



Decision Document

Environmental Protection Act 1986, Part V

Proponent: Sand Queen Gold Mines Pty Ltd

Licence: L7817/2000/6

Registered office: Level 1, 672 Murray Street
WEST PERTH WA 6005

ACN: 141 839 297

Premises address: Sand Queen dewatering project
Mining tenements M29/52; M29/233; M29/321 and L29/67
MENZIES WA 6436

Issue date: Thursday, 10 October 2013

Commencement date: Monday, 14 October 2013

Expiry date: Saturday, 13 October 2018

Decision

Based on the assessment detailed in this document, the Department of Environment Regulation (DER) has decided to issue a licence. DER considers that in reaching this decision, it has taken into account all relevant considerations.

Decision Document prepared by:

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Regional Environmental Officer

Decision Document authorised By:

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Regional Leader – Industry Regulation
(Goldfields)



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1 Purpose of this document

The Decision Document explains how DER has assessed and determined the application for a works approval or licence 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 it has all relevant approvals for its premises.

Works approval and licence conditions

DER has three types of conditions that may be imposed on works approvals and licences. They are as follows;

Standard conditions

DER has standard conditions that are imposed on all works approvals and licences regardless of the activities undertaken on the premises and the information provided in the application. These are included as the following conditions on works approvals and licences:

Works approval conditions: 1.1.1-1.1.3, 1.2.1, 1.2.2, 5.1.1 and 5.1.2.

Licence conditions: 1.1.1-1.1.3, 1.2.1-1.2.4, 5.1.1-5.1.4 and 5.2.1.

For such conditions, justification within the Decision Document is not provided.

Optional standard conditions

In the interests of regulatory consistency DER has a set of optional standard conditions that can be imposed on works approvals and licences. DER will include optional standard conditions as necessary and are likely to constitute the majority of conditions in any licence. The inclusion of any optional standard conditions are justified in section 4 of this document.

Non-standard conditions

Where the proposed activities require conditions outside the standard conditions suite DER will impose one or more non-standard conditions. These include both premises and sector specific conditions and are likely to occur within few licences. Where used, justification for the application of these conditions will be included in section 4.



2 Administrative summary

Administrative details		
Application type	Works approval <input type="checkbox"/>	
	New licence <input checked="" 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)	Design capacity
	6	1,500,000 tonnes per year
Application verified	Date: 25/06/2013	
Application fee paid	Date: 02/07/2013	
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 checked="" type="checkbox"/> No <input type="checkbox"/> Department of Water consulted Yes <input type="checkbox"/> No <input checked="" 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

Sand Queen Gold Mines Pty Ltd Sand Queen dewatering project is located approximately 100km north of Kalgoorlie. The project area has been extensively disturbed and contains infrastructure from historic mine sites, including Sand Queen, Gladsome and Sand Prince. Sand Queen Gold Mines Pty Ltd is a 100% owned subsidiary of Reed Resources Ltd. The licence was transferred from Reed Resources Ltd to Sand Queen Gold Mines Pty Ltd in January 2014.

Sand Queen dewatering project has been assessed as a 'prescribed premises' category 6 under Schedule 1 of the Environmental Protection Regulations 1987. Other infrastructure within the fenced mine compound include the Sand Queen shaft and winder room, bulk fuel storage, generator area, workshop, lay down and administration buildings. All operations were suspended at the end of May 2010 and the site was placed in managed care and maintenance. Mining equipment has since been removed from the mine site and it has been allowed to flood.

Groundwater abstraction is covered under 5C Licence 156854(4) which authorises annual abstraction of 1,500,000kL. Mine dewater is discharged onto the surface of Lake Goongarrie via a part buried, part surface pipeline to a circular nested spillway dam on the lake. The spillway dam is designed to be naturally degradable and constructed of sandbags filled with dune sand. The discharge point is located 300m off shore to limit impacts to shoreline vegetation.

The groundwater depth is approximately 20 to 30 metres below ground level and in fractured rock aquifers associated with mine scale structural elements. Sampling indicates that water pH ranges from 5.8 – 7.3, contains heavy metal elements, is hypersaline with a total dissolved solids ranging between 120,000 and 260,000mg/L.

The intent of this decision document is to assess the potential environmental impacts of emissions and discharges associated with the operational phase of category (6) mine dewatering.

4 Decision table

All applications are assessed under the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987*, DER's Policy Statement - Limits and targets for prescribed premises 2006 and the risk matrix attached to this decision document in section 6 of this document. Where other references have been used in making the decision they are detailed in the decision table.

OSC = Optional standard condition
NSC = Non-standard condition

DECISION TABLE				
Licence section	Condition number L= licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	L1.2.5	OSC	Potential contamination of stormwater may occur. OSC 1.2.5 has been included in the licence to ensure the licensee maintains sufficient infrastructure to direct stormwater from any possible contaminated sites.	Application supporting documentation
	L1.3.1 – 1.3.3	NSC	The NSCs have been included in the licence to ensure hypersaline mine dewater is managed and to prevent discharge to the surrounding environment. Visual inspection daily will ensure any accidental pipeline failures or spillages are effectively managed.	Application supporting documentation
Emissions general	L2.1.1	OSC	Descriptive limits will be set through condition 2.3.2 of the licence and therefore OSC regarding recording and investigation of exceedances of limits or targets has been included.	N/A
Point source emissions to air including monitoring	L2.2 and L3.2	N/A	<p>Operation <i>Emission significance - 1</i> <i>Socio-political context - no concern or interest.</i> <i>Risk assessment - E – other management mechanisms</i></p> <p>No significant point source air emissions are expected from the operation of the dewatering infrastructure. No specific conditions relating to point source emissions to air or the monitoring of these emissions are required to be added to the licence.</p>	<p>Environmental Protection (Unauthorised Discharges Regulations, 2004).</p> <p>Application supporting documentation</p>



DECISION TABLE

Licence section	Condition number L= licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
<p>Point source emissions to surface water including monitoring</p>	<p>L2.3 and 3.3</p>	<p>OSC</p>	<p>Operation <i>Emission significance</i> - 3 <i>Socio-political context</i> - no concern or interest <i>Risk assessment</i> - C - licence conditions</p> <p>Mine dewatering occurs directly into Lake Goongarrie. OSCs have been included in the licence to ensure adequate management of the discharge of hypersaline water into Lake Goongarrie. Conditions have been included in the licence to minimise the environmental impacts to Lake Goongarrie including impacts on riparian vegetation communities and micro-fauna. Specific monitoring conditions have been outlined in Table 3.3.1 of the licence.</p> <p>Full justification for limits in table 2.3.2 can be found in Appendix A.</p>	<p>Application supporting documentation. General provisions of the <i>Environmental Protection Act 1986</i>.</p>
<p>Emissions to land including monitoring</p>	<p>L2.5 and 3.5</p>	<p>N/A</p>	<p>Operation <i>Emission significance</i> - 1 <i>Socio-political context</i> - no concern or interest. <i>Risk assessment</i> - E - other management mechanisms</p> <p>No significant point source land emissions are expected from the operations at Sand Queen. No specific conditions relating to point source emissions to land or the monitoring of these emissions are required to be added to the licence.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i> Environmental Protection (Unauthorised Discharge) Regulations 2004 Application supporting documentation</p>



DECISION TABLE

Licence section	Condition number L= licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
Point source emissions to groundwater including monitoring	L2.4 and 3.4	N/A	<p>Operation <i>Emission significance - 1</i> <i>Socio-political context - no concern or interest.</i> <i>Risk assessment - E – other management mechanisms</i></p> <p>There will be no point source emissions to groundwater during the operation of the dewatering pipelines. No specific conditions relating to point source emissions or monitoring of such emissions are required to be added to the licence.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i></p> <p>Application supporting documentation</p>
Fugitive emissions	L2.6.1	OSC	<p>Operation <i>Emission significance - 2</i> <i>Socio-political context - no concern or interest.</i> <i>Risk assessment - E – other management mechanisms</i></p> <p>Cumulative dust levels may increase due to vehicle movements as a result of regular pipeline inspections. This increase is not expected to be significant. OSCs are included on the licence to ensure adequate management of dust emissions.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i></p> <p>Application supporting documentation</p>
Odour	L2.7	N/A	<p>Operation <i>Emission significance - 1</i> <i>Socio-political context - no concern or interest.</i> <i>Risk assessment - E – other management mechanisms</i></p> <p>No odour emissions are expected during the operation of the dewatering infrastructure. No specific conditions relating to odour are required to be added to the licence.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i></p> <p>Application supporting documentation</p>



DECISION TABLE

Licence section	Condition number L= licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
Noise	L2.8	N/A	<p>Operation <i>Emission significance - 1</i> <i>Socio-political context - no concern or interest.</i> <i>Risk assessment - E - other management mechanisms</i></p> <p>During operation some noise emissions may be generated from the dewatering pumps when in operation however it is not expected to have a significant impact offsite. No specific conditions relating to noise are required to be added to the licence.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i></p> <p>Application supporting documentation</p>
Monitoring general	L3.1	OSC	<p>Optional standard conditions relating to general monitoring have been included in the licence to ensure appropriate monitoring standards techniques are used during sampling.</p>	<p>Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design of sampling programs, sampling techniques and the preservation and handling of samples.</p> <p>Application supporting documentation</p>
Monitoring of inputs and outputs	L3.6	N/A	<p>Monitoring of inputs and outputs is not required to ensure efficient operation of the dewatering, therefore no specific conditions relating to monitoring of inputs and outputs are required to be added to the licence.</p>	<p>Application supporting documentation</p>
Process monitoring	L3.7	N/A	<p>Process monitoring conditions have not been included in the licence.</p>	<p>Application supporting documentation</p>
Ambient quality monitoring			<p>Environmental groundwater quality monitoring is not required to be added to the licence.</p>	<p>Application supporting documentation</p>
Meteorological monitoring	L3.9	N/A	<p>Monitoring of meteorological conditions is not required to adequately manage emissions from this proposal and therefore have not been included.</p>	



DECISION TABLE

Licence section	Condition number L= licence	OSC or NSC	Justification (including risk description & decision methodology where relevant)	Reference documents
Improvements	L4	N/A	No specific improvements are required by DER. No conditions relating to improvements are required to be added to the licence.	
Information	L5	N/A	Standard conditions relating to the management of records and complaints, notifications requirements and the submission of an annual audit compliance report and annual environmental report are included on the licence.	General provisions of the <i>Environmental Protection Act 1986</i>

5 Advertisement and consultation table

Date	Event	Comments received/notes	How comments were taken into consideration
19/08/2013	Application advertised in <i>The West Australian</i>	No comments received	
02/10/2013	Proponent sent a copy of draft instrument	No objections received, minor administrative changes	



6 Emissions and discharges risk assessment matrix

Note: These matrix are taken from the current DER Officer's Guide to Emissions and Discharges Risk Assessment May 2006.

Table 3: Measures of significance of emissions

Emissions as a percentage of the relevant emission or ambient standard		Worst case operating conditions (95 th percentile)			
		>100%	50 – 100%	20 – 50%	<20%*
Normal operating conditions (50 th percentile)	>100%	5	N/A	N/A	N/A
	50 – 100%	4	3	N/A	N/A
	20 – 50%	4	3	2	N/A
	<20%*	3	3	2	1

*For reliable technology, this figure could increase to 30%

Table 4: Socio-political context of each regulated emission

		Relative proximity of the interested party with regards to the emission				
		Immediately adjacent	Adjacent	Nearby	Distant	Isolated
Level of community interest or concern*	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Note: These examples are not exclusive and professional judgement is needed to evaluate each specific case

*This is determined by DER using the DER "Officer's Guide to Emissions and Discharges Risk Assessment" May 2006.

Table 5: Emissions risk reduction matrix

		Significance of emissions				
		5	4	3	2	1
Socio-political context	High	A	A	B	C	D
	Medium high	A	A	B	C	D
	Medium	A	B	B	D	E
	Low	A	B	C	D	E
	No	B	C	D	E	E

PRIORITY MATRIX ACTION DESCRIPTORS

A = Do not allow (fix)

B = licence condition (setting limits + EMPs - short timeframes)(setting targets optional)

C = licence condition (setting targets + EMPs - longer timeframes)

D= EIPs, other management mechanisms/licence conditions (monitoring/reporting)/other regulatory tools

E = No regulation, other management mechanisms



Appendix A

Point source emission limits to surface water

Mine dewater from the Sand Queen mine is discharged into Lake Goongarrie via pipeline. Lake Goongarrie is an ephemeral playa lake with a thin ephemeral salt crust up to 1cm thick. It is characterised as hypersaline and neutral to weakly alkaline with a dominant sodium chloride chemical signature. Total dissolved solids of the lake water are greater than 50,000mg/L. The closest shoreline dune systems are greater than 300m from the discharge point. Species of trees and shrubs other than samphires to be found on dunes and hills surrounding Lake Goongarrie include acacia aneura (mulga), eremophila miniata (kopi poverty bush), dodonea viscosa (sticky hop bush), pittosporum phillyaeoides (native willow), exocarpus aphyllus (leafless ballart), santalum spicatum (sandalwood) and grevillea species.

The mine dewater discharge water quality is show in the table below.

Parameter	Lake Goongarrie Discharge										
	13/09/05	12/01/06	30.01.07	18.04.08	18.09.08	29.12.08	24.03.09	15.06.09	17.03.10	2010/11	2011/12
pH	6.4	6.3	6.9	7.1	6.9	6.5	6.8	6.7	6.8	NS	NS
TDS mg/L	160,000	220,000	120,000	240,000	280,000	260,000	210,000	170,000	260,000	NS	NS
TSS mg/L	31	170 (R<5)	<5	800	87	<5	(100) ¹ 12	<5	21	NS	NS
Na mg/L	56,000	96,000	65,000	81,000	96,000	82,000	84,000	81,000	69,500	NS	NS
K mg/L	740	930	13,700	1,100	1,400	1,400	1,300	1,000	1,120	NS	NS
Ca mg/L	890	530	1,300	470	680	600	660	590	557	NS	NS
Mg mg/L	9,600	13,000	11,000	11,000	14,000	12,000	12,000	12,000	11,400	NS	NS
Fe(Sol) mg/L	0.1	4.4	12	2.2	<2	<2	<2	<2	1.1	NS	NS
Cl mg/L	110,000	160,000	150,000	160,000	170,000	150,000	160,000	160,000	156,000	NS	NS
C03 mg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NS	NS
HC03 mg/L	350	35	100	50	55	50	45	40	37	NS	NS
S04 mg/L	15,000	19,000	18,000	19,000	19,000	19,000	20,000	18,000	17,000	NS	NS
N03 mg/L	0.9	<0.2	<5	7.1	34.0	5.9	1.7	9.8	3.8	NS	NS
METALS											
As(Sol) mg/L	0.001	0.001	<0.005	<2.0	<2.0	<2.0	<0.04	<2.0	<0.001	NS	NS
Pb(Sol) mg/L	0.9	<0.5	<0.005	<2.0	<0.5	<0.5	<0.5	<0.5	0.24	NS	NS
Ni(Sol) mg/L	0.3	<0.5	<0.5	-	-	-	-	-	<0.05	NS	NS
Cd(Sol) mg/L	0.16	<0.05	<0.1	-	-	-	-	-	0.0084	NS	NS
Cr(Sol) mg/L	0.35	<0.5	<0.5	-	-	-	-	-	0.01	NS	NS
Cu(Sol) mg/L	0.35	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.088	NS	NS
Hg (Sol) mg/L	0.0001	<0.0001	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	NS	NS
Zn(Sol) mg/L	9.7	0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.52	NS	NS
WAD CN mg/L	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	NS	NS

Note: NS= No sample. During the 2010/11 and 2011/12 reporting periods no dewatering was undertaken and no discharge occurred. The mine remained in managed care and maintenance.

The limits found in table 2.3.2 of the licence are taken from the recommended water quality trigger values (low risk) for heavy metals and metalloids in livestock drinking water according to the National water quality management strategy paper no. 4, Australian and New Zealand guidelines for fresh and marine water quality, volume 1 (chapters 1-7), October 2000. As there is no guideline for total dissolved solids, the limit is based on historical emission level data from mine discharge water into Lake Goongarrie. Limits will be reviewed when water is available on the lake to conduct a baseline sampling program on Lake Goongarrie by the proponent.