



Statement No.

**MINISTER FOR THE ENVIRONMENT AND HERITAGE**

**000598**

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED  
(PURSUANT TO THE PROVISIONS OF THE  
ENVIRONMENTAL PROTECTION ACT 1986)**

**HYDROGEOLOGICAL RESEARCH PROGRAMME AT MARANDOO  
TRIAL DEWATERING & RE-INJECTION TEST  
KARIJINI NATIONAL PARK**

**Proposal:** To undertake a hydrogeological research programme at the Marandoo mine site, as documented in schedule 1 of this statement. Marandoo mine site is 35 kilometres north-east of the town of Tom Price in the Pilbara, and is operated by Hamersley Iron Pty Limited. The Marandoo Mining Lease (M272SA) abuts the Karijini National Park.

**Proponent:** Hamersley Iron Pty Limited

**Proponent Address:** Central Park, 152-158 St George's Terrace  
Perth WA 6837

**Assessment Number:** 1428

**Report of the Environmental Protection Authority:** Bulletin 1048

The proposal referred to above may be implemented subject to the following conditions and procedures:

*Procedural conditions*

**1 Implementation and Changes**

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

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- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

## **2 Proponent Commitments**

- 2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.
- 2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of the conditions in this statement.

## **3 Proponent Nomination and Contact Details**

- 3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.
- 3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.
- 3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

## **4 Commencement and Time Limit of Approval**

- 4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

- 4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

### *Environmental conditions*

#### **5 Compliance Audit**

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments; and
- the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement. Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

## **Procedures**

- 1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.
- 2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

## **Notes**

- 1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

Dr Judy Edwards MLA  
MINISTER FOR THE ENVIRONMENT AND HERITAGE

- 2 JUL 2002

### Marandoo hydrogeological research programme

#### The Proposal (Assessment No. 1428)

The proposal is to undertake a hydrogeological research programme at the Marandoo mine site which is 35 kilometres north-east of the town of Tom Price in the Pilbara, and is operated by Hamersley Iron Pty Limited. The Marandoo Mining Lease (M272SA) abuts the Karijini National Park.

The research programme seeks to clarify the extent of connection of the Marra Mamba orebody aquifer with a deep Wittenoom Dolomite aquifer that extends beneath the Karijini National Park and between this Wittenoom Dolomite aquifer with two shallow un-named calcrete aquifers.

Understanding the connectivity of the Marra Mamba aquifer with and between these aquifers will provide the basis for:

- evaluating the feasibility of dewatering the orebody to access the below-watertable Marandoo ore; and
- predicting the environmental impacts of dewatering on the aquifers and significant vegetation inside the Karijini National Park.

The main components of the research programme are:

- Drilling, constructing and short term (3 day) test pumping of production bores and trial re-injection bores;
- Establishing a network of piezometers that intersect key aquifers;
- Running a pipeline from the production bores to the re-injection bores;
- Establishing a temporary track to the re-injection bores to allow access for vehicles; and
- Conducting a short term trial dewatering and re-injection.

The research programme incorporates a 60-day trial dewatering programme from the Marra Mamba orebody aquifer during which water will be re-injected into the deep Wittenoom Dolomite aquifer. The production bores will be located in the Marandoo Mining Lease while the re-injection bores will be located in the Karijini National Park. A temporary pipeline will supply the water from the production bores to the re-injection bores in the Karijini National Park. Piezometers will be used to monitor responses in groundwater levels during the trial dewatering and re-injection programme.

The pipeline, vehicular track, and down-hole instrumentation will be removed from the Karijini National Park upon the completion of the trial. The re-injection bores and piezometers inside the Karijini National Park will be retained until such time that Marandoo is decommissioned. All disturbed areas inside the Karijini National Park will be rehabilitated, including areas used for drill pads, pipeline and track.

The trial dewatering and re-injection component of the research programme is scheduled to be completed by end 2002. Drilling is scheduled to commence as soon as all approvals have been obtained.

The Key Proposal Characteristics are shown in Table 1.

#### Figures

Figure 1 – Location Map (attached).

Figure 2 – Programme Layout (attached).

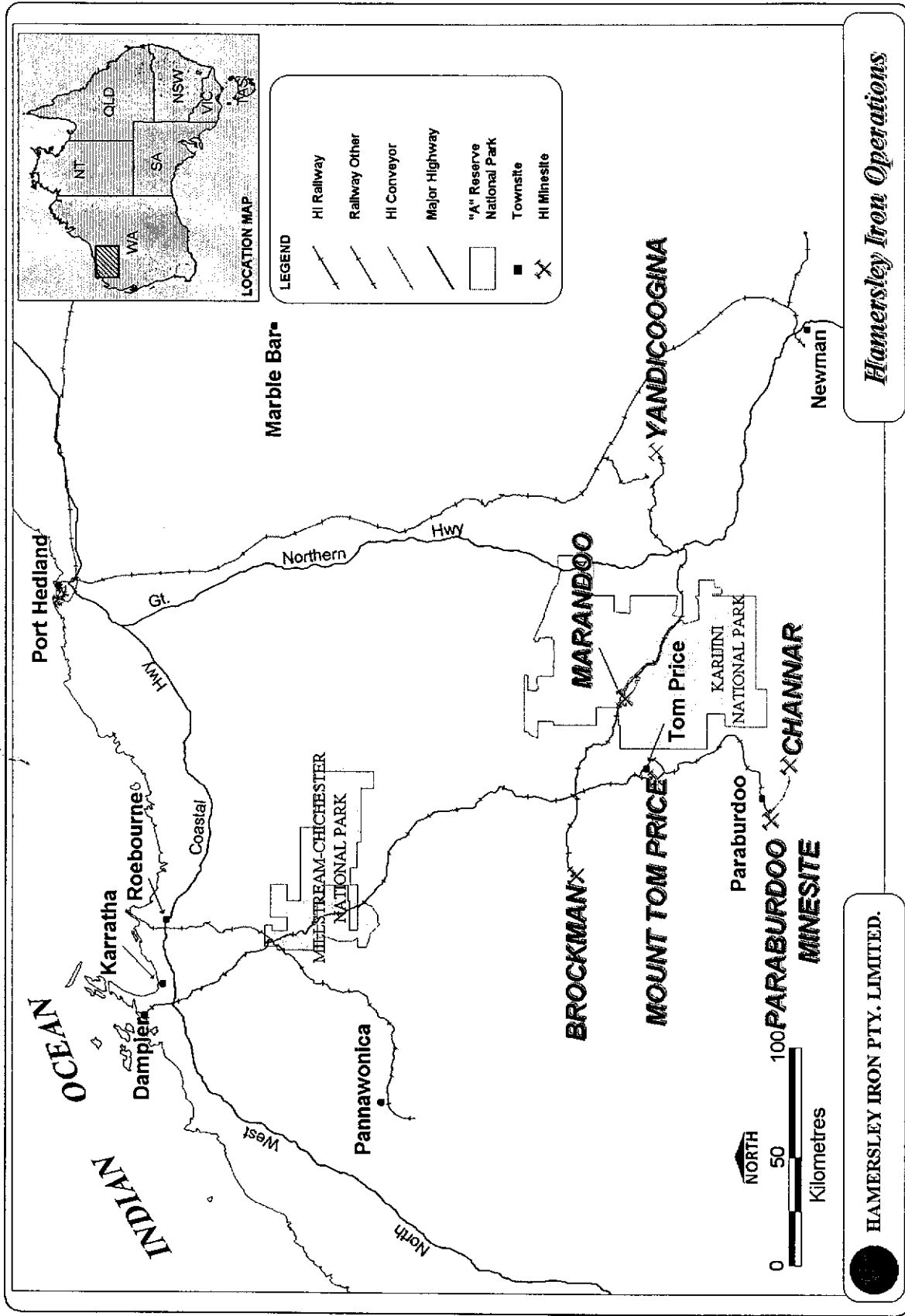


Figure 1: Location Map

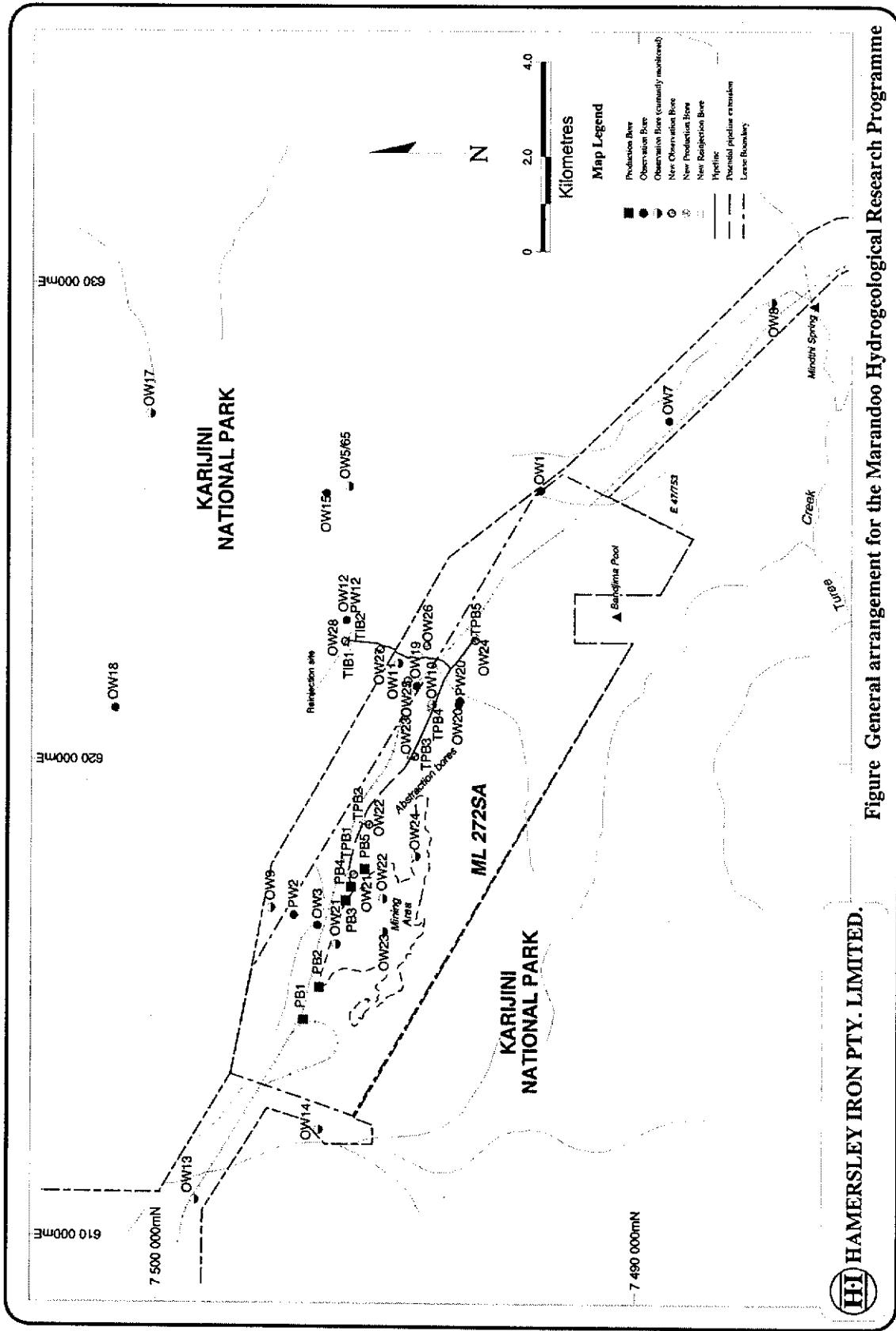


Figure 2: Programme Layout (Source: Hamersley Iron Pty Limited, 2002)

**Table 1 - Key Proposal Characteristics (Assessment No. 1428)**

<b>Component</b>	<b>Project characteristic</b>	<b>Description</b>
<b>Dewatering bores</b>	Number of new bores	Five
	Location of bores	Marandoo Mining Lease (M272SA)
	Aquifer targeted	Marra Mamba (orebody) aquifer
	Depth of bores	Between 120 metres and 240 metres
	Diameter of bore holes	Approximately 300 millimetres (inside diameter)
	Activities to be undertaken	Drill, construct and short term (3 days) test pumping
<b>Re-injection bores</b>	Number of new bores	Two
	Location of bores	Approximately 1.2 kilometres inside Karijini National Park
	Aquifer targeted	Wittenoom Dolomite
	Depth of bores	Between 130 metres and 150 metres
	Diameter of bore holes	Up to approximately 300 millimetres (inside diameter)
	Activities to be undertaken	Drill, construct and short term (3 days) test pumping
<b>Piezometers</b>	Number of new piezometers	Eight sets of multi-aquifer piezometers (ie some sets will have three separate monitoring holes)
	Location of piezometers	<ul style="list-style-type: none"> <li>• Two sets in Karijini National Park (existing sets will also be used)</li> <li>• Two sets in Transport Corridor</li> <li>• Four sets in Mining Lease (existing sets will also be used)</li> </ul>
	Aquifers targeted	Two shallow calcrete aquifers, deep Wittenoom Dolomite aquifer and Marra Mamba aquifer (where they occur)
	Activities to be undertaken	Monitor water level fluctuations during and after the trial
<b>Temporary pipeline</b>	Length	Total length approximately 5.2 kilometres, of which approximately 3 kilometres is in the Mining Lease, one kilometre in the Transport Corridor and 1.2 kilometres in the Karijini National Park
	Diameter of pipeline	Between 300 millimetres and 400 millimetres
	Type of pipeline	Black poly
	Arrangement	Pipeline will link 3 or 4 production bores to each other and then feed water to the re-injection bores
<b>Trial dewatering and re-injection</b>	Activities to be undertaken	Pumping of water from the Marra Mamba aquifer and re-injection of discharge into Wittenoom Dolomite aquifer. Monitoring of dewatering and re-injection impacts via piezometers.
	Duration of test	60 days
	Volumes to be dewatered/re-injected	Up to 12 million litres per day
<b>Other infrastructure</b>	Track	A temporary track that runs alongside the pipeline will be established to allow access to the piezometers and re-injection bores
	Drill pads	Drill pads will be required at each bore and piezometer site to enable drilling to occur
	Pumps/generators	A generator will be placed next to each production bore to pump water to the re-injection bores
<b>Decommissioning and rehabilitation</b>	Infrastructure to be removed post-trial	Pipeline, vehicular track, down-hole instrumentation and generators/pumps
	Infrastructure to be retained post-trial	Production bores (in Mining Lease), re-injection bores (in Karijini National Park) and piezometers (all)
	Rehabilitation	Disturbed areas (drill pads, track, pipeline) inside the Karijini National Park and Transport Corridor will be rehabilitated in the manner agreed with CALM



**Proponent's  
Environmental Management Commitments**

April 2002

Hydrogeological Research Programme at Marandoo  
Trial Dewatering and Re-injection Test  
Karijini National Park

(Assessment No. 1428)

**Hamersley Iron Pty Limited**

**Proponent's Environmental Management Commitments - Hydrogeological Research Programme, Marandoo  
(Assessment No. 1428)**

No.	Topic	Action	Objective/s	Timing	Advice from
1.	Environmental Management Plan	<p>Prepare and implement an Environmental Management Plan for the research programme that has been agreed to by CALM that specifically addresses the issues listed below where they relate to the Karijimi National Park:</p> <ul style="list-style-type: none"> <li>• Route and general approach for the pipeline/track to the re-injection bores</li> <li>• Approaches to establishing the access track, drill pads and pipeline and surface treatment for the access track to avoid long term damage to soil surface</li> <li>• Surface water management during individual bore test pumping</li> <li>• Vehicle controls</li> <li>• Vehicle hygiene and national park regulations</li> <li>• Hydrocarbon storage and handling during drilling works</li> <li>• Controls to limit the risk of fire</li> <li>• Avoidance of Coolibah trees and habitat</li> <li>• Liaison with CALM Rangers and others within CALM</li> <li>• Rehabilitation requirements</li> <li>• Auditing and reporting</li> </ul>	<p>Manage environmental aspects of the research programme and minimise environmental impacts.</p>	<p>Prior to start of ground disturbance</p>	<p>CALM, WRC</p>
2.	Groundwater Licence	<p>Apply for a Groundwater Licence from the Water and Rivers Commission to abstract groundwater from the Mining Lease. Develop and implement an operating strategy for the management of water.</p>	<p>Obtain required groundwater abstraction licence and implement operating strategy.</p>	<p>Prior to start of ground disturbance</p>	<p>WRC</p>

No.	Topic	Action	Objective/s	Timing	Advice from
3.	Surface discharge of water	No surface discharge of water will be permitted to flow into the Karjimi National Park during the trial dewatering and re-injection (some discharge from the individual bore test pumping at the re-injection site will occur prior to the commencement of the trial). The trial will be terminated if the re-injection fails and cannot be restored requiring more than two days of surface discharge.	Contain surface water flow within the Mining Lease during the trial.	During test pumping.	CALM via EMP review
4.	Declared and Priority listed flora	Undertake a survey for Declared Rare Flora and Priority listed flora and forward the findings of that survey to CALM (Karratha). If any DRF is identified, re-position the infrastructure and/or implement appropriate management measures to protect them.	Identify and protect any Rare or Priority listed Flora. Manage any Rare or Priority listed Flora that may be recorded.	Prior to start of ground disturbance	CALM
5.	Vehicle hygiene	Implement a procedure for the compulsory wash down of all vehicles and machinery prior to their first entry into the Karjimi National Park as part of vehicle hygiene regime.	Minimise risk of introducing weeds and seeds into Karjimi National Park.	All times.	CALM via EMP review
6.	Coolibah woodland access	Prohibit any vehicles from entering the Coolibah woodland, with access to the existing monitoring sites only permitted on foot.	Preclude vehicle access to Coolibah woodlands during trial.	All times.	CALM via EMP review
7.	Hydrocarbon management	Prohibit any fuel from being taken into the Karjimi National Park, except for fuel contained in a secured tank on the support truck for re-fuelling the drill rig and fuel held in normal vehicle tanks.	Minimise risk of loss of containment of hydrocarbons and soil/water contamination.	All times.	CALM via EMP review

No.	Topic	Action	Objective/s	Timing	Advice from
8.	Aboriginal heritage	Undertake an Aboriginal heritage (ethnographic and archaeological) survey of those areas not previously surveyed in accordance with the proponents's existing protocols and procedures that involve consultation with the relevant Aboriginal group/s. Relocate any infrastructure so as to avoid any identified sites or submit a Section 18 application in full consultation with relevant Aboriginal groups.	Identify any heritage sites. Avoid or seek approval to disturb any recorded sites.	Prior to start of ground disturbance	Department of Indigenous Affairs.
9.	Peer review of hydrogeological design	Commission a peer (third party) review of the design and approach of the hydrogeological research programme and make available to Government agencies upon request, including the EPA.	Obtain third party view on validity of the design of the trial.	Design phase	External Consultant
10.	Photographic monitoring	Establish photographic records of the area of the trial and make outcomes available to Government agencies upon request.	Obtain photographic record of trial area and make available for scrutiny.	Before, during and after the trial.	-
11.	Stygofauna	Undertake stygofauna sampling at available piezometers and production bores, with particular emphasis on sampling the Wittenoom Dolomite aquifer and shallow calcrete aquifers. Provide collected specimens to the Western Australian Museum and the University of Western Australia and forward a copy of any report to CALM (Karratha).	Understand the distribution of the stygofauna population. Share outcomes with the general research community.	April 2002, prior to the commencement of the trial, after the trial, and in April 2003.	Western Australian Museum
12.	Removal of infrastructure	Decommission and remove from site the temporary track, down hole equipment, generators and the re-injection pipeline upon completion of the trial.	Remove infrastructure and equipment from Karjini National Park that do not need to be retained.	Within 2 months of the completion of the trial.	CALM

No.	Topic	Action	Objective/s	Timing	Advice from
13.	Rehabilitation	Agree with CALM (Karratha) the rehabilitation requirements for disturbed areas in the Karijini National Park toward the end of the trial and then implement that agreed approach.	Rehabilitate disturbed areas within the Karijini National Park.	Implement agreed rehabilitation approach within 2 months of end of the trial	CALM, via EMP review and inspection
14.	Compliance audits	Conduct joint Proponent-CALM (Karratha) compliance audits at agreed stages of the research programme and at times suitable to both parties.	Verify compliance with conditions and commitments and evaluate environmental performance.	During drilling of bores, near end of the trial and post-rehabilitation or as agreed with CALM.	CALM, via EMP review
15.	"Duckboards"	Design, construct and utilise appropriate "duckboards" around the drill rig during drilling activities as a means of reducing soil disturbance.	Minimise soil compaction and soil disturbance.	Design phase and during drilling activities	CALM, via EMP review

#### Abbreviations / Glossary

CALM = Department of Conservation and Land Management  
 EMP = Environmental Management Plan  
 EPA = Environmental Protection Authority  
 WRC = Water and Rivers Commission

"Duckboards" = normally wooden, flat platform that sits above the ground to minimise direct foot contact with the ground.