



Application for Licence Amendment

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

Licence Number	L7465/1999/9
Licence Holder	Northern Star (Carosue Dam) Pty Ltd
ACN	116 649 122
File Number	2011/011727-1
Premises	Carosue Dam Operations MENZIES WA 6436 Legal description – Mining tenements M28/166-168, M28/245, M28/269, M31/208-210, M31/219-220, M31/295, L28/23, L28/24, L28/25, L28/26, L28/28, L28/29, L28/30, L28/31, L28/41, L28/42, L28/54, L28/241, L31/37, and L31/40. As defined by the Premises maps attached to the Revised Licence
Date of Report	30 May 2024
Decision	Revised licence granted

**MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES**

an officer delegated under section 20 of
the *Environmental Protection Act 1986* (WA)

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Application summary	1
2.3 Overview of proposed premises operations	3
3. Risk assessment	7
3.1 Source-pathways and receptors	7
3.1.1 Emissions and controls	7
3.1.2 Receptors	10
3.2 Risk ratings	12
4. Consultation	17
5. Conclusion	17
5.1 Summary of amendments	17
References	19
Appendix 1: Summary of licence holder’s comments on risk assessment and draft conditions	20
Table 1: Proposed production capacity changes	2
Table 2: Licence holder controls	7
Table 3: Sensitive environmental receptors and distance from prescribed activity	10
Table 4. Risk assessment of potential emissions and discharges from the Premises during construction and operation	13
Table 5: Consultation	17
Table 6: Summary of licence amendments	17
Figure 1: Indicate Qena layout	6

1. Decision summary

Licence L7465/1999/9 is held by Northern Star (Carosue Dam) Pty Ltd (licence holder) for the Carosue Dam Operations mine site (the Premises), located in Menzies, Western Australia.

This amendment report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, revised licence L7465/1999/9 has been granted.

The revised licence issued because of this amendment consolidates and supersedes the existing licence previously granted in relation to the Premises.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this amendment report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary

On 12 February 2024, the licence holder submitted an application to the department to amend licence L7465/1999/9 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

Inclusion of category 5 – Tailings Storage Facility (TSF) Cell 3 Stage 4

- TSF Cell 3 Stage 4 has been constructed and currently under time limited operations in accordance with works approval W6626/2021/1. The licence holder seeks to include TSF Cell 3 Stage 4 added to the licence.
- The licence holder also seeks to remove monitoring bores MB10S and MB10D, as these monitoring bores were destroyed during construction of TSF Cell 3. Additional monitoring bores are to be constructed as part of TSF Cell 3 under works approval W6626/2021/1.

Inclusion of the changes to operations associated with the Qena Project (Qena)

- Category 6: Mine dewatering – inclusion of the Qena's turkey's nests. Monitoring bore LVHY8A may be destroyed when the Qena boxcut is developed. The licence holder has indicated that a replacement monitoring bore, QBMB1, may be constructed (if LVHY8A is destroyed).
- Category 52: Electric power generation – increase the production capacity to 33 megawatts (MW) and include the point source emission for a temporary power station at Qena.
- Category 63: Class I inert landfill – inclusion of the proposed landfill for the disposal of Class I and Class II inert waste and to bury tyres at Qena and increase the production capacity to 4,500 tonnes.
- Category 73: Bulk storage of chemicals – inclusion of the Qena fuel facility and increase the production capacity for bulk storage of chemicals to 1,800 cubic metres (m³).

Changes to the licence to be more consistent with other regulatory controls

- Increase the production capacity for category 6 to 6,520,000 kilolitres per annum (kL/a) to align with the groundwater licences (GWL 157428, GWL 103538, and GWL 151848)

granted under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

- Amend the prescribed premises boundary to better align with the Disturbance Envelope approved under Mining Proposal (MP) Reg ID 101504 under the *Mining Act 1978*.

This amendment is limited only to changes to Category 5, 6, 52, 63, and 73 activities from the existing licence. No changes to the aspects of the existing licence relating to Category 54 and 64 have been requested by the licence holder. Table 1 below outlines the proposed changes to the existing licence.

Table 1: Proposed production capacity changes

Category	Current production capacity	Proposed production capacity	Description of proposed amendment
Category 5: Processing and beneficiation of metallic or non-metallic ore	4,500,000 tonnes per annual period (tpa)	No change to production capacity.	Amendment is for the inclusion of TSF Cell 3 Stage 4 to operate under the licence (associated with works authorised under W6626/2021/1).
Category 6: Mine dewatering	1,000,000 tpa	6,520,000 tpa	Increase the production capacity to align with the groundwater licences under the RIWI Act. Inclusion of Qena's turkey's nests and changes to the monitoring bore locations.
Category 52: Electric power generation	28 MW	33 MW	Increase the production capacity and include the point source emission for a temporary power station at Qena's Project.
Category 54: Sewage facility	150 m ³ / day	-	No proposed changes.
Category 63: Class I inert landfill site	3,500 tpa	4,500 tpa	Increase the production capacity and include the proposed landfill site at Qena's Project for the disposal of Class I and II inert waste and to bury tyres.
Category 64: Class II or III putrescible landfill site	6,000 tpa	-	No proposed changes.
Category 73: Bulk storage of chemicals etc.	1,400 m ³	1,800 m ³	Increase the production capacity and include the Qena's Project fuel facility to the licence.

2.3 Overview of proposed premises operations

TSF Cell 3 Stage 4 operations

TSF Cell 3, Stage 4, embankment raise has been constructed under works approval W6626/2021/1. A critical containment infrastructure report (CCIR) was received by the department on 14 February 2023 and deemed partially compliant on 20 June 2023. This was due to late submission of the CCIR and a minor change in the thickness of the erosion protection layer of waste rock capping for Cell 3 Stage 4. The department accepted the works approval holder's explanation that this was a result of a typographical error with the design report and no further action was required.

An environmental compliance report (ECR) for the TSF pipelines was submitted on 22 June 2023 and was deemed compliant on 11 August 2023 after additional requested information was provided to the department on 4 July 2023 to meet compliance requirements. Time limited operations commenced on 20 June 2023 for a period not exceeding 180 calendar days or until the TSF Cell 3 Stage 4 embankment raise is granted on the current licence.

The TSF Cell 3 Stage 4 embankment raise consists of a 3.5 m raise where tailings are deposited from the perimeter embankments towards the centre of the Cell 3 basin. Tailings will eventually desiccate and develop a beach with a supernatant pond surrounding the central decant tower. The formation of the beach and location of the supernatant pond will be manually controlled by the Processing personnel on site by the operation of spigot clamps. Supernatant water is recovered via a submersible pump located in the decant (along with the underdrainage towers) and then returned to the processing plant for reuse. TSF Cell 3, Stage 4, has a capacity of 2.9 million tonnes of dry tailings and operates as a standalone facility.

Changes to operations associated with the Qena Project

The Qena Project includes the development of an underground mine and associated infrastructure, which includes, but not limited to, a boxcut, run-of-mine pad, two waste rock dumps (WRDs), workshops, offices, and topsoil stockpiles. In addition, two turkey's nests will be constructed with associated pipelines for excess mine dewatering wastewater to be stored for the use of dust suppression. The licence holder indicates that most of the Qena dewatering wastewater will be used in the processing plant and discharged to Monty's pit and / or Twin Peaks pit. Qena will be located adjacent to the Luvironza in-pit TSF and works are planned to commence in July 2024 (Figure 1). The prescribed activities associated with Qena include category 6, 52, 63, and 73 all of which are approved under the current licence. The licence holder has also advised the department that the MP Reg ID 101504 revision will be submitted to DEMIRS for the inclusion of the Qena Project.

Dewatering

For the development of the Qena underground mine, dewatering is required. Pennington Scott (2024) undertook a hydrological assessment for the Qena. Numerical groundwater modelling has indicated a dewatering rate of 1.0 to 6.5 litres per second (L/s), dependent on key hydraulic parameters, for example the host rock permeability. The estimated dewatering requirement for Qena is up to 500,000 kL/a.

Pennington Scott (2024) recommended to install several vibrating wire piezometers around the proposed underground area to measure and monitor pore pressure changes in the lower saprolite, saprock, and deep fresh rock horizons. For surface water management, Pennington Scott (2024) recommended there should be no changes made to the natural drainage system; however, the Qena box cut should have a 1 m high flood exclusion bund / windrow with a top elevation of at least 351 m RL surrounding it and a built-up crest in the decline access haul road. A 1 m high perimeter bund around the Qena WRD and decline access haul road should contain any potentially acid generating material located at the WRD from being discharged into the surrounding natural drainage system.

As part of this assessment, an environmental impact assessment was undertaken on the potential surface water and groundwater management risks from Qena. The outcome of the assessment is summarised below:

- There are no other groundwater users within a 5 km radius of Qena that would be impacted. As the groundwater is hypersaline (50,000 to 200,000 mg/L total dissolved solids (TDS)), there is no potential beneficial use for other groundwater users, for example livestock drinking water.
- Qena will have no impacts on vegetation health and diversity or potential subterranean fauna within a 2 km radius of Qena. The original saline alluvial plain shrublands are not groundwater dependent as groundwater depth is approximately 8 m or more below ground level. In addition, historically the Premises has been cleared and disturbed from previous mining activities.
- Two registered aboriginal heritage sites located approximately 1.8 km and 2.6 km south of Qena are listed as artifact scatters, which are likely not sensitive to water impacts.

The existing monitoring bore network around the Luvionza in-pit TSF will be used to monitor groundwater changes with a proposed additional monitoring bore, QMB01, if monitoring bore, LVHY8A is to be destroyed during the development of the Qena boxcut. The licence holder has noted that the mine dewatering wastewater quality for Qena will be the same water quality as that from the Luvionza in-pit TSF.

Electric power generation and bulk fuel storage

As part of the Qena, a temporary diesel driven power station will be installed that will be comprised of six 1250 kilovolt-amps (kVA) diesel generators to power up to a 5 MW power station. Up to three 110 kL diesel fuel tanks will be installed with the proposed controls detailed in section 3.1.1. The inclusion of the Qena power generation will increase the category 52 production capacity to 33 MW and the Qena fuel storage will increase the category 73 production capacity to 1,800 m³. The licence holder has not determined the final location of the power station and fuel storage; however, has provided three indicative locations in Schedule 1 maps, Figure 8 of the licence.

Class I and II inert landfill and tyre disposal area

Class I and II inert landfill and tyre disposal area is proposed to be constructed and operated within the proposed Qena WRD, where it is expected approximately 1,000 tpa of inert waste to be disposed of. As a result, the licence holder proposes to increase the current production capacity on the licence to 4,500 tpa to include the Qena landfill and tyre disposal area. The landfill area will compose of trenches with the dimensions of 20 m by 2 m by 2m and will be constructed in accordance with the *Environmental Protection (Rural Landfill) Regulations 2002*. Operational requirements for the Qena landfill and tyre disposal area will be the same requirements for the existing landfill areas within the Premises approved under the current licence.

Changes to the licence to be consistent with other regulatory controls

Dewatering production capacity

The licence holder has several groundwater licences approved under the RIWI Act with a combined total water abstraction of 6,520,000 kL/a. GWL 157428 is permitted for abstraction of 4,000,000 kL/a, GWL 151848 is permitted for abstraction of 20,000 kL/a, and GWL 103538 is permitted for abstraction of 2,500,000 kL/a. The licence holder notes that the current licence for mine dewatering production capacity does not align with the combined abstraction total approved under the RIWI Act and requests for this to be aligned.

The department requested further details from the licence holder on the use of mine dewater and the containment infrastructure capacities that the mine dewater would be discharged into.

The licence holder indicated that mine dewater will be used for onsite dust suppression and in the processing plant and any excess mine dewater will be discharged into the approved pits on the current licence. The total storage capacity of the approved pits is approximately 45,736,327 m³ comprised of:

- Whirling Dervish pit – capacity of 24,380,141 m³;
- Karari pit – capacity of 18,402,000 m³;
- Twin Peaks pit – capacity of 1,811,289 m³; and
- Monty's pit – capacity of 1,142,892 m³.

Changes to prescribed premises boundary

The licence holder has requested to amend the prescribed premises boundary to better align with the Disturbance Envelope approved under MP Reg ID 101504 under the *Mining Act 1978*. Three additional tenements, L28/42, L28/54, and L28/241 are included in the revised prescribed premises boundary under the licence.

The department has made the above requested changes.

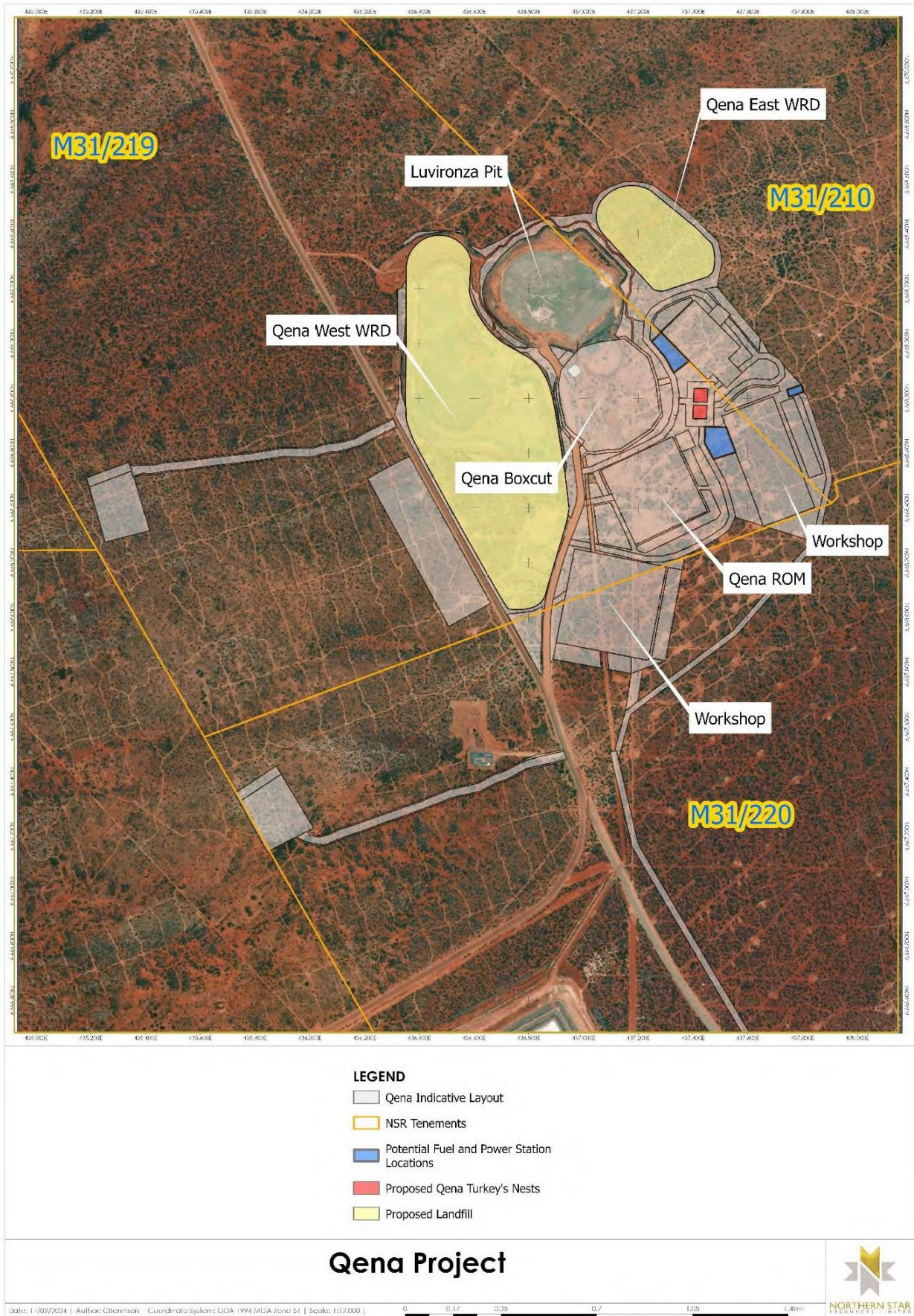


Figure 1: Indicate Qena layout

Licence: L7465/1999/9

IR-T15 Amendment report template v3.0 (May 2021)

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 *Guideline: Risk assessments* (DWER 2020a).

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.

3.1 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 amendment report are detailed in Table 2 below. Table 2 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence holder controls

Sources / activities	Potential emission	Potential pathways	Proposed controls
Construction			
Construction of two turkey's nests and associated pipeline for the Qena Project Installation of the power station Construction of the landfill area at the Qena WRD Construction of 3 x 110 kL fuel tanks Construction and installation of monitoring bore Earthworks and machinery	Dust	Air / windborne pathway, then deposition.	<ul style="list-style-type: none"> • turkey's nests must be constructed with the following: <ul style="list-style-type: none"> ○ earth / rock bund walls; ○ a HDPE liner; ○ installation of fauna egress ladders / nets; ○ dimensions of 50 m x 50 m x 2 m; ○ storage capacity of 5,000 m³ (total combined capacity of 10,000 m³); and ○ designed to maintain a 300 mm freeboard. • associated pipelines to the two turkey's nests must be constructed as per existing requirements under condition 3. • power station requires no construction requirements. • fuel tanks must be self-bunded and the transformers with low voltage (LV) and high voltage (HV) switchgear must be on fully bunded skids designed to hold at least 110% of contained fluid. • Qena landfill area must be constructed in accordance with the <i>Environmental Protection (Rural</i>

Sources / activities	Potential emission	Potential pathways	Proposed controls
			<p><i>Landfill) Regulations 2002</i>. The landfill will be constructed as per the existing landfill areas at the Premises with exception of the trench dimensions proposed as 20 m x 2 m x 2m.</p> <ul style="list-style-type: none"> existing conditions 2, 3, 7, and 22 under the licence apply.
Operation			
Dust (dried tailings) lift-off from the surface of the TSF	Dry tailings (particulates) on exposed beaches potentially containing increased concentrations of metals, salts, and nutrients	Air / windborne pathway, then deposition.	<ul style="list-style-type: none"> existing conditions 11 and 13 under the licence apply. due to the short timeframe between lifts, dusting of tailings is not expected to occur as the material will retain moisture from operation of the cell.
Operation of TSF Cell 3 Stage 4 – deposition of tailings	Tailings with cyanide and elevated metals and metalloids	Direct discharge to land and overtopping of TSF	<ul style="list-style-type: none"> existing conditions 11, 12, 13, 14, 20, 30, and 31 under the licence apply.
	Seepage of tailings material through the TSF Cell 3 embankment and foundation base	Infiltration through soil to underlying groundwater	
Use of turkey's nests and associated pipeline at the Qena Project	Mine dewatering wastewater	Direct discharge and overflow	<ul style="list-style-type: none"> existing conditions 7, 11, and 13 under the licence apply.
		Direct discharge to land from leaks / ruptured pipeline	
Increased capacity of mine dewatering wastewater to be discharged into approved turkey's nest and pits under the current licence and used in the CDO	Mine dewatering wastewater	Seepage through unlined pits	<ul style="list-style-type: none"> existing conditions 25, 28, and 29 under the licence apply.
		Direct discharge to land and overland flow	<ul style="list-style-type: none"> existing conditions 7, 11, and 13 under the licence apply.

Sources / activities	Potential emission	Potential pathways	Proposed controls
processing plant		(including pipeline leaks and ruptures)	
Mine dewatering wastewater for onsite dust suppression	Saline mine dewatering wastewater	Overspray or runoff during dust suppression operations Saline mine dewatering on native vegetations	<ul style="list-style-type: none"> existing conditions 6 and 22 under the licence apply.
Operations of Class I and II inert landfill and tyre disposal area at the Qena WRD	Dust	Air / windborne pathway	<ul style="list-style-type: none"> existing conditions 6, 17, 18, 19, and 22 under the licence apply. Qena landfill and tyre disposal area must be inspected and maintained regularly, and once the trench has reached capacity, inert waste, clean fill, or other appropriate cover material must be used to cover the landfill to an approximate depth of 500 mm. Qena landfill and tyre disposal area must be maintained and operated in accordance with the <i>Environmental Protection (Rural Landfill) Regulations 2002</i>.
	Stormwater run-off	Stormwater run-off	
Operation of the temporary diesel power station at the Qena Project	Exhaust gases (particulates, nitrogen oxides, carbon monoxide)	Air / windborne pathway	<ul style="list-style-type: none"> existing conditions 23 and 24 under the licence apply. no further risk assessment is required to be undertaken, only inclusion of the Qena power station to Table 10 as an emission point where waste is emitted to the air.
Operation of 3 x 110 kL fuel tanks	Hydrocarbon spills and leaks	Direct discharge to land	<ul style="list-style-type: none"> no proposed operational controls imposed as the general provisions of the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> applies.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020a), the Delegated Officer has excluded employees, visitors and contractors of the licence holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 3 below provides a summary of potential environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020b)). It should be noted that any potential sensitive human receptors have been screened out from the risk assessment as the nearest human receptors, due to a distance of more than 20 km from the prescribed premises boundary.

Table 3: Sensitive environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
<p><u>Public Drinking Water Source Area</u> <i>Cue Water Reserve</i></p>	Approximately 9.5 km west of the premises boundary.
<p>Surface water – minor non-perennial water course</p>	<p>Borders the western edge of the proposed TSF3. The ephemeral creek originates north of the TSF3 and runs immediately to the west of the TSF3 before turning to the south-west. The ephemeral creek intersects a main creek line approximately 2.5 km to the south of the Premises. During heavy rainfall events the main creek discharges into Lake Austin located approximately 5 km south of the Premises.</p> <p>Minor tributaries flow on the western and eastern edges of the TWTSF flowing towards Lake Austin.</p>
<p><u>Surface water – Lake Austin</u> Lake Austin is a significant salt-lake system that supports micro-organisms which provide a food source for local and migratory bird species.</p>	Approximately 10 km south of the southern portion of the premises boundary.
<p><u>Groundwater</u> Historically flows in a south direction towards Lake Austin.</p>	<p>Historical groundwater located 26-27 metres below ground level (mbgl).</p> <p>Electromagnetic and resistivity surveys around TSF2 in March 2021 indicated water levels of between 12 to 18 mbgl.</p>
<p>Tuckabeena Well</p>	<p>Approximately 600 m to the southeast of TSF3.</p> <p>Applicant states that the “<i>reserved area within the PPB (Tenement M 20/108) with no plans for development or future utilization.</i>”</p>
<p><u>Priority Ecological Communities (PEC)</u></p> <ol style="list-style-type: none"> <i>Lake Austin vegetation complexes (banded ironstone formation) P1</i> <i>Austin Land System P3</i> 	<ol style="list-style-type: none"> Within the southern portion of the premises boundary, approximately 1.5 km southeast from TWTSF and approximately 5 km southeast of TSF3. Approximately 3.7 km southeast from the premises boundary, but approximately 12.7 km southeast from TWTSF.
<p><u>Priority flora</u></p> <ol style="list-style-type: none"> <i>Acacia speckii P4</i> <i>Prostanthera ferricola P3</i> 	<ol style="list-style-type: none"> Approximately 5 km from TSF3. Approximately 1.6 km west from TSF3 outside the premises boundary. Within the premises boundary. Considered endemic to

Environmental receptors	Distance from prescribed activity
<ol style="list-style-type: none"> 3. <i>Drummondita miniata</i> P3 4. <i>Sida picklesiana</i> P3 5. <i>Dodonaea amplisemina</i> P4 6. <i>Calotis</i> sp. Perrinvale Station P3 <p>No species protected by the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) or the <i>Biodiversity Conservation Act 2016</i> (BC Act) were recorded in the Survey Area.</p>	<p>the Murchison bioregion. One plant was located 200m to the south of TSF2.</p> <ol style="list-style-type: none"> 4. Within the premises boundary. A single plant was also recorded in the drainage line, 600m south of TSF2. 5. Located outside the premises boundary approximately 2 km. 6. Within the premises boundary.
<p><u>Threatened and Priority fauna</u></p> <ol style="list-style-type: none"> 1. West Coast Mulga Slider (<i>Lerista eupoda</i>) P1 2. Shield-backed Trapdoor Spider (<i>Idiosoma nigrum</i>) Vulnerable 	<ol style="list-style-type: none"> 1. Western Ecological survey (2021) considered the potential for the slider to inhabit the survey area due to suitable habitat. However, no records in the survey area. 2. Recorded at Weld Range.
<p><u>Aboriginal and other heritage sites</u></p> <ol style="list-style-type: none"> 1. Heritage Site ID 6200 – South Tree Scar (Lodged) 2. Heritage Site ID 6199 – Tuckabianna South-West Artefacts/Scatter (Lodged) 3. Heritage Site ID 6257 – Webbs Patch Artefacts/Scatter/Water Source (Registered) 4. Heritage Site ID 10787– Cue East Artefacts/Scatter/Painting, Rockshelter, Arch Deposit, Camp (Registered) 5. Heritage Site ID 10736 – Painting (Registered) 6. Heritage Site ID 10738 – Cue Artefacts / Scatter / Man-Made Structure / Skeletal Material / Burial (Lodged) 7. Heritage Site ID 10735 – Muir’s Site 05. Engraving, Named Place, Water Source (Registered) 	<ol style="list-style-type: none"> 1. Approximately 200 m west from the premises boundary. 2. Approximately 690 m southwest from the premises boundary. 3. Approximately 3.4 km south of the premises boundary. 4. Approximately 3 km east from the premises boundary. 5. Approximately 3.7 km northwest from the premises boundary. 6. Approximately 2.9 km east from the premises boundary. 7. Approximately 4.5 km west from the premises boundary.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the licence holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the licence holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the licence holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The revised Licence L7465/1999/9 that accompanies this amendment report authorises emissions associated with the operation of the Premises. The conditions in the revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence holder's controls				
Construction								
Construction of two turkey's nests and associated pipeline for the Qena Project Installation of the power station Construction of the landfill and tyre disposal area at the Qena WRD Construction of 3 x 110 kL fuel tanks Construction of monitoring bore Earthworks and machinery	Dust	Air / windborne pathway Potential impact to vegetation health and threatened fauna	Native vegetation including priority flora Malleefowl	Refer to Section 3.1	C = Slight L = Possible Low Risk	N	Conditions 2 , 3 , 7 , 8 and 22	Condition 2: Inclusion of the design and construction requirements for the Qena turkey's nests pipelines, fuel tanks, and landfill and tyre disposal area. Condition 7: Inclusion of the containment infrastructure for the Qena turkey's nests. Condition 8: Inclusion of the design, construction, and installation requirements for monitoring bore QMB1.
Operation								
Dust (dried tailings) lift-off from the surface of the TSF	Dry tailings (particulates) on exposed beaches potentially containing increased concentrations of metals, salts, and	Air / windborne pathway, then deposition. Potential impact to vegetation health.	Native vegetation including priority flora	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Conditions 11 and 13	N/A

Licence: L7465/1999/9

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence holder's controls				
	nutrients							
Operation of TSF Cell 3 Stage 4 – deposition of tailings	Tailings with cyanide and elevated metals and metalloids	Direct discharge to land and overtopping of TSF causing impact to vegetation health (including priority flora), surface water, threatened fauna and associated habitat.	Native vegetation including priority flora Malleefowl and associated habitat Surface water	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1 , 11, 12, 13, 14, 20, 30, and 31	Condition 1: Inclusion of the production or design capacity limits for the Schedule 1 categories.
	Seepage of tailings material through the TSF Cell 3 embankment and foundation base	Infiltration through soil to underlying groundwater causing a detrimental effect on the local groundwater quality. Infiltration through soil causing an increase in groundwater level. Impacts on native vegetation due to waterlogging and increased salts.	Native vegetation including priority flora Malleefowl and associated habitat Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 11, 12, 13, 14, 20, 30, and 31	N/A
Use of turkey's nests and associated pipeline at the Gena Project	Mine dewatering wastewater	Direct discharge and overflow. Potential impact to vegetation health (including priority flora), surface water and threatened fauna and associated	Native vegetation including priority flora Malleefowl and associated habitat	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 7, 11, and 13	Condition 13: Inclusion of visual inspection for turkey's nests pipeline integrity when in operation.

Licence: L7465/1999/9

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence holder's controls				
		habitat.	Surface water					
		Direct discharge to land from leaks / ruptured pipeline. Potential impact to vegetation health (including priority flora), surface water, and groundwater.	Native vegetation including priority flora Surface water Groundwater	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 7, 11, and 13	Refer to condition 13 reasoning above.
		Seepage through unlined pits causing contamination of the groundwater.	Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1 , 25, 28, and 29	Refer to condition 1 reasoning above.
Increased capacity of mine dewatering wastewater to be discharged into approved turkey's nest and pits under the current licence and used in the CDO processing plant	Mine dewatering wastewater	Direct discharge to land and overland flow (including pipeline leaks and ruptures). Potential impact to vegetation health (including priority flora), surface water, threatened fauna and associated habitat.	Native vegetation including priority flora Malleefowl and associated habitat Surface water	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Conditions 7, 11, and 13	Refer to condition 13 reasoning above.
Mine dewatering wastewater for onsite dust suppression	Saline mine dewatering wastewater	Overspray or runoff during dust suppression operations (e.g., action of spraying saline water) Saline mine dewatering on	Surrounding native vegetation including priority flora Soil	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 6 and 22	N/A

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence holder's controls				
		native vegetation impacting vegetation health and cause erosion / sedimentation.						
Operations of Class I and II inert landfill and tyre disposal area at the Qena WRD	Dust	Air / windborne pathway potential to impact vegetation health, threatened fauna and associated habitat.	Native vegetation including priority flora Malleefowl and associated habitat	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 6, 17, 18, 19, and 22	N/A
	Stormwater run-off	Stormwater run-off Causing potential surface water and groundwater contamination and impact to surface water and groundwater quality.	Native vegetation including priority flora Soil Groundwater Surface water	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 17, 18, and 19	N/A
Operation of 3 x 110 kL fuel tanks	Hydrocarbon spills and leaks	Direct discharge to land Contamination of the surrounding soils and possible infiltration to groundwater.	Soil Groundwater	Section 3.1	C = Slight L = Rare Low Risk	Y	No conditions imposed.	For any likely hydrocarbon spills and leaks, the general provisions of the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> apply.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020a).

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

4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Licence holder was provided with draft amendment on 02 May 2024	Licence holder's comments are provided in Appendix 1.	Department's response is provided in Appendix 1.

5. Conclusion

Based on the assessment in this amendment report, the Delegated Officer has determined that a revised licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised licence as part of the amendment process.

Table 6: Summary of licence amendments

Condition no.	Proposed amendments
-	Minor typographical and grammatical errors corrected.
Cover page	Inclusion of the mining tenements L28/42, L28/54, and L28/241 to align with the disturbance envelope for Carosue Dam Operations approved under the Mining Act. Amended the assessed production capacity for categories 6, 52, 63, and 73.
Licence history	Removal of previous works approvals. Inclusion of changes for this licence amendment.
1, Table 1	New condition for the production or design capacity limits for the schedule 1 categories to not be exceeded.
2, Table 2	Previously condition 16, Table 7 (renumbered and reordered). Inclusion of the design and construction requirements for the Qena Turkey's nests and pipelines, fuel tanks, and landfill and tyre disposal area.
3	Previously condition 1 (renumbered and reordered).
4	Previously condition 17 (renumbered and reordered). Inclusion of the reference to conditions 2 and 3 for reporting requirements.
5	Previously condition 18 (renumbered and reordered). Inclusion of the reference to conditions 2 and 3 for reporting requirements.
6	Previously condition 2 (renumbered and reordered).
7, Table 3	Previously condition 3, Table 1 (renumbered and reordered).

Condition no.	Proposed amendments
	Inclusion of the Qena turkey's nests and infrastructure requirements.
8, Table 4	New condition for the construction and installation requirements for the proposed monitoring bore QMB01.
9	New condition for the submission of a bore construction report for monitoring bore QMB01.
10	New condition for groundwater baseline sampling to be undertaken for monitoring bore QMB01.
11 and 12	Previously conditions 4 and 5 (renumbered and reordered).
13, Table 5	Previously condition 6, Table 2 (renumbered and reordered). Inclusion of the visual inspection of turkey's nests pipelines for integrity.
14 to 16	Previously conditions 7, 8, and 9 (renumbered and reordered).
17, Table 6	Previously condition 10, Table 3 (renumbered and reordered).
18, Table 7	Previously condition 11, Table 4 (renumbered and reordered).
19	Previously condition 12 (renumbered and reordered).
20, Table 8	Previously condition 13, Table 5 (renumbered and reordered). Amended the stage 3 raise to stage 4 of TSF cell 3 and operating height from 377.5 m to 381.0 m.
21, Table 9	Previously condition 14, Table 6 (renumbered and reordered).
22 and 23	Previously conditions 15 and 19 (renumbered and reordered).
24, Table 10	Previously condition 20, Table 8 (renumbered). Inclusion of the Qena power station generator.
25, Table 11	Previously condition 21, Table 9 (renumbered).
26 and 27	Previously conditions 22 and 23 (renumbered).
28, Table 12	Previously condition 24, Table 10 (renumbered).
29, Table 13	Previously condition 25, Table 11 (renumbered).
30, Table 14	Previously condition 26, Table 12 (renumbered). Removal of TSF monitoring bores MB10S and MB10D and the inclusion of the Qena monitoring bore QMB01.
31	Previously condition 27 (renumbered).
32 to 34	Previously conditions 28, 29, and 30 (renumbered).
35, Table 15	Previously condition 31, Table 12 (renumbered).
36	Previously condition 32 (renumbered).
37, Table 16	Previously condition 33, Table 14 (renumbered).
38	Previously condition 34 (renumbered).

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
3. DWER 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
4. Pennington Scott 2024, *Northern Star Resources Limited – Qena Project – Carosue Dam Operation – Water Investigations 02 February 2024*, unpublished report for Northern Star Resources Limited.

Appendix 1: Summary of licence holder's comments on risk assessment and draft conditions

Condition	Summary of licence holder's comment	Department's response
2, Table 2	<p>Qena Turkeys Nest Dewatering Pipeline</p> <p>Northern Star does not intend to construct the Qena Project's turkeys nest pipelines to the standard of Condition 1, Table 1 of W6626/2021/1.</p> <p>Table 1 of W6626/2021/1 refers to design and construction requirements pertaining to "Pipelines carrying tailings and TSF return water" (see attached).</p> <p>The Qena Turkeys Nest Dewatering Pipeline is intended to contain saline mine dewater, and as such, it is intended that the design and construction requirements will adhere to the standard of all other licenced mine dewater pipelines (as per L7465/1999/9, Condition 1, or Condition 3 in the amended licence draft) as follows:</p> <ul style="list-style-type: none"> - <i>Equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures;</i> - <i>Equipped with automatic cut-outs in the event of a pipe failure; or</i> - <i>Provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections</i> <p>This mine dewater pipeline will fall under the relevant inspection timeframes of the amended licence, being every 12 hours when in operation (Condition 13, Table 5).</p> <p>These proposed design and construction requirements will be audited and reported upon once constructed, as per Condition 4 of the amended operating licence.</p>	Amended.
24, Table 10	<p>Qena Power Station Emission Point Height</p> <p>The minimum emissions point height of the Qena Power Station Generator will be 5 m.</p>	Emission point height added.