



# Cairncross Waste Management Facility Preliminary Environmental Assessment

Prepared by Port Macquarie-Hastings Council

December 2012

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## 1. Introduction

The Cairncross Waste Management Facility was granted approval for operations in 1999 (DA 178/99), and commenced operations in September 2001.

The site features an Organic Resource Recovery Facility (ORRF), one of the early Alternate Waste Technologies (AWT) in Australia.

The existing contract for the operation of the ORRF is due to conclude in 2014. A new contract is being developed and is expected to be at least 10 years. The current Cairncross approval was time limited and is due to conclude before the end of any new 10 year contract. It is therefore necessary to prepare a new DA and secure approval prior to the new contract being let to provide security for any future contractors.

Preliminary enquires indicate that the site would be considered to be a State Significant Development (SSD) by the NSW Department of Planning.

### 1.1 Site Details

The Port Macquarie-Hastings Council (PMHC) Local Government Area (LGA) is located on the NSW Mid North Coast approximately 420 km north of Sydney. The Cairncross Waste Management Facility is located to the north west of Port Macquarie. Access to the site is via the Pacific Highway at Telegraph Point.

The Cairncross Waste Management Facility is the primary centre for PMHC's waste operations. The site opened for operation in 2001. The site contains; a landfill, Organic Resource Recovery Facility (ORRF), Materials Recovery Facility (MRF), ancillary waste stockpile areas (ie. scrap metal and green-waste), and a small Transfer Station.

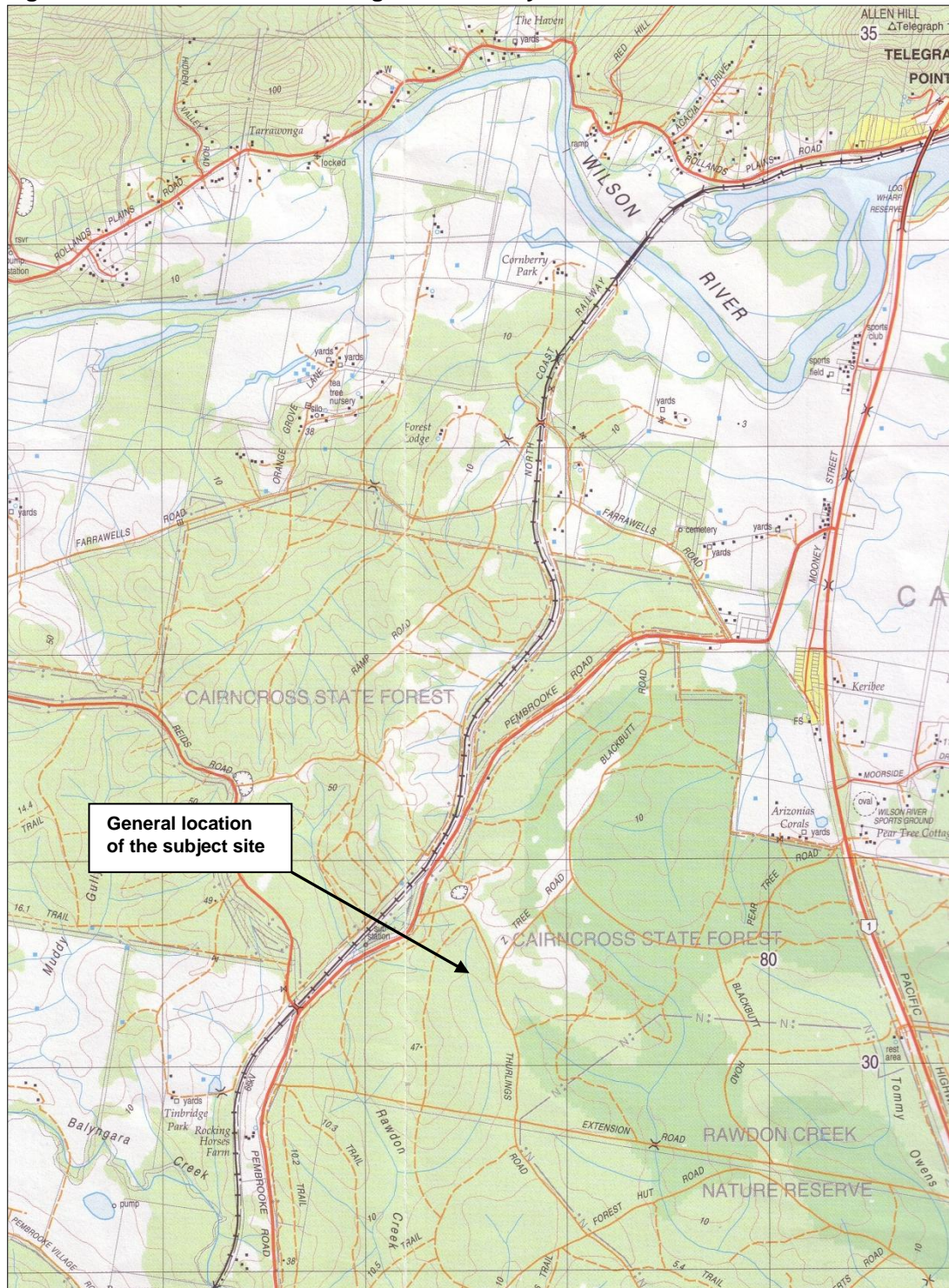
The site is bounded by the Cairncross State Forest to the north, east and south; National Park reserve to the southeast; and by Pembroke Road to the west. The site is irregular in shape with a total area of 143.8 hectares. Over 55 hectares of the site has been set aside as a buffer for the landfill and to provide compensatory habitat. The remainder of the site has been set aside for the provision of future landfill stages, in addition to areas of the site which are actively used for inert and organic waste processing, site infrastructure, (including gate house and weighbridge), plant workshop, materials recovery facility, waste transfer station and recyclable materials storage areas.

Approximately 40,000 tonnes of material goes to landfill at Cairncross annually, and the landfill site services a population of about 78,000 residents. A small landfill currently exists at Dunbogan but is planned to be closed within the next few years. Transfer Stations are located at Port Macquarie, Wauchope and a small waste drop off service is located at Comboyne. However, almost all waste is sent to Cairncross to be processed, sorted or landfilled.

While the landfill only takes waste from the Port Macquarie-Hastings area, Kempsey Shire Council also sends all kerbside collected organic material to the Cairncross ORRF (approximately 1800 tonnes pa), and kerbside recycling to the Cairncross MRF (approximately 2000 tonnes pa).

The location of the facility can be seen in **Figure 1**.



**Figure 1: Cairncross Waste Management Facility Location**

The site is managed by the Port Macquarie-Hastings Council and classed as Operational Land. The site is within Lot 5; DP 1041766, Lot 6; DP 1106420 and Part Lot 7; DP 1106420, Pacific Highway, Pembroke. The site is zoned *SP2 Waste or Resource Management Facility* under Port Macquarie-Hastings Local Environment Plan 2011.

The site is over 1 km from its nearest neighbour to the west (Rocking Horse Farm on Pembroke Rd), and slightly further from the nearest residences to the north east at Gougevale. An aerial photo showing neighbouring properties can be seen in **Figure 2**, on the following page.

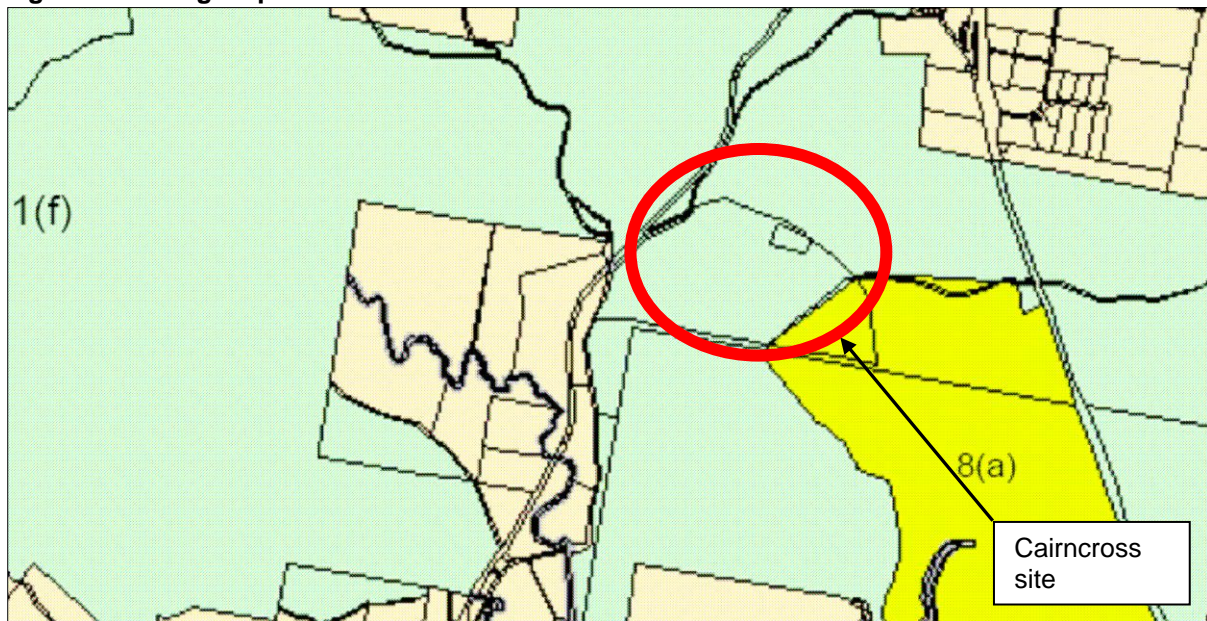


**Figure 2: Cairncross Waste Management Facility and neighbouring properties**



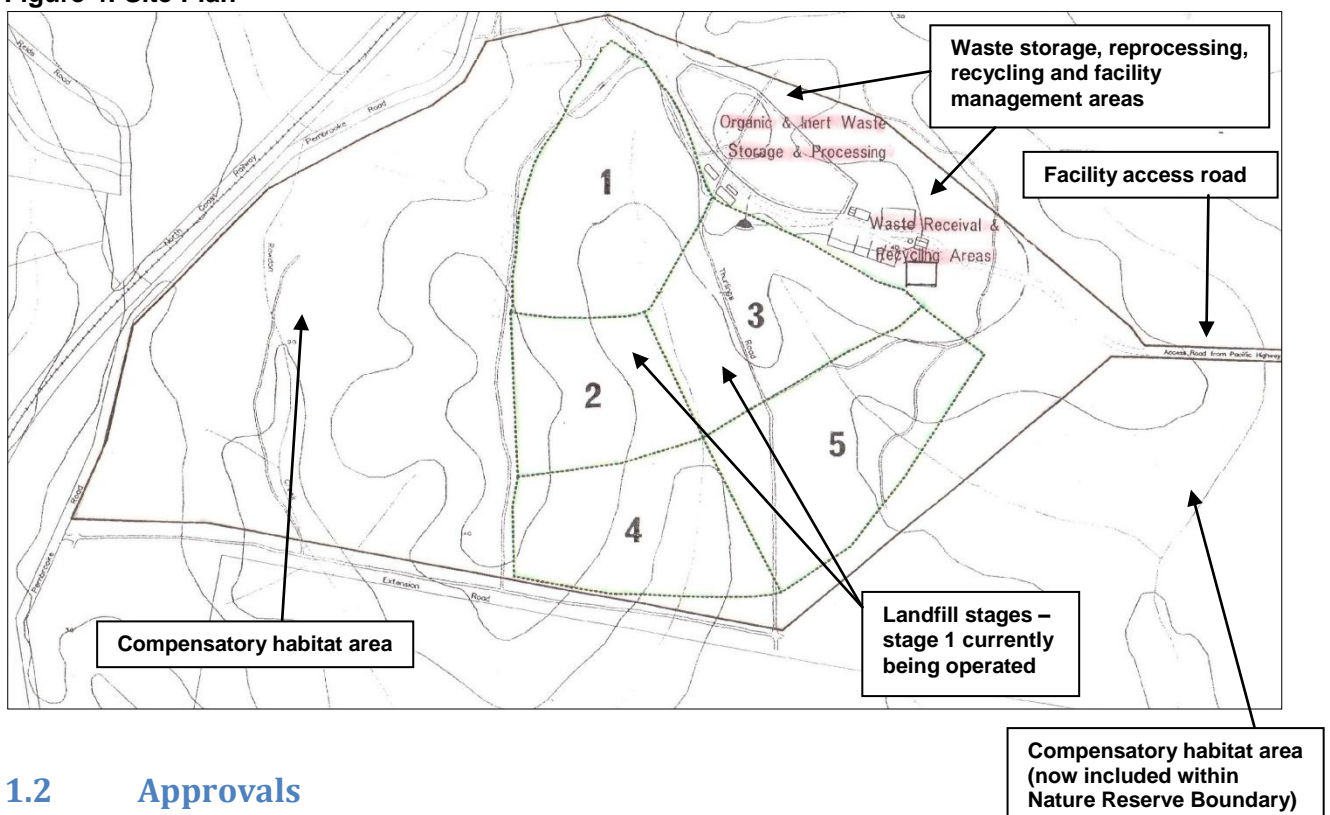
The zoning of the site and surrounding area is shown in **Figure 3**.

**Figure 3: Zoning as per 2011 LEP**



General plan of the site and major functional areas are shown in **Figure 4**.

**Figure 4: Site Plan**



## 1.2 Approvals

The Cairncross Waste Management Facility was assessed in 1999 as a part of the initial planning process, under the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and ongoing waste operations. Activities assessed include landfill, extraction of materials (ie. fill), construction of roads and facilities etc.



An Environmental Impact Statement (EIS) was prepared for the Cairncross Waste Management Facility by ERM Mitchell McCotter in January 1999. A copy of the EIS table of contents is included as **Appendix 8**.

Following preparation and submission of the EIS, Port Macquarie-Hastings Council approved the Cairncross Waste Management Facility under Part V of the *Environmental Planning and Assessment Act 1979* on July 26th 1999 (DA 1999/0178). Approval was granted on the 6th September 1999 for Stage 1 of the landfill area along with the ORRF and other waste management activities, however this approval was time limited for 20 years.

Under the *Protection of the Environment Operations Act (1997)*, the Waste Management Facility is listed on Schedule 1 as a Scheduled Activity. The Facility therefore, requires an Environment Protection Licence (EPL) for its operation. EPL 11189 has been issued for the operation of the Facility

PMHC will continue to obtain advice on an ongoing basis with respect to amendments to, or additional legislation that may relate to the operation of the Waste Management Facility.

Mitigation measures related to activities on site were incorporated into the Landfill Environmental Management Plan (LEMP). A LEMP was prepared for the site in 2001, and a new updated Operational Environmental Management Plan (OEMP) completed in 2008.

Additional applications have followed in recent years:

- for the construction of the small Transfer Station, gatehouse and site shed (DA 00/582),
- the construction of the Materials Recovery Facility, or MRF (DA 2005/0531),
- the expansion of the ORRF facility to cope with increased input.

A total of 30.7 ha of compensatory habitat area was reserved to the west of the landfill during the original approvals process (shown on **Figure 4**). Approximately 26 ha was reserved to the east of the facility as an exchange for NPWS Nature Reserve land that originally existed to the north of the facility access road.

### 1.3 The ORRF/ AWT Facility

The original ORRF was designed in two parts. One area to process organic waste into high quality compost, and the other area to stabilise mixed solid waste prior to landfilling. The Organic area of the facility has been very successful, processing over 20,000 tonnes of domestic and commercial garden and food organics, woody waste and treated bio-solids annually into compost. This process will continue in the same or a similar form into the future.

The mixed solid waste area was not as successful and the process was put on hold in 2011, using the facility in the interim for a commercial waste sorting trial. In November 2012, PMHC advertised an *Alternative Waste Treatment (AWT) Contract* Expression of Interest (EOI) for consideration of best practice technologies, to process the mixed solid waste stream and provide more positive results in terms of diversion from landfill.

The EOI also considers:

- Linking a gas (methane) extraction and power generation system to the process.
- Link a package sewer treatment plant (STP) system to the process,
- Further inclusion of Commercial & Industrial (C&I) and Domestic waste streams,
- Carbon Price Mechanism (CPM) and future Carbon Emissions Trading Scheme (ETS).

Following the EOI, tender documents will be developed. The new AWT contract is proposed to run over a 10 year period and is estimated at \$28 million over this period.

There is potential to greatly reduce waste to landfill through a new AWT process.

## 2. Description of proposal

### 2.1 Current DA approval

The current approval covers the operation of the site, however only included Stage 1 of the landfill area and was a set time period of 20 years.

In general, approval of the project involved the construction and initial usage of the following parts:

- A solid waste landfill (Stage/Cell 1);
- Access road from the Pacific Highway;
- Office and weighbridge;
- Workshop, wheel-wash, wash down bay;
- Water storage areas;
- Internal roads;
- An organic waste composting facility;
- An 'Alternate Waste Technology' (AWT) facility, for processing of mixed solid waste;
- Receiving and processing areas for inert building and construction waste, green-waste and ferrous and non ferrous metal;
- A waste Transfer Station for local users (with small storage of tyres, chemicals, batteries and oil);
- Excavation of clay and rock to provide landfill capacity and cover; and
- Signage and fencing.

The Facility receives the types of waste approved by the EPA for disposal at a Solid Waste Class 1 landfill. The environmental guidelines for solid waste landfills EPA 1996, defines the waste to be accepted at such landfills as being 'all solid waste including putrescible waste and other wastes approved by the EPA'.

Solid waste does not include waste which is classified as 'industrial waste' or hazardous waste' under the EPA Guidelines.

Council completed a new *Waste and Resource Management Strategy 2011-15* in 2011. It is expected that future AWT processes, increased services and waste strategy programs will continue to reduce waste to landfill.

### 2.2 Waste Management Process

#### Resource Recovery in the Port Macquarie-Hastings Area

Table 1 outlines recent waste figures for the PMHC LGA.

**Table 1: 2011/12 Waste Figures (tonnes)**

LANDFILL		RECYCLING		ORGANICS		OTHER RECOVERY	
Asbestos	376	C&I Processed	98	Commercial	1,134	Hazardous	26
Clean Fill	775	General C&I	2,861	Bio-Solids	7,121	Oil	2
Community Group	291	PMHC Domestic	8,717	Domestic	11,960	C&D	10,000
Dead Animals	7	Mattresses	14	Green-Waste	2,853	Scrap Metal	773
C&D All	2,628	Mixed Metal	72	Mulch (K,W)	1,201	E-Waste	73
Domestic	8,208	Kempsey Bulk	257	C&I Processed	15	Sharps	1
C&I	13,298	Kempsey Domestic	1,968	Kempsey Domestic	1,703	Mattresses	146
Processed	11,168	Great Lakes Domestic	291			Gas Bottles	9



Road Material	1,152					Drum Muster	1
C&I	1					Tyres	45
Transfer Bins	1,426					Transfer Stations	251
Dunbogan Landfill	2,417						
<b>TOTAL</b>	<b>41,747</b>	<b>TOTAL</b>	<b>14,278</b>	<b>TOTAL</b>	<b>25,986</b>	<b>TOTAL</b>	<b>11,326</b>

- Total waste handled in 2011/12 = **93,337 tonnes.**
- Percentage of waste sent to landfill = **45%**
- Percentage of waste diverted from landfill = **55%**

### Domestic Services

Port Macquarie-Hastings Council offers a three bin system to domestic premises, as follows:

- red bin waste collected weekly (in 80,120 and 240 litre sizes),
- green organics bin serviced weekly (including all food waste and dirty paper). This includes a cornstarch bag and kitchen tidy system offered free to residents by Council;
- yellow recycling bin collected fortnightly.

### Recycling stream

Commercial services in town are available for comingled recyclables and paper in bins of various sizes. All domestic and commercial recycling is taken to the Cairncross MRF for processing and is then onsold out of the area.

### Organics stream

Domestic organics is combined with commercial organic material, mulch from outlying sites and also biosolids from the sewerage treatment works, and processed through the ORRF to make compost.

### Other resource recovery

Other materials diverted from landfill for recycling (listed in Table 1) through other contracts/services include:

- Scrap metal (regional contract)
- Ewaste (included in the above scrap metal regional contract)
- Mattresses (Mattress recycler in Newcastle)
- Oil (local commercial collector and processing facility)
- Hazardous materials (regional contract, some recycling and then safe disposal for the remainder in Sydney)
- Concrete and masonry (local collector/processor)
- Sharps (contract, taken to Sydney for safe disposal)
- Gas bottles (local contractor, devalves and sells bottles for recycling through scrap metal)
- Tyres (tyre recycler in Newcastle)
- DrumMuster drums (collected as a part of the DrumMuster program)
- Broken MGBS (sold back to sulo for recycling)

### Waste to landfill

General waste is delivered by residents to transfer stations at Wauchope and Port Macquarie, and regularly transported to Cairncross to the landfill by Council. Transfer stations are for domestic waste only, all commercial material must be delivered to Cairncross (eg skip bins, commercial waste operators, business waste).

From 2001 - 2011 a proportion of general waste was processed through the ORRF AWT. This was the waste that contained more organic content, ie domestic and C&I material. Transfer bins and C&D waste continued to go straight to landfill.

This process was discontinued in 2011 due to cost considerations weighed against the success of the process in reducing waste to landfill. As an alternative a C&I sorting trial has been being carried out from 2011 and is currently still running. An EOI is now out to seek a new process for general waste, exploring options prior to development of the new ORRF contract.

Waste types to landfill can be seen in Table 1. Generally asbestos, clean fill, community group waste, dead animals and C&D materials all go direct to landfill (due to their hazardous and inert nature). Clean fill and some C&D material can be used for cover, landfill construction or internal roads.

All domestic waste, C&I waste and public place material (eg litter bins) has the potential to be processed prior to landfilling through a new AWT process. At the moment these materials are being taken straight to landfill, with only a proportion of C&I material sorted in part of the ORRF, with recoverable materials such as scrap metals, ewaste, mattresses, cardboard and plastic being removed.

## 2.3 The Proposal

### Strategic planning and approvals

The land in question is zoned SP2 Infrastructure (Waste Management Facility), under Port Macquarie-Hastings LEP. Provided that all uses are directly associated with a waste management facility then the proposal is permissible with consent. Considering the State Environmental Planning Policy (State and Regional Development 2011, clause 23 (1b), schedule 1, this proposal is a State Significant Development (see clause 1b, highlighted below):

*Waste and resource management facilities*

1. *Development for the purpose of regional putrescible landfills or an extension to a regional putrescible landfill that:*
  - a) *has a capacity to receive more than 75,000 tonnes per year of putrescible waste, or*
  - b) has a capacity to receive more than 650,000 tonnes of putrescibles waste over the life of the site, or***
  - c) *is located in an environmentally sensitive area of State significance.*

The landfill process is considered to represent designated development and as per the Director Generals Requirements an EIS would be required.

The Minister for Planning and Infrastructure would be the consent authority as per Schedule 4A of the EP&A Act 1979.

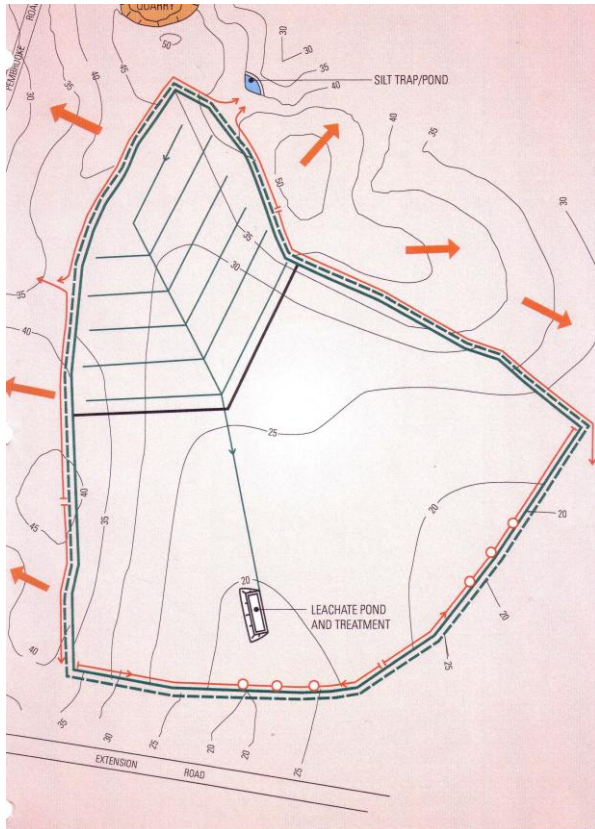
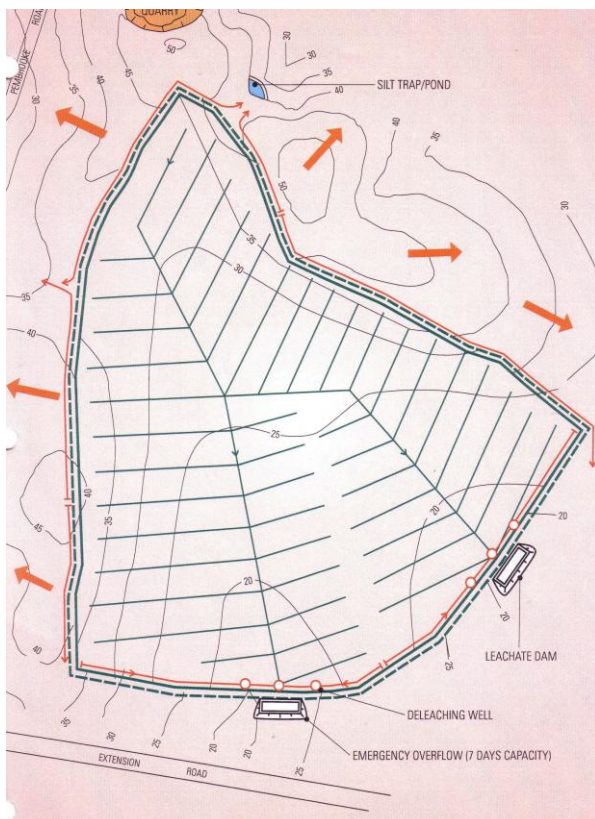
Under the Protection of the Environment Operations Act 1997 (POEO Act), the site is required to have an environmental protection licence and complete a licence return with environmental reporting results annually for the EPA. Cairncross Waste Management Facility has two licences, the ORRF (# 13120), and Cairncross landfill site (# 11189).

More recently a Pollution Incident Response Management Plan (PRIMP) has been completed for the site as required by the Protection of the Environment Legislation Amendment Act 2011, in an effort to better manage any pollution incidents. Environmental testing results and the PRIMP are now published on the Councils website, as required by new Guidelines for publishing monitoring data.

### Landfill stages

As a part of the original planning process for the site the landfill has been designed in stages (cells) to completion. These design stages are shown on the following pages. The leachate collection systems are shown in Figures 5 and 6, and Figures 7-11 show the staged filling plan. At the moment Cell 1 (stage 1) is partially filled.



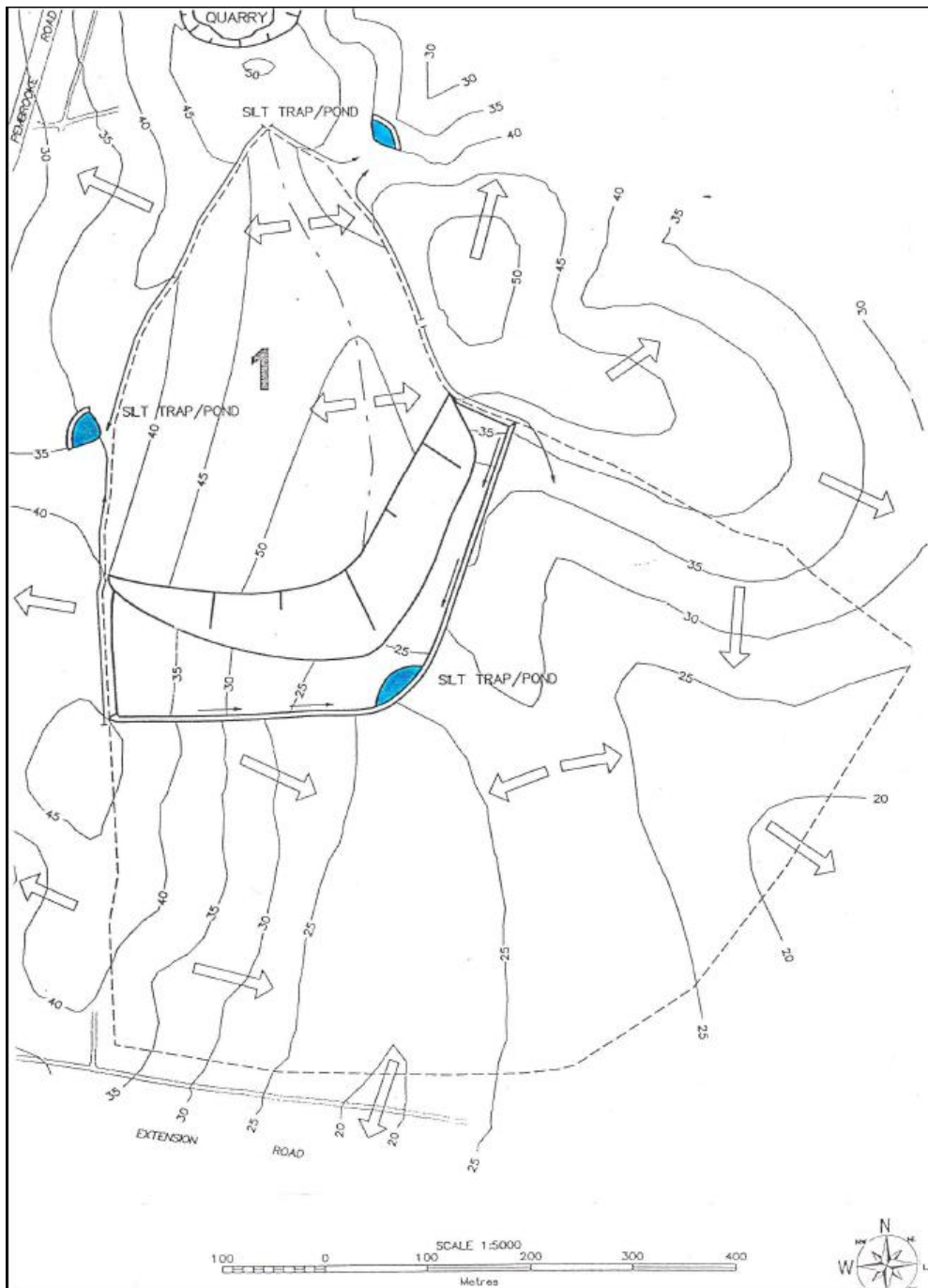
**Figure 5: Stage 1 Leachate collection system****Figure 6: Final leachate collection system**

## Landfill Cell 1

Stage 1 of the Cairncross landfill (also referred to as Cell 1 in some documents), is currently more than half filled (see **Figure 7** for the cell design). The capacity of this cell is 1,440,000 m<sup>3</sup>. It is predicted using current data that Cell 1 will now be completed by 2033 - 38, and at that stage the annual tonnage to landfill will sit at approximately 54,000 tonnes per annum. This is considering waste disposal at the current rate, using predicted population change only to estimate annual change.

It is likely that due to service changes in 2014/15 and a new AWT process that the rate to landfill will be significantly reduced (see Figure 12).

**Figure 7: Stage 1 land filling plan**

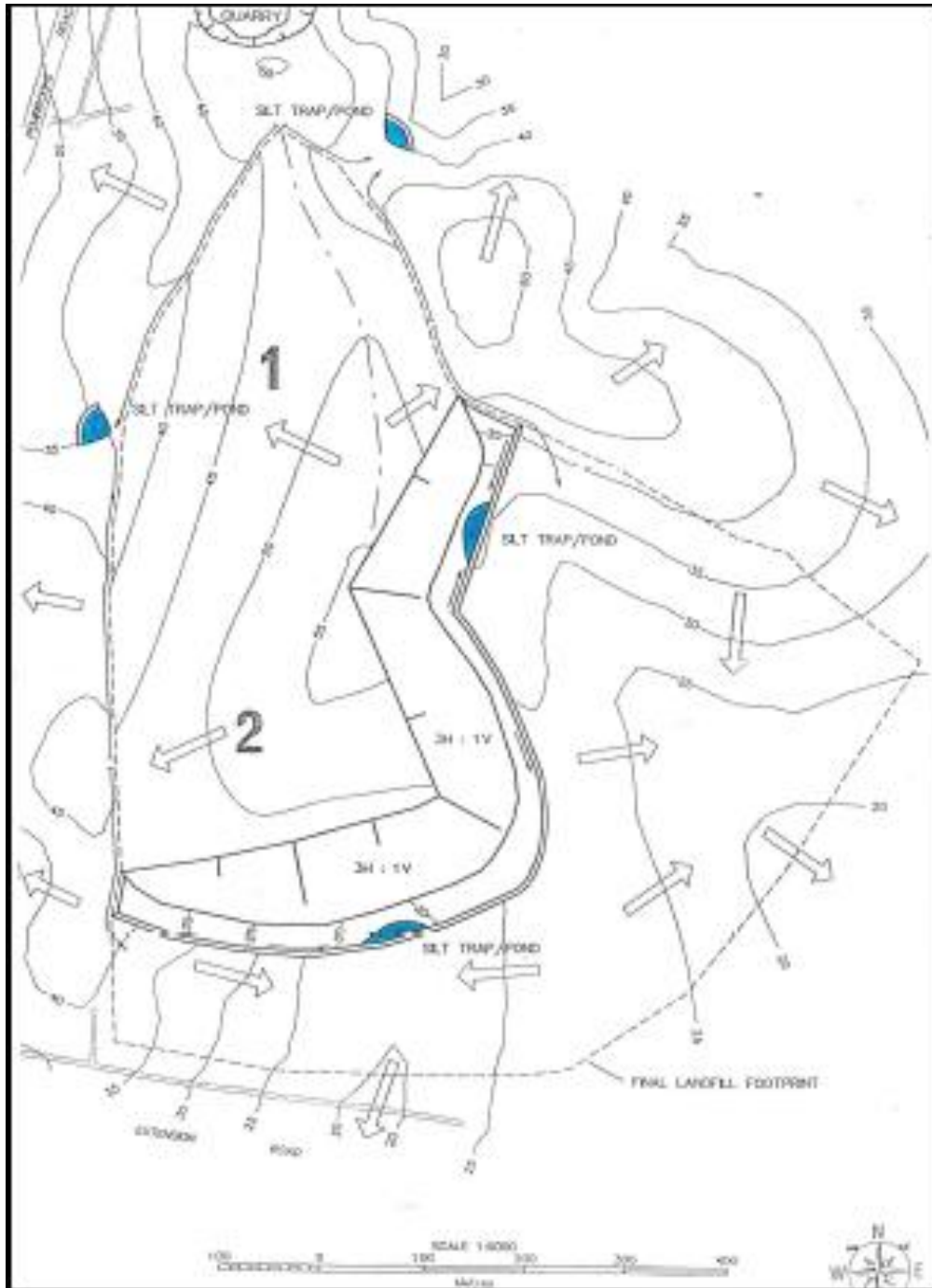




## Landfill Cell 2

The capacity of landfill Cell 2 is 1,196,000m<sup>3</sup>. It is predicted to be filled by 2052-2060, with the tonnage to landfill estimated at 74,000 tonnes per annum at the time the cell should be completed. This is considering waste disposal at the current rate, using predicted population change only to estimate annual change.

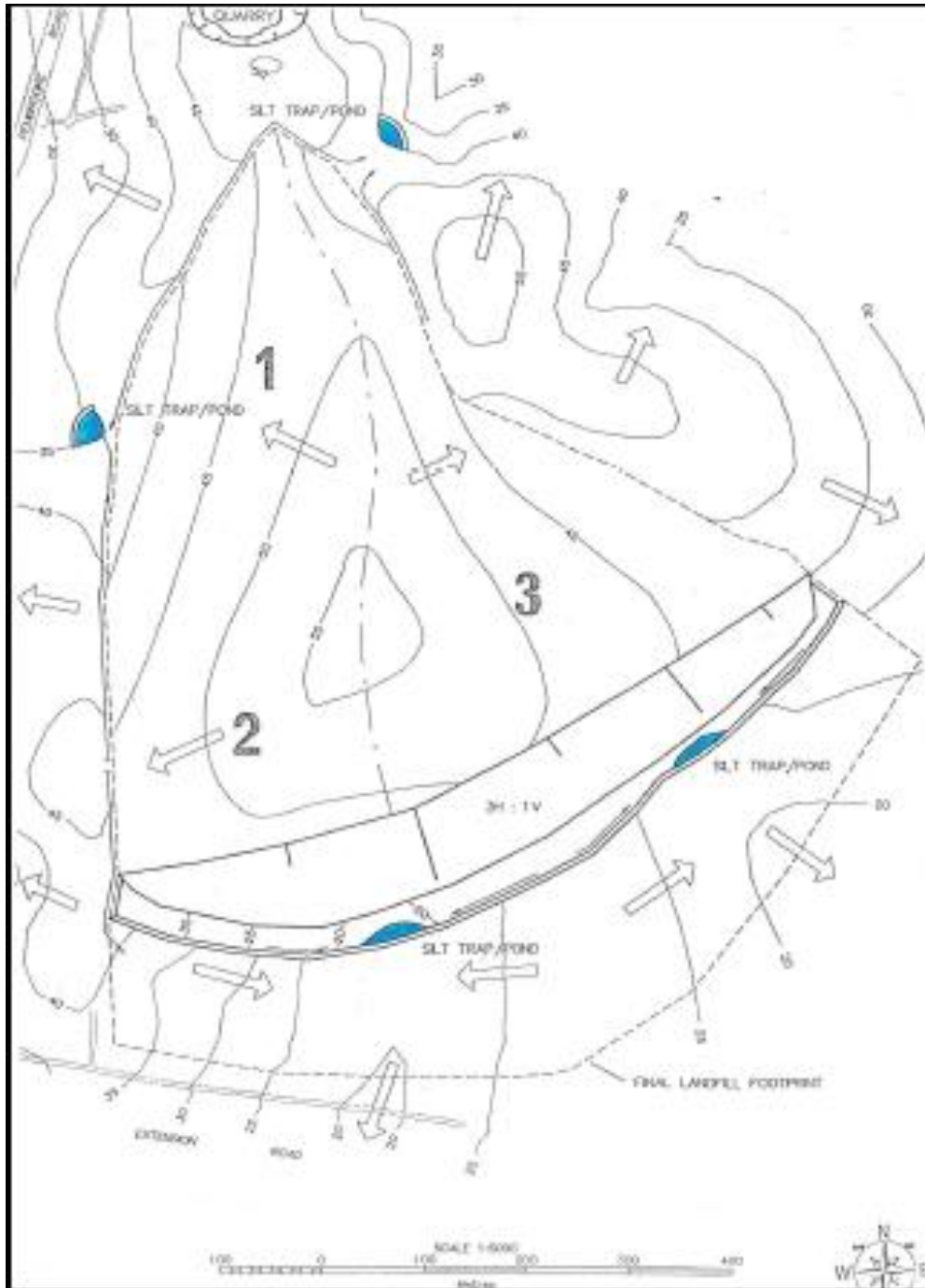
**Figure 8: Stage 2 land filling plan**



**Landfill Cell 3**

The capacity of landfill Cell 3 is 1,897 800m<sup>3</sup>. It is predicted to be filled by 2052-2060, with the tonnage to landfill estimated at 74,000 tonnes per annum at the time the cell should be completed. This is considering waste disposal at the current rate, using predicted population change only to estimate annual change.

**Figure 9: Stage 3 land filling plan**

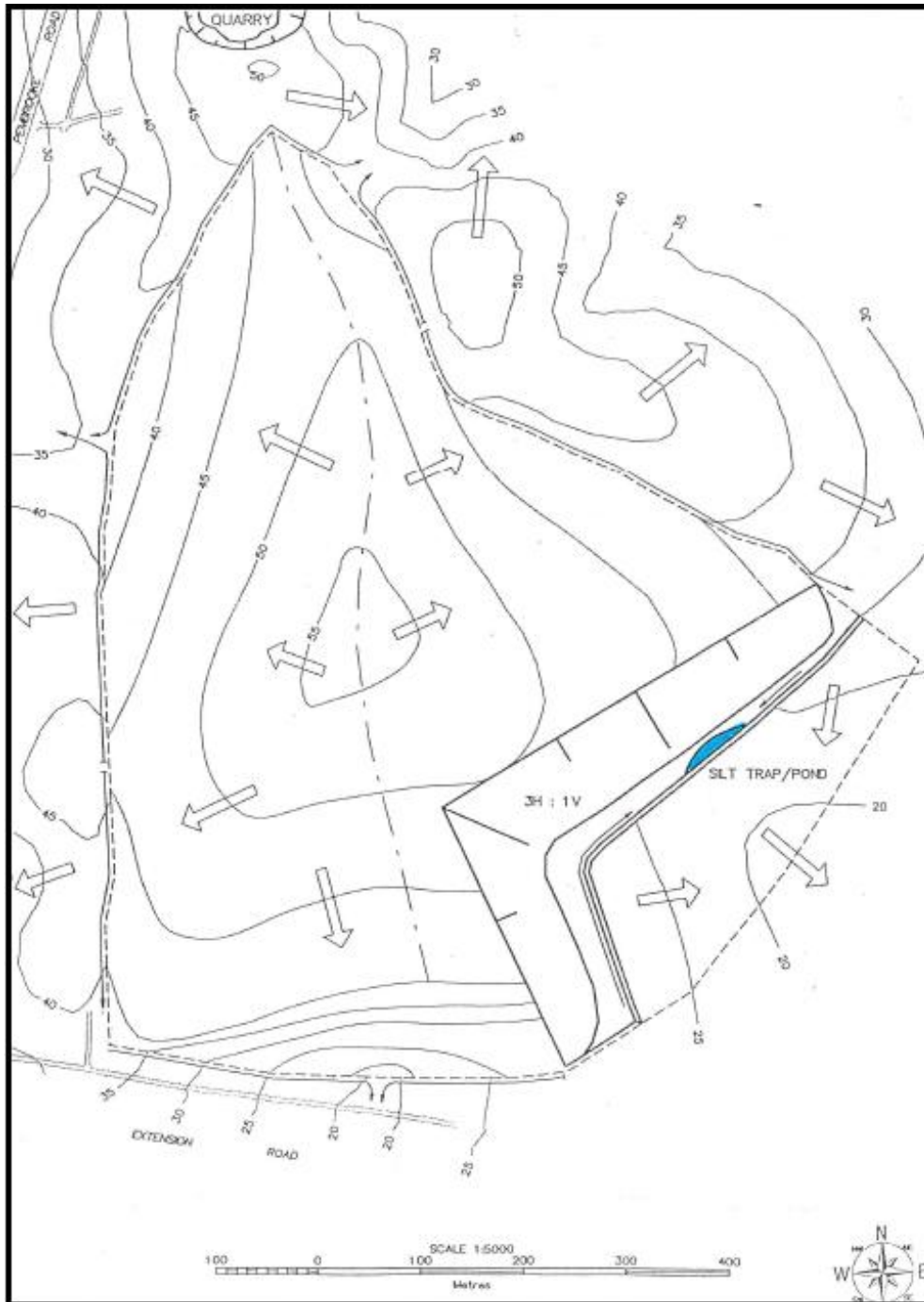




**Landfill Cell 4**

The capacity of landfill Cell 4 is 996,100m<sup>3</sup>. It is predicted to be filled by 2083-84, with the tonnage to landfill estimated at 122,000 tonnes per annum at the time the cell should be completed. This is considering waste disposal at the current rate, using predicted population change only to estimate annual change.

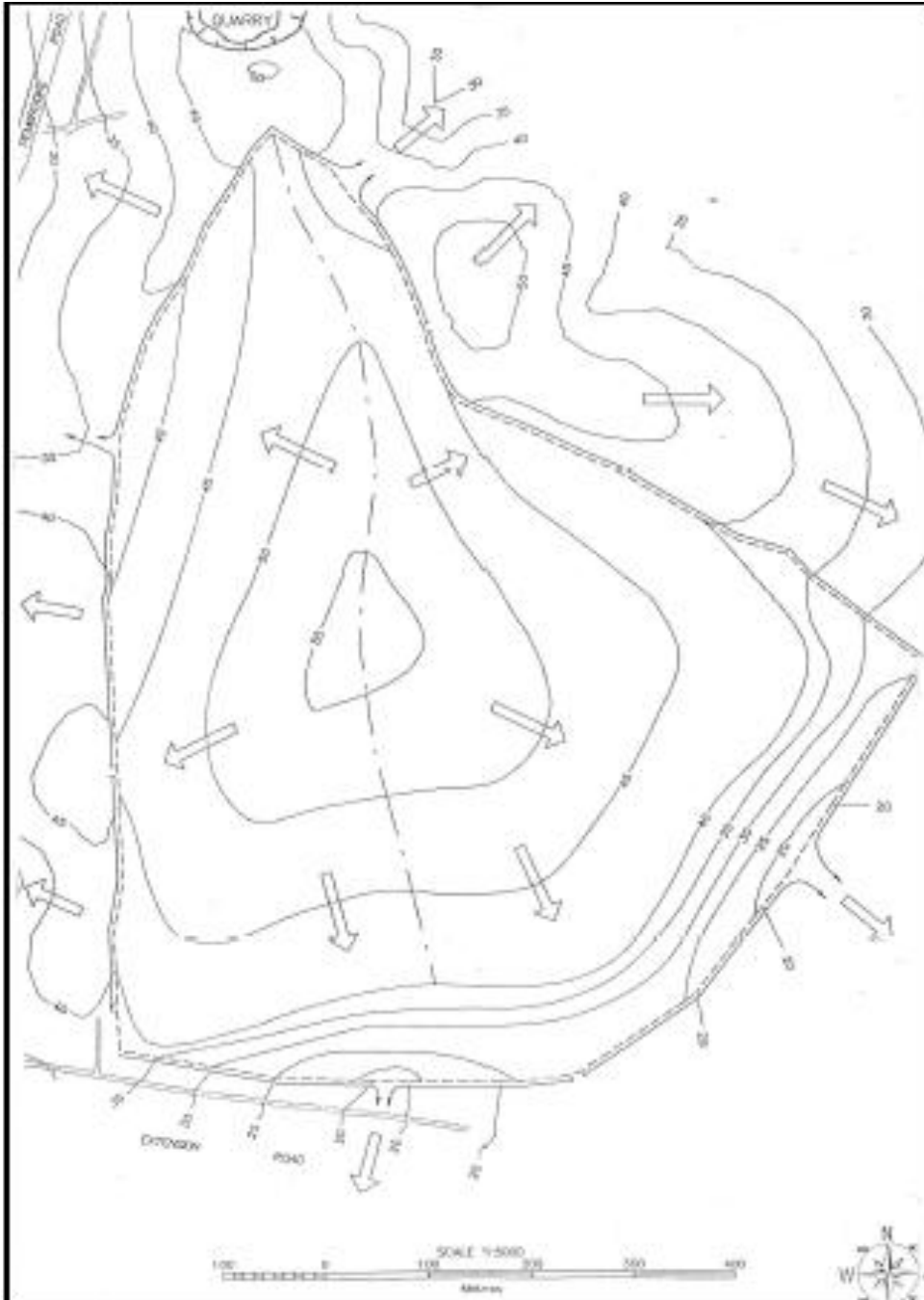
**Figure 10: Stage 4 land filling plan**



#### Landfill Cell 5 and the final landform

The capacity of landfill Cell 5 is 1,292 700m<sup>3</sup>. It is predicted to be filled by 2093-94, with the tonnage to landfill estimated at 140,000 tonnes per annum at the time the cell should be completed. This is considering waste disposal at the current rate, using predicted population change only to estimate annual change.

**Figure 11: Final Landfill Landform**



#### Landfill life

PMHC is seeking DA approval to continue current '*business as usual*' operations on site (as described in section 2.1) and to provide security for contractors managing the ORRF and MRF facilities in the future. The landfill will be completed as per the original design and environmental impacts will continue to be managed in accordance with existing processes (ie. EPL, OEMP etc). The application does not propose any changes that would affect any environmental issues identified in the original EIS and listed in section 3 of this document.

The proposal covers the operation and filling of the remaining cells 2, 3, 4 and 5, as well as the operation of the ORRF, MRF, Transfer Station, stockpile areas and other waste management activities.

**Table 2: Estimated annual tonnages**

Year	2011/12	2021/22	2031/32	2041/42	2051/52	2061/62	2071/72	2081/82	2091/92	Comments
Tonnage p/a (based on population only)	40,000 (actual figure)	46,000	54,000	63,000	74,000	87,000	103,000	121,000	138,000	At this rate the landfill should close ~ 2093/94
Tonnage p/a (based on some predicted resource recovery)	40,000	36,000	38,000	44,000	52,000	61,000	72,000	85,000	97,000	At this rate by 2093/94 Cell 4 will be over half filled.

*\*Note the figures above are based on population estimates and the waste process described in Section 2.2.*

**Table 2** shows annual waste tonnages at 10 year intervals. This information is used as a basis for the graphs featured in **Figure 12**, on the following page, and can be used to provide a guide of the upper limit estimate of waste going into the landfill over time.

Using only population estimates, **Figure 12** (dashed line) indicates the remaining landfill would be completed by around 2093-94. However, this estimate is considered very conservative as it assumes that service changes, the introduction of a new AWT process, and resource recovery strategies will have no impact (as these contracts are not yet finalised). The 'population only' scenario also assumes that the site will only accept waste from the PMHC area into the future. This scenario should be considered as a 'upper level' estimate.

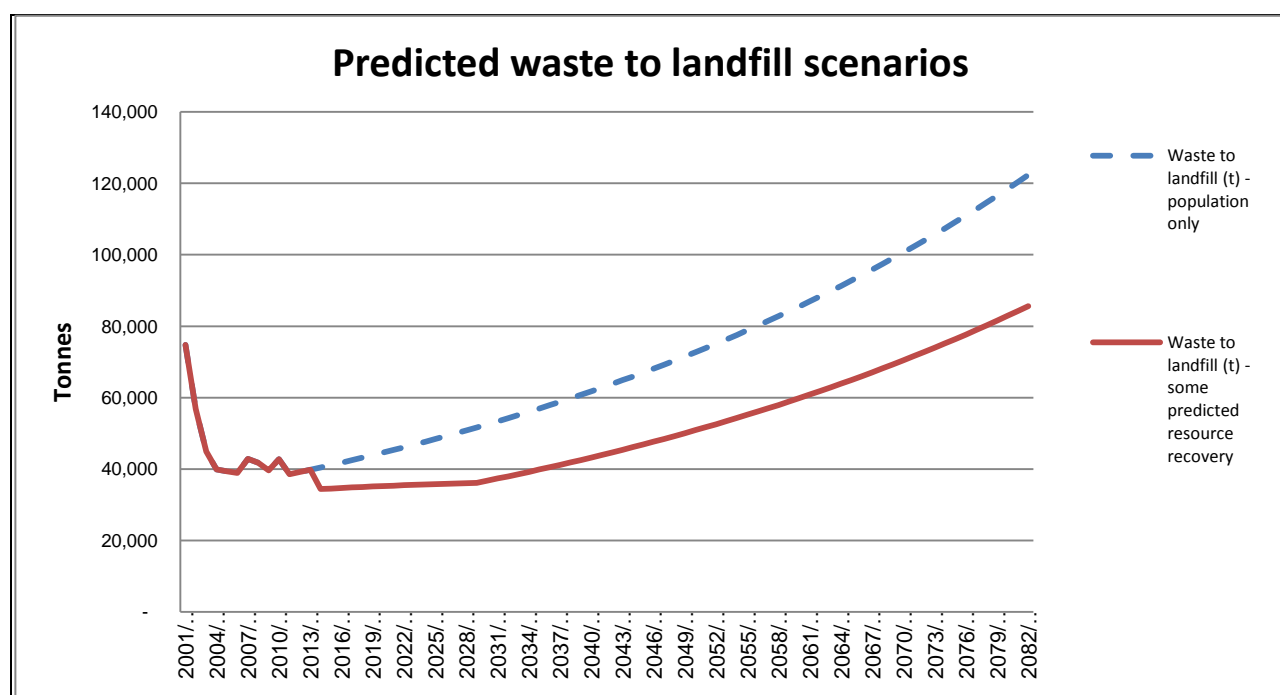
The second lower line in **Figure 12** (solid line) depicts possible impacts of resource recovery over time at the Cairncross Waste Management Facility. Changes to services through the new Domestic Waste Collection Contract and the effect of the new ORRF and AWT have been estimated and are represented by a drop in waste to landfill after 2014.

However, the effectiveness of a new AWT process is unknown at this stage and will depend greatly on the results of the AWT Expression of Interest (EOI) currently being advertised. Nevertheless, the previous process of the MSW section of the ORRF reduced waste processed through the AWT to landfill by 10%, and it is anticipated that any new process will at least equal or better this target.

The impact of new services including a proposed change from weekly to fortnightly waste collection, combined with a weekly organics service, would be expected to increase resource recovery from the domestic red waste stream by about 20% (DSEWPC, 2012, Moira Shire Council organics collection pilot trial, p. 25). This would result in an estimated reduction of approximately 2,000 tonnes per annum to landfill. However, at around this same time the Dunbogan landfill is planned to close and approximately 2,500 tonnes of material per annum will then be directed to Cairncross. This indicates the net change would be minimal.

Rising landfill prices due to the NSW Environment and Waste Levy, and the Federal Governments Carbon Price Mechanism (CPM) and future Carbon Emissions Trading Scheme (ETS), the impact of education and resource recovery programs, a national e-waste scheme, changing packaging and MRF technology will all result in reduction in waste to landfill in the future. The exact impact is difficult to estimate and unknown at this stage. As such, these aspects have not been included in the future estimates - although the impacts would likely be significant.



**Figure 12: Predicted Waste to Landfill scenarios**

PMHC is seeking approval for the remaining life of the landfill as currently designed.

### 3. Impact identification and assessment

There are a number of environmental issues related to ongoing management of the site which were identified through the original EIS in 1999 and the LEMPs in 2011 and 2008..

The following sections outline these impacts and the ongoing management systems.

Potential environmental impacts include the following:

- Potential impacts to groundwater through leaching of water percolating through the landfill,
- Surface water quality impacts due to site,
- Noise from traffic travelling to and from the facility as well as operational noise,
- Gaseous emissions (particularly methane and possible hydrogen sulphide),
- Odour from decomposing waste,
- Inappropriate waste disposal at the facility,
- Dust emissions due to hot, dry and windy conditions, particularly during covering of waste,
- Weed proliferation on the site and adjacent areas,
- Feral species infestation (eg rats, foxes etc),
- Traffic impacts to local roads, and
- Impacts related to clearing of vegetated cell areas in preparation for landfilling.

In order to minimise these potential impacts, a range of measures have been implemented as suggested by the LEMP.

#### 3.1 Environmental Goals and Benchmark Techniques

The EPA Guidelines "*Solid Waste Landfills*" prescribe a number of Environmental Goals aimed at protecting the environment from the impacts associated with Landfills. The Guidelines provide the basis for performance based environmental management and regulation of the landfill site.

##### Preventing Water Pollution by Leachate

This environmental goal aims to prevent the pollution of local ground and surface water from leachate originating from the site. Mitigative measures include the installation of a leachate barrier and collection system, surface water controls and water quality monitoring.

A leachate barrier system has been installed at the site in conjunction with the development of the existing landfill footprint. This system will minimise the migration of leachate into the groundwater, soil and substrata. The leachate barrier system will be extended to other areas as they become required for landfilling.

Leachate is collected into dry wells and pumped back into the upper reaches of the landfill. The leachate being pumped directly into a number of pits which are formed in the crown of the landfill mass. Essentially the entire leachate interception, collection and recirculation system is located underground; beneath the clay soil cover such that all surface water is diverted off the landfill and off-site. As with the leachate barrier system the leachate collection system will be progressively extended to other areas as they become required for land filling (Refer to **Appendix 1 & 2**).

### Surface Water Controls

The initial site selection, within the head of a catchment, has ensured that necessary surface drainage control will be limited to the operational area of the landfill and a small lateral catchment area immediately adjoining the landfill.

All workings on the site will be undertaken according to the following principles for surface water management;

- Minimize the extent of disturbed areas.
- Divert clean runoff around disturbed areas.
- Collect rain water runoff from disturbed areas and direct to settling basins sized to contain runoff from a six hour duration, once in a ten year, storm.
- Where possible shape the final landform to drain runoff around the contour slopes rather than directly down gradient.

The landform of the landfill will be shaped to direct surface water runoff to a series of drains located at the toe of the landfill. These drains gravitate to a series of silt trap/water quality ponds. As the landfill is progressively filled, the location and number of these drains and pits will be moved to accommodate new landfill areas. Surface water which percolates through the landfill will be collected by the leachate collection system. Refer to **Appendix 3-7**.

To minimise erosion of the landfill, completed areas of the landfill will be revegetated as soon as practicable. Mulching will be applied to the landfill surface to minimise the effects of erosion.

Sediment/water quality control basins have been provided downstream of other usage areas of the site, (ie. green waste stockpiling and waste storage areas). Contaminated surface water generated from these areas is conveyed to these structures where it is held before being pumped back and irrigated onto vegetated areas of the Facility for disposal via infiltration/evapotranspiration.

This approach also provides for reuse opportunities for dust suppression. No collected water from the surface water management infrastructure will be discharged to the natural surface water collection system unless it complies with Environment Protection Authorities discharge standards and requirements.

### Leachate, Groundwater and Surface Water Monitoring Program

A network of leachate, surface and groundwater monitoring sites were established on site and to enable analysis and assessment of water quality impacts from site activities. These points are sampled and tested quarterly as required by the EPL.

Future monitoring locations will be identified and established as part of the formalization of the filling plans for future stages of the landfill and as part of the ongoing review of this OEMP.

### Remediating Water Pollution

If surface water pollution is detected, the surface water remediation procedure will include the following actions:

- Take immediate action to contain any known breach as far as practicable.
- Report to be prepared and submitted to the EPA detailing the nature and source of contamination, any actions taken and future actions that will be carried out to prevent recurrence.
- Implementation of future actions on approval from the EPA.

### Preventing Noise Pollution

Noise impacts from the operation of the site include vehicles travelling to and from the site, operation of excavators, plant and machinery and operation of waste processing facilities.

The EPA noise criteria for the site (when measured at the nearest receptor) are as follows:

Noise receptor	Location	EPA Noise Criteria - Operation (LA10)dB(A)	EPA Noise Criteria Traffic (LAeq,1hr)dB(A)
Rocking Horse Farm	Approximately 1500m south west of site	40	55
Residences near Pacific Highway (Gougeville)	Approximately 1800m north east of site	41	60

The nearest residence (Rocking Horse Farm) is located approximately 1500m to the south west of the site. This distance, topography and the vegetation screening provides a natural attenuation of noise. Noise impacts from the operation of the facility have not breached EPA criteria since opening in 2011.

In this regard the original noise assessment prepared for the operation of the facility recommended that all equipment be fitted with residential class mufflers. The proper maintenance of equipment operating on the site and the operating hours of the Facility are measures which assist in reducing the impact of the operation of the Facility on the acoustic environment of the locality.

Should complaints be received noise monitoring of the Facility is to be undertaken to assess the impact of the noise. Noise complaints are to be recorded so that they can be correlated with the use of equipment on the site and climatic conditions.

### Landfill Gas

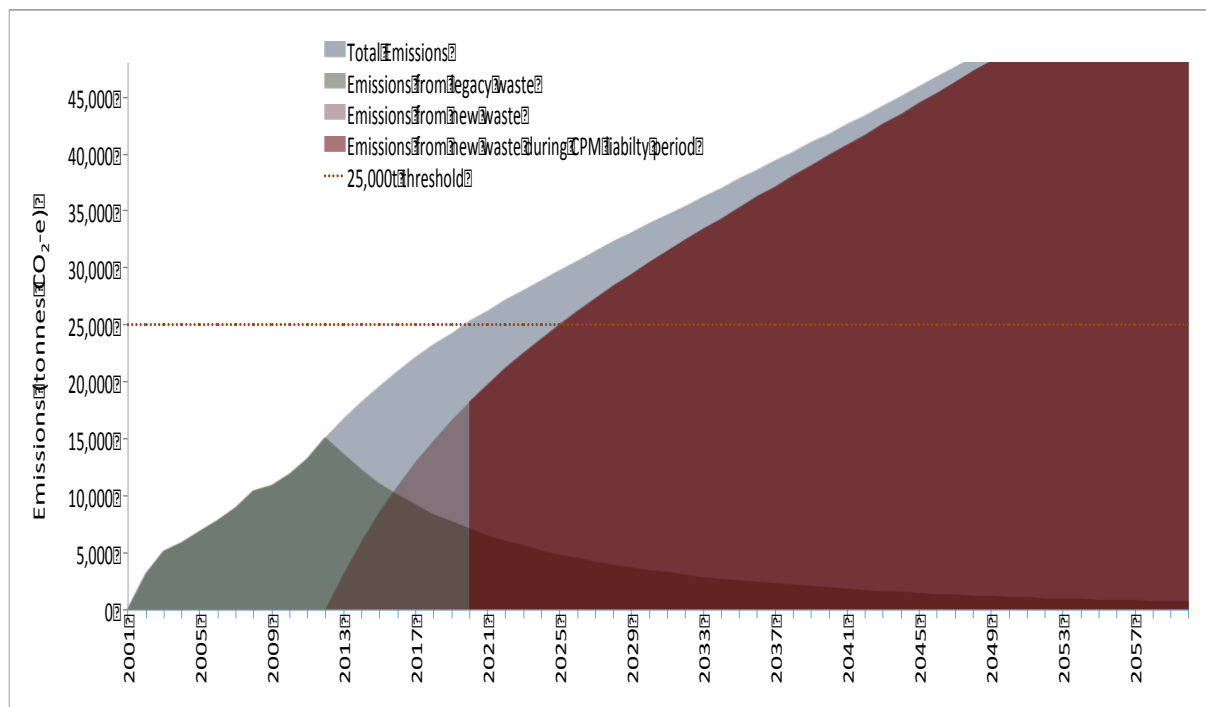
A Landfill Gas Containment System is not currently employed at the Facility. Controls for gas emissions throughout the site has been limited at this stage to a network of gas monitoring wells. The gas monitoring wells provide a sampling location for detection and measurement of gas qualities generated within the landfill. Subsurface and surface gas monitoring is undertaken on a regular basis, and results are sent quarterly to the EPA to satisfy licence conditions.

The current method of managing gas emissions at the site is through passive release. Installation of a gas management system has been added to programs in the short term as a results of a landfill gas emissions assessment recently completed to calculate Council's carbon liability - the *Midwaste Regional Waste Forum Carbon Pricing Mechanism & Council Landfill Review* (MRA, 2012).

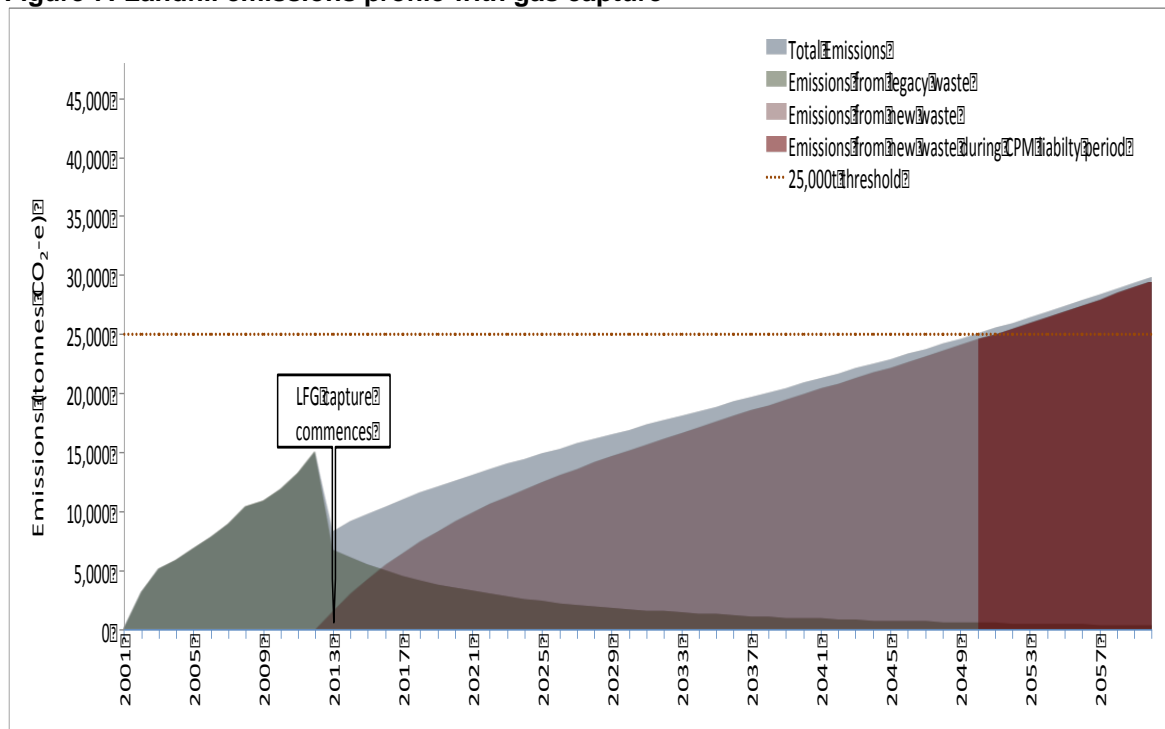
**Figure 6** shows the results of the emissions assessment, with no gas monitoring. **Figure 7**, shows the same profile but with gas monitoring installed.

At this stage the Cairncross Landfill does not trigger the Carbon pricing scheme but a gas monitoring system is recommended as soon as possible in order to avoid liability in 2019 or 2020 when emissions would cross the 25,000 tonne threshold.



**Figure 6: Landfill emissions profile (no gas monitoring)**

Profile courtesy of MRA, 2012

**Figure 7: Landfill emissions profile with gas capture**

Profile courtesy of MRA, 2012

### Odour Control

To minimise odour impacts of the Facility operations, the following measures will be employed:

- Biosolids will be incorporated into the existing composting process on the day it is delivered or as soon as possible after it is received.
- Good housekeeping practices including prompt compaction and covering of the incoming waste.
- Informal odour assessment by Facility personnel.
- Inspection of green waste stockpiles with corrective action to be initiated where any anaerobic storage conditions are encountered.
- Regular maintenance of onsite sewage management systems.
- Regular reuse of water from water quality control ponds so as to reduce the potential for the creation of anaerobic storage conditions.
- Use of proprietary bacterial odour control agent injected into the leachate return line

Odour complaints are to be recorded so that they can be correlated with climatic conditions and management practices on the site.

### Fire Prevention

Fires will be prevented at the site through the following measures:

- Implementation of the *Bushfire and Fuel Management Plan* which has been developed for the site as a part of the initial planning process in 2001. A Bush Fire Threat Assessment was carried out in 1998 as a part of the original EIS process. This assessment included recommendations that provided a basis for the Plan.
- Clear signs will be displayed at the site entrance to notify the public that flammable liquids are not permitted on the site.
- Upon entering the site, loads will be inspected to ensure flammable liquids are not allowed on site.
- Combustible materials including tyres, wood and vegetation will be divided into small piles to ensure any burning material can be kept away from other fuels.
- Waste will be covered on a daily basis to prevent the occurrence of fire.
- Burning off will not be permitted at the facility.
- Stockpiles of green waste will be regularly processed so as to reduce the possibility of spontaneous combustion due to decomposition processes.
- Processed green waste (mulch) is to be divided into small piles to minimize the risk of spontaneous combustion due to decomposition processes. Stockpiles will be regularly inspected and the temperature of the piles monitored. Where necessary mulch stockpiles are to be provided with aeration in order to reduce pile temperatures.

### Screening of waste received

To ensure only 'acceptable wastes' are permitted to be disposed of at the facility, the following procedure will be followed:

- Signs will be displayed at the point of entry which clearly indicates the type of waste that is to be accepted and not accepted.
- All incoming loads will be inspected by Facility staff prior to acceptance to the site. A detailed Methodology for screening waste is described in Port Macquarie-Hastings Councils *Solid Waste Management: Policies, Standard Operating Procedures and Safe Work Method Statements* (2012).
- The EPA will be notified of any incident where hazardous wastes have been found on the site. Parties responsible for dumping hazardous wastes will be reported to the EPA. Soil waste will only be accepted if it has been classified in accordance with the EPA guidelines. "Assessment and Classification of Liquid and Non Liquid Waste".
- Contaminated soil must be accompanied by a consultant's report which states the classification of the soil. Only soil classified as 'solid' or 'inert' is permissible at the facility. Soil classified as "hazardous" or "industrial" is not permitted at the facility.
- Selected loads will be diverted to an area for close inspection. The load will be dumped and inspected for unapproved wastes. The frequency of this will be at the discretion of the Site Supervisor.
- Any incident involving exclusion or detailed inspection is to be entered in the incident register with supporting documentation.

### Measurement of Quantities of Waste Received

To accurately measure the quantities of waste received at the facility, the following measures will be implemented.

- Weighbridges for incoming and outgoing vehicles have been installed. The weighbridges are calibrated every two (2) years.
- The weighbridges are operational at all times. If, at any time, the weighbridges should cease operation, the EPA will be notified immediately and the weighbridges repaired immediately.
- If the weighbridges become inoperable vehicles will be assessed in accordance with the vehicle factors in Appendix D of the EPA Environmental Guidelines "*Solid Waste Landfills*".
- A report on the quantity of waste is lodged with the EPA every 12 months.

### Recording of the Quantities, Types and Sources of Waste Received

Each month, data is provided to the EPA regarding the amount, type and source of waste according to the National Waste Classification System. The report is submitted in accordance with the EPA reporting form in Appendix D of the EPA document "*Environmental Guidelines: Solid Waste Landfills*".

Each twelve months, a survey of the site is undertaken by a registered surveyor to confirm the volume of landfill space consumed in the previous twelve months. This report is submitted to the EPA to demonstrate that the quantities of waste recorded by the weighbridge (for the twelve month period) are the same as those committed to the landfill.

### Recycling and Resource Recovery

PMHC has an existing kerbside recycling collection service. All residents are provided with a recycling bin which is collected every second week in conjunction with the domestic weekly waste collection service.

This service provides for the collection of recyclable products including:

- Paper and cardboard,
- Plastic containers (PET and HDPE Plastics),
- Aluminium/steel cans,
- Aerosol cans,
- Gas bottles and jars.

Collected recyclables are processed by Council's contractor at the Cairncross MRF. The marketing of the processed recyclables is carried out by Council's contractor. The principle markets for these recyclable materials are in Sydney and Wollongong.

Waste which is not acceptable is segregated and disposed of appropriately. Material which may be accepted at the facility is placed in accordance with the filling plan (Refer to **Appendix 3-7**). Material which is not acceptable at the landfill will be rejected to the person delivering the material to the facility for disposal at their cost.

Additionally all green wastes collected as part of the existing kerbside recycling collection service, (collected every week in conjunction with the domestic weekly waste collection service), is processed together with other materials such as sewerage sludge in a organics processing facility to create compost which is sold commercially by the operator of the ORRF.

The following waste reuse and recycling activities are also actively provided for at the Cairncross Waste Management Facility;

- Scrap metal (ferrous and non ferrous),
- Green waste,
- Paper and Cardboard,
- Glass,
- Waste engine oils/Cooking oils and fats,
- Batteries (car, truck, boat etc),
- Gas bottles,
- Tyres,
- Inert materials (concrete, bricks, soils).

The operation of the Materials Recovery and Organics Processing Facilities is subject to compliance with specific Environmental Management Plans for these activities. In this regard copies of the



compliance inspection and auditing reports which are applicable to the operation of these Facilities have been provided to PMHC.

### Minimising Landfill Space Used

The aim of this environmental goal is to ensure procedures for compaction of waste and filling is undertaken in a systematic manner. These procedures have been developed to maximise landfill space, and are included in the *Solid Waste Management: Policies, Standard Operating Procedures and Safe Work Method Statements* (2012).

The landfill is receiving less than 50,000 tonnes of waste per annum and the designed waste compaction density is 650 kg/m<sup>3</sup>. A survey of the landfill is undertaken on an annual basis.

A filling plan has been prepared for the site to conform with the final landfill landform design (Refer to **Appendix 3-7**).

### Preventing Degradation of Local Amenity

Potential impacts to the local amenity include deposition of site litter, windblown dust, dirt and mud deposited from trucks and cars, odour from decomposing waste and the proliferation of weeds and vermin.

### Litter Control

To minimise the potential migration, (off site), of litter, the following measures have been implemented:

- Waste is compacted and covered on a daily basis.
- Litter/security fences have been installed around the perimeter of the site.
- Daily inspection of the litter fences and clearing as required.
- Signage has been placed at the entry/exit points to advise the customers that if they drop or transport waste in an inappropriate fashion, they will be liable for prosecution.

### Cleaning of Vehicles

In order to minimise litter, sediment and mud from leaving the site, a wheel wash facility has been installed to enable vehicles to clean their wheels down prior to departure.

The standard of construction and maintenance of the internal access roads are such that the opportunities for the offsite tracking of soils and litter are minimized. Where necessary any accumulations of materials on the internal bitumen road system are to be removed where required manually. Additionally the location and operation of the tipping area is to be visually monitored during wet weather events so as to ensure that the accumulation of materials on vehicles is minimized.

Signs is displayed at key locations advising customers of the need to pass through the wheel wash prior to departing the site. Signage is provided at the gatehouse and access road to advise customers of their responsibilities with respect to ensuring that the remnants of their load and material stuck to vehicles does not litter public roads.

### Daily Covering of Waste

Waste is tipped in a defined filling area which may vary from day to day. Staff restrict the tipping face to approximately 20 metres in length, depending on the level of demand.

Daily cover is at least 150mm. All wastes should be covered prior to ceasing operations at the end of the day. An intermediate cover of 300mm is applied to surfaces which will be exposed for a period of 90 days or more. Cover material is sourced from excess excavated material from landfill cells.

A detailed methodology for the covering of waste is provided in the *Solid Waste Management: Policies, Standard Operating Procedures and Safe Work Method Statements* (2012).

### Dust Controls

To minimise the emissions of dust, the following measures will be implemented:

- Water sprays and water carts will be available, when required, to minimise dust emissions during hot, dry or windy conditions.
- Mulching and revegetation of exposed areas is carried out to minimize the potential for dust creation.
- A sealed bitumen road is present from the gate house towards the active landfill area.

- Where necessary accumulation of materials on the internal bitumen road leading to and from the gatehouse towards the active landfill area are to be removed manually.
- Visual assessment of dust generation by Facility personnel.

Given the location of the Facility, the prevailing winds and the nature of surrounding land uses, the creation of dust nuisances is unlikely. Formal dust monitoring will not be undertaken on the site as it is considered that such monitoring is unjustified.

Should complaints be received dust monitoring of the Facility is to be undertaken to assess the impact of dust on Facility occupants/users and adjoining and adjacent areas. Dust complaints are to be recorded so that they can be correlated with climatic conditions and management practices on the site. There have been no dust complaints since the facility opened in 2001.

### **Pest/Vermin and Noxious Weed Controls**

Typical weeds in the vicinity of the site include Lantana, Crofton Weed, Wild Tobacco Tree and Whisky Grass. Common pests and vermin include the black rat, feral cats and foxes.

To minimise/eliminate the presence of pests, vermin and weeds, the following measures have been implemented:

- Waste is compacted and covered on a daily basis to keep the amount of exposed waste to a minimum.
- A security fence has been installed around the site to prevent the entry of larger pests.
- The landfill (final contours), has been designed to ensure surfaces are adequately drained to prevent pondage of water which may promote weed growth.
- Trapping of feral animals is carried out when required.
- Baiting of flies during the summer months.
- A range of techniques to eradicate weeds include chemical spraying and removal of weeds by mechanical means (eg by hand).

If noxious weeds become a problem at the site, a weed management plan is implemented. A range of techniques to eradicate weeds include chemical spraying and removal of weeds by mechanical means (eg by hand). Council's weed management team assess and treat the site regularly.

It is also noted that the development consent for the establishment and operation of the Facility requires the implementation of management measures specific for the compensatory habitat area of the site. These measures relate to pest and noxious weed monitoring and management.

### **Clearing for landfill cell development**

Cell 1 has been fully cleared and is partially completed. The clearing of cells 2-5 (as with Cell 1) will involve the removal of plantation timber that was planted in 1976 and 1977. The native plantation is a tall open woodland forest dominated by blackbutt with some understorey of acacia, forest oak and eucalyptus regrowth (ERM Mitchell McCotter, 1999). Vegetation clearing is carried out progressively, aiming to minimise the area disturbed at any one time.

In 1999 as a part of the Cairncross Waste Facility EIS a Species Impact Statement (SIS) was carried out and it was determined that the proposal would not significantly impact on threatened species, populations, ecological communities or their habitats (pursuant of S78A(8)(b) of the EP&A Act (ERM Mitchell McCotter, 1999). Inspections are carried out prior to clearing to avoid death or injury to fauna.

An archaeological survey was carried out as a part of the previous EIS in 1999, and three small campsites were identified. The sites were assessed as having low level significance.

As discussed in section 1.3, a total of 30.7 ha of compensatory habitat area was reserved to the west of the landfill during the original approvals process (refer to **Figure 4**). Approximately 26 ha was reserved to the east of the facility as an exchange for NPWS Nature Reserve land that originally existed to the north of the facility access road. This area is now included in the nature reserve boundary and the general location is noted in **Figure 4**. Being included within the Nature Reserve boundary "will significantly increase its value as compensatory habitat" (ERM Mitchell McCotter 1999).

## 4. Justification

### 4.1 Site suitability

The Cairncross Waste Management Facility has been used by Port Macquarie-Hastings Council for waste disposal and resource recovery activities for the past 11 years. Prior to the purchase and development of the site the land formed part of the Cairncross State Forest, which at that time was owned by NSW Forests. The site had been developed by State Forests as a Blackbutt tree plantation since 1975/1976.

Following an extensive site selection process the land, which now forms the Facility, was identified as being the most suitable site for the management of solid waste for the PMHC local government area. The land was subsequently purchased from NSW Forests and developed as a solid waste management facility and became operational in October 2001.

Since its initial commissioning the Facility has undergone further development such as the relocation of the MRF from the Port Macquarie (Kingfisher Road) Waste Management Facility in June 2006 and more recently the establishment of a gas bottle recycling centre at the site.

### 4.2 Waste strategy

PMHC aims to continue to provide the community with waste management services that encourage waste minimisation and improve the recovery and re-use of resources through sustainable actions. These actions are intended to build on the substantial work undertaken by Council over the last decade. Specific areas of waste management across the LGA will focus on such actions as:

- reducing the level of contamination in recoverable resources;
- the targeting of particular problem wastes;
- the possibilities for improving separation of food waste;
- improving away from home recycling;
- education and assistance to enable local businesses to improve waste and resource management;
- optimising the use of existing waste assets;
- ensuring equality of access to all residents;
- anticipating future requirements for waste asset and infrastructure.

The new *Waste and Resource Management Strategy 2011-15* sets out work programs for implementing these actions through the municipal; commercial and industrial; and construction and demolition waste sectors, as well as considers Council's own waste responsibilities. In particular, PMHC's waste assets and infrastructure are examined for opportunities to ensure that access to waste services is available across the LGA.

Importantly, this strategy aims to confirm that PMHC is optimising the use of these waste assets and infrastructure on behalf of the community. The focus areas are supported by actions particular to each waste stream. Actions are targeted at steering PMHC towards achieving improved sustainable waste management.

One of the major aims of the strategy is to reduce waste to landfill and continue to increase resource recovery. This was also a condition of the original approval of the Cairncross Waste Management Facility.



### 4.3 The future of services and facilities

As discussed in section 1.3, an EOI was advertised, in November 2012, seeking waste processors that could use the existing infrastructure to process and or treat both organic and mixed solid waste. This EOI will provide Council with information to assist tender development in 2013. It is likely the composting process will continue as it has been so successful.

The timing of the EOI, the location of the site and the existing infrastructure may provide some significant EOI proposals in the context of Waste Management in Australia. It is possible that a *Waste To Energy* system will be proposed. Council has also considered in the EOI whether a landfill gas capture system can be incorporated into the system. However, it is likely this system will be developed in the near future regardless of the EOI.

Waste collection contracts are also due for renewal in 2014, and PMHC is considering services that may result in increased resource recovery and reduction in waste to landfill. At the moment PMHC already provides a weekly organics service, including a kitchen 'tidy' bin and cornstarch bag system that is available to residents.

Other services being considered under the new collection contract include:

- Fortnightly waste collection,
- 360 litre recycling bins,
- Public place recycling,
- Kerbside junk collection (with recovery targets).

PMHC is committed to reducing waste with landfill being the final option. Strategies and programs that reduce waste will continue to be a priority.

## 5. Capital investment value

The construction of the existing ORRF is valued at approximately \$11 million, and the MRF at \$7 Million. The ORRF contract is a Build Own Operate Transfer (BOOT) style contract and the facility will become PMHC property at the end of the current contract in 2014. The cost of the next phase of the AWT is unknown at this stage, however the AWT EOI should give some indication. It is anticipated that the composting side of the ORRF will continue with only small modifications (if any). PMHC owning the facility should also reduce costs.

The new AWT contract to be let in 2014 is proposed to run over a 10 year period and is estimated at \$28 million over this period.

The Cairncross site operational is approximately \$1.4 million per annum, and of this amount, landfill cell construction is estimated at \$120,000 annually. Assuming the landfill was to be completed in 2085 the cost of the landfill cell construction as originally designed from 2012 to 2085 would be approximately \$9 million.

## 6. Consultation

Significant community consultation was undertaken during the original DA approval process with a high focus on the location and activities on site.

However, over the past 11 years of operations, there have been few complaints from neighbours or the wider community.

As the proposal does not intend any operational changes (ie. business as usual), and follows the original design for the site it is likely the community interest will be low.

## 7. Appendices

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(ERM Mitchell McCotter, 1999)

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