Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L4597/1988/14
Licence Holder	Barto Gold Mining Pty Ltd
ACN	161 566 490
File Number	DER2014/000887-1~11
Application	APP-0028981
Premises	Southern Cross Operations MARVEL LOCH WA 6426 Mining Leases M77/7, M77/8, M77/10, M77/26, M77/31, M77/66, M77/72, M77/86, part of M77/109, M77/112, M77/113, M77/114, M77/133, M77/137, M77/138, M77/159, M77/175, M77/193, M77/197, M77/198, M77/217, M77/221, M77/224, M77/225, M77/239, M77/251, M77/347, M77/352, M77/380, M77/408, M77/424, M77/431, M77/432, M77/525, M77/554, M77/555, M77/593, M77/631, M77/638, M77/640, M77/660, M77/655, M77/668, M77/702, M77/745, M77/721, M77/746, M77/747, M77/722, M77/765, M77/766, M77/768, M77/775, M77/790, M77/791, M77/792, M77/793, M77/794, M77/811, M77/969, M77/977, M77/1009, M77/1036, M77/1052 and M77/1275, Miscellaneous Licences L77/31, L77/42, L77/51, L77/87, L77/106, L77/112, L77/113, L77/114, L77/126, L77/128, L77/162, L77/167, L77/168, L77/173, L77/281, L77/290 and General Purpose Leases G77/1-3 As defined by the Premises maps (Figure 1 and Figure 2) attached to the Revised Licence
Date of Report	4 August 2025
Decision	Revised licence granted

Christine Pustkuchen

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MANAGER, RESOURCES INDUSTRIES
ENVIRONMENTAL REGULATION (STATEWIDE DELIVERY)
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L4597/1988/14 is held by Barto Gold Mining Pty Ltd (works approval holder) for the Southern Cross Operations (the premises), located at Mining Leases: M77/7, M77/8, M77/10, M77/26, M77/31, M77/66, M77/72, M77/86, part of M77/109, M77/112, M77/113, M77/114, M77/133, M77/137, M77/138, M77/159, M77/175, M77/193, 77/197, M77/198, M77/217, M77/221, M77/224, M77/225, M77/239, M77/251, M77/347, M77/352, M77/380, M77/408, M77/424, M77/431, M77/432, M77/525, M77/554, M77/555, M77/593, M77/631, M77/638, M77/640, M77/660, M77/655, M77/668, M77/702, M77/745, M77/721, M77/746, M77/747, M77/722, M77/765, M77/766, M77/768, M77/775, M77/790, M77/791, M77/792, M77/793, M77/794, M77/811, M77/969, M77/977, M77/1009, M77/1036, M77/1052 and M77/1275, Miscellaneous Licences L77/31, L77/42, L77/51, L77/87, L77/106, L77/112, L77/113, L77/114, L77/126, L77/128, L77/162, L77/167, L77/168, L77/173, L77/281, L77/290 and General Purpose Leases G77/1-3.

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 operation of the premises. As a result of this assessment, revised licence L4597/1988/14 has been granted.

The revised licence issued as a result of this amendment 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 Amendment summary

On 6 May 2025, the licence holder submitted an application to the department to amend licence L4597/1988/14 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction of a new mine dewater pipeline from the Frasers mine area to Polaris South Pit and upgrade of a section of the pipeline from Polaris South Pit to Cornishman pits (north, central and south) (section 2.4);
- Add tenements L77/31 and L77/42 to the premises boundary to reflect current licence holders tenements and operational activities. (Figure 1);
- Construction of a mine dewatering pipelines from Marvel Loch underground mine to Triad Pit and add Lenneberg, Mary Lena and Treasury pits as dewater discharge locations from Marvel Loch underground mine (section2.5); and
- Administrative amendment to change the pipeline construction requirement diameter for Yilgarn Star Pit to Nevoria Pit (section 2.7).

This amendment is limited only to changes to Category 6 activities from the existing licence. No changes to the aspects of the existing licence relating to Category 5, 57 and 64 have been requested by the licence holder.

The Licence Holder advises that the Category 6 authorised discharge rate for the Premises will not exceed the current limit of 6,000,000 tonnes per annual period.

2.3 Current dewatering activities

The licence holder has historically discharged mine dewater from open pits and underground mines to various discharge locations. Licence L4597/1988/14 currently authorises discharge of mine dewater to: Marvel Loch Pit, Glendower Pit, Jaccoletti Pit, Nevoria Pit, Fraser's Pit, Triad Pit, Polaris South Pit, Yilgarn Star pit, Axehandle Pit, Transvaal complex (Transvaal Pit, Aquarius Pit, Polaris Pit and Sunbeam Pit), Achilles West/East Pit, Achilles South Pit, Achilles North Pit, Rhapsody Pit, Windmills Pit, Redox Pit, Cornishman Complex Pits, GVG Pit, Hercules Pit, Grand National Pit, Southern Star Pit, Harris Find Pit, Ruapehu Pit and Maori Lass Pit.

2.4 Frasers to Polaris South & Cornishman complex

The licence holder has recommenced underground mining operations at the Frasers underground mine in September 2024. Currently the licence allows the licence holder to discharge water extracted from Frasers underground mine in to the Transvaal complex (consisting of Aquarius, Transvaal, Polaris and Sunbeam pits). Mine dewater is then able to be extracted from the Transvaal complex and discharged again to the Cornishman complex consisting of Cornishman North Pit, Cornishman Central Pit and Cornishman South Pit (Figure 2).

All Transvaal complex pits and Cornishman complex pits are already authorised category 6 mine dewater discharge locations. Transvaal complex and Cornishman complex were authorised as mine dewater discharge locations on 4 July 2023 and 4 July 2024 respectively.

During the underground operations at Frasers mine the licence holder has identified a requirement for a more direct route for the dewatering operation from Frasers mine to the Cornishman complex for both short and long-term dewatering. The direct route will involve a newly constructed dewatering pipeline from Frasers underground mine to Polaris South Pit (a Transvaal complex pit) (Figure 2) and an upgrade of a portion of pipeline from Polaris South Pit to the Cornishman complex to accommodate the larger anticipated maximum flow rate of 180 L/s as the pipeline is degraded and consists of a low pressure nominal (PN) rating.

As the Cornishman complex pits are already approved dewater discharge locations the department has not re-assessed the environmental impact associated with the discharge of mine dewater into these pits. The department has risk assessed the transportation of the mine dewater from Frasers underground mine to the Cornishman complex due to the new proposed pipeline route and has risk assessed the potential overtopping from the increased flow rate within the risk assessment (section 3.2).

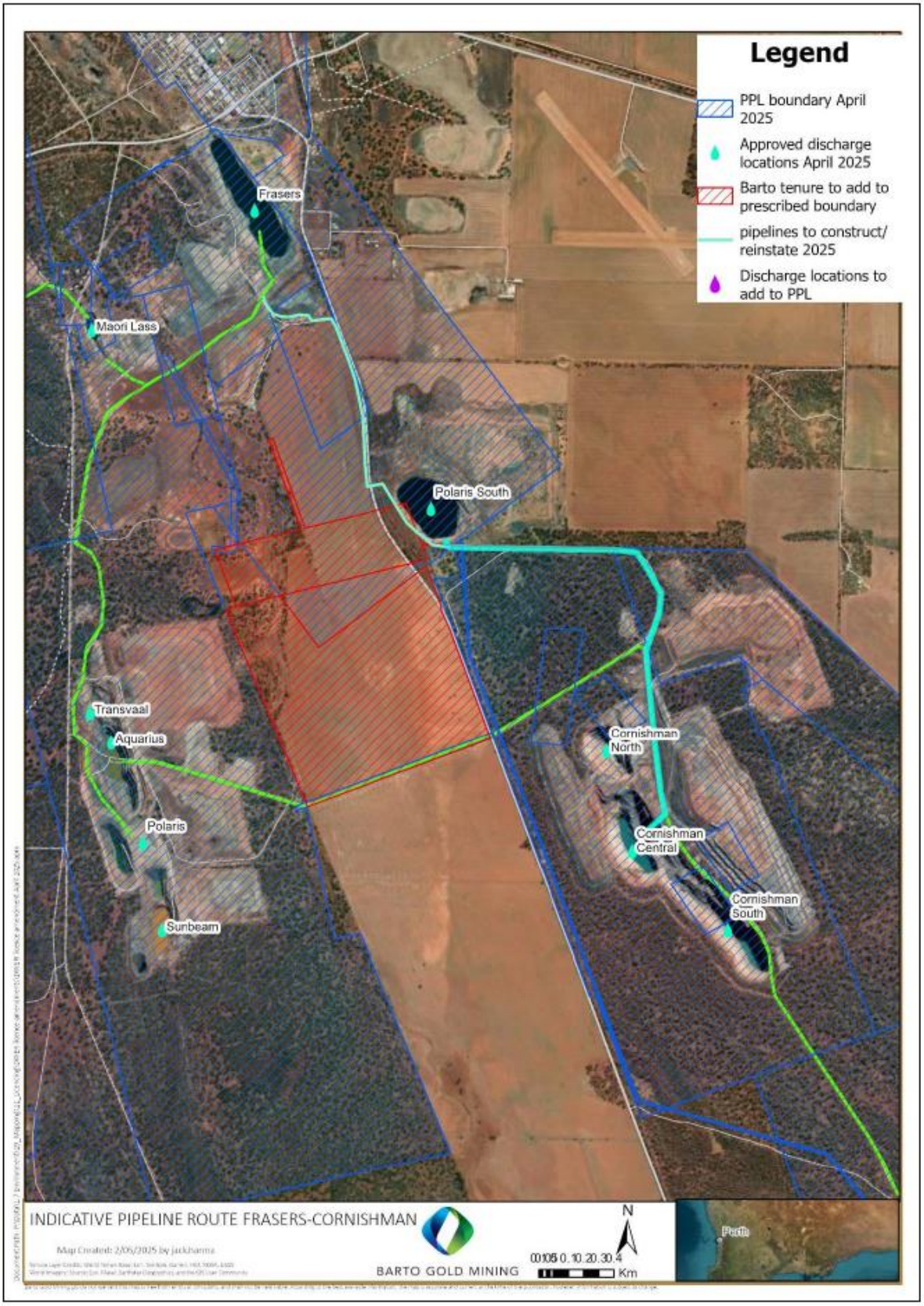

Figure 1: Frasers to Polaris South to Cornishman mine dewater pipeline route

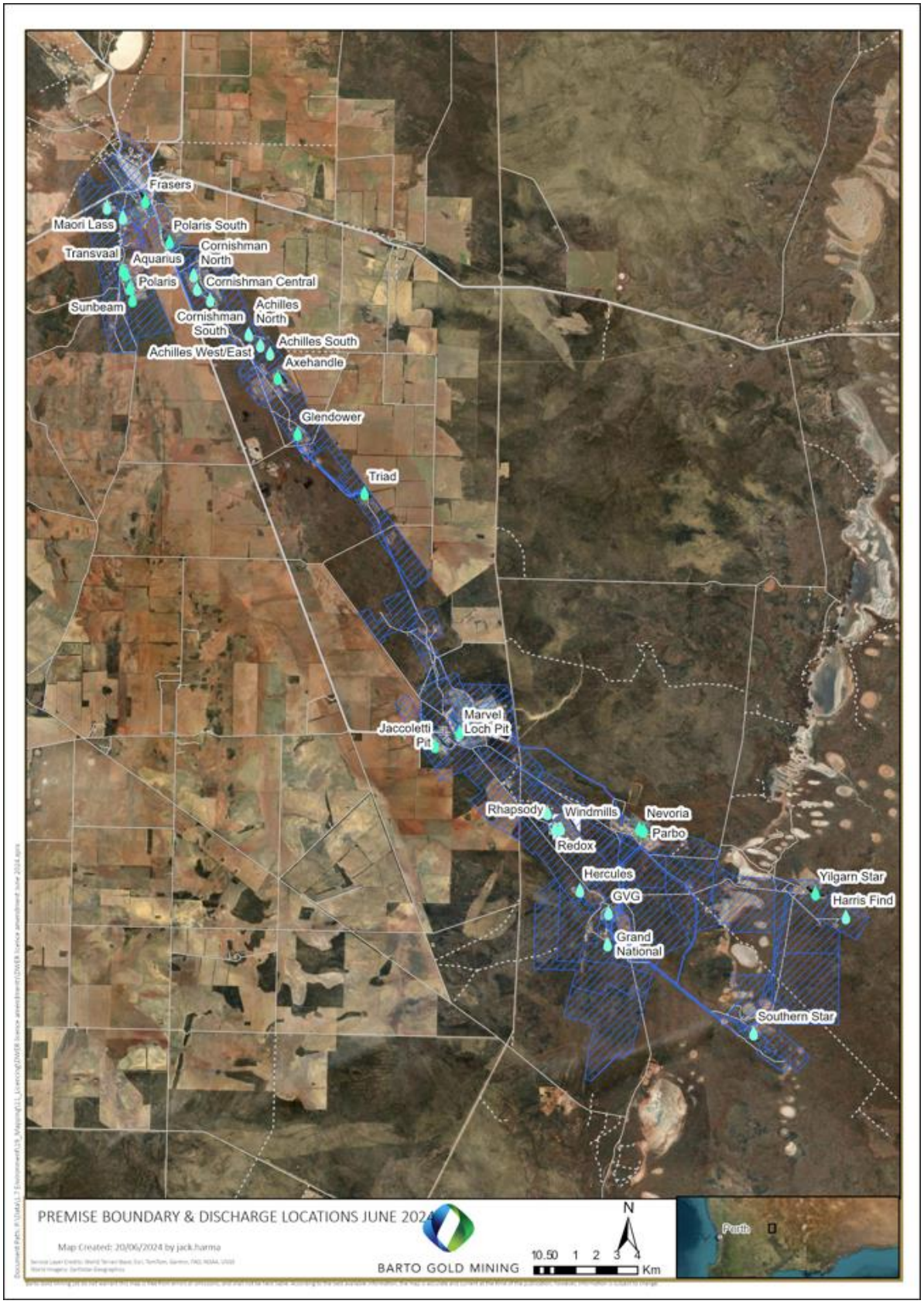

Figure 2: Category 6 mine dewatering discharge locations.

2.4.1 Water volume availability

To provide an overarching status of availability of authorised mine dewater storage pits near the vicinity of Frasers the licence holder has submitted the information within Table 1 and Table 2 for this licence amendment application.

Current pit water volume availability near the Frasers area is presented in Table 1. The licence holder is anticipating a maximum flow rate of 180 L/s (subject to operational requirements) which equates to a flow rate of approximately 108,864 kL/week[1]. According to the anticipated flow rate the Transvaal complex pits has a holding capacity for approximately 21 weeks (discounting removal of water including evaporation, seepage and deposition into other pits i.e. Frasers South and Cornishman complex).

Table 2 presents the available holding capacity of Polaris South Pit and the Cornishman complex pits which has a combined total remaining capacity of 16,772,458 kL which equates to an approximate holding capacity of 154 weeks when assuming pumping rates of 180 L/s.

Table 1: Available volume capacity in Transvaal complex and surrounding pits

	January 2025 pit water levels (mRL)	**January 2025 remaining capacity with 10-meter freeboard (kL)**	**April 2025 pit water levels (mRL)**	**April 2025 remaining capacity with 10-meter freeboard (kL)**
Aquarius Pit			338.09	1,200,857
Transvaal Pit			338.09	
Polaris Pit			338.05	724,438
Sunbeam Pit			338.05	
Area total				**1,925,295**
Maori Lass Pit	333.15	100,513		
Ruapehu Pit	333.14	252,377		
Area total		**352,890**		
Combined total				**2,278,185**

[1] operating continually for 24 hours a day seven days a week

Table 2: Available volume capacity in Polaris South and Cornishman pits

	January 2025 pit water levels (mRL)	Current pit water volumes (kL)	Remaining capacity with 10-meter freeboard (kL)
Polaris South Pit	329.05	4,643,605	966,537
Cornishman North Pit	Dry	0	2,113,299
Cornishman Central Pit	285.04	531,229	7,806,338
Cornishman South Pit	283.41	434,876	5,886,284
Area total			**16,772,458**

2.5 Lenneberg, Mary Lena and Treasury pits

The licence holder intends to construct a new mine dewatering pipeline from Marvel Loch underground mine to Triad Pit. Triad Pit is a currently approved mine dewater discharge location and was added to the licence in 2016. The proposed pipeline route will pass three additional proposed mine dewater discharge pits: Mary Lena, Treasury and Lenneberg pits. The pits are located between Marvel Loch and Triad Pit and are presented in Figure 3.

The licence holder has mentioned in the amendment application that in November 2001, a previous tenement holder (Sons of Gwalia) applied to the Department of Environmental Protection for a works approval for a pipeline from Marvel Loch to Mary Lena and Treasury Pit. The approval was granted in December 2001 however the pipeline was never constructed.

Similar to the Frasers to Cornishman pipeline the anticipated maximum flow rate for this pipeline is also 180 L/s (subject to operational requirements).

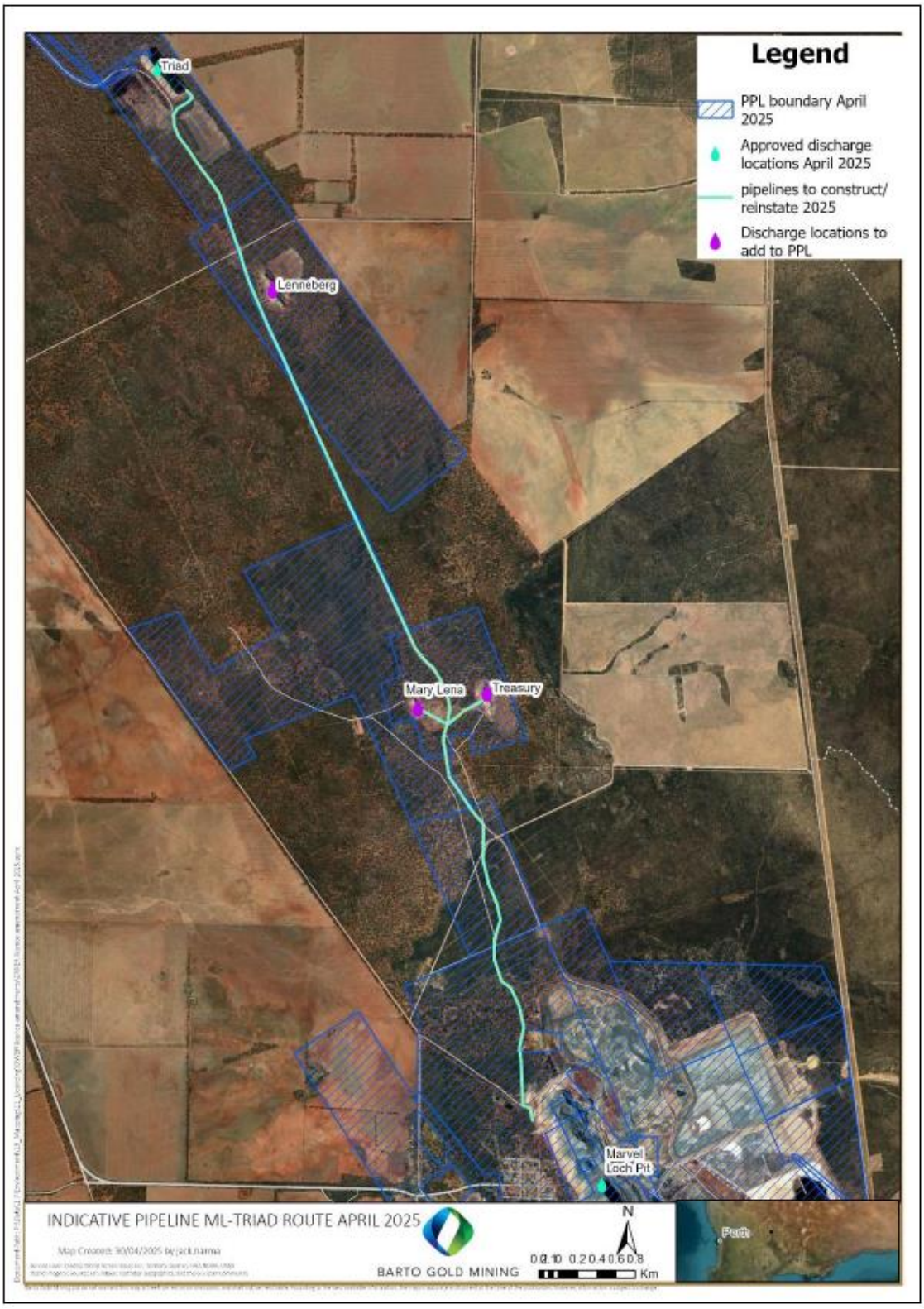

Figure 3: Marvel Loch to Triad Pit proposed mine dewater pipeline route

2.5.1 Water volume availability

Mary Lena, Treasury, Lenneberg and Triad pits have a total remaining capacity of 3,053,463 kL when a 10 m freeboard is applied (Table 3). As previously mentioned, the licence holder is anticipating a maximum flow rate of approximately 108,864 kL/week (subject to operational requirements). According to the anticipated flow rate Mary Lena, Treasury, Lenneberg and Triad pits has a combined holding capacity for approximately 28 weeks (discounting removal of water including evaporation and seepage).

Table 3: Available volume capacity for pits to received mine dewater from Marvel Loch Underground Operations

	February 2025 pit water levels (mRL)	**Current pit water volumes (kL)**	**Remaining capacity with 10-meter freeboard (kL)**
Mary Lena Pit	Dry	0	171,990
Treasury Pit	Dry	0	410,978
Lenneberg Pit	Dry	0	450,249
Triad Pit	348,43	257,002	2,020,246
Total Volume			**3,053,463**

2.5.2 Marvel Loch underground water quality

Large scale mining operations at Marvel Loch began in the 1980's. Pre mining groundwater levels within the Marvel Loch area is understood to be approximately 17 meters below ground level (mbgl) but as a result of mining and dewatering the groundwater levels are currently approximately 150 mbgl (Barto 2025).

Reported water parameters within the Marvel Loch underground presents the water as hypersaline and with a neutral pH (Table 4). Similar to the surrounding groundwater within the premises the mine dewater from Marvel Loch is not suitable for use for livestock consumption or crop irrigation because of elevated total dissolved solids (TDS) concentrations (Table 4) and other high parameters such as sodium.

Low concentrations of metals appear within the Marvel Loch underground (Table 5) with aluminium, arsenic, cadmium, chromium, copper, lead, mercury and selenium have been reported below the limit of reporting for each sampling period from 13 April 2024 to 24 March 2025.

Table 4: Major Ions in Marvel Loch Underground (Sourced from Barto 2025)

Sample date	Cations (mg/L)				Anions (mg/L)				pH	Total Dissolved Solids (mg/L)
	Sodium	Potassium	Calcium	Magnesium	Carbon Trioxide	Hydrogen carbonate	Sulfate	Chlorine		
13/04/2024	22,000	220	1,100	2,900	<LOR	120	5,200	42,000	7.6	47,000
4/10/2024	22,000	240	1,100	2,800	<LOR	130	4,500	43,000	6.8	72,000
24/03/2025	21,000	240	1,100	2,600	<LOR	130	5,300	45,000	7.0	78,000

Table 5: Metal concentrations reported in Marvel Loch Underground (Sourced from Barto 2025)

Sample date	Metal concentrations (mg/L)				
	Cobalt	Iron	Manganese	Nickel	Zinc
13/04/2024	0.11	0.93	8.9	0.10	0.048
4/10/2024	0.10	14	8.0	0.10	0.039
24/03/2025	0.112	2.2	9.0	0.093	0.071

2.5.3 Lenneberg, Mary Lena and Treasury pits water quality

Lenneberg was previously mined in 1993 and to an approximate depth of 50 mbgl. During the mining operation it is understood that no groundwater was encountered during the operation (Barto 2025).

Mary Lena and Treasury pits were mined in 1999. During the exploration phase of the project no groundwater was encountered above 95 mbgl within the vicinity of Mary Lena and Treasury pits. Both pits were mined to a maximum depth of approximately 60 mbgl and like Lenneberg Pit no groundwater was encountered during the mining process (Barto 2025).

It is understood that groundwater near Lenneberg, Mary Lena and Treasury pits is still below the maximum pit depth as all pits has been reported as dry in the supporting documentation provided to the department (Barto 2025) (Table 3).

2.5.4 Triad Pit water quality

Triad Pit was approved for use as a mine dewater discharge location during a licence amendment that was granted in April 2016. When Triad Pit was added as a discharge location the maximum pit depth was 58 mbgl and was dry (Barto 2025).

2.6 Native vegetation clearing

Some clearing is required for the installation of the new proposed pipelines. The licence holder has advised that the Frasers to Polaris South proposed pipeline route is located on freehold farmland and has been historically cleared for agricultural use. The Marvel Loch to Triad proposed pipeline route will primarily be located within the existing haul road.

The licence holder has mentioned within the application that any native vegetation that is required to be cleared will be cleared under *Mining Act 1978*. As a result, the clearing of native vegetation has not been assessed under this licence amendment.

2.7 Yilgarn Star – Nevoria pipeline

Yilgarn Star Pit and Nevoria Pit are approved mine dewater discharge locations and are linked via an existing 600 mm diameter dewatering pipeline. Licence L4597/1988/14 was amended in 2023 to authorise the construction of an additional 600 mm pipeline to achieve the dewatering rate of 400 L/s.

During the assessment of this licence amendment the licence holder has requested an administrative amendment to the Yilgarn Star – Nevoria pipeline. The licence holder has requested that the licence condition to construct the additional 600 mm diameter pipeline from Yilgarn Star to Nevoria pipeline be amended to allow an option of either two 450 mm pipelines or one 710 mm pipeline.

The department considers that the change in pipeline diameters does not increase the potential risks of spills/leaks to receptors and therefore the risk has not been reassessed in this amendment report. No change to the existing controls as presented in the amendment report for the licence amendment granted on 27 January 2023. The department has amended the condition for the construction of the Yilgarn / Nevoria dewatering pipeline to be constructed with either two maximum 450 mm diameter pipelines or a single maximum 710 mm diameter pipeline and for the existing 600 mm pipeline to be decommissioned.

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 6 below. Table 6 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

Table 6: Licence holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Placement, installation and/or upgrade of dewatering pipeline including any earthworks required.	Air/windborne pathway.	• Implement dust control measures via water cart on construction areas.
Noise			• N/A
Hypersaline mine dewater (TDS between 50,000 – 180,000 mg/L)	Transportation and discharge of mine dewater from Frasers to Cornishman Complex at an increase rate.	Mine dewater discharged to land from overtopping of discharge pits.	• Managed in accordance with existing licence conditions: ○ Condition 3: Twice daily inspection of freeboard in discharge pits; ○ Condition 5: 10 m freeboard requirement for mine dewater discharge pits; ○ Condition 24: Maximum flow rate design for pipeline; and ○ Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits.
		Mine dewater discharged to land from rupture/leak of dewatering pipeline.	• Managed in accordance with existing licence conditions: ○ Condition 1: Pipelines equipped with telemetry, automatic cut-outs or secondary containment; ○ Condition 3: Twice daily inspection of mine dewater pipelines; and ○ Condition 24: Pipeline design requirements.
	Discharge of mine	Seepage of	• Managed in accordance with existing

Emission	Sources	Potential pathways	Proposed controls
	dewater from Marvel Loch underground mine to Lenneberg, Mary Lena and Treasury pits.	mine dewater through the base and walls of pits through soil profile to groundwater.	licence conditions: ○ Condition 5: 10 m freeboard requirement for mine dewater discharge pits; ○ Condition 33: Monitoring of volumetric flow rate and water quality of mine dewater discharge points; and ○ Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits.
		Mine dewater discharged to land from overtopping of discharge pits.	• Managed in accordance with existing licence conditions: ○ Condition 3: Twice daily inspection of freeboard in discharge pits; ○ Condition 5: 10 m freeboard requirement for mine dewater discharge pits; ○ Condition 24: Maximum flow rate design for pipeline; and ○ Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits.
	Transportation of mine dewater from Marvel Loch Underground to Lenneberg, Mary Lena, Treasury and Triad pits.	Mine dewater discharged to land from rupture/leak of dewatering pipeline.	• Managed in accordance with existing licence conditions: ○ Condition 1: Pipelines equipped with telemetry, automatic cut-outs or secondary containment; ○ Condition 3: Twice daily inspection of mine dewater pipelines; and ○ Condition 24: Pipeline design requirements.

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 7 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 *(Guideline: Environmental siting* (DWER 2020b)).

Table 7: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Closest residential premises (Marvel Loch)	Approximately **500 m** from the new proposed pipeline from Marvel Loch Pit to Triad Pit.
Environmental receptors	**Distance from prescribed activity**
Native vegetation	Located approximately **6 m** from both new proposed dewatering pipelines. Located approximately **50 m** from the new proposed discharge locations (Lenneberg, Mary Lena and Treasury). Located approximately **20 m** from the Cornishman complex of pits.
Ephemeral water lines	Water lines that cross the pipeline routes are highly ephemeral with surface water flow only occurring after rainfall events that exceed loss rates to soils and environment. Runoff events are generally localised, relatively short duration and occur approximately once every two to five years (Barto 2025). The closest identified ephemeral water lines appear approximately: - **150 m** northeast of the pipeline from Frasers to Cornishman and appears to flow towards Lake Polaris or Lake Kookoordine located approximately 850 m and 7.2 kms respectively from the pipeline; - **Intersecting** across the proposed pipeline from Marvel Loch Pit to Triad Pit. The water lines appear to flow onwards towards Lake Kookoordine located approximately 17 kms from the pipeline; - The closest waterline to a new proposed discharge locations is approximately **30 m**; and - *The closest water line to the Cornishman complex is approximately **1.8 kms** west and therefore is discounted as a receptor due to the distance from the mine dewater discharge pits.*
Ephemeral water bodies (including Lake Polaris)	Lake Polaris is located approximately **850 m** west of the proposed pipeline route from Frasers to Polaris South. The licence holder has acknowledged that the pipeline is partially within the Lake Polaris drainage area (Barto 2025). An unnamed manmade water body that appears to be used for agricultural use is located approximately **550 m** northeast of the new proposed pipeline route from Frasers to Polaris South.
Underlying groundwater	Groundwater within the premises is hypersaline with TDS concentrations ranging from 50,000 - 180,000 mg/L.

	Historically at the northern portion of the premises it is assumed that groundwater flowed north. Groundwater within the northern portion of the premises is over 50 mbgl. Groundwater at the newly proposed discharge locations (Lenneberg), is **>50 mbgl**. No groundwater was encountered 95 mbgl at Mary Lena and Treasury pits and therefore has been risk assessed to be **>95 mbgl**.
Parker Range Vegetation Complex (Priority Ecological Community)	A Priority Ecological Community (PEC) Priority 3 buffer zone intersects the proposed pipeline route from Marvel Loch Pit to Triad Pit. The department notes that the licence holder has confirmed that the pipelines will be outside of the actual PEC (Barto 2025).
Threatened and/or priority fauna and native fauna [discounted]	Licence holder has mentioned that the Chuditch and Malleefowl are present within the prescribed premises boundary. Department records indicate: - P4 (Mammal) located approximately 330 m from a proposed dewatering pipeline; - Vulnerable (Mammal) located approximately 360 m from a dewatering pipeline; All other vulnerable/priority fauna species are located over 2 km away from pipelines and 4.8 kms from new mine dewater discharge locations. [Discounted]

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 in-complete 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 8.

The Revised licence L4597/1988/14 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. additional dewater discharge locations.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 8. 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								
Placement, installation and/or upgrade of dewatering pipeline including any earthworks required.	Dust	**Pathway:** Air/windborne pathway **Impact:** Reduction of the premises amenity and/or reduction in receptors health values.	• Residential residence (500 m)	Refer to section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	Noise and dust generated from any required earthworks is likely to be minimal and of t short duration. The placement and installation of mine dewatering pipelines is unlikely to significantly contribute to any existing noise and/or dust emissions for the premises.
	Noise					Y	N/A	
Operation								
Transportation and discharge of mine dewater from Frasers underground mine to Cornishman Complex pits at an increase rate.	Hypersaline mine dewater (TDS between 50,000 – 180,000 mg/L)	**Pathway:** Mine dewater discharged to land from overtopping of discharge pits. **Impacts:** Soil solidity, impacted areas may become dispersive, causing increased erosion/sedimentation and reduction of environmental values.	• Native vegetation (50 m)	Refer to section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 3: Twice daily inspection of freeboard in discharge pits Condition 5: 10 m freeboard requirement for mine dewater discharge pits Condition 24: Maximum flow rate design for pipeline Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits	The department considers the current licence conditions are suitable to manage this risk. As mentioned in section 2.4.1 a substantial volume of space is available for dewatering discharge and the twice daily freeboard inspection during operation requirements conditioned on the licence is likely to provide sufficient time to react to potential pit freeboard encroachment. No additional regulatory controls are required to be added to the licence.
			• Ephemeral water body (550 m)		C = Minor L = Rare **Low Risk**	Y		
		Pathway: Mine dewater discharged to land from rupture/leak of dewatering pipeline. **Impacts:** Soil solidity, impacted areas may become dispersive, causing increased erosion/sedimentation and reduction of environmental values.	• Native vegetation (6 m) • Ephemeral water lines (150 m)		C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: pipelines equipped with telemetry, automatic cut-outs or secondary containment Condition 3: Twice daily inspection of mine dewater pipelines Condition 24: Pipeline design requirements	The licence holders proposed pipeline construction specifications provides a comprehensive series of controls to manage the potential impacts of ruptures or leaks from dewatering pipelines including a telemetry system with flow monitoring stations that will detect leaks and failures. No additional regulatory conditions have been included on the licence. The department considers the proposed controls and current licence conditions are suitable to manage this risk event.
Discharge of mine dewater from Marvel Loch to Lenneberg, Mary Lena and Treasury pits.	Hypersaline mine dewater (TDS between 50,000 – 180,000 mg/L)	**Pathway:** Seepage of mine dewater through the base and walls of pits through soil profile to groundwater. **Impacts:** Groundwater mounding potentially causing impacts to native vegetation due to waterlogging of root Zones and changes to groundwater quality.	• Native vegetation (50 m) • Ephemeral water lines (30 m)	Refer to section 3.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 5: 10 m freeboard requirement for mine dewater discharge pits Condition 33: Monitoring of volumetric flow rate and water quality of mine dewater discharge points. Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits	The depth of groundwater within the vicinity of the receiving pits is greater than 50 mbgl. Lenneberg, Mary Lena and Treasury pits have been mined to approximately 50 to 60 mbgl and during mining operations groundwater was not encountered. During the exploration phase prior to mining groundwater was not encountered at 95 mbgl near the Mary Lena and Treasury pits (Barto 2025). As a result of the deep groundwater within the vicinity of the pits and the proposed freeboard of 10 m the department considers that the likelihood of seepage resulting in extensive groundwater mounding near the pits would be rare. No additional regulatory conditions have been included on the licence. The department considers that the licence holder's controls are suitable to manage potential risks of seepage and/or groundwater mounding.
			• Groundwater (>50 mbgl)		C = Minor L = Unlikely **Medium Risk**	Y		
		Pathway: Mine dewater discharged to land from overtopping of discharge pits. **Impacts:** Soil solidity, impacted areas may become dispersive, causing increased erosion/sedimentation and reduction of environmental values.	• Native vegetation (50 m) • Ephemeral water lines (30 m)		C = Minor L = Unlikely **Medium Risk**	Y	Condition 3: Twice daily inspection of freeboard in discharge pits Condition 5: 10 m freeboard requirement for mine dewater discharge pits Condition 24: Maximum flow rate design for pipeline	The department considers the current licence conditions are suitable to manage this risk event. The twice daily freeboard inspection during operation condition is likely to provide sufficient time to react to potential pit freeboard encroachment. No additional regulatory are required.

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**				
							Condition 37: Monitoring of cumulative volume of mine dewater discharged to pits	
Transportation of mine dewater from Marvel Loch Underground to Lenneberg, Mary Lena, Treasury and Triad pits	Hypersaline mine dewater (TDS between 50,000 – 180,000 mg/L)	**Pathway:** Mine dewater discharged to land from rupture/leak of dewatering pipeline. **Impacts:** Soil solidity, impacted areas may become dispersive, causing increased erosion/sedimentation and reduction of environmental values.	• Native vegetation (6 m) • Ephemeral water lines (intersects) • Priority Ecological Community public boundary (intersects)	Refer to section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: Pipelines equipped with telemetry, automatic cut-outs or secondary containment Condition 3: Twice daily inspection of mine dewater pipelines Condition 24: Pipeline design requirements	The licence holders proposed pipeline construction specifications provides a suitable amount of controls to manage the potential impacts of ruptures or leaks from dewatering pipelines including a telemetry system with flow monitoring stations to detect leaks and failures. The department notes that a small portion of the proposed pipeline intersects the public boundary of the Parker Range Vegetation Complex. The licence holder has advised the department that the pipeline will not intersect the actual PEC boundary. No additional regulatory conditions have been included on the licence for this licence amendment. The department considers the proposed controls and current licence conditions are suitable to manage the potential risk event.

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

Table 9: Consultation

Consultation method	Comments received	Department response
Local Government Authority (Shire of Yilgarn advised of proposal (13 June 2025)	No response received.	N/A
A resident advised of proposal (13 June 2025).	No response received.	N/A
Licence holder was provided with draft amendment on 22 July 2025.	Comments were received by the department on 29 July 2025 and comments are presented in Appendix 1.	Refer to 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 10 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 10: Summary of licence amendments

Condition no.	Proposed amendments
N/A	Amended figure numbers throughout licence no change to current operation
Throughout licence	Change to table and figure numbers, no change in operation or controls imposed.
Front page	Added Internal number to Licence
	Added tenements L77/31 and L77/42 to prescribed premises boundary.
Licence history	Updated Instrument log
2 (table 1)	Added Lenneberg Pit, Mary Lena Pit and Treasury Pit to containment infrastructure table.
3 (table 2)	Added Lenneberg Pit, Mary Lena Pit and Treasury Pit to inspection table which required twice daily inspections during operation.
24 (table 6)	Amended Yilgarn Star / Nevoria dewatering pipeline to require: • decommissioning of the existing 600 mm dewatering pipeline; and

	• the 'to be constructed' 600 mm pipeline to be constructed with either a maximum of two 450 mm diameter pipelines or a single 710 mm diameter pipeline.
	Added Frasers to Polaris South dewatering pipeline construction requirements.
	Added Marvel Loch to Triad Pit dewatering pipeline construction requirements.
	Added the reinstatement of the Polaris South to Cornishman complex dewatering pipeline to achieve a maximum flow rate of up to 180 l/s and to ensure the pipeline meets the same design and construction conditions as Frasers and Polaris South pipeline.
	Removed requirement of regular cleaning processes (freshwater flushing from the Transvaal-Sunbeam/Cornishman/Axehandle and the Yilgarn Star / Nevoria dewatering pipelines).
33 (table 8)	Added Lenneberg Pit, Mary Lena Pit and Treasury Pit to monitoring point source emission to land table.
37 (table 11)	Added Lenneberg Pit, Mary Lena Pit and Treasury Pit to process monitoring table (monitoring of cumulative volumes of mine dewater discharged to each pit).
39 (table 13)	Corrected the unit for particle matter size from PM^{10} to PM_{10}.
40(c)	Administration amendment to typographical error to remove reference to 40(c) within the condition.
Definitions table	Added definition to for PM_{10}.
	Included Figure 2 under the premises definition.
Schedule 1: Figure 1	Updated Figure one premises map to include L 77/31 and L 77/42.
Schedule 1: Figure 21 *deleted figure*	Removed Figure 21 from licence (Duplicate figure in licence as Figure 11).
Schedule 1: Figure 24	New Figure showing the Frasers to Polaris South pipeline route.
Schedule 1: Figure 25	New Figure showing the Marvel Loch to Triad pipeline route.

References

1. ANZECC & ARMCANZ (2000) Primary Industries – Rationale and Background Information. Irrigation and general water uses stock drinking water aquaculture and human consumers of aquatic foods (Chapter 9). *Dated October 2000.*
2. Barto Gold Mining Pty Ltd (Barto) 2025, Application for Licence Amendment L4597/1988/14, Supporting documentation, Version: 1, Revision: 1. *Issue Date: 5 May 2025.*
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
5. DWER 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
6. Maas EV 1990. Crop salt tolerance. In Agricultural salinity assessment and management, ed KK Tanjii, ASCE Manuals and Reports on Engineering Practice 71, ASCE, New York, 262–304.

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

Condition	Summary of licence holder's comment	Department's response
24 (table 6)	The licence holder has requested to remove regular cleaning processes (freshwater flushing from the Transvaal to Sunbeam/Cornishman/Axehandle dewatering pipeline and the Yilgarn Star / Nevoria dewatering pipeline) from the condition. The condition would require the licence holder to stop dewatering and purchase freshwater to then flush through the pipeline.	The freshwater flushing requirement was added to these pipelines during licence amendments granted on 19 August 2022 (Axehandle dewatering pipeline) and 27 January 2023 (Yilgarn Star/Nevoria dewatering pipelines). The supporting documentation for the 19 August 2022 licence amendment included a report by ZEB Engineering which recommended that due to the high TDS concentrations the licence holder implement regular cleaning processes (such as freshwater flushing, particularly on shutdown of equipment, or pigging) to minimise the occurrence of any blockages from crystallisation. No justification or rational was provided within the January 2023 amendment report for the Yilgarn Star/Nevoria dewatering pipelines for this requirement. The department notes that the application did not originally propose the freshwater flushing condition and appears to have been automatically transferred and applied to the Yilgarn Star/Nevoria dewatering pipelines from the previous amendment. As a result, the department has removed the freshwater flushing requirement as the assessment was limited to leaks or spills from pipelines. The department considers existing licence conditions and the requirement for daily inspections for the visual condition and presence of leaks are suitable to address environmental risks.
	Change the maximum diameter of the Frasers underground mine to Polaris South Pit dewatering pipeline and the Marvel Loch underground mine to Triad pit pipeline from 350 mm to 450 mm.	Amended, the department notes that this was requested and incorporated into the risk assessment however was mistakenly forgotten in the draft licence sent to the licence holder.