



Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: **Keras (Gold) Australia Pty Ltd**

Works Approval Number: **W5980/2016/1**

Registered office: 11 Ventnor Ave
 WEST PERTH WA 6005

ACN: 152 080 110

Premises address: Prince of Wales
 Mining tenements M24/430, M24/300, M24/193 and M24/387
 KALGOORLIE WA 6430
 as depicted in Schedule 1.

Issue date: Thursday, 13 October 2016

Commencement date: Monday, 17 October 2016

Expiry date: Wednesday, 16 October 2030

The following category from the *Environmental Protection Regulations 1987* cause this Premises to be a prescribed premises for the purposes of the *Environmental Protection Act 1986*:

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
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	250 000 tonnes per year

Conditions

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

Date signed: 13 October 2016

.....
Tim Gentle

Officer delegated under section 20
 of the *Environmental Protection Act 1986*



Works Approval Conditions

1 General

1.1 Interpretation

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

1.1.2 In the Works Approval, unless the contrary intention appears:

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

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

'CEO' for the purpose of notification means;

Chief Executive Officer
 Department Div.3 Pt.V EP Act
 Locked Bag 33
 CLOISTERS SQUARE WA 6850
 Telephone: (08) 9333 7510
 Facsimile: (08) 9333 7550
 Email: info@der.wa.gov.au

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

'Schedule 1' means Schedule 1 of this Works Approval unless otherwise stated;

'Works Approval' means this Works Approval numbered W5980/2016/1 and issued under the *Act*;

'Works Approval Holder' means the person or organisation named as the Works Approval Holder on page 1 of the Works Approval;

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

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

1.2 General conditions

1.2.1 The Works Approval Holder shall construct the works in accordance with the documentation detailed in Table 1.2.1:

Table 1.2.1: Construction Requirements ¹		
Document	Parts	Date of Document
Works Approval Application Form	All	June 2016

Note 1: Where the details and commitments of the documents listed in condition 1.2.1 are inconsistent with any other condition of this works approval, the conditions of this works approval shall prevail.



1.2.2 The Works Approval Holder must ensure that the Works specified in Column 1 of Table 1.2.2 meet or exceed the specifications in Column 2 for the infrastructure in each row of Table 1.2.2.

Table 1.2.2: Infrastructure to be constructed	
Infrastructure	Details
Pipelines	<p>- Pipelines to be constructed of PE100 PN10 HDPE which meets the following:</p> <ul style="list-style-type: none"> • AS/NZS 2033:2008: Installation of polyethylene pipe systems; • AS/NZS 4129:2008: Fittings for polyethylene pipes for pressure applications; • AS/NZS 4130:2009: Polyethylene pipes for pressure applications; and • AS/NZS 4131:2010 Polyethylene compounds for pressure pipes and fittings. <p>- Pipelines to be placed within v-drains and earthen bunding.</p> <p>- Scour pits to be constructed at intervals along the length of the pipeline.</p> <p>- The v-drains and scour pits in combination will have sufficient capacity to completely contain any spills from pipeline leakage or breach for a period equal to the time between routine inspections.</p> <p>- Pipeline route to be located as depicted in Schedule 1.</p>

2 Information

2.1 Reporting

2.1.1 The Works Approval Holder shall submit a compliance document to the CEO, following the construction of the works and prior to commissioning of the same.

2.1.2 The compliance document shall:

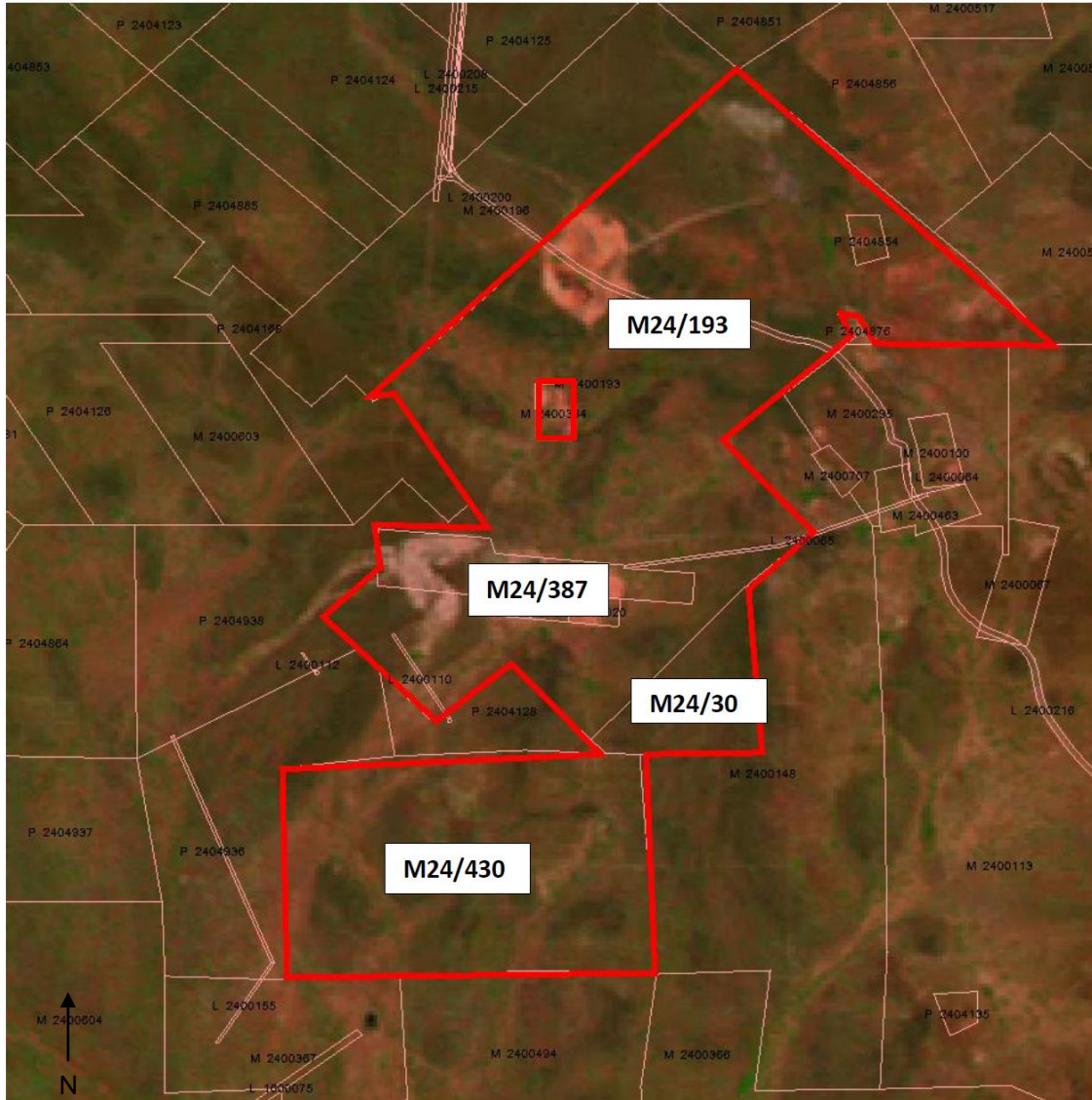
- (a) certify that the works were constructed in accordance with the conditions of the works approval;
- (b) be signed by person authorised to represent the Works Approval Holder and contain the printed name and position of that person within the company.

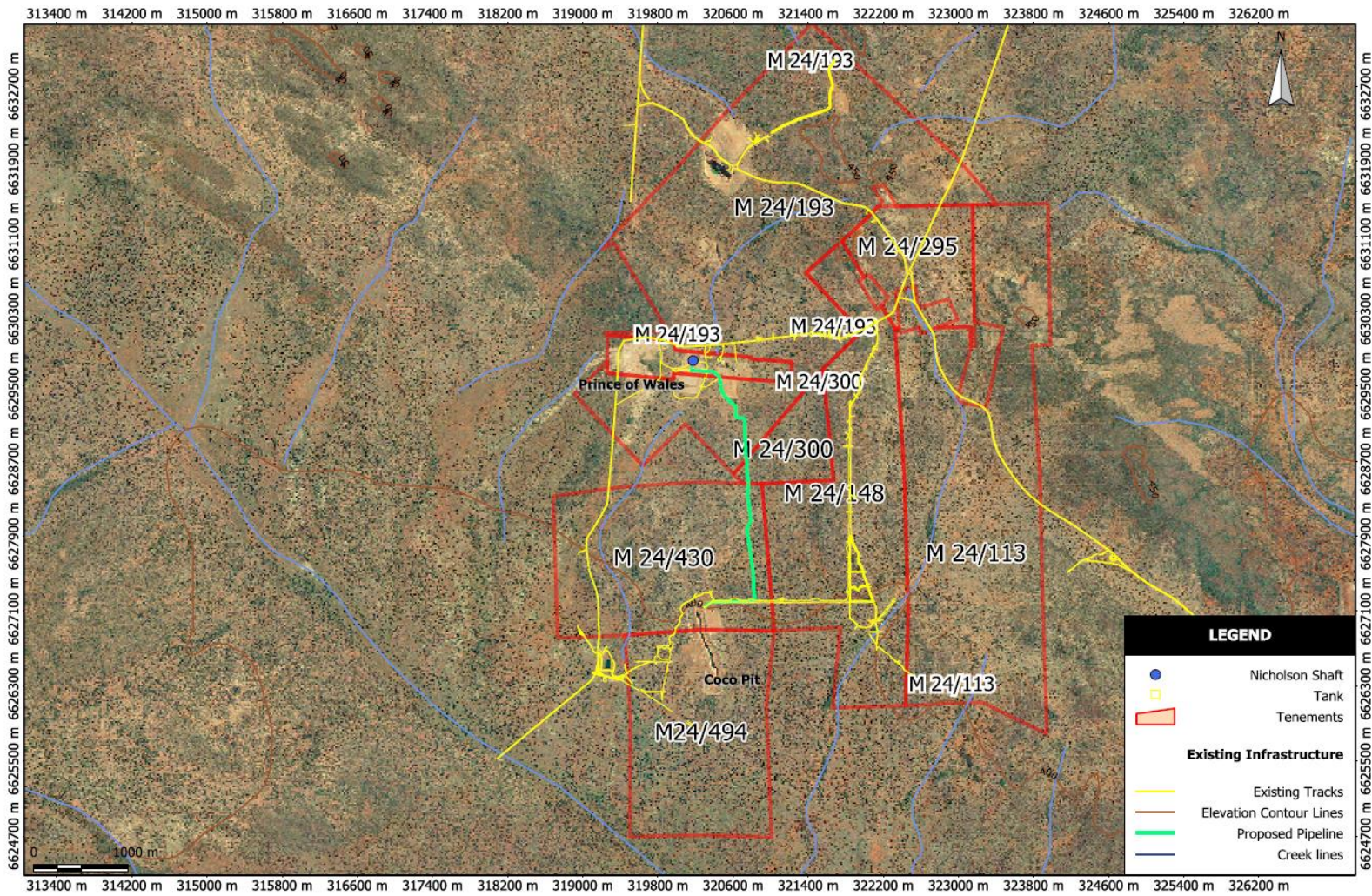


Schedule 1: Maps

Premises map

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





Proposed pipeline route



Decision Document

Environmental Protection Act 1986, Part V

Proponent: **Keras (Gold) Australia Pty Ltd**

Works Approval: **W5980/2016/1**

Registered office: 11 Ventnor Ave
WEST PERTH WA 6005

ACN: 152 080 110

Premises address: Prince of Wales
Mining tenements M24/430, M24/300, M24/193 and M24/387
KALGOORLIE WA 6430

Issue date: Thursday, 13 October 2016

Commencement date: Monday, 17 October 2016

Expiry date: Wednesday, 16 October 2030

Decision

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

Decision Document prepared by:

Fiona Sharpe
Licensing Officer

Decision Document authorised by:

Tim Gentle
Delegated Officer



Contents

Decision Document	1
Contents	2
1 Purpose of this Document	2
2 Administrative summary	2
3 Executive summary of proposal and assessment	3
4 Decision table	3
5 Advertisement and consultation table	12
6 Risk Assessment	13

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 checked="" type="checkbox"/> New Licence <input type="checkbox"/> Licence amendment <input type="checkbox"/> Works Approval amendment <input type="checkbox"/>	
Activities that cause the premises to become prescribed premises	Category number(s)	Assessed design capacity
	6	250 000 kL
Application verified	Date: 1 August 2016	
Application fee paid	Date: 5 August 2016	
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 checked="" type="checkbox"/>	
Commercial-in-confidence claim outcome		
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 <i>Environmental Protection Act 1986</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: 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.		
Is the Premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If Yes, include details here, eg Site is subject to SO ₂ requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

The Prince of Wales project is located approximately 50 kilometres (km) north-west of Kalgoorlie-Boulder and is located on mining tenement M24/387. It is operated by Keras (Gold) Australia Pty Ltd (Keras).

The Prince of Wales site has been previously mined and consists of an underground mine and an adjacent open pit. The underground Nicholson shaft / decline was refurbished in the 1960's and used as a water source to supply the mill and camp area to the north of the shaft with process water. The mine was closed in 1991.

Dewatering the underground Nicholson Shaft is required prior to the re-commencement of underground mining. The current water level in the Nicholson Shaft is at 48 m to the collar of the shaft (i.e. below ground level).

Water from the Nicholson Shaft will be discharged into the Cocos open pit which has an available volumetric capacity of 578 000 m³. Approximately 250 000 m³ of water will need to be discharged into the Cocos pit in the first year to allow mining to a depth of 100 metres below ground level (mbgl). Keras has estimated that 150,000 m³ per annum will need to be discharged after the first year.

In the application supporting document, the pipeline route is described as the following:

- A 110 mm HDPE pipeline will run approximately 100 m from the southern side of the Prince of Wales underground mine to two distribution tanks.
- From there, the pipeline will run 434 m east along the southern boundary of M24/387, before turning south in M24/193.
- The pipeline will then continue to run south through M24/193 (1.2 km), M24/300 (260 m) and M24/430 (1 km) before turning west through M24/193 (800 m) to the Cocos pit.
- In total the pipeline is approximately 3.8 km in length.

The application supporting document includes information regarding the hydrogeology of the area. It describes the majority of the area as located within low productivity aquifers which form the matrix between paleochannels, with the major ionic composition of the groundwater being sodium and chloride with minor levels of sulphate, magnesium and calcium. The standing water level in the area is currently 48 m below ground level and the water quality is saline to brackish and ranges from 4,000



mg/L total dissolved solids (TDS) to 27,000 mg/L TDS. There is no potable groundwater known to occur in the area.

There is no information as to whether any groundwater-dependent vegetation occurs in the area. Although the groundwater is brackish or saline, if there are areas with perched groundwater of lower salinity, these could support such vegetation.

Black Flag Lake (a salt lake) is the nearest surface water body and is located 7 km to the east.



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.

DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	W1.2 L1.1.1 – 1.1.4	Construction and Operation Standard conditions will apply to both the Works Approval and Licence including definitions.	General provisions of the <i>Environmental Protection Act 1986</i> .
Premises operation	W – no conditions L1.2.1 – 1.2.3	Construction No premises operation conditions are required for the Works Approval. Operation Abnormal Operation <u>Emission Description</u> <i>Emission:</i> Brackish / saline water will be transported in pipelines through areas of native vegetation. Emissions will occur if the pipeline leaks or ruptures (e.g. from failure in a flange or weld, from pipeline corrosion, overpressure, operator error, vehicle damage, or damage caused by animals). <i>Impact:</i> Contamination of surrounding soils with dissolved solids (salts) can cause vegetation stress or death. The application supporting document states that a desktop search of the Department of Parks and Wildlife Threatened and Priority Ecological Communities Database found no recorded Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within a 40 km radius of the project. However the project is within the Great Western Woodlands which are recognised as	Application supporting documentation General provisions of the <i>Environmental Protection Act 1986</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>being of particular biodiversity conservation significance.</p> <p><i>Controls:</i> The pipeline will be contained in an earthen v-drain bund with sufficient capacity to contain spillage in the event of a pipeline leak or failure. Scour pits (wider areas within the bunds to provide extra spill containment in case of pipeline failure) will be constructed along the length of the pipeline where there is suitable topography. The following are commitments from the proponent to control the risk:</p> <ul style="list-style-type: none"> • Service and maintenance of pumps, breathers, isolation valves and flow meters; • Bund and sump maintenance and upgrades when required; • 12 hourly pipeline inspections; and • Site training and induction of all personnel working in the area. <p><u>Risk Assessment</u> <i>Consequence:</i> Moderate <i>Likelihood:</i> Unlikely <i>Risk Rating:</i> Moderate</p> <p><u>Regulatory Controls</u> The proponent's commitments for pipeline bunding (spill containment) and 12 hourly visual inspections for pipeline integrity will be made binding through licence conditions. The proponent will also be required to keep a record (log) of all inspections signed by the responsible person.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p>	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Emissions general	L2.1.1	General emission conditions will be included in the Licence to ensure any limit exceeded is recorded and investigated.	General provisions of the <i>Environmental Protection Act 1986</i> .
Point source emissions to air including monitoring	W – no conditions L – no conditions	Construction and Operation There will be no point source emissions to air generated from the dewatering project. No conditions are required.	Application supporting documentation
Point source emissions to surface water including monitoring	W – no conditions L – no conditions	Construction and Operation There will be no point source emissions to surface water generated from the dewatering project. No conditions are required.	Application supporting documentation
Point source emissions to groundwater including monitoring	W – no conditions L2.1.1 – 2.2.2 L3.2.1	Construction There will be no point source emissions to groundwater during the construction of the dewatering project. No conditions for the Works Approval are required. Operation <u>Emission Discharge</u> <i>Emission:</i> Mine dewater will be transported in pipelines from the Nicholson Shaft underground mine and discharged into Cocos pit. A current sample shows TDS in the water to be discharged has been measured at 4,170 mg/L classifying it as brackish. A full analysis of the water quality from the Nicholson Shaft has been included in the supporting document and indicates the majority of metals and nutrients were either below the ANZECC & ARM CANZ (2000) freshwater criteria, or (in the case of copper, zinc and nitrogen) only marginally above the freshwater criteria. The results also show that the water is not contaminated by hydrocarbons. The pH is 7.98 indicating the water is slightly alkaline and therefore not	Applicant Supporting Documentation The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARM CANZ) 2000 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>contaminated from acid mine drainage.</p> <p><i>Impact:</i> Potential mounding of the water table in the vicinity of the receiving pit with impacts to adjacent vegetation through inundation of roots. Possible overtopping in the event of heavy rainfall with spillage of pit lake water onto the ground surface around the pit causing contamination and vegetation impacts. Possible subsurface lateral movement of pit lake water though higher transmissivity rock strata resulting in contamination of lower salinity perched groundwater (if present) adjacent to the pit.</p> <p><i>Controls:</i> The proponent has committed to undertake basic monitoring of water quality (pH and TDS). pH will be measured as a precautionary measure in case acid mine drainage should develop, although this appears unlikely given that the water is currently alkaline. TDS will also be monitored as a precautionary measure to determine whether higher salinity water is encountered as dewatering proceeds. This is necessary because acid or more highly saline water may cause more rapid deterioration of the pumps and pipework, increasing the risk of water leakage.</p> <p>To ensure the specified maximum pit lake volume is not exceeded, the proponent will record monthly water volumes deposited into Cocos pit. Surveyors will also measure the water levels on a monthly basis for the same reason.</p> <p><u>Risk Assessment</u> <i>Consequence:</i> Moderate <i>Likelihood:</i> Unlikely <i>Risk Rating:</i> Moderate</p> <p><u>Regulatory Controls</u> Licence conditions will be included to allow the discharge to occur and also to include monitoring of pit lake level, along with volumetric flow, pH and TDS. The Licence will</p>	1986.



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>have a limit of 6 mbgl for freeboard within the pit. The Delegated Officer considers that this freeboard is sufficient to avoid overtopping in the case of a heavy rainfall event. The Delegated Officer also considers the 6 m freeboard should be sufficient to ensure the roots of surrounding vegetation are not impacted by groundwater mounding or lateral movement of pit lake water through the pit walls, should it occur.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p>	
Emissions to land including monitoring	W – no conditions L – no conditions	<p>Construction and Operation There will be no emissions to land from the construction or operation of the Prince of Wales dewatering activities. No conditions are required for the Works Approval or Licence.</p>	General Provisions of the <i>Environmental Protection Act 1986</i> .
Fugitive emissions	W – no conditions L – no conditions	<p>Construction and Operation Significant fugitive emissions are not expected to be generated during the construction and operation of the dewatering pipelines. Dust suppression measures will be implemented if required and consist of water carts, restricting access and increased wind breaks. The substantive offenses of the <i>Environmental Protection Act 1986</i> provide enforceable prohibitions for dust emissions that result in pollution or environmental harm. No conditions are required for the Works Approval or Licence.</p>	Applicant Supporting Documentation General Provisions of the <i>Environmental Protection Act 1986</i> .
Odour	W – no conditions L – no conditions	<p>Construction and Operation There will be no odour emissions from construction or operation of the Prince of Wales dewatering activities. No conditions are required for the Works Approval or Licence.</p>	General provisions of the <i>Environmental Protection Act 1986</i> .



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Noise	W – no conditions L – no conditions	Construction and Operation Noise impacts are not expected. The nearest sensitive human receptor is Ora Banda, located approximately 10 km to the northwest of the project area. No conditions are required for the Works Approval or Licence.	<i>Environmental Protection (Noise) Regulations 1997</i>
Monitoring general	W – no conditions L – conditions	Construction No monitoring will be required under the Works Approval. Operating Monitoring will be included in the Licence, therefore general monitoring conditions will be included to specify that monitoring is carried out in accordance with relevant guidelines and standards.	General provisions of the <i>Environmental Protection Act 1986</i> .
Monitoring of inputs and outputs	W – no conditions L – no conditions	Construction and Operation No monitoring of inputs or outputs is required for the Works Approval or Licence.	N/A
Process monitoring	W – no conditions L – no conditions	Construction and Operation No process monitoring is required for the Works Approval or Licence.	N/A
Ambient quality monitoring	W – no conditions L – no conditions	Construction and Operation No ambient monitoring is required for the construction or operation of the Prince of Wales dewatering activities. See the emissions to groundwater section of this table for licence monitoring requirements.	N/A
Meteorological monitoring	W – no conditions L – no conditions	Construction and Operation No meteorological conditions are required for the Works Approval or Licence.	N/A
Improvements	W – no conditions L – no conditions	No improvements are required for the Works Approval or Licence.	N/A
Information	W1.2.1 – 1.2.2 W2.1.1 – 2.1.2 L - conditions	Standard conditions are listed on the Works Approval which include construction requirements of the pipeline infrastructure. Conditions are included for the submission of a compliance document at the end of the construction phase. Standard conditions will be included on the Licence relating to the management of	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
		records and complaints, notification requirements and the submission of a compliance report and annual environmental report.	
Licence Duration	N/A	The Works Approval will be issued for a duration of 14 years in accordance with DER's Guidance Statement on Licence Duration and in line with mining tenement expiry dates.	DER's Guidance Statement on Licence Duration 2016



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
15/08/2016	Application advertised in West Australian (or other relevant newspaper)	No comments received.	N/A
15/08/2016	Application referred to interested parties listed: City of Kalgoorlie-Boulder	No comments received.	N/A
13/09/2016	Proponent sent a copy of draft instrument	The proponent requested that scour pits be allowed to be constructed along the length of the pipeline where topography allows, rather than every 800 m.	This requested has been accepted, however, the proponent was requested to demonstrate that the capacity of the bunding is sufficient to contain a worst case spill in between 12 hourly inspections. The proponent has provided a diagram outlining the specifications of a typical scour pit, including volumes and flow rates.



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