MIDLAND REDEVELOPMENT AUTHORITY

SOUTHERN EMBANKMENT EROSION AND REHABILITATION MANAGEMENT PLAN

FORMER RAILWAY WORKSHOPS, MIDLAND

VERSION 2
JULY 2007
REPORT NO: 2007/127
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1. INTRODUCTION

The Midland Redevelopment Authority (MRA) proposes to remediate and redevelop 17ha of land referred to as Helena East and the Southern Embankment, located within the former Midland Railway Workshops site (Figure 1). During and after site remediation works, it is possible that a risk of erosion or siltation may arise which in turn could adversely impact landscape amenity, human health and environmental values onsite and offsite.

Specific erosion and siltation management measures are required for the Southern Embankment area in order to prevent a higher risk of exposure to waste fill and entrainment of contaminated sediment into the down-gradient Helena River floodplain. This Southern Embankment Erosion and Rehabilitation Management Plan (SEERMP) forms part of the overall environmental management program (EMP) for Helena East and the Southern Embankment including the ATA (2006a) Site Management Plans appended to the ATA (2006b) Public Environmental Review (PER) document (see Section 2.1).

This SEERMP has been developed in accordance with best practise guidelines including those publications contained within the Department of Environment and Conservation (DEC) Contaminated Sites Management Series and is consistent with Environmental Protection Authority’s Guidance Statement 33, Environmental Guidance for Planning and Development. The structure and terminology contained within is consistent with the draft DoE (2005) publication “Compliance Monitoring – Guidelines for Proponents”.

1.1 Objectives

The broader objective of the EMP is to enable remedial works to be undertaken in a manner that will not adversely impact on the environment or human health. Specific objectives of the SEERMP are as follows:

- Minimise the risk of erosion, siltation and general instability along the Southern Embankment during and after remediation works; and
- Rehabilitate and enhance local native vegetation along the Southern Embankment.

In order to achieve the above objectives, the SEERMP will address the following key elements:

- Identification of potential impacts that may result from erosion and siltation along the Southern Embankment;
- Environmental safeguards to minimise risk of erosion and siltation during and after remediation works;
- Post-remediation landscape amenity and native vegetation rehabilitation strategy; and
- Monitoring & reporting programs.
2. **BACKGROUND INFORMATION**

2.1 **Legislative Framework**

The Helena East and Southern Embankment remediation and redevelopment proposal was formally assessed under the *Environmental Protection Act 1986*, and a *Public Environmental Review* (PER) of the proposal was prepared and released for public comment in March 2006. Commitments were made by the MRA in the ATA (2006b) PER to rehabilitate the site to be compatible with the proposed future land uses, and to do so in a manner that would not adversely impact on the environment or human health.

In response to the ATA (2006b) PER, the Environmental Protection Authority (EPA) released Bulletin 1234 containing its report and recommendations on 16 October 2006 (EPA 2006). The PER proposal has since been conditionally approved by the Minister for the Environment (Climate Change; Peel) by the issue of Ministerial Statement No. 742 on 6 June 2007. The scope of works that is proposed herein has been developed to reflect Condition 7-1 of Ministerial Statement 742, which is as follows:

7-1) “Prior to commencing remediation works on the Southern Embankment, the proponent shall revise the Site Environmental Management Plans: Remediation of Helena East Precinct Former Railway Workshops, Midland (March 2006, Version 2) included in Appendix 12 of the Public Environmental Review document (March 2006, Version 3) and include management methods for the remediation and recontouring works on the Southern Embankment to the requirements of the Minister for the Environment on the advice of the CEO.”

“The management methods shall be consistent with the Environmental Protection Authority’s Guidance Statement 33, Environmental Guidance for Planning and Development and shall address:

1. risk of erosion and siltation during works on the Southern Embankment;
2. measures to minimise these risks;
3. rehabilitation of the area by planting with local native species of vegetation; and
4. monitoring of the final surface of the recontoured area for stability and erosion.”

Rather than revise the ATA (2006a) *Site Environmental Management Plans* and other subsequent environmental management plans in order to satisfy the four key requirements of Condition 7-1 of Ministerial Statement 742, it was considered a more efficient process to develop a stand-alone erosion & rehabilitation-specific management plan for the Southern Embankment. The development of the SEERMP is therefore considered to satisfy the overall intent of Condition 7-1 of Ministerial Statement 742.

It is noted that in addition to Ministerial Statement 742, the proposal to remediate and rehabilitate the Southern Embankment has also been conditionally approved through the issue of Ministerial Statement 640, as issued on 3 December 2003 under the Helena West Precinct proposal. There are however, no conditions within Ministerial Statement 640 which pertain to the specific management of the Southern Embankment. The remedial strategy proposed in the ATA (2006a) PER together with the EMP is considered to satisfy the overall intent of both Ministerial Statements.
In accordance with DEC (2006) *Contaminated sites auditors: guidelines for accreditation, conduct, and reporting*, this document is submitted to the appointed Contaminated Sites Auditor for this site, Mr Jeremy Hogben of Environmental Resources Management (Australia) Pty Ltd, for his consideration and endorsement. Subsequent approval by the Minister of the Environment on the advice of the Chief Executive Officer (CEO) of the DEC, will be sought prior to implementation of the SEERMP.

### 2.2 Southern Embankment Description and Setting

The Southern Embankment, as depicted in the ATA (2006b) PER, is approximately 0.8ha in area and is characterised by a narrow flat area abutting the southern boundary of Helena East leading to a steep embankment of some 6-7m height that slopes down to the Helena River floodplain at a level of approximately 7mAHD (Figure 1). The Helena River floodplain is classified as a *Conservation Category Wetland* according to the Department of Environment (DoE) *Geomorphic Wetlands Swan Coastal Plain Dataset*.

The presence of significant fill material within the Southern Embankment (up to approximately 9.0m thick) suggests that prior to site development, the natural floodplain embankment was further north within Helena East. As noted in the ATA (2006b) PER, it is estimated that the Southern Embankment comprises approximately 70,000m$^3$ of fill material including building rubble, coal cinders, ash/clinker, foundry slag, occasional asbestos products and hydrocarbon contaminated soil. Other than the presence of a disused tank associated with the former site wastewater treatment system (Figure 1), no infrastructure or other site improvements currently exist within the Southern Embankment.

In a *Site Vegetation and Faunal Assessment* performed as part of the ATA (2006b) PER, the nature and condition of vegetation within the Southern Embankment was assessed as being highly degraded and disturbed with little understorey remaining.
3. **ASSESSMENT OF POTENTIAL IMPACTS**

There are a number of potential adverse environmental impacts and other impacts that could potentially occur as a result of erosion, siltation and general instability along the Southern Embankment during and after site remedial works. A review of the more significant potential impacts and the risk of these occurring are provided below in Table 1.

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Risk Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrainment of contaminated waste into wetlands</td>
<td>Considered a potential risk. Without controls, any disturbed soil could be</td>
</tr>
<tr>
<td>and waterways</td>
<td>washed down the Southern Embankment and into the abutting Helena River floodplain.</td>
</tr>
<tr>
<td>Damage to native vegetation and ecological function</td>
<td>Considered a potential risk that is primarily associated with the potential entrainment of waste into the Helena River floodplain (discussed above). The vegetation and ecological function of the Southern Embankment in its current state has been assessed as being highly degraded, and this area will be rehabilitated and enhanced through the planting of local native vegetation at the completion of remedial works.</td>
</tr>
<tr>
<td>Embankment failure</td>
<td>Considered a potential risk. A poorly engineered embankment could result in a failure of capping material potentially causing it to slide off the contained waste fill.</td>
</tr>
<tr>
<td>Exposure of capped waste fill.</td>
<td>As part of the proposed remedial works, contaminated waste fill within the Southern Embankment will be managed in the long-term through ‘Cap and Contain’. Erosion of the clean fill capping material is considered a potential risk and one that could potentially lead to the exposure of contaminated waste fill to future users of this area.</td>
</tr>
<tr>
<td>Damage to structures and services</td>
<td>Considered a potential risk. Embankment erosion could potentially damage the integrity of heritage-listed service tunnel that terminates at the base of the Southern Embankment. Service conduits and other structures that may be installed within this area under the site development could also be damaged through embankment erosion.</td>
</tr>
</tbody>
</table>

An assessment of potential impacts that may result through erosion, siltation and general instability along the Southern Embankment has identified a number of risks that will need to be carefully managed through the implementation of operational safeguards during remedial works and appropriate embankment design at the completion of works.
4. **KEY PERFORMANCE INDICATORS**

Key performance indicators for the effective performance of the SEERMP will include the following:

- The remediation and rehabilitation works along the Southern Embankment do not result in the entrainment of contaminated waste into the Helena River Floodplain;

- The remediation and rehabilitation works along the Southern Embankment do not result in the damage of structures and services;

- The final landform of the Southern Embankment, including the clean fill capping layer, is stable and resistant to future erosion as certified by the Project Engineer;

- Vegetation along the final landform of the Southern Embankment is rehabilitated and enhanced through the planting of native species endemic to the local area.
5. IMPLEMENTATION STRATEGY

Taking into consideration the objectives of the SEERMP and the potential impacts and risks that may result through erosion, siltation and general instability along the Southern Embankment, an implementation strategy has been developed. It is possible that revision and refinement of some elements of SEERMP may be required to suit actual site conditions encountered during remedial works. The revision to elements of the SEERMP has been recognised as a contingency measure in Section 8.

5.1 Roles and Responsibility

The Environmental Supervisor and the Earthworks Contractor are considered to be the primary parties responsible for the implementation and management of the SEERMP during site remedial works. A description of key roles and responsibilities for the Environmental Supervisor and the Earthworks Contractor along with other key members of the project works group (PWG) in relation to the SEERMP are summarised under separate headings below.

Environmental Supervisor (ATA Environmental/Coffey Environments)

- Oversee general conformance of remedial earthworks with environmental management measures through site inspections, review of site records and communication with the Earthworks Contractor;

- Assist as needed the Earthworks Contractor and the PWG in the resolution of issues related to erosion, siltation, and general embankment instability and native vegetation rehabilitation and enhancement;

- Respond to any environmental complaints and non-conformances and as applicable, communicate such issues with the PWG, regulatory bodies and its representatives (including the Contaminated Sites Auditor).

Earthworks Contractor (Georgiou Group)

- Obtain licences, approvals and/or permits applicable to remedial earthworks within the Southern Embankment;

- Implement erosion and siltation management measures and safeguards in accordance with the SEERMP and any specific contractual and legislative requirements;

- Review and monitor compliance of the site team and contractors/subcontractors to project standard requirements such as implementation of engineering, procurement, safety and environmental activities and safe practices;

- Assist as needed the Environmental Supervisor and the PWG in the resolution of issues related to erosion, siltation, and general embankment instability and native vegetation rehabilitation and enhancement; and

- Notify the Environmental Supervisor and the PWG of any environmental complaints and non-conformances using an Environmental Incident & Hazard Form.
Client/Project Manager [Midland Redevelopment Authority (MRA)].

- Provide guidance to the Environmental Supervisor and the PWG on the consistency of the SEERMP (and any subsequent revisions) with respect to the objectives of the MRA and its environmental, social and economic priorities;

- Through its Landscape Architect, rehabilitate, inspect and maintain native vegetation along the Southern Embankment;

- Inform the community of any potential disruptions and address community complaints and queries in accordance with ATA (2006a) Community Consultation Plan.

Project Superintendent/Project Engineer [Wood & Grieve Engineers (WGE)].

- Provide engineering advice to the Earthworks Contractor and the PWG with respect to engineering and design elements of the SEERMP (and any subsequent revisions), particularly with respect to embankment design;

- Oversee general project management of the development works and ensure that works are being conducted in accordance with contract specifications, regulations; and

- Regularly inform the Client of the project status.

5.2 Stakeholder Consultation

To evaluate the feasibility of implementing the SEERMP, key stakeholders have been consulted during its development. The Earthworks Contractor, Project Engineer, Client and its Landscape Architect, have been consulted with respect to critical elements of the SEERMP and feedback obtained through this process has been incorporated into the finalised SEERMP. Endorsement of the SEERMP by the appointed Contaminated Sites Auditor, followed by approval from the Minister of the Environment, on the advice of the CEO of the DEC, will be obtained prior to implementing the SEERMP.

The DEC-Wetlands Branch has been consulted with respect to the applicability of the Environmental Protection (Clearance of Native Vegetation) Regulations 2004 and the potential removal of native vegetation along the Southern Embankment. The DEC-Wetlands Branch has advised that the clearing of native vegetation is exempt from the above regulations where it is done in accordance with the implementation agreement or decision as permitted under Schedule 6 clause 2 (a) of the Environmental Protection Act 1986 (DEC correspondence included in Appendix 3). Based on this advice and the following considerations, the proposed remedial works within Helena East and the Southern Embankment can be considered as being exempt from the Environmental Protection (Clearance of Native Vegetation) Regulations 2004:

- It is implicit that the removal of native vegetation will occur during the course of implementing the approved ATA (2006b) PER proposal, particularly with respect to installing a clean fill capping layer of at least 1.0m above contaminated waste fill within the Southern Embankment;
In EPA Bulletin 1111 (EPA 2003), the Environmental Protection Authority (EPA) has recognised the removal of native vegetation will occur as a consequence of implementing the Helena West proposal which included the Southern Embankment, as approved by Ministerial Statement 640; and

In EPA Bulletin 1234 (EPA 2006), the EPA has recognised the site as being of limited flora and fauna conservation value and not a relevant environmental factor in implementing the proposed site remedial and rehabilitation works.

According to mapping of the Swan River Trust (SRT) Management Area, as shown in SRT (2000), the Southern Embankment currently resides outside of the designated SRT Management Area. In the event that there is an incident that could adversely impact the SRT Management Area, such as entrainment of contaminated waste into the Helena River, the SRT along with other relevant stakeholders will be consulted in developing an appropriate response.

5.3 Remedial Earthworks

The proposed scope of remedial works within the Southern Embankment, along with Helena East, has been detailed in the ATA (2007) Remediation and Validation Plan (RVP). In summary, aside from a contamination ‘hotspot’, the ATA (2007) RVP proposes that remediation within the Southern Embankment will be limited to northern (relatively flat) portions that are within the development boundary. Localised remediation of the hydrocarbon contamination hotspot within the central portion of the Southern Embankment will be guided by field evidence and validation analytical results.

The ATA (2007) RVP proposes that remediation of the Southern Embankment will be performed through excavation and offsite disposal of contaminated soil followed by recontouring and placement of a geofabric ‘warning layer’ overlain by a 1.0m thick cap of uncontaminated fill over areas of residual contaminated fill. Environmental investigation works undertaken as part of the ATA (2006b) PER, suggest that the hydrocarbon contamination hotspot extends to approximately 9.5m below ground level (mBGL) and this material will require excavation and offsite disposal.

The final extent of recontouring works along the Southern Embankment will be largely dependant on the outcome of the remediation works outlined above. Engineering Specification Plans provided by Wood and Grieve Engineers (WGE) (included as Appendix 1), depict three different design scenarios for excavation and capping along the length of the Southern Embankment. Based on the WGE Engineering Specification Plans, it is anticipated that portions of the Southern Embankment will be reworked to reduce the current gradient of up to 1:1 to a more stable 1:2.5. Minor landscaping and revegetation of the Southern Embankment will also be undertaken to accommodate the stormwater drainage network as governed by the DoE-approved Egis (2002) Stormwater Drainage Strategy.

5.4 Vegetation Rehabilitation and Enhancement

Remedial works, including installation of warning barriers and capping layers, will necessitate the removal of vegetation within the Southern Embankment. Accordingly, a landscape and vegetation rehabilitation strategy has been developed by Tract (WA) Pty Ltd (Appendix 2) to rehabilitate this area. The strategy proposes an end outcome that meshes the environmental, engineering and landscape requirements while allowing a number of access points down to the Helena River Floodplain and connections through to a proposed ‘Water Tank Park’.
The planting schedule proposed as part of the Tract (2007) vegetation and landscape rehabilitation strategy has been designed in order to create a largely self sustaining and environmentally responsible embankment cover that will minimise erosion and sediment runoff. The use of local plant varieties will ensure that vegetation along the embankment is rehabilitated and enhanced beyond the present highly degraded condition, and also broadly consistent with plantings along the Southern Embankment within adjoining precincts to the east and west.
6. **EROSION AND SILTATION MANAGEMENT MEASURES AND SAFEGUARDS**

Proposed erosion and siltation safeguards and rehabilitation measures applicable to works along the Southern Embankment during remediation and development works and post-development are outlined below.

- In consultation with the Environmental Supervisor, minimise the area to be cleared, retain as much vegetation as possible along the embankment, and only clear vegetation in areas where work is about to commence. Barricade off areas of the Southern Embankment that do not need to be disturbed;

- In consultation with the Project Engineer, install sediment control barriers and traps along the base of the Southern Embankment before excavation works commence. During excavation works, ensure that sediment control barriers are inspected on a daily basis and after each rainfall event for breaks or blockages and repair any faults immediately;

- Ensure that excavated material is stockpiled at least three metres within the boundary of sediment control barriers and drainage lines, and limit the amount of material stockpiled along the embankment as far as is practicable and in consultation with the Environmental Supervisor;

- In consultation with the Environmental Supervisor, minimise excavation within the Southern Embankment where heavy rain is forecast and surface runoff is likely. In such cases, alternative works within Helena East should preferentially be performed;

- In accordance with WGE (2007a) engineering specification plans (Appendix 1), certified clean sand is to be used as the capping layer across contaminated waste fill material. Use of sand will avoid the capping material becoming waterlogged and from shedding off the contaminated waste fill. The use of soils other than sand as the Southern Embankment capping material will require the consideration and agreement of the Project Engineer;

- Ensure embankment excavations are battered to prevent slippage. In accordance with WGE (2007a) engineering specification plans (Appendix 1), a maximum batter grade of 1:2.5 is to be applied for the final landscaping of capping material. Batter crests and toes should be gently sloping where practicable. Berms and/or benches along the higher sections of the embankment batter may also be considered subject to actual ground conditions and in consultation with the Project Engineer;
In accordance with the ATA (2007) RVP, a permeable geofabric barrier is to be installed in areas across the Southern Embankment where waste fill will not be excavated. Whilst the primary function of the geofabric barrier is to provide a ‘warning barrier’ above contaminated fill, geofabric material is also commonly used for embankment stabilisation applications. According to the ATA (2006b) PER, ‘Enkagrid’ or ‘Bidim’ geofabric were nominated as appropriate products for the intended application. The choice of geofabric has since been further refined to Enkagrid, as nominated in WGE (2007a) engineering specification plans (Appendix 1). Enkagrid is a welded, rigid geo-grid that has a high passive bearing resistance and exhibits almost equal tensile strength in both longitudinal and transverse directions. Enkagrid technical specifications are included in the ATA (2006b) Site Environmental Management Plans;

The finalised landform should be stabilised as soon as is practicable following completion of earthworks along the Southern Embankment. In addition to minimising erosion and siltation, prompt stabilisation will ensure dust generation and weed invasion is minimised. According to the WGE (2007b) engineering specification plans (Appendix 1) and the Tract (2007) Planting Schedule (Appendix 2), topsoil along the Southern Embankment will initially be stabilised using Hydromulch and in turn by planting of tubestock trees, shrubs and ground covers;

In accordance with the proposed monitoring program (Section 7), the embankment plantings should be inspected, maintained and replaced where necessary on a fortnightly basis for a period of twelve months or until plants are established, as determined by the Landscape Architect. Alternative plant species and/or soil amelioration should be considered where plantings do not establish. Any erosion should be promptly stabilised;

Irrigation of the Southern Embankment is currently not envisaged as a long term vegetation management measure. Should this change, an Irrigation Management Plan should be prepared for the Southern Embankment in order to prevent potential leaching of waste fill materials and/or embankment instability;

6.1 Other Management Measures

Whilst the SEERMP specifically focuses on managing the risk of erosion, siltation and general embankment instability along the Southern Embankment, this portion of the site will be subject to other management measures contained within the overall site EMP. The site EMP includes specific management plans that address dust and air quality, noise and vibration, surface and groundwater, groundwater effluent and other effluent, waste and asbestos waste. The SEERMP should be implemented in conjunction with other management plans that form the overall site EMP.
7. MONITORING AND REPORTING

7.1 Monitoring of General Operations

In accordance with the roles and responsibilities outlined in Section 5.1, the Earthworks Contractor will be responsible for monitoring the general operations associated with the prevention of erosion and siltation and general embankment instability. As part of its quality assurance program, the Earthworks Contractor has developed an internal Environmental Management Plan (EMP) as its working document for Helena East and the Southern Embankment. The Environmental Supervisor will review the specifications and commitments contained within the Earthworks Contractor’s EMP to ensure compliance with the SEERMP and other environmental management commitments that form part of the overall EMP for this site.

In undertaking general operational monitoring, the Earthworks Contractor should monitor and record the following information:

- Monitor the effective performance of the SEERMP management measures particularly the correct function of sediment control barriers and traps, temporary impermeable covers (where applicable), and the storage of stockpiles with the Southern Embankment;

- Any uncontrolled discharge, such as entrainment of waste into the Helena River Floodplain, which could impact the environment or human health onsite or offsite, along with any complaints should be reported to the Environmental Supervisor as soon as possible along with the corrective action taken. Such incidents should be recorded on an Environmental Incident and Hazard Form in accordance with Section 9.4 of ATA (2006a). The Environmental Supervisor will endeavour to notify the appointed Contaminated Sites Auditor and applicable parties within 24 hours of the incident occurring.

The Environmental Supervisor will undertake random checks to verify conformance with this SEERMP. Any non-conformances will be discussed with the Earthworks Contractor and noted in an Environmental Field Activity Sheet that is completed at the end of each day of attendance by the Environmental Representative.

7.2 Monitoring of Surface Water Runoff

No active surface water monitoring program will be undertaken as part of the SEERMP. The proposed groundwater effluent extraction and disposal methodologies in themselves have been designed to minimise the potential adverse impacts identified in Table 3. However, where an uncontrolled discharge incident is identified through general operational monitoring works discussed above, then in accordance with the ATA (2006a) Surface and Groundwater Management Plan, specific surface water monitoring works may be initiated depending on the nature and magnitude of the discharge and in consideration of guidance provided by the appointed Contaminated Sites Auditor and the DEC.

Monitoring of the background water quality within the Helena River will continue to be undertaken on a periodic basis in accordance with Proponent Commitment Item 6 of the ATA (2006b) PER.
7.3 Monitoring of Native Vegetation Establishment and Embankment Stability

In accordance with the roles and responsibilities outlined in Section 5.1, the monitoring and maintenance of native vegetation and general embankment stability will be the responsibility of the client and carried out through its appointed Landscape Architect. Notionally, the maintenance of native vegetation plantings and general embankment stability will be performed on a fortnightly basis for a period of twelve months or until such a time that the plantings are adequately established as determined by the Landscape Architect.

The client will retain management responsibility for the Southern Embankment beyond the completion of remedial works until such a time that the land is normalised and vested in the care of another government authority. It is envisaged that an agreement for the care, control and management of the Southern Embankment, together with public open spaces within the site development, will be reached through a written intergovernmental memorandum of understanding.

Irrespective of the future custodian of the Southern Embankment, contaminated waste fill that will be capped within the embankment will be tracked and managed indefinitely through a Subsurface Constraints Register proposed as part of the Subsurface Constraints Plan [ATA (2006b) Site Environmental Management Plan].

7.4 Reporting

SEERMP reporting will be undertaken in two formats as follows:

- Incident Report: Where an incident occurs that results or may result in an adverse impact to the environment or human health, in addition to contingency response measures outlined in Section 8, an incident report and/or Environmental Incident & Hazard Form will be submitted to the Auditor. The incident report will include the nature of the incident, causal factors, and corrective action in accordance with Section 9.4 of ATA (2006a); and

- SEERMP Compliance Documentation. At the completion of remedial works, information regarding the embankment construction and the rehabilitation of native vegetation will be documented into either a standalone SEERMP Compliance Report or incorporated into the Remediation and Validation Report. The SEERMP compliance documentation will be submitted to the appointed Contaminated Sites Auditor for his consideration. Verification documents such as operation logs, incident reports and field activity records will be included in the documentation. The nature and extent of waste fill capped within the Southern Embankment together with embankment design will be documented in a Subsurface Constraints Register in accordance with the ATA (2006a) Subsurface Management Plan.
7.5 Regulatory Approval

Remedial earthworks will not commence within the Southern Embankment as depicted on Figure 1 until the SEERMP has been formally endorsed by the Contaminated Sites Auditor and subsequently approved by the Minister of Environment on the advice of the CEO of the DEC.

It envisaged that the endorsed SEERMP along with other management plans that form part of the site EMP will be published on the MRA website (www.mra.wa.gov.au) in accordance with in the ATA (2006a) Community Consultation Plan and in order to satisfy Condition 7-2 of Ministerial Statement 742.
8. CONTINGENCY MEASURES

Table 2 below identifies potential non-conformances and the proposed corrective action measure. It is noted that the SEERMP has been designed to wherever possible avoid unsafe environmental and social incidents or hazards from arising in the first place.

### TABLE 2
CONTINGENCY RESPONSE MEASURES

<table>
<thead>
<tr>
<th>Nature of Non-Conformance</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| Entrainment of contaminated waste into the Helena River floodplain and/or damage to native vegetation and ecological function | • Contain any further contaminated waste onsite and avoid further excavation works where this is likely to result in the further entrainment of contaminated waste;  
• Record event on a *Environmental Incident/Hazard Form*;  
• In consultation and agreement with key stakeholders, review and revise erosion and siltation management measures;  
• In consultation with the Contaminated Sites Auditor and relevant stakeholders, review or initiate surface water monitoring program. |
| Embankment Instability | • In consultation with the Project Engineer and the PWG, identify causal factors and where necessary review and revise operational management measures and embankment design elements;  
• Further excavation works within the Southern Embankment should be avoided where this is likely to result in the further embankment instability. |
| Damage to structures and services | • In consultation with the Project Engineer and the PWG, identify causal factors and where necessary review and revise operational management measures and embankment design elements;  
• Further excavation works within the Southern Embankment should be avoided where this is likely to result in the further damage to structures and services. |

Contaminated waste fill that is capped within the Southern Embankment along with waste fill in areas of Helena East will be managed through the implementation of the ATA (2006a) *Subsurface Management Plan*, which includes procedures and precautions that should be followed in the event that subsurface activities are required or in situations where waste fill is otherwise exposed to future site users.

In accordance with reporting requirements, the appointed Contaminated Sites Auditor and relevant regulatory bodies will be notified in writing by the Environmental Supervisor within 24 hours of an incident or hazard associated with the SEERMP or the EMP in general that may present an adverse risk to human health and/or the environment.
REFERENCES


WGE (2007a) Typical Sections and Details, Helena East Precinct - Forward Works, Drawing Nos.16697C-HEFW/04 and 16697C-HEFW/05, Revision C. Wood and Grieve Engineers (WGE).

WGE (2007b) Earthworks Plan, Helena East Precinct - Forward Works, Drawing Nos.16697C-HEFW/03, Revision C. Wood and Grieve Engineers (WGE).

WGE (2007c) Remediation Plan, Helena East Precinct - Forward Works, Drawing Nos.16697C-HEFW/04, Revision C. Wood and Grieve Engineers (WGE).


FIGURES
APPENDIX 1

WOOD & GRIEVE ENGINEERS (WGE)
SELECTED ENGINEERING SPECIFICATION
PLANS
APPENDIX 2

TRACT (WA) PTY LTD LANDSCAPING AND VEGETATION REHABILITATION STRATEGY
Project/Subject: MRA – Southern Embankments  
Date: 7 May 2007

The Southern Embankment Landscape is an integral part of the Workshop Village redevelopment. The desirable end outcome is one that meshes the environmental, engineering and landscape requirements while allowing a number of access points down to the river and connections through to the Water Tank Park. The embankment landscape should include:

- Pedestrian connections to the Helena River and its environs, providing a linear parkland edge to the southern edge of Midland. These connections should allow viewing opportunities to the Helena River as well as facilitating passive recreation for the local residents.
- A transition zone between the attractive, landscaped parkland at Water Tank Park and the Helena River bushland.
- An overlay of cultural meaning referencing the Helena River to the local indigenous community as well as the settlement and development since the 1830’s.
- Plantings of a range of local tubestock trees, shrubs and groundcovers to create a largely self sustaining and environmentally responsible vegetative cover, screening and protecting the embankments.
The following planting list sets out recommended species to the embankment and associated flood plain areas.

**TRACT PROPOSED PLANTING LIST**

**Planting List - non-irrigated tubestock plantings to Southern embankment within the Midland Redevelopment Authority site**

<table>
<thead>
<tr>
<th>Category</th>
<th>Species</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trees</strong></td>
<td>Melaleuca rhaphiophylla – Swamp paperbark</td>
<td></td>
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<tr>
<td></td>
<td>Melaleuca preissiana – Moonah - away from the river’s course</td>
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<td></td>
<td>Banksia littoralis – Swamp banksia</td>
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<tr>
<td></td>
<td>Eucalyptus rudis - Swamp gum</td>
<td></td>
</tr>
<tr>
<td><strong>Shrubs &gt;2m</strong></td>
<td>Taxandria linearifolia – Swamp peppermint - must be included</td>
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<tr>
<td></td>
<td>Kunzea vestita - Spearwood</td>
<td></td>
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<td></td>
<td>Melaleuca incana – Grey melaleuca</td>
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<tr>
<td></td>
<td>Oxylobium lineare – River pea</td>
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<td></td>
<td>Trymalium floribundum – Karri hazel</td>
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<tr>
<td></td>
<td>Hakea varia – Variable leaf hakea</td>
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<td></td>
<td>Paraserianthes lophantha - Albizzia</td>
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<tr>
<td><strong>General Areas</strong></td>
<td>Acacia saligna – Orange wattle</td>
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<td></td>
<td>Astartea affin. fascicularis</td>
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<td></td>
<td>Melaleuca lateritia – Robin red breast bush (especially away from the very wet area)</td>
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<tr>
<td><strong>Shrubs 1-2m</strong></td>
<td>Hypocalymma angustifolium – White myrtle</td>
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<td></td>
<td>Xanthorrhoea preissii – Grasstree (on the edge away from water)</td>
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<tr>
<td><strong>Shrubs &lt;1m</strong></td>
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<td></td>
<td>Eucalyptus rudis - Swamp gum</td>
<td></td>
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<tr>
<td><strong>Perennial Herbs</strong></td>
<td>Apium prostratum – Sea celery</td>
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<td></td>
<td>Cotula coronopifolia - Waterbuttons</td>
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<td></td>
<td>Polygonum salicifolium – Slender knotweed</td>
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<td></td>
<td>Lobelia alata – Angled lobelia</td>
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<td>Velleia trinervis -</td>
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<td>Pattersonia occidentalis – Purple flags (on the edge away from water)</td>
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<td></td>
<td>Anigozanthos viridis – Green kangaroo paw</td>
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<td></td>
<td>Tribonanthes species – Flannel flowers</td>
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<td></td>
<td>Juncus pallidus</td>
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<tr>
<td><strong>Wetter Areas</strong></td>
<td>Baumea articulata – Jointed twig-rush</td>
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<tr>
<td></td>
<td>Bulboschoenus caldwellii – Marsh club rush</td>
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<td></td>
<td>Chorizandra enodis – Black bristle-rush</td>
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<td></td>
<td>Isolepis nodosa – Knotted club-rush</td>
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<td></td>
<td>Lepidosperma longitudinale – Pithy sword-sedge</td>
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<tr>
<td></td>
<td>Lepidosperma tetraquetrum - 4-angled sedge</td>
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</tbody>
</table>
Please do not hesitate to contact me should you have any queries.

Regards
Emma Carr
Tract (WA) Pty Ltd
APPENDIX 3

STAKEHOLDER CORRESPONDENCE
Hi Justin

Schedule 6 clause 2 (a) of the EP Act allows for the implementation of a proposal in accordance with an implementation agreement or decision;

This exemption applies to clearing formally assessed as part of a proposal under section 38 of Part IV of the Environmental Protection Act 1986. The clearing is only exempt if it is done in accordance with the implementation agreement or decision.

Only the clearing exemptions covered under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 do not apply to ESAs.

Peter

Hi Peter

Could you please look at this? No need to actually have a view about whether the Ministerial Statement is exempt, but just explain the meaning of the clause 2(a) exemption as per the guidelines.

Thanks

Sarah McEvoy
A/Manager
Native Vegetation Conservation Branch
Department of Environment and Conservation
Phone 9219 8702

Hi Sarah,
Pls can you get one of your Policy officers to respond to this email.
Thanks
Vi

Hi Justin

From: Kiss, Peter [Peter.Kiss@dec.wa.gov.au]
Sent: Thursday, 14 June 2007 5:40 PM
To: Justin Lumsden
Cc: Saffer, Vi; NAVI Policy
Subject: RE: Applicability of a Clearance of Native Vegetation Permit to Ministerial Statement 640

Hi Justin

Schedule 6 clause 2 (a) of the EP Act allows for the implementation of a proposal in accordance with an implementation agreement or decision;

This exemption applies to clearing formally assessed as part of a proposal under section 38 of Part IV of the Environmental Protection Act 1986. The clearing is only exempt if it is done in accordance with the implementation agreement or decision.

Only the clearing exemptions covered under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 do not apply to ESAs.

Peter

From: McEvoy, Sarah
Sent: Thursday, 14 June 2007 2:52 PM
To: Kiss, Peter
Subject: FW: Applicability of a Clearance of Native Vegetation Permit to Ministerial Statement 640

Hi Peter

Could you please look at this? No need to actually have a view about whether the Ministerial Statement is exempt, but just explain the meaning of the clause 2(a) exemption as per the guidelines.

Thanks

Sarah McEvoy
A/Manager
Native Vegetation Conservation Branch
Department of Environment and Conservation
Phone 9219 8702

From: SAFFER Vi [mailto:vi.saffer@dec.wa.gov.au]
Sent: Thursday, 14 June 2007 1:58 PM
To: McEvoy, Sarah
Cc: HIGBID Jennifer
Subject: FW: Applicability of a Clearance of Native Vegetation Permit to Ministerial Statement 640

Hi Sarah,
Pls can you get one of your Policy officers to respond to this email.
Thanks
Vi

From: Higbid, Jennifer [mailto:Jennifer.Higbid@dec.wa.gov.au]
Hi Vi,

I’ve just been checking Nat’s emails (she’s on long service leave) and have come across this inquiry in regards to a clearing permit. Could you please forward it onto someone to respond or let me know who I should send it to. Thanks kindly.

Cheers,
Jen

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Jennifer Higbid
Wetlands Program, Species and Communities Branch
Department of Environment and Conservation

17 Dick Perry Avenue, Technology Park, Kensington WA 6151
Locked Bag 104, Bentley Delivery Centre WA 6983

Ph: 9219 8709   Fax: 9219 8701
Email: jennifer.higbid@dec.wa.gov.au

From: Thorning, Natalie
Sent: Thursday, 14 June 2007 11:26 AM
To: Higbid, Jennifer

From: Justin Lumsden [mailto:Justin.Lumsden@ataenvironmental.com.au]
Sent: Tue 12/06/2007 2:07 PM
To: Thorning, Natalie
Cc: Greg Milner

Natalie,

I have left a couple of messages on your voicemail in the last week. The reason for my phone calls was to seek clarification on the applicability of a Clearance of Native Vegetation Permit for a particular site that may have some unusual circumstances as described below.

As the Environmental Representative for the Midland Redevelopment Authority (MRA), ATA Environmental seek advice regarding the relevance and implications of the Environmental Protection (Clearance of Native Vegetation) Regulations 2004 with respect to a portion land that is covered by the following Ministerial Statements:

- MS 640 (statement that a proposal may be implemented) issued on 2 December 2003 for Remediation of Midland Railway Workshops Site Helena West Area, Helena Precinct, Midland.
- MS 742(statement that a proposal may be implemented) issued on 6 June 2006 for Helena East Precinct Remediation and Redevelopment, Midland, City of Swan.

From the Environmental Protection (Clearance of Native Vegetation) Regulations 2004, it is understood that where the clearance of native vegetation is to occur within a environmentally sensitive area under Section 51B of the EP Act 1986 [such as a Conservation Category Wetland (CCW), or within a nominal 50m buffer zone of a CCW], there are no exemptions from obtaining a Native Vegetation Clearance Permit from the DEC. With consideration to Schedule 6 of the EP Act 1986, are you able to confirm whether the proposal to undertake remedial earthworks and post rehabilitation works within an embankment containing degraded native vegetation and large volumes of waste fill that abuts a CCW (Helena River Floodplain), as conditionally

2/07/2007
approved by Ministerial Statement 640 and 742, **will or will not require a Native Vegetation Clearance Permit to be issued by the DEC?**

Your prompt response will be much appreciated and I am happy to provide further information to assist you in providing advice.

Regards,

JUSTIN LUMSDEN  
Environmental Scientist  
ATA Environmental/Coffey Environments Pty Ltd  
2 Bulwer Street Perth WA 6000  
T (+61) (8) 9328 3488 F (+61) (8) 9328 3588 M 0418 914 967  
www.coffey.com.au

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