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	L6168/1991/11
Licence Holder	BHP Iron Ore Pty Ltd
ACN	008 700 981
App Number	APP-0034351
Premises	Yandi (Marillana Creek) Iron Ore Mine Mining Tenements M270SA, G47/12, G47/13, G47/14, G47/15, G47/16, G47/17, G47/18 and G47/19 As defined by the Premises maps attached to the Revised Licence
Date of Report	09/06/2026 (**FINAL**)
Decision	Revised licence granted

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1. Decision summary

Licence L6168/1991/11 is held by BHP Iron Ore Pty Ltd (Licence Holder) for the Yandi (Marillana Creek) Iron Ore Mine (the Premises), located within Mining Lease M270SA and General Purpose Leases G47/12, G47/13, G47/14, G47/15, G47/16, G47/17, G47/18, G47/19, Newman, Western Australia. These tenements are held by the Yandi Joint Venture and accessed/used in accordance with the *Iron Ore (Marillana Creek) Agreement Act 1991*.

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 L6168/1991/11 has been granted.

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 16 March 2026, the Licence Holder submitted an application to the department to amend Licence L6168/1991/11 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

Category 6 – Mine dewatering

- addition of six discharge bores to the licence;
- extending the reinjection trial for three years (1 July 2029) – note original assessment for Stage 1 of the trial was completed in October 2024.The additional discharge points are outside of the prescribed premises boundary, however as BHP has tenure over the areas, regulatory controls were included on the Part V licence to manage emissions from the trial.
- updating monitoring bores associated with the trial.

Category 12 – Crushing and screening

- increase category 12 throughput due to the requirement of establishment of a new flood bund within the Yandi premises from 200,000 tpa to 300,000 tpa. The activity is expected to be short term (3 – 6 months).

Category 13 – Crushing of building material

- add category 13 to the licence with an annual limit of 33,000 tonnes.

Category 52 – Electric power generation

- remove category 52 and associated infrastructure to be constructed as this facility is no longer required. Remove conditions 11, 14 and 17.

Category 54 – Sewage facility

- remove monitoring point MCSWSTP001 as this facility was decommissioned as part of the Yandi Camp decommissioning.
- Install a macerator and aerator at the Spinifex WWTP for receiving waste from other ablution facilities.

Category 62 – Solid waste depot

- remove one solid waste depot that has not been used and has been rehabilitated
- add three new Solid Waste Depot locations: OHP1 Screenhouse, OHP1 Crib Rooms and OHP2
- Increase the limit of 33,000 tonnes to 48,000 tonnes per annum.

Category 64 – Class II putrescible landfill

- Remove the inert landfill locates at Yandi Camp as these facilities have not been constructed and no longer required.
- Remove the requirement for inert landfills to be fenced as they are not a source of windblown waste.
- Remove the referent to the Yandi camp demolition from Condition 4, Table 3 as these works are now complete.
- Increase the disposal limit of Category 64 by 8,200 tonnes per annum to 40,000 tpa to enable waste concrete stored under Category 62 and processed under Category 13 to be disposed of in-pit.
- Update wording in Table 3 to align to other BHP licences which clarify how wastes are disposed of and the cover requirements (wording to be aligned to the MAC licence L7851).

Administrative

Condition 10: Update the reference to Condition 0 to be Condition 9.

This amendment is limited only to changes to Categories 6, 12, 13, 52, 54, 62, 64 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Categories 5 and 73 have been requested by the Licence Holder.

Table 1 below outlines the proposed changes to the existing Licence Approval

Table 1: Proposed throughput capacity changes

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
6	15,000,000 tonnes per annum	No change	The Licence Holder is requesting to commence Stage 2 of the hydrogeological trial to the Ministers North Aquifer.
12	200,000 tonnes per annum	300,000 tonnes per annum	The Licence Holder has requested to increase throughput to allow crushing and screening of more material to establish a new flood bund.
13	N/A	33,000 tonnes per annum	New category to be added to licence to allow for the crushing of building waste
52	45 megawatts	0	Remove the category and associated infrastructure as the facility is not required to be built.

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
54	773 cubic metres per day	No change	The Licence Holder requests the Spinifex WWTP be permitted to accept waste from ablution facilities across the premises due to capacity at the WWTP.
62	15,000 tonnes per annum	48,000 tonnes per annum	The Licence Holder proposes to add three solid waste depots within the premises to store an additional 33,000 tonnes of concrete waste, prior to be crushed under Category 13.
64	31,800 tonnes per annum	40,000 tonnes per annum	The Licence Holder has requested an increase in throughput to allow for the disposal of the concrete waste stored under Category 64 and processed under Category 12

2.2.1 Category 6 – Stage 2 of the Hydrogeological Trial

Stage 1 of the hydrogeological trial was approved by the Department in October 2024. It allowed for a six-month trial involving the redirecting of surplus groundwater sourced from Yandi Mine to a new discharge point in the Ministers North catchment via an overland pipeline, where it was reinjected into an existing bore at the head of Jugari (Yandicoogina) gorge (the Gorge).

Groundwater level and quality monitoring was undertaken during the trial in accordance with the licence and BHP's Short-term Trial Groundwater Supplementation Scheme Trigger Action Response Plan (TARP). Following the initial Nov – Dec (2024) testing phase, between 5 August and 11 December 2025, the scheme averaged 1.2 ML/day with a maximum rate of 1.4 ML/day. The increased rate correlates to 0.2 – 0.3 m of groundwater recovery within 500 m of the reinjection bore. The following points are noted:

- No exceedances of groundwater trigger level values were recorded.
- One trigger exceedance of groundwater quality was recorded throughout the trial relating to salinity adjacent to the reinjection location.
- No impact of injection on pool water levels was noted, with water levels continuing to decline in Pool 4 (YC4).
- Injection rates were constrained due to available head space (<10m) and poor efficiency within the injection bore.
- Groundwater levels at the head of the Gorge stabilized at a reinjection rate of approximately 1 ML/day, which aligns with the existing Ministers North aquifer conceptual water balance.
- Groundwater levels across the broader Ministers North aquifer continued to decline during the 2024/25 dry season by approximately 0.5 m (Dec 2024 – 2025).
- Following the end of the reinjection trial groundwater levels around the head of the gorge began to decline in alignment with the broader Ministers North aquifer.

- No significant rainfall events have been recorded across the 2025/26 wet season (as of mid-Feb 2026).

The Licence Holder is now seeking to get approval for Stage 2 of the trial. Whilst Stage 1 successfully managed to supplement an average of 1.2 ML/day into the local aquifer using bore HMN0045P, injection rates at this location were constrained by the shallow water table, which resulted in mounding. Stage 2 of the trial seeks to remedy this constraint by expanding the potential injection locations around the head of the Gorge.

They are proposing to operate the trial for a duration of 36 months (three years) to continue stabilization and hydrogeological investigations into the cause of the decline. The water reinjection trial involves the redirecting of surplus groundwater from the existing Marillana Creek discharge at Yandi Mine, to two above ground water tanks within Minsters North. It also involves utilizing other reinjection bores within Minister North, including HMN0042P, HMN0043P and HMN0044P. Utilising these existing reinjection locations will enable further refinement of the hydrogeological conceptual understanding and potentially enable increasing the supplementation rate to ~2.7 ML/day based on the pumping and pipeline capacity.

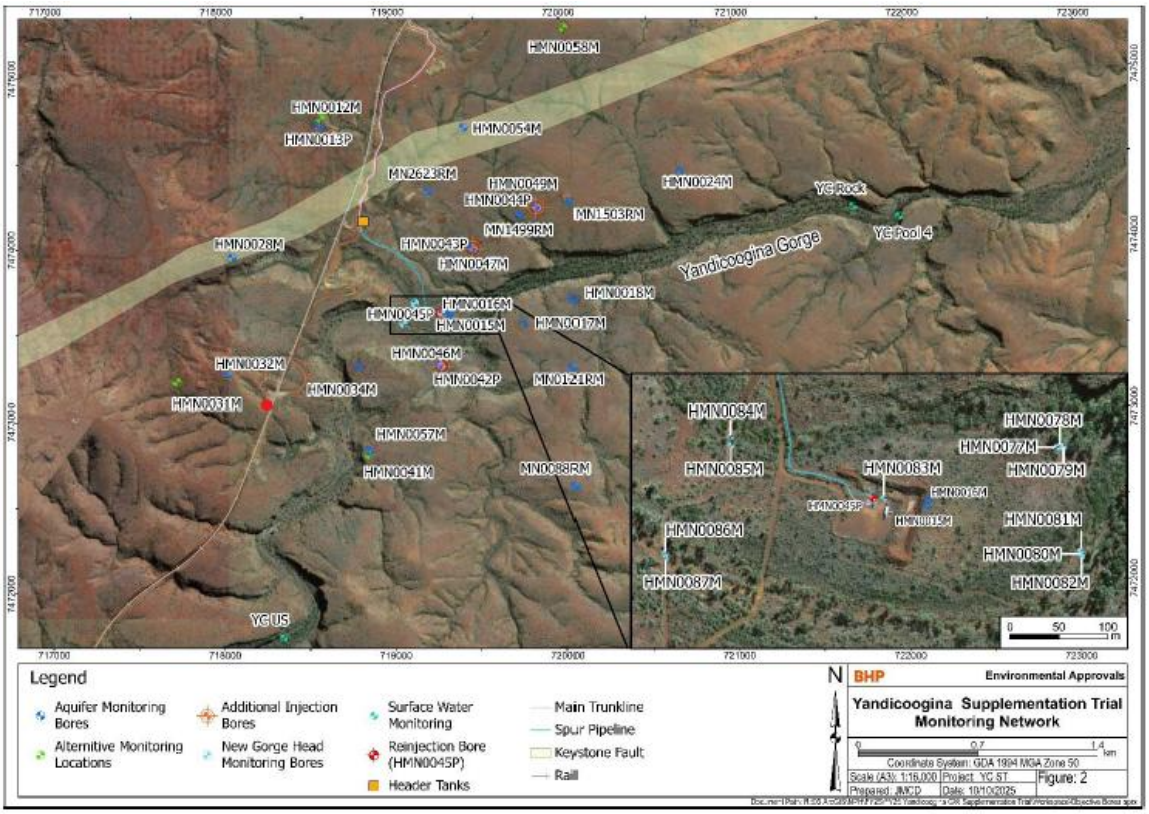

Figure 1: Trial Stage 2 injection and monitoring bore network

The primary injection bores for supplementation are located near the Gorge (HMN0042 – 45P), with the remaining bores planned to be used for periodic pump testing to improve the hydrogeological conceptualisation. Figure 1 depicts the bore network for Stage 2. The actual injection rate will be determined via monitoring and adherence to thresholds and triggers to achieve the objectives of the trial. The conveyance infrastructure has a maximum capacity of 2.7 ML/day.

Stage 2 of the trial is expected to operate until a longer-term supplementation scheme from BHP's Mining Area C / South Flank comes online in ~2029. This proposal replacement scheme is currently under assessment with the EPA as part of BHP's Central Pilbara Surplus Water Project.

The Licence Holder has proposed a groundwater and surface water quality monitoring program

for the extension of the trial, that will be undertaken in accordance with the Yandicoogina Gorge Supplementation Scheme: Trial Stage 2 – Trigger Action Response Plan (TARP).

Findings from Stage 1 of the initial trial demonstrated that the source water quality is stable and suitable for injection during Stage 2. Results from the initial trial have been reviewed by the Department's internal hydrogeologists, with no concerns raised.

Further information on water quality results from Stage 1 as well as proposed monitoring for Stage 2 can be found in Section 3.3 of this report.

2.2.2 Category 12: Crushing and Screening

The Licence Holder has stated that due to the requirement of a new flood bund within Yandi, an increase in the throughput of crushing is required to enable the bund to be established. The activity is expected to be short term (3 – 6 months) and is not likely to alter the risk rating for Category 12 due to the remote location of the premises, the short-term nature of the project and that the prescribed premises is currently operating well under it's maximum design capacity for category 5, meantime that any dust emission from a crushing and screening plant would not increase potential dust emissions from the site to levels above that previously assessed.

2.2.3 Category 13: Crushing of Waste Concrete

The Licence Holder has proposed to add Category 13 to the licence to allow the crushing of concrete waste. A series of demolition projects across the Yandi Hub are being undertaken and it is expected up to 33,000 tonnes of concrete waste will be produced. The Licence Holder proposes to store this waste at the existing Solid Waste Depot 1 as well as the three proposed new solid waste depots (OHP1 Screenhouse, OHP1 Crib Rooms and OHP2).

The waste concrete will be processed using either a 50,000 tpa mobile crushing and screening plant, or an excavator fitted with concrete crushing jaws to break down the waste concrete and removal any steel reinforcement.

2.2.4 Category 52: Temporary Power Station

The temporary 45 MW Power Station approved under L6168/1991/11 has not been constructed and is no longer required. The Licence Holder is therefore seeking to remove this category as well as associated conditions from the licence.

2.2.5 Category 54: Yandi Camp Wastewater Treatment Plant

The Yandi Camp WWTP has been decommissioned and the WWTP closed. The Licence Holder is therefore requesting the removal of monitoring point MCSWSTP001 from Table 12 of the licence.

<u>Spinifex Camp Macerator or Wastewater Pump</u>

An opportunity has been identified to dispose of waste from ablution facilities that would typically go to offsite disposal sites into the Spinifex WWTP system. This is due to the current Spinifex Camp not operating at full capacity.

To ensure that any new waste introduced to the Spinifex WWTP does not impact on the operation of the plant, the Licence Holder is proposing to feed waste into the Spinifex WWTP system via an internally mounted system consisting of:

- Grundfos SEG.50.26.EX.2.50B Macerator Pump (Duty/Standby) internally mounted inside the existing 50KL tanks; and
- Tsurumi TRN_50TRN43.7 Submersible Aerator, internally mounted.

Both options have been designed to ensure the facilities maximum flow rate does not exceed 24.3/hour to ensure it aligns with current flow rates from the existing Grundos pumps located in

the Spinifex wet walls and aligns to the WWTP design capacity.

The introduction of either option and the disposal of sewage from other ablution facilities will not alter the waste type, plant design of capacity of the existing Spinifex WWTP.

The Licence Holder has stated that they will advise the Department on which option has been selected one month prior to construction.

2.2.6 Category 62: Solid Waste Depots

As stated in section 2.2.2, the Licence Holder is undertaking a series of demolition projects across the Yandi Hub, which is expected to generate an additional 33,000 tonnes of concrete waste. One solid waste depot exists (Solid Waste Depot 1) with three new proposed depots (OHP1 Screenhouse, OHP1 Crib Rooms and OHP2).

The four solid waste depots will be able to store up to 48,000 tonnes of concrete in a financial year (33,000 across the three new facilities with 15,000 tonnes at the existing facility). Stored concrete will be crushed and placed in pit or reused on site.

The new solid waste depots will be located within the cleared footprints of the OHP1 Screenhouse, OHP1 Eastern Crib and OHP2. No significant construction activities are required for the depot as the area has been previously cleared, levelled and bunded to minimise surface water entry to the operational areas. Some minor earthworks may be required to provide access to the depot locations.

2.2.7 Category 64: Landfills

The Licence Holder has requested some minor updates to conditions associated with the Yandi inert landfills:

- Remove the inert landfill locations at Yandi Camp as these facilities were not constructed and are not required:
- Remove the requirement for inert landfills to be fenced as they are not a source of windblown waste.
- Remove the reference to the Yandi camp demolition from Condition 4, Table 3 as these works are now complete.
- Increase the disposal limit of Category 64 by 8,200 tonnes per annum (tpa) to 40,000 tpa to enable waste concrete stored under Category 62 and processed under Category 13 to be disposed of in pit.
- Update wording in Table 3 to align with other BHP licences to clarify down wastes are to be disposed of and the cover requirements.

2.3 Part IV of the EP Act

The Premises is subject to two Ministerial Statements issued under Part IV of the EP Act, MS679 as amended by MS1039:

- MS679 relates to the life-of-mine proposal to mine iron ore and includes clearing of native vegetation, subsequent rehabilitation and decommissioning of the site, and post-assessment amendments for mine production rate and throughput.
- MS1039 includes administrative amendments and replacement of conditions relating to Marillana Creek Diversion and consideration of proponent's contribution to the offset fund.

Management of impacts to Marillana Creek and conservation significant flora and fauna associated with ground disturbance activities have been assessed under the ministerial statements.

It is unlikely that the trial may results in any additional detrimental environmental impacts outside of those already assessed under MS679 and MS1039, as the intent of the trial is to stabilise groundwater decline and to determine whether long term supplementation is needed.

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 2020).

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

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of the new solid waste depots.	Air/windborne pathway	• Dust control on unsealed roads managed with water carts. • Storage of inert concrete waste will be at the designated Solid Waste Depots and will be used as backfill once a selected pit(s) become available. • Concrete waste will be tested to ensure that it is inert before being stored at the facilities. • Facilities are designed to minimise stormwater entering or leaving the depots. • Depth to groundwater at the proposed solid water depots is greater than 70 m.
Operation			
Dust	Crushing of concrete waste Vehicle movements Liftoff from stockpiles	Air/windborne pathway	• Dust from roads and stockpiles will be managed via water carts. • The plant is only required for approximately 12 months and therefore any dust generated will be minor, localised and short-term.
	Crushing of material for establishment new flood bund	Air/windborne pathway	• Dust from roads and stockpiles will be managed via water carts
Sediment laden stormwater	Stockpiles of stored concrete waste	Overland runoff	• Concrete waste will be tested prior to being stored at facilities to ensure it is inert. • Facilities are designed to minimise stormwater entering or leaving the solid waste depots. • The facilities will be operated in accordance with licence conditions. • Depth to groundwater at the proposed solid waste depots is greater than 70m.
Leachate	Burial of concrete waste at landfill or	Infiltration through soil and into	• Testing was undertaken to confirm composition of the

Emission	Sources	Potential pathways	Proposed controls
Construction			
	used as backfill in pit(s)	groundwater	cement and the leaching behaviour of concrete under oxygenated, unsaturated conditions • Outcomes determined that the concrete waste is inert for on-site disposal above the water table, but did not address how cement behaves under saturated, low oxygen/anoxic conditions or how cement leachate interacts with the general Yandi backfill. • The Licence Holder is currently undertaking a study into pH-dependent leaching (USEPA 1313)(LEAF method) of Yandi waste rock and the short-term leaching behaviour of cement under low oxygen condition and saline conditions. If the study indicates there are any issues with the leach generated via these short-term tests, they will proceed with more complex long-term tests. The LEAF method will show quickly what is the potential mobilization of elements when in contact with high pH generated by the cement in the backfill.
Surplus groundwater	Groundwater from existing Marillana Creek discharge at Yandi Mine	Groundwater injection leading to groundwater levels above historic levels or daylighting/flooding unnaturally at surface within the gorge.	• Limit set for flow rate of a maximum 2.7 ML/day which is constrained by pipe dimensions. • Actual injection rate will be paired to groundwater level targets, to propagate sub-surface flow within the gorge, indicatively set at 1 ML/day. Initial injection rates will be stepped at 0.2 ML/day increases to test local aquifer responses. • Routine groundwater and surface water level monitoring within the gorge to avoid daylighting and flooding. Initial targets will be set at <0.5 mbgl at the lowest point of the creek.
		Groundwater injection impacting on water quality	• Routine groundwater and surface water quality monitoring will be undertaken throughout

Emission	Sources	Potential pathways	Proposed controls
Construction			
			the trial. Initially this will occur fortnightly and be reassessed based on the trial operations. • Reinjection rates will be limited at the start of the trial to validate expected aquifer response, including mixing and attenuation within the aquifer. • The trial injection rate will be scaled back, paused or terminated if significant water quality changes are observed during the trial.
		Spillage from pipeline / pump failure	• Routine monitoring of pipeline and pumping system. • Utilise existing sump at the reinjection point in the event of mechanical failure requires the tank or pipeline to be drained.
Treated sewage waste	Waste from ablution facilities across the premises all treated at the Spinifex WWTP	Overflow of maturation pond	• Waste is proposed to feed into the Spinifex WWTP via an internally mounted system consisting of a: - Grundfos SEG.50.26.EX.2.%)B Macerator Pump (Dusty/Standby) internally mounted inside the existing 50 KL tank; - Tsurumi TRN_50TRN43.7 Submersible Aerator, internally mounted. • Both options have been designed to ensure maximum flow rate does not exceed 24 m^3/hour. • The introduction of either option and disposal of waste from other facilities will not alter water type, plant design or capacity of the existing Spinifex WWTP.
		Pipeline failure/rupture	• No change in assessed throughput of discharge • Existing controls apply

Emission	Sources	Potential pathways	Proposed controls
Construction			
		Direct discharge to land via sprayfield	• No change in assessed throughput of discharge • Existing controls apply

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), 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 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 2020)).

Table 3: Sensitive human and environmental receptors

Human receptors	Distance from prescribed activity
Rio Tinto Hope Downs 4 Accommodation Camp	25 km South of Premises **Screened out as a receptor due to distance**
Marillana and Juna Downs Homesteads	35 km from premises **Screened out as a receptor due to distance**
Environmental receptors	**Distance from prescribed activity**
Pilbara Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act)	The prescribed activity is located within the Pilbara Groundwater Area. Main Aquifer is the Hammersley – Fractured Rock Aquifer – groundwater levels may be deep below the surface, and water is generally fresh. Main use of the aquifer is for mining and mine dewatering from iron ore mines. Bores also drilled for road and railway construction. Groundwater depth across the prescribed premises ranges from from 5 to 55 m.
Pilbara Surface Water Area, proclaimed under the RIWI Act	The prescribed activity is located within the Pilbara Surface Water Area, within the Fortescue River Upper surface water catchment.
Surface water lines	Marillana Creek is situated within the Prescribed Premises boundary and drains into the Weeli Wolli Creek system. Weeli Wolli Creek drains into Fortescue Marsh, a place of high cultural importance and biodiversity area. The Jugaricoogina Creek runs through the Jugari Gorge from east to west.

Native Vegetation	Jugari Gorge occurs approximately 8kms south of the Prescribed Premises boundary. Groundwater chemistry of the Ministers North aquifer which surrounds Jugari Gorge indicates that the groundwater in the aquifer is fresh. The Jugari Gorge supports a GDE with characteristics that align with the Department of Biodiversity, Conservation and Attractions Priority 2 PEC 'Riparian flora and plant communities of springs and river pools with high water permanence of the Pilbara Region'. The values of the GDE include permanent pools, *Melaleuca argentea* woodland, hydro-mesic priority flora species, a high diversity of aquatic macro invertebrates, several unique stygal aquatic species and habitat for several vertebrate fauna species classified as Matters of Environmental Significance (MNES) (BHP, 2024). Monitoring data collected since 2018 indicates that the decline in groundwater levels within the Ministers North aquifer coincides with similar declines in surface water pools within Jugari Gorge.
Aboriginal and Cultural Heritage sites	The prescribed activity occurs within the Banjima Native Title Claim (WC 2011/006).

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) 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 L6168/1991/11 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 6, 12, 13, 62 and 64 activities.

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

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls/ DWER comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Construction of three new solid waste depots Installation of macerator and aerator at the Spinifex WWTP	Dust	**Pathway**: Air/windborne pathway **Impact**: Health and amenity	Native vegetation Aboriginal heritage sites	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 10 – design and construction requirements. Conditions 11 and 12 – compliance requirements	Standard design and construction requirement conditions have been included.
Operation								
Reinjection of excess mine dewater into the Ministers North Aquifer	Mine dewater containing trace levels of PFAS and elevated nitrogen	**Pathway**: Direct injection into groundwater **Impact**: Surface water and groundwater quality due to water containing concentrates of analytes of concern	Jugaricoogina Creek Jugari Gorge DGE Subterranean fauna	Refer to section 3.1	C = Major L= Unlikely **Medium Risk**	Y	Conditions 14, 15, 16 and 28	Condition 14 has been amended to allow continuation of the trial and with the updated reinjection bores outlined. The Delegated Officer is satisfied for the existing monitoring program to continue, with the addition of extra monitoring bores. See section 3.3 for detailed risk assessment.
		Pathway: Direct injection into groundwater **Impact**: An increase of groundwater	Native vegetation Jugari Gorge GDE Subterranean fauna habitat	Refer to section 3.1	C = Moderate L = Possible **Medium Risk**	Y	Conditions 14, 15, 16 and 28	See section 3.3 for detailed risk assessment

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls/ DWER comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
		levels leading to mounding which may result in a decline of vegetation health and impacts to subterranean fauna habitat.						
Operation of overland discharge pipeline that connects the existing pipeline to the Ministers North Aquifer before discharging to the additional discharge point	Discharge of excess mine dewater containing trace levels of PFAS and elevated nitrogen	**Pathway**: Direct discharge from pipeline leak or rupture **Impact:** Discharge into native vegetation causing topsoil contamination and plant stress of death.	Surrounding native vegetation	Refer to section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	N/A	The Delegated Officer considers the likelihood of this risk event to be unlikely noting the controls proposed by the applicant. No conditions are required. General provisions relating to pollution or unreasonable emissions of the EP Act apply
Operation of three new solid waste depots (vehicle movement and waste deposition)	Dust	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Native vegetation Aboriginal heritage sites	Refer to Section 3.1	C = Minor L = Rare **Low Risk**	Y	N/A	N/A
	Leachate	**Pathway:** Stormwater runoff and potential Infiltration through soil **Impact:** Soil contamination, surface water contamination	Native vegetation Groundwater Aboriginal heritage sites	Refer to section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 10 – design and construction requirements	The Delegated Officer is satisfied with the applicants controls for the prevention of stormwater runoff, and has included the applicants controls within condition 10.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls/ DWER comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
		from runoff						
Crushing of demolition concrete	Dust	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Native vegetation Aboriginal heritage sites	Refer to section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 10 – Design and construction requirements	The Delegated Officer is satisfied with the applicants controls for the prevention of dust during crushing of concrete material, and has included the applicants controls within condition 10.
Waste from on-site ablution facilities to be processed at Spinifex Cap WWTP.	Raw and partially treated sewage Treated sewage Treated chemicals Potentially contaminated stormwater Sludge leachate	**Pathway:** Overland runoff **Impact:** Ecosystem disturbance or impact to water quality	Surface water lines Native vegetation Aboriginal Heritage Sites	Refer to section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 10 – Design and construction requirements	The Delegated Officer is satisfied that addition of waste from other ablution blocks across the premises can be managed with existing conditions on the licence as there is no increase in throughput. Installation of the macerator has been included within condition 10.
Increase of landfill throughput for disposal of concrete waste	Dust / windblown waste	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Native vegetation Aboriginal heritage sites	Refer to section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Existing Conditions 4,7 and 8	The Delegated Officer is satisfied that the risk of excess dust through disposal of concrete can be managed through existing controls and conditions. No extra conditions

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls/ DWER comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								are required.
	Leachate	**Pathway:** Seepage through base of landfill **Impact:** Contamination of groundwater and vegetation death/decline	Native vegetation Groundwater Aboriginal heritage sites	Refer to section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	**<u>Conditions 5 and 6</u>**	The Delegated Officer is satisfied with the Licence Holder's controls for the prevention of leachate from the crushed cement. Two conditions have been included into the Licence to ensure a study is completed with leachate testing of the cement under certain conditions with results provided to the Department prior to any disposal into pits below ground water level.

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

Note 2: Proposed Licence Holder's controls are depicted by standard text. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment for reinjection of mine dewater into Ministers North Aquifer

3.3.1 Overview of risk events

The reinjection of mine dewater to the Ministers North Aquifer, may result in low level PFAS, heavy metals and hydrocarbons which consequently may adversely impact the health for the GDE through surface and groundwater contamination. In turn, this could impact the biodiversity as well as cultural significance of the gorge and Jugaricoogina Creek.

3.3.2 Review of water quality data

During the assessment for Stage 1, it was determined that the Licence Holder was required to carry out monitoring for PFAS compounds with the default guideline value (at 99% species protection level) as a limit. Monitoring of point source emissions to groundwater and ambient groundwater quality for all trial monitoring bores and the additional discharge point (Yandi Transfer Tanks to reinjection bore HMN0045P) was also added to the licence in order to obtain results of local groundwater quality and for any groundwater chemistry changes during the trial. The following sampling was undertaken:

- Monthly baseline sampling prior to reinjection commencement (baseline duration of three months for the bores and nine months for pool 4).
- Fortnightly sampling during the initial two months of trial operation.
- Monthly monitoring following the wet season, prior to recommencement of the trial. Note, access to Ministers North during the wet season was restricted due to flooding of creeks and roads.
- Monthly monitoring following the trial restart.

A draft 6-month summary report from Stage 1 was submitted to the Department during this assessment.

Surface Water Level Response

One permanent surface water feature (YC4) remains within the gorge. Review of the water levels within YC4 did not identify any changes which correlate (and can be attributed) to the reinjection trial. All changes in water levels were correlated to surface flow event within the creek. During the 2024/25 wet seasons, there were five events where levels in pool YC4 increased. Three of the events correlated with creek flow in Yandicoogina Creek and two events were likely due to localized rainfall along one of the smaller surface water catchments / tributaries within the Gorge. There was no significant rainfall post the 2024/25 wet season which are resulting in recoded creek flows. As such, surface water levels within YC4 have continued to decline without any filling or recharge events.

Water Quality – Trial Summary

EC and TDS exceeded the TARP trigger in September 2025 at bore HMN0083M (10 m east of the reinjection bore). The exceedance was reported to the Department and repeat sampling undertaken. The repeat (and ongoing) sampling confirmed the exceedance, although no corresponding increase in the source water or other wells nearby. It is likely the increased EC was due to the dissolution of salt within the alluvial sediments which were subject to localized mounding near the reinjection bore. The Licence Holder continued with increased (fortnightly) in-field monitoring of down gradient bores to ensure no further exceedance occurred in other monitoring wells. No further exceedances were recorded. It was expected that the concentration in HMN0083M would reduce relatively quickly following cessation of the trial, with sampling to resume in May 2026 to assess the response within the shallow alluvial system.

No PFOS or PFOA trigger exceedances were recorded.

Following a review of the draft report, the following observations stand:

- The Department has no concerns with the water quality results reported and no exceedances of groundwater level trigger values were recorded.
- One trigger exceedance of groundwater quality was recorded throughout the trial relating to salinity adjacent to the reinjection location.
- No impact of injection on pool water levels was observed, with water levels continuing to decline in Poor 4.
- Groundwater levels at the head of the gorge stabilized at a reinjection rate of approximately 1 ML/day, which aligns with the existing ministers North aquifer conceptual water balance.
- Groundwater levels across the broader Ministers North Aquifer continued to decline during the 2024/25 dry season by approximately 0.5 m.
- Following the end of the reinjection trial groundwater levels around the head of the gorge began to decline in alignment with the broader Minister North Aquifer.
- The Department is generally supportive of the proposal to extend the trial and the proposed monitoring outlined in the Stage 2 TARP.

It was noted that in relation to PFAS, the trigger levels adopted in the monitoring program were derived from the draft (interim) default freshwater guideline values used at the time the TARP was prepared. Since then, the final guideline value for PFOS has been published, with a value of 0.02 µg/L, which is higher than the current trigger level of 0.0091 µg/L. Notwithstanding this, the Department supports retaining the existing, more conservative trigger level for any extension of the trial. Monitoring to-date indicates that 0.0091 µg/L is an appropriate sensitivity threshold to assess whether any increase in PFOS concentrations occurs over time.

It was also noted that the draft report only provided results for PFOS and PFOA only, and was unclear whether other PFAS compounds have been analysed. The licence was updated during the Stage 1 trial to include monitoring of up to 28 PFAS compounds associated with mining operations and the use of fire-fighting foams to ensure concentrations of the other PFAS compounds are monitored and recorded.

3.3.3 Applicant's regulatory controls

The Licence Holder has outlined a water sampling program within the Stage 2 TARP as shown in Table 5. Groundwater levels will be monitored within the injection bores to assess groundwater level response within the bore casing. Given the investigative nature of the trial, the Licence Holder has stated they will ensure that appropriate groundwater monitoring (level and quality) will be undertaken throughout the trial depending on which injection locations are used.

Water quality sampling will be split into two regimes:

1. Yandicoogina Gorge Core Monitoring: This will be undertaken every 3 months during the trial operation, irrespective of which injection location is used. This monitoring is focused on the receptor of concern to ensure no negative impacts during the trial.

2. Supplementation Bore specific monitoring: This will vary depending on which injection bore is operating. This will be undertaken on monthly basis for the first 3 months of operation, prior to switching to 3-monthly sampling.

Table 5: Proposed Stage 2 monitoring, including locations, parameters and trigger levels

Sample type	Sample point	Parameter	Frequency	Trigger level
Injection Location	Minimum of 6 monitoring wells within 500 m of the injection locations (see Figure 1) Specific locations will be determined based on which injection bore is being utilised at that specific stage of the trial	Water Quality Analytical Suite (parameters listed in Table 15 of Part V Licence L6168/1991/11)	Monthly during first 3 months of a new injection bore being brought online. Quarterly thereafter	(EC) field measurement >1,569 uS/cm TDS >1,500 mg/L NO_3-N >2.4 mg/L PFOS >0.0091 µg/L PFOA >19 µg/L
		Water Level – Continuous via logger	Continuous (logger)	N/A *Note: trigger values set at Yandicoogina Gorge Bores HMN0077, 79, 80 and 82M*
Yandicoogina Creek Pool Monitoring Point	Ephemeral Pools (currently dry): YC Pool 1 YC Rock YC Pool 3	Surface water depth (m)	Continuous (remote telemetry)	No surface water expression during periods of no rainfall
	Permanent pool: YC Pool 4	Surface water depth (m)	Continuous (remote telemetry)	>548.5 mAHD
Yandicoogina Gorge bores	HMN0077M, HMN0079M, HMN0080M, HMN0082M	Groundwater elevation (mAHD)	Continuous (logger)	562 mAHD
	HMN0017M, HMN0018M, HMN0024M, HMN0057M, HMN0089M, HMN0093M, MN2623RM	Groundwater elevation (mAHD)	Continuous (logger)	N/A *Note: Trigger values set at Yandicoogina Gorge Bores HMN0077, 79, 80 and 82M*
	HMN0077M, HMN0079M, HMN0080M, HMN0082M, HMN0017M, HMN0018M, HMN0024M, HMN0089M, HMN0093M, MN2623RM, HMN0041M	Water Quality	Monthly during the first 3 months of new injection bore being brought online. Quarterly thereafter	Electrical conductivity field measurement >1,560uS/cm TDS >1,599 mg/L NO_3-N. >2.4 mg/L PFOS >0.0091 µg/L PFOA >19 µg/L

The Department supports the implementation of the TARP and monitoring program. The spatial coverage, monitoring frequencies and use of trigger-based management actions provide an adequate framework to detect changes in groundwater and surface water quality as well as water levels in order to manage potential risks to Yandicoogina Gorge.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Banjima Native Tittle Aboriginal Corporation RNTBC advised of proposal on15 April 2026	Comments received on 11 May 2026: **Categories 62 and 64** • Banjima has stated they do not support the use of on-site landfills on Banjima Country and that all waste should be removed from site and disposed of at existing waste facilities. • The Banjima People do not support burying decommissioned infrastructure and waste on Banjima Country. • Banjima does not object to Category 62 provided previously cleared areas are used and surface water is managed appropriated. However, concerns are held that once the waste is disposed of in pits, or buried that the waste will be very close to, or below, the groundwater table when groundwater levels recover post-mining/dewatering. • Banjima would like a review from BHP to ensure that any concrete disposed of in-pit will not impact water quality. Banjima does not accept any activities that have the potential to contaminate any aspect of Country. • BHP should provide it's review to BNTAC once complete, and inform the Heritage Advisory Committee (HAC) before initiating any in-pit disposal activities.	• Category 64 already exists on L6168/1991/11, allowing the landfilling of Inert Wastes Type 1 and 2, as well as putrescible waste. The scope of this amendment is limited only to the increase in throughput to 40,000 tpa to allow for the disposal of concrete waste. The Department uses a risk-based framework to complete a risk assessment to determine the level of regulation of the prescribed activity. • The Department has undertaken a risk assessment in regards to the disposal of the concrete within designated landfills and within pit voids and determined the risk of leachate is considered low, due to the significant separation to groundwater. • The Licence Holder has stated they are currently undertaking a study into pH-dependent leaching (USEPA 1313) (LEAF method) of Yandi waste rock and the short-term leaching behaviour of cement under low oxygen conditions and saline conditions. If the study indicates there are any issues with the leach generated, then BHP will proceed with more complex, long-term tests. • The Licence Holder confirmed that no concrete waste will be placed in below water table locations within pit voids until investigations have been completed and they confirm that concrete disposal will not result in significant impact to the environment. • The Department has added two conditions to the licence, requiring the study to be completed, with

Consultation method	Comments received	Department response
		results submitted to the department prior to any crushed concrete being disposed of into pits below the water table. • The Department has also added a condition in Table 3: Waste Processing, to ensure that no waste is to be deposited into pit voids lower than the water table until the results from the study demonstrate the concrete waste is environmentally acceptable. • The Licence Holder is encouraged to ensure they inform the HAC of any outcomes of reviews.
	Category 6 – Yandicoogina Gorge Supplementation Scheme: Trial Stage 2 • Banjima supports the continuation of the trial, subject to strict adherence to the TARP and any subsequent versions co-developed with and agreed by BNTAC. • Banjima states that DWER's description of the trial as "discharging surplus groundwater to the Ministers North Aquifer" is inaccurate. • BHP has stated in Table 3 of their Supporting Document that there is a provision to "pause" the trial in certain circumstance. It is unclear what conditions must be met before the trial can be un-paused.	• The Department notes the support of the continuation of the trial. • The short description provided in DWER's letter was intended as a brief introduction. The nature of the trial has been summarised in more detail in section 2.2.1 of this report. • Table 3 of the supporting document states that should any monitoring criteria in regards to maximum daily flow rates be exceeded the trial will be paused and reinjection rates scaled back. It is expected the trial could be 'un-paused' once flow rates have been reduced to the licenced throughput. Any exceedances of throughput are required to be reported to the Department as a non-compliance.
	Trigger Action Response Plan • Banjima has stated the monitoring programs identified on page 8 need to be described more fully	• The Department has completed a risk assessment, including seeking internal advice from Contaminated Sites and Water Experts, and is satisfied with their proposed monitoring program, which is a continuation

Consultation method	Comments received	Department response
	and there is insufficient detail to understand what is being committed by BHP. Further, why is the use of telemetry for the continuous monitoring of groundwater levels and basic parameters not proposed? • The water quality triggers in Table 2 are inconsistent for EC and TDS. If the EC trigger is >1,560 uS/cm, the TDS trigger should use the generally accepted freshwater conversion factor of 0.65 to 0.75, which would place the TDS trigger, depending on the conversion factor used, in the range of 1,014 to 1,170 mg/L. Table 2 has a TDS trigger of >1,500 mg/L. • Banjima stated the monitoring program listed on page 10 should be more fully described, or a reference should be provided to a document detailing the design of the monitoring programs. • The TARP should also include a commitment to report of the trial's progress at each HAC meeting, or at another frequency as determined by the HAC. All data and related research and monitoring programs directly or indirectly associated with this trial should be made publicly available to BNTAC on request. • The final TARP should continue to be co-developed with BNTAC, with the final version endorsed by the Banjima People via the HAC and to the satisfaction of the CEO of DWER.	of what is currently listed on L6168/1991/11.Refer to section 3.3 of this report for further details. • The Department's Hydrogeologist has confirmed that as a general rule of thumb TDS in mg/L is approximately 0.6 – 0.7 EC in uS/cm. It is likely that the TDS trigger listed in the TARP is based on the generally accepted upper limit for 'fresh' water as per the Australian Drinking Water Guideline Values. Having the EC level at a more conservative value allows for the possibility that in mine dewater effluent, the mix of species may not reflect the natural surface water electrolyte profile. Note: L6168/1991/11 does include trigger levels for EC or TDS (via implementation of the *Yandicoogina Gorge Supplementation Scheme: Trial Stage 2: Trigger Action Response Plan (TARP)).* Should BNTAC require further clarification on this matter, it is recommended they enquire directly with the Licence Holder. • The Department encourages a high level of communication and consultation between BHP and the BNTAC. The Department assesses and regulates the risk of indirect impacts to Aboriginal Heritage from prescribed activities. However, it is the Licence Holder's responsibility to meet all requirements of relevant legislation, including the *Aboriginal Heritage Act 1971*.
Licence Holder was provided with draft amendment on (26 May 2026)	Refer to 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 7 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 7: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Updated to include amendments to relevant throughputs, the addition of category 13 and the deletion of category 52.
Condition 1, Table 1	Updated to include category 13
Condition 2, Table 2	Waste acceptance – updated throughputs for categories 62 and 64. Specification for sewage waste amended to allow waste from non-sewered facilities.
Condition 4, Table 3	The Licence Holder requested a change in lay-out of the table to make it clearer of the process limits for each waste type and also to align with other BHP licences. As there is no change in risk profile, the amendments have been accepted.
Conditions 5 and 6	Conditions 5 and 6 have been added during this amendment to ensure the Licence Holder undertakes a study into the leaching of the crushed concrete waste prior to disposal within pits. Results are to be submitted to the Department.
Condition 7, Table 4	The Licence Holder requested a change in layout of the table to make it clearer and to align with other BHP licences. As there is no change in risk profile, the amendments have been accepted.
Condition 9, Table 5	Updated to include the requirement for sewage waste processed at the Spinifex WWTP from other ablution facilities to be passed through macerator first.
Condition 10, Table 6	Category 52 infrastructure and equipment removed from the table as not required to be constructed. Solid Waste Depot infrastructure updated to include three new facilities. New inert landfill infrastructure removed as they are no longer required to be constructed. Concrete crushing plant added
Condition 13 (previously 11)	Removed, power station no longer required to be constructed.
Condition 14, Table 7	Contingencies to allow discharge of water to Marillana Creek during and post wet weather events, when discharge location MCDMDEW040 is offline for maintenance and when abstracted water from the western pits exceeds the volume required for dust suppression. New Yandi reinjection bores HMN0003P, HMN0013P, HMN0033P, HMN0042P, HMN0043P, HMN0044P, added to row 3 for the hydrological trial.
Condition 15	Previously condition 13 – updated to reflect the Yandicoogina Gorge Supplementation

Condition no.	Proposed amendments
	Scheme: Trial Stage 2 TARP.
Condition 16, Table 8	New emission points HMN0003P, HMN0013P, HMN0033P, HMN0042P, HMN0043P, HMN0044P added into the emission and discharge limits table.
Condition 19	Previously condition 17 – condition has been removed as the temporary power station is no longer required and will not be constructed.
Condition 25, Table 12	Monitoring point MCSWSTP001 removed as the Yandi Camp WWTP has been decommissioned.
Condition 28, Table 15	Monitoring points for ambient and groundwater quality have been updated in this table based on the new reinjection bores and outcomes of the initial trial.
Schedule 1 – Figure 1, Premises Map	An updated premises map with indicative general arrangement of waste facilities, discharge and monitoring points has been added in Schedule 1
Schedule 1 – Figures 2 and 3	Figures of temporary power station removed as this infrastructure will no longer be constructed.
Schedule 1 – Figure 4	An updated figure of the solid waste depot locations has been added in Schedule 1
Schedule 1 – Figure 6	An updated figure of monitoring and injection bore network to reflect stage 2 of the hydrological study has been included in Schedule 1

References

1. BHP 2026, *Yandi Licence Amendment, Supporting Documentation for the Application to Amend the Environmental Licence L6168/1991/11*, Perth, Western Australia
2. BHP 2026, *Yandicoogina Gorge Supplementation Scheme: Trial Stage 2 – Trigger Action Response Plan (TARP),* Perth, Western Australia
3. BHP, 2026, *Memorandum – Yandicoogina Gorge Mitigation Trial Summary Report DRAFT,* Perth, Western Australia
4. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Hopkins C., 2026, *RE: Bural and backfilling of concrete waste*, email communications.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Condition 4, Table 3, Row 1	Updated wording in the last paragraph of column 3 to "*Tyres/rubber must only be landfilled in overburden storage areas **or landfills** located within the prescribed premises boundary shown in Schedule 1*." This is order to clarify that rubber can be disposed of in landfills as well as overburdern storage area.	Accepted and wording updated for clarification purposes.
Table 7, Row 2	Update the wording to "*When MCDMDEW040 is offline for **system** maintenance.*" This clarifies that MCDMDEW040 may be offline for other maintenance reasons than direct maintenance on the discharge point (e.g. maintenance on the dewatering pipeline).	Accepted and wording updated for clarification purposes.
Table 8, Column 1	Update the wording to: "Yandi Transfer Tanks ~~to reinjection bores HMN0003P, HMN0013P, HMN0033P, HMN0042P, HMN0043P, HMN0044P and HMN0045P~~ (refer to Table 7 for discharge description and location details). It is currently not possible to monitor the reinjection bores themselves as there is equipment in the wells blocking sampling, however the Yandi transfer tanks are representative of the water quality reinjected at all of the reinjection bores.	Reasoning accepted and reinjection bores removed from table to ensure the condition is clear.
Table 15, Column 1 Header	Change the reference from Figure 6 to **Figure 3**	All figures and condition numbers have been updated in final issue of the licence.
Table 15, Column 1	Update the wording to: "Yandi Transfer Tanks ~~to reinjection bores HMN0003P, HMN0013P, HMN0033P, HMN0042P, HMN0043P, HMN0044P and HMN0045P~~ (refer to Table 7 for discharge description and location details). It is currently not possible monitor the reinjection bores themselves as there is equipment in the wells blocking sampling, however the Yandi transfer tanks are representative of the water quality reinjected at all of the reinjection bores.	Reasoning accepted and reinjection bores removed from table to ensure the condition is clear.
Figure 4	Renumber Figure 4 to Figure 2	All figures and condition numbers have been updated in final issue of the licence
Figure 5	Remove Figure 5	All figures and condition numbers have been updated in final issue of the licence
Amendment Report – Table 5	Bore 82M is listed twice, it should be bores 80M and 82M	Error corrected.