

# **Remediation of Midland Railway Workshop Site Clayton Precinct Area E, Midland**

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**Midland Redevelopment Authority**

**Report and Recommendations  
of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
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# Contents

	<b>Page</b>
<b>1. Introduction</b>	<b>1</b>
<b>2. The proposal</b>	<b>1</b>
<b>3. Consultation</b>	<b>5</b>
<b>4. Relevant environmental factors</b>	<b>5</b>
<b>5. Conclusions</b>	<b>6</b>
<b>6. Recommendations</b>	<b>6</b>

## Figures

1. Midland Railway Workshops Area E Referral Location Plan	2
2. Midland Railway Workshops Area E Referral Site Layout and Potential Source of Contamination	3

## Appendices

1. References
2. Recommended Environmental Conditions

# 1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the factors relevant to a proposal by the Midland Redevelopment Authority (MRA) to remediate 22 hectare (ha) of land which includes a portion of the former Midland Railway Workshop Site (Area E) within the Clayton Precinct, Clayton Street road extension and the Helena Street and Viveash Road rail crossings outside of the Clayton Precinct in Midland (Figure 1 and 2).

The EPA was advised of the proposal on [11 May 2001](#). Based on the information provided, the EPA considered that while the proposal had the potential to have a significant effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in the *West Australian* newspaper on 22 October 2001 that the EPA intended to set the level of assessment at Environmental Protection Statement (EPS).

The proponent has prepared the EPS document, which accompanies this report (Midland Redevelopment Authority, 2001). The EPA considers that the proposal described can be managed in an acceptable manner subject to the imposition of environmental conditions. The net result of the proposal would be an improved environment.

The EPA therefore has determined under Section 40 (1) of the *Environmental Protection Act 1986* that the level of assessment for the proposal is EPS, and this report provides the EPA's advice and recommendations in accordance with Section 44 (1) of the Act.

Any person who disagrees with the EPA's decision on the level of assessment may lodge an appeal with the Minister for the Environment and Heritage within 14 days of 22 October 2001.

A separate right of appeal exists for any person who disagrees with the content of, or any recommendations in this report, also within 14 days of 22 October 2001.

## 2. The proposal

The proposal is to remediate 22 ha of land, which includes a portion of the former Midland Railway Workshop Site (Area E) within the Clayton Precinct, Clayton Street road extension and the Helena Street and Viveash Road rail crossings outside of the Clayton Precinct in Midland (Figure 1 and 2).

Area E was subject to an extensive site investigation program which involved the installation of 254 soil sampling sites into the natural ground and 12 groundwater monitoring wells up to a depth of 10 m. The land is contaminated with 25,000 m<sup>3</sup> of cinder ash (from the combustion of coal in steam trains) and low quality sand fill with minor amounts of waste material. The ash and fill have been used extensively across some of the site (3 ha) to an average depth of 0.5 m for filling in low ground and as a road base. The contamination is principally in the form of the heavy metals, copper, lead and tin. There is also some hydrocarbon contamination associated with the used drum storage area and paint shop.

Approximately 2,000 m<sup>3</sup> of contaminated soil has contaminant levels that exceed the Department of Environmental Protection's *Contaminated Site Assessment Criteria Health Investigation Levels – Exposure setting F* (HIL<sub>F</sub>) for commercial and industrial land use. This material will be relocated to the waste fill Area C of the Midland Railway Workshop site, which will be remediated as part of the proposed development of Areas B, C and D which is currently being assessed by the EPA as a Public Environmental Review.

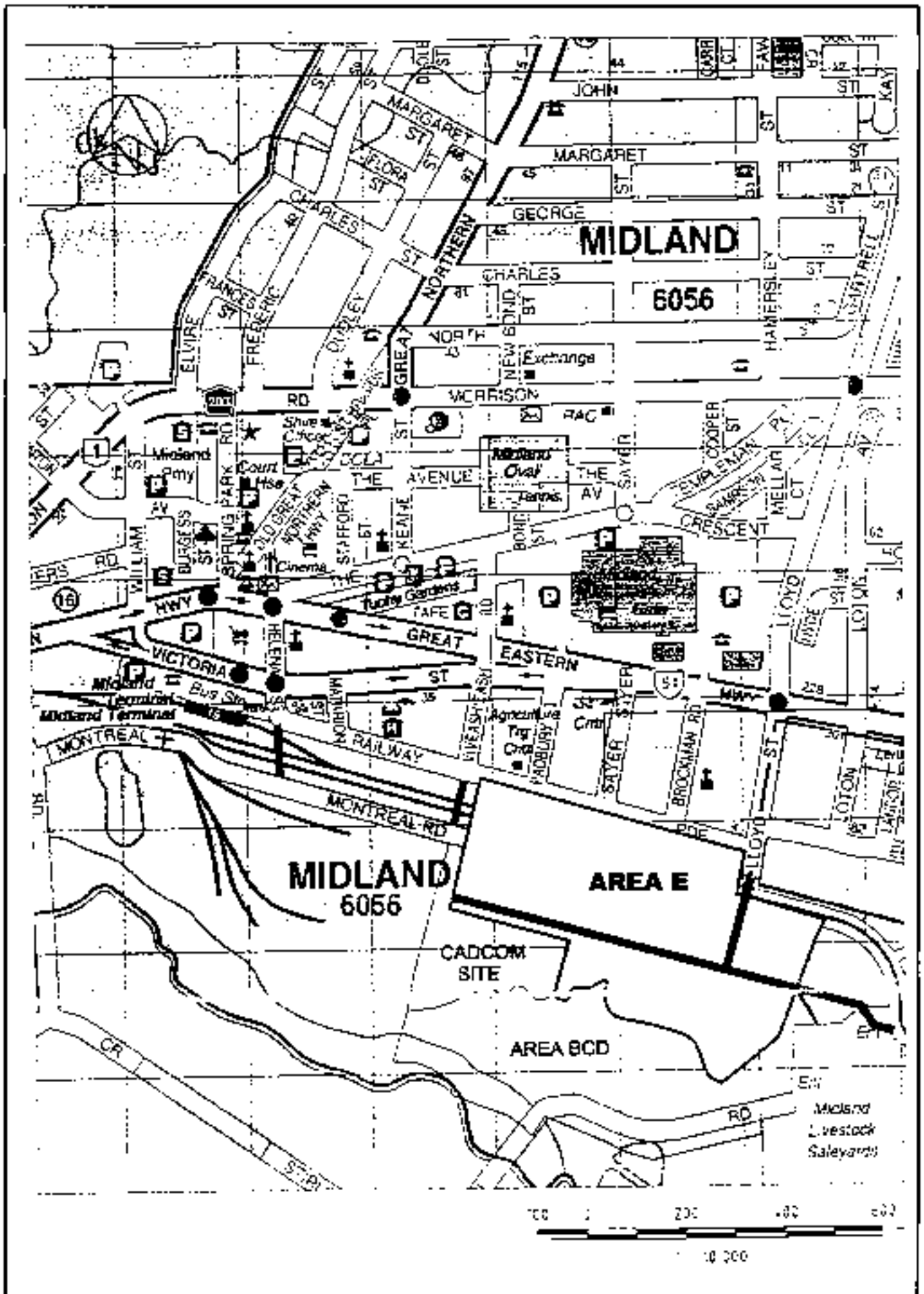


Figure 1. Midland Railway Workshops Area E Referral Location Plan.

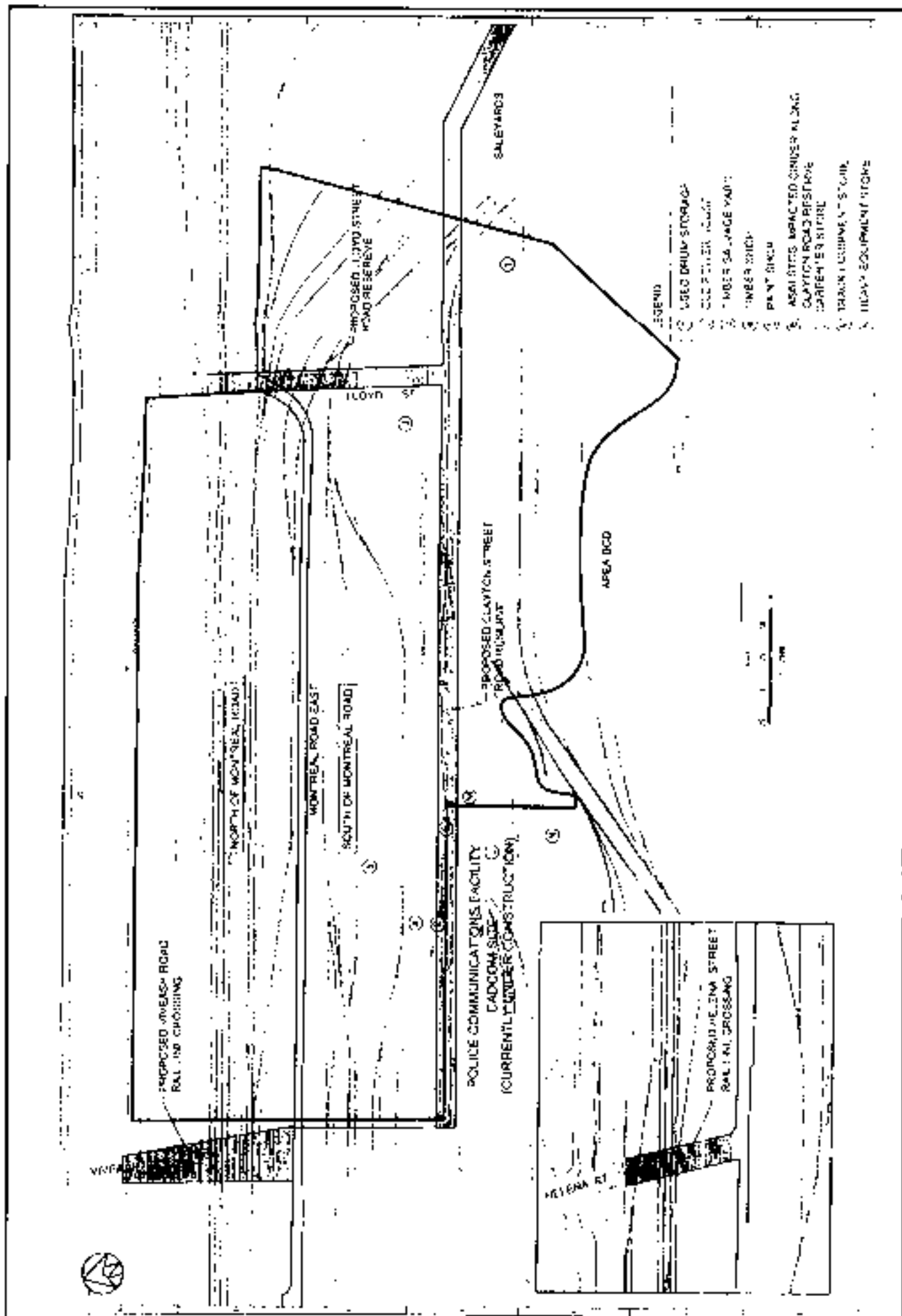


Figure 2. Midland Railway workshops Area E, Referral Site Layout and Potential Source of Contamination.

The remaining 23,000 m<sup>3</sup> of material that has contaminant levels above the ecological criteria (Environmental Investigation Levels (EIL) but lower than HIL<sub>F</sub> levels will be retained on site. Soil contaminants in excess of the EIL pose a risk to groundwater quality from leaching and also to the Helena River as a result of contaminated groundwater flowing to the river. Extensive soil investigations and studies of the fate and transport of contaminants in soil and groundwater indicate that some leaching of heavy metals may occur, however the potential to cause a significant impact to groundwater quality and the Helena River is low. This is based on studies carried out by CSIRO, which demonstrate that there is sufficient capacity for the underlying clayey soils to attenuate or remove heavy metals.

### Key proposal characteristic

Element	Description
SITE IDENTIFICATION	The Clayton Precinct (Area E) which includes the proposed Clayton Street road extension and Helena Street and Viveash Road rail crossings
CURRENT ZONING	INDUSTRIAL
PROPOSED ZONING	COMMERCIAL AND SERVICE/LIGHT INDUSTRIAL
DEMOLITION	Old derelict buildings to be demolished and removed
REMEDIAL ACTION and MANAGEMENT	
Soil	<ul style="list-style-type: none"> <li>Remove approximately 2 000m<sup>3</sup> of material which exceeds the HIL<sub>F</sub> criteria and relocate to Area C;</li> <li>Leave remaining contaminated soil with concentration levels below HIL<sub>F</sub> criteria as is;</li> <li>Prepare and implement a Remedial Action and Validation Plan which addresses remedial methods, transport, validation prior to backfilling;</li> <li>Prepare an Asbestos Waste Management Plan which addresses the management and disposal of asbestos, in the event that asbestos is found;</li> <li>Placement of memorials on titles to ban the use of contaminated groundwater; and</li> <li>Develop a database detailing the location of all contaminated material to be retained consistent with the Department of Environmental Protection's contaminated site database.</li> </ul>
Groundwater	<ul style="list-style-type: none"> <li>Prepare a long-term Groundwater Quality Monitoring and Management Plan;</li> <li>Conduct an investigation of groundwater quality at depth and at the base of the superficial aquifer; and</li> <li>Prepare and implement a Groundwater Contingency Plan, if groundwater monitoring of the aquifer at depth indicates that significant environmental impacts have occurred due to leaching.</li> </ul>
Dust	<ul style="list-style-type: none"> <li>Prepare and implement a modified Environmental Management Plan outlining dust mitigation measures and monitoring procedures for both site works and transportation of material.</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>Prepare and implement a modified Environmental Management Plan outlining noise mitigation measures and monitoring procedures.</li> </ul>
Worker safety and occupational health	<ul style="list-style-type: none"> <li>Prepare and implement an occupational health and safety plan.</li> </ul>

Asbestos fibres were detected in the shallow ground at a localised area in the western part of Area E, adjacent to a number of asbestos clad buildings (now removed). Approximately 220 m<sup>3</sup> of asbestos contaminated soil was removed to the Red Hill landfill facility as part of the recent

works associated with the installation of a services trench through Area E to for the Police Communication Facility in Area A (previously approved by the DEP). A Validation Report, which included test results of soil samples collected from the walls and base of the excavations, was submitted to the requirements of the DEP prior to backfilling the services trench.

Groundwater quality beneath the site is contaminated with trace levels of organic solvents and heavy metals including lead, nickel and zinc. This contamination appears to be confined to the shallower levels (0 to 8 m depths) of the superficial aquifer and poses a low risk to the Helena River if it discharges into it. The Water and Rivers Commission (WRC) has identified Area E as a groundwater recharge area for the Leederville aquifer, which the WRC considers as an important groundwater resource. Additional groundwater investigation will therefore be carried out to determine the potential impact on the deeper superficial aquifer (8 to 15m depth) and the underlying Leederville aquifer.

### **3. Consultation**

During the preparation of the EPS document, the proponent has undertaken consultation with various government agencies and organisations with a direct interest in the project and other key stakeholders.

Prior to the preparation of the EPS document for Area E, the MRA had advertised the release of the Public Environmental Review (PER) for the remediation of Area's B, C and D of the Clayton Precinct, which comprised the eastern part of the former Midland Railway Workshops. This area contained deposits of waste fill (230,000 m<sup>3</sup>), which had impacted upon the underlying groundwater. The public review period was set at eight weeks and was extensively advertised both in the local press and in the *West Australian*. No formal comments were received from members of the public. Area E is considered to have significantly less environmental issues associated with it. In addition Area E is relatively isolated from other land uses given its historical use.

The process of communication used by the MRA included:

- future development options for Area E have been outlined in the 2000 MRA Draft Concept Plan which has been widely circulated to the public, through media releases and which is available on the MRA web site;
- regular liaison with the DEP and WRC during the development of the EPS document and prior to issue of this Bulletin; and
- meetings with the WA Police and adjoining landowners being the WA Meat Industry and Metro Brick.

The EPA considers that the consultation process has been appropriate and that the proponent has taken all reasonable steps to address the concerns raised by government agencies and stakeholders.

### **4. Relevant environmental factors**

The summary of all of the environmental factors and their management is outlined in the commitments presented in Section 6 of the EPS document.

In the EPA's opinion the following are the environmental factors relevant to the proposal:

- a) risk of contamination to the groundwater and the Helena River; and
- b) risk of contaminated soil to public health.

The EPA has summarised its assessment of these factors in Section 5 below.



## 5. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA has concluded that the factor of the risk of contamination to the Helena River can be managed to meet the EPA's objectives of protection of groundwater and the Helena River ecosystems, and protection of human health, provided that the use of contaminated groundwater is prohibited. The proponent has committed to prepare a long-term Groundwater Quality Monitoring and Management Plan and place memorials on the titles to prevent the use of contaminated groundwater.

The proponent has also committed to prepare a Groundwater Contingency Plan, if groundwater quality monitoring of the base of the superficial aquifer indicates that groundwater contamination poses a risk to public health and/or the Helena River. In addition, the proponent has committed to notify appropriate authorities and prepare an Asbestos Management Plan in the event that asbestos is found in soil during remediation.

The EPA has concluded that the factor of the risk of contaminated soil to public health can be managed to meet the EPA's objectives of enabling the site to be used for commercial development. The proponent has undertaken an extensive site investigation and has delineated the extent and nature of contamination. The EPA considers that adoption of the DEP Health Investigation Level<sub>(F)</sub> (HIL-F) criteria as a clean-up level for commercial and industrial land use will afford protection to human health. The proponent has committed to remove and remediate contaminated soil in accordance with the requirements of an Environmental Management Plan (EMP) that will be prepared by the proponent to the requirements of the EPA. This EMP will address remediation issues including occupational health and safety, dust monitoring and management, and excavation, transport and disposal of contaminated soil, and validation prior to backfilling.

In summary, the EPA has concluded that the proposed arrangements for remediation, as set out in Section 2 of this report, are appropriate for commercial development. The EPA will require additional information and detail in relation to a number of the actions. The appropriate mechanism for providing this information is through the preparation and implementation by the proponent of acceptable Environmental Management Plans detailed in the commitments.

The proponent has committed to this process in its list of commitments.

## 6. Recommendations

The EPA considers that the proponent has demonstrated in its EPS document that the remediation proposal is capable of being managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that the proposal being assessed is for the remediation of 22 ha of land which includes a portion of the former Midland Railway Workshop Site (Area E) within the Clayton Precinct and Clayton Street road extension and the Helena Street and Viveash Road rail crossings outside of the Clayton Precinct in Midland for commercial purposes.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.

3. That the Minister notes that the EPA has concluded that the remediation program can be undertaken in an environmentally acceptable manner, and that the net result of the program will be an improved environment, provided there is satisfactory implementation by the proponent of the recommended environmental conditions and proponent commitments as set out in Appendix 2, including the provision for implementation of an environmental management plan.
4. That the Minister imposes the environmental conditions and procedures recommended in Appendix 2 of this report.

## **Appendix 1**

### **References**

Midland Redevelopment Authority (2001).  
*Precinct Area E Referral, Midland..*

*Midland Railway Workshops Site Clayton*

Midland Redevelopment Authority (2001).  
*Report Services Trench Installation.*

*Midland Railway Workshops Area E Validation*

## **Appendix 2**

### **Recommended Environmental Conditions**

**Recommended Environmental Conditions**

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

**REMEDIATION OF MIDLAND RAILWAY WORKSHOPS SITE  
CLAYTON PRECINCT AREA E, MIDLAND**

**Proposal:** The remediation of 22 ha of land which includes the former Midland Railway Workshop Site (Area E) within the Clayton Precinct and Clayton Street road extension and the Helena Street and Viveash Road rail crossings outside of the Clayton Precinct in Midland for commercial purposes, as documented in schedule 1 of this statement.

**Proponent:** Midland Redevelopment Authority

**Proponent Address:** Railway Institute Building  
Midland Railway Workshop Site  
Montreal Road East  
Midland WA 6056

**Assessment Number:** 1401

**Report of the Environmental Protection Authority:** Bulletin 1030

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.
- 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 consolidated environmental management commitments documented in schedule 2 of this statement.

- 2-2.1 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 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 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 and Performance Review**

- 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 CEO 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 the proposal is implemented as required. The CEO is responsible for the preparation of written advice to the proponent, which is signed off either by 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 the condition states “to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority”, the CEO 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 CEO of the Department of Environmental Protection.

## **Note**

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



## Schedule 1

### Proposal

The remediation of 22 ha of land which includes the former Midland Railway Workshop Site (Area E) within the Clayton Precinct and Clayton Street road extension and the Helena Street and Viveash Road rail crossings outside of the Clayton Precinct in Midland for commercial purposes.

### Key proposal characteristic

Element	Description
SITE IDENTIFICATION	The Clayton Precinct (Area E) which includes the proposed Clayton Street road extension and Helena Street and Viveash Road rail crossings
CURRENT ZONING	INDUSTRIAL
PROPOSED ZONING	COMMERCIAL AND SERVICE/LIGHT INDUSTRIAL
DEMOLITION	Old derelict buildings to be demolished and removed
REMEDIATION and MANAGEMENT	
Soil	<ul style="list-style-type: none"> <li>Remove approximately 2 000m<sub>3</sub> of material which exceeds the HIL<sub>F</sub> criteria and relocate to Area C;</li> <li>Leave remaining contaminated soil with concentration levels below HIL<sub>F</sub> criteria as is;</li> <li>Prepare and implement a Remedial Action and Validation Plan which addresses remedial methods, transport, validation prior to backfilling;</li> <li>Prepare an Asbestos Waste Management Plan which addresses the management and disposal of asbestos, in the event that asbestos is found;</li> <li>Placement of memorials on titles to ban the use of contaminated groundwater; and</li> <li>Develop a database detailing the location of all contaminated material to be retained consistent with the Department of Environmental Protection's contaminated site database.</li> </ul>
Groundwater	<ul style="list-style-type: none"> <li>Prepare a long-term Groundwater Quality Monitoring and Management Plan;</li> <li>Conduct investigation of groundwater quality at depth and at the base of the superficial aquifer; and</li> <li>Prepare and implement a Groundwater Contingency Plan, if groundwater monitoring of the aquifer at depth indicates that significant environmental impacts have occurred due to leaching.</li> </ul>
Dust	<ul style="list-style-type: none"> <li>Prepare and implement a modified Environmental Management Plan outlining dust mitigation measures and monitoring procedures for both site works and transportation of material.</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>Prepare and implement a modified Environmental Management Plan outlining noise mitigation measures and monitoring procedures.</li> </ul>
Worker safety and occupational health	<ul style="list-style-type: none"> <li>Prepare and implement an occupational health and safety plan.</li> </ul>

**Proponent's Consolidated Environmental Management  
Commitments**

**October 2001**

**REMEDICATION OF MIDLAND RAILWAY WORKSHOP SITE  
CLAYTON PRECINCT AREA E, MIDLAND**

**MIDLAND REDEVELOPMENT AUTHORITY**

**ENVIRONMENTAL MANAGEMENT COMMITMENTS FOR THE REMEDIATION  
OF AREA E, CLAYTON PRECINCT, MIDLAND RAILWAY WORKSHOPS  
MIDLAND REDEVELOPMENT AUTHORITY (1401)**

No.	Topic	Actions	Objectives	Timing	Advice/ Requirements
1.1	Remedial Action and Validation Plan - Preparation	<p>Prepare a Remedial Action and Validation Plan that details the scope of the remediation, identifies the contaminated material to be removed and the disposal location. The response level for clean-up is the Department of Environmental Protection Health Based Investigation Levels (HIL<sub>F</sub>) for a commercial setting. The plan will address:</p> <ul style="list-style-type: none"> <li>• excavation methods;</li> <li>• relocation of contaminated material into Area C;</li> <li>• transport of contaminated material;</li> <li>• waste tracking system;</li> <li>• validation prior to backfilling;</li> <li>• analytical testwork including methods; and</li> <li>• community consultation.</li> </ul>	To ensure that the contamination within Area E is remediated to prevent contamination of the underlying groundwater and that the land is suitable from a human health perspective for a commercial land use.	Prior to commencement of ground- disturbing activities.	<b>Requirements of:</b> EPA
1.2	Remedial Action and Validation Plan - Implementation	Implement the Remedial Action and Validation Plan	To ensure that the contamination within Area E is remediated to prevent contamination of the underlying groundwater and that the land is suitable from a human health perspective for a commercial land use.	Prior to commencement of ground- disturbing activities.	<b>Requirements of:</b> EPA
1.3	Soil Remediation	If approval for remedial works in Area B, C and D is not given and relocation to an alternative site is not possible, remove the contaminated material (approximately 2000 m <sup>3</sup> ) with contaminant levels in excess of the HIL <sub>F</sub> level to landfill.	To ensure that the contamination relocated from Area E is not stockpiled indefinitely in Area C should approval for Area B, C and D remedial works not be granted.	Within 2 months following completion of all other remedial works.	<b>Requirements of:</b> EPA
1.4	Soil Remediation	In the event that asbestos is found in soil during remediation, the proponent will immediately notify appropriate Authorities.	To ensure that the contamination within Area E is remediated and that the land is suitable from a human health perspective for a commercial land use.	During remediation.	<b>Requirements of:</b> EPA <b>On advice from:</b> DOH, Work safe

No.	Topic	Actions	Objectives	Timing	Advice/ Requirements
1.5	Soil Remediation	In the event that asbestos is found in soil during remediation, the proponent will prepare an Asbestos Waste Management Plan to address the management and removal of asbestos from the site.	To ensure that the contamination within Area E is remediated and that the land is suitable from a human health perspective for a commercial land use.	During remediation	<b>Requirements of:</b> EPA <b>On advice from:</b> DOH, Work safe
1.6	Soil Remediation	In the event that asbestos is found in soil during remediation, the proponent will implement an Asbestos Waste Management Plan to address the management and removal of asbestos from the site.	To ensure that the contamination within Area E is remediated and that the land is suitable from a human health perspective for a commercial land use.	During remediation	<b>Requirements of:</b> EPA <b>On advice from:</b> DOH, Work safe
2.1	Environmental Management Plan - Preparation	Modify the Environmental Management Plan used for the recent services trench installation (including removal of contaminated material) through Area E. The plan will address, but not be limited to: <ul style="list-style-type: none"> <li>• occupational health and safety;</li> <li>• dust monitoring and management;</li> <li>• noise and vibration; and</li> <li>• surface water management.</li> </ul>	To ensure that the contamination within Area E is removed in a manner that is protective of the environment and human health.	Prior to commencement of ground-disturbing activities.	<b>Requirements of:</b> EPA <b>On advice from:</b> DOH, Work safe
2.2	Environmental Management Plan - Implementation	Implement the modified Environmental Management Plan	To ensure that the contamination within Area E is removed in a manner that is protective of the environment and human health.	Prior to commencement of ground-disturbing activities.	<b>Requirements of:</b> EPA
3.1	Groundwater Quality Monitoring and Management Plan - Preparation	Prepare a long term Groundwater Quality Monitoring and Management Plan addressing: <ul style="list-style-type: none"> <li>• the need for additional monitor wells at the base of the superficial aquifer;</li> <li>• the frequency of testing existing monitor wells;</li> <li>• analytes to be analysed; and</li> <li>• management measures to ban/restrict access to contaminated groundwater in excess of drinking water criteria.</li> </ul>	To ensure retention of contaminated soil (below the HIL <sub>F</sub> criteria) does not result in contaminated groundwater with the potential to impact upon: <ul style="list-style-type: none"> <li>• the aquatic environment of the Helena River through the superficial aquifer; or</li> <li>• the potential potable supplies of the underlying Leederville Formation</li> </ul> To ensure future groundwater quality is managed to protect the environment and human health.	Within 6 months following completion of remediation.	<b>Requirements of:</b> EPA <b>On advice from:</b> WRC

No.	Topic	Actions	Objectives	Timing	Advice/ Requirements
3.2	Groundwater Quality Monitoring and Management Plan - Implementation	Implement the Groundwater Quality Monitoring and Management Plan.	<p>To ensure retention of contaminated soil (below the HIL<sub>F</sub> criteria) does not result in contaminated groundwater with the potential to impact upon:</p> <ul style="list-style-type: none"> <li>• the aquatic environment of the Helena River through the superficial aquifer; or</li> <li>• the potential potable supplies of the underlying Leederville Formation</li> </ul> <p>To ensure future groundwater quality is managed to protect the environment and human health.</p>	Within 6 months following completion of remediation.	<b>Requirements of:</b> EPA
3.3	Groundwater Contingency Plan - Preparation	Prepare a Groundwater Contingency Plan if groundwater monitoring of the superficial aquifer shows that significant environmental impact has occurred due to leaching of contaminants. This plan will describe measures to ameliorate such impacts, and consider practical management techniques and groundwater abstraction, treatment and containment options.	<p>To ensure retention of contaminated ground (below the HIL<sub>F</sub> criteria) does not result in contaminated groundwater with the potential to impact upon:</p> <ul style="list-style-type: none"> <li>• the aquatic environment of the Helena River through the superficial aquifer; or</li> <li>• the potential potable supplies of the underlying Leederville Formation</li> </ul> <p>To ensure future groundwater quality is managed to protect the environment and human health.</p>	Within 6 months following completion of remediation.	<b>Requirements of:</b> EPA

No.	Topic	Actions	Objectives	Timing	Advice/ Requirements
3.4	Groundwater Contingency Plan - Implementation	Implement the Groundwater Contingency Plan	To ensure retention of contaminated ground (below the HIL <sub>F</sub> criteria) does not result in contaminated groundwater with the potential to impact upon: <ul style="list-style-type: none"> <li>the aquatic environment of the Helena River through the superficial aquifer; or</li> <li>the potential potable supplies of the underlying Leederville Formation</li> </ul> To ensure future groundwater quality is managed to protect the environment and human health.	Within one month of observation of contamination	<b>Requirements of:</b> EPA
4	Validation Report	Submit a report within two months following completion of the remedial works that provides evidence of conformity to the Environmental Conditions and Commitments for the proposal.	To document that the clean-up of Area E has been performed in accordance with EPA requirements.	Within two months following completion of remediation.	<b>Requirements of:</b> EPA
5	Memorials on Titles	Place memorials on the titles of all lots created at the subdivision stage within Area E, which contain contaminated material.	To ensure contaminated land is managed as <i>Contaminated-Restricted Use</i> in accordance with the proposed Contaminated Sites Legislation.	Subdivision of Lots	<b>Requirements of:</b> EPA
6	Contaminated Material Database	Develop a database detailing the location of all contaminated material to be retained.	To ensure the location of all contaminated material is identified to all future owners of lots created in Area E.	Subdivision of Lots	<b>Requirements of:</b> EPA

Legend

DEP	Department of Environmental Protection
EPA	Environmental Protection Authority
DOH	Department of Health
WRC	Water and Rivers Commission
Work safe	Department of Consumer and Employment Protection – Work safe Division