LESLIE VALE INERT LANDFILL AND RESOURCE RECOVERY CENTRE
ENVIRONMENTAL EFFECTS REPORT

Prepared by: INTEGRATED LAND MANAGEMENT AND PLANNING
Barry Williams
14 August 2009

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EXECUTIVE SUMMARY

Hazell Bros. Group proposes establishing an Inert Landfill and Resource Recovery Centre at the H.B.M.I. Pty. Ltd. Leslie Vale Quarry site. It is intended that the ILRRC will be used by other companies in the Hazell Bros. Group and other Hazell Bros. account customers including the Kingborough Council.

The proponent intends to recover a large portion of the waste received at the site and either recycle or value-add to produce new products for use on site or for resale. The quality of the waste accepted will be strictly controlled by documented waste management procedure which will include an agreement with customers to maintain responsibility for the waste until it is accepted by a dedicated landfill operator.

The total landfill capacity will be 286,000 tonnes and it will cover an area of approximately 5.5 hectares. The ILRRC will receive around 17,000 tonnes of waste annually of which 11,000 tonnes will be placed in the landfill. These quantities will increase through the life of the facility to 37,000 tonnes received and 24,000 tonnes to landfill at the end of its design life of 17 years.

The quarry operation and the ILRRC will operate cooperatively and customers will be presented with opportunities to back-load construction materials saving time, costs and greenhouse gas emissions. The site offers good access off a major highway without the need to negotiate residential streets and by back-loading trucks overall truck movements on the local road network can be reduced.

To inform this Environmental Effects Report detailed studies have been undertaken to establish the site’s suitability for establishing this facility. A hydro-geological assessment found the subgrade is structurally sound and that the natural clay subsoil could be utilised as a liner for the landfill. Water sampling of a deep groundwater monitoring bore adjacent to the site showed this water had not been affected by previous activities. A forest practices plan investigated natural and cultural values and the proponent has made commitments to address any effects or risks posed on these values by the proposal.

The development of the ILRRC will cause 1.7 hectares of forest and woodland to be cleared; of which 1.0 hectares is considered a high priority forest community. The proponent will provide a remedy satisfactory to the Forest Practices Authority as an offset. The proponent will undertake a surface and groundwater monitoring program to ensure that downstream waters are unaffected by the development.

The existing fill material placed at the site has an unstable face that will be cut down in a series of benches and the material thus won will be placed over the insitu clay layer. The landfill will be constructed using more permeable fill in a series of benches from the southwest toe up and using less permeable fill from the northeast back. The final form will have a gradient of permeability creating a free draining and stable landform to rehabilitate with grassland species.

The appearance of the site will change little over the life of the facility. One small area of clearing is located at the toe of the existing batter in a natural gully; the other area is on the ridge line but will cause an existing break in the tree line to be widened by only 80 metres. As the landfill is progressively revegetated with a combination of grassland and trees, the appearance of the site will blend with the existing landscape mosaic of pasture and forest.

The establishment of the ILRRC is supported by other major construction companies and by the Kingborough Council. By diverting inert waste away from the Council’s putrescible landfill site the local community will be saved the cost of creating expensive extra landfill capacity.
1. **INTRODUCTION**

Hazell Bros. Group proposes developing an inert landfill and resource recovery centre (ILRRC) on the site of an existing quarry at Leslie Vale. The quarry is operated by a company within the Hazell Bros Group, H.B.M.I. Proprietary Limited. This company is the title holder of the land CT 198868-1 and is also the Lessee of Mining Lease number 1382P/M.

The site is located off the Huon Highway around five kilometres from the central business district of Kingston. The landfill will occupy the eastern corner of the site and cover 5.5 hectares including sediment control infrastructure. The ILRRC operation will use the same access, weighbridge and office facilities as the quarry operation.

This report has been prepared to provide information to enable the regulatory authorities to fully assess the implications of the proposal. The Environment Protection Authority and the Kingborough Council will be responsible for assessing the proposal and this report will be provided as information supporting the Development Application.

After a description of the proposal this report details the planning aspects of the development and then describes the environment in which it is located and the geology. Alternative sites are briefly discussed and previous activities on this site are detailed. The next section of the report follows the format of the Landfill Sustainability Guide (Environment Division, 2004) and finally the commitments made by the proponent throughout the report are presented as a list.

The initial report by SEMF (SEMF, 2008) is referenced in this document and all the design details and stability calculations included here refer to, and are consistent with the original SEMF design. The SEMF report is not included in the appendices but is available as a reference if requested.

### 1.1. Proponent

The Proponent is Hazell Bros Group Pty. Ltd. This company is the parent to a group of companies involved in construction industry. The Hazell Bros. Group employs around 500 people state wide and has a 65 year history supporting industrial construction in Tasmania.

For this project the key contact with the Hazell Bros Group is:

Mr Michael Hazell  
Hazell Bros. Group Pty. Ltd.  
ABN 27 088 345 804  
8b Lampton Avenue  
Derwent Park   TAS   7009  
Business Phone   (03) 6277 7888  
Business Fax   (03) 6273 4160  
Email: [Michael.Hazell@hazellbros.com.au](mailto:Michael.Hazell@hazellbros.com.au)
1.2. Project outline

The proponent proposes establishing an inert landfill and resource recovery centre (ILRRC) to compliment its current quarrying operation at Leslie Vale. Hazell Bros. Group accounts holders that require a disposal location for inert construction wastes will have the opportunity to deliver inert waste and backload construction materials. The inert landfill facility will also feature a designated area for stockpiling reusable and recyclable materials. The proponent will recover the recyclables and value-add to the reusable materials before on-selling into the market place.

The site of the proposed landfill and recycling area is located to the east of the existing weighbridge and office complex that services the quarry. The site has previously been used as a fish waste composting facility and waste and recoverable materials stockpile area. A discussion about the previous activities on this site is included in Section 1.12 of this report.

Figure 1 shows the location of the landfill footprint in relation to the main quarry complex, access road and Huon Highway. The closest neighbours to the new facility are indicated with attenuation distances shown.

![Aerial image showing mining lease boundary (red) and landfill footprint (white)](image)

Access to the stockpiling and landfill area will be shared with the quarry access as far as the existing weighbridge. Incoming materials will cross the weighbridge and then be diverted into the stockpiling area. Materials will be dumped onto separate stockpiles or into stalls according to the material type. Inert waste with no reuse or recycling potential but that can be used to construct access tracks over the landfill will be delivered to the landfill site and dumped in a location convenient for the operation at the time. All other inert waste will be delivered to the active placement area.
1.3. Operating Hours

The ILRRC operating hours will compliment the quarry operating hours to enable trucks loaded with inert waste to back load new construction materials. The proposed operating hours for the ILRRC and the existing operating hours for the quarry are listed below:

Table 1 Site Operating Hours

<table>
<thead>
<tr>
<th>Days</th>
<th>ILRRC Operating hours</th>
<th>Quarry Operating hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td>0700 – 1630</td>
<td>0600 – 1800</td>
</tr>
<tr>
<td>Saturday</td>
<td>0700 - 1630</td>
<td>0600 - 1630</td>
</tr>
<tr>
<td>Sundays</td>
<td>closed</td>
<td>closed</td>
</tr>
<tr>
<td>Public Holidays</td>
<td>closed</td>
<td>closed</td>
</tr>
</tbody>
</table>

1.4. Production Rates

Once operational the landfill has a total fill capacity of 221,000 cubic metres (SEMF, 2008). A specific Gravity of 1.3 tonnes to one cubic metre has been assumed in this report. The total landfill capacity is therefore 287,300 tonnes. This volume includes the landfill cap which will be comprised of 300 mm clay-based inert waste base layer over the inert fill and a 200 to 300 mm surface layer of clean topsoil-based material suitable for revegetation; see typical cross section diagrams Figure 4. The cap will be comprised of suitable inert waste material delivered to the site and is included in the production figures.

Based on past production rates of the existing landfill operated between 1996 and 2008 and described in Section 2.1, it is expected that a maximum annual volume of 24,000 tonnes of inert waste will be received on the landfill. At this assumed filling rate the life of the landfill will be 17 years or until 2026.

1.5. Waste Types

It is the intention of the operator to reuse or recycle a large portion of the total quantity materials accepted at the site. Records kept on the previous operation indicate that around 35 percent of materials received will be suitable for recovery. The types of materials accepted for processing will include those specified in the Landfill Sustainability Guide (Environment Division, 2004). These materials include the following:

- demolition waste;
- asphalt and rubble;
- wood;
- bricks;
- concrete;
- inert synthetic materials;
- uncontaminated soil;
- rocks;
- excavated material (uncontaminated);
- green waste; and
- fencing material.

These materials will be treated as detailed in Table 2 below:
<table>
<thead>
<tr>
<th>Material</th>
<th>Treatment</th>
<th>Product</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition waste</td>
<td>Sorted into categories below</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt and rubble</td>
<td>Crushed and screened</td>
<td>Road base or structural fill</td>
<td>Road construction or landscaping contactors</td>
</tr>
<tr>
<td>wood</td>
<td></td>
<td>Timber to wood recycling</td>
<td>Timber recyclers</td>
</tr>
<tr>
<td>Bricks</td>
<td>Intact bricks sorted and stacked for re-sale</td>
<td>Seconds or feature brickwork</td>
<td>Construction industry</td>
</tr>
<tr>
<td></td>
<td>Brocken bricks crushed and screened</td>
<td>Course aggregate</td>
<td>Landscaping contractors</td>
</tr>
<tr>
<td>Concrete</td>
<td>Crushed and screened</td>
<td>Course aggregate</td>
<td>Road construction or landscaping contactors</td>
</tr>
<tr>
<td>Glass</td>
<td>Crushed and screened</td>
<td>Fine aggregate</td>
<td>Construction industry</td>
</tr>
<tr>
<td>Uncontaminated soil</td>
<td>Screened and stockpiled</td>
<td>Used onsite or on-sold as topsoil</td>
<td>Road construction or landscaping contactors</td>
</tr>
<tr>
<td>Rocks</td>
<td>Sorted</td>
<td>Stone walls or feature stone</td>
<td>Landscaping contractors</td>
</tr>
<tr>
<td>Excavated materials</td>
<td>Stockpiled according to characteristics</td>
<td>Used onsite or on-sold as clean fill</td>
<td>Construction industry</td>
</tr>
<tr>
<td>Green waste</td>
<td>Only course material suitable for chipping</td>
<td>Course mulch</td>
<td>Landscaping contractors</td>
</tr>
<tr>
<td>Fencing material</td>
<td>Sorted into timber and steel and recycled accordingly</td>
<td>Timber to wood recycling</td>
<td>Timber recyclers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steel to metal recycling</td>
<td>Metal recyclers</td>
</tr>
</tbody>
</table>
Of those materials accepted by the ILRRC only those materials classified as inert fill by the Landfill Sustainability Guide (Environment Division, 2004) can be diverted to the landfill. These materials include only the following:

- inert building and demolition waste;
- clean fill;
- wood
- bricks
- inert synthetic materials
- concrete
- rocks; and
- fencing materials.

1.6. Project Timeframe

Table 3 Proposed Project Timeline

<table>
<thead>
<tr>
<th>Preparation of Environment Effects Report</th>
<th>Submission of Development Application</th>
<th>Advertising by Authorities</th>
<th>Assessment of submissions and approval</th>
<th>Engineering design</th>
<th>Construction and commissioning</th>
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<tr>
<td>20 weeks</td>
<td>1 weeks</td>
<td>2 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
</tr>
</tbody>
</table>

1.7. Relevant Legislation and Policies

The following legislation, policies and guides have been considered in the production of this report:

- Land Use Planning and Approvals Act 1993;
- Environmental Management and Pollution Control Act 1994;
- Resource Management and Planning Appeal Tribunal Act 1993;
- Kingborough Planning Scheme 2000;
- Water Management Act 1999;
- Workplace Health and Safety Act 1995;
- State Policy on Water Quality Management 1997;
- Environment Protection Policy (Air Quality) 2004;
- Draft Environmental Protection Policy (Noise) 2003;
- Weed Management Act 1999;
- Tasmanian Solid Waste Management Policy 1994; and
1.8. Planning aspects

For ease of referencing, this section of the report conforms to the numbering system of the Kingborough Planning Scheme (Kingborough Council, 2000).

Table 4 Planning Scheme Response

<table>
<thead>
<tr>
<th>1.2</th>
<th>Intent of the Scheme</th>
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</thead>
<tbody>
<tr>
<td>1.2.1</td>
<td>The Intent of the Scheme is to further:</td>
</tr>
<tr>
<td>(a)</td>
<td>Objectives of the Land Use Approvals Act 1993</td>
</tr>
<tr>
<td>(b)</td>
<td>Councils Strategic Plan Titled “Kingborough Community Directions 2000 Onwards” (2000)</td>
</tr>
<tr>
<td>(c)</td>
<td>National Strategies on Ecological Sustainable Development</td>
</tr>
<tr>
<td>(d)</td>
<td>The Following State Policies:</td>
</tr>
<tr>
<td></td>
<td>• State Policy on Water Quality Management 1997</td>
</tr>
<tr>
<td></td>
<td>• The State Policy on the Protection of Agricultural Land 2000</td>
</tr>
<tr>
<td></td>
<td>• The State Coastal Policy</td>
</tr>
</tbody>
</table>

2.2 Scheme Objectives (relevant to proposal)

(i) To facilitate decision making which maximises the sustainable commercial use and development of resources by:

(a) providing for a growing and diversified economy focusing on employment generation, which can enhance the capacity for sustainable use of the planning scheme area’s resources while protecting its key natural resource assets.

Response:

The ILRRC will give the construction industry an opportunity to integrate demolition and construction works efficiently by providing a single location to dispose of inert waste and pick up new construction materials (see EER Section 2.1.).

The disposal of inert construction waste is a service that the Kingborough Council cannot provide at this time.

(c) ensuring effective integration of long and short term economic, environmental, social and equity considerations whilst recognising the cumulative environmental impact of certain types of developments.

Response:

The Proponent is motivated to use the ILRRC to recover as much of the construction waste currently going to landfill as possible. By turning a waste product into marketable resource this proposal will generate income while reducing costs to industry and the community:

Inert waste will no longer be using expensive capacity in the Council’s putrescibles landfill.

• Industry can back load construction products reducing costs and heavy traffic movements.
• An already degraded site can be progressively rehabilitated with local provenance.
woodland and grassland species increasing habitat for natural ecosystems.  
(see EER Section 2.1., 3.7., 3.12. and 4.1.).

(ii) To retain and maintain **natural ecological processes** by ensuring:

(a) the minimisation of interference with natural processes particularly those which are important in protecting the planning scheme area’s natural resources.

**Response:**

The entire development will disturb 1.5 ha of natural woodland and only 1.0 ha of high priority forest community (see EER Section 2.8.).

(b) the maintenance of natural areas of forests, grasslands, wetlands, heathlands, coastal and near shore and riverine environments and the ecological processes on which life depends.

**Response:**

The disturbed priority woodland will be offset by a remedy satisfactory to the Forest Practices Authority (see EER Section 2.8.).

(c) the protection of flora and fauna habitats from inappropriate development or use and their affects and impacts;

**Response:**

A nest site survey has been undertaken to ensure that no breeding pairs of wedge-tailed eagle or white belted sea eagle will be affected by the development (see EER Section 2.8.).

(d) the maintenance and enhancement of the physical and biological quality of surface and ground water;

**Response:**

A surface water management system will be introduced to capture sediment that may be suspended in run-off water (see EER Section 3.3 and 4.3.).

A surface and ground water monitoring program will ensure that any changes in the receiving waters are identified. (see EER Section 3.3)

(e) the restoration of damaged or degraded physical environments;

**Response:**

Of the 5.5 hectare site 3.8 hectares is already degraded. The landfill will be progressively rehabilitated as it is developed. An additional area, currently disturbed, will be revegetated with local provenance species to blend with the surrounding woodland. This will become the vegetation screen (see EER Section 5.).

(f) monitoring of impacts of use or development occurs if it is foreseeable that they may affect land instability, natural coastal processes and hazards.

**Response:**

The proponent will undertake a program of monitoring water quality and dust emissions from the site (see EER Section 3.11. and 4.4).

(iii) To protect **cultural heritage** by ensuring:

(a) sites of significant and contemporary Aboriginal heritage significance are identified and protected;

**Response:**

A survey has indicated that no known sites or items of historical or cultural heritage significance will be affected by the development (see EER Section 2.10.).

(d) the protection of significant viewshed and landscapes of cultural significance to the local community and visitors alike.
### Response:

A viewshed analysis has been undertaken as part of the Forest Practices Planning and found that the landscape character is likely to remain unchanged (see EER Section 3.12., 5. and appendices).

(iv) To apply responsible and equitable decision making by ensuring:

(a) all appropriate information is collected to confirm the full ramifications of an application for use of development before it is given approval.

Response:

A comprehensive Environmental Effects Report has been prepared with specialist consultants reports in Hydro-geology and Forest Practices.

(b) that decision making about the use or development of resources and enforcement procedures provide for integrated decision making.

Response:

The level of detail in the documentation provided has been guided by input from all the appropriate regulatory authorities.

(c) the precautionary principle is applied with respect to the impacts of greenhouse-induced sea level rise as well as other matters where the full understanding of particular processes, or the consequences of use or development are not fully understood.

(vi) To achieve better integration of land use and transport strategies by:

(i) creating new and unplanned access points;

Response: The development will utilise an existing high standard access point.

(ii) allowing new use or development close to roads which would reduce service and safety levels;

Response: The development is very unlikely to reduce service or safety levels on affected roads (see EER Section 3.10. and 4.6).

### 3.0 Scheme Operation and Administration

#### 3.1 Zones and Use Classes

3.1.2 The proposal is located across two zones:

- Primary Industries
- Environmental Management

3.1.3 The use class is designated as Utilities.

3.1.4 Utilities is defined as:

Land used for infrastructure services established or provided by public or private sources.

The use activity is “refuse disposal site”.

3.1.6 In order to establish a utilities use within the Primary Industries zone and the Environmental Management zone a planning permit is required.

Response:

The use proposal will not meet all the acceptable solutions and will therefore be assessed in
accordance with SS7 of the Act and will be assessed to determine compliance with the zone objectives, desired future character statements and accompanying strategies.

### 3.4 Application requirements

#### 3.4.2 This application includes the following documentation:

- (a) a completed application form;
- (b) a copy of certificate of title, title plan and schedule of easements for which the use is proposed;
- (c) a report that demonstrates that performance in accordance with the relevant scheme standards, desired future character statements and strategies; and
- (d) fees amounting to $400 + $1 per $1000 project cost + $170 for advertising.

#### 3.4.3 A site analysis plan at an appropriate scale and showing all relevant details is included as Figure 2 in this document.

### 8.0 PRIMARY INDUSTRIES ZONE

#### 8.1.2 Relevant objectives of the Primary Industries Zone are to:

- (a) protect and allow for the sustainable use or development of the natural and non-natural resources on which agriculture, aquaculture, forestry and mining depend.

**Response:**

A synergy exists between the ILRRC and the existing quarry. By locating the two operations on the one site the sustainability of both are enhanced. Construction projects are preceded by clearing and demolition. Trucks carrying inert waste can be back-loaded with construction materials saving time; costs and green house gas production (see Section 1.2. and 2.1.).

#### 8.2 Desired Future Character Statements and Strategies

**DFCSS**

The avoidance of land use conflict between a range of land uses, recognising the intent of the zone to facilitate agricultural uses.

**SS Strategy**

Attenuation distances and other strategies will be applied to reduce the likelihood of conflict.

**Response:**

The site of the ILRRC has a minimum of 800 metres attenuation distance to the nearest sensitive use (residence). This residence is owned by the proponent. The next nearest sensitive use is 1220 metres distant (see Figure 1 EER).

The proponent has committed to a waste management process to eliminate the risk of inappropriate wastes being delivered to site causing litter problems, noxious odours or vermin (see Section 3.11. EER).

The proponent has committed to expanding the existing dust management procedure to incorporate the ILRRC operation (see Section 3.11 EER).

#### 8.3.1 Table of Use Classes

A planning permit is required for utilities in the Primary Industries Zone.

#### 8.4 Standards for Use or Development in the Primary Industries Zone

**Issue 1** Controls applying to Use Classes that are permissible

To ensure that all permissible use or development is compatible with the objectives of the Primary
Leslie Vale Inert Landfill and Resource Recovery Centre EER

Industries Zone.

8.4.1.6 Use or development in the Utilities Use Class
Council may approve an application for use or development not meeting the Acceptable Solution where it can be demonstrated that;

(a) the proposal will not prejudice the zone objectives or applicable desired future character statements and strategies; and
(b) no environmental nuisance will result; and
(c) all relevant provisions of the scheme are met.

Response:
The quarry operation has significant reserves and will continue to be viable into the future. Any future strategy would include the quarry and supporting activities within the mining lease boundary.

The risk of an environmental nuisance resulting from the handling of inert waste is limited to emissions of dust, sediment, and weeds and diseases. In the EER the proponent has committed to:

- Expanding the current dust and weed management programs to include the ILRRC and manage Phytophthora cinnamomi (see Section 4.4 EER).

This document addresses all the relevant provisions of the scheme.

9.0 ENVIRONMENTAL MANAGEMENT ZONE

9.1.2 Objectives of the Environmental Management Zone are to:

(a) Provide for the protection and management of natural and cultural resources including cultural heritage, natural heritage, scenic landscapes, fragile landforms, water catchments, the coastal area and areas of recreational value:

(b) Prevent urban sprawl by not allowing ribbon development between townships; and

(c) Allow use of development that is compatible with these values.

Response:
During the filling of the landfill progressive capping and revegetation will take place until finally the entire ILRRC site will be regenerated to native forest and grassland.

The proponent has committed to undertaking a groundwater monitoring program to ensure that the development does not degrade the water quality in the receiving environment (see Section 4.8 EER).

To protect the surrounding natural environment the proponent has commissioned a flora and fauna survey as part of a forest practices plan and a dedicated nest site survey (see Section 2.8 EER). Historic and cultural heritage surveys show that the development will not disturb any known sites or relics (see Section 2.11 ERR).

9.2 Desired Future Character Statements and Strategies

DFCS2 To retain biological values of coastal and hinterland vegetation communities, native forests and grasslands, wildlife habitats and ecological processes.

S2 Strategy
Vegetation clearance is to be controlled to prevent erosion, protect water quality in waterways and wetlands by acting as pollution filter, assist in land stabilisation and protect scenic and visual amenity.
| **Response:** | The footprint of the ILRRC is 5.5 hectares in area. 3.8 hectares is already cleared and 1.7 hectares is degraded native vegetation. A part of the ILRRC development a vegetation screen of around 0.6 hectares will be developed using local provenance trees and shrubs on the north east corner of the property (see Section 3.12 and 5. EER).
Developing the ILRRC will necessitate clearing 1.0 hectares of a forest community important because it provides foraging habitat for swift parrot. The proponent has committed to providing a remedy satisfactory to the Forest Practices Authority to compensate for the clearing (see Section 2.8 EER). |
| **DFCS4** | Landscape and Scenic features of beaches, coastal and inland hills and mountains, estuaries, lagoons, headlands and coastal vegetation will be preserved. |
| **S4 Strategy** | Significant landscapes are protected in the Scheme in accordance with the document Planning Guidelines for Urban Skylines and Hillfaces 2000 prepared by DPIWE 2000. |
| **Response:** | The proponent has commissioned a forest practices plan to inform the EER. The forest practices plan refers to the existing clearing on site of the ILRRC as conforming to the background mosaic of forest and pasture. As the landfill develops it will be progressively capped and revegetated with native grass species. The growing vegetation screen behind the landfill be serve to mask the height as will the low shrubs on the perimeter slopes (see Section 3.12., 5. EER and appendices). |
| **DFCS4** | Landscape and Scenic features of beaches, coastal and inland hills and mountains, estuaries, lagoons, headlands and coastal vegetation will be preserved. |
| **S4 Strategy** | Significant landscapes are protected in the Scheme in accordance with the document Planning Guidelines for Urban Skylines and Hillfaces 2000 prepared by DPIWE 2000. |
| **Response:** | The quarry operation has significant reserves and will continue to be viable into the future. Any future strategy would include the quarry and supporting activities within the mining lease boundary. The risk of an environmental nuisance resulting from the handling of inert waste is limited to emissions of dust, sediment, and weeds and diseases. In the EER the proponent has committed to: Expanding the current dust and weed management programs to include the ILRRC and manage *Phytophthora cinnamomi* (see Section 4.4 EER). This document addresses all the relevant provisions of the scheme. |

**Table of Use Classes**

A planning permit is required for utilities in the Environmental Management Zone

**Standards for Use or Development in the Environmental Management Zone**

**Issue 1**

**Controls applying to Use Classes that are permissible**

To ensure that all permissible uses or development is compatible with the objectives of the Environmental Management Zone

**Use or development in the Utilities Use Class**

Council may approve an application for use or development not meeting the Acceptable Solution where it can be demonstrated that:

- (a) the proposal will not prejudice the zone objectives or applicable desired future character statements and strategies; and
- (b) no environmental nuisance will result; and
- (c) all relevant provisions of the scheme are met.

**Response:**

The quarry operation has significant reserves and will continue to be viable into the future. Any future strategy would include the quarry and supporting activities within the mining lease boundary. The risk of an environmental nuisance resulting from the handling of inert waste is limited to emissions of dust, sediment, and weeds and diseases. In the EER the proponent has committed to: Expanding the current dust and weed management programs to include the ILRRC and manage *Phytophthora cinnamomi* (see Section 4.4 EER). This document addresses all the relevant provisions of the scheme.
### Issue 5

**Landscape and visual values**

Landscape and Visual values are to be protected.

#### 9.4.5.1 Alternative Solution

Development on prominent skylines, ridgelines or exposed slopes must be designed and sited to avoid, remedy or mitigate any adverse effects on significant public views.

**Response:**

Throughout the life of the landfill the visual character of the site will change only slightly. The current shallow depression in the saddle between a stand of trees on the site and neighbouring forest will gradually be replaced with a hill. The height of the hill will be reduced visually by a planted vegetation screen growing behind. The colour of the fill materials will be consistent with that of pastures and the final revegetated surface will be native grassland with low shrubs on the lower slopes (see Section 3.12., 5. EER and appendices).

### SCHEDULES

#### 1.0 Environmental Management Schedule

**1.1 Objectives of the Schedule**

It is the purpose of the schedule to set out Scheme standards to allow for the sustainable use and development of land and resources in all zones through the protection of environmental values and avoidance of environmental hazard and nuisance.

**Response:**

The site for the proposal is shared with a large scale quarry operation. Many of the environmental management issues can be met by expanding procedures established for the quarry. Where this does not provide a complete answer the proponent has committed to developing specific systems or procedures to address the issue.

#### Issue 2

**Natural hazards**

Areas of natural hazard will be avoided or suitable strategies to minimise risk applied

**1.2.2.1 Response:**

The proposal is located within a bushfire prone area but does not involve habitable buildings. Therefore 1.2.2.1 is not applicable.

#### Issue 5

**Utilities**

All appropriate utilities shall be provided for proposed use or development.

**1.2.5.2 Acceptable Solution**

Stormwater discharge: Stormwater must be discharged by either:

(a) A connection to a reticulated stormwater system; or

(b) Where a reticulated system is not available it must be demonstrated by a suitably qualified person that any discharge will not be an environmental nuisance or cause environmental harm under the provisions of EMPCA.

**Response:**

A surface water management system will be employed to control the discharge of runoff from the site during construction and filling. The discharge from the system will occur after a designed retention time, will be diffuse and into existing vegetation away from the natural drainage paths (see Section 3.3 and 4.3 EER).
Issue 6  **Avoiding discharges**  
To maintain the sustainable management of surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of the State Policy on Water Quality Management 1997.

1.2.6.2  **Emissions from diffuse sources:**  
**Alternative Solution**  
Council may permit the discharge of diffuse sources of untreated stormwater or urban runoff off-site provided it is satisfied that integrated stormwater management techniques are to be used and applied so that the water quality objectives of the receiving waters are not prejudiced.  

**Response:**  
The surface water management system is designed to control all runoff over 24 hours from a 1 in 10 year storm event.  
The discharge from this system is diffuse, away from natural drainage paths and into natural vegetation. The risk of water erosion is mitigated by diffuse nature of the discharge, moderate slope, robust vegetation and stable soil (see Section 3.3 and 4.3 EER).

Issue 7  **Potential Nuisance generators**  
Environmental nuisance should be carefully managed.

1.2.7.1  **Acceptable Solution**  
**Noise/Sound Pressure Levels:**  
Noise/Sound Pressure Levels from activities or equipment related to use or development must not, at any time exceed 5dB(A) above the background noise level when measured at the boundary with, or curtilage of, any sensitive use in separate ownership.

**Response:**  
Attenuation distances ensure that blasting noise and sound pressure levels are within the required range. Similar attenuation distances apply to the landfill but with far less sound or vibration emanating (see Section 2.5 EER).

1.2.7.2  **Acceptable Solution**  
**Atmospheric Emissions:**  
No emissions from activities from activities or equipment related to the proposed use or development including odours and vibration can be detected by a person at the boundary of another property.

**Response:**  
Inert fill does not have substances that are likely to produce offensive odours. No equipment will be utilised that is likely to cause vibrations that can be detected at the boundary of the property.

1.2.7.3  **Alternative Solution**  
**Loading/unloading and use of machinery:**  
Council may permit a variation in the hours available for loading/unloading of goods or operation of machinery where it is demonstrated that no environmental nuisance shall result.

**Response:**  
The hours of operation are 0700 to 1630 weekdays and Saturdays. The facility will not be open on Sundays and public holidays. The hours of operation are set to compliment the quarry operation. These hours are a minor variation on the hours proposed in the acceptable solution (Page 109 of the Scheme).

3.0  **Road Asset and Access Schedule**

3.1  **Objectives of the Schedule**

3.1.1  **The purpose of this schedule is to:**

(a)  Ensure that use or development of land not on a road does not adversely affect the efficiency and safety of that part of the Tasmanian road system as lies within the planning scheme area; and

(b)  Ensure that the road network operates with the maximum degree of efficiency and safety for both road users and adjoining landowners by managing the interaction between roads and adjoining
use and development; and
(c) Assist the planning, construction, maintenance and management of roads by identifying the function and performance expected of each road within the planning scheme area; and
(d) Specify the standards for traffic circulation and movement within a site; and
(e) Identify specific requirements for use or development which has major traffic generating qualities.

Response:
The development is likely to increase traffic movements through the existing intersection with the Huon Highway by 4 percent. This amount would be within normal variability of traffic volumes (see Section 3.10 and 4.6 ERR).

Issue 1 Access Sight Distance
To ensure that adequate sight distance is provided in relation to the speed of through traffic.

3.2.1.1 Acceptable solution
Sight Distance Standards:
Category 1-6 road and State Roads must meet the standards set out in Figure S3.1.

Response:
The Department of Infrastructure Energy and Resources has evaluated the safety of the current intersection with the Huon Highway and found it complies.

Issue 2 Accesses/junctions
To ensure that the performance and safety of roads is not reduced by the number and location of vehicular entry points.

3.2.2.1 (a) Category 1 – 3 roads outside the urban speed limit. Limit: None.

Response:
There is currently one access to the site and there are no new accesses proposed.

3.2.2.2 Location of accesses

Response:
There are no new accesses proposed.

9.0 Environmental Weeds Schedule

9.1 Objective of the Schedule
9.1.1 The purpose of this schedule is to ensure that environmental weeds are not incorporated into landscape plans or otherwise are allowed to impact on native vegetation.

Response:
The proponent as committed to expanding the weed management program developed as part of the quarry environmental management plan to cater for the landfill facility (see Section 4.4 EER).

10.0 Protected Vegetation Schedule

10.1 Objectives of the Schedule
10.1.1 The purpose of this schedule is to ensure that vegetation identified as having conservation value is protected as far as practicable.
**Issue 1**

Clearance and Disturbance of Vegetation
to ensure that vegetation identified as warranting protection and conservation is afforded suitable management.

<table>
<thead>
<tr>
<th>10.2.1.1</th>
<th>Clearance/disturbance of “high priority” vegetation identified in Table S10.2:</th>
<th>Response:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1.0 hectares of “high priority” vegetation will be disturbed during construction. The proponent has made a commitment to provide a remedy satisfactory to the Forest Practices Authority (see Section 2.8 EER).</td>
</tr>
</tbody>
</table>

**11.0**

Potentially Contaminated Lands Schedule

**11.1**

Objectives of the Schedule

| 11.2.1.3 | Dust and runoff from contaminated sites: Where use or development is to be undertaken on a site previously used for an activity listed in Table S11.2, dust and stormwater runoff from site works during the construction phase must be contained within the site or treated to remove contaminants to acceptable levels. | Response:
The proponent has committed to establishing a surface water management system to treat runoff at the start of construction and will maintain the system during the life of the project (see Section 3.3 and 4.3 EER).
The proponent already has a dust management plan that will be expanded to include the inert landfill facility (see Section 3.11 EER and appendices). |

---

**1.9. Environmental aspects**

Table 5 Site Description Climate Data

<table>
<thead>
<tr>
<th>SITE DESCRIPTION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate data</td>
<td></td>
</tr>
<tr>
<td>Mean max. Temperature (°C)</td>
<td>17.0</td>
</tr>
<tr>
<td>Mean min. Temperature (°C)</td>
<td>6.2</td>
</tr>
<tr>
<td>Mean annual rainfall (mm)</td>
<td>676.8</td>
</tr>
<tr>
<td>Wind data</td>
<td>The predominant wind direction (&gt; 40 %) and the strongest winds come from the northwest.</td>
</tr>
<tr>
<td>Land capability</td>
<td>Class 5 and 6</td>
</tr>
<tr>
<td>Aspect</td>
<td>The site is located on the crest and south west facing side of a saddle at between R.L. 252 and 280 metres AHD. A contact between Jurassic dolerite and Permian sediment substrata runs adjacent to the site.</td>
</tr>
<tr>
<td>Vegetation</td>
<td>The majority of the site has been previously disturbed. The surrounding</td>
</tr>
</tbody>
</table>
Forest is mapped as TASVEG DPU (*Eucalyptus pulchella* forest and woodland). This community has been a comprehensive mapped for this report.

**Geophysical data**

The soil types as mapped are listed below. A more detailed and comprehensive study has been conducted to inform this report.

**Soil type on mudstone**

Poor to imperfectly drained grey brown texture contrast soils developed on Permian siltstone bedrock and colluvium on undulating to rolling (3-32%) land.

**Soil type on dolerite**

Imperfectly drained texture contrast soils developed on Jurassic dolerite bedrock and colluvium on rolling to steep (10-56%) land.

**Table 6 Site Description Receiving Waters**

<table>
<thead>
<tr>
<th>RECEIVING WATERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The landfill will be located at the upstream extremity of two drainage depressions ID 234808 and 234809. Below these is a drainage section consisting of two units ID 231212 and 231214. The Conservation of Freshwater Ecosystem Values Project classifications for these sections are detailed below:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Conservation management Priority (CMP)</th>
<th>Representative Conservation Value (RCV)</th>
<th>Integrated Conservation Priority (ICV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>234808</td>
<td>moderate</td>
<td>C</td>
<td>low</td>
</tr>
<tr>
<td>234809</td>
<td>moderate</td>
<td>C</td>
<td>low</td>
</tr>
<tr>
<td>231214</td>
<td>moderate</td>
<td>B</td>
<td>moderate</td>
</tr>
<tr>
<td>231212</td>
<td>moderate</td>
<td>B</td>
<td>moderate</td>
</tr>
<tr>
<td>231190</td>
<td>moderate</td>
<td>B</td>
<td>moderate</td>
</tr>
<tr>
<td>Mafeking creek</td>
<td>moderate</td>
<td>B</td>
<td>moderate</td>
</tr>
<tr>
<td>Northwest Bay River</td>
<td>very high</td>
<td>B</td>
<td>high</td>
</tr>
</tbody>
</table>

The proposed operation will not accept wastes that constitute a risk to the receiving waters other than through inert suspended solids. A sediment retention facility will retain these solids before runoff water enters the drainage system. An existing water supply dam located on Mafeking Creek provides an extra level of security to the more highly classified downstream section of Mafeking Creek and Northwest Bay River.

A more comprehensive condition assessment of the drainage depressions and the vegetation immediately downstream of the new landfill footprint is presented here as (Williams, 2009) .
Figure 2: Identity and CMP of drainage paths from (Department of Primary Industries and Water, 2006)
1.10. Geological aspects

The site is predominantly (90 percent) underlain by Jurassic aged dolerite the balance is underlain by Permian sedimentary rock. In the vicinity of landfill Permian aged sedimentary rock has been intruded by the Jurassic dolerite however in the southeast corner of the landfill footprint the boundary is mapped as a fault (Cromer W. C., 2009 A).

1.11. Alternative sites

This site has been chosen for the inert landfill proposal because of synergies with the quarry operation that gives commercial benefits to the proponent and to account customers. The marketability of both operations is enhanced by offering savings in travel distances and costs when the activities are combined. The community can realise a benefit from an overall reduction in heavy traffic when vehicles are back loaded. Alternative sites were discounted because they did not offer these advantages.

1.12. Previous activities on the site

In recent years various activities have taken place at on the site of the proposed ILRRC. These include a fish waste composting operation and a storage area for reusable and recyclable materials and waste landfill.

- The fish waste composting activity operated under a separate permit from the quarry operation. This operation ceased in 2004. All fish waste and leachate was removed from the site during the decommissioning process which commenced in 2005 and completed in 2006. All materials won in the decommissioning process were blended with topsoil and either sold or stockpiled with the other topsoil materials.
- The demolition materials storage, recycling and landfill operation was operated by HBMI from 1996 to 2008. The previous activity accepted general demolition wastes and materials other than those now described in the Landfill Sustainability Guide (Environment Division, 2004) as inert waste may have been included.
2. LANDFILL SITING AND PLANNING

2.1. Demand

2.1.1. Acceptable standard

A proposal for a landfill (or an extension to an existing landfill) must consider the demand for further landfill space. (Environment Division, 2004)

2.1.2. Situation:

The catchment for this landfill includes the local Kingborough and Hobart municipal areas. Civil and structural construction projects incorporating a demolition component will produce inert waste. Many of these projects will be undertaken by Hazell Bros. account customers.

2.1.3. Action

A previous landfill operated at this site received waste from account customers and the operator’s own activities. An estimate of the quantities of materials likely to be received annually is based on historic waste receipt records. The estimates are presented here as Table 4 taken from (SEMF, 2008) and adjusted to include the likely growth in demand over the life of the operation.

The proponent or agent has interviewed representatives of organisations likely to use the facility.

- The Kingborough Council has given a commitment it will negotiate with the proponent to use the facility to divert inert waste from its putrescibles landfill facility. The life of the Council’s facility will be extended with an associated cost benefit for the local community.
- Ron Carthew Civil Construction (RCCC) will use the facility for projects where quantities of inert waste materials are likely to be generated. RCCC have environmental management procedures for handling waste products and will be happy to integrate their procedures with those of HBMI and also to enter into an agreement to ensure that only appropriate materials are delivered to the facility.
- Pat Dwyer Civil Construction will use the facility and will agree to take responsibility for the materials delivered to the site until they are accepted as being suitable by the Landfill Operator.
- The Hazell Bros Group is one of the largest construction companies in Tasmania and has ongoing projects with the potential to generate inert waste.

The responses by those companies invited to express and interest in using the landfill are included in this report as appendix 1.
Table 7 Expected Annual Quantities of Various Waste Types

<table>
<thead>
<tr>
<th>TYPE OF WASTE</th>
<th>ESTIMATED ANNUAL QUANTITY (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>4200</td>
</tr>
<tr>
<td>Clean fill (soil and gravel)</td>
<td>11000</td>
</tr>
<tr>
<td>Timber</td>
<td>3300</td>
</tr>
<tr>
<td>Synthetic materials</td>
<td>2200</td>
</tr>
<tr>
<td>Steel</td>
<td>300</td>
</tr>
<tr>
<td>Bricks and rubble</td>
<td>3000</td>
</tr>
<tr>
<td>Total (approx)</td>
<td>24000</td>
</tr>
</tbody>
</table>

2.2. Community Liaison

2.2.1. Acceptable Standard
Community liaison should be conducted throughout the life of all landfills, commencing during site selection to ensure local communities are informed and aware of the proposal. Community liaison should be conducted in an open and timely fashion, and allow local knowledge to be obtained.

2.2.2. Situation
The application must be referred to the Environment Protection Authority for assessment. Following the board of the EPA’s determination, Kingborough Council will conduct a planning assessment and make its determination.

2.2.3. Action
The application for a permit to undertake a level 2 activity has been classified as a 2A assessment and the Board of the EPA has required the planning application be advertised for 14 days. During this time the public is invited to review the development application documentation and make representations. The public submissions are taken into account when the development is considered for approval and may influence conditions placed on the permit issued.

2.2.4. Commitments
2.2.4.1. Information will be provided to any person to enable them to prepare representations to the regulatory authorities.
2.3. **Geology**

2.3.1. Performance criteria

Landfills must be located on stable land that is able to support the weight of the landfill over an extended period. Sites must also provide a natural unsaturated attenuation layer below any liner system to minimise downward movement of leachate.

2.3.2. Situation

The proponent commissioned a geological assessment by William C. Cromer Pty Ltd to establish the site’s suitability for establishing an inert landfill. The finding are summarised below, the complete report is reproduced in the appendices as Appendix 2.

2.3.3. Actions

The site is underlain by a dolerite sill in all but the south eastern corner where Permian sediments are present. The contact between the two substrates occurs as a fault in the vicinity of the landfill footprint. There is no record of seismic activity associated with the fault and it presents a very low and acceptable risk to the integrity of the landfill.

The natural clay layer and weathered dolerite sub-grade presents a stable foundation on which to place the landfill. The natural clay layer will be effective as a low permeability liner for the landfill without further working or compaction.

(Cromer W. C., 2009 A)

2.3.4. Commitments

2.3.4.1. The existing natural clay layer will remain intact and the base layer of fill will be placed over the topsoil thus protecting the instu clay layer.

2.4. **Hydrogeology**

2.4.1. Acceptable Standard

Landfill sites must be selected to minimise their potential impacts on PEVs of groundwater.

2.4.2. Situation

The proponent commissioned a hydro-geological assessment by William C. Cromer Pty Ltd to establish the site’s suitability for establishing an inert landfill. The finding are summarised below, the complete report is reproduced in the appendices as Appendix 2. An addendum to the report dealing with the receiving waters is included as Appendix 11.

2.4.3. Actions

Analysis of ground water in an existing bore located approximately 100 metres south of the present waste landfill show it to be unaffected by site activities.

The existing fill material contains shallow unconfined groundwater. This water seeps from the ground down-slope of the existing fill face. Analysis of the quality of this water found it had contamination levels above the discharge to fresh waters standard NEPM Schedule B(1) Table 5-B. The presence of contaminants in the shallow groundwater is the result of previous activities on the site.

(Cromer W. C., 2009 A)
2.5. Buffer Distances

2.5.1. Acceptable Standard

Landfills must be located with sufficient distance between the boundary of the landfill site and adjacent, sensitive land uses.

2.5.2. Situation

The landfill site is located on an existing extractive industry site. The Planning Scheme protects the industry and sensitive uses from conflict by imposing a buffer of one kilometre around the site. The Planning Scheme imposes an attenuation distance of 500 metres around a disposal site that accepts greater than 100 tonnes per annum.

The Cambridge airport is nearest to the site but is 23 kilometres distant, well outside the minimum separation distance of 10 kilometres. A privately owned and operated landing ground is located 3 kilometres away from the landfill facility.

The nearest permanent water course is Mafeking Creek which is 1200 metres distant from the landfill site.

2.5.3. Action

The site plan Figure 1 shows the footprint of the landfill and the closest residences are highlighted with attenuation distances shown. No residence is located within the minimum buffer distance of 300 metres set out in (Environment Division, 2004) or within the 500 metres attenuation distance set out in (Kingborough Council, 2000).

Landfills pose a risk to aircraft during takeoff and landing by attracting birds and especially seagulls, which can alight when startled and strike an aircraft causing it to crash. The materials that will be delivered to the landfill will be inert and not an attractant for birds. It is highly unlikely that the population of birds foraging in the area will be elevated above levels that would be expected over a forested area. This combined with the infrequent use of the landing ground apparently for a single private ultra-light plane (Masters, 2009) means that the risk of bird strike to an aircraft is negligible.

2.5.4. Commitments

2.5.4.1. Management controls on accepting only inert waste will prevent any potential bird attractant product from being stored on site.
2.6. Surface Waters

2.6.1. Acceptable Standard

Potential impacts upon surface waters must be considered in the siting of landfills. The ongoing potential impacts of landfills must be minimised so as not to significantly impact upon the environment (e.g. surface water runoff and occasional occurrences including floods).

2.6.2. Situation

The landfill is located on a saddle and occupies nearly all the catchment. An area of forest of approximately one hectare on neighbouring land would drain onto the site. However a road cut into the slope on Hazell Bros side of the boundary intercepts runoff and directs it to a natural drainage depression down-slope from the landfill footprint.

2.6.3. Action

The surface water management system incorporated into the design of the landfill is sized to accommodate all the runoff produced over a 24 hour period in a 1 in 10 year storm event. This design capacity is nominated in the Landfill Sustainability Guide (Environment Division, 2004) for intercepting surrounding runoff but has been used here as a worst case scenario for runoff from the landfill site. The design of the surface water management system is described in section 3.3 and Figures 2 to 6.

An addendum to the Geotechnical Investigation (Cromer W. C., 2009 B) includes a comprehensive assessment of the water quality in the receiving waters. Samples were taken from the seepage from the existing landfill, from the drainage downstream as it enters the water supply dam on Mafeking Creek as well as waters upstream of the dam.

2.6.4. Commitments

2.6.4.1. The sediment retention basins design will cause diffuse outfall into surrounding vegetation.

2.6.4.2. A comprehensive water quality monitoring program has been undertaken initially to establish baseline conditions (see addendum to the Geotechnical Assessment (Cromer W. C., 2009 B) included as Appendix 11).

2.7. Infrastructure

2.7.1. Acceptable Standard

The distance for transport of materials (e.g. incoming waste and outgoing recyclables) must be taken into account in the location of a landfill. Transportation must occur safely with minimum disruption to the community. Adequate transportation infrastructure for a landfill must be determined prior to submission of the DP&EMP (or EMP).

2.7.2. Situation

The development site is shared with an operational quarry and it is likely that a portion of the traffic destined for the landfill would have needed to visit the site to receive construction materials. If it is assumed that the waste materials would have been delivered to an alternative site, this development will actually reduce the total heavy vehicle movements in the region. The site is accessed off a major arterial road without the need for heavy traffic to pass through business districts or residential areas.
2.7.3. Actions

The discussion in Section 3.10 shows that the operation of the ILRRC is likely to cause a 4 percent increase in heavy vehicle traffic movements to and from the site. This figure does not include a reduction in movements likely to occur when customers take advantage of back loading opportunities.

2.8. Flora and Fauna

2.8.1. Acceptable Standard

The development and operation of landfills must minimise the impact upon threatened flora and fauna and threatened forest and non-forest vegetation communities, particularly where the landfill occupies land that has previously been subject to minimal disturbance. The operation of landfills must also avoid the introduction and spread of pest plants and animals and diseases.

2.8.2. Situation

Flora and fauna study was undertaken as part of the forest practices plan. A forest practices plan is required because an area of native forest will be cleared to facilitate the construction of the landfill.

2.8.3. Actions

The Forest Practices Plan requires that any sensitive values associated with the site are identified and potential impact resulting from the clearing assessed. The complete evaluation of sensitive values is included in the appendices as Appendix 3. After consultation with the Forest Practices Authority an area of forest was reclassified as a priority A community. The Sensitive Values sheets were revised and are included in this document as Appendix 12. (Van Den Berg, 2009 B)

Flora:

- The forest types and areas to be cleared are extracted from (Van den Berg, 2009 A) and are detailed in Table 5 below:
- No individual representatives of threatened flora species were located in the study area during the flora and fauna survey.
- All affected forest communities have infestations of weeds including broom, thistles and fennel.
- *E. tenuiramis* individuals are present, not constituting a community but rather within the DRY-shGLOB community.
- The DRY-shOV and DRY-shGLOB forest communities are classified as priority A communities because they offer potential foraging opportunities for swift parrot.
- A total of 1 ha of these communities will be cleared to enable the development to proceed. The proponent will offer an offset of at least 5 to 1 of an equivalent community or other offset options as can be negotiated with the Forest Practices Authority and the Kingborough Council.
- An assessment revealed no symptoms of *Phytophthora cinnamomi* in susceptible plants in the study area. The DRY-shOV forest community contains species that are susceptible to *P. Cinnamomi* so strict wash down guidelines will be adopted for the operation.

Fauna:

- The site contains or is adjacent to habitat suitable for the species listed in Table 6 below.
- The area to be cleared is small and an area of land in excess of 100 ha adjacent with similar potential habitat will remain intact.

(Van den Berg, 2009 A)
2.8.4. Commitments
2.8.4.1. The proponent will provide an offset for the area of priority A forest community that will be disturbed.

Table 8 Forest Communities likely to be Disturbed

<table>
<thead>
<tr>
<th>Floristic Community</th>
<th>Priority</th>
<th>RFA Community</th>
<th>Area to be cleared (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRY-shOV</td>
<td>A</td>
<td>Shrubby <em>E. ovata</em> – <em>E. viminalis</em> forest</td>
<td>0.7</td>
</tr>
<tr>
<td>DRY-shPUL</td>
<td>B</td>
<td><em>E. pulchella</em> – <em>E. globulus</em> – <em>E. viminalis</em></td>
<td>0.7</td>
</tr>
<tr>
<td>DRY-shGLOB</td>
<td>A</td>
<td>Grassy <em>E. globulus</em> forest</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Table 9 Possible Threatened Fauna Species Present (based on range and habitat)

<table>
<thead>
<tr>
<th>Species</th>
<th>Habitat</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aquila audax fleayi</em> (wedge-tailed eagle)</td>
<td>Large tracts of Eucalypt forest greater than 10 ha.</td>
<td>A nest search failed to find evidence of a nest within the affected area.</td>
</tr>
<tr>
<td><em>Lathamus discolor</em> (swift parrot)</td>
<td><em>E. globulus</em> forest within and adjacent to the site</td>
<td>No known observations within or adjacent to the site. A very small proportion of the available habitat affected.</td>
</tr>
<tr>
<td><em>Perameles gunnii gunnii</em> (eastern barred bandicoot)</td>
<td>Mosaics of ground cover and pasture occur within and adjacent to the site</td>
<td>No further prescriptions required.</td>
</tr>
<tr>
<td><em>Dasyurus viverrinus</em> (eastern quoll) <em>Dasyurus maculates maculates</em> (spotted-tailed quoll)</td>
<td>Bush and pasture interfaces occur within and adjacent to the site.</td>
<td>No further prescriptions required.</td>
</tr>
<tr>
<td><em>Haliaeetus leucogaster</em> (white-bellied sea eagle)</td>
<td>Site is within 5 km of the coast and has an old growth component</td>
<td>A nest search failed to find evidence of a nest within the affected area.</td>
</tr>
</tbody>
</table>

A copy of the report describing the nest search and correspondence with the Forest Practices authority is included as Appendix 13.
### 2.9. Geo-conservation and Geo-Heritage

#### 2.9.1. Acceptable Standard

The development and operation of landfills must not impact upon areas that have been identified as significant in relation to their geologic, geomorphic or pedologic values.

#### 2.9.2. Situation

No geo-conservation sites are recorded as being located within 1000 metres of the development.

#### 2.9.3. Actions

Nil.

### 2.10. Historic and Cultural Heritage

#### 2.10.1. Acceptable Standard

Historic and cultural heritage must be identified, and if required appropriate approvals must be obtained prior to disturbance.

#### 2.10.2. Situation

Two historic properties are located in the area. Summerleas is located in Scott’s Road on the other side of the Leslie Vale locality and Wharncliffe Cottage is located on Summerleas Road on the opposite side of the Huon Highway. No high sensitivity zone indicators were identified in the sensitive values evaluation conducted as part of the forest practices planning.

#### 2.10.3. Actions

It is very unlikely that any activity associated with this development will impact on any areas or features with heritage significance.

The survey undertaken for the forest practices plan found an archaeological survey is not required.

#### 2.10.4. Commitments

2.10.4.1. No known features with cultural or heritage significance will be affected by the development.
2.11. Land Ownership and use

2.11.1. Acceptable Standard
Ownership of land to be used for a landfill must be defined and appropriate permission obtained prior to submission of the DP&EMP. The future use of the land upon completion of filling and rehabilitation must also be considered.

2.11.2. Situation
H.B.M.I. Pty Ltd owns the land with certificate of title volume 198868 folio 1, the entire operation is located on this land. H.B.M.I Pty Ltd is a subsidiary of the Hazell Bros Group.

2.11.3. Actions
A copy of the current title is included in the appendices as Appendix 4 as evidence of the company’s ownership.

2.12. Site Selection

2.12.1. Acceptable Standard
Landfills must be located in accordance with the land zoning under the local planning scheme. Furthermore, site selection should include preliminary assessment of other sites to determine appropriateness for use as a landfill disposal area.

2.12.2. Situation
The proposed landfill operation is complimentary to the existing permitted quarry operation. The proponent owns the land and has secure access. The existing quarry operation requires attenuation distances to sensitive uses in excess of that required for an inert landfill. The combined operation will result in an overall reduction in heavy traffic movements with a subsequent saving in fuel costs to users, traffic movements on local a state owned roads and carbon emissions.
Land use planning and planning scheme issues are discussed in Section 1.8.

2.12.3. Actions
Locating inert landfills at existing quarry operations has many advantages. No other sites were considered for this operation.
3. DESIGN

Acceptable Standard

3.1. Landfill Design

3.1.1. Acceptable Standard

As a minimum, new landfills and/or cells must be designed with regard for the following:
- containment and collection of leachate;
- management of surface water;
- landfill gas management; and
- future rehabilitation.

Category A landfills do not need to implement the same design elements as Category B and C landfills (e.g. engineered liners and internal cell walls) as solid inert wastes present a reduced environmental risk.

3.1.2. Situation

The site for this landfill proposal has been previously used as a site for a fish waste processing facility and a private landfill. The hydro-geological assessment found that the site is underlain by topsoil over a layer of clay. Under the clay over most of the site is weathered dolerite gravel.

The previous landfill placement has obvious signs of tension cracks along the top of the face indicating that this fill is unstable.

3.1.3. Actions

The design response for this proposal is to strip the vegetation from the landfill footprint, exposing the topsoil and clay layer. The existing fill face will be cut down in a series of benches and the spoil used to construct a new pad at the toe. The clay layer will remain in situ to provide leachate containment in lieu of an engineered liner. The cut and fill benches will provide a trafficable surface onto which the introduced waste will be dumped.

Dumping will start at the lower levels and as each layer is dumped spread and compacted this will become the trafficable surface for the next layer. The fill will be pulled back to conform to the grades specified in Figure 2. The toe of the existing landfill will be the site for more permeable materials. Less permeable materials will be directed to the north east corner of the site. Here the materials will be dumped, spread and compacted in layers. Where required, the layer will be topped with gravel type waste to provide a trafficable surface and increase structural integrity.

The final form will have a gradient of permeability across the structure reducing the risk of confined shallow groundwater affecting stability. When a surface area of around one hectare is shaped into the final form capping will commence.

The management of surface water and rehabilitation are considered in subsequent sections.

3.1.4. Commitments

3.1.4.1. The landfill will be progressively filled in a series of discrete layers and the final form will have contour drains and a maximum slope of 1 in 3.

3.1.4.2. When a surface area of around one hectare is filled to the design finished level progressive capping and revegetation will commence.
### 3.2. Leachate Containment and Collection

#### 3.2.1. Acceptable Standard

*Landfills must be designed so that pollution of water by leachate is prevented.*

#### 3.2.2. Situation

A category A landfill does not require leachate containment and collection system; however an amount of the surface water will percolate through the fill materials and potentially pick up sediment. It is possible that by encouraging the new landfill to be free draining historic contamination may be leached out of the pre-existing fill materials.

#### 3.2.3. Actions

Any leachate emanating from the landfill will be treated by a surface runoff containment system described in Surface Water Management in the next section.

### 3.3. Surface Water Management

#### 3.3.1. Acceptable Standard

*Uncontaminated surface water must be prevented from mixing with waste and/or carrying sediment or contaminants off the landfill site. This will minimise the generation of leachate, and avoid erosion of cover material or waste from the landfill.*

#### 3.3.2. Situation

The landfill facility is located on a ridge line and projects down-slope. An area of approximately 1.0 hectare of surrounding topography falls towards the landfill. Runoff from this area is intercepted by an existing road and directed towards a drainage depression below the site. The topography of the land between the road and the landfill will naturally direct water down-slope towards the same drainage depression.
3.3.3. Actions

**Sediment control infrastructure**

A Landfill that accepts only inert fill materials is classified as a category A landfill by the Landfill Sustainability Guide (Environment Division, 2004). Category A landfills are required to have surface water management infrastructure with capacity to accommodate a 1 in 10 year reoccurrence interval storm event. The diversion drains should be sized to carry all the runoff generated in a 24 hour period by such an event. Sediment control infrastructure will be designed to cope with runoff from the landfill site only. The footprint of the landfill area is 5.5 hectares. The length of overland flow is 1000 metres at a grade between one in three and one in thirty. The porosity of the fill material will delay the runoff from the site and cause much of the sediment to be retained in the fill. The water will percolate down through the fill over time until it reaches the less permeable substrate and then move down-slope towards the surface water management drains and basins at the toe of the facility.

The volume of runoff to be managed is all the runoff from a 1 in 10 year event over a 24 hour period and is calculated at 1850 cubic metres (see calculations in appendices as Appendix 5). This volume of runoff will be contained in two small sediment retention basins located at the downhill toe of the landfill see Figure 2. The combined surface area of these two impoundments is 1500 square metres; hence their average depth will be 1.2 metres. The two basins will be constructed in such a way that they have the same surface level and will be connected by a horizontal swale drain running along the contour. The outfall from the sediment retention basins will be over the top of the swale and the adjacent excavated sides of impoundments see Figures 2, 5 and 6. The natural vegetation surrounding the sediment retention basins will be retained and will serve to capture any remaining sediment in the water discharged. Plates 1 and 2 show the vegetation at the sites of the sediment retention basins.

**Remediation of historic contamination**

Experience during the geotechnical assessment shows that overland flow percolating through the insitu fill materials can cause leaching of contaminants into the seepage emanating from the site. The rate of seepage from the landfill was estimated at the time of hydro-geological assessment at between 1 and 2 L / sec in total. The assessment occurred during a period when 48 mm of rain were recorded at the Leslie Vale weather station over the preceding 2 days and during the first day of the assessment. An accumulated total in excess of 40 mm of rainfall over three days has been recorded a total of six times since 2005 (when the weather station was opened). It can be expected that similar events will occur one or two times per year.

The sediment control infrastructure is designed to contain a 1 in 10 year reoccurrence interval event of 4 mm / hr for 24 hours. In such an event a total of 1850 m3 of runoff will be contained within the sediment retention basins before the overflow is discharged. Seepage from the landfill will contribute 173 cubic metres to the volume or less than 10 percent of the total. A one to ten dilution of the seepage water will bring the level of metals recorded during the geotechnical assessment down to below maximum level in NEPM guidelines for discharge into fresh ecosystems. The proposed inert landfill operation will not contribute any additional contamination sources and leaching of the pre-existing sources will cause contaminant concentrations to dissipate over time.

Water emanating from the landfill site will either be contained by the surface water management system or if a discharge does occur, contaminants will be diluted to within acceptable levels. The water quality of the outfall from the sediment retention basins will be monitored in line with the requirements of the Landfill Sustainability Guide (Environment Division, 2004).

The arrangement of diffuse discharge from the sediment retention infrastructure into vegetation also contributes to reducing the contaminant levels in the discharge water. The soil will retard the flow of water and the roots of plants will take up excess nutrients. Certain plants particularly reeds are known for their capacity to take up metals from water. The strategy to discharge into vegetation will not only buffer discharge volumes but also remove a component of the leached contaminants.
Plate 1 Photo 1 Looking west across site of sediment retention basin 1

Plate 2 Photo 2 Looking west across site of sediment retention basin 2
3.3.4. Commitments

3.3.4.1. The surface water containment system will capture all the runoff water generated by a 1 in 10 year event. The system will detain the water long enough to allow the sediment to settle out and be retained.

3.3.4.2. The discharge from the sediment retention basins will be monitored to ensure that turbidity is of an acceptable standard.

3.3.4.3. An ongoing water quality monitoring program will compare water contained in the sediment retention structures, the water discharging into the water supply dam on Mafeking Creek and the water upstream of the dam on Mafeking Creek. This program will continue until the water discharged from the sediment retention structures is found to have contaminant concentrations less than the NEPM guidelines for discharge into fresh ecosystems.
Figure 3: General site plan showing the arrangement of all stages of development
Figure 4: Cross section diagrams showing first stage filling

- Cut off drain around perimeter
- Ultimate surface level of inert landfill
- Test pits show existing fill 4.0 metres thick
- More permeable fill material on southern area
- Less permeable fill material on northern area
- Assumed natural surface level under existing fill

Cross sectional diagram of south western filling

Cross sectional diagram through north eastern filling area
Figure 5: Cross section diagram showing first stage revegetation.
Figure 6: Cross section diagram through sediment retention basin

Figure 7: Cross section diagram through swale drain

Figure 8 Layout of resource recovery centre
3.4. Groundwater Management for Category B and C Landfill

3.5. Landfill Gas Management

3.5.1. Acceptable standard
Category B and C landfills only

3.5.2. Situation:
A category A inert landfill is not required to implement strategies to manage groundwater or landfill gas emissions. In this case however the surface water management infrastructure will capture legacy leachate emissions associated with previous activities.

3.5.3. Actions
Additional to surface water quality monitoring described in preceding sections, a new deep groundwater monitoring bore will be drilled directly below the landfill footprint. Ongoing water quality monitoring will occur on the groundwater from this bore and the existing bore alongside the landfill. The results of this monitoring will alert the operators of any impact that activities may have on groundwater quality and precipitate remedial actions.

3.5.4. Commitments
3.5.4.1. A new deep groundwater monitoring bore will be drilled at the toe of the new landfill.
3.5.4.2. An ongoing water quality monitoring program will assay samples from this and the existing monitoring bore to ensure that groundwater is unaffected by activities.

3.6. Construction Quality Assurance for Engineered Liners

3.6.1. Acceptable Standard
A Construction Quality Assurance (CQA) plan must be developed and implemented to ensure that the landfill construction meets design requirements. The CQA plan must be able to verify that the materials used comply with specifications, and that the method of construction / installation is appropriate to meet design requirements.

3.6.2. Situation
The geological assessment shows that the existing substrate will provide a foundation with permeability within the acceptable range without introducing an engineered clay liner. A Construction Quality Assurance plan is not required.

3.6.3. Actions
The new sections of the landfill will be founded on the insitu clay substrate.

3.7. Waste Minimisation

3.7.1. Acceptable Standard
Landfills must be designed to allow for recovery and diversion of selected waste materials, in accordance with the waste management hierarchy.
3.7.2. Situation

The quarry and the landfill operations will operate cooperatively to minimise the volume of inert materials destined for landfill. The quarry’s crushing and screening equipment will be utilised to process and value add to raw inert waste to produce materials for resale. The waste management and screening procedures will ensure that all materials with resale potential are identified and that cross contamination of material does not reduce product quality.

3.7.3. Actions

The waste management and screening procedures are set out in section 4.1.

3.8. Site Security

3.8.1. Acceptable Standard

Access to the site must be controlled to minimise risks to safety of livestock and public, as well as controlling unauthorised entry and waste dumping. Public access to active tipping areas must be kept to a minimum.

3.8.2. Situation

The site is located in close proximity to the control room and weighbridge used for the quarry operation at the end of an access road that is controlled with a boom gate.

3.8.3. Actions

Access to the landfill site is controlled by a boom gate that is locked out of normal operating hours. During operating hours the control room and weighbridge are continually manned. No vehicles can enter the site without being observed by the control room.

3.8.4. Commitments

3.8.4.1. Existing security arrangements for the quarry operation will be maintained to control access to the inert landfill operation.

3.9. Signage

3.9.1. Acceptable Standard

Signs must be erected and maintained in reasonable condition to clearly convey important operational and safety information.

3.9.2. Situation

Traffic to the various recycling and landfill dumping areas will be controlled with by the Landfill Operator with assistance from strategically located signs.
3.9.3. Actions
The Landfill Operator will direct traffic to the appropriate dump sites from the particular load. Signs will assist in directing the drivers.

The various recycling stockpiles will be indentified with signs. The appropriate dump site for inert waste products with differing properties will be identified to ensure that the landfill structural requirements are met. The preferred path to the dump sites will be sign posted to enhance the compaction in each layer.

3.9.4. Commitments
   3.9.4.1. Accurate placement of recyclables and inert fill will be achieved with clear signage.
   3.9.4.2. Compaction in the landfill layers will be enhanced by traffic controlled by signage.

3.10. Traffic Management

3.10.1. Acceptable Standard
Movement of vehicles to and from the landfills must not present safety concerns or pose a nuisance with regard to noise and road grime.

3.10.2. Situation
The ILRRC will use the same transport infrastructure as the quarry operation. The Huon Highway and quarry access intersection currently accommodates the quarry operation without difficulty. The calculations included in Appendix 6 show that the landfill operation will be responsible for a 4 percent increase in truck movements. This increase is unlikely to overload existing infrastructure. The 4 percent increase is conservative because it does not take into account customers back-loading construction materials.

The Landfill and recycling areas are located at the end of a sealed access road approximately 1.5 km in length. Traffic will be directed to the weighbridge and then around to the recycling area. Loads that are unsuitable for reuse or recycling will be directed to the landfill area. The recycling and landfill areas have gravel surface.

3.10.3. Actions
The sealed access road provides ample opportunity to spin off any dirt on truck tyres picked up while trafficking through the facility. Effective runoff water management across the recycling and landfill areas introduced to protect against accidental introduction and spread of Phytophthora cinnamomi will also prevent mud from developing in traffic paths.

The attenuation distances required for the quarry will protect sensitive uses against any potential nuisance from equipment and vehicle noise caused by the landfill operation.

3.10.4. Commitments
   3.10.4.1. The combination of a long sealed access road and surface water control will prevent road grime from being trafficked onto public roads.
   3.10.4.2. The landfill operation will cause only a 4 percent increase in truck movements to and from the site.
3.11. Planning to Minimise Off-Site Impacts

3.11.1. Acceptable Standard

Landfills must be designed to ensure that operations minimise off-site impacts resulting from dust, litter and noise so that environmental nuisance is not caused.

3.11.2. Situation

Attenuation distances will protect against nuisance being caused to neighbours by noise. Materials accepted will include construction materials and fill only. The landfill and recycling area will have a gravel surface.

3.11.3. Actions

The materials screening and management process for the landfill will positively control loads to ensure that no materials are delivered that may cause a litter nuisance. The quarry currently has a dust management plan in place to address dust on the haul and access roads. This dust management plan will be extended to the landfill and recycling area.

3.11.4. Commitments

3.11.4.1. The materials screening and management process will prevent any waste remaining on site that is likely to cause a litter nuisance.

3.11.4.2. The dust management procedures required for the quarry operation will be expanded to include the quarry operation.

3.12. Planning for Rehabilitation

3.12.1. Acceptable Standard

Landfills must be designed with regard for the rehabilitation and after-care of the site.

3.12.2. Situation

Two areas of rehabilitation are planned to coincide with the landfill development.

3.12.3. Actions

The area occupying the north east corner of the property outside the footprint area will be rehabilitated by planting local provenance forest species to blend with the surrounding forest. The landfill will be capped progressively during its development starting with the north eastern and south western ends. The cap will be planted with low shrubs and grassland species common locally, refer to Figures 2 and 4. The low shrubs and grasses will stabilise the cap surface with interlocking root systems and visually reduce the height of landfill while presenting a reduced risk of being uprooted by high winds. Details of the progressive rehabilitation works are included in Section 5.

3.12.4. Commitments

3.12.4.1. Progressive rehabilitation will occur after around one hectare of the landfill site has achieved full design levels. Rehabilitation of the landfill will constitute capping with low permeability waste and soil type waste materials and seeding and planting native grasses and shrubs.
4. **OPERATION**

### 4.1. Waste Minimisation

4.1.1. Acceptable Standard

*Landfill operators must provide for recovery and diversion of waste materials, in accordance with the waste management hierarchy.*

#### 4.1.2. Situation

It is the proponent’s intention to extend the life of the landfill by diverting as much reusable or recyclable material as possible.

#### 4.1.3. Action

The underlying principle for the waste management procedure will be in order of merit:

1. **Avoidance** – landfill users will be accountable for the materials that are delivered and will have a contractual responsibility to recover any inappropriate waste. This will be a strong incentive to manage and minimise waste at the source.
2. **Reuse** – where possible materials will be diverted to the recycling area for stockpiling and reuse. These materials will include rocks, road base, bricks, gravel and uncontaminated soil.
3. **Recycling** – Materials that have potential for reuse with some processing will also be stockpiled. These include broken bricks, glass, concrete, timber and limb wood. Processing actions include crushing and screening for concrete, bricks and glass to make aggregates and chipping for limb wood and timber.
4. **Energy recovery** – there are no plans at this stage to establish a ‘waste to energy’ facility or to process materials specifically for this purpose.
5. **Disposal** – only those materials that are unsuitable for any of the above purposes will be directed to the landfill.

#### 4.1.4. Commitments

4.1.4.1. As much waste as possible will be diverted back into active use rather than being contained in the landfill. The proponent has set a target of an upper limit of 20 percent of reusable waste received can be forwarded to the inert landfill (Hazell, 2009).

### 4.2. Waste handling

4.2.1. Acceptable Standard

*Landfills must accept only those wastes that are consistent with the appropriate category of the landfill under the Landfill Classification System and as stipulated in the permit conditions.*

#### 4.2.2. Situation

The ILRRC will accept waste from the proponents connected companies and selected account customers. The types of waste accepted and the methods of processing will be controlled through the waste acceptance and management procedure ‘DPQC 081 Inert Landfill and Resource Recovery Centre’ (Hazell, 2009). A copy of this procedure appears in the appendices as Appendix 7.
4.2.3.1. Resource recovery and reuse

Demolition activities that have the potential of producing large quantities of reusable or recyclable materials will have areas set aside for those materials. Smaller quantities of single type materials loads will be delivered directly to specific stockpile areas. Mixed loads will be dumped separately and the facility operator will be responsible for sorting the materials into their appropriate stockpiles.

Materials that require value-adding will remain in stockpiles until they are processed in batches. Bricks will be crushed and screened to produce aggregates for resale. Glass will be crushed and screened and used as a sand substitute in concrete manufacture. Processing these materials will be achieved with a mobile crusher and screener similar to the one depicted in Plate 3.

Plate 3 An example of a mobile crushing facility that will be used to process recyclable materials

4.2.3.2. Inert landfill

Materials delivered to site that have no reuse or recycling potential will be delivered to the landfill area. Here the materials will be placed in a series of benches. Each bench will be wide enough to allow a truck and trailer to enter forward, reverse to dump the load and exit via the same route. When the floor of a bench is covered with individual dumped loads a dozer will be used to level and compact the bench. Recovered gravel or crushed concrete will be used to make the new trafficable surface. The progression of the landfill construction will be in accordance with the arrangement plans included as Figures 2, 3 and 4.

The above activities will be controlled through the documented procedure (Hazell, 2009):

- The first level of control will be achieved by requiring ILRRC customers to enter into an agreement with the proponent. The agreement will clearly state the types of material that will be accepted at the ILRRC. The agreement will set out clearly that any waste delivered to the site will remain the responsibility of the deliverer until such time as it is accepted by the Landfill Operator.
- The second level of control will be the requirement for all loads to be identified at the weighbridge. The deliverer will be required to declare the types of material in the load for the purposes of establishing costs per unit weight. The driver must be aware of the materials in the load otherwise it cannot be accepted.
- The third level of control will be the Landfill Operator. A group of employees will be specially trained to undertake this role. The Landfill Operator will be in radio contact with the weighbridge and as each load arrives, will receive a call from the weighbridge stating the declared contents of the load. The Landfill Operator will then visually check the load to confirm the type of material. If the Landfill Operator finds that the load contains materials other than that declared the load will be rejected and sent back to the weighbridge for reprocessing. A load containing materials other than those stipulated in the agreement will be sent offsite. A rejected load will constitute a non-conformance against the
landfill customer’s agreement and the customer will receive written notification. Repeated non-conformances will result in the landfill customer’s certification being revoked.

Below is a schematic showing the waste acceptance and management procedure:

**Figure 9: Schematic showing Waste Acceptance and Management Procedures with Controls.**
4.2.4. Commitments

4.2.4.1. The DPQC 081 Inert Landfill and Resource Recovery Centre’ (Hazell, 2009) will introduce three levels of control, ensuring that only appropriate types of waste are handled on the site.

### 4.3. Water Management

**4.3.1. Acceptable Standard**

The leachate management system must be maintained to prevent infiltration to ground water and release surface water, prevent offensive odours and minimise human contact with the leachate.

**4.3.2. Situation**

The surface water management system includes a perimeter drain at the edge of the final landfill perimeter, two sediment retention basins and a connecting swale. Sections of the perimeter drain will be constructed with rip rap armouring where the grade is steep and water erosion can be a problem.

**4.3.3. Actions**

The perimeter drain will be inspected frequently to ensure that the drain surface is not eroding. Where necessary additional armouring will be installed to protect the drain.

Periodically, silt will be excavated from the sediment retention basins to ensure that the retention capacity is not reduced to less than design. The diffuse discharge areas from the basins and the swale drain will be inspected and armouring applied where channels occur through scouring.

**4.3.4. Commitments**

4.3.4.1. The surface water management infrastructure will be regularly inspected and any problems that can compromise the design capacity of the system will be rectified.

### 4.4. Nuisance Management

**4.4.1. Acceptable Standard**

Landfill operator must minimise the generation of nuisances such as dust, litter, pests and weeds, and odours from the landfill and as a minimum prevent any of the above from crossing the landfill boundary.

**4.4.2. Situation**

The waste acceptance and management procedure will ensure that only inert wastes enter the landfill and the waste in the stockpiles is benign. However the inert wastes can create a nuisance for neighbours from dust and weeds.
4.4.3. Action

The quarry has a dust management procedure in place (the Dust Management Plan is included as Appendix 8) and this will extended to include the ILRRC. The existing dust management procedure is designed to prevent dust from crossing the property boundary.

The quarry also has a weed management program operating (a brief description is included as Appendix 9) and this will also be extended to include the ILRRC. A number of weeds were observed in the surrounding vegetation, these included broom, thistles, and fennel. Topsoil taken from any source has the potential to contain weed seed that can cause local infestations around stockpiles and at the final destination. The weed management program will include the topsoil stockpiles to prevent cross contamination of topsoil while it is stored on the site.

The observed weeds and others presenting will be controlled by the implementation of a monitoring and control program. The program will include an annual inspection of the operation area for new infestations of weeds and the application of selective herbicide sprays to individual plants or where native vegetation is vulnerable ‘cut stump’ application. Herbicide selection and application details will be in accordance with Weed management publications listed in Table 10 below and manufacturer’s recommendations.

Transporting topsoil can also be a vector for soil pathogens including Phytophthora cinnamomi. The annual inspection for weeds will include a visual assessment of signs of P. cinnamomi in susceptible species.

The risk of infection and spread of P. cinnamomi can be reduced by regular inspections plus the following additional measures:

1. Maintaining good drainage to prevent mud forming on the active area of the site.
2. Ensuring that employees are aware of P. cinnamomi symptoms and can identify its presence on other sites they visit.
3. Stockpiling topsoil and stripping so as to drain away from the working areas of the site.

4.4.4. Commitments

4.4.4.1. The existing dust and weed management plans will be expanded to include P. cinnamomi management and encompass the ILRRC operation.

Table 10 Weeds observed onsite and relevant control and management publications

<table>
<thead>
<tr>
<th>Observed weed – Latin and common name</th>
<th>Weed management publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytisus scoparius L. - broom</td>
<td>(DPIWE, 2002)</td>
</tr>
<tr>
<td>Carduus spp. - thistle</td>
<td>(DPIW, 2008)</td>
</tr>
<tr>
<td>Foeniculum vulgare - fennel</td>
<td>(Tamar Valley Weed Strategy Working Group, 2004)</td>
</tr>
</tbody>
</table>
4.5. Fires

4.5.1. Acceptable Standard

Landfill operators must prevent fires from occurring on the landfill and immediately extinguish any fires that start.

4.5.2. Situation

Fires will not be used as a waste management tool and are unlikely to occur spontaneously.

4.5.3. Commitments

4.5.3.1. No fires will be lit and any fires that start from any ignition point will be immediately extinguished.

4.6. Traffic Management

4.6.1. Acceptable Standard

Landfill operators must provide a safe and convenient access for vehicles delivering waste to the landfill.

4.6.2. Situation

The ILRRC will use current road infrastructure to provide landfill customers with safe access to and from the landfill. Within the landfill roads to various stockpile and dump locations will change as the site fills.

4.6.3. Action

Maintenance on existing road infrastructure will ensure that access to the site is safe. The ILRRC will cause only a minor increase in traffic (see Section 3.10) and existing maintenance schedules will not need to change. The road network within the recycling and landfill areas will be laid out, constructed and maintained to ensure all traffic has safe access without the risk of live edges or poor sight distances.

4.6.4. Commitments

4.6.4.1. The Landfill Operator will layout, construct and maintain roads within the ILRRC to a safe standard.
4.7. Staffing

4.7.1. Training

4.7.1.1. Action

Personnel employed to manage the quarry operation will be utilised to manage the landfill operation. These employees are sufficiently experienced and trained in managing the weighbridge, record keeping and managing accounts.

A group of dedicated employees will be specially trained to control the acceptance, screening and movement of waste to the reuse or landfill areas. On any day one of these employees may take on the role of the Landfill Operator and will be responsible for classifying the waste and directing the load to the appropriate stockpile depending on the type. The Landfill Operator will also be responsible for spreading the dumped fill and hence achieving desired grades and compaction standards. The Landfill Operator will be responsible for managing the reuse and recycling area.

All personnel that are likely to be involved in the landfill operation will be familiar with the requirements of the operating permit and limitations of materials that can be accepted for a Type A inert landfill.

4.7.2. Occupational Health and Safety

4.7.2.1. Action

The personnel involved in running the landfill operation will be sourced from the existing quarry employees and will have a good understanding of occupational health and safety issues associated with heavy machinery and earthmoving operations.

The existing O. H. & S. policies and procedures and current induction program will be utilised for the landfill operation.

4.7.3. Commitments

4.7.3.1. All employees used in the landfill and recycling operation will be fully trained, inducted and have the appropriate level of understanding of the HBMI environmental and occupational health and safety polices.

4.8. Monitoring Programs

4.8.1. Acceptable Standard

Surface water must be monitored on a regular basis to detect and respond to any pollution from the landfill and to demonstrate compliance with any statutory requirements.

4.8.2. Situation

Initial groundwater quality analysis of unconfined aquifers in the existing fill has found that the ground water in this location has elevated levels in some parameters. (Cromer W. C., 2009 A)

The surface water management infrastructure terminates in two small sediment retention basins. The sediment in these structures will be contained under a layer of runoff water. At times the water in the sediment retention basins will decant off the top into the natural vegetation adjacent.
4.8.3. Action

Three groundwater monitoring points have been established to enable baseline water quality to be determined see Addendum to Geotechnical Report (Cromer W. C., 2009 B) included as Appendix 11. The parameters for the groundwater monitoring and the frequency are as set out in the Sustainability Guide (Environment Division, 2004).

Initially water samples will be taken quarterly from the sediment retention structures, at the point of discharge into the dam on Mafeking Creek and from Mafeking Creek upstream of the dam. Additionally samples will be taken from the existing and new deep groundwater monitoring bores. These samples will be assayed for parameters in groups 1 and 2 of the Landfill Sustainability Guide.

The turbidity of the water in the sediment retention basins will be assessed and reported against in the biannual water quality report.

4.8.4. Commitments

4.8.4.1. The proponent will extend the existing dust management plan to include the Landfill operation.

4.8.4.2. A new deep monitoring bore will be established down-slope from the proposed landfill footprint toe to facilitate sampling deep groundwater below the landfill. Initial sampling from the ground water monitoring bores will be carried out for groups 1, 2 and 3 of the Landfill Sustainability Guide (Environment Division, 2004).

4.8.4.3. The proponent will undertake a water monitoring program that include sampling from three surface monitoring points plus a new and the existing deep groundwater bore.

4.8.4.4. The water monitoring program will be conducted quarterly and assays will be conducted in accordance with groups 1 and 2 of the Landfill Sustainability Guide (Environment Division, 2004).

4.8.4.5. The existing water quality and vegetation condition will not be compromised by the operation of the new inert waste landfill facility.

4.9. Documentation for Reporting and Review

4.9.1. Acceptable Standard

Landfills operators must maintain accurate records that will be available for inspection and can be included in a periodic documented review. These records should include:

- Waste acceptance
- Monitoring analysis
- Incident reports

4.9.2. Situation

The quarry operation has a weighbridge management system for controlling the receipt and disposal of construction materials.

Water quality sampling will be used to monitor the performance of the landfill and the impact on deep groundwater quality over time.

H.B.M.I. has mandatory reporting procedures for occupational health and safety and environmental incident reporting.

4.9.3. Action
The weighbridge management program that has been modified to control and document the operation of the ILRRC. The system has fields for recording the number of loads daily, times of arrival, certified landfill customer’s name, types and weight of material delivered.

The results of the surface and subsurface water quality monitoring will evaluated and trends analysed to inform performance reports. If it can be shown that after three years that levels of particular parameters do not pose an environmental threat an application will be made to exclude those parameters.

In addition to the mandatory reporting requirements the ILRRC operation will also have a procedure of written notification to the certified landfill customer should the terms of the waste disposal agreement be breached. The notification is in addition to the requirement for the removal and cleanup of any inappropriate materials delivered.

4.9.4. Commitments

4.9.4.1. The landfill operator will maintain complete records of materials received, water quality trends and any incidents where operating procedures have been breached.
5. REHABILITATION AND AFTER CARE

5.1. Post Closure uses

The inert landfill site is within the boundary of a parcel of privately owned land. The presence of high grade reserves of rock for quarrying suggests that for the foreseeable future the Leslie Vale Quarry will continue to operate. The inert landfill will be rehabilitated to resemble the natural landform with natural grassland over the cap and a forest screen behind. The landfill will form a hill that will provide limited topographical sound attenuation for properties to the north and east. Mainly however the landfill will form part of the site’s progressive rehabilitation by restoring the natural forest and grassland communities that had long since been cleared.

The two distinct areas of rehabilitation will require different treatments:

5.2. Discrete areas of rehabilitation and revegetation

5.2.1. Vegetation Screen

This area is located between the perimeter of the landfill and the property and mining lease boundary on the eastern corner. The intention for this area is to create a visual barrier between the forested area to the east and north and the landfill. Additionally by establishing a forest behind the landfill the visual impact of the vertical scale of the landfill when observed from the west will be diminished.

It is the intention of this rehabilitation area to re-establish the existing forest community by planting the mix of shrubs and trees represented locally. Desirable roads and infrastructure will be maintained and the balance of the area indicated in Figure 2 will form the vegetation screen.

5.2.1.1. Preparation

The area to be planted will be cleared of inert waste and topsoil stockpiles already present will be spread over the surface. The area will then be ripped to a depth of 300 mm where possible. Some rock outcrops will refuse ripping and these should remain untreated. The surface treatment will remain rough with slash from clearing of volunteer vegetation left on the surface.

5.2.1.2. Seeding and planting

Seed collected from local provenance trees and shrubs will be broadcast over the area along with a standard N:P:K fertilizer. The seed will be broadcast at a rate of 2 to 3 kg per ha and the fertiliser applied at a rate of 200 kg per ha. Seedlings will also be planted in a random mix of species selected from those listed in table 7 below. The planting density will be around 1 seedling every 6 square metres. ‘Hydromulch’ may be used as an alternative revegetation and weed suppression technique where conditions are appropriate.

Table 11 Local Provenance Species for Vegetation Screen Planting

<table>
<thead>
<tr>
<th>PLANT SPECIES</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia stricta</td>
<td>hop wattle</td>
</tr>
<tr>
<td>Acacia myrtifolia</td>
<td>myrtle wattle</td>
</tr>
<tr>
<td>Allocasuarina littoralis</td>
<td>black sheoak</td>
</tr>
</tbody>
</table>
5.2.2. Land fill cap

The landfill will be progressively capped during its operational life. Two discrete areas of fill placement will be operated concurrently. The toe of the landfill on the southwest face will be filled with more permeable materials and the northeast corner will be filled with less permeable materials. Once approximately one hectare of the northeast corner has been filled (see Figures 2, 3 and 4) the surface will be covered with a 300 mm thick layer clay-based inert waste material. This layer will be overlain with a 200 to 300 mm thick layer of soil-based inert waste material. This surface will be planted and direct seeded with shallow rooted native grass species. The lower 1 in 3 slope will have low ground cover shrubs interspersed to visually reduce the height of the landform.

5.2.2.1. Preparation

The compacted surface of the cap will be prepared with a light scarification; a seed fertiliser mix will then be broadcast onto the surface either by hand or with a machine.

Table 12 Local Provenance Species for Landfill Cap Planting

<table>
<thead>
<tr>
<th>PLANT SPECIES</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austrodanthonia spp.</td>
<td>wallaby grass</td>
</tr>
<tr>
<td>Poa labillardieri</td>
<td>tussock grass</td>
</tr>
<tr>
<td>Lomandra longifolia</td>
<td>sagg</td>
</tr>
</tbody>
</table>

5.2.2.2. Seeding and planting

The application rate for seed will be approximately 3 kg / ha and up to 300 kg / ha of N:P:K fertilizer depending on the origins of the topsoil-based inert waste material used as a growing medium. ‘Hydromulch’ may be used as an alternative revegetation and weed suppression technique where conditions are appropriate.
6. COMMITMENTS

LANDFILL SITING AND PLANNING

<table>
<thead>
<tr>
<th>Community Liaison</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• Information will be provided to any person to enable them to prepare representations to the regulatory authorities.</td>
<td>Proponent / Consultant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• The existing natural clay layer will remain intact and the base layer of fill will be placed over the topsoil thus protecting the instu clay layer.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buffer Distances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• Management controls on accepting only inert waste will prevent any potential bird attractant product from being stored on site.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surface water</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• The sediment retention basins design will cause diffuse outfall into surrounding vegetation.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flora and Fauna</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• The proponent will provide an offset for the area of priority A forest community that will be disturbed.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cultural and Heritage Values</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commitments</strong></td>
<td><strong>Responsible entity</strong></td>
</tr>
<tr>
<td>• No known features with cultural or heritage significance will be affected by the development.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>
## Design

### Landfill Design

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The landfill will be progressively filled in a series of discrete layers and the final form will have contour drains and a maximum slope of 1 in 3.</td>
<td>Proponent</td>
</tr>
<tr>
<td>When a surface area of around one hectare is filled to the design finished level progressive capping and revegetation will commence.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Surface Water Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The surface water containment system will capture all the runoff water generated by a 1 in 10 year event. The system will detain the water long enough to allow the sediment to settle out and be retained.</td>
<td>Proponent / Consultant</td>
</tr>
<tr>
<td>The discharge from the sediment retention basins will be monitored to ensure that turbidity is of an acceptable standard.</td>
<td>Proponent</td>
</tr>
<tr>
<td>An ongoing water quality monitoring program will compare water contained in the sediment retention structures, the water discharging into the water supply dam on Mafeking Creek and the water upstream of the dam on Mafeking Creek. This program will continue until the water discharged from the sediment retention structures is found to have contaminant concentrations less than the NEPM guidelines for discharge into fresh ecosystems.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Groundwater Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A new deep groundwater monitoring bore will be drilled at the toe of the new landfill.</td>
<td>Proponent</td>
</tr>
<tr>
<td>An ongoing water quality monitoring program will assay samples from this and the existing monitoring bore to ensure that groundwater is unaffected by activities.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Site Security

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing security arrangements for the quarry operation will be maintained to control access to the inert landfill operation.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Signage

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate placement of recyclables and inert fill will be achieved with clear signage.</td>
<td>Proponent</td>
</tr>
<tr>
<td>Compaction in the landfill layers will be enhanced by traffic controlled by signage.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Traffic Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The combination of a long sealed access road and surface water control will prevent road grime from being trafficked onto public roads.</td>
<td>Proponent</td>
</tr>
<tr>
<td>The landfill operation will cause only a 4 percent increase in truck movements to and from the site.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>
## Planning to Minimise Off-site Impacts

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The materials screening and management process will prevent any waste remaining on site that is likely to cause a litter nuisance.</td>
<td>Proponent</td>
</tr>
<tr>
<td>• The dust management procedures required for the quarry operation will be expanded to include the quarry operation.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

## Planning for Rehabilitation

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Progressive rehabilitation will occur after around one hectare of the landfill site has achieved full design levels. Rehabilitation of the landfill will constitute capping with low permeability waste and soil type waste materials and seeding and planting native grasses and shrubs.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>
## OPERATION

### Waste Minimisation

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>As much waste as possible will be diverted back into active use rather than being contained in the landfill. The proponent has set a target of an upper limit of 20 percent of reusable waste received can be forwarded to the inert landfill (Hazell, 2009).</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Waste Handling

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The DPQC 081 Inert Landfill and Resource Recovery Centre’ (Hazell, 2009) will introduce three levels of control, ensuring that only appropriate types of waste are handled on the site.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Water Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The surface water management infrastructure will be regularly inspected and any problems that can compromise the design capacity of the system will be rectified.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Nuisance Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The existing dust and weed management plans will be expanded to include <em>P. cinnamomi</em> management and encompass the ILRRC operation.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Fires

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fires will be lit and any fires that start from any ignition point will be immediately extinguished.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Traffic Management

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Landfill Operator will layout, construct and maintain roads within the ILRRC to a safe standard.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>

### Staff Training

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>All employees used in the landfill and recycling operation will be fully trained, inducted and have the appropriate level of understanding of the HBMI environmental and occupational health and safety polices.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>
### Monitoring Programs

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The proponent will extend the existing dust monitoring and control program to include the Landfill operation.</td>
<td>Proponent</td>
</tr>
<tr>
<td>• A new deep monitoring bore will be established down-slope from the proposed landfill footprint toe to facilitate sampling deep groundwater below the landfill. Initial sampling from the ground water monitoring bores will be carried out for groups 1, 2 and 3 of the Landfill Sustainability Guide (Environment Division, 2004).</td>
<td></td>
</tr>
<tr>
<td>• The proponent will undertake a water monitoring program that includes sampling from three surface monitoring points plus one new and the existing deep groundwater bore.</td>
<td></td>
</tr>
<tr>
<td>• The water monitoring program will be conducted quarterly and assays will be conducted in accordance with groups 1 and 2 of the Landfill Sustainability Guide (Environment Division, 2004).</td>
<td></td>
</tr>
<tr>
<td>• The existing water quality and vegetation condition will not be compromised by the operation of the new inert waste landfill facility.</td>
<td></td>
</tr>
</tbody>
</table>

### Documentation for Reporting and Review

<table>
<thead>
<tr>
<th>Commitments</th>
<th>Responsible entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The landfill operator will maintain complete records of materials received, water quality trends and any incidents where operating procedures have been breached.</td>
<td>Proponent</td>
</tr>
</tbody>
</table>
7. CONCLUSION

This report describes the process of site selection, planning, design and operation of an inert landfill and resource recovery centre proposed by the Hazell Bros Group to compliment the quarry at Leslie Vale. Locating the two operations on the one site has many advantages:

- Infrastructure used for the quarry can be used for the ILRRC as well.
- Neighbours that are satisfied with the quarry operation are not likely to be affected by the ILRRC.
- Procedures and plans to manage environmental effects at the quarry can be simply expanded to accommodate the new facility.
- Employees trained and experienced with the quarry operation can be easily utilised on the ILRRC.
- Customers to the landfill can backload construction materials from the quarry.
- Rehabilitating the landfill can complement the progressive rehabilitation program for the quarry.

The development of the ILRRC will cause a small area of native forest to be cleared but the priority community component of this will be offset by protecting an area five times larger elsewhere. The proponent has commissioned a dedicated eagle nest search to guarantee that the proposal will not have an adverse effect on any potential breeding sites.

A surface water management system will protect downstream waters from the effects of sediments released during construction and operation. The proponent will install a deep groundwater monitoring bore and introduce deep and shallow a groundwater quality monitoring and reporting program. The program will ensure the operator and regulator has early warning of any adverse effect on background groundwater quality so that remedial measures can be implemented.

Dust and weed management plans in place for the quarry operation will be expanded to cater for the new facility. A waste management procedure with three levels of control will positively prevent any materials other than inert waste from entering the landfill. This will prevent any waste appearing onsite that could cause a vermin, litter or odour nuisance for neighbours.

The landfill and some areas adjacent will be progressively rehabilitated and revegetated with local provenance trees, shrubs and grasses. The final landform will blend with the background landscape of pastures interspersed with stands of native forest.

By recycling and creating new products from inert construction wastes the proponent can reduce the use of natural resources, reduce the amount of energy used to make new products and reduce the pressure on local landfill capacities. This privately owned and operated facility has the capacity to benefit the community and local and state governments without creating an environmental legacy.
8. APPENDICES

APPENDIX 1: EXPRESSIONS OF INTEREST FROM POTENTIAL LANDFILL CUSTOMERS
APPENDIX 2: GEOTECHNICAL ASSESSMENT (WILLIAM C. CROMER)
**APPENDIX 3: NATURAL AND CULTURAL VALUES EVALUATION SHEET (MARK VAN DEN BERG)**

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value 1</td>
<td>Value 2</td>
</tr>
<tr>
<td>Value 3</td>
<td>Value 4</td>
</tr>
</tbody>
</table>

...
APPENDIX 5: SEDIMENT CONTROL INFRASTRUCTURE DESIGN CALCULATIONS

The Bureau of Meteorology has a website that offers rainfall intensity – frequency – duration data for any location within Australia (BOM, 2009). The following calculations use this information to estimate the capacity of the stormwater infrastructure.

The design rainfall intensity chart for location 42.075S 147.250E calculates the intensity of a 1 in 10 year event over 24 hours as 4 mm/hr.

The runoff coefficient for an inert landfill will vary during its life according to the size of areas devoted to traffic, stockpiling, dumping and revegetation. In this proposal the worst case is likely to be during construction when the maximum area will be exposed compacted fill and road areas. The Urban Erosion and Sediment Control Manual (Hunt, 1992) quote C or runoff coefficient for bare packed soil (rough) to be between 0.15 and 0.45. The equivalent figure for bare packed soil (smooth) is between 0.25 and 0.55. The average of these four figures is 0.35 therefore C is assumed to be 0.35.

The rational method for calculating runoff has the formula (Minerals Council of Australia, 1997)

\[ Q = 0.278 \times C \times i \times A \]

Where: 
- \( Q \) = flow rate (m\(^3\)/sec)
- \( C \) = coefficient of runoff
- \( i \) = intensity of the storm (mm/hr)
- \( A \) = catchment area (km\(^2\))

The catchment area (footprint of the landfill) is 5.5 hectares

Therefore \[ Q = 0.278 \times 0.35 \times 4 \times 0.055 = 0.0214 \text{ m}^3/\text{sec} \]

Over a 24 hour period the total volume of runoff from the site is \( 0.0214 \times 3600 \times 24 = 1849 \) cubic metres.
APPENDIX 6: TRAFFIC DATA AND CALCULATIONS

The quarry operation is controlled through the weighbridge. All trucks leaving the site run across the weighbridge and a weighbridge program "I-weigh" manages the weighbridge docket system. The following data has been extracted from this program.

<table>
<thead>
<tr>
<th>Period</th>
<th>Weighbridge (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan – Dec 2005</td>
<td>615,000</td>
</tr>
<tr>
<td>Jan – Dec 2006</td>
<td>628,824</td>
</tr>
<tr>
<td>Jan – Dec 2007</td>
<td>794,035</td>
</tr>
<tr>
<td>Jan – Dec 2008</td>
<td>661,187</td>
</tr>
</tbody>
</table>

Average production over this period is 674,762 tonnes

Over the same period the average load per truck was 18 tonnes.

The total annual average number of truck loads over the weighbridge for this period was 37,487 units.

Total annual average number of truck movements is 74,974 movements.

The Environmental management Plan for the quarry estimates a maximum average annual production of 750,000 tonnes giving rise to 41,666 loads or 83,333 truck movements.

Accurate records were kept on the landfill operation between July 2008 and December 2008. During this period 840 truck loads were delivered carrying 6900 tonnes. This equates to an average annual number of loads of 1680 or 3360 truck movements.

If the quarry were operating at the maximum capacity the landfill operation will constitute a \((3,360/83,333*100) = 4\) percent increase in truck movements.
| APPENDIX 12: REVISED NATURAL AND CULTURAL VALUES EVALUATION SHEETS (MARK VAN DEN BERG) |
BIBLIOGRAPHY


Masters, D. (2009, April 15). Mr. (B. Williams, Interviewer)


