



Licence Number L7798/1993/6

Licensee Deflector Mining Limited

ACN 101 224 999

File Number: 2010/003052

Premises Gullewa Gold-Copper Operations
Mining Tenements M59/49, L59/49, L59/64, M59/68,
M59/356, M59/391, M59/392, M59/335, M59/442
L59/35, M59/507, M59/336, M59/522 and L59/71
Morawa - Yalgoo Road

Date of Amendment 11 June 2018

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.

Date signed: 11 June 2018

Louise Lavery

A/Manager Licensing (Resource Industries)

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 33 Cloisters Square PERTH WA 6850 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.
DPF	Deflector Processing Facility
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</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

Licensee	Deflector Mining Limited
m ³	cubic metres
Meters below ground level	mbgl
Minister	the Minister responsible for the EP Act and associated regulations
NEPM	National Environmental Protection Measure
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>
TDS	Total Dissolved Solids
tpa	tonnes per annum
TSF	Tailings Storage Facility
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>
WWTP	Waste Water 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 Categories 5 and 6, changes to the Premises boundary, and addition of Categories 64 and 85.

The following guidance statements have informed the decisions made on this amendment:

- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

On 12 August 2017, Deflector Mining Limited (Deflector) submitted an application for an amendment to the Gullewa Gold-Copper Operations Licence L7798/1993/6. The Licence amendment application relates to the following:

- Licence the operation of the new Deflector Processing Facility (DPF) which was built under Works Approval W5188/2012/1, and increase the existing Category 5 throughput from 300,000 tpa up to 700,000 tpa.

The DPF, including new tailings pipelines were completed in March 2016 with compliance documents submitted to DWER on 17 March 2016. The Gullewa Processing Facility is no longer required and will be decommissioned. Works Approval W5188/2012/1 for the construction of the DPF was originally assessed with a design capacity of 480,000 tpa. Increasing the throughput to 600,000 tpa is within the design capacity of the plant (GR Engineering Services, April 2017). The Licensee submitted a further request via email on 26 October 2017 to increase the throughput to 700,000 tpa. The Licensee stated that this further increase in throughput is within the capacity of the plant with no modifications required. All tailings generated at the Premises are discharged to the existing tailings storage facility.

- Include Mining Tenements L59/35, M59/507, M59/336, M59/522 and L59/71 into the Premises description.
- Licence the operation of the Category 64 landfill constructed under Works Approval W5188/2012/1. The Class II landfill has a design capacity of 4,000 tpa and consists of two separate areas located at the waste rock landform for the burial of Type 1 and 2 wastes and Putrescible wastes. Dedicated trenches are used for the burial of all wastes.
- Licence the operation of the Category 85 WWTP constructed under Works Approval W5188/2012/1. The WWTP has a design capacity of 35 m³/day. Construction of the WWTP was completed during 2016 with a compliance document submitted to DWER on the 16 November 2016.

As part of this Licence amendment application, Deflector also applied for the use of the Monarch pit as a storage facility for dewatered pit effluent from the Rocksteady and Michelangelo pits. Deflector has now advised DWER on the 14 May 2018 that they no longer wish to proceed with this part of the application.

TSF Evaporators

Also as part of this Licence amendment, DWER initially assessed the trial use of six evaporators at the Tailings Storage Facility (TSF), however Deflector has now advised DWER

on 28 May 2018 that they now wish to use the evaporators at the TSF on a permanent basis.

The evaporators have recently been installed and have been in use since February 2018 to increase the rate of evaporation at the TSF, as part of Deflector's onsite water management program. The evaporators are designed and expected to remove approximately 9 L/s of water from the TSF, with water supplied to the evaporators via the TSF decant water feed. Deflector estimates that half a million litres per day may be evaporated under optimal operating conditions. The evaporators do not change the design capacity for category 5 on the existing Licence.

Table 2 below outlines the proposed changes to the Licence.

Table 2: Proposed design or throughput capacity changes

Category	Current design throughput capacity	Proposed design throughput capacity	Description of proposed amendment
5	300,000 tonnes per annual period	700,000 tonnes per annual period	Increasing the throughput to 700,000 tpa is within the design capacity of the plant with no modifications required. All additional tailings generated will be discharged to the existing tailings storage facility.
64	New category to Licence	4,000 tonnes per annual period	Licence the operation of the Category 64 landfill constructed under Works Approval W5188/2012/1.
85	New category to Licence	35 m ³ /day	Licence the operation of the Category 85 WWTP constructed under Works Approval W5188/2012/1.

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 3.

Table 3: Relevant approvals

Legislation	Number	Approval
<i>Rights in Water and Irrigation Act 1914</i>	GWL168757(5)	Licence to take water – 1,280,000 kL of groundwater per annum
Mining Act 1978	Registration ID 71910 and 53343	Use of evaporators at the TSF and mining at the Gullewa Gold-Copper Operations respectively.

Amendment history

Table 4 provides the amendment history for L7798/1993/6.

Table 4: Licence amendments

Instrument	Issued	Amendment
L7798/1993/6	25/07/2008	Licence amendment to transfer the Licence from ATW (Australia) Pty Ltd to Mutiny Gold Ltd

L7798/1993/6	21/01/2016	Licence amendment to change the occupier name to Deflector Mining Ltd, include dewatering to the Golden Stream Pit and Salt River, and convert the Licence to template version 2.9.
L7798/1993/6	11/06/2018	Amendment Notice #1 for the operation of the new DPF, increase the existing Category 5 throughput from 300,000 tpa up to 700,000 tpa, operate 6 evaporators at the TSF, operation of the Category 64 landfill, and the operation of the Category 85 Wastewater treatment plant.

Location and receptors

Table 5 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
<p>The Premises is isolated with the nearest town of Yalgoo located approximately 60 km away.</p> <p>The Barnong Station homestead which is located 10 km away is managed by the Department of Biodiversity, Conservation and Attractions (DBCA). The homestead is unoccupied and is in a state of disrepair. DBCA has advised DWER there are no plans to repair the homestead for the purpose of occupation.</p>	60 km from the Premises

Table 6 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
Salt River	<p>Approximately 9.0 km south east of the TSF.</p> <p>One of a number of ephemeral creeks in the area that discharge into salt lakes. Flows during heavy rainfall events, remnant pools may remain for several weeks or months.</p> <p>Water quality is highly saline (20,000 to 23,000 mg/L TDS) and alkaline (pH 8.3 to 8.4), with elevated concentrations of total nitrogen and low concentrations of heavy metals.</p> <p>The local surface water drains from the northwest to the southeast across the Premises towards the Salt River system.</p> <p>The area is typically associated with sheet flow that contributes to the nearby Salt River during periods of heavy rainfall. The river is the main drainage channel for the catchment. In the vicinity of the mine, the river flows in a southerly direction for approximately 15 km, before intercepting a chain of salt lakes including Burra Lake; the local terminus. While the river is substantial in length, drainage along the channel and surrounding floodplain can be highly diffuse (Stantec, 2017).</p>
Groundwater	<p>Groundwater flow is assumed to be in a southeasterly direction towards the Salt River where static water levels are higher.</p> <p>Groundwater is approximately 20 metres below ground level. Salinity at the Premises varies greatly with ranges from 1,000 mg/L TDS up to 67,000 mg/L TDS nearer to the salt river system.</p> <p>There are no nearby groundwater users. The closest groundwater bore is located 4 km away from the TSF however is located on the Premises and is not in use.</p>

Conservation significant fauna	Considered unlikely due to lack of suitable habitat, a long history of land disturbance from grazing, timber cutting and mining, and disturbance created by mining, including light exposure at night and the noise associated with operations and equipment.
Threatened or priority flora	No threatened or priority flora species have been identified from Department of Biodiversity, Conservation and Attractions database searches, or recorded during previous surveys of the area associated with the Deflector Mine.

Risk assessment

Table 7 below describes the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. The 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				
Cat 5 Processing or beneficiation of metallic or non-metallic ore	Increased operation of crushing infrastructure and increased discharge of tailings	Dust: associated with ore handling	Town of Yalgoo is 60 km away	Air	Health and amenity impacts	Slight	Rare	Low	Water sprays are fitted along conveyor belts and at material handling and transfer points. All transfer chutes are hooded. A water cart is used around the process plant when required. The Premises is isolated with the nearest sensitive premises located 60 km away.
		Noise: associated with ore handling	Town of Yalgoo is 60 km away	Air	Health and amenity impacts	Minor	Rare	Low	Operating noise will be attenuated by distance (60km to nearest sensitive premises) and undulating terrain. Any noise complaints are recorded for investigation and corrective actions. Noise awareness training provided at pre-start inductions.
		Tailings: Discharge of tailings to land due to overtopping of the pit	Surrounding soils and vegetation Salt River	Sheet flow across land	Impacts to vegetation Changes to the surrounding soil composition Contamination of the Salt River system	Minor	Unlikely	Medium	Daily inspections of the TSF including the discharge and return pipelines and freeboard continue to be conducted in accordance with the Licence. Water is recovered through the decant tower and returned for use in the processing plant.

									<p>The surrounding vegetation is highly degraded as a result of current and historical mining practices.</p> <p>The Salt River system is located approximately 9 km away from the TSF.</p> <p>Operation of the TSF in accordance with the 'Deflector Mine Tailings Storage Facility (TSF) Management Plan V3'.</p>
		Tailings Seepage: Increased seepage to groundwater from an extra 400,000 tonnes of tailings being discharged into the tailings storage facility (TSF) per year	Groundwater	Seepage through soil	Contamination of groundwater potentially used for livestock drinking purposes. Adverse impacts to the health and survival of vegetation inundated with rising groundwater	Moderate	Possible	Medium	Refer to detailed risk assessment (risk event 1) below.
Cat 5: TSF evaporator system	Use of evaporators at the TSF	Saline spray drift	Surrounding vegetation and soils at the TSF	Air: Transport through air then deposition	Smothering and the potential suppression of photosynthetic and respiratory functions of vegetation. Accumulation of salts within the soil surface affecting the	Slight	Unlikely	Low	<p>The vegetation surrounding the TSF is highly degraded due to historical and current mining activities and historical pastoral activities.</p> <p>Four vegetation monitoring areas are photographed on a monthly basis.</p> <p>The evaporators are controlled by a weather</p>

					growth of vegetation				<p>station so if the wind is from the wrong direction or is very strong, the units shut down automatically.</p> <p>The area immediately outside of the TSF which is adjacent to the location of the evaporators contains the excess material stockpile</p> <p>A large portion of the wind direction at 9 am in this area is from the NE to SE (BOM, 2017) which causes the spray drift to settle on the surface of the TSF.</p> <p>A large portion of the wind direction at 3pm in this area is from the SW to SE (BOM, 2017) which may cause some of the spray drift to settle outside of the TSF if the wind is from the SW; however this area is not expected to be affected because it contains the excess material stockpile.</p>
Cat 64 Putrescible landfill	Operation of a Class II landfill facility	Odour: Associated with decomposition of putrescible waste	Town of Yalgoo is 60 km away	Air	Health and amenity impacts	Slight	Rare	Low	<p>The Premises is isolated with the nearest sensitive premises located 60 km away.</p> <p>Wastes will be covered regularly.</p>
		Dust: Associated with stockpiled cover material, vehicle movement and covering	Town of Yalgoo is 60 km away	Air	Health and amenity impacts Smothering of vegetation	Slight	Rare	Low	<p>The Premises is isolated with the nearest sensitive premises located 60 km away.</p> <p>A water cart will be used to suppress dust.</p>

		activities							<p>The landfill is located on the waste rock landform with vegetation in this area degraded due to historical grazing and current mining activities.</p> <p>No nearby rare or endangered vegetation.</p>
		Noise: Associated with vehicle movement and covering activities	Town of Yalgoo is 60 km away	Air	Health and amenity impacts	Slight	Rare	Low	<p>Operating noise will be attenuated by distance (60km to nearest sensitive premises) and undulating terrain.</p> <p>Minimal vehicle and plant use at the landfill during the day.</p> <p>Any noise complaints are recorded for investigation and corrective actions.</p>
		Waste: Windblown waste	Surrounding vegetation	Air	Visual amenity	Slight	Rare	Low	<p>Wastes are buried in dedicated trenches with the waste being covered regularly.</p> <p>The tipping area is less than 30 metres in length. Routine inspections to ensure no windblown waste.</p> <p>Cover material placed on the sides of the trenches shelters the waste from the wind.</p>
		Waste: Contaminated stormwater associated with contact with deposited	Surrounding soils and surface waters	Sheet flow across land	Contamination of surrounding soils and surface waters	Slight	Rare	Low	<p>Contaminated stormwater is contained within the trench.</p> <p>The nearest surface water is located 1.5 km away.</p>

		waste							Clean stormwater is diverted away from the landfill through the use of earthen bunding around the trenches.
		Waste: Seepage of leachate due to putrescible waste decomposition and rainwater infiltration	Groundwater (about 40,000 mg/L TDS in this area)	Seepage through soil	Contamination of groundwater	Slight	Rare	Low	<p>Leachate is not expected to reach groundwater which is located 16.5 mbgl from the base of the landfill.</p> <p>Groundwater in the area of the landfill is hypersaline (about 40,000 mg/L TDS) and is unsuitable for drinking water.</p> <p>Stormwater is diverted away from the landfill through the use of earthen bunding around the trenches.</p> <p>Waste is covered on a regular basis.</p>
Cat 85 Sewage Facility	Operation of a Waste Water Treatment Facility	Odour: Associated with effluent treatment and disposal	Town of Yalgoo is 60 km away	Air	Amenity	Slight	Rare	Low	<p>Odours generated at the WWTP are not expected to reach the nearest sensitive premises which is located 60 km away.</p> <p>The generation of odour is expected to be low with the use of a contained batch reactor for the processing of sewage.</p> <p>The WWTP will be managed in accordance with the WWTP management plan.</p> <p>Servicing of the equipment will be conducted in accordance with the</p>

									manufacturers specifications.
		Waste: Seepage of nutrient rich waste water to groundwater or discharge into surface waters	Groundwater Surface waters (Salt River)	Seepage through soil Sheet flow across land	Contamination of groundwater. Eutrophication of surface waters.	Minor	Rare	Low	Irrigated waste water is not expected to reach groundwater which is located 16.5 mbgl. Groundwater in the area of the WWTP is highly saline (about 40,000 mg/L TDS). The nearest surface water from the WWTP is located about 3.8 km away. Evaporation rates are high and rainfall low in this area. Effluent is treated by aeration and chlorination prior to discharge. Wastewater is sampled and analysed on a monthly basis. The sprinklers in the spray field are rotated on a regular basis to reduce the likelihood of pooling or water logging.

1. Risk Event: Increased seepage to groundwater from an extra 400,000 tonnes of tailings being discharged into the tailings storage facility (TSF) per year

Description of Risk Event

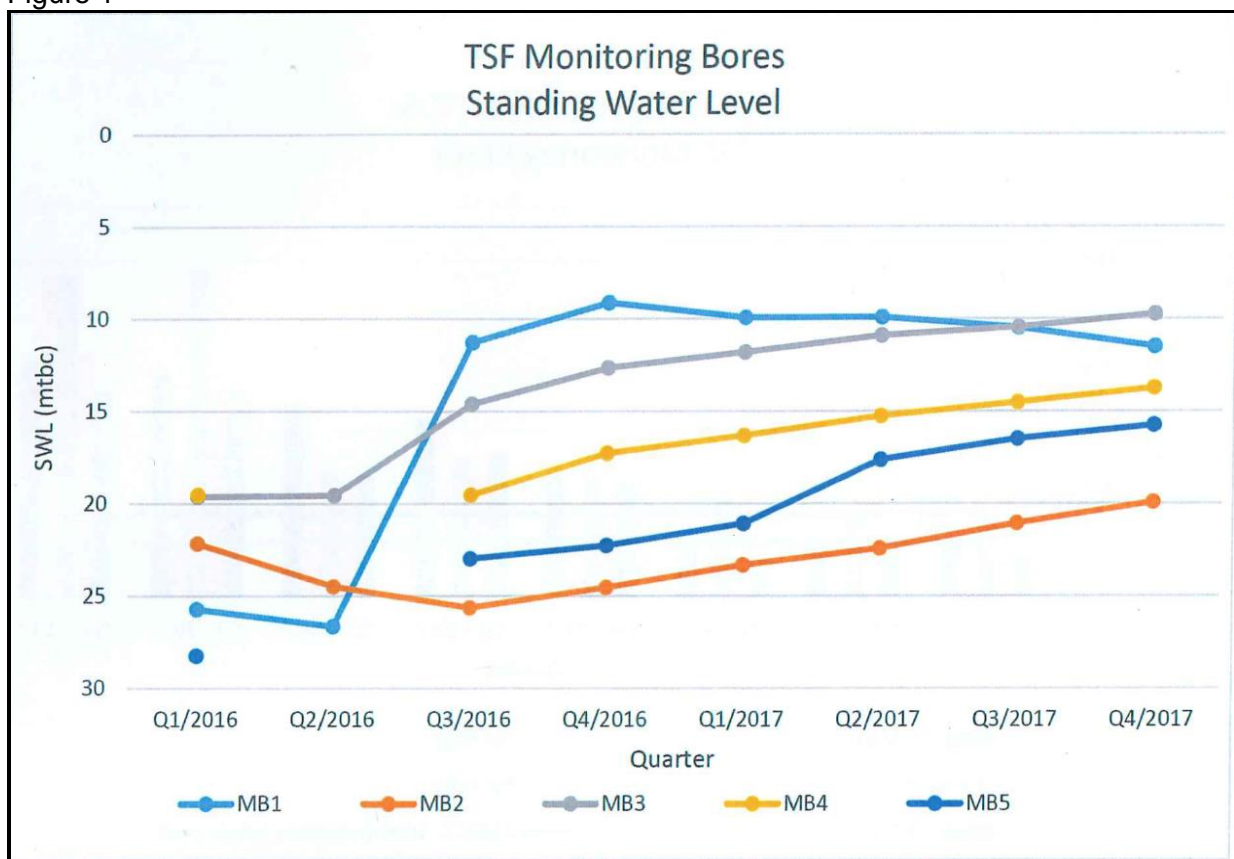
Increasing the amount of tailings disposed per year into the TSF causing an increase in the rate of seepage from the facility impacting on local groundwater levels.

Identification and general characterisation of emission

Historical depth to groundwater at the TSF ranged from 20 to 25 metres below ground level. Monitoring data presented in the Gullewa Gold Copper Operations 2017 Annual Environmental Report (AER), indicates seepage from the TSF has been occurring since the deposition of tailings recommenced in early 2016.

Monitoring of the Standing Water Level (SWL) in each of the five ground monitoring bores at the TSF show there has been an increase (shallowing) in the SWL since tailings deposition commenced in early 2016, however most of the increase occurred in the initial tailings deposition stages (see Figure 1). With the exception of monitoring bore MB1, there has been a gradual shallowing trend.

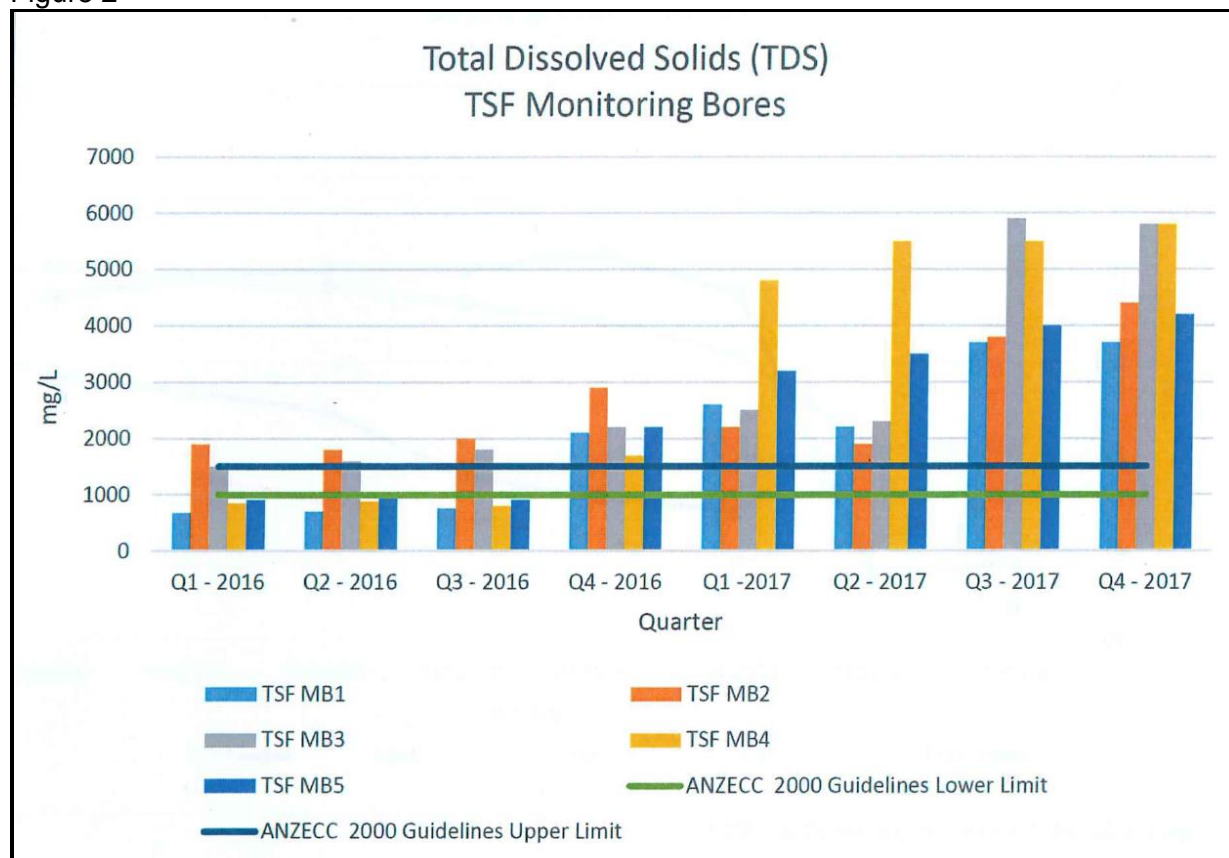
Figure 1



Monitoring for Total Dissolved Solids (TDS) in each of the five groundwater monitoring bores at the TSF also indicate that seepage has occurred. This is shown by an increase in the concentration of TDS in all monitoring bores since tailings deposition commenced (see Figure 2). Initially the concentrations were relatively stable for the first three quarters in 2016, however this started trending upwards from the fourth quarter with a significant increase

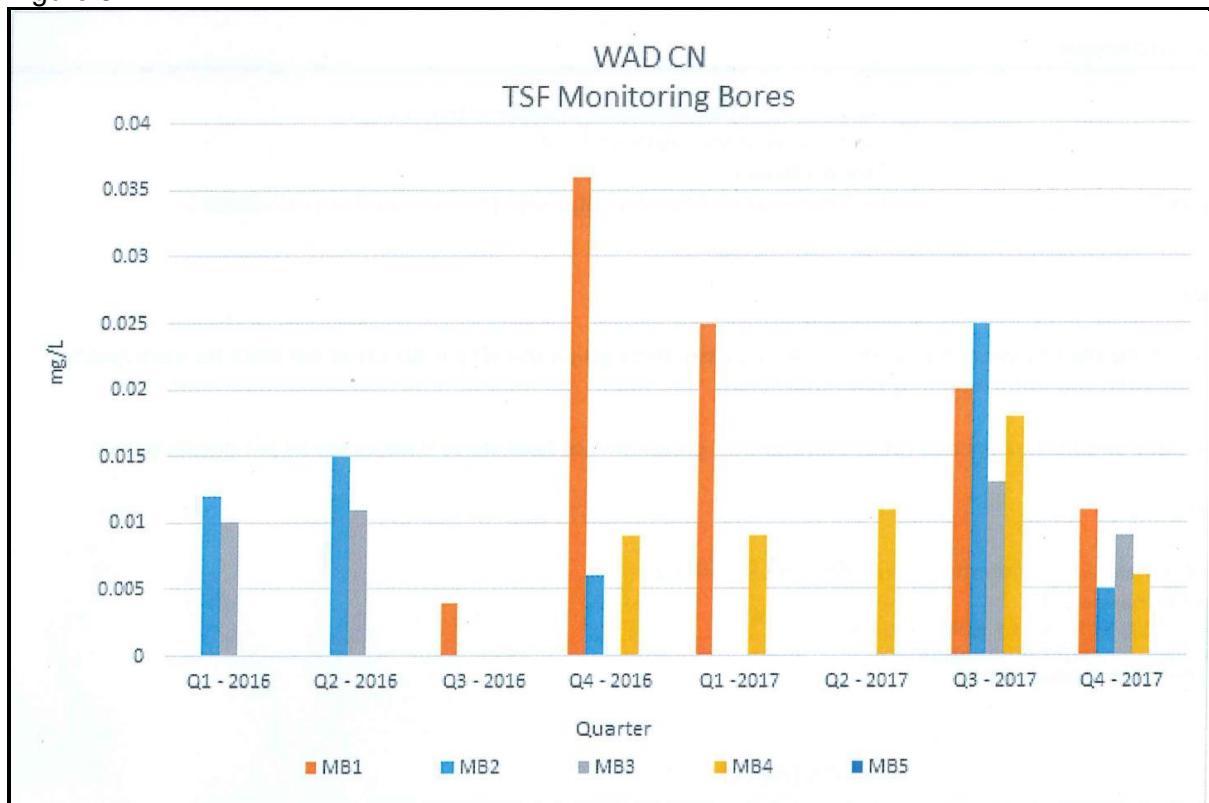
observed from the middle of 2017. The Licensee stated in their AER that a 'contributing factor to the gradual increase is likely to be the introduction of increasing amounts of (saline) mine dewater into the process circuit (and subsequently, tailings), which occurred from August 2017'.

Figure 2



Low levels of Weak Acid Dissociable Cyanide (WAD CN) has been detected in groundwater monitoring bores MB1 to MB4 that are downstream of the TSF, however no WAD CN has been detected in the upstream groundwater monitoring bore MB5 (see Figure 3). Although WAD CN has been detected in groundwater at the location of the TSF, the concentrations are still considered low with the highest reading of 0.011 mg/L observed in the fourth quarter of 2017. DWER normally applies a limit of 0.5 mg/L for WAD CN in groundwater a licence which is approximately 45 times higher in concentration than what has been observed in the groundwater monitoring bores at the TSF.

Figure 3



Description of potential impacts

Contamination of local groundwater with tailings seepage which contains cyanide and elevated levels of salt.

Criteria for assessment

DWER 'Water Quality Protection Guidelines No.2, Mining and Mineral Processing, Tailings facilities', 2000.

The Department of Mines, Industry Regulation and Safety Code of Practice 'Tailings Storage Facilities in Western Australia', 2013.

Relevant freshwater quality criteria for comparison include ANZECC guidelines for livestock drinking water quality.

Licensee controls

The Licensee has recently created the 'Deflector Mine Tailings Storage Facility (TSF) and Monarch Pit In-fill TSF (In-pit TSF) Management Plan, Rev 3.0. The management plan focuses on:

- Decant operations. This includes ensuring the decant pond is maintained well away from the embankment walls of the TSF, the pond is positioned around the decant facility and is maintained at the smallest practical operational size to maximise water return to the plant and enable most of the free water to be recovered for recycling at the process plant;
- Method of tailings deposition. This includes tailings being deposited over the exposed beaches at a low velocity from numerous spigot discharge points, and deposition occurs for a period of two to three days from each group of spigots;
- The use of evaporators to increase the rate of evaporation of the supernatant pond; and

- Daily inspections. This includes evaporators and gensets, discharge points/location, decant and return water pumps, tailings deposition, position of the supernatant pond in relation to the water recovery system/s, visible seepage (if present) from the embankment toe, and seepage sumps and pumps.

Note the 'Monarch Pit In-fill TSF' is currently under assessment through a separate Licence amendment application which was received by DWER on the 20 March 2018.

Current tailings density is 24-26 percent however the Licensee intends to increase this to 34 percent (Doray Minerals Limited, March 2018).

Routine monitoring of an additional seven new groundwater monitoring bores that have been recently installed downstream of the TSF to monitor for any impacts associated with seepage from the TSF.

A number of the existing monitoring bores around the TSF have been designed to be used as abstraction bores if required. These bores will be used to control the groundwater mound around the TSFs if unacceptable impacts are identified through the groundwater monitoring program.

Consequence

The impacts from the seepage of low quality saline water from the TSF will be **moderate** due to groundwater in this location flowing in a south easterly direction towards the Salt River system (approximately 9 km away), which has a high groundwater salinity of up to 67,000 mg/L TDS and that the nearest downstream groundwater bore is 4 km away, located on the Licensee's exploration lease. This bore, however, is not currently used, and the area around the TSF is highly disturbed and does not contain any threatened or priority flora or groundwater dependent vegetation.

Likelihood of Risk Event

The likelihood of an occurrence impacting on vegetation due to rising groundwater levels is **possible** given data showing increasing standing water levels. The impact on water quality of downstream users is also considered **possible**, despite the adjacent bore currently being not in use; this bore may be required for future use.

Overall rating of Risk Event

The risk rating for increasing the throughput at the processing plant with an increased tailings discharge to the TSF is **medium**; acceptable subject to an amendment to the existing conditions imposed in the Licence and the inclusion of new conditions which are discussed below.

Decision

Increased throughput at the processing plant

Based on the application supporting documentation, the Delegated Officer has determined that the increased throughput at the processing plant presents a low risk to the environmental for noise and dust emissions.

The risks associated with an increased discharge of tailings into the TSF presents a moderate risk to the environment as discussed above in Risk Event 1.

The approved premises production or design capacity for Category 5 has been increased to 700,000 tpa. This is an increase of 400,000 tpa to account for the increase in throughput at the processing plant and increased discharge of tailings into the TSF.

Condition 1.3.2 of the License has been amended to increase the process limit for Category 5

processing or beneficiation of metallic or non-metallic ore at the Premises from 300,000 tpa up to 700,000 tpa.

Conditions currently in the Licence capture operational emissions relating to processing of tailings at the TSF and the monitoring and reporting of ambient groundwater quality at the TSF. The Delegated Officer considers an amendment to these conditions is required to include limits for ambient monitoring for WAD CN in all groundwater monitoring bores at the TSF, and the inclusion of new groundwater monitoring bores TSFMB06, TSFMB07, SMW1, SMW2, SMW3, WB1 and WB2 as part of the ambient groundwater monitoring at the TSF. These new groundwater monitoring bores were recently installed by the Licensee following an independent groundwater investigation.

Additional parameters for contaminants generally associated with gold ores have also been added to Table 3.4.1.

Putrescible landfill

Based on the application supporting documentation, the Delegated Officer has determined that the operation of the landfill built under works approval W5188/2012/1 presents a low risk to the environment.

The approved premises production or design capacity for Category 64 of 4,000 tpa has been included in the Licence.

New conditions relating to the types and quantities of wastes allowed to be accepted at the landfill for burial and the covering of waste requirements have been included in the Licence.

Waste Water Treatment Plant

Based on the application supporting documentation, the Delegated Officer has determined that the operation of the waste water treatment plant built under works approval W5188/2012/1 presents a low risk to the environment.

The approved premises production or design capacity for Category 85 of 35 m³/day has been included in the Licence.

Condition 1.3.2 of the Licence has been amended to include the throughput limit of 35 m³/day for Category 85.

Condition 2.2.1 has been amended to include the emission point for irrigation to land of treated wastewater.

The Licensee has committed to monthly monitoring of the wastewater discharged to land to assess concentrations of biological oxygen demand, total suspended solids, faecal coliforms, pH, total phosphorus and total nitrogen and this has been included as new condition 3.2 for the monitoring of emissions to land. Also included is the requirement to monitor the cumulative volumes of wastewater discharged.

Evaporator at the TSF

Based upon information provided to DWER, the Delegated Officer has determined that the operation of six evaporators at the TSF presents a low risk to the environment.

Table 3.4.2 has been amended to include the nominated photo monitoring sites Point 1, Point 2, Point 3 and Point 4 for the assessment of any impacts to vegetation health from the operation of the evaporators at the TSF.

New condition 2.3 has been included in the Licence for the operation of the evaporators at the TSF.

Other Amendments

Condition 3.5.1 has been added to the Licence to require monitoring of the discharges to Golden Stream pit.

Administrative changes to the Licence have been made as follows:

- Addition of definitions for 'Anniversary Date', 'Annual Audit Compliance Report', 'Australian Standards', 'Department', and updates to the definition of 'CEO for the purpose of correspondence';
- Removal of condition 1.2.1 as it is an explanatory condition to provide clarification of the operation of the Licence and DWER considers it is not enforceable or risk based; and
- Removal of the Annual Audit Compliance Report form.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 17 May 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. The Licence is amended by the deletion of the text shown in strikethrough below and 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	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes per annual period	300,000 <u>700,000</u> tonnes per annual period
6	Mine dewatering	50,000 tonnes or more per annual period	300,000 tonnes per annual period <u>to Salt River</u>
<u>64</u>	<u>Class II landfill site</u>	<u>20 tonnes or more per year</u>	<u>4,000 tonnes per annual period</u>
<u>85</u>	<u>Sewage facility: premises-</u> <u>a) On which sewage is treated (excluding septic tanks); or</u> <u>b) From which treated sewage is discharged onto land or into waters</u>	<u>More than 20 but less than 100 cubic metres per day</u>	<u>35 cubic metres per day</u>

2. Definitions of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the text shown in bold and underline below:

'Anniversary Date' means 30 June of each year;

'Annual Audit Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website'

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 Water Quality –

Sampling – Guidance on sampling of waste waters;

‘AS/NZS 2031’ means the Australian Standard AS/NZS 2031:2001 - Selection of containers and preservation of water samples for microbiological analysis;

‘CEO’ for the purpose of correspondence means:

Chief Executive Officer
~~Department Administering the Environmental Protection Act 1986~~
~~Locked Bag 33~~
~~CLOISTERS SQUARE WA 6850~~
~~Email: info@dor.wa.gov.au~~

Department Div.3 Pt. V EP Act
Locked Bag 33 Cloisters Square
Perth WA 6850
info@dwer.wa.gov.au

‘Department’ means the department established under section 35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Division 3 Part V of the EP Act’;

3. The Licence is amended by the deletion of the text shown in strikethrough below:

~~1.1.5 Nothing in the Licence shall be taken to authorise any omission that is not mentioned in the Licence, where the omission amounts to:~~

- ~~(a) pollution;~~
~~(b) unreasonable omission;~~
~~(c) discharge of waste in circumstances likely to cause pollution; or~~
~~(d) being contrary to any written law.~~

4. The Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

- 1.3.2 The Licensee shall carry out the Authorised Activities on the Premises in accordance with the requirements set out in Table 1.3.1.

Table 1.3.1: Authorised Activities		
Authorised activity	Process(es)	Process limits
Category 5	Processing or beneficiation of metallic or non-metallic ore	Processing of material at the premises shall not exceed 3 <u>700,000</u> tonnes of ore per annual period
Category 6	Mine dewatering	Dewatering discharge at the premises shall not exceed 300,000 tonnes per annual period <u>to Salt River</u>
<u>Category 85</u>	<u>Sewage facility: premises-</u> <u>a) On which sewage is treated</u> <u>(excluding septic tanks); or</u> <u>b) From which treated sewage</u> <u>is discharged onto land or</u> <u>into waters</u>	<u>35 cubic metres per day</u>

- 2.2.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.2.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emissions to land		
Emission point reference on Map of emission points	Description	Source including abatement
<i>Golden Stream Pit</i>	<i>End-of-pipe discharge</i>	<i>Water from dewatering of mine. Approved to discharge a maximum of 300,000 tonnes per annual period.</i>
<i>Salt River</i>	<i>Rock-armoured gabion outlet/s</i>	
<u>Irrigation spray field</u>	<u>Discharge of treated wastewater by irrigation to land</u>	<u>Treated waste water from the waste water treatment facility.</u>

5. The Licence is amended by the insertion of the following conditions shown in bold and underline below:

1.3.5 The Licensee shall only accept waste on to the landfill if:

- a) **it is of a type listed in Table 1.3.3;**
- b) **the quantity accepted is below any quantity limit listed in Table 1.3.3;**
- c) **it meets any specification listed in Table 1.3.3;and**
- d) **it conforms to the description in the documentation supplied by the producer and holder.**

Table 1.3.3: Waste acceptance		
Waste	Quantity Limit	Specification
Clean fill	None specified	None specified
Inert Waste Type 1	Combined total of 4,00 tonnes per annual period	None specified
Putrescible waste		
Inert Waste Type 2	100 used tyres are stored	Used tyres only

- 1.3.6 The Licensee shall ensure that cover is applied to waste in the tipping area in accordance with Table 1.3.2 and that sufficient stockpiles of cover are maintained on site at all times for the tipping area of the site to be covered, in accordance with this condition, at least twice.**

Table 1.3.4: Cover requirements			
Waste type	Material	Depth	Timescale
Putrescible Wastes	Inert and incombustible material	A minimum of 200 mm. No waste is to be left exposed after covering	Cover shall be applied fortnightly

2.3 Emissions to air

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

Table 2.3.1: Emissions to air		
Emission point reference on Map of emission points	Description	Source including abatement
<u>TSF Evaporators</u>	<u>Six turbo mist evaporators</u>	<u>Water supplied to the evaporators is provided via the TSF decant water feed.</u>

- 3.2.2 The Licensee shall undertake the monitoring in Table 3.2.2 according to the specifications in that table.**

<u>Table 3.2.2: Monitoring of point source emissions to land</u>			
<u>Monitoring point reference</u>	<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<u>Discharge to irrigation area</u>	<u>pH¹</u>	<u>-</u>	<u>Quarterly</u>
	<u>E.coli</u>	<u>cfu/100mL</u>	
	<u>Biochemical Oxygen Demand</u>	<u>mg/L</u>	
	<u>Residual chlorine²</u>		
	<u>Total Phosphorus</u>		
	<u>Total Nitrogen</u>		
	<u>Total Suspended Solids</u>		
	<u>Volumes of wastewater discharged to the environment</u>	<u>m³</u>	<u>Continuous</u>

Note 1: In-field non-NATA accredited analysis permitted for pH measurement.

Note 2: In-field non-NATA accredited analysis permitted for residual chlorine measurement.

3.5 Monitoring of emissions to groundwater

3.5.1 The Licensee shall undertake the monitoring in Table 3.5.1 according to the specifications in that table.

Table 3.5.1: Monitoring of point source emissions to groundwater				
<u>Emission point reference and location as depicted in Schedule 1</u>	<u>Parameter</u>	<u>Units</u>	<u>Averaging Period</u>	<u>Frequency</u>
<u>Dewatering discharge outlet/s into the Golden Stream pit</u>	<u>Volumetric flow rate</u>	<u>m³/day</u>	<u>Monthly</u>	<u>Continuous</u>
	<u>Aluminium</u>	<u>mg/L</u>	<u>Spot sample</u>	<u>Quarterly</u>
	<u>Arsenic</u>			
	<u>Cadmium</u>			
	<u>Chlorine</u>			
	<u>Copper</u>			
	<u>Chromium</u>			
	<u>Iron</u>			
	<u>Lead</u>			
	<u>Magnesium</u>			
	<u>Manganese</u>			
	<u>Mercury</u>			
	<u>Molybdenum</u>			
	<u>Nickel</u>			
	<u>Potassium</u>			
	<u>Selenium</u>			
	<u>Sodium</u>			
	<u>Thallium</u>			
	<u>Zinc</u>			
	<u>Total dissolved solids</u>	<u>-</u>		
	<u>Total suspended solids</u>			
	<u>pH¹</u>			

Note 1: In-field non-NATA accredited analysis permitted.

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

3.1.1 The Licensee shall ensure that:

- (a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
- (b) all surface water sampling is conducted in accordance with AS/NZS 5667.4 or AS/NZS 5667.6 as relevant;

- (c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and
- (d) all samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in relevant table;
- (e) **all wastewater sampling is conducted in accordance with AS/NZS 5667.10; and**
- (f) **all microbiological samples are collected and preserved in accordance with AS/NZS 2031;**

3.4.1 The Licensee shall undertake the monitoring in Tables 3.4.1 and 3.4.2 according to the specifications in those tables and present this information in the Annual Environmental report, including a comparison against the appropriate ANZECC 2000 water quality trigger values and previous years' monitoring data.

Table 3.4.1: Monitoring of ambient groundwater quality

Monitoring point reference and location as depicted in Schedule 1	Parameter	Units	Limit	Averaging Period	Frequency
Monitoring bores: MB1-MB5 TSFMB01, TSFMB02, TSFMB03, TSFMB04, TSFMB05, <u>TSFMB06,</u> <u>TSFMB07,</u> <u>SMW1,</u> <u>SMW2,</u> <u>SMW3,</u> <u>WB1 and</u> <u>WB2</u>	Standing Water Level ¹	m(AHD)	=	Spot sample	Quarterly
	pH ²	-			
	Major ions and metals – Aluminium Arsenic Cadmium Chlorine <u>Chromium</u> Copper Iron Lead Magnesium Manganese <u>Mercury</u> <u>Molybdenum</u> Nickel Selenium Sodium <u>Thallium</u> Zinc	mg/L			
	Total dissolved solids				
	Weak Acid Dissociable Cyanide (WADCN)				
			<u>0.5 mg/L</u>		

Table 3.4.2: Monitoring of ambient vegetation quality

Monitoring point reference and location as depicted in Schedule 1	Parameter	Requirements	Frequency	Method
Photo monitoring sites: PS#1 – PS#4, PMS#1, PMS#6 and PSC#9 , <u>Point 1, Point 2,</u> <u>Point 3 and</u> <u>Point 4</u>	Vegetation health (i.e. decline in vegetation or change in composition)	The Licensee shall on a monthly basis: (i) take photographic images; (ii) provide a general environmental description of the site; and (i) record any changes to vegetation health or	Monthly while dewatering is occurring	Visual inspection and photographs

		composition which may have been induced by dewatering.		
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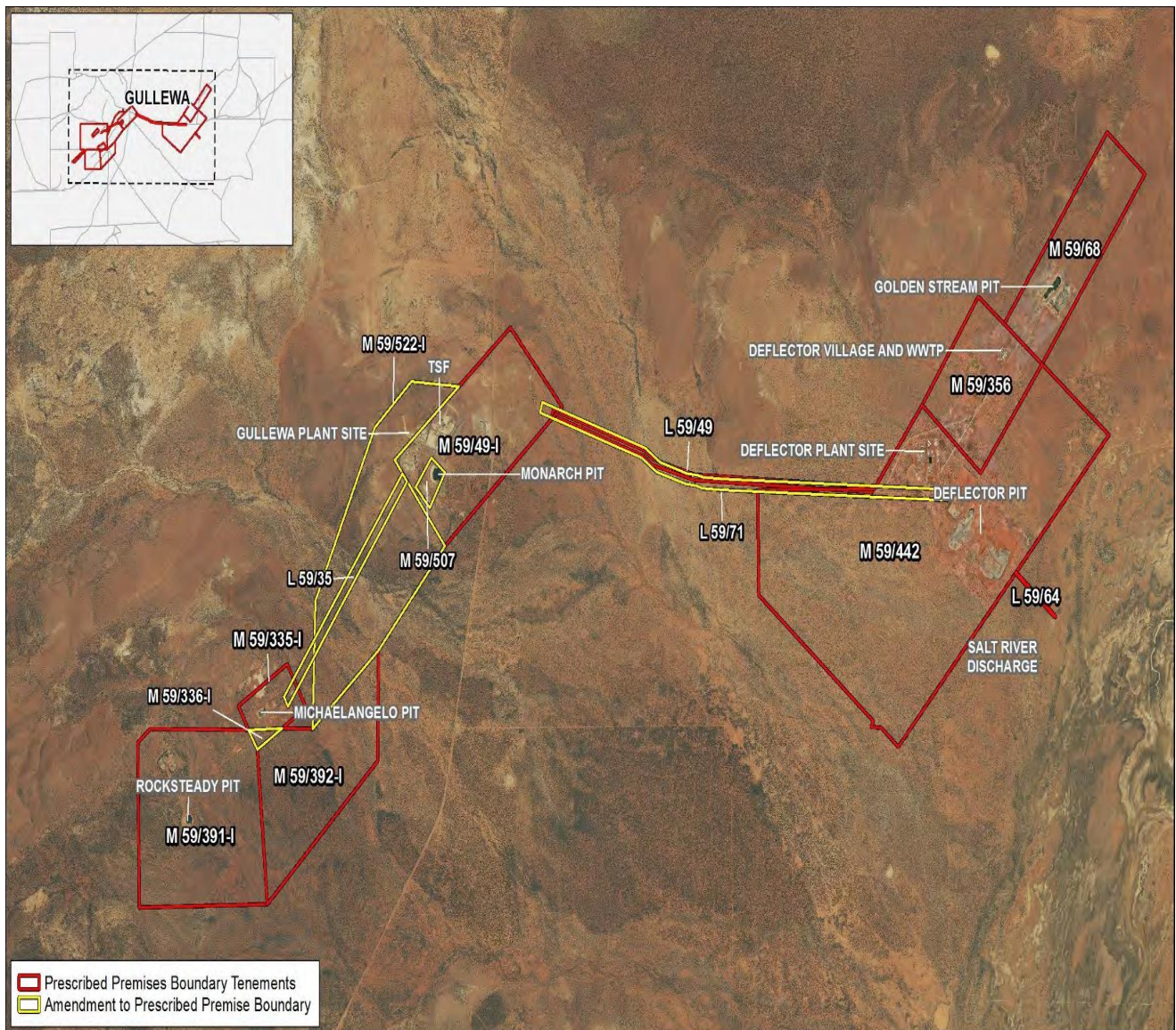
7. The Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

Table 4.2.1: Annual Environmental Report		
Condition or table	Parameter	Format or form¹
-	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 1.3.1	Actual throughput for the annual period for Categories 5 and 6	
Table 3.2.1	All dewatering water monitoring parameters specified in Table 3.2.1	
<u>Table 3.2.2</u>	<u>All discharge to irrigation area monitoring parameters specified in Table 3.2.2</u>	
Table 3.3.1	Summary of the TSF inspections including details on any seepage, spills or leaks and corrective measures undertaken to rectify any issues identified.	
Table 3.3.1	Summary of the dewatering pipeline and discharge point inspections including details on any identified pipeline failures, seepage, spills or leaks and corrective measures undertaken to rectify any issues identified.	
Table 3.4.1	All ambient groundwater quality monitoring parameters specified in Table 3.4.1	
Table 3.4.2	All ambient vegetation quality monitoring parameters specified in Table 3.4.2	
<u>Table 3.5.1</u>	<u>All dewatering water monitoring parameters specified in Table 3.5.1</u>	
4.1.3	Compliance	Annual Audit Compliance Report (AACR)
4.1.4	Complaints summary	None specified

8. The licence is amended by the removal of the Annual Audit Compliance Report template in Schedule 2.

9. The Licence is amended by removing the map in Schedule 1 Premises map and insertion of the map below:

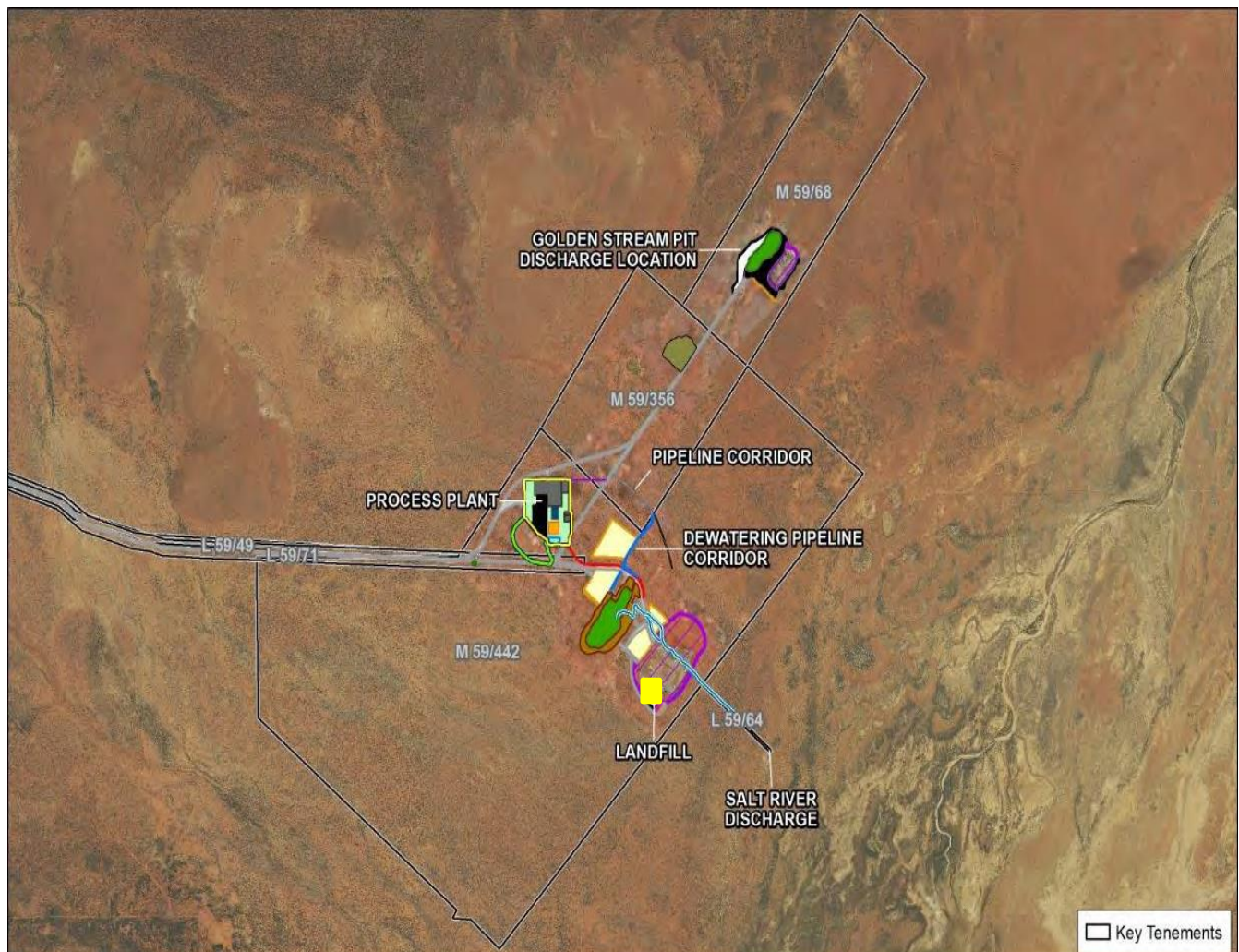
Premises map



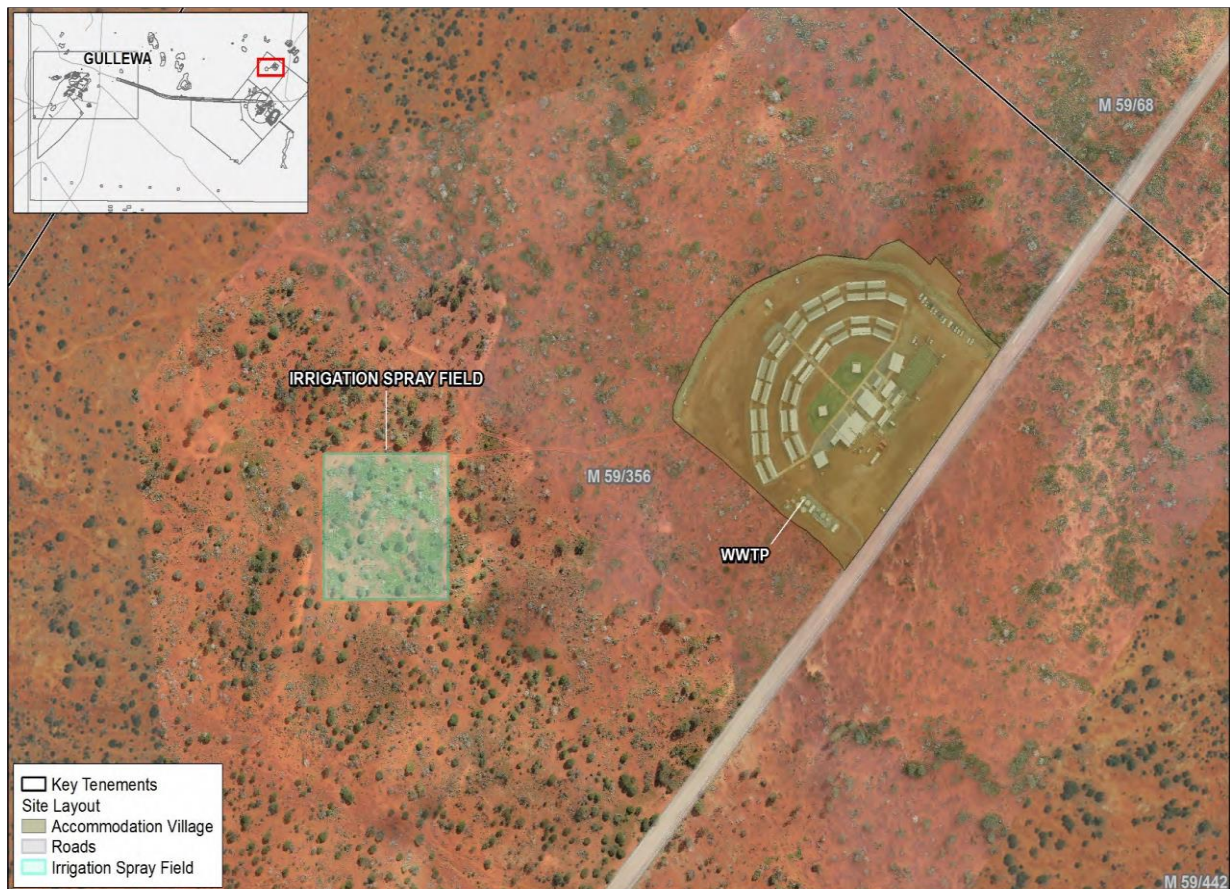
10. The Licence is amended by insertion of the maps below into Schedule 1:

Landfill Area Map

The area in which the disposal of waste by landfilling may take place is show in the map below.



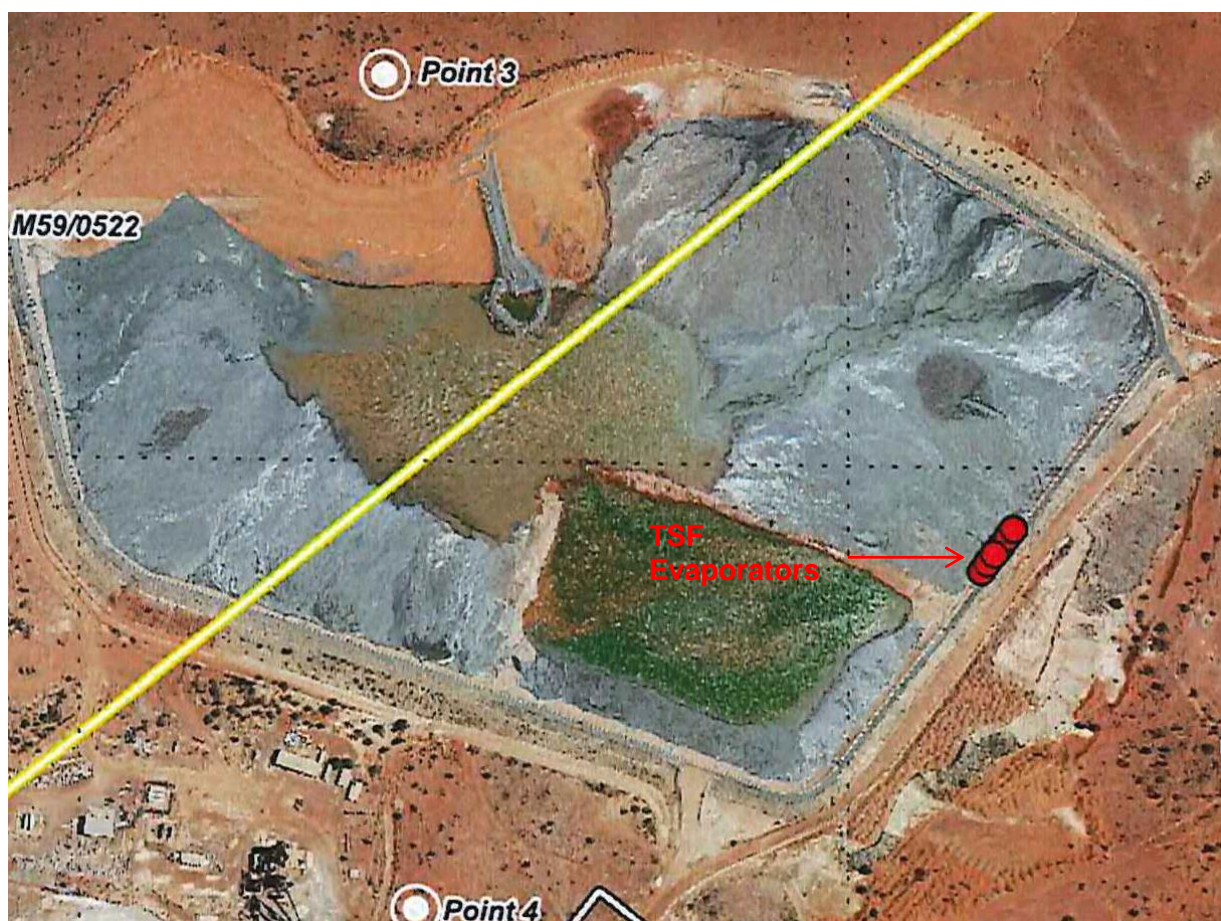
The location of the irrigation spray field defined in Table 2.2.1 is shown in the map below.



The locations for the Point 1, Point 2, Point 3 and Point 4 photo monitoring sites in Table 3.4.2 is shown in the map below.



The location of the emission points defined in Table 2.3.1 is shown in the map below:



11. The Licence is amended by removing the map in Schedule 1 Map of emission and monitoring points defined in Table 3.4.1 and insertion of the map below:

The locations of the groundwater quality monitoring points defined in Table 3.4.1 are shown below.



Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L7798/1993/6 – Gullewa Gold/Copper Operations	L7798/1993/6	accessed at www.dwer.wa.gov.au
2	Works Approval W5188/2012/1	W5188/2012/1	DWER records (A947191 and A1537279)
3	GR Engineering Services, April 2017. Doray Minerals Limited, Deflector Gold Project, Process Plant Throughput Design Review	GR Engineering, April 2017	A1504573
4	Stantec, June 2017. Deflector Mining Limited. Gullewa Gold-Copper Operations Licence Amendment	Stantec, 2017	A1504573
5	Deflector Mining Limited Annual Environmental Report 2016	AER, 2016	A1406065
6	Doray Minerals Limited, 'Deflector Mining Limited Operations, Licence Amendment Application Supporting Document', Gullewa TSF Embankment Lift to MRL 335.5 and Monarch In-Pit TSF, 20 March 2018	Doray Minerals Limited, March 2018	A1639723

Appendix 2: Summary of Licence Holder comments

The Licensee was provided with the draft Amendment Notice on 23 May 2018 for review and comment. The Licensee responded on 28 May 2018. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
Page 5, Table 3	GWL168757 (6) is in the process of being finalised and has an allocation of 4,700,000 kL. Mining Proposal MP06 pertains to LoM TSF lift and Monarch In-Pit Tailings.	This table refers to relevant approvals at the time of the assessment. GWL 168757(6) is under assessment by DWER and is yet to be approved. Reference to Mining Proposal MP06 has been removed.
Page 6, Table 4	Salt Lake should be Salt River. With reference to the evaporators, it is likely that we would make them a permanent installation. Can we include them on the licence without an end date?	All reference to 'Salt Lake' has been amended to 'Salt River'. Note the document also refers to salt lakes which reference general salt lakes within that region. The evaporators at the TSF were considered a low risk to the environment and therefore have been included as permanent infrastructure at the Premises. The requirement for routine inspections and vegetation monitoring remains as a requirement of the Licence.
Page 6, Table 6	TDS in top line should be TSF. The 67,000 TDS value is considered an outlier. This reading was from a sample taken in 2015 prior to dewatering operations and not considered representative.	Amended to TSF. The concentrations shown for TDS in groundwater in this table are used to illustrate the large variation across the Premises only. The concentration of 67,000 mg/L from sampling taken in 2015 was the latest available information provided to DWER. DWER expects this to vary due to seasonal changes and influences from mining activities, however is likely to remain high

Condition	Summary of Licence Holder comment	DWER response
		due to the close proximity to the Salt River system.
Page 8, Table 7	There is currently no approval in place for the depositing of tailings into an In-Pit TSF. There has been a licence amendment application lodged for this purpose into Monarch Pit but this is still being assessed. Also, considering Salt River is 9km to the east, it is very unlikely that a spill from this TSF would ever make it to Salt River. I would suggest that risk level at "medium" could be reviewed to "low".	<p>All potential receptors (for example groundwater, soils, and vegetation) are considered in determining the overall risks. The Salt River was considered as part of this overall risk assessment as a potential receptor, however due to distance the likelihood of impacts to the Salt River would be rare.</p> <p>DWER has reassessed the risks to the environment from the overtopping of the embankment at the TSF and now considers the consequences to be Minor due to the degraded surrounding vegetation, depth to groundwater and distance to surface water, and the likelihood to be Unlikely as a result of tailings management practices and routine inspections. The overall risk remains the same as Medium.</p>
Page 8, Table 7	It is likely that this trial will be successful and that units will be purchased rather than hired as they currently are. If we include on the licence, can we take out the reference to trial such that we can proceed past 6 months if proven successful?	Updated to reflect the permanent use of the evaporators at the TSF.
Page 13	Reference to Salt Lake in Potential receptors column should be Salt River.	Amended to Salt River
Page 16	As is suggested on page 17, the area is disturbed and contains no groundwater dependent vegetation. Does this still constitute a potential impact?	Amended to remove the reference to groundwater depended vegetation as a potential impact.
Page 21 Table 2.3.1	As alluded to in earlier part of the document, It is likely that these could become permanent. Can we leave it open ended?	Reference to the operation of the evaporators at the TSF for a 6 month period only has been removed from this new condition.
Page 22 Table 3.2.2	Reference to monitoring associated with emissions to land only refers to the irrigation spray field and not to Salt River.	Monitoring of emissions to the Salt River remains a requirement of the Licence under Table 3.2.1 of

Condition	Summary of Licence Holder comment	DWER response
		Condition 3.2.1. Condition 3.2.2 and Table 3.2.2 of this condition was included as a new condition to the Licence for the monitoring of emissions to land from the waste water treatment plant.
Page 24 Table 4.2.1	Reference to Table 3.2.1 is confusing as there doesn't seem to be one in the document.	Table 3.2.1 of Condition 3.2.1 remains as part of the Licence. No changes occurred to this condition therefore is not part of this Amendment Notice 1.