



# Licence

## *Environmental Protection Act 1986, Part V*

**Licensee: Monument Murchison Pty Ltd**

**Licence: L7972/2004/4**

**Registered office:** Level 2, 1 Walker Avenue  
WEST PERTH WA 6005

**ACN:** 167 323 855

**Premises address:** Burnakura Gold Project  
M51/116, M51/117, M51/178 and M51/177  
Culculli Pastoral Station  
CUE WA 6640 as depicted in Schedule 1.

**Issue date:** Thursday, 19 September 2013

**Commencement date:** Tuesday, 24 September 2013

**Expiry date:** Saturday, 23 September 2028

**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 or more per year	750 000 tonnes per annual period.
6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	50 000 tonnes or more per year	900 000 tonnes per annual period
7	Vat or in situ leaching of metal: premises on which metal is extracted from ore with a chemical solution	5 000 tonnes or more per year	500 000 tonnes per annual period.

**Conditions**

This Licence is subject to the conditions set out in the attached pages.

Date signed: 6 October 2016

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**Alana Kidd**  
**Manager – Resource Industries**  
Officer delegated under section 20  
of the *Environmental Protection Act 1986*



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## Introduction

This Introduction is not part of the Licence conditions.

### DER's industry licensing role

The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

### Licence requirements

This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:

<http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html>

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.
- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.
- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.



You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

### **Licence fees**

If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non-payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

### **Ministerial conditions**

If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

### **Premises description and Licence summary**

Monument Murchison Pty Ltd (the Licensee) operates the Burnakura Gold Project located approximately 45 kilometres (km) south of Meekatharra in the Shire of Cue. Currently the site is in Care and Maintenance (C&M) and has been since April 2013. The Licensee is currently undergoing feasibility assessment for a return to operations, possibly by the end of 2016.

Current infrastructure on site includes:

- Workshop, offices and wash down bay;
- Bunded hydrocarbon storage area;
- Accommodation Camp -100 man (outside of the prescribed premises boundary, with a WWTP and irrigation field, registered under category 85);
- Mill to treat 750 000 tonnes per year – Carbon In Leach (CIL) process;
- In pit Tailings storage facility (TSF) at Reward Pit and a second In pit TSF at Lewis pit, however no tailings have been deposited into Lewis Pit as yet;
- Power - Diesel generating units initially to 3.6 MW (3x 1.2 MW diesel Gensets); and
- Class II Putrescible Landfill which is a trench facility located on top of the NoA2 waste rock dump. It takes inert, domestic and putrescible waste less than 20 tonnes per annum (below threshold for Category 89).

The most recent amendment to this licence has resulted in:

- the construction and operation of a heap leach facility which consists of 7 cells and three ponds (pregnant solution pond, barren solution pond and stormwater pond). The facility has been designed to treat 500 000 tonnes pa of feed for a period of 2 years (category 7);
- Approval to refurbish and reinstall the current Burnakura crushing plant. This includes replacing the primary jaw crusher with a Trio CT2436 jaw crusher, replacing the secondary crusher with a 51" Symons cone crusher, replacing the existing screen within the secondary crusher and repositioning the crushing circuit 30-50 metres east of its current location.
- Approval to construct and operate a new crushing plant for the heap leach facility which has been added to the existing crushing circuit at Burnakura. Maximum throughput for the crusher is 1 million tonnes per annum. The expected nominal throughput is 750 000 tonnes per annum (pa).
- The addition of Category 6 – Mine dewatering to the licence with an approved throughput of 900 000 tonnes pa. The licensee is seeking approval to operate existing dewatering infrastructure to undertake dewatering of Alliance/New Alliance, NoA2 and NoA7&8 pits as required to other pits with available storage capacity on Mining Leases M51/116, M51/117, M51/177 and M51/178.



The licences and works approvals issued for the Premises since 24/03/2005 are:

Instrument log		
Instrument	Issued	Description
W4107/2004/1	24/03/2005	No information on record
W4278/2004/1	31/08/2006	Works approval to allow deposition of tailings into reward and Lewis pits
W4256/2004/1	13/07/2006	Construction of Lewis TSF
W5072/2011/1	08/12/2011	Works approval for the upgrade to processing plant to increase production capacity.
W5147/2012/1	03/05/2012	Works approval to allow deposition of tailings into expanded reward and Lewis pits.
W5402/2013/1	26/04/2013	Works approval for upgrade to processing plant to increase production capacity.
L7972/2004/2	01/05/2006	First licence recorded in ILS
L7972/2004/3	20/08/2008	Licence re-issue and transfer
L7972/2004/4	19/09/2013	Licence re-issue and transfer
L7972/2004/4	06/10/2016	Licence amendment to allow the construction and operation of heap leach facility, new processing plant and the dewatering of pits across the site.

#### Severance

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

#### END OF INTRODUCTION



## Licence conditions

### 1 General

#### 1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

**'Act'** means the *Environmental Protection Act 1986*;

**'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;

**'annual period'** means a 12 month period commencing from 1 September until 31 August in the following year;

**'AS/NZS 5667.1'** means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*;

**'AS/NZS 5667.10'** means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters*;

**'AS/NZS 5667.11'** means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*;

**'averaging period'** means the time over which a limit is measured or a monitoring result is obtained;

**'CEMS'** means continuous emissions monitoring system;

**'CEO'** means Chief Executive Officer of the Department of Environment Regulation;

**'CEO'** for the purpose of correspondence means;

Chief Executive Officer  
Department Div. 3 Pt. V EP Act  
Locked Bag 33 Cloisters Square  
PERTH WA 6850  
Email: [info@der.wa.gov.au](mailto:info@der.wa.gov.au);

**'Department'** means the department established under s. 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Division 3 Part V of the *Environmental Protection Act 1986*;

**'freeboard'** means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

**'HDPE'** means high density polyethylene;

**'Licence'** means this Licence numbered L7972/2004/4 and issued under the Act;



**'Licensee'** means the person or organisation named as Licensee on page 1 of the Licence;

**'mbgl'** means metres below ground level;

**'NATA'** means the National Association of Testing Authorities, Australia;

**'NATA accredited'** means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

**'Premises'** means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

**'Schedule 1'** means Schedule 1 of this Licence unless otherwise stated;

**'Schedule 2'** means Schedule 2 of this Licence unless otherwise stated;

**'spot sample'** means a discrete sample representative at the time and place at which the sample is taken;

**'TSF'** means Tailings Storage Facility; and

**'WAD cyanide'** means weak acid dissociable cyanide.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.1.5 The Licensee shall construct the works specified in Column 2 of Table 1.1.1 in accordance with the specifications detailed in column 3 and the documentation detailed in column 4 of Table 1.1.1.

<b>Table 1.1.1: Infrastructure to be constructed</b>			
<b>Column 1 Stage of works</b>	<b>Column 2 Infrastructure</b>	<b>Column 3 Details</b>	<b>Column 4 Document</b>
Stage 1	Part of Heap leach facility	Construction to include: <ol style="list-style-type: none"> <li>1. Crushing of foundation materials.</li> <li>2. Levelling of heap leach facility site including cut and filling with suitable construction materials.</li> <li>3. Establishment of heap leach sub-base (engineered foundations).</li> <li>4. Establishment of heap leach cell base including installation of liners (geosynthetic clay underlay liner (at least 300mm thick) and 1.5mm thick HDPE liner), geo-synthetic membrane and pipelines.</li> <li>5. One pregnant solution pond 48m wide x 48 m long x 4 m deep; lined with a geosynthetic clay underlay liner (at least 300mm thick) and 1.5mm thick HDPE liner.</li> <li>6. One Barren solution pond 56m wide 48m long x 4m deep; lined with a geosynthetic clay underlay liner (at</li> </ol>	Monument Mining Burnakurra Heap Leach Project Front End Engineering Design, Como Engineers Pty Ltd Mechanical & Mineral Processing Engineers, January 2016.





		<p>least 300mm thick) and 1.5mm thick HDPE liner.</p> <ol style="list-style-type: none"> <li>7. Stormwater pond 70m wide x 70m long x 5 m deep; lined with a HDPE liner and designed for a 100 yr 24 hr and a 100 yr 5 day rainfall event.</li> <li>8. Final construction of cells 1-2 as outlined in Schedule 1 Premises Maps, establishing bund walls.</li> <li>9. Water cut-off bund constructed on the uphill side of the heap leach and process pond area.</li> <li>10. Installation of six groundwater monitoring bores around the heap leach facility in the locations depicted on the second Map of monitoring locations in Schedule 1.</li> </ol>	
	Refurbished Burnakura crushing plant	<p>Construction to include:</p> <ol style="list-style-type: none"> <li>1. replacing the primary jaw crusher with a Trio CT2436 jaw crusher.</li> <li>2. replacing the secondary crusher with a 51" Symons cone crusher.</li> <li>3. replacing the existing screen within the secondary crusher; and</li> <li>4. repositioning the crushing circuit 30-50 metres east of its current location.</li> </ol>	Department of Environmental Regulation Application form: licence amendment, Monument Murchison Pty Ltd, Attachment 3A proposed activities, 18 May 2016.
	New heap leach facility crushing plant	<p>Construction to include:</p> <ol style="list-style-type: none"> <li>1. A fully refurbished 51" Symons cone crusher based on the existing secondary crushing circuit as basis of design with a design capacity of 1 million tonnes per annum.</li> <li>2. Installation between existing secondary crusher discharge conveyor and the existing agglomerator feed bin.</li> </ol>	Department of Environmental Regulation Application form: licence amendment, Monument Murchison Pty Ltd, Attachment 3A proposed activities, 18 May 2016.
Stage 2	Part of Heap Leach Facility	<p>Construction to include:</p> <ol style="list-style-type: none"> <li>1. Final construction of cells 3-7 as outlined in Schedule 1, Premises Maps, establishing bund walls on the uphill side of the heap leach and process pond areas.</li> </ol>	Monument Mining Burnakurra Heap Leach Project Front End Engineering Design, Como Engineers Pty Ltd Mechanical & Mineral Processing Engineers, January 2016.

- 1.1.6 The Licensee must not depart from the specifications in Column 2 and 3 for the infrastructure in each row of Table 1.1.1 except:
- a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
  - b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment; and
  - c) in accordance with all other conditions in this Licence.

## 1.2 Premises operation

- 1.2.1 The Licensee shall ensure that all above-ground pipelines containing tailings, processing liquors, effluent or saline water are either:
- (a) equipped with telemetry; or
  - (b) equipped with automatic cut-outs in the event of a pipe failure; or



- (c) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.2.2 The Licensee shall ensure that tailings, decant water, raw water and processing liquors are only discharged into the infrastructure detailed in Table 1.2.1.

<b>Table 1.2.1: Containment infrastructure</b>		
<b>Containment cell or dam number(s)</b>	<b>Material</b>	<b>Infrastructure requirements</b>
Lewis TSF	Tailings	In-pit TSF. Pit base and walls consists of low permeability granites.
Reward TSF	Tailings	In-pit TSF. Pit base and walls consists of low permeability granites.
Raw water holding tanks	Mine dewater, bore water and TSF decant water	Self bunded tanks.
Heap Leach Facility Pregnant solution pond	Pregnant leach solution	Lined with a geosynthetic clay underlay liner and 1.5mm thick HDPE liner.
Heap Leach Facility Barren solution pond	Barren leach solution	Lined with a geosynthetic clay underlay liner and 1.5mm thick HDPE liner.
Heap Leach Facility Stormwater pond	Stormwater	Lined with a 1.5mm thick HDPE liner.
Heap Leach Cells 1 - 7	Ore and Processing Liquors	Lined with a geosynthetic clay underlay liner and 1.5mm thick HDPE liner. 5.92 hectare facility

1.2.3 The Licensee shall:

- (a) manage Lewis TSF and Reward TSF such that a minimum top of embankment freeboard of 500mm is maintained; and
- (b) manage the heap leach facility pregnant solution pond, barren solution pond and stormwater pond such that a minimum top of embankment freeboard of 600 mm is maintained.

1.2.4 The Licensee shall:

- (a) undertake inspections as detailed in Table 1.2.2;
- (b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and
- (c) maintain a written record of all inspections undertaken.

<b>Table 1.2.2: Inspection of infrastructure</b>		
<b>Scope of inspection</b>	<b>Type of inspection</b>	<b>Frequency of inspection</b>
Tailings delivery pipelines	Visual integrity	Daily
Return water lines	Visual integrity	
Lewis TSF & Reward TSF embankment freeboards	Visual to confirm required freeboard capacity is available	
Dewatering effluent pipelines	Visual integrity	
Heap leach facility pipelines	Visual integrity	
Alliance/New Alliance pit Pit and North of Alliance 2 pit	Visual to confirm required freeboard capacity is available	
Heap leach facility process ponds and stormwater pond	Visual to confirm required freeboard capacity is available.	





## 2 Emissions

### 2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

### 2.2 Point source emissions to air

2.2.1 The Licensee shall ensure that where waste is emitted to air 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.

<b>Table 2.2.1: Emission points to air</b>			
<b>Emission point reference and location on Map of emission points</b>	<b>Emission Point</b>	<b>Emission point height (m)</b>	<b>Source, including any abatement</b>
A1	Off-gas released to air via a stack	8	Stack above the smelter furnace in the gold room.
A2	Off-gas released to air via a stack	18	Stack on the regeneration kiln located at rear of the gold room/stripping circuit.
A3	Off-gas released to air via a stack	8	Stack from the gas boiler in the stripping circuit.

### 2.3 Emissions to land

2.3.1 The Licensee shall ensure that where waste is emitted to land 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.

<b>Table 2.3.1: Emissions to land</b>		
<b>Emission point reference and location on Map of emission points</b>	<b>Description</b>	<b>Source including abatement</b>
L1	Treated wastewater to an infiltration/evaporation pond.	Wastewater from wash down bay and heavy vehicle workshop treated via an oil/water separator.

2.3.2 The Licensee shall not cause or allow emissions to land greater than the limits listed in Table 2.3.2.

<b>Table 2.3.2: Emission limits to land</b>			
<b>Emission point reference</b>	<b>Parameter</b>	<b>Limit (including units)</b>	<b>Averaging period</b>
L1	Total recoverable hydrocarbons	15 mg/L	Spot sample

### 2.4 Point source emissions to groundwater

2.4.1 The Licensee shall ensure that where waste is emitted to groundwater from the emission points in Table 2.4.1, 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 2.4.1: Emission points to groundwater</b>		
<b>Emission point reference (refer to Map of emission points in Schedule 1).</b>	<b>Description</b>	<b>Source including abatement</b>
DWD2	Discharge of dewatering effluent into North of Alliance (NoA) 2 pit	Pit water from dewatering of Alliance/New Alliance and North of Alliance (NoA) 7&8 pits
DWD7	Discharge of dewatering effluent into Alliance/New Alliance pit	Pit water from dewatering of North of Alliance (NoA) 2 and North of Alliance (NoA) 7&8 pits

### 3 Monitoring

#### 3.1 General monitoring

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

3.1.2 The Licensee shall ensure that quarterly monitoring is undertaken at least 45 days apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

#### 3.2 Monitoring of emissions to land

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

<b>Table 3.2.1: Monitoring of emissions to land</b>			
<b>Emission point reference</b>	<b>Parameter</b>	<b>Units</b>	<b>Frequency</b>
L1	Total Recoverable Hydrocarbons	mg/L	Quarterly

#### 3.3 Ambient environmental quality monitoring

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table prior to the operation of stage 1 of the works as outlined in condition 1.1.5.



<b>Table 3.3.1: Monitoring of baseline ambient groundwater quality</b>				
<b>Monitoring point reference and location</b>	<b>Parameter</b>	<b>Unit</b>	<b>Averaging period</b>	<b>Frequency</b>
<b>Heap leach facility monitoring bores</b> HLMB01 HLMB02 HLMB03 HLMB04 HLMB05 HLMB06	Total Dissolved Solids	mg/L	Spot sample	Once prior to operation of Stage 1 of the works.
	pH <sup>1</sup>	pH units		
	WAD cyanide	mg/L		
	Standing water level <sup>2</sup>	mbgL		
	Arsenic (As)	mg/L		
	Antimony (Sb)			
	Cadmium (Cr)			
	Cobalt (Co)			
	Copper (Cu)			
	Iron (Fe)			
Lead (Pb)				
Nickel (Pb)				
Selenium (Se)				
Zinc (Zn)				
Thallium (Tl)				

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

Note 2: To be determined prior to the collection of water samples for other parameters.

3.3.2 The Licensee shall undertake the monitoring in Table 3.3.2 according to the specifications in that table and record and investigate results that do not meet any limit specified.

<b>Table 3.3.2: Monitoring of ambient groundwater quality</b>					
<b>Monitoring point reference and location</b>	<b>Parameter</b>	<b>Limit</b>	<b>Unit</b>	<b>Averaging period</b>	<b>Frequency</b>
<b>TSF monitoring bores</b> BU23 BU24-A BU25-A BU26-A BU27 BU28	Total Dissolved Solids	5000	mg/L	Spot sample	Quarterly
	pH <sup>1</sup>	None specified	pH units		
	WAD cyanide	0.8	mg/L		
	Standing water level <sup>2</sup>	None specified	mbgL		
	Arsenic (As)	None specified	mg/L		
	Antimony (Sb)				
Cadmium (Cr)					
Cobalt (Co)					
Copper (Cu)					
<b>Heap leach facility monitoring bores</b> HLMB01 HLMB02 HLMB03 HLMB04 HLMB05 HLMB06	Iron (Fe)	None specified	mg/L		
	Lead (Pb)				
	Nickel (Pb)				
	Selenium (Se)				
	Zinc (Zn)				
	Thallium (Tl)				

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

Note 2: To be determined prior to the collection of water samples for other parameters.

### 3.4 Monitoring of point source emissions to groundwater

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table.



Table 3.4.1 Monitoring of point source emissions to groundwater				
Emission point	Parameter	Units	Averaging Period	Frequency
DWD2 DWD7	Volumetric flow rate	m <sup>3</sup> /day	Month	Continuous
	Total Dissolved Solids	mg/L	Spot sample	Quarterly
	Total Suspended Solids			
	pH <sup>1</sup>			

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

### 3.5 Process monitoring

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 Process monitoring					
Monitoring point reference	Process description	Parameter	Units	Frequency	Method
Each heap leach cell	Heap leaching of ore	Volumes of ore deposited on to heap leach cells	m <sup>3</sup>	Cumulative monthly total	None specified

## 4 Improvements

### 4.1 Improvement program

4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date specified.

Table 4.1.1: Improvement programme		
Improvement reference	Improvement	Date of completion
IR1	The Licensee shall provide to the CEO ore composition and/or mill feed composition data, processing rates of the carbon regeneration and gold smelting circuits to aid in determination of significance of air emissions from these circuits.	3 months from this amendment issue date

## 5 Information

### 5.1 Records

- 5.1.1 All information and records required by the Licence shall:
- (a) be legible;
  - (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
  - (c) except for records listed in 5.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
  - (d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
    - (i) off-site environmental effects; or
    - (ii) matters which affect the condition of the land or waters.



- 5.1.2 The Licensee must submit to the CEO an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of this Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.
- 5.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

**5.2 Reporting**

- 5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 60 calendar days after the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

<b>Table 5.2.1: Annual Environmental Report</b>		
<b>Condition or table (if relevant)</b>	<b>Parameter</b>	<b>Format or form<sup>1</sup></b>
-	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	Emissions to land monitoring results	
Table 3.3.1	Ambient Environmental monitoring results	
Table 3.4.1	Groundwater monitoring results	
Table 3.5.1	Process monitoring results	
5.1.2	Compliance	AACR
5.1.3	Complaints summary	None specified

Note 1: Form is available on the Department’s website.

- 5.2.2 The Licensee shall ensure that the Annual Environmental Report also contains an assessment of the information contained within the report against previous monitoring results and Licence limits.

**5.3 Notification**

- 5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

<b>Table 5.3.1: Notification requirements</b>			
<b>Condition or table (if relevant)</b>	<b>Parameter</b>	<b>Notification requirement<sup>1</sup></b>	<b>Format or form<sup>2</sup></b>
2.1.1 and 3.3.1	Breach of any limit specified in the Licence	Part A: As soon as practicable, but no later than 5pm of the next usual working day.  Part B: As soon as practicable	N1
3.1.5	Calibration report	As soon as practicable.	None specified
-	Production ceasing for an unspecified period of time	As soon as practicable after the decision has been made.	None Specified
-	Production recommencing	At least 28 days prior to production recommencing.	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act

Note 2: Forms are in Schedule 2



- 5.3.2 The Licensee must submit a compliance document to the CEO, following the construction of each stage of works outlined in Table 1.1.1 and prior to commissioning of the same.
- 5.3.3 The compliance document shall:
- (a) certify that each of the stage of works were constructed in accordance with the conditions of the Licence; and
  - (b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.
- 5.3.4 The compliance document for Stage 1 of the works shall include the baseline groundwater monitoring data required by condition 3.3.1.

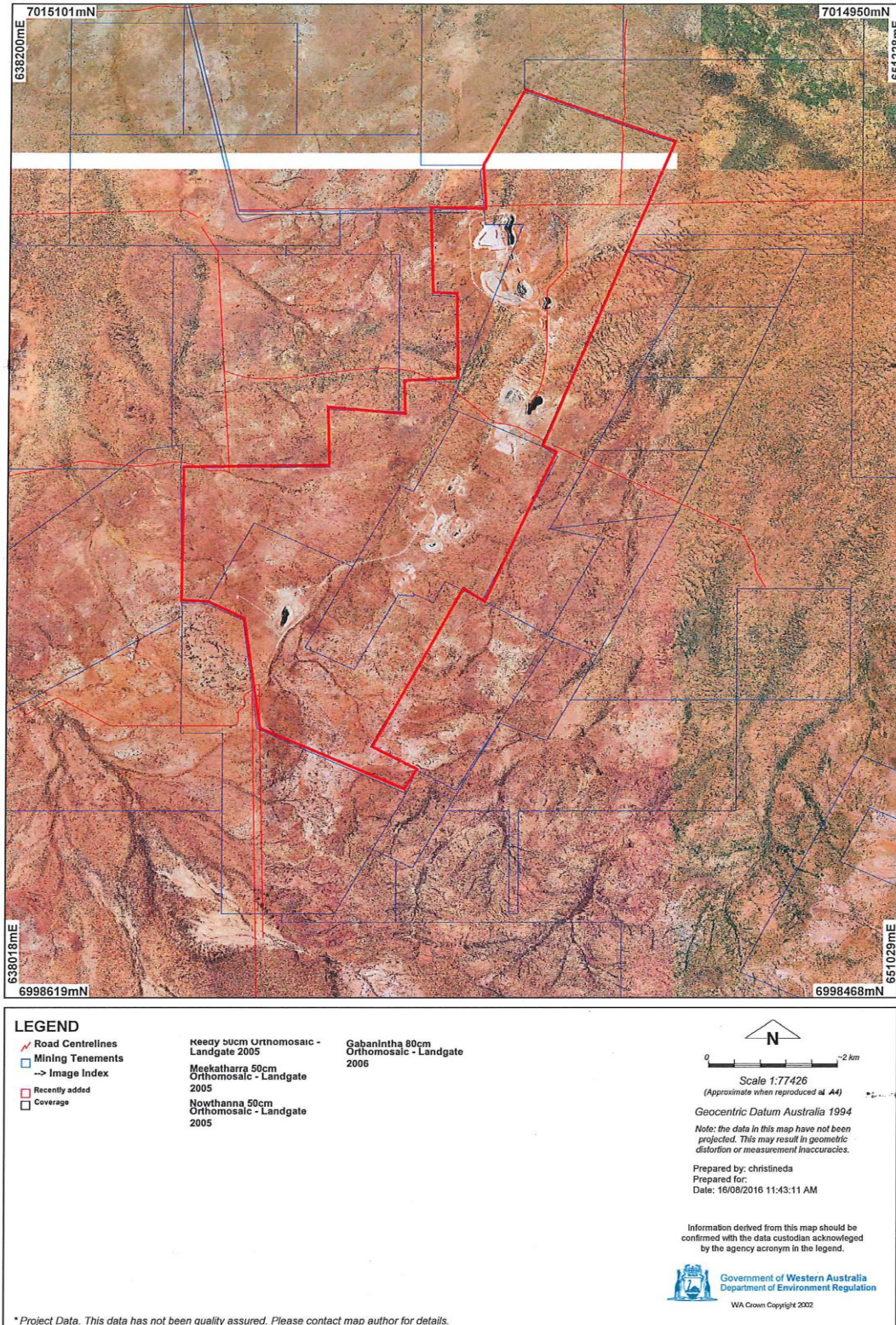




# Schedule 1: Maps

## Premises maps

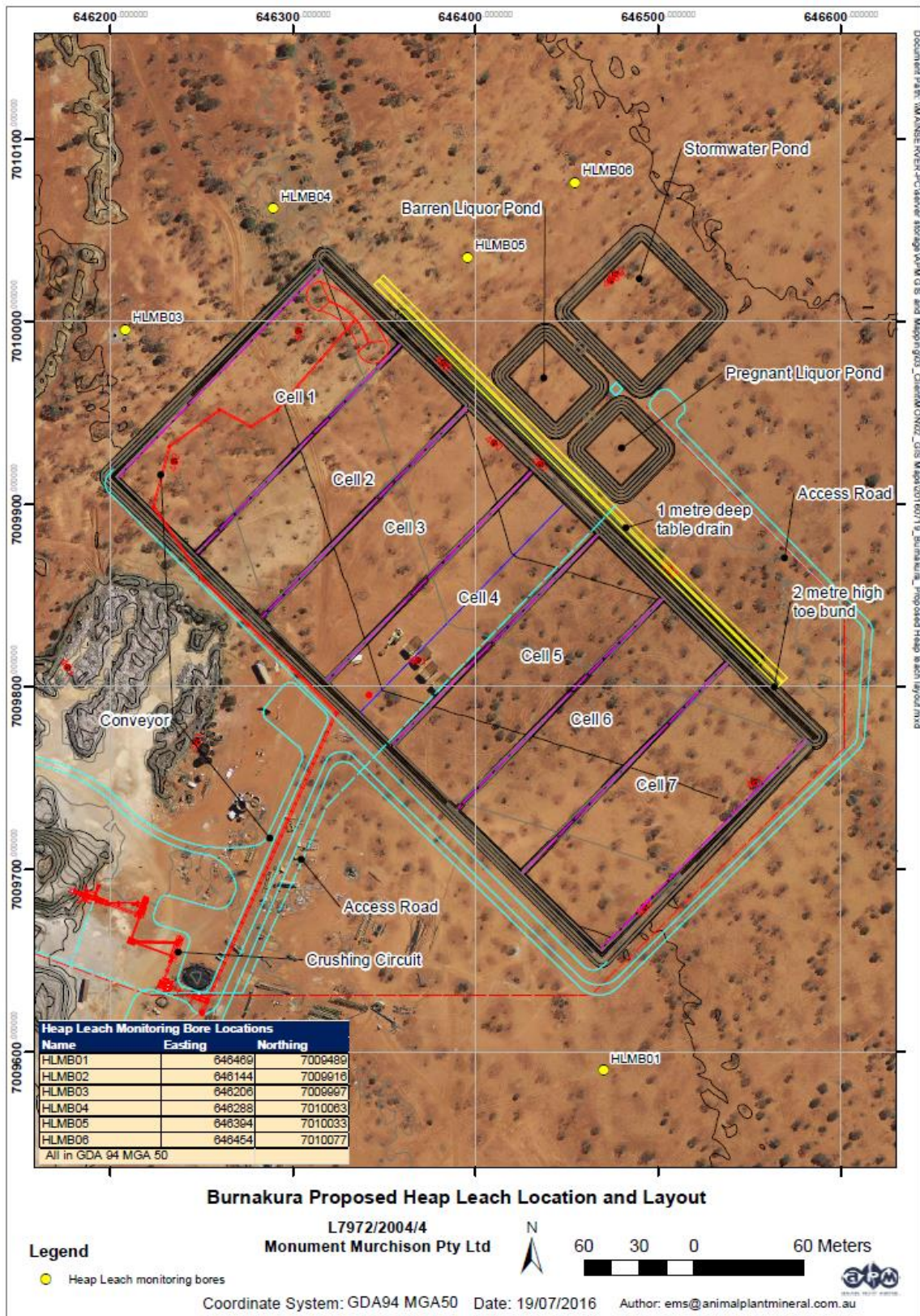
The Premises is shown in the map below. The red line depicts the Premises boundary.







The layout of the heap leach facility as defined in Table 1.1.1 is shown below.

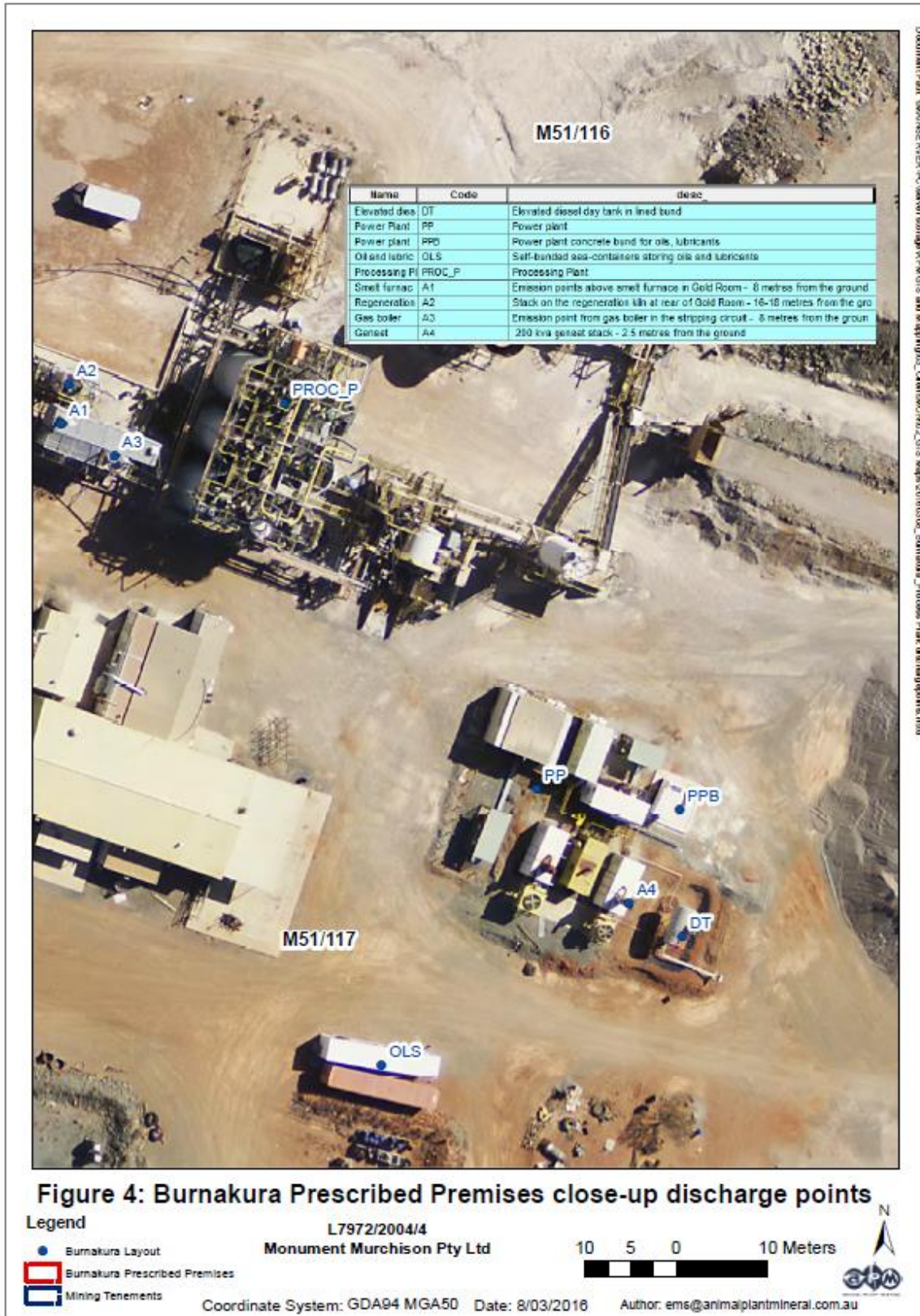






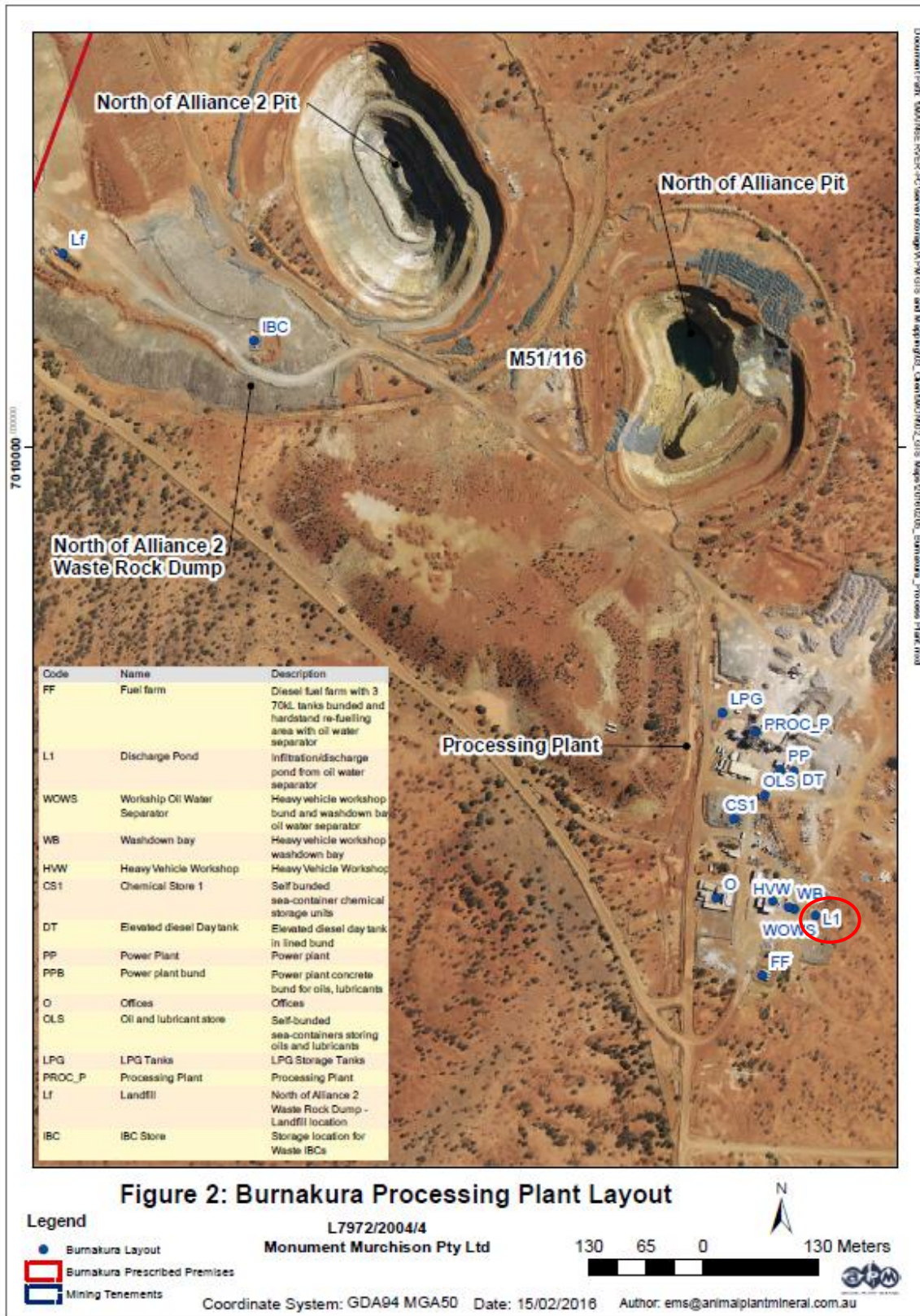
### Maps of emission points

The locations of the air emission points defined in Tables 2.2.1 are shown below.





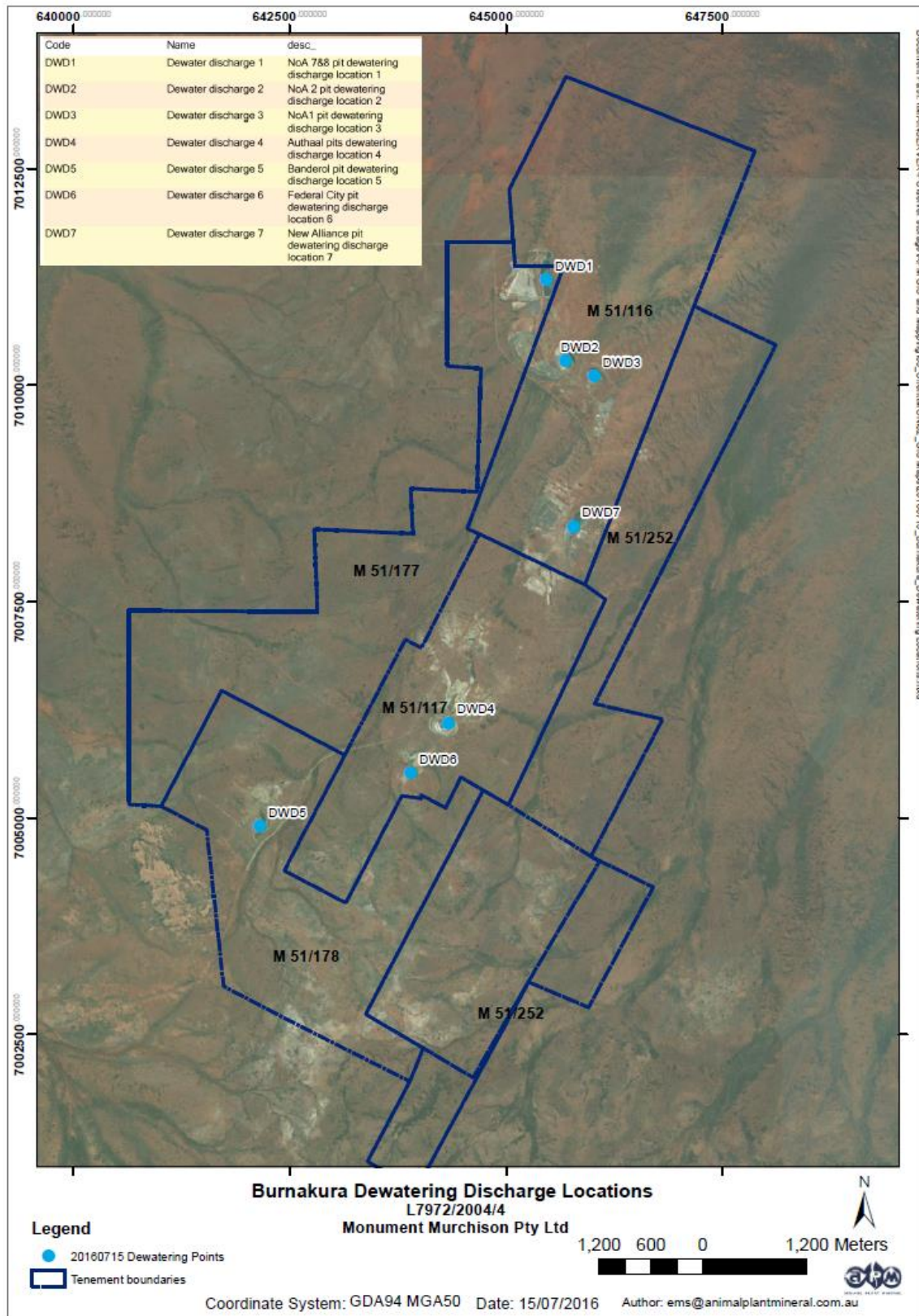
The locations of the land emission points defined in Tables 2.3.1 are shown below.







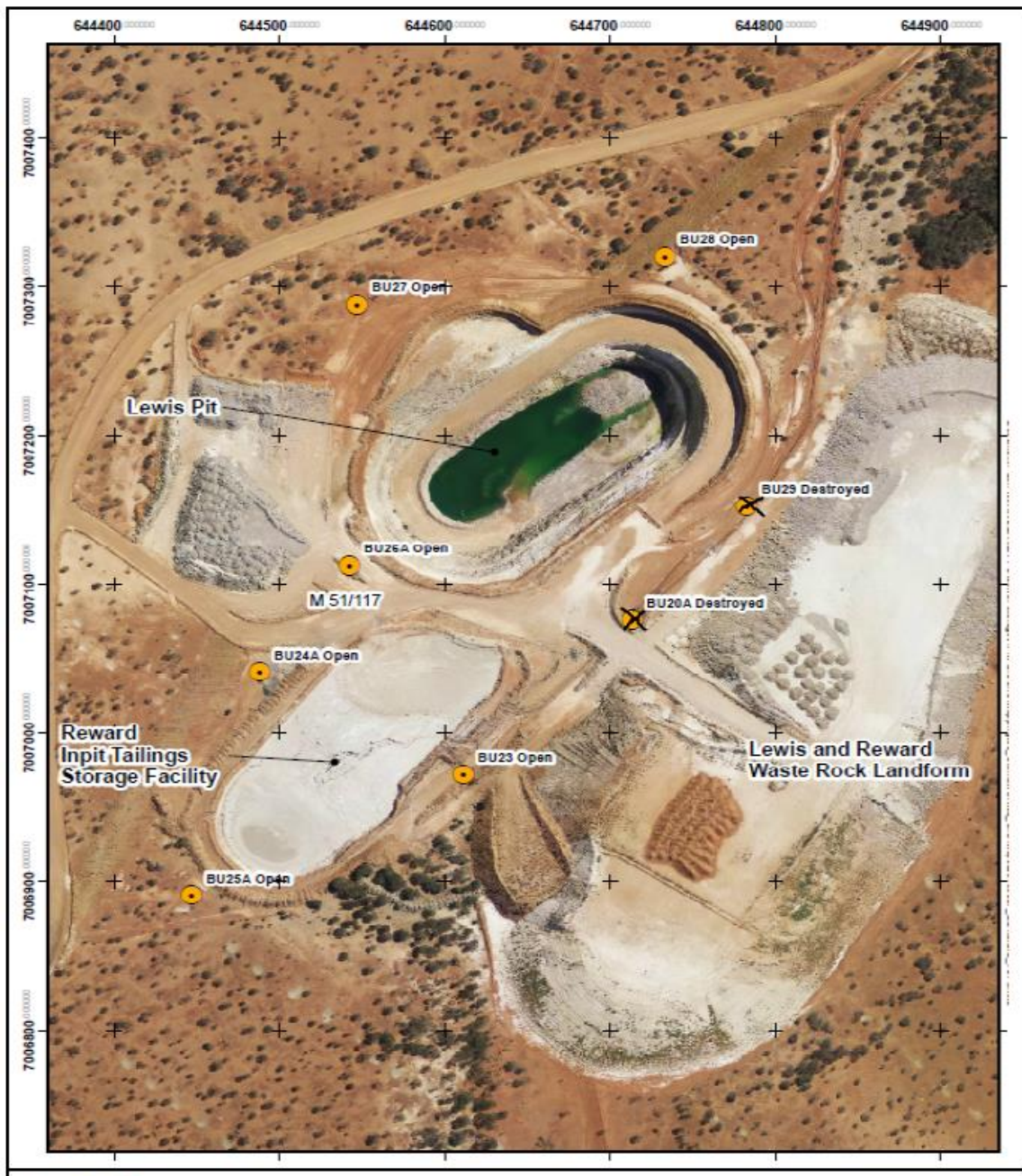
The locations of the groundwater emission points defined in Table 2.4.1 are shown below.





### Map of monitoring locations

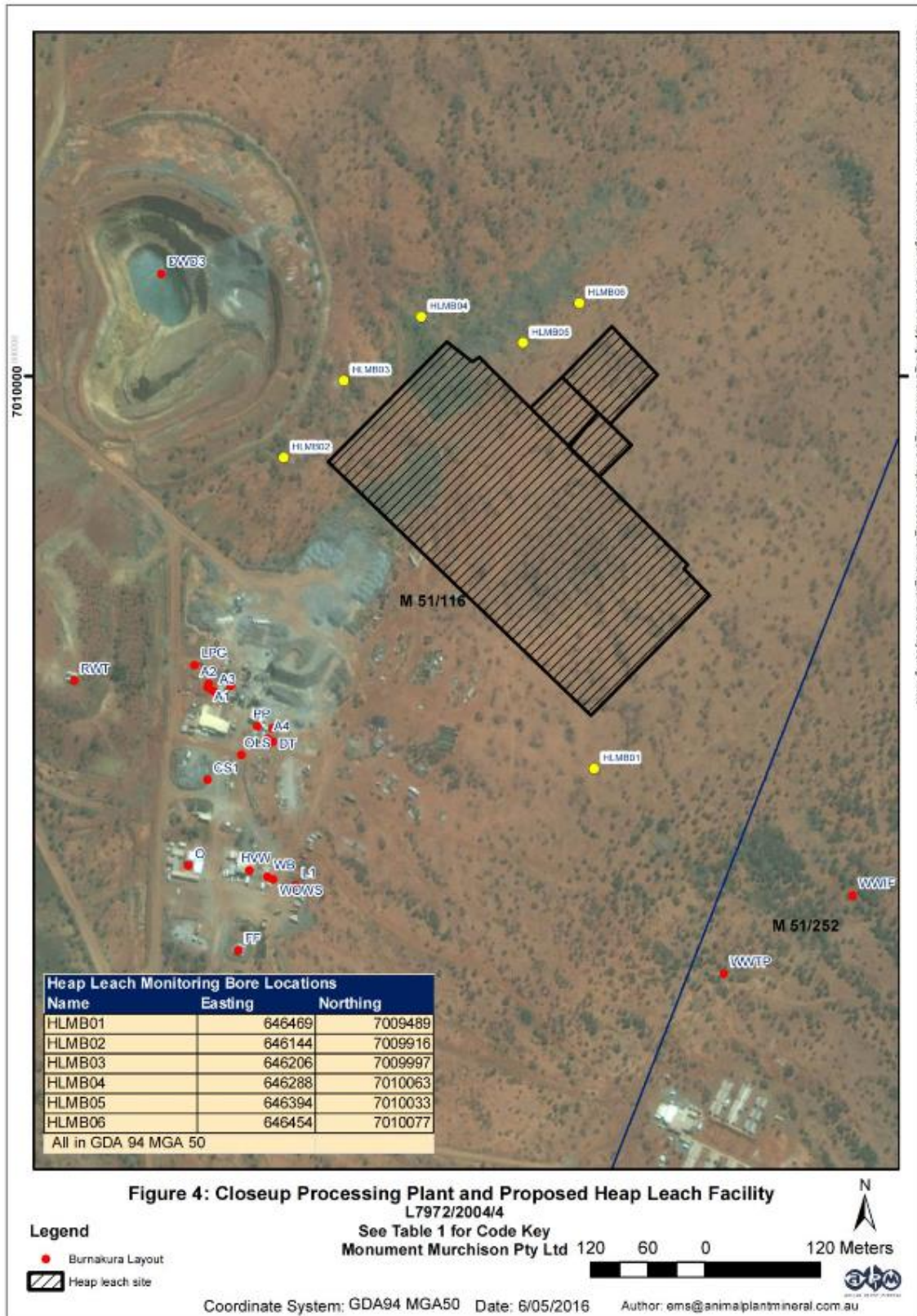
The locations of the monitoring points defined in Table 3.3.1 are shown below.







The locations of the monitoring points defined in Table 3.3.1 are shown below





## Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

Licence: L7972/2004/2                      Licensee: Monument Gold Operations Pty Ltd  
Form: N1    Date of breach:

### Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.  
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

### Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

### Notification requirements for the breach of a limit

Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

### Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Monument Gold Operations Pty Ltd	
Date	



# Decision Document

## *Environmental Protection Act 1986, Part V*

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**Proponent:** Monument Murchison Pty Ltd

**Licence:** L7972/2004/4

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**Registered office:** Level 2, 1 Walker Avenue  
WEST PERTH WA 6005

**ACN:** 167 323 855

**Premises address:** Burnakura Gold Project  
M51/116, M51/117, M51/178 and M51/177  
Culculli Pastoral Station  
CUE WA 6640

**Issue date:** Thursday, 19 September 2013

**Commencement date:** Tuesday, 24 September 2013

**Expiry date:** Saturday, 23 September 2028

### Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER) has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Christine Pustkuchen  
Licensing Officer

Decision Document authorised by: Alana Kidd  
Delegated Officer



## Contents

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## 1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986*. Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

## 2 Administrative summary

Administrative details		
Application type	Works Approval	<input type="checkbox"/>
	New Licence	<input type="checkbox"/>
	Licence amendment	<input checked="" type="checkbox"/>
	Works Approval amendment	<input type="checkbox"/>
Activities that cause the premises to become prescribed premises	<b>Category number(s)</b>	<b>Assessed design capacity</b>
	5 – Processing or beneficiation of ore.	750 000 tonnes per annual period.
	6 – Mine dewatering.	900 000 tonnes per annual period.
	7 – Vat or in situ leaching of metal.	500 000 tonnes per annual period.
Application verified	Date: May 2016	
Application fee paid	Date: N/A	
Works Approval has been complied with	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Compliance Certificate received	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Commercial-in-confidence claim	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> Referral decision No:





<i>Environmental Protection Act 1986?</i>		Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i> )?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Department of Water consulted Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the Premises within an Environmental Protection Policy (EPP) Area Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes include details of which EPP(s) here.		
Are the Premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes, include details here, e.g. Site is subject to SO <sub>2</sub> requirements of Kwinana EPP.		

### 3 Executive summary of proposal and assessment

Monument Gold Operations Pty Ltd (the Licensee) operates the Burnakura Gold Project located approximately 45 kilometres (km) south of Meekatharra in the Shire of Cue. Currently the site is in Care and Maintenance (C&M) and has been since April 2013. The Licensee is currently undergoing feasibility assessment for a return to operations.

Current infrastructure onsite includes:

- Workshop, offices and wash down bay;
- Bunded hydrocarbon storage area;
- Accommodation Camp for 100 persons with WWTP and irrigation field (located outside of the prescribed premises boundary – registration application being processed);
- Mill to treat 500 000 tonnes per year – Carbon In Leach (CIL) process;
- In pit Tailings Storage Facility (TSF) at Reward Pit and a second In pit TSF at Lewis pit, however no tailings have been deposited in Lewis Pit yet;
- Power - Diesel generating units initially to 1 MW (below prescribed threshold); and
- Class II Putrescible Landfill. Trench facility located on top of the NoA2 waste rock dump and takes inert, domestic and putrescible waste less than 20 tonnes per annum (pa) (below threshold for Category 89).

The Licensee conducted a review of Prescribed Premises Licence L7972/2004/4 during August 2015 and as a result has requested a licence amendment for the following:

- Increase in Total Dissolved Solids (TDS) from 3,100 mg/L to 4,900 mg/L (added as 5,000 mg/L limit on licence) for groundwater monitoring bores surrounding the TSF;
- The removal of two monitoring bores (surrounding the TSF) from the licence as these have been destroyed by previous mining activities (in 2011). No replacements are proposed; and
- Revise the sampling method required in the licence for pH to allow for in-situ testing.

On 18 May 2016 the Licensee submitted another amendment to L7972/2004/4 which is being amalgamated with the previous amendment received (outlined above). The Licensee has requesting the following:

- The Transfer of the licence from Monument Gold Operations Pty Ltd to Monument Murchison Pty Ltd who is the current holder of the premises mining tenements. Both companies are Australian subsidiaries of the owner of the Project, Monument Mining Limited (Canadian based company); however Monument Murchison Pty Ltd is the tenement holder and therefore should be the licence holder.



- The addition of Category 7 – Vat or In-situ leaching of metal. The Licensee is seeking approval to construct and operate a heap leach facility which consists of 7 cells and three ponds (pregnant solution pond, barren solution pond and stormwater pond). The facility will be designed to treat 500 000 tonnes pa of feed for a period of 2 years.
- Approval to refurbish and reinstall the current Burnakura crushing plant. This will include replacing the primary jaw crusher with a Trio CT2436 jaw crusher, replacing the secondary crusher with a 51” Symons cone crusher, replacing the existing screen within the secondary crusher and repositioning the crushing circuit 30-50 metres east of its current location.
- Approval to construct and operate a new crushing plant for the heap leach facility which will be added to the existing crushing circuit at Burnakura. The additional tertiary crushing circuit will be installed using the existing secondary crushing circuit as a basis of design including a fully refurbished 51” Symons cone crusher as the tertiary crusher. Maximum throughput for the crusher is 1 million tonnes per annum. The expected nominal throughput is 750 000 tonnes pa.
- An increase in approved throughput for category 5 on the licence from 500 000 tonnes pa period to 750 000 tonnes per annual period to capture the above mentioned changes to the crushing circuits.
- The addition of Category 6 – Mine dewatering to the licence with an approved throughput of 900 000 tonnes pa. The Licensee is seeking approval to operate existing dewatering infrastructure to undertake dewatering of Alliance/New Alliance, NoA2 and NoA7&8 pits as required to other pits with available storage capacity on Mining Leases M51/116, M51/117, M51/177 and M51/178 (Category 6 was not on previous licence).
- The expansion of the prescribed premises boundary to include mining tenements M51/178 & M51/177 as these tenements contain pits where water from dewatering activities will be disposed of.

The above requests form the basis of this assessment. Other changes have also been made to update the licence from an old format licence to version 2.9 of the DER licence template and to reflect Departmental reform as published on DER’s website under “*Administrative changes implemented within the Department of Environment Regulation*” [www.der.wa.gov.au](http://www.der.wa.gov.au) (i.e. removal of targets etc.). Where conditions have been added or removed in the existing Licence these have been justified in Section 4.





## 4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

<b>DECISION TABLE</b>			
<b>Works Approval / Licence section</b>	<b>Condition number W = Works Approval L= Licence</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
<b>Transfer of licence</b>	N/A	The Licensee wishes to change the company name that holds this licence (from Monument Gold Operations Pty Ltd to Monument Murchison Pty Ltd). Both companies are Australian subsidiaries of the owner of the Project, Monument Mining Limited (Canadian based company); however Monument Murchison Pty Ltd is now the tenement holder and therefore should be the licence holder. Copies of the tenement registers have been provided as part of the licence amendment application which proves the legal occupier of the sites mining tenements is Monument Murchison Pty Ltd.	Application supporting documentation
<b>General conditions</b>	L1.1.5 & L1.1.6	Conditions have been added to the licence to allow for the construction of the heap leach facility, processing plant and dewatering infrastructure in accordance with the details supplied in the application form. The Licensee is proposing to construct the heap leach facility, new processing plant and dewatering infrastructure in stages. In particular the Licensee wishes to operate cells 1 and 2 of the heap leach facility prior to the construction of cells 3-7. Conditions 1.1.5 & 1.1.6 outline what infrastructure is to be constructed and at what stage (stage 1 or 2).	Application supporting documentation
<b>Premises operation</b>	L1.2.1, L1.2.2, L1.2.3, L1.2.4	Premises operation conditions have been added to the licence for the TSF, heap leach facility and the dewatering activities onsite. Justification for the addition of conditions in this section is outlined within Appendix A – Emissions to land including monitoring.  No additional premises operation conditions have been added to the licence as a result of the increase in approved throughput for Category 5 as a result of the construction and operation of the new and refurbished processing plants.	Application supporting documentation
<b>Emissions general</b>	L2.1.1	A limit will be set through condition 2.3.2 of the licence and therefore a condition regarding recording and investigation of exceedances of limits has been included.	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Point source emissions to air including monitoring	L2.2.1	Air emissions are generated from the carbon regeneration and gold smelting processes onsite; historically these emissions have not been identified on the licence. As a result, air emission points (stacks A1, A2 and A3) have been added to the licence through conditions L2.2.1 and the map in Schedule 1. There is limited information available regarding these emissions as they have not been monitored or captured in the licence before. Therefore an improvement condition has been added to the licence (condition 4.1.1) so that information is provided to DER to determine the significance of these emissions.	Application supporting documentation
Point source emissions to surface water including monitoring	N/A	There is no point source emissions to surface water associated with the premises. No specified conditions relating to point source emissions to surface water or the monitoring of such emissions are required to be added to the licence as part of this amendment.	N/A
Point source emissions to groundwater including monitoring	L2.4.1 & L3.4.1	See Appendix B for DER's assessment and decision making.	Application supporting documentation
Emissions to land including monitoring	L2.3.1 L2.3.2 L3.2.1	<p><b>Point source emissions to land</b></p> <p>Original condition 1 relates to the treatment of hydrocarbon contaminated wastewater from the wash-down bay, prior to water being disposed of into an evaporation/ infiltration pond. This condition has been transferred to the new licence and is now captured in condition 2.3.1 (emission point L1).</p> <p><u>Emission Description</u></p> <p><i>Emission:</i> Wash water from wash-down bay and heavy vehicle workshop contaminated with hydrocarbons and chemicals discharged to an infiltration pond.</p> <p><i>Impact:</i> Contamination of surrounding land and groundwater.</p> <p><i>Controls:</i> Wash water from the wash-down bay (lined) is directed to an oily water separator prior to discharge. The depth to groundwater in the area is approximately 12-</p>	<p>Application supporting documentation</p> <p><i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i></p>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>30 metres below ground level (mbgl).</p> <p><u>Risk Assessment</u>  <i>Consequence:</i> Minor  <i>Likelihood:</i> Unlikely  <i>Risk Rating:</i> Moderate</p> <p><u>Regulatory Controls</u>            The risk of discharge of contaminated wash water to the environment is unlikely to occur if the oily water separator is functioning efficiently and is regularly maintained. To ensure that it is operating correctly a monitoring requirement (condition 3.2.1) has been added to the licence to ensure the wastewater is sampled regularly for total recoverable hydrocarbons (TRH). A limit of 15 mg/L for TRH has been included on the licence (condition 2.3.2) to ensure TRH levels within the discharged water is kept to acceptable levels.</p> <p><u>Residual Risk</u>  <i>Consequence:</i> Minor  <i>Likelihood:</i> Rare  <i>Residual Risk Rating:</i> Low</p> <p><b>Fugitive emissions to land</b>            See Ambient Environmental Monitoring section and Appendix A for DER's assessment and decision making.</p>	
<b>Fugitive emissions</b>	N/A	<p><u>Emission Description</u>  <i>Emission:</i> Fugitive dust from crushing and the transfer of materials from the existing processing plant and the new heap leach facility processing plant, from the TSF and vehicle movement.</p>	N/A General provisions of the <i>Environmental Protection Act</i>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p><i>Impact:</i> Fugitive dust can impact human health and amenity. Elevated particulate concentrations in ambient air can impact on native vegetation by smothering leaves.</p> <p><i>Controls:</i> The Licensee has committed to the following:</p> <ul style="list-style-type: none"> <li>• Water carts are employed to reduce dust emissions from vehicle movements and stockpiles; and</li> <li>• Water sprays are located at transition points on the crushing circuit to minimise dust emissions.</li> </ul> <p>The closest sensitive land use is Polell Pastoral station homestead approximately 15km east of the premises.</p> <p>No Declared Rare Flora (DRF), Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) have been reported in the area (within a 2km radius).</p> <p><u>Risk Assessment</u>  <i>Consequence:</i> Insignificant  <i>Likelihood:</i> Unlikely  <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u>            This risk is Low therefore no conditions for fugitive dust are required to be added to the licence. The Provisions of the <i>Environmental Protection Act 1986</i> and the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> apply.</p> <p><u>Residual Risk</u>  <i>Consequence:</i> Insignificant  <i>Likelihood:</i> Unlikely  <i>Residual Risk Rating:</i> Low</p>	<p>1986.</p> <p><i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i></p>
<b>Odour</b>	N/A	There are no odour emissions associated with the premises. No specified conditions relating to odour emissions or the monitoring of such emissions are required to be	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		added to the licence as part of this amendment.	
Noise	N/A	<p><u>Emission Description</u>  <i>Emission:</i> Noise generated by processing areas and machinery/vehicle movement  <i>Impact:</i> Noise can reduce the amenity value for nearby land-users.  <i>Controls:</i> Separation distance - The closest sensitive land use is Polell Pastoral station homestead approximately 15km east of the premises. Current land use in the area is mining and pastoral activities.</p> <p><u>Risk Assessment</u>  <i>Consequence:</i> Insignificant  <i>Likelihood:</i> Unlikely  <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u>            The risk of noise is Low. No noise conditions are required to be added to the Licence. The <i>Environmental Protection (Noise) Regulations 1997</i> will apply.</p> <p><u>Residual Risk</u>  <i>Consequence:</i> Insignificant  <i>Likelihood:</i> Unlikely  <i>Residual Risk Rating:</i> Low</p>	<p>Application supporting documentation</p> <p><i>Environmental Protection (Noise) Regulations 1997</i></p>
Monitoring general	L3.1.1, L3.1.2, L3.1.3, L3.1.4	<p>As monitoring conditions exist on the original licence and are being transferred to the new format licence, conditions relating to the appropriate monitoring methods have been added to the licence. These replace part of Condition 2 Table 1 requirements in the original licence and are required to ensure sampling and analysis are conducted to acceptable and comparable standards.</p> <p>L3.1.1 ensures sampling is conducted in accordance with applicable AS/NZ standards and submitted to a NATA accredited laboratory.</p> <p>L3.1.2 ensures sampling is undertaken with appropriate time intervals between</p>	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>samples. L3.1.3 &amp; 3.1.4 sets requirements for calibration of monitoring equipment.</p>	
<b>Monitoring of inputs and outputs</b>	N/A	No conditions relating to the monitoring of inputs and outputs are required to be added to the licence as a result of this amendment.	N/A
<b>Ambient quality monitoring</b>	3.3.2	<p>The current licence has conditions relating to the monitoring of groundwater quality from bores surrounding the in-pit TSF onsite (Reward Pit). These conditions (previous condition 2 table 1 and condition 3(a) Table 2) have been replaced by new condition 3.3.2.</p> <p><b>Monitoring bores</b> The Licensee has requested that bores BU20 and BU29 be removed from the licence as these were destroyed by mining operations during the 2011-2012 cutback of the Lewis open pit. These bores are located to the east of the Lewis pit (which has been approved as a TSF, but is currently empty) and Reward in-pit TSF. Six groundwater monitoring bores remain operational to the north, west and south of the TSF (BU23, BU24-A, BU25-A, BU26-A, BU27, BU28).</p> <p>The Licensee has stated within their application that groundwater flow from the TSF area has been found to flow towards the saline playa at Lake Annean approximately 12-13 km to the north/north west. This means that Lewis pit, which is located to the north of the Reward pit TSF, is acting as a groundwater sink with groundwater flowing towards it. The two monitoring bores that were destroyed are to the east of Lewis pit were therefore unlikely to have been useful in detecting possible pollution plume from the TSF due to groundwater flow direction.</p> <p>Seepage flow from the pits is low due to the low permeability of the surrounding bedrock and hydraulic conductivity of the tailings being <math>10^{-7}</math> to <math>10^{-8}</math> m/s which blanket the pit floor. A review of data provided to DER in historical (pre damage) AER reports for these two bores indicates the groundwater quality to be generally below the</p>	<p>Application supporting documentation.</p> <p><i>The Contaminated Sites Ground and Surface water chemical screening guidelines</i>, Department of Health, 2014.</p> <p>NWQMS - <i>Australian Water Quality Guidelines for Fresh and Marine Water Quality</i>, 2000.</p>



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>previous licence targets. These bores were destroyed in 2011-2012 so there is no recent groundwater quality data for these two locations. Recent data for the other bores indicates that quality appears satisfactory for most parameters with the exception of TDS.</p> <p>The Licensee has sought advice from a hydrologist consultant who advises that the remaining monitoring bores will be adequate to monitor and detect any significant changes within groundwater quality parameters due to the direction of groundwater flow (north and north-west towards existing open monitoring bores).</p> <p>Two bores (BU25 A and BU23) remain upstream of the in pit TSF and these should be sufficient to compare to the four monitoring bores downstream of the TSF. Based on the above it has been determined that replacement bores are unnecessary and that the remaining bores are sufficient to monitor groundwater quality around the TSF. Groundwater quality will continue to be assessed via AERs also.</p> <p><b>pH monitoring</b> The Licensee has requested that the licence be amended to allow for in-situ monitoring of pH. Groundwater samples taken from monitoring bores are not able to comply with AS 5667.1:1998 standard holding times for pH sample analysis, due to the remote nature of the site. Samples must be taken and couriered to the NATA accredited laboratory in Perth which takes approximately 24 hours.</p> <p>Condition 3.3.2 has been updated to allow for infield non-NATA accredited analysis of pH.</p> <p><b>Groundwater quality targets</b> The Licensee has requested that the target for TDS is increased from 3100mg/L to 4900 mg/L as recent groundwater monitoring data has indicated exceedances of this target at monitoring bore BU23 (all other bores are below target). This request has been addressed in Appendix A.</p>	





<b>DECISION TABLE</b>			
<b>Works Approval / Licence section</b>	<b>Condition number W = Works Approval L= Licence</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
		<p><b>Metals and metalloids</b></p> <p>DER has increased the parameters within Table 3.3.2 to include the following metals and metalloids; antimony, cadmium, cobalt, iron, nickel, selenium, zinc and thallium. This suite has been determined by the Department's hydrogeologist as the most adequate suite for gold mines to provide data from the monitoring programme to indicate any seepage and effects it may be having on the surrounding environment.</p>	
<b>Meteorological monitoring</b>	N/A	No conditions relating to meteorological monitoring are required to be added to the licence as a result of this amendment.	
<b>Process monitoring</b>	L3.5.1	Condition 3.5.1 has been added to the licence to require monitoring of the volumes of ore deposited in to each heap leach cell. This will allow the Licensee to monitor how much ore is processed through the heap leach facility to ensure the approved threshold of 500 000 tonnes per annual period (Category 7) is not exceeded.	Application supporting documentation
<b>Improvements</b>	L4.1.1	An improvement condition has been added to obtain information regarding air emissions on site. See air emissions section for more information.	N/A
<b>Information / Reporting</b>	L5.1.1 L5.1.2 L5.1.3 L5.2.1 L5.3.1 L5.3.2 L5.3.3	<p>L5.1.1 requires information and records to be legible and sets requirements for retaining records.</p> <p>L5.1.2 replaces condition 5 on original licence – it requires completion of an Annual Audit Compliance report (AACR).</p> <p>L5.1.3 requires implementation of a complaints management system.</p> <p>L5.2.1 &amp; L5.2.2 replaces condition 4(a) and 4(b) on the original licence - it requires submission of an Annual Environmental Report which includes the AACR, monitoring results with an assessment against previous results and a complaints summary.</p> <p>L5.3.1 requires notification times for any breach of a Licence limit and for intention for the site to cease or recommence operations.</p> <p>The Licensee is proposing to construct the heap leach facility, new processing plant and dewatering infrastructure in stages. In particular the Licensee wishes to operate</p>	Application supporting documentation



<b>DECISION TABLE</b>			
<b>Works Approval / Licence section</b>	<b>Condition number W = Works Approval L= Licence</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
		cells 1 and 2 of the heap leach facility prior to the construction of cells 3-7. Licence conditions 5.3.2 & 5.3.3 have been added to the licence to ensure a compliance certificate (stating the works have been constructed in accordance with the information provided to DER) is submitted to DER after each stage of works is complete and prior to the operation of that stage.	
<b>Licence Duration</b>	N/A	The licence expiry date has been extended to 23 September 2028 in accordance with DERs <i>Guidance statement: Licence Duration</i> . This decision has taken into account the expiry date of the sites mining tenements (which expiry on 12 October 2029).	N/A



## 5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
28/04/2016	Proponent sent a copy of draft instrument (first amendment)	<p>Monument would prefer the licence holder be Monument Murchison Pty Ltd (ACN 167 323 855) rather than Monument Gold Operations Pty Ltd. Both are Australian subsidiaries of the owner of the Project, Monument Mining Limited (Canadian based company), however Monument Murchison Pty Ltd is the tenement holder and as such would be better placed to be the licence holder.</p> <p>As the 21 day consultation waiver is nearly exhausted, it won't be submitted.</p> <p>On Page 5 of 9 of the licence – the definition of licence says L7972/2004/2 – it should be L7972/2004/4.</p> <p>The footer on the draft amended licence including the AACR proforma has L7972/2004/2 – should be L7972/2004/4.</p>	<p>Minor comments received. Licence was updated.</p> <p>Second amendment was submitted before this amendment was issued and so the two amendments were amalgamated.</p>
15/09/2016	Proponent sent a copy of draft instrument (amalgumated amendment)	Update to detail about power generation on site.	Minor comments received. Licence was updated



## 6 Risk Assessment

*Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management*

**Table 1: Emissions Risk Matrix**

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High



## Appendix A

### Emissions to Land

#### ***Tailings Storage Facility***

##### ***Emission Risk Assessment – Normal Operation of TSF***

Groundwater generally occurs near the base of weathering in alluvial and colluvial material and in fractured rock aquifers in the mineralized zones. Permeability is typically low in the area. Salinity of water varies across the project area with TDS levels ranging from 800 to 3500 mg/L. Standing water levels range in depth from 12 to 30 metres. The site is part of Culculli Pastoral Station and therefore the groundwater in the area is used for stock watering and process water for the surrounding mine sites. The nearest active groundwater licences close to Burnakura are two stock watering bores located approximately 10km south west of Lewis Pit and 15km North west towards Lake Annean.

#### Emission Description

*Emission:* Deposition of tailings in the in-pit TSF. Seepage of tailings pore water potentially containing elevated elements of environmental concern and/or in excess of known baseline concentrations.

*Impact:* Seepage from the TSF entering the groundwater system causing mounding and potential groundwater contamination. Potential to increase groundwater salinity and affect quality of stock bores.

*Controls:* The Licensee has stated within their application documents that:

- Seepage flow from the pits is expected to be low due to the low permeability of the surrounding bedrock and hydraulic conductivity of the tailings being  $10^{-7}$  to  $10^{-8}$  m/s which will blanket the pit floor;
- In pit TSF so there are no seepage recovery measures in place as the regional flow is to the north – west and potential flows are expected to be intercepted by the alliance/new alliance pits approximately 1 km to the north of the two TSFs. It is planned that a dewatering bore field be constructed if required to recover excess groundwater, so far this has not been required; and
- Quarterly groundwater monitoring is carried out from six surrounding monitoring bores – 2 upstream and 4 downstream.

#### Risk Assessment

*Consequence:* Minor

*Likelihood:* Possible

*Risk Rating:* Moderate

#### Regulatory controls

Groundwater quality targets (in original condition 3 (c) table 2) have been removed from the licence. The removal of reference to targets is in accordance with Departmental reform as published on DER's website under "*Administrative changes implemented within the Department of Environment Regulation*" [www.der.wa.gov.au](http://www.der.wa.gov.au).

As the risk rating is moderate it has been deemed necessary to place limits on the licence to prevent contamination of groundwater (condition 3.3.2).

- A limit of 0.8 mg/L for WAD cyanide has been added to the licence in accordance with the Department of Health's guideline *The Contaminated Sites Ground and Surface water chemical screening guidelines*, (DoH, 2014).
- A limit of 5000 mg/L for total dissolved solids has been added to the licence. This is the upper limit tolerable to beef cattle (as groundwater use in the area includes stock watering).



This is in accordance with the *National Water Quality Management Strategy (NWQMS) – Australian Water Quality Guidelines for Fresh and Marine Water Quality, 2000*.

Condition L5.3.1 will also require the Licensee to notify DER in the event of a breach of any limit.

Conditions L5.2.1 and L5.2.2 require the ambient groundwater quality monitoring results to be reported in the Annual Environmental Report along with an assessment and comparison against previous years data, which will also allow DER to review and see trends in these parameters overtime.

Residual Risk

*Consequence:* Insignificant

*Likelihood:* Possible

*Residual Risk Rating:* Low

**Operation – Emergency Operation of TSF**

Emission Description

*Emission:* Failure of either tailings delivery pipelines from the Process Plant to the in-pit TSFs releasing tailings to land or overflow from the in-pit TSF following a one in one hundred 72 hour rainfall event.

*Impact:* Contamination of soil, surface water/drainage lines and soil contamination with tailings solids containing heavy metals and cyanide. Potential impact to avifauna from cyanide ingestion if liquor spills are not cleaned up as they occur. Destruction of vegetation by smothering from tailings overflow.

*Controls:* The Licensee has committed to the following:

- The design of the in-pit TSFs caters for deposition of tailings to a maximum capacity of 1 m below ground level within the pits. This provides a freeboard of at least 1 m to ensure significant rain events ( up to 1:100 year ARI event) are contained within the TSFs and to avoid overtopping;
- All pipelines are banded in trenches and there are sumps at regular intervals to contain and assist with recovery of tailings during pipeline leaks; and
- The TSFs are operated in accordance with an Operating Manual (required by the Department of Mines and Petroleum) during active tailings deposition.

Risk Assessment

*Consequence:* Moderate

*Likelihood:* Unlikely

*Risk Rating:* Moderate

Regulatory Controls

As the risk rating is moderate the following conditions have been placed on the licence.

L1.2.1 requires pipelines containing tailings, effluent or saline water to be equipped with automatic cut-outs or provided with secondary containment to contain any spill for a time equal to that between inspections.

L1.2.2 lists containment structures and infrastructure requirements for tailings and dams to ensure waste material are deposited into appropriate infrastructure only.

L1.2.3 ensures appropriate TSF management by maintaining freeboard limit.

L1.2.4 ensures daily inspections are undertaken for tailings delivery pipelines, return water lines, TSF embankment freeboard and corrective action is taken if required.





Residual Risk Assessment

*Consequence:* Moderate

*Likelihood:* Rare

*Risk Rating:* Moderate

**Other indirect discharges to land**

*Hydrocarbon / chemical spills*

Emission Description

*Emission:* Hydrocarbon and other environmentally hazardous material spills.

*Impact:* Contamination of ground and surface water and soils, potentially causing vegetation death.

*Controls:* The Licensee has outlined the following controls:

- Grease and oils for maintenance of the processing plant are stored in self bunded shipping containers;
- Processing chemicals are also currently stored in a self bunded shipping container;
- Waste oils and grease are stored in bunded areas prior to pick up by a hydrocarbon recycler; and
- Hydrocarbon and chemical storage areas are covered under the sites Dangerous Goods Licence (DGS020039).

Risk Assessment

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* Low

Regulatory Controls

As there is a low risk of these spills, no licence conditions are required to be added to the licence to regulate spills and leaks of hydrocarbons or chemicals. General provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Unauthorised Discharges) Regulations 2004* apply.

Residual Risk

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* Low

*Contaminated stormwater*

Emission Description

*Emission:* Stormwater contaminated with environmentally hazardous materials such as hydrocarbons and chemicals.

*Impact:* Contamination of surrounding land and surface water drainage systems. The closest surface water feature is an ephemeral drainage line connected to Lake Annean approximately 8km from the processing area.

*Controls:* The Licensee has the following controls in place:

- Stormwater in the process plant is contained within a bunded area and is then pumped into the process tanks as top up water, any excess is pumped to the tailings dam;
- Stormwater collected from the hard stand on the fuel farm is put through an oil/water separator and collected into intermediate bulk containers (ICBs) and when full are placed into the bunded area at the mill and sent to the tanks as top up water;
- Stormwater from within the heavy vehicle workshop areas is captured and put through an oil/water separator and pumped over to the evaporation pond; and



- Any stormwater collected from the self banded power house transformers is collected in IBCs and put through the heavy vehicle oil/water separator.

#### Risk Assessment

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* Low

#### Regulatory Controls

As there is a low risk, no licence conditions are required to be added to the licence to regulate contaminated stormwater. General provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Unauthorised Discharges) Regulations 2004* apply.

#### Residual Risk

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* Low

### **Heap Leach Facility – Emissions to land**

#### ***Emission Risk Assessment –Abnormal/ Emergency operation of Heap Leach Facility***

#### Background

The Burnakura Heap Leach Facility has been designed to treat 500,000 tonnes per annum (tpa) of ore for a period of 2 years, treating a total of 1 million tonnes of ore. The heap leach operation will occur on a continuous 24 hour basis.

The heap leach area will be approximately 160m wide by 370 m long and consist of 7 cells. The pad cells will be constructed progressively to allow stacking of ore on the initial cells while the balance of the leach pad is still under construction. Leach pads will be constructed with a Geosynthetic clay liner (GCL) underlay covered with a 1.5mm High-density polyethylene (HDPE) liner to prevent seepage of processing liquor. The construction of the cells involve the compaction of in-situ material and mine waste to provide a stable soil sub-base for the placement of the liner.

Three process ponds will be constructed as part of the heap leach facility:

- Pregnant Solution Pond, 48 m wide x 48 m long x 4 m deep: this pond holds approximately 5,400 m<sup>3</sup> of solution;
- Barren Solution Pond, 56m wide x 48 m long x 4 m deep; this pond holds approximately 6,500 m<sup>3</sup> of solution; and
- Stormwater pond, 70 m wide x 70 m long x 5 m deep; this pond holds approximately 15,500 m<sup>3</sup> of stormwater and designed for a 100 yr. 24 hr and a 100 yr. 5 day rainfall event.

All process ponds will be lined with a GCL followed by a 1.5 mm HDPE liner. The stormwater pond will be lined with a 1.5mm HDPE liner. Liners will be installed in accordance with AS3706 and all joints will be pressure tested.

#### **Leaking of heap leach cell and process pond liners**

##### Emission Description

*Emission:* Leaking of heap leach cells and process pond liners allowing seepage of process liquors containing trace metals and cyanide.

*Impact:* Contamination of groundwater with cyanide and trace metals.



The site is part of Culculli Pastoral Station and the groundwater in the area is used for stock watering and process water for the surrounding mine sites.

**Controls:**

- Standing water levels in the area range in depth from 20 to 45 metres;
- Heap leach cells will be constructed using GCL underlay and HDPE liner to prevent seepage of processing liquor;
- 6 monitoring bores will be installed surrounding the facility to allow for the monitoring of any groundwater contamination. One upstream and 5 downstream of the facility;
- Heap leach cells will be inspected twice daily for leaks.
- All process ponds will be lined with a geosynthetic clay liner followed by a 1.5 mm HDPE liner. The stormwater pond will be lined with a 1.5mm HDPE liner;
- The HDPE liners will be installed according to the following standards:
  - Subgrade Testing Standard: AS1289. This ensures that the sub-base of the leach pad is compacted to the required engineered standard to minimise potential for slumping, shearing and stress cracking. Testing of the subgrade will be done in accordance with AS1289 every 2,000 m<sup>2</sup>. This equates to approximately 30 compaction tests across the heap leach facility;
  - Liner Conformance Standard: AS3706;
  - Weld Testing – Tensile: ASTM D638;
  - Weld Testing – Pressure: To 250 kPa; and
- Ponds will have a leak detection sump and inspection pipe installed in the lower corner of each pond.

Risk Assessment

*Consequence:* Moderate

*Likelihood:* Unlikely

*Risk Rating:* Moderate

Regulatory Controls

Conditions L1.2.2 has been updated to include the heap leach facility infrastructure (cells and ponds). This condition will ensure the cells and ponds have the appropriate liner system installed as proposed by the Licensee. Condition 1.2.4 has also been updated to ensure inspections of the cells and ponds occur daily to ensure any leaks from the liner are detected.

Condition 3.3.2 has also been updated to include the 6 new groundwater monitoring bores proposed to be constructed around the heap leach facility (1 upstream and 5 downstream). Monitoring of the groundwater for a standard suite of parameters will occur on a quarterly basis to ensure any contamination to groundwater is detected. Baseline groundwater monitoring will be undertaken prior to the operation of stage 1 of the works to ensure comparisons of groundwater quality can occur after operation begins (Condition 3.3.1).

As the risk rating is moderate it has been deemed appropriate to apply the same limits for WAD cyanide and total dissolved solids associated, that apply to the TSF groundwater monitoring bores to the groundwater monitoring bores surrounding the heap leach facility. Condition 3.3.2 has been updated to reflect this. This will help detect groundwater contamination.

- A limit of 0.8 mg/L for WAD cyanide has been added to the licence in accordance with the Department of Health's guideline *The Contaminated Sites Ground and Surface water chemical screening guidelines*, (DoH, 2014).
- A limit of 5000 mg/L for total dissolved solids has been added to the licence. This is the upper limit tolerable to beef cattle (as groundwater use in the area includes stock watering). This is in accordance with the *National Water Quality Management Strategy (NWQMS) – Australian Water Quality Guidelines for Fresh and Marine Water Quality*, 2000.



Residual Risk

*Consequence:* Moderate

*Likelihood:* Possible

*Risk Rating:* Moderate

**Overtopping of heap leach cells / ponds**

*Emission:* Overtopping of heap leach cells or process ponds due to poor management or storm inundation or the failure of pipelines, spilling process liquor containing trace metals and cyanide to land.

*Impact:* Soil contamination and impact to native vegetation including death. No surface water bodies are located within 10 km of the project area.

*Controls:*

- Cells will be constructed and managed such that a practical freeboard will be maintained in each cell as the cells are designed to leach liquid into the ponds;
- The cells and ponds have been designed to ensure that a 1 in 100 year 72 hour event (over the whole of the heap leach facility) will be able to be contained in the stormwater pond with a volume of 15,500 m<sup>3</sup>;
- In the event of possible overflowing of cells or ponds due to a heavy rainfall event the Licensee has stated that processing will stop and excess water collected in the stormwater pond will be transferred to the existing CIL tails hopper where it can be pumped out to the tailings dam if required (in a rainfall event greater than that seen in 1 in 100 year, 72 hour average return interval event);
- A water cut-off bund will be constructed on the uphill side of the heap leach and process pond area to protect the structures from storm flood damage;
- Freeboards of 600mm will be maintained on all ponds;
- Cells and ponds will be inspected daily to monitor liquor levels; and
- All pipelines delivering cyanide solutions have had provision made for installation of basic pipe burst detection. This includes pressure/flow metres for the Pregnant Liquor Solution and the Barren Leach Solution main lines.

Risk Assessment

*Consequence:* Moderate

*Likelihood:* Unlikely

*Risk Rating:* Moderate

Regulatory Controls

Condition 1.2.3(b) has been added to the licence to ensure that a freeboard of 600 mm is maintained on the process ponds and stormwater pond to prevent overtopping.

Condition 1.2.4 has been added to ensure inspections of pipelines, cells and ponds occur daily to monitor freeboard capacity and to check visual integrity.

Condition 1.2.1 has been added to the licence to ensure pipelines containing processing liquors are either equipped with telemetry, automatic cut-outs or secondary containment in the event of a pipeline failure.

Residual Risk

*Consequence:* Moderate

*Likelihood:* Unlikely

*Risk Rating:* Moderate





## Dewatering activities – emissions to land

### ***Emission Risk Assessment – Operations***

#### ***Overtopping of receiving pits and rupture of dewatering pipelines***

*Emission:* Pipeline leak/ spill of dewatering effluent and the overtopping of pits leading to an emission to land of dewatering effluent.

*Impact:* contamination of surrounding soils with brackish water which can cause vegetation stress or inundation of vegetation which can cause vegetation death. The total dissolved solid levels of the water to be dewatered range from 1800 mg/L – 10 000 mg/L (brackish to saline). Areas where pipelines will be constructed are degraded as they have been impacted by mining activities. There are no priority flora or ecological communities within or near by the premises.

*Controls:*

- Water transfer pipelines are 150 mm HDPE lying in trenches adjacent to the haul road;
- Sumps will be constructed at regular intervals with sufficient volume to ensure that between inspections, any leak does not escape onto vegetation;
- Dewatering pipelines will be inspected daily for visual integrity;
- A freeboard of 5 metres below pit crest level (mbcl) will be maintained on all pits receiving dewatering discharge to prevent overtopping;
- Receiving pit capacities are sufficient to contain volumes of dewater effluent proposed to be dewatered and to maintain a freeboard of 5 mbcl; and
- Evaporation rate in the area vs rainfall is high, helping to reduce the amount of water stored in pits.

#### Risk Assessment

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* low

#### Regulatory Controls

Condition 1.2.1 has also been added to the licence to ensure dewatering pipelines have secondary containment.

Condition 1.2.4 has been added to the licence to ensure pipelines are visually inspected daily for leaks as inundation can cause vegetation death.

#### Residual Risk

*Consequence:* Insignificant

*Likelihood:* Unlikely

*Risk Rating:* low

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## **APPENDIX B**



**Point source emissions to groundwater including monitoring**

***Emission Risk Assessment – Operation***

Background

Monument will be undertaking cutbacks to a number of existing pits that have partially filled with groundwater and rainfall runoff. The following pits are proposed to be dewatered to allow for mining:

- Alliance/New Alliance pit (ANA);
- North of Alliance 2 (NoA2); and
- North of Alliance 7&8 (NoA 7&8).

The total volume of water to be removed across all pits is approximately 900 000 m<sup>3</sup> per annum. Dewatering is expected to take 2.5 years.

Approximately 10 000 cubic metres (m<sup>3</sup>) of water (per pit) will also need to be dewatered from Federal City and Authaal pit, however water will be moved within the same pit (due to pit cut-back works) using in pit sumps and consequently water from dewatering will not be discharged to the environment and therefore is not required to be covered under this amendment. Table 1 below provides a summary of the dewatered pits and the receiving pits capacity and location.

<b>Table 1: Proposed dewatering activities</b>			
<b>Pit requiring dewatering</b>	<b>Amount to be dewatered (over two years)</b>	<b>Receiving pit</b>	<b>Capacity of receiving pit/s</b>
ANA	900,000 m <sup>3</sup>	NoA 2	NoA2 – 1 500 000 m <sup>3</sup>
NoA 7&8	600 000 m <sup>3</sup>	NoA 2 or ANA	NoA2 – 1 500 000 m <sup>3</sup> ANA – current available volume – 1 600 000 m <sup>3</sup> ANA Stage 1 of cutback– Additional 1,310,000 m <sup>3</sup> ANA Stage 2 of cutback – Additional 344,000 m <sup>3</sup> ANA Stage 3 of cutback – Additional 1,400,000 m <sup>3</sup> ANA Stage 4 of cutback – Additional 897,000 m <sup>3</sup>
NoA 2	150 000 m <sup>3</sup>	ANA	ANA – current available volume – 1 600 000 m <sup>3</sup> ANA Stage 1 of cutback– Additional 1,310,000 m <sup>3</sup> ANA Stage 2 of cutback – Additional 344,000 m <sup>3</sup> ANA Stage 3 of cutback – Additional 1,400,000 m <sup>3</sup> ANA Stage 4 of cutback – Additional 897,000 m <sup>3</sup>

The pit dewatering schedule is shown in Table 2 below. Alliance/New Alliance pit will be cut back in stages allowing for the storage of dewater from within the pit and other pits.

<b>Table 2: Pit dewatering schedule and expected volume of water disposed in receiving pits</b>											
Dewatered pit	Receiving Pit	Months (from commencement of dewatering)									
		3	6	9	12	15	18	21	24	27	30
ANA Stage 1	NoA2	273000	273000								
ANA Stage 1	ANA stg2			273000	81000						
NoA 7&8	NoA2		273000	273000	273000	273000					
NoA 7&8	ANA stg3						273000	35000			
NoA2	ANA stg3						273000	273000	273000	273000	273000



NoA2	ANA stg4							238000	273000	273000	
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**Dewatering of Alliance/New Alliance**

The ANA pit complex has approximately 900,000 m<sup>3</sup> of water that is proposed to be dewatered to the North of Alliance 2 (NoA 2) pit prior to mining operations. All pipework is in place to enable dewatering from ANA to NoA 2 which has been used historically for water storage; this water may be used later for processing as required.

During mining operations there is likely to be an ongoing need to dewater ANA pit. This will involve in-pit sumps that will extract approximately 20 kilolitres of water per day at ANA. All water in in-pit sumps will be used for dust suppression along roads. There is no rare or priority flora within or nearby the premises. TDS in water from ANA is approximately 3,700 mg/L (brackish).

**Dewatering of NoA 7&8 Pit**

Dewatering will be required at NoA 7&8 prior to pit cut-backs. All pipework is in place to dewater to NoA 2 pit and ANA pit. The volume in NoA 2 will have reduced since the original dewatering of New Alliance Pit as processing and heap leach operations would have begun, utilising significant volumes from this source.

**Dewatering of NoA 2 Pit**

Approximately 150 000 m<sup>3</sup> will need to be dewatered from NoA 2 Pit prior to cutbacks. All pipework is in place to dewater to ANA pit.

**Water balances**

NoA2 pit will receive 1,638,000 m<sup>3</sup> and has 150,000 m<sup>3</sup> already in it. NoA 2 pit water will be used for processing at a rate of 26,000 m<sup>3</sup> per month, 3000 m<sup>3</sup> per month for dust suppression and another 1000 m<sup>3</sup> per month for offices/ablutions and miscellaneous use. Over the 15 months that NOA2 will be used for dewatering storage the volume stored peaks at 1,339,000 m<sup>3</sup>. This will leave capacity of 104,000 m<sup>3</sup> to prevent overtopping during significant rain events. Water quality of both pits (ANA and NoA 2) is similar (see water quality section below).

Over the 24 months that ANA will be used for containing dewater it will receive approximately 2,811,000 m<sup>3</sup>. There will be a remaining capacity of approximately 40,000 m<sup>3</sup> at the end of dewatering, however evaporation losses that exceed rainfall by 10:1 will make further space available in the storage to the extent of approximately 20,000 m<sup>3</sup> year annum; reaching an equilibrium for the mining phase of 60,000 m<sup>3</sup> available capacity remaining.

**Water quality**

Water quality analysis of pit water of the pits to be dewatered and the receiving pits was recently undertaken (May 2016); results are below (taken from application document).

Analyte	Units	Reporting limit	Authaal	NoA 2	NoA 7&8	New Alliance	Banderol
pH**	pH Units	0.1	8.6	8.8	8.5	8.6	8.6
Total Dissolved Solids Dried at 175-185°C	mg/L	10	10000	1800	1600	3700	4300
Arsenic, As	µg/L	1	8	26	33	<5	9
Lead, Pb	µg/L	1	<5	<1	<1	<5	<5
Copper, Cu	µg/L	1	<5	<1	<1	<5	<5
Manganese, Mn	µg/L	1	<5	<1	2	<5	42



As can be seen in the table above water quality of the dewatered pits and receiving pits are similar. Total dissolved solids (TDS) in water from New Alliance is approximately 3,700 mg/L, which would be diluted by the existing water of the NoA 2 pit which is approximately 1,800 mg/L or by the existing water of the NoA 7&8 pit which is approximately 1,600 mg/L. Net water TDS is likely to stabilise between 2,400 and 2,800 mg/L.

### **Groundwater contamination and mounding**

#### Emission Description

*Emission:* The discharge of saline dewatering effluent to onsite pits resulting in groundwater contamination and/or mounding.

*Impact:* Death of vegetation due to root flooding and impact to groundwater dependant ecosystems.

*Controls:*

- There are no groundwater dependant ecosystems near the project area;
- There are no priority flora or ecological communities or surface water features within or near the premises;
- Water quality of dewatered pits and receiving pits are similar; and
- Pits act as groundwater sinks and have low rates of groundwater inflow. The groundwater aquifer in the area is characterised by discontinuous faults, mineralised zones and rock area. This will help prevent movement of water from the pits to the aquifer.

#### Risk Assessment

*Consequence:* Insignificant

*Likelihood:* Possible

*Risk Rating:* Low

#### Regulatory Controls

Condition 2.4.1 has been added to the licence to identify the location of the dewatering effluent discharge points (receiving pits) within the premises. These have been listed as point source emissions to groundwater.

Condition 3.4.1 has been added to the licence to ensure monitoring of point source emissions to groundwater occurs. Flow rate, total dissolved solids (TDS), total suspended solids (TSS) and pH will be required to be monitored at the receiving pits to ensure any potential groundwater contamination is identified. Heavy metals have not been included as previous sampling results indicate levels are similar in both the receiving pits and dewatered pits. Limits for TDS, TSS and pH have not been added to the licence as previous sampling results indicate parameters are similar in both the receiving pits and dewatered pits.

#### Residual Risk

*Consequence:* Insignificant

*Likelihood:* Possible

*Risk Rating:* Low