

THUNDERBIRD MINERAL SANDS PROJECT

PRELIMINARY GROUNDWATER MANAGEMENT PLAN

**REPORT FOR
SHEFFIELD RESOURCES
LIMITED**

NOVEMBER 2016



Rockwater
HYDROGEOLOGICAL AND ENVIRONMENTAL CONSULTANTS



Report No. 464-0/16/03

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REVISION	AUTHOR	REVIEW	ISSUED
Rev 0	IBdR	JC	15/11/16

1 SUMMARY

This Condition Environmental Management Plan (Condition EMP) is submitted in accordance with Part IV of the *Environmental Protection Act 1986* (WA) for the Thunderbird Mineral Sands Project by Sheffield Resources Limited (Sheffield).

Table 1 presents the environmental criteria to measure achievement of the conditioned environmental objective that must be met through implementation of this Condition EMP.

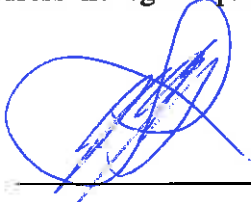
Table 1: Environmental management targets

Title of proposal	Thunderbird Mineral Sands Project
Proponent	Sheffield Resources Limited
Relevant Act	Part IV of the <i>Environmental Protection Act 1986</i> (WA)
Purpose of this Condition EMP	The Groundwater Management Plan is submitted to fulfil the requirements of Part IV of the <i>Environmental Protection Act 1986</i> (WA)
EPA's environmental objective for the key environmental factor/s	
Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.
Inland Water Environmental Quality	To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.
Condition environmental outcome or proposed measurable outcome	Acceptable groundwater quality and drawdown and mounding levels maintained.
Environmental Criteria	Groundwater quality and drawdown and mounding levels, as measured in key monitoring bores
Trigger criteria	<p><u>Trigger Criterion 1: Groundwater drawdown (Fraser River South valley)</u></p> <ul style="list-style-type: none"> A 1 m decrease in groundwater levels beyond seasonal trends <p><u>Trigger Criterion 2: Groundwater drawdown (surface water ponding areas)</u></p> <ul style="list-style-type: none"> A 0.5 m decrease in groundwater levels beyond seasonal trends in the shallow surface water ponding areas, synchronous with groundwater level trends in the proximal Broome aquifer monitoring data <p><u>Trigger Criterion 3: Groundwater drawdown (existing groundwater users)</u></p> <ul style="list-style-type: none"> Groundwater drawdown of 1 m beyond seasonal trends <p><u>Trigger Criterion 4: Groundwater mounding (injection region mounding)</u></p> <ul style="list-style-type: none"> Groundwater levels of <10 m below ground level <p><u>Trigger Criterion 5: Groundwater drawdown (tailings mounding)</u></p> <ul style="list-style-type: none"> Groundwater levels of <10 m below ground level <p><u>Trigger Criterion 6: Groundwater quality</u></p> <ul style="list-style-type: none"> To be determined
Threshold criteria	<p><u>Threshold Criterion 1: Groundwater drawdown (Fraser River South valley)</u></p> <ul style="list-style-type: none"> To be determined

	<p><u>Threshold Criterion 2:</u> Groundwater drawdown (surface water ponding areas)</p> <ul style="list-style-type: none"> • A 1 m decrease in groundwater levels beyond seasonal trends in the shallow surface water ponding areas, synchronous with groundwater level trends in the proximal Broome aquifer monitoring data <p><u>Threshold Criterion 3:</u> Groundwater drawdown (existing groundwater users)</p> <ul style="list-style-type: none"> • Groundwater drawdown of ≥ 5 m beyond seasonal trends <p><u>Threshold Criterion 4:</u> Groundwater mounding (injection region mounding)</p> <ul style="list-style-type: none"> • Groundwater levels of < 3 m below ground level <p><u>Threshold Criterion 5:</u> Groundwater drawdown (tailings mounding) Groundwater levels of < 3 m below ground level</p> <p><u>Threshold Criterion 6:</u> Groundwater quality</p> <ul style="list-style-type: none"> • To be determined
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Corporate endorsement

I hereby certify that to the best of my knowledge, the Condition EMP provisions within this Groundwater management Plan are true and correct and address the legal requirements of Part IV of the Environmental Protection Act 1986 (EP Act).

Name: Bruce McFadzean Signed: 

Designation: Managing Director Date: 14 November 2016

2 CONTEXT, SCOPE AND RATIONALE

2.1 PROPOSAL

The proposed Thunderbird Mineral Sands Project (the project) is located approximately 98 km northeast of Broome and 72 km west of Derby in Western Australia. The project includes heavy mineral sands mining above and below the water table, dewatering within the Broome aquifer, onsite mineral processing, transport of mineral products to Broome and Derby Port, and transshipping via King Sound using new and existing infrastructure at Derby Port. The project includes:

- Mining up to a depth of approximately 100 m below ground level.
- Processing of heavy mineral sands including use of a tailings storage facility (TSF).
- Progressive backfilling of the mine pit with mine and processing wastes and rehabilitation of backfilled areas.
- Upgrade and extension of an existing road to provide an approximately 32 km long Site Access Road linking the project to the Great Northern Highway.
- Groundwater abstraction from the Broome Sandstone aquifer.
- Injection of excess mine dewatering water into the Broome Sandstone aquifer.
- Supporting infrastructure including internal roadways, accommodation camp, power plant, workshops, offices and landfill.
- Storage of mineral sands products and export from Derby Port and Broome Port.

2.2 KEY ENVIRONMENTAL FACTORS: HYDROLOGICAL PROCESSES AND INLAND WATERS ENVIRONMENTAL QUALITY

This Condition EMP specifically addresses the groundwater environmental aspects that relate to Hydrological Processes and Inland Waters Environmental Quality. Groundwater is a key environmental consideration because the proposal includes groundwater abstraction from, and injection into the Broome Sandstone aquifer. This water management requirement will result in localised groundwater drawdown and mounding, with the potential to impact on surrounding ecosystems and groundwater users.

2.3 REQUIREMENTS OF THE CONDITION

Specifically, this Groundwater Management Plan is submitted as an appendix to the PER approval document in order to satisfy the EPA that Sheffield has taken into consideration the environmental objective set for the respective key environmental factors and are committed to

undertaking a project that meets these objectives. This will occur through the application of management and monitoring measures as detailed in this Plan.

2.4 RATIONALE AND APPROACH IN MEETING THE ENVIRONMENTAL OUTCOME

Results of baseline surveys and a number of assumptions and uncertainties inform the management approach for meeting the environmental objective stated in Section 3.1. The identified trigger criteria, threshold criteria, trigger level actions and threshold contingency actions are aligned with the overall management approach.

2.4.1 Results of hydrogeological assessments

A numerical modelling assessment of the project has been undertaken. The model incorporates both project-scale hydrogeology and mine sequencing and also hydrogeological processes for the greater Dampier Peninsula. The model was developed with reference to the Australian groundwater modelling guidelines and has been designed to meet the key requirements of a Class 3-confidence-level classification. Model parameters are based on site-specific data and regional reference data. Model calibration was based on local and regional monitoring data. The model incorporated existing groundwater users on the Dampier Peninsula, including the Broome town borefield.

Predictive modelling assessments were undertaken for the proposed water management strategy. Predictive assessments incorporated a variety of potential future climate scenarios, based on CSIRO's summary of climate predictions. The impact of parameter uncertainty was assessed via predictive uncertainty assessments. Model results suggest that drawdown of up to about 2 m may be expected at the Fraser River South valley, about 8 km south-east from the mine. Groundwater drawdown at the Fraser River South valley is predicted to be a gradual process over the Thunderbird Project's 40+ year duration. Vegetation communities in this region are likely to experience seasonal variability in groundwater levels. Groundwater drawdown is not predicted to impact on existing licenced groundwater users, including the Broome town water supply. Drawdown results are relatively insensitive to future climate scenarios and model-parameter uncertainty. Dewatering volumes are predicted to peak in later stages of the mining sequence, with about 30 GL/year dewatering predicted in mining year 47. Predictive uncertainty assessments suggest that a 97.5 percentile uncertainty scenario would result in dewatering volumes of up to 16% greater on average over the 40+ year mine life, with peak dewatering rates up to 8 GL greater towards the end of the mine sequence.

2.4.2 Key assumptions and uncertainties

Limitations and uncertainty associated with the hydrogeology assessment include the uneven distribution of monitoring bores, uncertainty associated with private groundwater extraction and aquifer parameter heterogeneity. Given these limitations and uncertainties, the groundwater modelling assessment has adopted a predictive uncertainty assessment whereby a variety of model outcomes are presented for a variety of potential model configurations.

Results from mine waste and mine residue characterisation indicates that the significant majority of mine materials will be Non Acid Forming (NAF). However, two samples of PAF material have been identified in regions that are close to the final stages of the mining schedule. Pit dewatering during later stages of mining has the potential to expose PAF materials to oxidation and acidification. PAF materials have the potential to cause down-gradient acidification when oxidised. Groundwater quality monitoring will be conducted during early stages of mining. This will be done to characterise baseline groundwater quality, with these data used to refine this Groundwater Condition Environmental Management Plan for inclusion of groundwater quality trigger levels and actions as required.

2.4.3 Management approach

The management approach is based on the following actions:

- A baseline monitoring and trigger-location bore network.
- Appropriate environmental criteria for trigger and threshold levels (provisional triggers are provided, to be confirmed after further input from Department of Water).
- Reviews of the hydrogeological assessment and groundwater monitoring based on operational data.
- Reviews of the water management strategy where required to meet the trigger and threshold levels; for example, altering the location and/or timing of aquifer injection to meet trigger and threshold level requirements.
- Delaying or avoiding certain mining regions to comply with trigger and threshold levels.

2.4.4 Rationale for choice of environmental criteria

Site-specific management targets are based on the following rationale:

Groundwater drawdown in the Fraser River South valley: Vegetation assessments have not identified groundwater dependence in this region. However, a precautionary approach is adopted given the relative groundwater depth. Proposed provisional triggers are based on the

groundwater model predictions. A trigger level of half the predicted drawdown is proposed, whereby trigger-reporting, increased-intensity monitoring and further assessments are activated.

Surface water ponding areas: Hydrogeological and vegetation assessments do not suggest that these locations are groundwater dependent. However, a precautionary approach is adopted whereby triggers are proposed to assist in further assessments of these locations. Proposed provisional triggers are based on likely seasonal and long-term water level changes in surface ponding areas.

Impact on existing groundwater users: Hydrogeological assessments do not suggest that existing groundwater users will be impacted by groundwater drawdown and mounding. However, a precautionary approach is adopted whereby triggers are used to further confirm these conclusions. Proposed provisional triggers are based on modelled groundwater drawdowns.

Injection region and tailings region mounding: Hydrogeological assessments do not identify mounding-related impacts. However, a precautionary approach is adopted whereby triggers are used to further confirm these conclusions. Proposed provisional triggers are based on groundwater levels with respect to ground level.

2.4.5 Rationale for choice of trigger level actions and threshold contingency actions

Site-specific management targets are based on the following rationale:

Groundwater drawdown in the Fraser River South valley: Proposed provisional triggers are based on the groundwater model predictions. A trigger level of half the predicted drawdown is proposed, whereby trigger-reporting, increased-intensity monitoring and further assessments are activated. A threshold level equal to the predicted drawdown is proposed as a provisional level for pre-emptive impact-mitigation measures.

Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the Fraser River valley region. If this strategy is required prior to below-watertable mining then the timing of injection may need to be altered.

Surface water ponding areas: Proposed provisional triggers are based on likely seasonal and long-term water level changes in surface ponding areas. Triggers are based on comparison of

shallow surface water levels with deeper Broome aquifer monitoring data and regional-response data.

Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the Fraser River valley region. If this strategy is required prior to below-watertable mining then the timing of injection may need to be altered.

Impact on existing groundwater users: Proposed provisional triggers are based on modelled groundwater drawdowns. Triggers are based on comparison of regional-response data.

In the event that unexpected drawdown impacts on existing groundwater users Sheffield will provide alternative water sources. This may include:

- Deepening existing bores or providing increased pumping capacity; and/or
- Piping or transporting water from the Thunderbird Project to the existing user's water source.

Injection region and tailings region mounding: Proposed provisional triggers are based on groundwater levels with respect to ground level. Triggers are based on a likely threshold whereby impacts from mounding effects may reasonably occur.

Mitigation measures include altering the location and/or timing of aquifer injection and/or tailings emplacement.

Triggers and thresholds are developed with reference to Western Australia's Department of Water Operational Policy 5.08 (Use of Operating Strategies in the Water Licensing Process) and 5.12 (Hydrogeological reporting associated with a groundwater well licence). Monitoring will be undertaken in a manner consistent with the requirements of Western Australia's Department of Water Operational Policies 5.08 and 5.12.

Triggers with reference to seasonal trends require synchronous baseline data to assess seasonal trends outside drawdown and mounding areas. Assessments of seasonal trends will be developed in consultation with Department of Water and documented in the Groundwater Licence Operating Strategy.

3 CONDITON EMP PROVISIONS

This section of the Condition EMP identifies the legal provisions that Sheffield proposes to implement to implement the environmental management plan. It identifies the environmental criteria that Sheffield will use to measure performance and monitoring that will be undertaken in relation to these environmental criteria. Finally, it defines the trigger level actions and threshold contingency actions that Sheffield will undertake if the environmental criteria are exceeded. These Condition EMP provisions aim to fulfil the requirements of Part IV of the *EP Act*.

3.1 ENVIRONMENTAL CRITERIA

Two levels of criteria were considered during development of this Condition EMP. They are trigger criteria and threshold criteria, which will vary in function. The trigger criteria were set at a conservative level to ensure trigger level actions are implemented well in advance of the environmental outcome being compromised. The threshold criteria were framed to measure achievement of the environmental outcome. A failure to meet threshold criteria signals the environmental outcome is not being met and implies non-compliance. Groundwater quality criteria are to be determined.

Table 2: Environmental criteria

Trigger criterion	Groundwater drawdown and mounding approaching that predicted in the hydrogeological assessment
Threshold criterion	Groundwater drawdown and mounding equal to or greater than that predicted in the hydrogeological assessment

3.2 MONITORING

The purpose of monitoring is to inform, through the environmental criteria, if the condition environmental outcome is being achieved and when trigger level actions or threshold contingency actions will be implemented. This section describes how Sheffield will undertake monitoring to determine the performance against the environment criteria. Refer to Table 3 and Table 4 and Figure 1 for monitoring provisions.

Sheffield will be responsible for monthly monitoring, maintenance and replacement of monitoring bores. The data from the monitoring bores will be stored in a computer database. Production bores will be fitted with a flow meter as per Department of Water *Operational policy 5.03 Metering the taking of water*. Meters will be properly maintained to ensure that accurate readings can be taken. Meter reading data will be maintained on a database.

Sheffield will prepare annual and triennial groundwater monitoring and management reports for submission to the Department of Water. The annual and triennial groundwater monitoring and management reports will comply with Department of Water *Operational policy no. 5.12 – Hydrogeological reporting associated with a groundwater well licence*. The reports will include an assessment of compliance with the Groundwater Management Plan and may include recommendations for changes to the water management system to maintain compliance with the Groundwater Management Plan.

3.3 IMPLEMENTATION OF TRIGGER LEVEL ACTIONS

Sheffield has developed trigger level actions that would be implemented if the associated trigger criterion signals the need for increased mitigation or protection (Table 3). These trigger level actions will be implemented by Sheffield to mitigate and manage impacts so they once again will meet trigger criteria and safeguard threshold criteria.

3.4 IMPLEMENTATION OF THRESHOLD CONTINGENCY ACTIONS

Sheffield has developed a number of threshold contingency actions that would be implemented if the associated threshold criterion signals that the environmental outcome is exceeded (Table 4). The threshold contingency actions will be implemented to manage aspects of the proposal and achieve the condition environmental outcome and manage the impact to below threshold and trigger criteria again and hence bring Sheffield back into compliance.

Table 3: Monitoring to measure environmental outcome against threshold criteria

Indicator	Method	Location	Frequency	Trigger level actions and timing to implement
<p><u>Groundwater drawdown (Fraser River South valley)</u></p> <p>A 1 m decrease (half of the predicted maximum drawdown) in groundwater levels beyond seasonal trends.</p>	Monthly groundwater level measurements	Monitoring location 15 in Figure 1	Monthly	Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the Fraser River valley region. If this strategy is required prior to below-watertable mining then the timing of injection may need to be altered.
<p><u>Groundwater drawdown (Surface water ponding areas)</u></p> <p>A 0.5 m decrease in groundwater levels beyond seasonal trends in the shallow surface water ponding areas. The trigger is applicable when the 0.5 m decrease is shown to be synchronous with groundwater level trends in the proximal Broome Sandstone aquifer monitoring data.</p>	Monthly groundwater level measurements	Monitoring location 17 in Figure 1	Monthly	Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the surface water ponding areas. If this strategy is required prior to below-watertable mining then the timing of injection may need to be altered.
<p><u>Groundwater drawdown (Existing groundwater users)</u></p> <p>A 1 m trigger for groundwater drawdown beyond seasonal trends.</p>	Monthly groundwater level measurements	Monitoring locations 1, 18 & 20 in Figure 1	Monthly	<p>In the event that unexpected drawdown impacts on existing groundwater users Sheffield will provide alternative water sources. This may include:</p> <ul style="list-style-type: none"> - Deepening existing bores or providing increased pumping capacity; and/or - Piping or transporting water from the Thunderbird Project to the existing user's water source.

Indicator	Method	Location	Frequency	Trigger level actions and timing to implement
<u>Groundwater Mounding</u> (Injection region mounding) Groundwater levels of <10 m below ground level	Monthly groundwater level measurements	Monitoring locations 4,5&6 in Figure 1	Monthly	Altering the location and/or timing of aquifer injection
<u>Groundwater drawdown</u> (Tailings mounding) Groundwater levels of <10 m below ground level	Monthly groundwater level measurements	Monitoring location 3 in Figure 1	Monthly	Altering the location and/or timing of tailings emplacement
<u>Groundwater quality</u>	Groundwater quality sampling from monitoring bores	To be determined	To be determined	To be determined



Table 4: Monitoring to measure environmental outcome against threshold criteria

Indicator	Method ¹	Frequency	Trigger level actions and timing to implement
<u>Groundwater drawdown (Fraser River South valley)</u> To be determined	Monthly groundwater level measurements	Monthly	Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the Fraser River valley region. If this strategy is required prior to below-watertable mining then the timing of injection may need to be altered.
<u>Groundwater drawdown (Surface water ponding areas)</u> A 1 m decrease in groundwater levels beyond seasonal trends in the shallow surface water ponding areas. The threshold is applicable when the 1 m decrease is shown to be synchronous with groundwater level trends in the proximal Broome aquifer monitoring data.	Monthly groundwater level measurements	Monthly	Mitigation measures include altering the location and/or timing of aquifer injection. This strategy involves moving the injection borefield or components of the injection borefield closer towards the Fraser River South valley. The proposed injection borefield would remain within the access road corridor. This strategy will maintain groundwater levels in the surface water ponding areas. If this strategy is required prior to below-watertable mining then the timing of aquifer injection may need to be altered.
<u>Groundwater drawdown (Existing groundwater users)</u> A 5 m trigger for groundwater drawdown beyond seasonal trends	Monthly groundwater level measurements	Monthly	In the event that unexpected drawdown impacts on existing groundwater users Sheffield will provide alternative water sources. This may include: <ul style="list-style-type: none"> - Deepening existing bores or providing increased pumping capacity; and/or - Piping or transporting water from the Thunderbird Project to the existing users' water source.
<u>Groundwater Mounding (Injection region mounding)</u> Groundwater levels of <3 m below ground level.	Monthly groundwater level measurements	Monthly	Altering the location and/or timing of aquifer injection

Indicator	Method ¹	Frequency	Trigger level actions and timing to implement
<u>Groundwater mounding</u> (Tailings mounding) Groundwater levels of <3 m below ground level.	Monthly groundwater level measurements	Monthly	Altering the location and/or timing of tailings emplacement
<u>Groundwater quality</u>	Groundwater quality sampling from monitoring bores	To be determined	To be determined

1. Monitoring locations as defined in Table 3



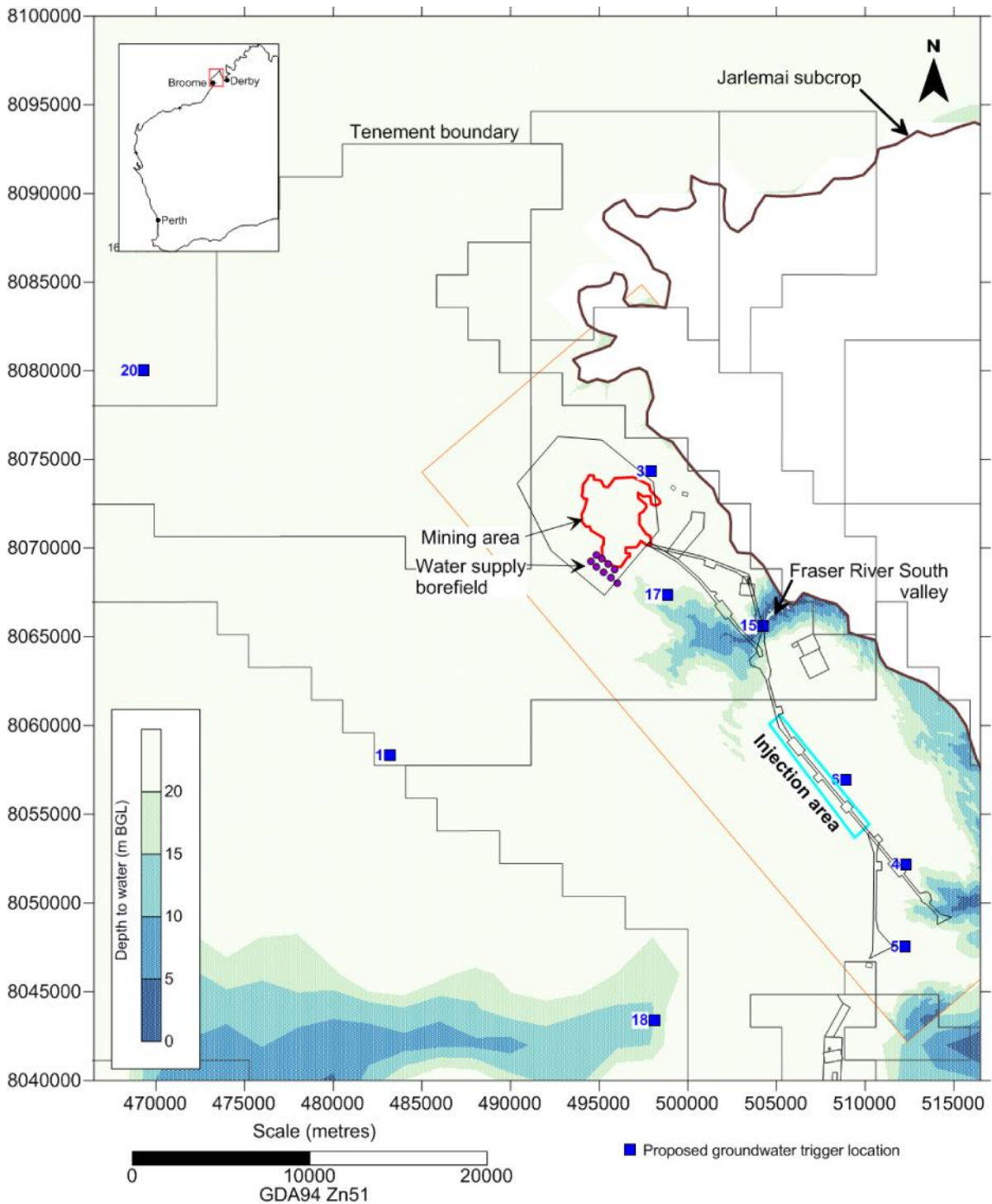


Figure 1: Location of proposal and monitoring sites/areas

3.5 REPORTING PROVISIONS

3.5.1 Annual reporting

The environmental outcome will be reported annually against trigger and threshold criteria (Table 5). Draft proposed timing is for the period 1 July–30 June to be reported by 1 September in an annual report. Final reporting timeframes are to be agreed in consultation with the Department of Water.

In the event that trigger criteria or trigger and threshold criteria were exceeded during the reporting period, the annual report will include a description of the effectiveness of trigger level actions, and threshold contingency actions that have been implemented to manage the impact, as well as an analysis of trends.

3.5.2 Reporting on exceedance of trigger criteria and threshold criteria

In the event of exceedance of any trigger or threshold criteria, Sheffield will notify the OEPA in writing within 14 days.

Table 5: Condition Environmental Management Plan reporting

Key environmental factor: Groundwater drawdown and mounding (Part IV of the EP Act)

Condition environmental objective and threshold and trigger criteria set in the condition EMP	Reporting on the environmental outcome, threshold and trigger criteria	Status ¹
Condition environmental outcome: Maintaining groundwater levels within the ranges predicted in the hydrogeological assessment	Assessments of the trigger and threshold compliance will be contained in the annual groundwater monitoring and assessment report. In the event of exceedance of any trigger or threshold criteria, Sheffield will notify the OEPA in writing within 14 days.	
Trigger criteria:		
1. Groundwater drawdown approaching levels that are predicted in the hydrogeological assessment		
2. Groundwater mounding approaching a level likely to result in mounding impacts		
3. Groundwater quality impacts		
Threshold criteria:		
1. Groundwater drawdown reaching levels that are predicted in the hydrogeological assessment		
2. Groundwater mounding reaching a level likely to result in mounding impacts		
3. Groundwater quality impacts		

- The status of achievement of environmental outcome is indicated by the following:
YES: Condition environmental outcome achieved
NO: Condition environmental outcome not achieved

4 ADAPTIVE MANAGEMENT AND REVIEW OF THE CONDITION EMP

Sheffield will also implement adaptive management to learn from the implementation of mitigation measures, monitoring and evaluation against trigger and threshold criteria, to more effectively meet the condition environmental outcome. The approach detailed below will be followed:

- Monitoring data will be systematically evaluated and compared to baseline and reference site data on a monthly basis in a process of adaptive management to verify whether hydrological responses to the impact are the same or similar to predictions.
- The assumptions and uncertainties listed in Section 3.1 will be assessed via comparison of measured and predicted groundwater responses. The groundwater model will be updated where required.
- Monitoring reports will include sections detailing updated understandings of the hydrogeological regime, where required.
- Where required, monitoring reports may include recommendations to review the EMP conditions.

5 STAKEHOLDER CONSULTATION

Consistent with the EPA's expectations for this Condition EMP to align with the principles of EIA, Sheffield has undertaken consultation as part of the broader approvals process. The primary stakeholder in relation to groundwater is the Department of Water (DoW). Sheffield received feedback from DoW on the hydrogeological assessment that underpins this management plan in May and June 2016. The report was subsequently updated in accordance with the feedback and this groundwater management plan was developed. Sheffield reports numerous other stakeholder consultations (Table 6) and will continue to consult with relevant stakeholders in relation to this groundwater management plan and update it as required.

Table 6: Stakeholders consultation

Stakeholder sector	Organisation
Primary stakeholders	
State government departments and agencies	Office of the Environmental Protection Authority
	Department of Mines and Petroleum
	Department of Water
	Department of Environment Regulation
Commonwealth government departments	Department of the Environment and Energy
Indigenous groups	<ul style="list-style-type: none"> • Yawuru People • Nyikina Mangala People • Bindinbur Claimants • Mt Jowlanga #2 Claimants • Kimberley Land Council • KRED
Underlying land owner	Mt Jowlaenga pastoral lease
Secondary stakeholders	
Adjacent land owners	Yeeda, Kilty and Country Downs pastoral leases
Local government authorities	Shire of Broome
Non-government organisations, including environmental interest groups	<ul style="list-style-type: none"> • Environs Kimberley • Conservation Council of Western Australia (CCWA) • The Wilderness Society • Australian Conservation Foundation • Kimberley Pilbara Cattlemen's Association • Rangelands NRM
State government departments and agencies	<ul style="list-style-type: none"> • Department of Agriculture • Pastoral Lands Board (PLB)

Dated: 15 November 2016**Rockwater Pty Ltd**

Ian Brandes de Roos
Principal Hydrogeologist