



## Application for Works Approval

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

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<b>Works Approval Number</b>	W6595/2021/1
<b>Applicant</b>	Roy Hill Iron Ore Pty Ltd
<b>ACN</b>	123 722 038
<b>File number</b>	DER2021/000494
<b>Premises</b>	Roy Hill Iron Ore Mine  Mining tenements M46/518 and M46/519 NEWMAN WA 6753  As defined by the coordinates in Schedule 1 of the works approval
<b>Date of report</b>	27 July 2022
<b>Decision</b>	Works approval granted

**Sonya Poor**

**A/MANAGER, RESOURCE INDUSTRIES**

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

# Table of Contents

<b>1. Decision summary</b>	<b>1</b>
<b>2. Scope of assessment</b>	<b>1</b>
2.1 Regulatory framework	1
2.2 Application summary and overview of premises	1
2.3 Part IV of the EP Act	4
<b>3. Risk assessment</b>	<b>4</b>
3.1 Source-pathways and receptors	4
3.1.1 Emissions and controls	4
3.1.2 Receptors	6
3.2 Risk ratings	8
3.3 Detailed risk assessment for seepage	10
<b>4. Consultation</b>	<b>11</b>
<b>5. Conclusion</b>	<b>11</b>
<b>References</b>	<b>12</b>
<b>Appendix 1: Summary of applicant’s comments on risk assessment and draft conditions</b>	<b>13</b>
<b>Appendix 2: Application validation summary</b>	<b>15</b>
<b>Appendix 3: Summary of tailings supernatant composition</b>	<b>17</b>
Table 1: Groundwater quality background around Zulu 6 IPTSF	4
Table 2: Proposed applicant controls	5
Table 3: Sensitive human and environmental receptors and distance from prescribed activity	6
Table 4: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation	8
Table 5: Summary of abstraction bores logs	10
Table 6: Consultation	11
Figure 1: Location and general arrangement of IPTSF Zulu 6	2
Figure 2: Distance to sensitive receptors	7
Figure 3: Cross section of Zulu pit area and Fortescue Marshes	11

## 1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the for works approval construction and operation of the premises. As a result of this assessment, works approval W6595/2021/1 has been granted.

## 2. Scope of assessment

### 2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) 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 and overview of premises

On 27 August 2021, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works relating to category 5 – discharge of tailings into an in-pit tailings storage facility (TSF) Zulu 6 at the premises. The premises is approximately 66 km south-west of Nullagine.

The premises relates to the category and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6595/2021/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6595/2021/1.

#### **Zulu 6 in-pit TSF (Z6 IPTSF)**

In-pit disposal in the Zulu 6 pit void has been identified and proposed as the next in-pit TSF (IPTSF) as a component of the long-term strategy for tailings management.

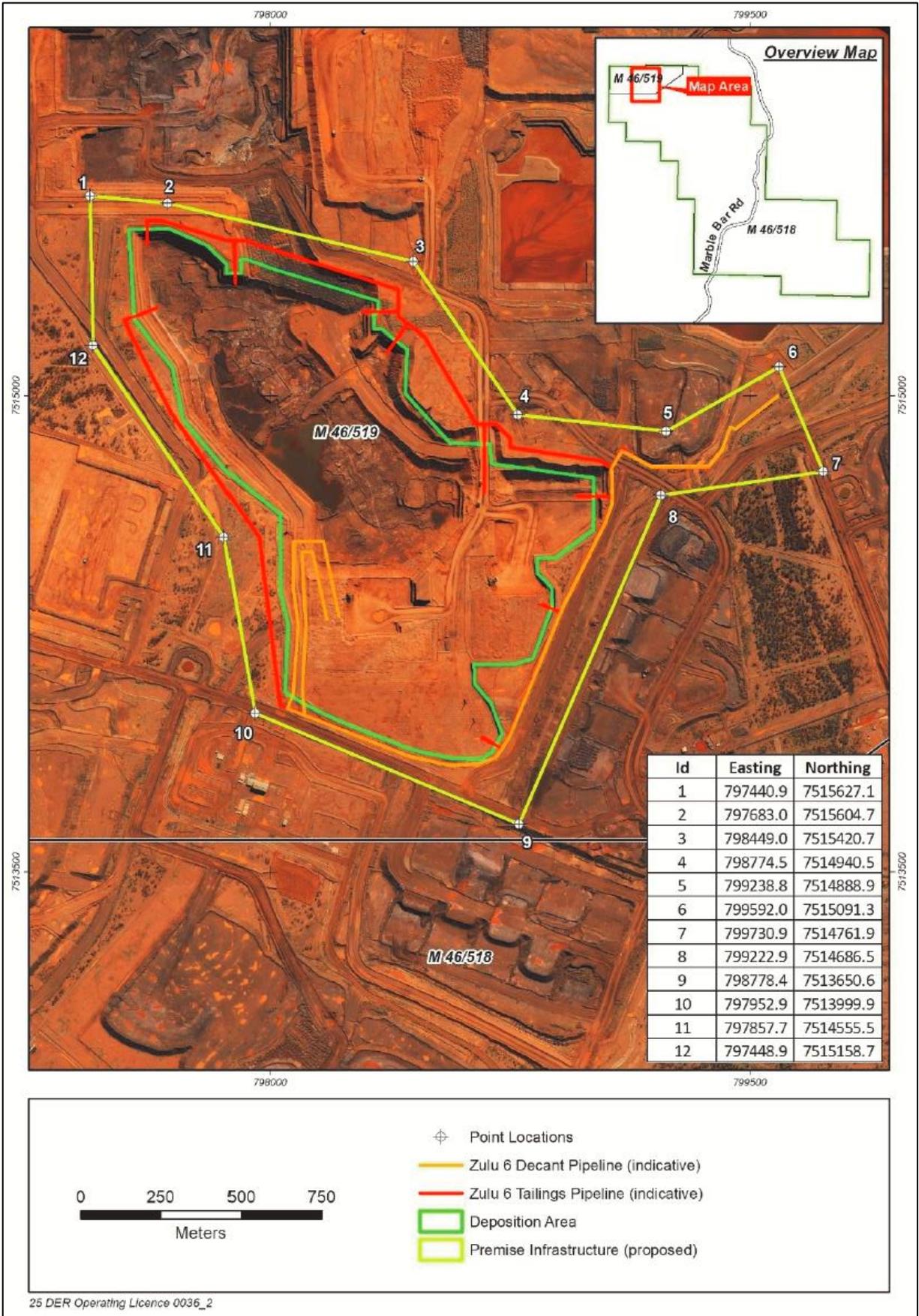
The majority of the Zulu 6 IPTSF perimeter will be formed by the post mining pit shell. Mine waste backfill will be placed between Zulu 5 and Zulu 6 pits. This backfill will provide containment to isolate Zulu 6 from the active Zulu 5 IPTSF and ongoing mining activities to the north. The Zulu 6 IPTSF will have a maximum depth of 54.5 m.

The tailings delivery system installed to service the Zulu 6 IPTSF utilises existing infrastructure for a majority of the route. The deposition ring main will be installed in two branches around the perimeter of the Zulu 6 IPTSF. The ring mains will be installed with a 10 m setback from the edge and protected by a windrow.

The decant return water system for Zulu 6 IPTSF will discharge to the process water pond at the plant, the AG TSF and a central transfer pond. A number of decant pumps will be installed in a duty/assist arrangement within the pit. As the TSF fills and the decant level encroaches on the platform the pumps are on, they will be dragged up the ramp to the next platform.

The life of the facility is estimated at approximately three years and will reach capacity in early Q4 2025.

The Zulu 6 IPTSF general arrangement is shown in Figure 1.



**Figure 1: Location and general arrangement of IPTSF Zulu 6.**

### ***Tailings geochemical characteristics***

Tailings are generated during ore processing which comprises of cyclones, up-current classifiers and spirals. Tailings streams are mixed in a conventional thickener to increase the solids content before being pumped to the TSF.

Tailings produced by the process plant were analysed in 2016 (SRH, 2018). In 2021, Mine Waste Management reviewed the geochemical data between 2016 to 2021 (MWM, 2021). The main finds were:

- All samples were classified as non-acid forming (NAF).
- Multi-element chemical assays were used to calculate global abundance indicator (GAI) values. Arsenic (As) is enriched in most of the samples. Other elements that are enriched to a lesser extent are: chromium (Cr), antimony (Sb) and selenium (Se).

Leach testing at lower contact ratio can be considered more indicative of seepage conditions. Based on leachate test results, chromium (Cr), fluoride (F) and sulphate ( $\text{SO}_4^{2-}$ ) leached at concentrations that were above guideline values (F and Se leached at concentrations above stock water guideline values). Based on this dataset, F and Se may be of concern in contact waters seeping from waste facilities.

The composition of the tailings supernatant was determined and is shown in Appendix 3. The concentrations of Cr and Se are above ANZG 2018 and F above ANZECC 2000 stock water guideline values.

### ***Nitrogen in process water***

Groundwater from the dewatering bore fields is the primary source of water for mining operations. The lowest nitrate ( $\text{NO}_3^-$ ) concentrations (less than 20 mg/L) were measured in the groundwater. The highest  $\text{NO}_3^-$  concentrations are from the decant water ranging from 150 to 300 mg/L.

### ***Tailings geotechnical characteristics***

The geotechnical assessment of the tailings from Roy Hill has determined particle size distribution, settling properties and dry density. The test results determined that the latest tailings are significantly finer than the tailings placed in Zulu 5 IPTSF to date.

Particle size distribution of tailings samples show that between 80 to 90% of the material is characterized as fines (less than 75 micron). Consolidation results used for the Zulu 6 IPTSF show that the samples have poor consolidation characteristics. Compared with the Z5 IPTSF design product, the tailings are 3.3 times slower to settle, which may impact the water recovery and beach development. The sample containing 53% solids, the settling time (drained conditions) to achieve density of 1.43 t/m<sup>3</sup> was 238 hours (GHD, 2021a).

### ***Flocculant***

Roy Hill is investigating the use of polymer treatment to enhance settling, aid water recovery and promote beach development. The addition of flocculant may result in an increase in the dry density achieved post settling, but until the additional results are available the drained settled density of 1.2 t/m<sup>3</sup> has been adopted as a lower bound estimate for storage calculations.

Rheomax® DR 1030 SDS has been used for the settling of mine waste fines. Rheomax is an anionic polyacrylamide (APAM). APAM is a group of high molecular weight polymers formed from polymerisation of the acrylamide monomer.

Polyacrylamide is classified as harmless. However, when in water containing elevated iron concentration and exposure to intense sunlight; these polymers can break-down to form monomeric acrylamide. Acrylamide is highly toxic and can impact sensitive receptors.

## Groundwater background around Zulu6 IPTSF

Groundwater quality around the proposed Zulu6 IPTSF was analysed when abstractions bores were constructed. Table 1 show a summary of groundwater quality for the bores located north and south of Zulu 6 IPTSF.

Nitrate levels in all bores are below ANZG 2018 for 95% protection (10.6 mg/L nitrate as nitrate).

**Table 1: Groundwater quality background around Zulu 6 IPTSF.**

Parameter	Sample date	NO <sub>3</sub> <sup>-</sup> (mg/L)*	TDS (mg/L)	Cl (mg/L)	F (mg/L)	Se (mg/L)	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Sr (mg/L)	Zn (mg/L)
RHDB0259A	24/10/2019	9.1	7800	3200	0.6	<0.002	1600	2	0.017
RHDB0296	24/10/2019	2.5	2900	750	0.5	<0.001	1100	1.1	0.025
RHDB0412	1/10/2020	8.6	88000	42000	<1	<0.05	13000	6.1	<0.25
RHDB0420	23/08/2020	9.4	4300	1800	0.7	0.002	920	1	0.015
RHDB0423	12/10/2020	0.7	61000	30000	<1	<0.02	9700	7.4	<0.1
RHDB0443	12/11/2020	8.3	17000	7100	<1	<0.01	2700	2.1	<0.05
RHDB0444	11/11/2020	9.4	15000	7200	<1	<0.05	2700	1.7	<0.25

## 2.3 Part IV of the EP Act

Ministerial Statement 1189 (approved 19 May 2022) is a revised proposal for the Roy Hill Iron Ore Mine to increase the disturbance footprint, increase mine dewatering and discharge, inclusion of Zulu and Bravo pits, an increased volume of saline water up to 50,000 mg/L total dissolved solids (TDS) used for dust suppression and use of TSF decant water for dust suppression.

The EPA advised that the implementation of plans (RHIO 2016) and procedures (RHIO 2019), and regulation under Part V of the EP Act will manage risks to surface water quality.

Impacts to the Fortescue Marsh, flora and vegetation and associated terrestrial fauna habitats are to be managed under Part IV of the EP Act.

## 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 / operation which have been considered in this decision report are detailed in Table 2 below. Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

**Table 2: Proposed applicant controls**

Emission	Sources	Potential pathways	Proposed controls
<b>Construction</b>			
Dust	Construction activities and vehicles movements	Air windborne pathway /	During the construction and operations of the Z6 IPTSF, low levels of dust will be generated. Dust emissions will be minimised during the construction and commissioning through the application of water for dust suppression.
Noise	Construction activities and vehicles movements	Air windborne pathway /	Not Provided
<b>Operation</b>			
Seepage	Tailings	Seepage through gravels towards Fortescue Marshes	<p>Groundwater monitoring bores will be installed surrounding Zulu 6 IPTSF and the monitoring of these bores will be incorporated into the RHIO Mine Monitoring Manual (OP-MAN-00007).</p> <p>Monitoring will include:</p> <ul style="list-style-type: none"> <li>• Monthly standing water level measurement monitoring of IPTSF monitoring bores to assess potential groundwater seepage.</li> <li>• Quarterly monitoring of groundwater quality in the vicinity of the IPTSF to determine if any changes in heavy metals, salinity or baseline values occur due to the deposition of tailings.</li> </ul> <p>Removal of decant water.</p>
		Remaining vegetation	<p>Vegetation health is monitored across the Mine in accordance RHIO Vegetation Management Plan (OP-REP-00344) as per requirements of Part IV approval.</p> <p>The Zulu 6 IPTSF will be located on an existing cleared area.</p>
Tailings deposition	Surface water inflow causing overtopping	Direct discharge	<p>Flood protection is currently in place in the form of the Zulu West Levee and will remain during the operation and closure of the Zulu 6 IPTSF. The levee diverts runoff from the upstream catchment and has been designed for a 1% Annual Exceedance Procedure (AEP).</p> <p>The Zulu 6 IPTSF will be developed with safety bunds along the pit perimeter that will prevent any surface water runoff from adjacent areas entering the pit. The contributing catchment will therefore be limited to the pit extent.</p> <p>There will be no discharges to surface water during the construction or operation of the Z6</p>

Emission	Sources	Potential pathways	Proposed controls
			IPTSF.
Spills	Tailings pipeline	Direct discharge	<p>Magnetic flowmeters installed at the pit perimeter.</p> <p>Automated fast-shutdown sequence to prevent any leak from propagating.</p> <p>Where HPDE piping is installed and a burst disc is required, a pressure transmitter directly upstream of the burst disc will signal an alarm if pressure approaches the burst disc limit.</p>

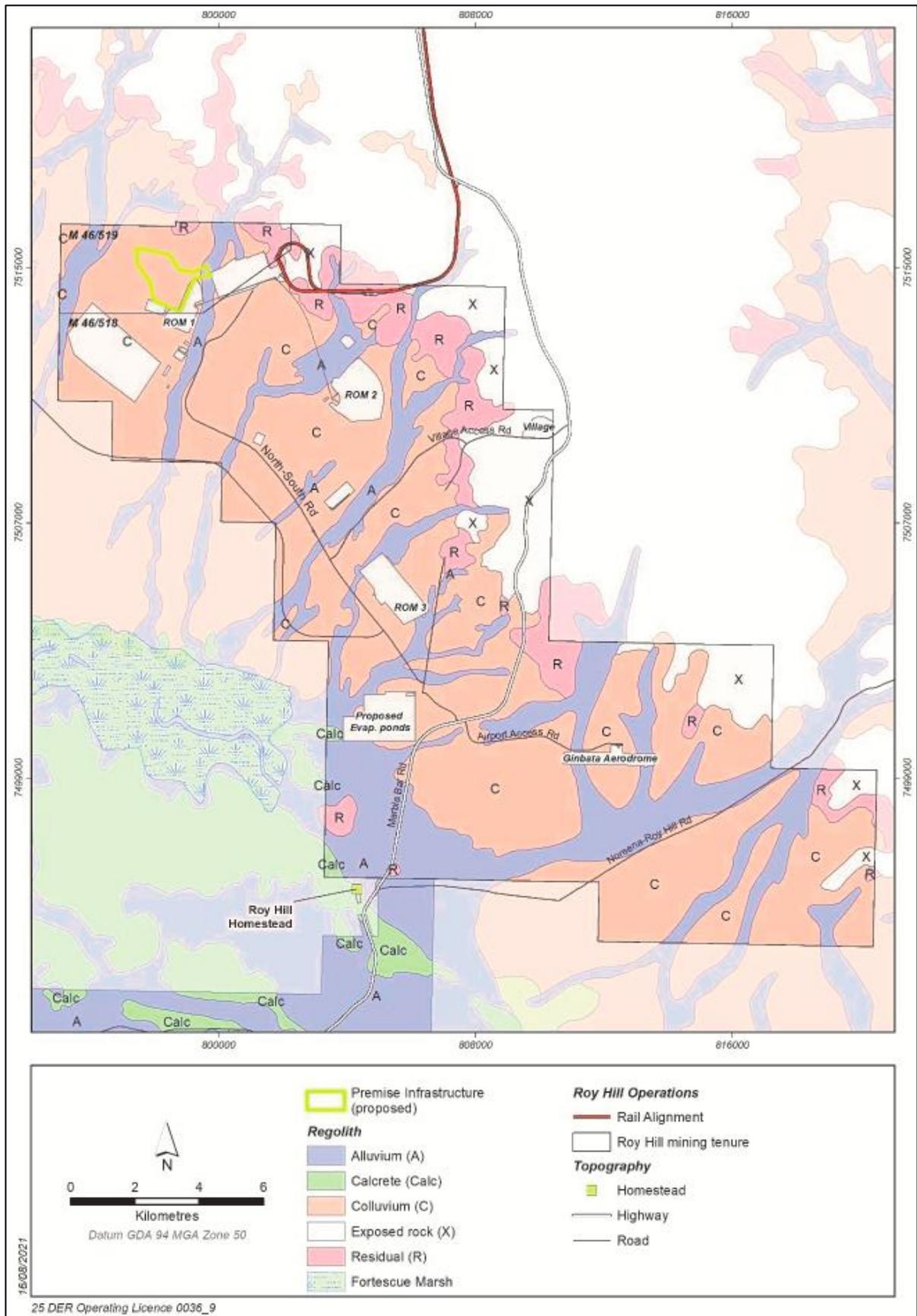
### 3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant's employees, visitors, and contractors 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 and Figure 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

**Table 3: Sensitive human and environmental receptors and distance from prescribed activity**

Human receptors	Distance from prescribed activity
Roy Hill Homestead	20 km from the MSP. Due to distance, it is not considered a receptor.
Environmental receptors	Distance from prescribed activity
Native vegetation and riparian vegetation on the premises	Within tenements M46/519 and M46/518 – less than 500 m from pit edge.
Fortescue River and Marsh - Priority 1 Ecological Community	Approximately 11 km southwest
Non perennial water course	Approximately 500m southeast of Zulu 6
Shallow aquifer within alluvium	approximately 408m RL



**Figure 2: Distance to sensitive receptors**

## 3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source 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 applicant 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 applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

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

Works approval W6595/2021/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

**Table 4: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation**

Risk events					Risk rating <sup>1</sup> C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
<b>Construction</b>								
Construction activities for Zulu6 IPTSF pipeline installation, vehicle movements	Dust	Air / windborne pathway causing impacts to health and amenity	No receptors	Refer to Section 3.1	C = Slight L = Possible <b>Low risk</b>	Y	Condition 1 – design and installation requirements	N/A
	Noise							
<b>Commissioning and time limited operations</b>								
Pipelines to new towers	Tailings containing metals, metalloids and residual flocculant discharging to land	Direct discharge from rupture of pipelines causing contamination	Soils	Refer to Section 3.1	C = Moderate L = Unlikely <b>Medium Risk</b>	Y	Condition 1 – design and installation requirements Condition 8 – Commissioning requirements Condition 13 – Time limited operation requirements	N/A
Deposition of tailings into Zulu	Seepage of tailings	Seepage and infiltration through	creek line,	Refer to	C = Major	N	<b>Condition 1 – design and</b>	Refer to Section 3.3

Works Approval: W6595/2021/1

27 July 2022

Risk events					Risk rating <sup>1</sup> C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
6 IPTSF	containing metals, metalloids and residual flocculant	subsurface impacting the quality and ecology of surface water/groundwater;  Potential adverse health impacts to Fortescue Marsh	groundwater	Section 3.1	L = Likely  <b>High Risk</b>		<b><u>installation requirements.</u></b> <b><u>Condition 4, 5 and 6 – construction of 4 monitoring bores within superficial gravel layer</u></b> <b><u>Condition 14 – monitoring during time limited operation</u></b>	
	Overtopping	Discharge of waste fines outside of the containment infrastructure		Refer to Section 3.1	C = Moderate L = Unlikely <b>Medium Risk</b>	Y	Condition 1 – design and installation requirements  Condition 13 – Time limited operation requirements	N/A

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

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

### 3.3 Detailed risk assessment for seepage

A series of abstraction bores and monitoring bores were constructed around the Zulu area. The bore logs around Zulu 6 IPTSF show that the top 10 to 28 metres is comprised of alluvium with lateral permeability between  $10^{-5}$  and  $10^{-6}$  m/s. This alluvial layer extends to the south and west of the pit all the way to the Fortescue Marsh. To the south-east, the alluvium connects to the non-perennial creek. Figure 3 shows a schematic of the geological formation around Zulu 5 and Zulu 6 IPTSF.

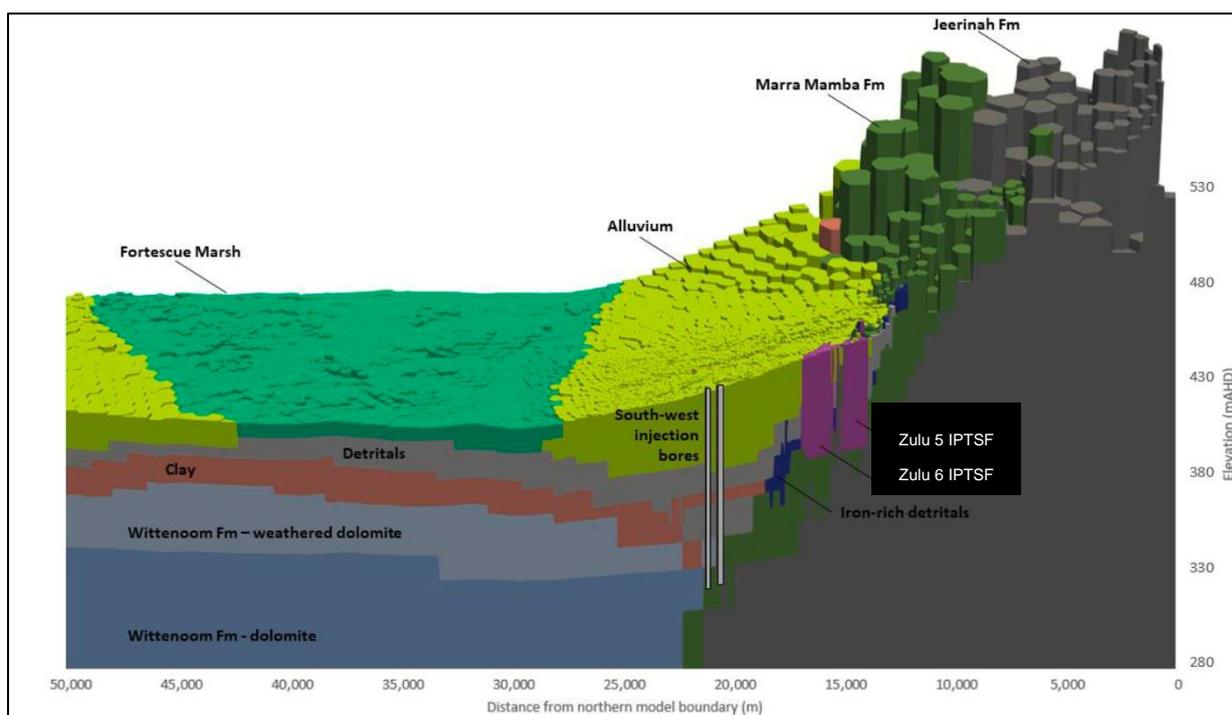
The groundwater change assessment report for the Zulu 6 IPTSF (GHD, 2021b) indicates that the operation of IPTSFs will result in localised groundwater mounding, limited to the immediate vicinity of the TSF footprint. Mounding is not expected to significantly change hydrodynamic flow patterns in the area which are predominantly influenced by dewatering and injection operations. The predicted groundwater level during the life of the mine will be 30 to 50 mbgl. The prevailing hydraulic head in the Z6 and Z5 IPTSF will result in net seepage to groundwater which is predicted to be 800 m<sup>3</sup>/d during mining. It is the equivalent of 0.3 GL per year. The IPTSF will be a source of elevated trace metals, such as Se and Cr, and nitrate. Seepage from the TSF to groundwater will introduce these solutes into the groundwater system.

The monitoring bores around the Zulu area (RHPZ0117, RHPZ0119, RHPZ0242, RHPZ0314 and RHPZ0352) were installed to monitor the deeper aquifer (below 412 m RL). Most of them have very long screened intervals at a large depth. If lateral seepage is to occur through the gravel layer, groundwater samples from the existing monitoring bores would not produce meaningful results. Given that environmental receptors (riparian vegetation and groundwater) are most likely to be affected by poor water quality in the shallow alluvial aquifer, new bores with a short screened interval (less than 6 m long) must be constructed within this aquifer.

Table 5 show a summary of bore logs and groundwater level around Zulu 6 IPTSF.

**Table 5: Summary of abstraction bores logs**

Bore	Top layer	Groundwater level (m bgl)	Groundwater level (m RL)
RHDB0259A	20 m alluvium	36	402
RHDB0296	18 m alluvium	38	402
RHDB0412	8 m hematite	1	396
RHDB0420	10 m alluvium	41	396
RHDB0423	14 m alluvium	39	396
RHDB0443	14 m alluvium	45	395
RHDB0444	24 m alluvium	46	395
RHPZ0117	22 m alluvium	49	399
RHPZ0119	12 m alluvium	48	399
RHPZ0242	28 m alluvium	38	403
RHPZ0314	23 m alluvium	20	not provided
RHPZ0352 (destroyed)	14 m alluvium	40	402



**Figure 3: Cross section of Zulu pit area and Fortescue Marshes.**

The GHD (2021b) report recommended two new monitoring bores, RHPZ0339 and RHPZ0507M. The department believes that the location for the new bores are appropriate but again the screening interval is very long for RNPZ0399 and both bores are targeting the deep aquifer. Also, monitoring bore RHPZ0352 has been destroyed and will need replacement.

## 4. Consultation

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

**Table 6: Consultation**

Consultation method	Comments received	Department response
Application advertised on the department's website on 8 October 2021	None received	N/A
Local Government Authority – East Pilbara - advised of proposal on 8 October 2021	None received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 8 October 2021	None received	N/A
Applicant was provided with draft documents on 16 June 2022	Applicant provided comments on 04 July 2022 Refer to Appendix 1	Applicant provided comments on 04 July 2022 Refer to Appendix 1

## 5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

## References

1. ANZG 2018. Australian and New Zealand Governments and Australian state and territory governments. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Canberra. <http://waterquality.gov.au/anz-guidelines>
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
4. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
5. Environmental Protection Authority (EPA) 2021, *Revised Proposal for the Roy Hill Iron Ore Mine – Report 1716*, Environmental Protection Authority, Perth, WA.
6. SRK 2018, *Roy Hill – geotechnical characterization of iron ore tailings*, ROY006. Report prepared for Roy Hill Iron Ore by SRK Consulting (Australasia) Pty Ltd.
7. MWM 2021, *Zulu 6 In-Pit Tailings Disposal – Geochemical Risk Review*. Memorandum prepared for Roy Hill Iron Ore by Mine Waste Management Greenroad Group.
8. GHD 2021a, *Zulu 6 In-Pit Tailings Storage Facility - Basis of Design, 2720-GE-BOD-0001*. Report prepared for Roy Hill Iron Ore by GHD.
9. GHD 2021b, *Zulu 6 In-Pit Tailings Storage Facility - Groundwater Change Assessment Report, 2720-HY-REP-0001*. Report prepared for Roy Hill Iron Ore by GHD.

## Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Works Approval		
Condition 1, Table 1	<p>Roy Hill confirms that no booster pump station is being installed and as such requests this be removed from the design requirements in column 3 of Table 1.</p> <p>Roy Hill advises that the Zulu West Levee is the safety bund at the perimeter of the existing Zulu 6 pit. As such they are the same. Figure 3 has been update as requested.</p> <p>Roy Hill refers to item 2 column 3 which request that Roy Hill confirm the number and location of groundwater monitoring bores. Roy Hill advises that shallow monitoring bores will be installed where possible within 500 meters to the west, south and south-east of the perimeter of Zulu 6. The area to the south and south-east of the Zulu 6 IPTSF support ROM1 as such some monitoring bores will be located further than 500 meters.</p> <p>Existing shallow monitoring bore RHPZ0507S will be utilised as a monitoring bore for Zulu 6. RHPZ0507S is located approximately 1300 meters south of Zulu 6. Bore log details have been attached for RHPZ0507S.</p> <p>The final location of the bores will be confirmed after they have been installed. Roy Hill will submit the final coordinates and bore log details in the compliance report required under condition 6 of the Works Approval.</p> <p>Roy Hill confirms that piezometers will not be installed on shallow groundwater bores required for Zulu 6 IPTSF. As such Roy Hill requests that the wording requiring the installation of survey instrumentation (i.e. wire vibrating piezometers) is removed from Table 1.</p>	Updated as requested.
Condition 5	Roy Hill notes that ANZG 2018 95% level of species protection is considered slightly to moderately disturbed system. Roy Hill will apply site specific guideline values where the concentration of background groundwater parameters are greater than the default guideline values as defined in ANZG 2018.	Noted.

Condition	Summary of applicant's comment	Department's response
Condition 9	Roy Hill request that one consolidated Commissioning Report be submitted 60 days from the completion of item 2 of Table 3 i.e. Z6 IPTSF as commissioning will require the use of the pipelines and spigots, which would likely occur at the same time.	Updated as requested.
Condition 13, Table 4	Roy Hill confirms that piezometers will not be installed on shallow groundwater bores required for Zulu 6 IPTSF. As such Roy Hill requests that the wording requiring the installation of survey instrumentation (i.e. wire vibrating piezometers) is removed from Table 4.	Updated as requested.
Schedule 1, Figure 3	Roy Hill has provided an updated Figure 3	Updated as requested.
Schedule 1, Figure 4	Roy Hill request that this map refer to locations as indicative, as the final locations will be confirmed after installation, with bore log details included in the Compliance Report required by condition 6.	Updated as requested.
Decision Report		
Page 14	Roy Hill notes that the Part IV Ministerial Statement was issued on 19 May 2022. As such the table will need to be updated to replace the wording under assessment with EPA.	Updated as requested.

## Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY		
<b>Application type</b>		
Works approval	<input checked="" type="checkbox"/>	
Date application received	27/08/2021	
<b>Applicant and Premises details</b>		
Applicant name/s (full legal name/s)	Roy Hill Iron Ore Pty Ltd	
Premises name	Roy Hill mine	
Premises location	M46/518 and M46/519	
Local Government Authority	Shire of East Pilbara	
<b>Application documents</b>		
HPCM file reference number:	DER2021/000494	
Key application documents (additional to application form):	Supporting Document - Environment	
<b>Scope of application/assessment</b>		
Summary of proposed activities or changes to existing operations.	Zulu 6 In-pit Tailings Storage Facility Design Report	
<b>Category number/s (activities that cause the premises to become prescribed premises)</b>		
<b>Table 1: Prescribed premises categories</b>		
Prescribed premises category and description	Proposed design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: processing or beneficiation	No change in throughput: 86,000,000 tonnes per year	N/A
<b>Legislative context and other approvals</b>		
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"/>	Referral decision No:2214 Managed under Part V <input type="checkbox"/> Assessed under Part IV <input checked="" type="checkbox"/>
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 1189 approved 19 May 2022
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Reference No: EPBC2018/8330 dated 8/09/2021
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: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 type="checkbox"/> No <input checked="" type="checkbox"/>	No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	No clearing is proposed.
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 type="checkbox"/>	Licence/permit No: GWL 172642
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 xxxx</i> )	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Mining Act 1978</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
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"/>	Date of classification: N/A

## Appendix 3: Summary of tailings supernatant composition

Sample ID	pH	EC	Ca	Mg	Na	K	SO <sub>4</sub>	Cl	F	Si
	NONE	µS/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RH_TAILS_01	7.4	1910	174	84	164	17	578	261	0.8	30
RH_TAILS_05	7.5	1800	159	73	160	17	548	224	0.9	27
RH_TAILS_07	7.5	1790	156	73	160	17	554	235	1	26
RH_TAILS_09	7.5	1780	165	78	144	16	541	234	0.9	25
RH_TAILS_12	7.5	2240	217	101	217	21	704	373	1.4	25
RH_TAILS_15	7.5	2140	211	101	181	22	775	296	1.3	24
Tails 11/11/16	7.5	1863	187	86	157	21	620	256	2.3	23
RH_TAILS_19	7.6	1778	168	83	153	19	582	240	1.9	21
RH_TAILS_21	7.8	1987	192	84	166	16	604	282	1.4	21
RH_TAILS_23	7.7	2076	200	93	184	21	679	304	1.7	21
Sample ID	As	B	Ba	Cr	Mo	Sb	Se	Sr	U	-
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	-
RH_TAILS_01	0.0014	0.25	0.01	0.24	0.0006	0.00008	0.02	1.02	0.002	-
RH_TAILS_05	0.0009	0.24	0.01	0.22	0.0003	0.00005	0.02	0.96	0.002	-
RH_TAILS_07	0.0007	0.25	0.01	0.2	0.0003	0.00008	0.02	0.76	0.001	-
RH_TAILS_09	0.0004	0.27	0.02	0.16	0.0004	0.00005	0.02	0.72	0.002	-
RH_TAILS_12	0.0003	0.37	0.02	0.06	0.0016	0.00006	0.02	1.02	0.001	-
RH_TAILS_15	0.0002	0.37	0.02	0.01	0.0012	0.00023	0.01	0.95	0.001	-
Tails 11/11/16	<0.0001	0.19	0.02	0.02	0.0002	0.00004	0.01	0.76	0.001	-
RH_TAILS_19	<0.0001	0.2	0.02	0.02	0.0003	0.00007	0.01	0.74	0.001	-
RH_TAILS_21	0.0004	0.17	0.02	0.04	0.0006	0.00006	0.01	0.88	0.003	-
RH_TAILS_23	0.0002	0.19	0.02	0.03	0.0005	0.00008	0.01	0.95	0.001	-