



Application for Licence Amendment

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

Licence Number	L8621/2011/1
Licence Holder	Roy Hill Iron Ore Pty Ltd
ACN	123 722 038
File Number	2011/009784
Premises	Roy Hill Iron Ore Mine M46/518 and M46/519 NEWMAN WA 6753
Date of Report	03 November 2020
Decision	Revised licence granted

**SUZY ROWORTH
A/MANAGER, RESOURCE INDUSTRIES**

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

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1. Decision summary

Licence L8621/2011/1 is held by Roy Hill Iron Ore Pty Ltd (Licence Holder) (Roy Hill) for the Roy Hill Iron Ore Mine (the Premises), located at M46/518 and M46/519 Newman, Western Australia.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L8621/2011/1 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 29 May 2020, the Licence Holder submitted an application to the department to amend Licence L8621/2011/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act) for:

- a three year extension of the current two year approval for the Managed Aquifer Recharge (MAR) trial program.

The Licence Holder has also requested:

- removal of four groundwater monitoring bores related to operation of the Zulu 5 in-pit Tailings Storage Facility (Z5IPTSF); and
- that this amendment includes construction and operation of a proposed replacement Process Water Dam.

This amendment is limited only to changes to Category 5 and 6 activities from the existing licence. No changes to the throughput or design capacities have been requested and no changes to the aspects of the existing licence relating to Categories 12, 52, 54, 57, 64, 73 or 85B have been requested by the Licence Holder.

2.3 Part IV of the EP Act

Ministerial Statements (MS) 824 and 829 were issued under Part IV of the *Environmental Protection Act 1986* (EP Act) in December 2009 and March 2010, respectively.

MS 824 and MS 829 provide conditions at the Roy Hill Iron Ore Mine for the management of groundwater drawdown, groundwater dependent vegetation (from groundwater abstraction), impacts from run-off and seepage from the waste rock dump, waste fines storage facility and evaporation pond.

Attachment 5 to MS 824 and Attachment 3 to MS 829 approved Dewatered Saline Groundwater up to 30,000 mg/L TDS and RO Plant reject water to be disposed to recharge basins and/or reinjection bores to the extent of up to 55 GL per annum for a period of up to 2 years.

On 30 September 2020, Attachment 8 to MS 824 and Attachment 5 to MS 829 approved *Dewatered Saline Groundwater (up to 30,000MG/L TDS), Reverse Osmosis Plant reject water and Tailing Storage Facility Decant to be disposed to recharge basins and/or reinjection bores for up to 55 GL per annum for an additional period of up to 3 years (total trial of 5 years)*.

A Revised Proposal has been referred to the Environmental Protection Authority (EPA) under s38 of the EP Act for the Roy Hill Iron Ore Mine with a Life of Mine water management strategy including Managed Aquifer Reinjection and a significant increase in dewatering volumes. At the time of this Amendment Report, the proposal is being assessed at the level of Public Environmental Review.

3. Discharge of water to MAR

3.1 Background

The existing licence approved a two year trial for the disposal of up to 55 GL per annum of excess mine dewatering and reject from the BWRO Plant into reinjection bores and recharge basins; and decant from TSFs, into the Southwest Injection Borefield (SWIB). The licence includes conditions for discharge water quality limits and groundwater monitoring.

Roy Hill seeks an amendment to the operating licence to extend the current 2-year trial period until the determination of the s 38 Revised Proposal (see Section 2.3) or three years from the date of the amendment application, whichever is sooner. Roy Hill has stated there are no requested changes to any other licence conditions related to the MAR.

The annual injection volumes of around 4 GL/year are currently well below the limit of 55 GL/year.

Injection water quality has not exceeded the limits or the trigger level in the Licence as per below:

- 30,000 mg/L TDS or 40,000 μ S/cm EC for SWIB.
- 5,000 mg/L TDS or 7,300 μ S/cm EC for Stage 1 Borefield.
- 75 mg/L Total Suspended Solids (TSS) for SWIB.

No MAR induced groundwater level changes are apparent by documents submitted. Vegetation health is monitored across the Mine in accordance with RHIO Vegetation Condition Environmental Monitoring Plan (OP-REP-00363).

3.2 Decision

A three year extension of the MAR trial has been assessed and approved under s45C of the EP Act. Therefore, in accordance s54(4)(b) and s57(4)(b) of the EP Act, the licence is amended to extend the existing MAR trial for an additional 3 years (total five years), to expire on 25/03/2023, being the date of MS approval expiry (from communication with EPA Services).

Conditions are amended to include decant to reinjection bores and MAR recharge basins in addition to the SWIB.

Existing licence limits for TDS for discharge to groundwater at the Stage 1 and Stage 2 Recharge Basins are amended to accord with s45C limits of 30,000 mg/L.

4. Process Water Dam

The Licence Holder proposes to replace the existing Process Water Dam with a replica pond by volume, lining and management, to be located adjacent to the existing pond within the process area as shown in Figure 1 below. There will be no change to materials stored within the pond (mine dewatering water, tailings return water and water from the Stage 1 borefield), distance to sensitive receptors, or applicant's controls, and hence there is no change to risk.

Figure 1: Proposed location area of the replacement Process Water Dam.



Determination

The licence is amended to include construction and compliance controls for the replacement Process Water Dam. Existing operating conditions remain applicable.

5. Z5IPTSF monitoring bores

Amendment Notice 7 required installation of groundwater monitoring bores for monitoring groundwater levels at Zulu 5 In-pit Tailings Storage Facility (Z5IPTSF), to be sited under advice from an experienced hydrogeologist. Construction compliance documents for installation of ten monitoring bores were submitted on 17 April 2020 and location map as shown in Figure 2 below.

All ten of the monitoring bores were included in the licence on 10 August 2020, pending construction compliance review of Z5IPTSF pipeline infrastructure and further information.

The Licence Holder has requested the removal of Z5IPTSF groundwater monitoring bores RHPZ086, RHPZ0125, RHPZ0398 and RHPZ0107 from Table 3.6.1.

Determination and reasoning

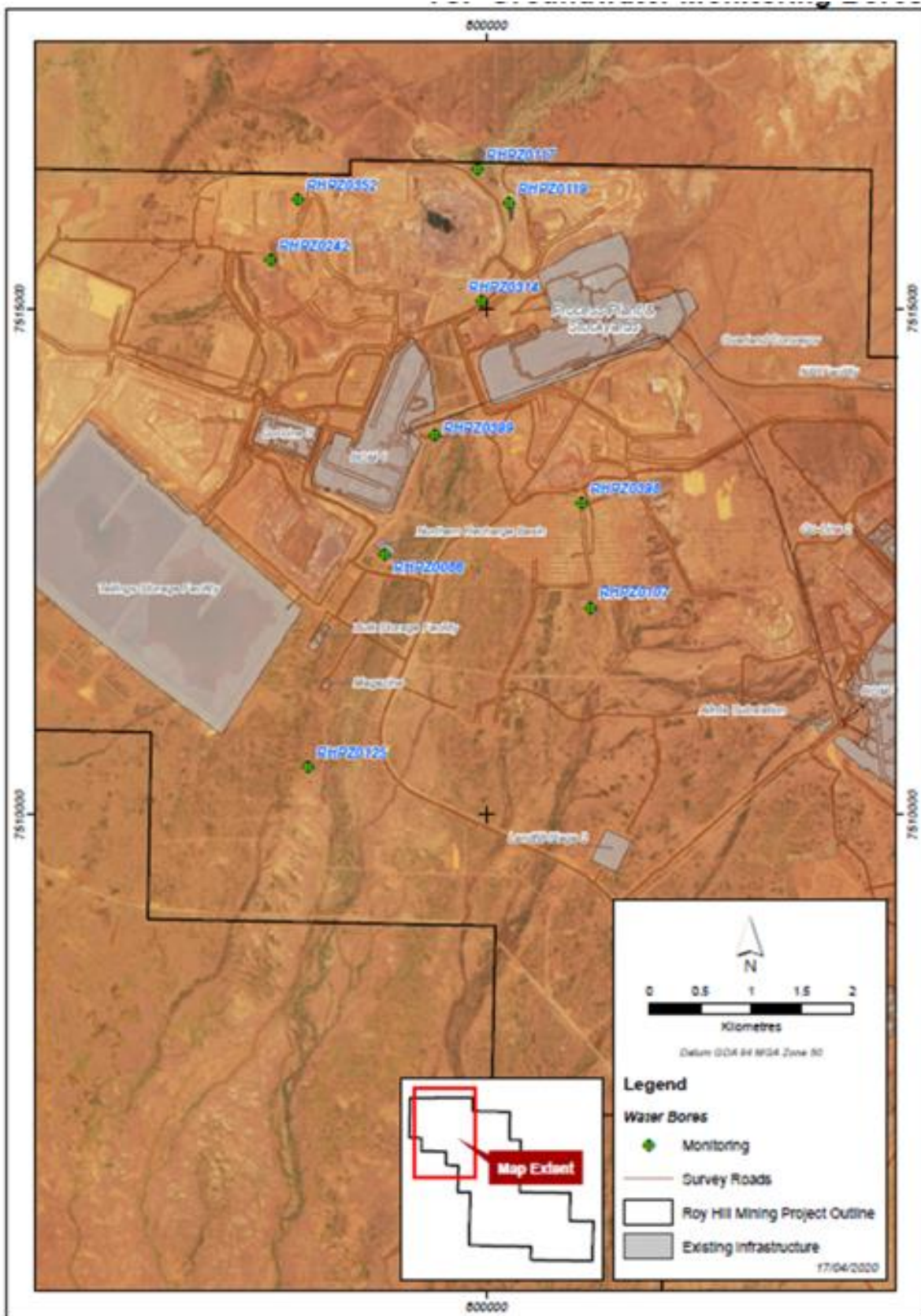
GHD (2019) modelling for deposition of tailings into Z5IPTSF predicts that groundwater mounding will be small and limited to the immediate vicinity of the Z5IPTSF footprint due to the dewatering at an adjacent pit for the duration of tailings deposition.

Roy Hill's hydrogeologist has stated that Zulu and Bravo dewatering zones adjacent to Z5IPTSF form groundwater sinks.

The remaining six bores are considered adequate for monitoring groundwater levels for potential seepage and mounding at Z5IPTSF. Groundwater monitoring bores RHPZ086, RHPZ0125, RHPZ0398 and RHPZ0107 are removed from the licence.

Z5IPTSF groundwater monitoring bore construction conditions are also removed.

Figure 2: Z5IPTSF groundwater monitoring bores



6. Other changes

Total Magnetic Separation Plant (MSP) recovery is added to Table 1.2.6 works specification table, consistent with the instrument log.

The Licence Holder suggested changes to streamline the licence including the following items which have been incorporated into the licence:

- “Removal of condition 3.5.1 for monitoring volumes related to seepage from the TSFs as the monitoring is inherently required by water balance condition 3.5.2”. Condition 3.5.1 is removed from the licence and condition 3.5.2 is updated to explicitly include seepage loss and for clarity for reporting purposes. Condition 3.5.2 renumbered to Condition 3.5.1.
- Sampling of MAR injection bores and associated groundwater monitoring bores to be clarified as required “when injection occurs during the quarter”. Tables 3.2.1 and 3.6.1 are amended to clarify.
- Multiple tables in the licence refer to installed and proposed injection bores and monitoring bores, which could be replaced with a referral to existing licence Appendix 1 which lists these bores. Tables 2.2.1, 2.2.2, 3.6.1, 3.2.2 and 3.6.1 are amended to refer to Appendix 1 to reduce administrative burden with updates to bores and potential for unintentional error.
- Removal of reporting form AGW1. Removed as requested – considered redundant.

7. Consultation

Table 1 provides a summary of the consultation undertaken by the department.

Table 1: Consultation

Consultation method	Comments received	Department response
Department of Mines, Industry Regulation and Safety (DMIRS) was advised of the application for a licence amendment on 11/08/2020	No comments received for Part V assessment.	N/A
Licence Holder was provided with draft amendment on (16 October 2020)	Refer to Appendix 1	Refer to Appendix 1

8. 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.

8.1 Summary of amendments

Table 2 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, and conditions renumbered as required.

Table 2: Summary of licence amendments

Existing Condition no. Existing Table no.	Proposed amendments
Licence cover	Category 6 assessed premises production capacity reworded in accordance with s45C approval to extend the period of dewater discharge to 5 years.
Definitions	Updated where relevant.
Table 1.2.4	Material contained updated for Stage 1 and Stage 2 Recharge Basins to include RO plant reject water and TSF decant.
Condition 1.2.14	Deleted. Updated to the latest format. Considered a redundant condition.
Table 1.2.6	MSP total recovery capacity of 9 Mtpa added. Z5IPTSF monitoring bores removed - construction compliance documents submitted 17/04/2020. Replacement Process Water Dam (process pond) added to the works specifications.
Conditions 1.2.15, 1.2.16, 1.2.17	Construction compliance reporting conditions deleted and replaced with updated construction compliance conditions 1.2.14 and 1.2.15.
Table 1.2.7	Category 6 discharge extended an additional three years in accordance with s45C approval.
Table 2.2.1	Listing of injection bores replaced with reference to Appendix 1. Description of emission to groundwater for Stages 1 and 2 recharge Basins, and SWIB injection bores updated for disposal of excess mine pit dewatering water, MSP reject water and tailings decant water.
Table 2.2.2	Listing of injection bores replaced with reference to Appendix 1. Limits for TDS discharge to the Stages 1 and 2 recharge basins amended to accord with s45C limits.
Table 3.2.1	Clarified for monitoring of injection bores when re-injection occurs during the quarter. Listing of injection bores replaced with reference to Appendix 1.
Table 3.2.2	Listing of injection bores replaced with reference to Appendix 1.
Condition 3.5.1 and Table 3.5.1	Process monitoring table deleted as considered duplicated information.
Condition 3.5.2	Condition deleted (replaced by new condition 3.5.1) water balance condition updated with requirement to undertake monitoring and record information.

Existing Condition no. Existing Table no.	Proposed amendments
Table 3.6.1	Removal of four groundwater monitoring bores at Z5IPTSF Listing of injection bores and adjacent monitoring bores replaced with reference to Appendix 1.
Table 3.6.1	Z5IPTSF groundwater monitoring bores RHPZ086, RHPZ0125, RHPZ0398 and RHPZ0107 removed.
Condition 4.2.1	Condition updated.
Schedule 1: Maps	Premises map updated MAR injection and monitoring maps updated
Schedule 2:	Form AGW1 removed (requested by Licence Holder and considered redundant).

References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. GHD 2019, *Zulu 5 In-Pit TSF Detailed Design Groundwater Change Assessment*.
5. Roy Hill Iron Ore Pty Ltd, *Application Form* dated 21 May 2020, and Supporting Document *Mine Operating Licence Amendment Application (L8621/2011/1) – MAR Trial Extension OP-APP-00074* dated 28 May 2020.
6. Roy Hill Environmental Regulation, 14 September 2020, Email: *Roy Hill Mine Operating Licence - Streamlining Conditions*.
7. Roy Hill, 4 August 2020, Memo from Bobak Willis-Jones Re: *Removal of 4 monitoring bores from Z5 IPTSF monitoring network*

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

Condition	Summary of Licence Holder's comment	Department's response
Table 1.2.4	Stage 1 and 2 recharge basins – It is unclear if the text in the “Material” column and “Infrastructure Requirements” column applies to both recharge basins due to location of the page break. Please ensure this is clear in final document.	Table 1.2.4 formatted to sit on one page.
Table 1.2.6 (Process Water Dam)	Roy Hill requests to reword information in Column 2 as follows: <i>Capacity of up to 100,000 kL</i> <i>Lined with 1.5 mm thick HDPE or alternative that will achieve the same or better impermeability</i>	The capacity of the Process Water Dam has been modified to a range of between 70,000 and 75,000 kL as advised by the applicant on 3/11/2020. Considering the nature of the process water (mine dewatering water, tailings return water and water from the Stage 1 borefield), Table 1.2.6 has been amended to allow for an alternative liner that matches the permeability of the HDPE liner of no less than 1×10^{-9} metres per second.
Table 2.2.1, Table 3.2.1 and Table 3.2.2	Roy Hill notes that the disposal of reverse osmosis plant reject water and tailings storage facility decant has been added to Stage 1 borefield. Roy Hill advises that this is not required at the Stage 1 borefield as Stage 1 will only be used for disposal of excess mine pit dewatering water. Accordingly, Roy Hill do not consider the sampling of chromium, selenium and Total Suspended Solids or the TSS limit should apply to the Stage 1 bores as these were added for the disposal of decant water.	As per the information provided during the assessment, Table 2.2.1 has been amended to state that only disposal of excess mine dewatering water from the Stage 1 borefield is permitted. Consequently, Table 3.2.1 and Table 3.2.2 are amended, with sampling of chromium, selenium and Total Suspended Solids, and the TSS limit removed from the licence.
Table 2.2.1	SWIB Borefield Injection bores – There is one proposed bore (RHIB0277) that has not been removed. Please remove this and include in the Appendix.	Table 2.2.1 amended to exclude proposed bore RHIB0277. This bore is included in Appendix 1.
Table 2.2.2	The limit for Stage 1 Borefield should be 5,000mg/L.	As per the information provided during the assessment, Table 2.2.2 has been amended for Stage 1 Borefield TDS limit to 5,000 mg/L (EC less than 7,300 μ S/cm).

Condition	Summary of Licence Holder's comment	Department's response
Table 3.6.1	The monitoring bore network is set up into two types of monitoring bores being MAR control bores (located next to each injection bore) and MAR regional bores (to provide regional context). Roy Hill considers that there is limited value in monitoring bores next to the injection bore if the injection bore is not used in the quarter. Roy Hill is committed to continue monitoring regional bores every quarter. Appendix 1 is broken into regional bores and monitoring bores next to injection bores and Roy Hill suggests quarterly monitoring for monitoring bores next to injection bores should only be if injection occurs during the quarter.	Table 3.6.1 amended frequency of monitoring for groundwater monitoring bores adjacent to injection bores (SWIB Injection Bores and Stage 1 Borefield Injection Bores) to reflect whether an injection bore has been used in the quarter. Frequency of monitoring at Regional bores remains at 'quarterly'.
Schedule 1	The Southern Recharge Basins map has been deleted however this is still required.	Map reinstated.
Appendix 1	<ul style="list-style-type: none"> • RHPZ0228S is repeated twice. Please remove the one from the bottom of the list • RHPZ026S should be RHPZ0262 	Noted. Repeat of RHPZ0228S removed from the list. RHPZ026S modified to RHPZ0262
Maps	Roy Hill provides updated MAR bore maps and in-pit above ground TSF bore map	Noted. These maps have been added to the licence.
Schedule 1	Map of surface water emission point has not been updated with the map showing the proposed location area of the new Process Water Dam	Noted. This map has been updated in the licence.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)				
Application type				
Works approval	<input type="checkbox"/>			
Licence	<input type="checkbox"/>	Relevant works approval number:		None <input type="checkbox"/>
		Has the works approval been complied with?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Has time limited operations under the works approval demonstrated acceptable operations?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Date Report received:		
Renewal	<input type="checkbox"/>	Current licence number:		
Amendment to works approval	<input type="checkbox"/>	Current works approval number:		
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8621/2011/1	
		Relevant works approval number:	N/A	<input checked="" type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:	None	<input type="checkbox"/>
Date application received	30/05/2020			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Roy Hill Iron Ore Pty Ltd			
Premises name	Roy Hill Iron Ore Mine			
Premises location	M46/518 and M46/519, Newman			
Local Government Authority	Shire of East Pilbara			
Application documents				
HPCM file reference number:	A1899017, A1898995			
Key application documents (additional to application form):	Supporting document and including: MS829 and MS824; s45C application MS829/824 MAR extension to Two Year Trial, including a review of groundwater monitoring for MAR from 1 November 2017 to 31 December 2019.			
Scope of application/assessment				
Summary of proposed activities or changes to existing operations.	Licence amendment Cat 5 – up to three year extension of the existing 2 year MAR trial.			

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

Table 1: Prescribed premises categories

Category number	Category description	Category production or design capacity	Assessed premises production or design capacity	Proposed changes to the production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	86,000,000 (wet) tonnes per annual period (to produce 65,000,000 [wet] tonnes of ore per annual period for export)	None
6	Mine dewatering	50,000 tonnes or more per year	55,000,000 tonnes per annual period discharged for a period of up to two years following submission of the construction compliance document required under condition 1.2.16. Thereafter, the discharge throughput will revert back to 843,000 (scheduled) tonnes per annual period	Three year extension of the two year period authorised.
12	Screening, etc. of material	50,000 tonnes or more per year	6,570,000 tonnes per annual period	None
52	Electric power generation	10 MW or more in aggregate (using a fuel other than natural gas)	80 MW	None
54	Sewage facility	100 cubic metres or more per day	593 cubic metres per day	None
57	Used tyre storage (general)	100 tyres or more	No more than 5,000 tyres	None
64	Class II putrescible landfill site	20 tonnes or more per year	8,000 tonnes per annual period	None
73	Bulk storage of chemicals, etc	1,000 cubic metres in aggregate	5,530 cubic metres in aggregate	None
85B	Water Desalination Plant	0.5 GL or more per year	15 GL per year	None

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	s45C submitted for extension of the MAR.
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: 824 & 829
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	EPBC No: 2008/4624 But not specifically for this amendment application

Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input checked="" type="checkbox"/> Expiry: 31/10/2031
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Mining tenement.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>	But no clearing for this application.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	But no clearing for this application.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>	GWL172642 But not for this application
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: Pilbara Type: Proclaimed Groundwater Area/Surface Water Area Has Regulatory Services (Water) been consulted? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Regional office: North West
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004</i> , <i>Environmental Protection (Controlled Waste) Regulations 2004</i> , <i>State Agreement Act xxx</i>)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Not relevant for this application