sup>3</sup>	25,972 kg/annum
Carbon Monoxide (CO)	1,038 mg/Nm <sup>3</sup>	125,392 kg/annum
Carbon Dioxide (CO <sub>2</sub> )	178,169 mg/Nm <sup>3</sup>	21,523,085 kg/annum
Volatile Organic Compounds- (VOC)	53.1 mg/Nm <sup>3</sup>	6,415 kg/annum

## Schedule 1: Maps

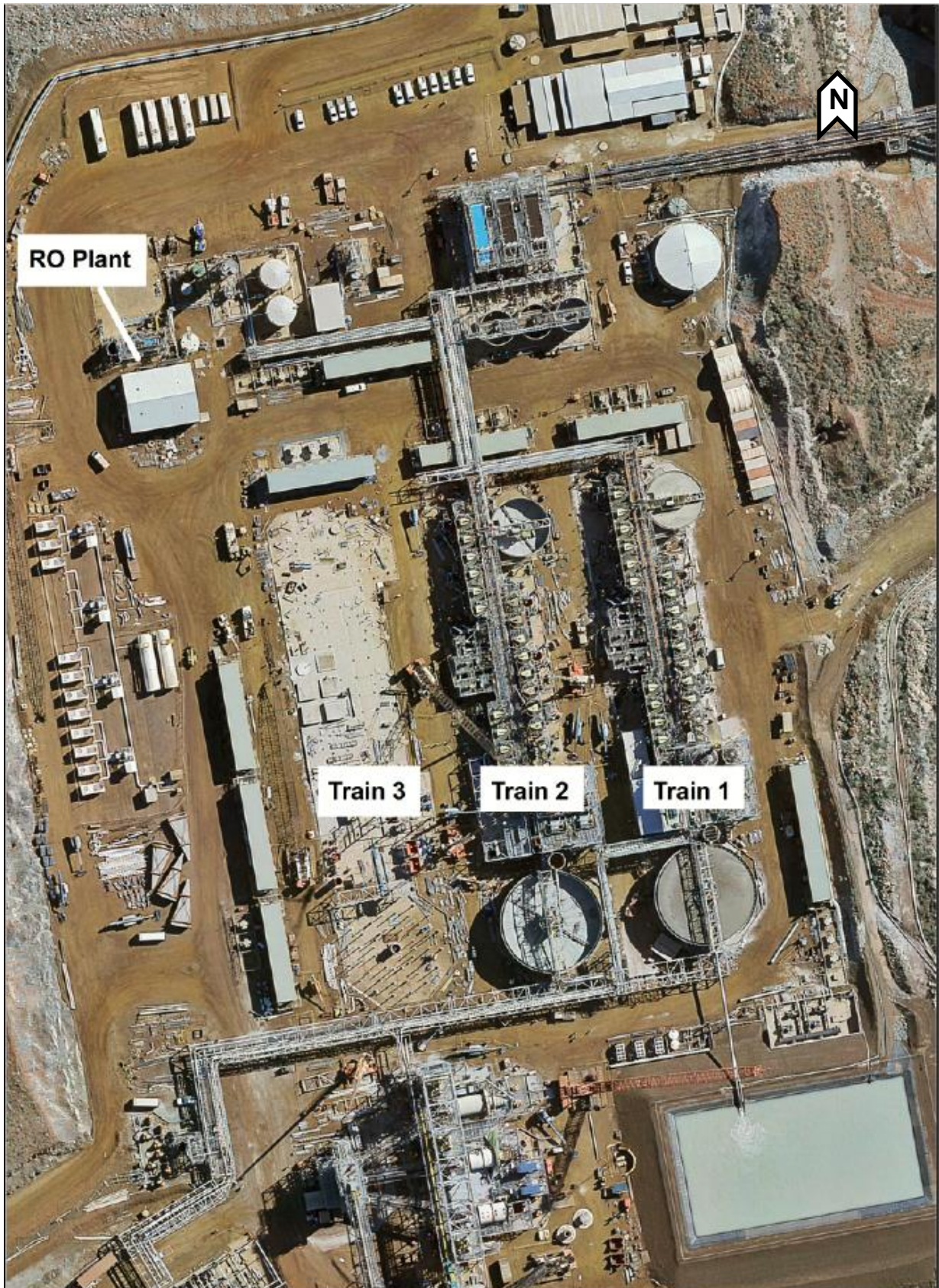
8. The map of Prescribed premises in Schedule 1 maps of this Licence is amended by the addition of the new map below: Location of putrescible landfill expansion in relation to existing putrescible landfill.

### Location of putrescible landfill expansion in relation to existing putrescible landfill



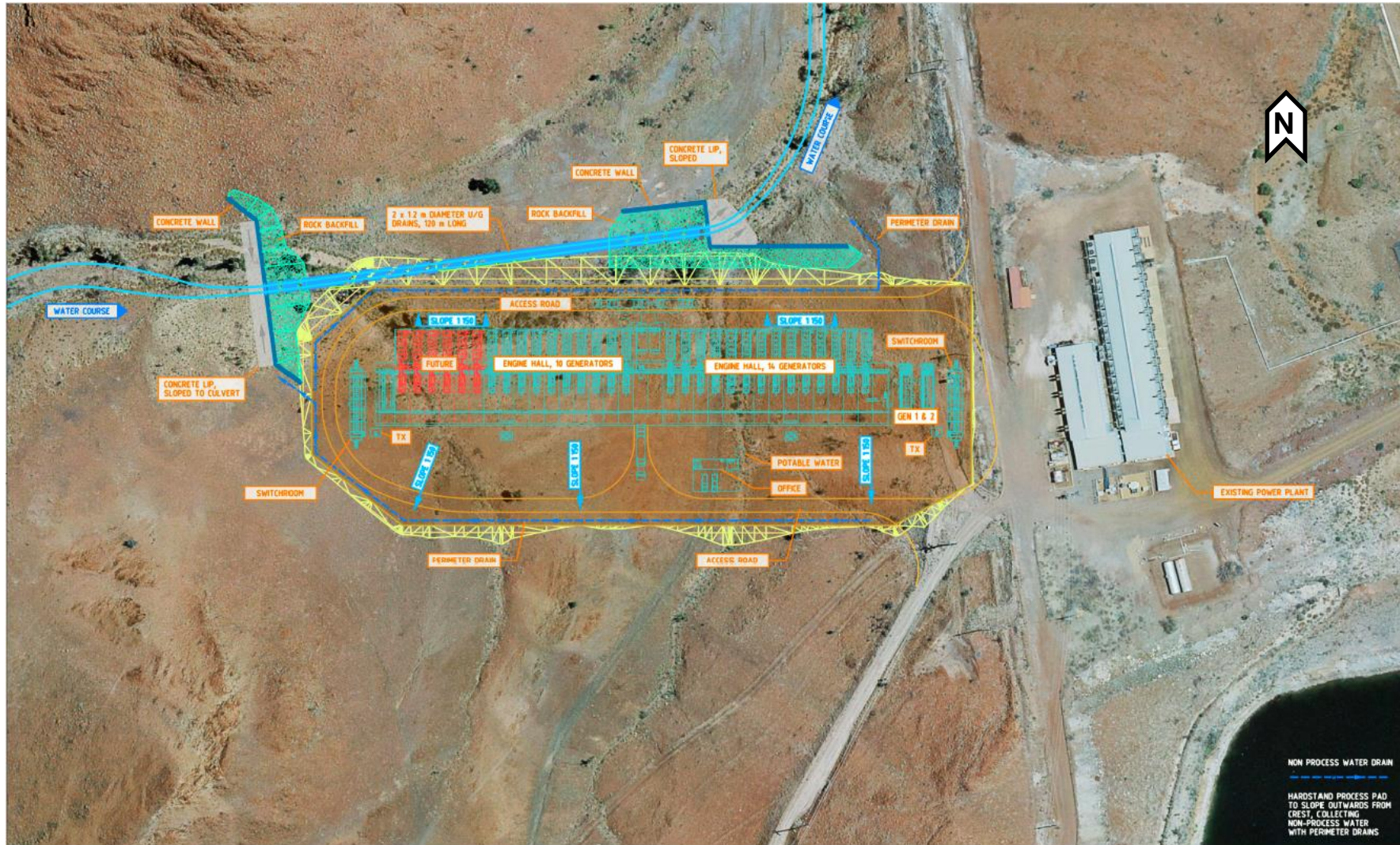
9. The map of the Prescribed premises in Schedule 1 maps of this Licence is amended by the addition of the new map below: Location of Reverse Osmosis Plant.

**Location of Reverse Osmosis Plant**



10. The map of Prescribed premises in Schedule 1 maps of this Licence is amended by the addition of the new map below: Location of Gas Power Station.

**Location of Gas Power Station**



NON PROCESS WATER DRAIN  
 HARDSTAND PROCESS PAD TO SLOPE OUTWARDS FROM CREST, COLLECTING NON-PROCESS WATER WITH PERMETER DRAINS

WODGINA POWER PLANT LAYOUT, 26 GENERATORS



REV	DESCRIPTION	DATE	DN	CHK	APP
G	CONCRETE WALL & BACKFILL ADDED FOR CULVERT DRAIN	07/02/10	ADL		
F	DIVERSION DRAINS REVISED	07/02/10	ADL		
E	FUTURE GEN SETS REPRESENTED	05/02/10	ADL		
D	DRAINS UPDATED (HY-CABLE REROUTED); ACCESS ROAD AMENDED	01/02/10	ADL		
C	GAS PIPELINE & DRAINS UPDATED	05/02/10	ADL		
B	ISSUED FOR INFORMATION	18/01/10	ADL		
A	ISSUED FOR INTERNAL REVIEW	28/10/10	ADL		



CRUSHING SERVICES INTERNATIONAL PTY LTD  
 1 SLEAT ROAD  
 APPLECROSS  
 WESTERN AUSTRALIA 6103  
 TELEPHONE 080 9329 3000  
 FACSIMILE 080 9329 3001  
 CRUSHING & SCREENING MANUFACTURERS & DESIGNERS

DO NOT SCALE PRINT	PROJECT	B831 WODGINA SPUDUMENE PROJECT	REV
	TITLE	WODGINA SPUDUMENE PROJECT POWER PLANT LAYOUT PLOT PLAN	
SCALE 1:500	DRAWN BY	TBA	
CHECKED	ENGINEER APPROVED	P. SLATER	PROJECT MANAGER
DATE			T. DEIGHTON

11. The Air Emissions Monitoring in Schedule 2 of this Licence is amended by the deletion of the text shown in strikethrough below:

**Schedule 2: Air Emissions Monitoring**

The Licence Holder must monitor the Emissions specified in Column 2 from the locations specified in Column 1 of Table 5. Emissions must be calculated as an average over the period specified in Column 4, and in accordance with the method specified in Column 5. The monitoring program shall take place during the Commissioning period.

**Table 6.1: Point source emissions to air monitoring table**

Column 1	Column 2	Column 3	Column 4	Column 5
Emission point	Parameter	Units	Minimum sampling time (minutes) per run	Method
All gas generator exhausts	Carbon monoxide	mg/m <sup>3</sup> and g/s	Minimum 60 minutes	USEPA Method 10
	Nitrogen oxides			USEPA Method 7D or USEPA Method 7E
	Volatile organic compounds			USEPA Method 18 or USEPA Method 25A



## Appendix 1: Key documents

	Document title	In text ref	Availability
1	Works Approval W6132/2018/1	W6132/2018/1	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
2	Licence L4328/1989/10	L4328/1989/10	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
3	Strategen, May 2019 Wodgina Operations Water Desalination Plant Licence L4328/1989/10 amendment application supporting attachments MRL19067_01 R003 Rev 0 - 22 May 2019		DWER records (A1790831)
4	MBS, February 2019 Wodgina Lithium Project – Interim Groundwater Quality Guideline Value Assessment	MBS, February 2019	DWER records (DWERDT138712)
5	Mineral Resources e-mail – Response to request for further information (1) 23 July 2019		DWER records (A1810632)
6	Mineral Resources, December 2018 Power Station compliance report – Wodgina Lithium Project – Works Approval (W6132/2018/1)		DWER records (A1748287)
7	Mineral Resources, June 2019 Wodgina Landfill Compliance Report – Works Approval W6132/2018/1		DWER records (A1799221)
8	Mineral Resources, June 2019 Wodgina Power Station Commissioning Report – Licence L4328/1989/10		DWER records (A1799221)
9	Mineral Resources e-mail – Response to request for further information (2) 20 August 2019.		DWER records (A1816723)
10	Mineral Resources e-mail – Response to request for further information (3) 22 August 2019.		DWER records (A1817844)
11	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
12	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2016b	
13	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2016c	

## Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 6 September 2019 for review and comment. The Licence Holder responded on 16 September 2019 waiving the remaining comment period until 30 September 2019. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
--	<p>Predicted wastewater quality data previously presented to the Department, on 22 August 2019, for Simulation 2 (worst case) scenario was inaccurate as the RO plant manufacturer did not complete simulation as per the feed water composition proposed in the licence amendment application. Updated data was provided to the Department on 16 September 2019.</p>	<p>Updated simulation data provided considered and assessment updated to reflect the same.</p>
--	<p>WLPL believe that whilst some water quality parameters may periodically exceed the ANZECC livestock drinking water guideline trigger values, the risk of significant harm to the environment and/or livestock is negligible. As indicated in Section 9.3.2 of the ANZECC livestock drinking water guideline, the parameter values listed are "trigger" values and not "Limits".</p>	<p>Applicant comments and proposed management measures were considered. Assessment and conditions of the licence have been updated as appropriate.</p>
--	<p>As the current RO reject water is being proposed for use in dust suppression, the pathway to ingestion for livestock through drinking pooled/ ponded water is low. From an exposure perspective, occasional standing water on roads (not a permanent drinking source), poses a low risk of livestock/ fauna. The potential for harm to livestock/ fauna due to the operations dust suppression activities is considered low. Continued monitoring and reporting of the Mining and Haulage Tanks against the ANZECC trigger value guidelines values is proposed. The restriction on RO reject water in the current draft amendment can be modified. WLPL also suggested changes to licence condition text to operationalise their commitments.</p>	