Decision Report

Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6509/2021/1
Applicant	Northern Star (Carosue Dam) Pty Ltd
ACN	116 649 122
File Number	DER2020/000690
Premises	Carosue Dam Mine Site M31/295, M31/220 and M28/269 MENZIES WA 6436 As defined by the Premises map attached to the issued works approval.
Date of Report	30 March 2021
Decision	Works approval granted

Terrel MacGregor

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Date: 2021.03.30 15:39:59 +08'00'

Terrel MacGregor
A/Manager – Resource Industries
INDUSTRY REGULATION
an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)

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1. Decision summary

This Decision Report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Works Approval W6509/2021/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Decision Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://www.der.wa.gov.au.

2.2 Application summary and overview of Premises

On 16 December 2020, Northern Star (Carosue Dam) Pty Ltd (applicant) submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works and time-limited operations relating Category 5: Processing or beneficiation of metallic or non-metallic ore; stage 3 embankment raise to Cell 3 of an existing paddock style tailings storage facility (TSF) located at the Carosue Dam Operations (operated under licence L7465/1999/8) which is situated approximately 120 km north east of the town of Kalgoorlie-Boulder.

The Premises relates to the categories and assessed production capacities under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in Works Approval W6509/2021/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guidance Statement: Risk Assessments* (DER 2017) are outlined in Works Approval W6509/2021/1.

2.2.1 Description of proposed works

TSF Cell 3 was constructed in 2014 and is located adjacent to and abutting Cell 1 and Cell 2 of the TSF. The location of these cells in relation to the processing plant and mine is depicted below in Figure 1. The Cell 3 Stage 1 embankment crest is RL371.5 m, providing a storage capacity of 6.2 Million tonnes (Mt). Cell 3 design incorporates a partially soil lined basin area, underdrainage system beneath the supernatant pond (to reduce seepage) and upstream toe drain (to lower the phreatic surface at the embankment). The upstream toe drains and underdrainage system drain by gravity to a collection tower. Decant water is collected from the TSF via a decant tower located within the central part of the basin. Water recovered from the underdrainage and decant systems is pumped back to the plant for re-use in the process circuit.

In October 2017, Cell 3 Stage 2 embankment was constructed to an elevation of RL375.5 m (4.0 m raise). Completion of Cell 3 Stage 2 provided a cumulative storage of 10.0 Mt approximately.

The applicant is now proposing to construct a downstream embankment raise to Cell 3 from RL375.5m to the Stage 3 design height of RL377.5m (2.0m total). Cell 3, stage 3 will have a capacity of 1.6Mt of dry tailings.

The works required to complete the embankment raise are summarised below:

- Disassemble and move tailings delivery and distribution lines;
- Prepare the existing Cell 3 embankment crest by removing the wearing course, scarifying, wetting and re-compacting the Zone A fill;

- Raise the TSF embankment to design levels and grades, including erosion protection, wearing course and safety bunds;
- Replace erosion protection material to embankment faces as required;
- Reinstate tailings delivery and distribution lines and spigot droppers; and
- Install new monitoring infrastructure (settlement pins and piezometers).

All seepage control infrastructure has been completed as part of the Stage 1 works (cut-off trench, low permeability soil liner, basin underdrainage collection system, underdrainage collection tower and embankment upstream toe drain). The existing underdrainage systems will be operated independently as they are, and the underdrainage tower is not required to be raised as part of the Stage 3 works.

TSF Cell 3 has an existing decant system that comprises of the following components:

- An access causeway;
- A decant tower consisting of 1,800 mm diameter slotted concrete pipe surrounded by clean waste rock;
- A submersible pump and pipework; and
- A hoist and pully to raise and lower the pump.

The decant tower is not required to be raised as part of the stage 3 works. The level of the decant tower is determined from the maximum pond level generated from water management modelling for a 1% AER 72-hr storm event.

All pipelines will be double skinned PE100 and will be constructed and installed in accordance with AS4130 and AS413, and the Plastics Industry Pipe Association of Australia Limited (PIPA) Guideline POP003. Additional monitoring infrastructure (piezometers and settlement pins) will also be installed.

2.2.2 Operation of TSF Cell 3 stage 3

Once completed, tailings will be deposited from the perimeter embankments towards the centre of the basin. A submersible pump will be located in the decant and underdrainage towers to continually recover supernatant water and return it back to the processing plant.

Cell 3 Stage 3 will have a capacity of 1.6Mt of dry tailings and will be operated as a standalone facility. A minimum embankment freeboard of 300mm will be maintained at all times within this Cell. The facility will be inspected at minimum every 12 hours including:

- Tailings delivery lines;
- Return water lines;
- Tailings Deposition;
- Pond on surface of the TSF;
- Internal embankment freeboard; and
- The external walls of the TSF.

Survey pins and/or prisms, Piezometers and Monitoring Bores will be monitored quarterly.

The Applicant will be authorised to undertake time limited operations for tailings to be deposited into TSF Cell 3 stage 3 provided that relevant requirements of this works approval (W6509/2021/1) are met. Ongoing operation of TSF cell 3 stage 3 will require licence L7465/1999/8 to be amended.

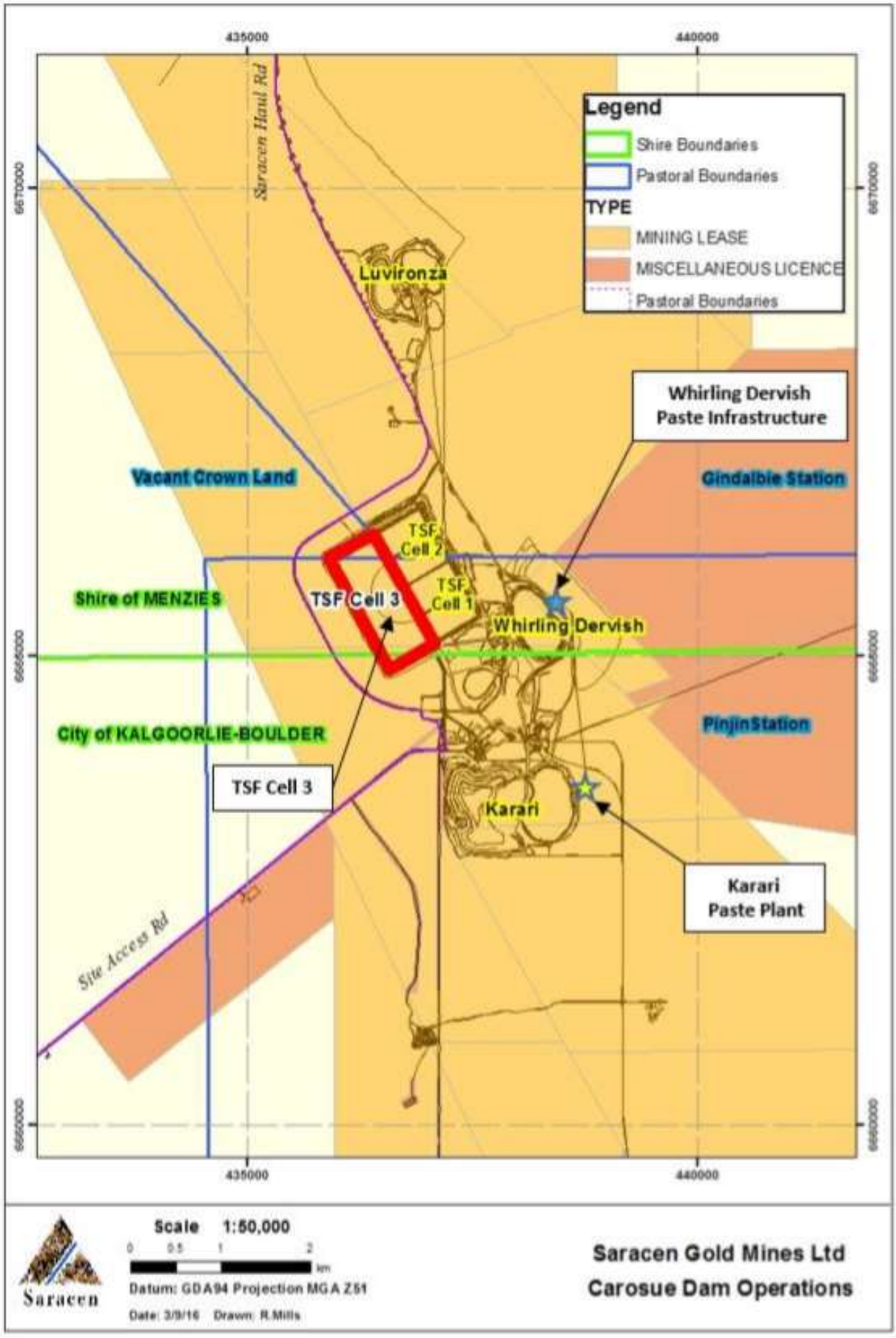

Figure 1: Location of cell 3 TSF in relation to other infrastructure at Carouse Dam (Source: Saracen Gold Mines Pty Ltd, 2020)

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guidance Statement: Risk Assessments* (DER 2017).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Decision Report are detailed in Table 1 below. Table 1 also details the proposed control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Earthworks and light vehicle/ mobile equipment movements	Air/windborne pathway	• Water carts will be used to minimise dust where required. • Material stockpiles will be watered down during handling. • Wetting down of roads/access tracks will be undertaken with dribble bars. • If local wind speeds are conducive to elevated dusting, construction works will be terminated until conditions improve.
Operation			
Leachate containing cyanide and elevated metals and metalloids	TSF Cell 3	Seepage of leachate through base and embankments of TSF Cell 3 into soil and groundwater.	• Cell 3 design incorporates a partially soil lined basin area, underdrainage system beneath the supernatant pond (to reduce seepage) and upstream toe drain (to lower the phreatic surface at the embankment). • The upstream toe drains and underdrainage system drain by gravity to a collection tower. Decant water is collected from the TSF via a decant tower located within the central part of the basin. Water recovered from the underdrainage and decant systems is pumped back to the plant for re-use in the process circuit. • Groundwater levels will be monitored on a quarterly basis as per existing licence conditions. • If groundwater levels in monitoring bores reach 6mBGL standing water level in the monitoring bores will be

Emission	Sources	Potential pathways	Proposed controls
			monitored monthly, and preparations will be made to implement a groundwater recovery system if groundwater reaches the 4mBGL licence limit. • Flora monitoring transects have been established around the TSF to monitor vegetation and these will be monitored annually until the TSF is decommissioned and rehabilitated. • Groundwater quality will also be monitored around TSF for evidence of seepage.
Tailings containing elevated metals and metalloids	TSF Cell 3	Direct discharge to land – overtopping of embankments of TSF Cell 3.	• Cell 3 Stage 3 has been designed with a minimum top of embankment freeboard of 300mm to prevent overtopping by tailings or significant (1-100 year) rainfall event. • The TSF will be inspected up to three times per twelve (12) hour shift during operation, which exceeds the frequency stipulated within operational licence conditions.
Tailings and return water containing elevated metals and metalloids	TSF Cell 3 tailing and return water pipelines.	Direct discharge to land – pipeline leak / rupture.	• All pipelines will be double skinned PE100 and constructed and installed to Australian Standards AS4130 and AS413 and Plastics Industry Pipe Association of Australia Limited (PIPA) Guideline POP003 • Pipelines will be connected to the Citect processing plant control system which monitors pressure in pipelines. A drop in pressure (leak) will trigger an alarm to notify mill control operators. • Pipelines will be inspected twice daily as per operational licence conditions • All pipelines will be placed within v-drains sufficient to contain spillages between routine inspections
Dust (dry tailings)	TSF Cell 3	Air/wind dispersion	• Spigot rotation to keep TSF area 'wet' and minimize dust generation

3.1.2 Receptors

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), the Delegated Officer has excluded employees, visitors and contractors of the applicants from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed

premises *(Guidance Statement: Environmental Siting* (DER 2016)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Sensitive receptor	Distance from prescribed activity
Human receptors	
• Town of Kalgoorlie-boulder • Pinjin Station	• 120km north-east of the Premises • 37km from the Premises Distances of premises to closest sensitive land uses is sufficient to inform that project activity impacts as not foreseeable. Human receptors are not considered to be impacted during construction or operations and therefore not further considered in the risk assessment.
Environmental receptors	
Lake Rebecca – (salt lake)	7km north east (down hydraulic gradient) of the TSF
Underlying groundwater (non-potable purposes)	Within the Goldfields Groundwater Area (RIWI Act 1914 designated area). The groundwater level prior to operations was approximately 20mbgl. It has been locally modified by the TSF operations and dewatering of pits. Groundwater is hypersaline with total dissolved solids (TDS) content being approximately 40,000mg/L. <u>Pastoral bores</u> - Relief Hill Well, ~5.5km east of the process plant and TSF - Y4 bore – ~10km north of the process plant and TSF
Native vegetation adjacent to TSF Cell 3.	The landscape surrounding the TSF is described as alluvial plains with mixed halophyte low shrublands and generally scattered low shrublands of *Acacia aneura* and *Acacia spp* (Saracen Gold Mines Pty Ltd, 2020). Three vegetation monitoring transects were established in March 2009 (prior to the recommencement of tailings deposition) around the existing TSF (TSF East, West and North). Following construction of Cell 3 Stage 1 new monitoring sites were erected in August 2015 by Alexander Holm and Associates. Annual monitoring has shown little change in species diversity or abundance since monitoring began (Saracen Gold Mines Pty Ltd, 2020). The vegetation monitoring sites are monitored annually
Threatened/Priority Flora	Two priority flora species recorded within the Premises – one plant of *Spartothamnella* sp. Helena & Aurora Range (priority 3) and 100 plants of *Eremophila arachnoides* subsp. Tenera (priority 1)
Threatened/Priority Fauna	Malleefowl are active on the Premises. Three active mounds and three inactive mounds were located during the 2012 survey for TSF Cell 3.

3.2 Modelling and monitoring data review

3.2.1 Tailings Geochemistry

Tailings will comprise of ore from a number of satellite operations (Whirling Dervish, Karari Underground, Deep South Underground and the Million Dollar Project). It is expected that the chemical composition of tailings slurry and return water will be similar to that of the current operation (Saracen Gold Mines Pty Ltd, 2020). The geochemical characterization undertaken illustrates that the tailings material from the TSF is relatively inert. Samples of tailings from Carosue Dam was supplied to NATA accredited laboratory for analysis. Consultants, Knight Pièsold, reviewed the assay data and provided the following conclusions were drawn from analysis:

- Acid forming potential of the tailings sample was determined based on the acid base accounting and the net acid generation test. The tailings sample was classified as Non-Acid Forming.
- Tailings have a moderate number of elemental enrichments, with arsenic, chloride and sulphur found to be highly enriched with bismuth, molybdenum and selenium also found to be significantly enriched.

Key tailings composition characteristics are summarized below.

Table 3: Carosue Dam tailings properties (Source: Saracen Gold Mines Pty Ltd, 2020).

Source	Parameter	Value
Process Water	TDS	250,000 mg/L
	pH	7.25
Tailings slurry	pH	8.4-8.5
	WAD CN	60-70 mg/L
Supernatant	pH	7.5
	WAD CN	10 mg/L

3.2.2 Monitoring of existing seepage impacts to groundwater

The Premises existing licence L7465/1999/8 requires the monitoring of groundwater surrounding the TSF complex (Cells 1 – 3). See figure 2 for location of groundwater monitoring bores.

Standing water levels

Pre-mining groundwater levels in the TSF area were approximately 20m below ground level (mbgl) prior to the construction of the TSF. Water levels around the existing TSF vary depending on which cell is in operation. Tailings deposition in the 2019 reporting year was directed to Cell 3 until December where it was then directed to the newly commissioned TSF Cell 1/2. Current groundwater standing water levels (SWL) surrounding the TSF complex ranges between 7.61mbgl (MB6s) and 30.59mbgl (MB3D). Monitoring bores closest to TSF Cell 3 range in depth from 7.61mbgl to 22.03mbgl (Saracen Gold Mines Pty Ltd, 2019). To date, monitoring bores on the western margin of Cell 3 (MB10 MB9s and MB11) remain dry. The Applicant has stated that this may indicate that the hydraulic pressure associated with tailings deposition is not affecting groundwater levels (Saracen Gold Mines Pty Ltd, 2020).

Modelling of seepage analysis conducted as part of the design of TSF Cell 3, indicated that seepage rates would be around <0.002L/s for the first lift, increasing to 0.8 L/s once the final design height is reached. The current rate of seepage from the TSF complex has been estimated by the applicant to be 3.5L/s (Saracen Gold Mines Pty Ltd, 2020).

The existing licence L7465/1999/8 contains a limit for SWL of 4mbgl within TSF monitoring bores and includes a condition requiring a groundwater recovery program to be implemented within six months of SWL in monitoring bores reaching 6.0mbgl.

The health of native vegetation adjacent to Cell 3 is also monitored on an annual basis. This has not been conditioned within the licence. Monitoring results to date indicate little change in species diversity or abundance since monitoring began (Saracen Gold Mines Pty Ltd, 2020).

Figure 2: Location of groundwater monitoring bores and piezometers at the Carosue Dam Paddock TSF.

Groundwater quality

Groundwater surrounding the TSF has a TDS between 20,000 – 120,000mg/L (Saracen Gold Mines Pty Ltd, 2019). The main use of this water is for mining purposes. The nearest stock watering bores is Relief Hill well located approximately 5.5km to the east of the existing TSF.

Metals and WAD-CN concentrations within groundwater has been monitored around the TSF

since 2000. WAD-CN concentration in monitoring bores surrounding TSF Cell 3 are <0.2mg/L (Saracen Gold Mines Pty Ltd, 2019) which is below the licence limit of 0.5mg/L. Other analytes measured include arsenic, cadmium, chromium, lead, nickel and Zinc. Results indicate concentrations are below the ANZECC livestock drinking water quality guidelines except for Lead (guideline of 0.1mg/L) which had a maximum result of 0.216mg/L (average of 0.055mg/L over last annual period). See Table 4 for groundwater quality data.

Table 4 –TSF groundwater monitoring results 2019 (source: Saracen Gold Mines Pty Ltd, 2020).

Monitoring Criteria		Paddock TSF			Luvironza In-Pit TSF		
	DWER Target Limit	Max	Min	Average	Max	Min	Average
WAD Cyanide	<0.5mg/L	0.223	<0.004	0.06852	0.076	<0.020	0.035
Arsenic	-	0.05	<0.005	0.017778	<0.100	<0.010	0.038
Cadmium	-	0.0057	<0.0005	0.002557	0.0335	<0.0050	0.0063
Chromium	-	0.058	<0.010	0.032696	0.179	<0.010	0.040
Nickle	-	0.597	<0.010	0.154762	0.711	<0.050	0.063
Lead	-	0.216	<0.010	0.058391	2.08	<0.050	0.059
Zinc	-	0.617	<0.025	0.1695	0.561	<0.050	0.214

*Averages for values below limit of reporting were calculated as if they were at the limit of reporting

**All analytes reported in mg/L unless specified otherwise

***Averages were calculated where samples below the limit of reporting (LOR) were halved relevant to their LOR, then a mean average of all samples (including the halved LORs) was then calculated for each analyte.

It is noted that the pH of the deep bores at MB6, MB7 and MB8 is acidic at 3.41 – 4.19 pH units (Saracen Gold Mines Pty Ltd, 2019). Previous investigations in 2012 have concluded that the pH acidity is due to ferrolysis, influenced by local groundwater abstraction which has created oxidising conditions.

Groundwater flow is towards Lake Rebecca (Salt Lake) located approximately 7km north east of the Premises. Seepage from the TSF is not expected to reach Lake Rebecca due to the slow hydraulic gradient of the aquifers in the Carosue Dam area and the distance to the lake. Seepage is more likely to extend north–west /south-east direction parallel to Lake Rebecca than across strike toward Lake Rebecca (Saracen Gold Mines Pty Ltd, 2020) and is heavily influenced by the dewatering of Whirling Dervish pit creating a drawdown effect (Saracen Gold Mines Pty Ltd, 2020).

Key findings:

- Groundwater is hypersaline and is mainly used for mining purposes. Closest pastoral bore is approximately 5.5km away from TSF.
- Groundwater mounding has occurred around the current TSF complex (Cells 1 – 3) from the current operations. However, SWL within groundwater monitoring bores closest to TSF Cell 3 range in depth from 7.61mbgl to 22.03mbgl. To date, monitoring bores on the western margin of Cell 3 (MB10 MB9s and MB11) are dry.
- Groundwater quality has been affected by current seepage from the TSF, however WAD CN and metal/metalloids concentrations are below livestock drinking water guidelines (apart from lead).

3.3 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for each identified emission source and takes into account potential

source-pathway and receptor linkages as identified in Section 0. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 0), these have been considered when determining the final risk rating. Where the Delegated Officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in

Table .

Works Approval W6509/2021/1 that accompanies this Decision Report authorises construction and time-limited operations. The conditions in the issued Works Approval, as outlined in

Table have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the TSF Cell 3 (stage 3) i.e. deposition into TSF cell 3 stage 3. A risk assessment for the operational phase has been included in this Decision Report, however licence conditions will not be finalised until the department assesses the licence amendment application.

Table 5: Risk assessment of potential emissions and discharges from the Premises during construction, time limited operations, and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Source: TSF cell 3 stage 3 embankment lift. Activity: Construction works, earthworks and light vehicle/mobile equipment movements	Dust	Pathway: Air/windborne dispersion Impact: Reduced native vegetation health or native vegetation death	Native vegetation adjacent to TSF Cell 3	Refer to Section 3.1	C= Minor L = Rare **Low Risk**	Yes	N/A	N/A
Operation (including time-limited-operations)								
Source: TSF Cell 3 (Stage3). Activity: Deposition of tailings into Cell 3.	Dust (dry tailings)	Pathway: Air/windborne dispersion Impact: Reduced native vegetation health or native vegetation death	Native vegetation adjacent to TSF Cell 3	Refer to Section 3.1	C= Minor L = Rare **Low Risk**	Yes	N/A	N/A
	Leachate containing cyanide and elevated metals and metalloids	Pathway: Seepage of leachate through base and embankments of TSF Cell 3 stage 3 into soil and groundwater Impact: mounding of groundwater table causing vegetation decline or death. Reduced quality or	Surrounding groundwater and native vegetation	Refer to Section 3.1	C= Moderate L = Possible **Medium Risk**	Yes	Condition 1 – Infrastructure requirements **Condition 2 and 3 – compliance reporting requirements** **Conditions 4 and 5 – time limited operations**	The Applicant's infrastructure controls have been conditioned within the works approval in accordance with Guidance statement: Risk Assessments (DER 2017). Some additional regulatory requirements apply to reporting and time limited operations commencement and duration. These are standard conditions

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
		contamination of groundwater/soils					**commencement and duration requirement.** **Condition 6-8 – standard record and general reporting conditions**	required for most works' approvals for TSFs. The sites licence has existing conditions relating to the regulation of seepage impacts from TSF Cell 3. These include: • Standing water level limit of 4 mgbl within monitoring bores (existing condition 3.5.1); • Requirement to design and implement a groundwater recovery plan in the event that standing water levels reach 6.0 mgbl (existing condition 1.2.8). Plan is to be in accordance with existing condition 1.2.9 of the Licence; • Annual water balance required to be reported for the TSF (existing condition 1.2.7); and • Groundwater monitoring program to assess changes in groundwater levels and quality (existing condition 3.5.1) The licence will require an amendment to modify condition 1.2.13 to allow deposition into TSF Cell 3 (stage 3). The conditions outlined above adequately regulate the impact of seepage from the raised TSF Cell 3 and no additional regulatory controls will be required during time limited operation under this

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
								works approval.
	Tailings or return water with elevated metals and metalloids	Pathway: Direct discharge to land – overtopping of TSF cell 3 stage 3. Impact: Degradation of soil structure and soil contamination inhibiting vegetation growth and survival. Smothering of vegetation.	Terrestrial ecosystems - surrounding soils and native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Yes	Condition 1 – Infrastructure requirements **Condition 2 and 3 – compliance reporting requirements** **Conditions 4 and 5 – time limited operations commencement and duration requirement.** **Condition 6-8 – standard record and general reporting conditions**	The Applicant's infrastructure controls have been conditioned within the works approval in accordance with Guidance statement: Risk Assessments (DER 2017). Some additional regulatory requirements apply to reporting and time limited operations commencement and duration. These are standard conditions required for the majority of works' approvals for TSFs. The premises licence has existing conditions relating to the regulation of the risk of overtopping of TSF Cell 3 These include: • Requirement to maintain a minimum 300mm operation freeboard free board (condition 1.2.4). • TSF embankment freeboard inspected every 12 hours (condition 1.2.6). • Requirement to undertake a monthly water balance for each TSF cell (condition 1.2.7). The conditions outlined above adequately regulate the risk of cell 3 overtopping and therefore no additional regulatory controls will be required during time limited operation under this works

Risk Event					Risk rating[1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
								approval.
Source: Tailings and return water pipelines Activity: transport of tailings and return decant water via pipelines between TSF and processing plant.	Tailings or return water with elevated metals and metalloids	Pathway: Direct discharge to land – pipeline leak/rupture Impact: Degradation of soil structure and soil contamination inhibiting vegetation growth and survival	Terrestrial ecosystems - surrounding soils and vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Yes	Condition 1 – Infrastructure requirements **Condition 2 and 3 – compliance reporting requirements** **Conditions 4 and 5 – time limited operations commencement and duration requirement.** **Condition 6-8 – standard record and general reporting conditions**	The Applicant's infrastructure controls have been conditioned within the works approval in accordance with Guidance statement: Risk Assessments (DER 2017). Some additional regulatory requirements apply to reporting and time limited operations commencement and duration. These are standard conditions required for the majority of works' approvals for TSFs. The premises licence has existing conditions relating to the regulation of spills and leaks from pipelines. These include: • Requirement for all pipelines to be equipped with telemetry systems, automatic cut outs or bunded (condition 1.2.1). • Pipelines inspected for integrity every 12 hours (condition 1.2.6). The conditions outlined above adequately regulate the risk of spills or leaks from pipelines and therefore no additional regulatory controls will be required during time limited operation under this works approval.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 22/02/2021.	No comments received.	N/A.
Local Government Authority advised of proposal on 15/02/20201.	No comments received.	N/A.
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 15/02/2021.	Comments received on 8/03/2021. Saracen contacted DMIRS earlier this year to discuss the proposed TSF raise and we discussed whether a Mining Proposal would be required. The embankment raise on Cell 3 Stage 3 of the TSF was approved by the DMIRS Environment Division on the 2nd of September 2013 through Mining Proposal Reg ID: 39084. The proponent advised that the final height of the facility would not be increased through their proposed works. I then discussed this with DMIRS Geotechnical Inspector who advised that given there will be no increase to the final height of the facility, safety is not compromised and their Division would not want to see a Mining Proposal should one be submitted. A Mining Proposal would not be required.	Noted.
Applicant was provided with draft documents on 26/03/2021. Comments were received on 26/03/2021.	Please find attached and below comments to the draft Works Approval documentation. The only changes required are: • Page 1- Please change the throughput design capacity to 4,000,000 tonnes p.a. (1,600,000 million tonnes is the target based on paste sent to the underground, however we do not want to be constrained to this figure); • Page 3- Northern Star confirms that there are no raises required to the underdrainage and main decant columns during the Cell 3 Stage 3 lift. Northern Star requests that the 21-day waiting period be waived and the Works Approval issued as final as soon as you are able.	Noted and mistake has been rectified.
Applicant comments provided on 26/03/2021 via email (A1992563)	The registered business address and ACN has changed in the period between submitting the Works Approval and receiving it as Saracen Merged with Northern Star Resources. The Works Approval Holder should now be under Northern Star (Carosue Dam) Pty Ltd (ACN 116 649 122). The new business address is Level 1, 388 Hay Street Subiaco WA 6008 Australia.	Noted and changes made.

5. Conclusion

Based on the assessment in this Decision Report, the Delegated Officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Saracen Gold Mines Pty Ltd 2020, Cell 2 TSF Stage 3 Embankment Raise & Whirling Dervish Paste Implementation Supporting Information, Perth Western Australia
5. Saracen Gold Mines Pty Ltd, 2019, Carosue Dam Operations Department of Water and Environmental Regulation Annual Environmental Report 2018, Perth Western Australia

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY		
Application type		
Works approval	☒	
Date application received		16/12/2020
Applicant and Premises details		
Applicant name/s (full legal name/s)		Saracen Gold Mines Pty Ltd
Premises name		Carosue Dam Mine site
Premises location		Shire of Menzies/City of Kalgoorlie Boulder M28/166-168, M28/245, M31/208-210, M31/219-220, L28/23-32, L31/37, L31/40
Local Government Authority		Shire of Menzies
Application documents		
HPCM file reference number:		DER2020/000690
Key application documents (additional to application form):		Application form Supporting report Appendix A Cell 3 stage 3 design drawings and design report.
Scope of application/assessment		
Summary of proposed activities or changes to existing operations.		Works approval A downstream embankment raise to Cell 3 of the existing Paddock Tailings Storage Facility (TSF) from RL375.5m to the Stage 3 design height of RL377.5m (2.0m total); and Installation of pipework to Whirling Dervish Pit from an existing paste plant. This was requested through an administrative licence amendment (applied for both a WA and an amendment on the same form). Admin officers confirmed that it was all to be covered under a works approval.

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non metallic ore	4 million tonnes per annum	

Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐

Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☐ General lease ☐ Expiry: Mining lease / tenement ☒ Expiry: Other evidence ☐ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes ☒ No ☐ N/A ☐	Approval: Expiry date: If N/A explain why?
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☒	Application reference No: Licence/permit No: N/A
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: Goldfields Groundwater Area Type: RIWI ACT 1914 – Groundwater Area Has Regulatory Services (Water) been consulted? Yes ☒ No ☐ N/A ☐ Regional office: Swan Avon Region
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☐ N/A ☒

Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Mining Act 1972* - Mining proposals *RIWI Act* – groundwater licences *Dangerous Goods Safety Act 2004*
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	Classification: Database has it listed as awaiting classification. Date of classification: N/A