

Armidale Regional Landfill

Construction Environmental Management Plan



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Client: Armidale Dumaresq Council

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Quality Information

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Abbreviations

CEMP	Construction Environmental Management Plan
CQAP	Construction Quality Assurance Plan
DP&E	Department of Planning and Environment
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
LEMP	Landfill Environment Management Plan
MSDS	Material Safety Data Sheets
NGER Act	National Greenhouse and Greenhouse Energy Reporting Act 2007
POEO Act	Protection of the Environment Operations Act 1997
TSC Ac	Threatened Species Conservation Act 1995

1.0 Introduction

1.1 Project Background

Armidale Dumaresq Council (Council) has obtained approval for the construction and operation of a new regional landfill to service the Armidale, Uralla, Walcha and Guyra Local Government Areas (LGA). The proposed landfill is located on Waterfall Way, approximately 12km east of Armidale.

The Planning Assessment Commission, as delegate for the then NSW Minister for Planning and Infrastructure, granted approval for the project under Section 75J of the *Environmental Planning and Assessment Act 1979*, subject to conditions, on 4 July 2012 (Approval 06_0220). The project involves the construction and operation of a landfill comprising five cells, each cell with a maximum volume of 211,000m³.

AECOM has been engaged by Council to prepare a Construction Environmental Management Plan (CEMP) to guide the management of environmental issues during the establishment of the new regional landfill facility, in accordance with approval conditions relating to the construction of the landfill. This plan forms part of the project's Landfill Environmental Management Plan (LEMP) as shown in Figure 1.

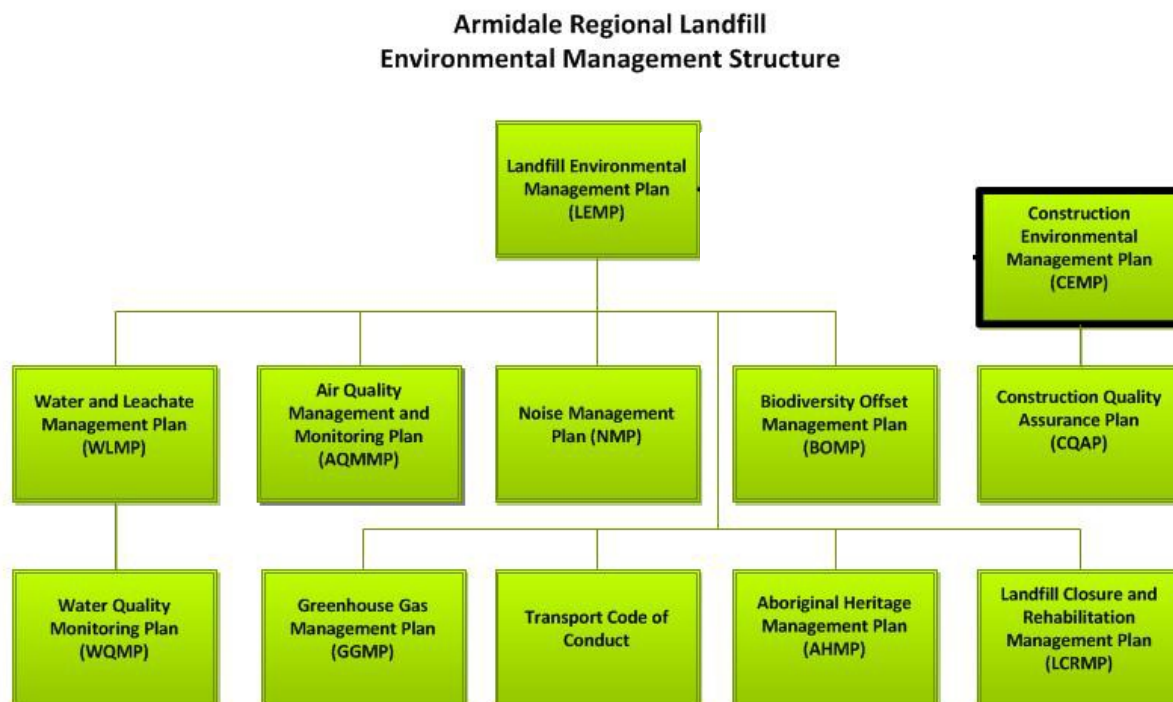


Figure 1 Environmental Management Structure

1.2 Purpose and Scope

Condition 1 / Schedule 5 of the Conditions of Approval requires the preparation of a Construction Management Plan for the project to be carried out to the satisfaction of the Secretary of the (now) Department of Planning and Environment (DP&E). The plan must be submitted to the Secretary for approval.

This document, the CEMP for the project, satisfies Condition 1.

This CEMP has been developed to include all reasonable and feasible measures to prevent and/or minimise harm to the environment that may result from construction of the project. This CEMP is intended to be the overarching document to be adopted and implemented by the Contractor(s) responsible for the construction of the landfill. The Contractor(s) may prepare a specific construction management plan(s) for their relevant phase of work however these plans must be consistent with and not substantially deviate from this CEMP.

1.3 Structure of this Plan

This CEMP is structured as follows:

Section 1.0 – Introduction

Section 2.0 – Statutory Requirements

Section 3.0 – Roles and Responsibilities

Section 4.0 – Construction Activities

Section 5.0 – Management Measures

Section 6.0 – Monitoring

Section 7.0 – Complaints Handling and Incident Response

Section 8.0 – Review and Records

Section 9.0 – References

Appendix A – Construction Quality Assurance Plan (CQAP)

The Construction Quality Assurance Plan defines, for the construction works, the construction quality assurance requirements and procedures necessary to demonstrate compliance with the Contract Documents (design and management).

2.0 Statutory Requirements

2.1 Project Approval Requirements (PA 06_0220)

The Project Approval includes the required construction activities that Council must adhere to and outlines the main requirements for this CEMP. Condition 1/Schedule 5 of the Conditions of Approval sets out the following requirement:

The Proponent shall prepare and implement a Construction Management Plan for the development to be carried out to the satisfaction of the Secretary. The Plan must be approved by the Secretary prior to the commencement of work.

Other approval requirements relevant to this CEMP include:

- Condition 10/ Schedule 3 – Operation of Plant and Equipment
- Condition 3/ Schedule 4 – Security
- Condition 4/ Schedule 4 – Discharge Limits
- Condition 13/ Schedule 4 - Bunding
- Condition 15/ Schedule 4 – Operating Hours
- Condition 16/ Schedule 4 – Noise Limits
- Condition 19,20/Schedule 4 – Dust
- Condition 21/ Schedule 4 – Odour

These conditions outline additional requirements that are applicable to the preparation and performance of this CEMP.

Table 1 Management Plan Requirements

Project Approval Conditions	Plan Section
Condition 10/ Schedule 3 <i>The Proponent shall ensure that all plant and equipment used for the Project is:</i> a) <i>maintained in a proper and efficient condition; and</i> b) <i>operated in a proper and efficient manner.</i>	4.6 5.2
Condition 3/ Schedule 4 The Proponent shall: a) <i>install and maintain a perimeter fence and security gates;</i> b) <i>ensure that the security gates are locked whenever the site is unattended.</i>	4.6 5.2
Condition 4/ Schedule 4 <i>The Proponent shall ensure that all surface water discharges from the site comply with the:</i> a) <i>discharge limits (both volume and quality) set for the development in any EPL; or</i> b) <i>relevant provisions of the POEO Act.</i>	5.6
Condition 15/ Schedule 4 The Proponent shall comply with the operating hours in Section 4.4.	4.4
Condition 16/ Schedule 4 The Proponent shall ensure the noise generated by the project does not exceed the emission limits in Table 4.	5.4
Condition 19,20/Schedule 4 19. <i>All operations and activities occurring at the premises or on a haulage route must be carried out in a manner that will minimise emissions of dust.</i> 20. <i>Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.</i>	5.2 5.5
Condition 21/ Schedule 4 <i>The Proponent shall not cause or permit the emission of offensive odours from the site, as defined under Section 129 of the POEO Act.</i>	5.4

2.2 Legislative and Other Requirements

This CEMP has been prepared in accordance with the Conditions of Approval, and with reference to the requirements provided in the following legislation, guidelines and standards:

- Project Approval (06_0220) under the EP&A Act and other relevant project information provided by Council
- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Waste Avoidance and Resource Recovery Act 2001*
- *Native Vegetation Act 2003*
- *Water Management Act 2000*
- *Work Health and Safety Act 2011*
- *Environmentally Hazardous Chemicals Act 1985*
- *Local Government Act 1993*
- *Threatened Species Conservation Act 1995* (TSC Act)
- *Noxious Weeds Act 1993*
- *Pesticides Act 1999*
- *National Parks and Wildlife Act 1974*
- *Rural Fires Act 1997*
- *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *National Greenhouse and Energy Reporting Act 2007* (NGER Act)

3.0 Roles and Responsibilities

3.1 Role Structure

Figure 2 shows the proposed staffing and structure to be implemented for the construction of the landfill. All staff will be made aware of the manner in which the site is to be constructed and managed to ensure compliance with this CEMP and consent conditions of the Project Approval (as relevant).

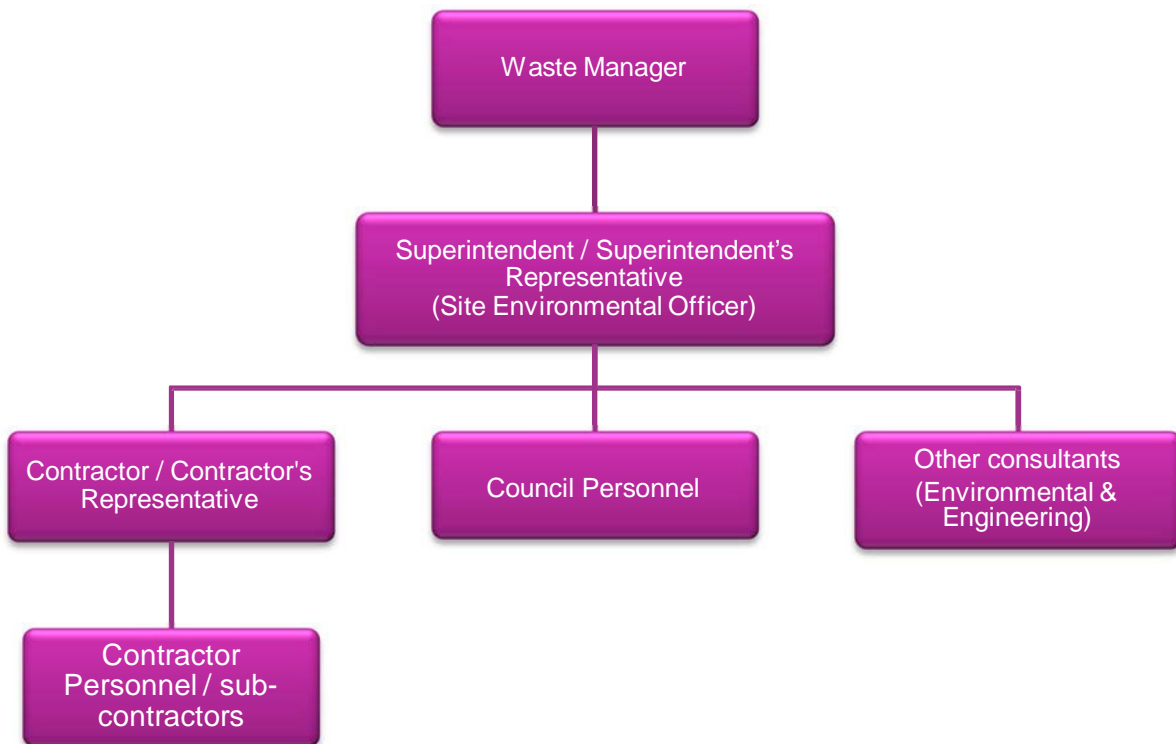


Figure 2 Hierarchy of Responsibility for Implementation of the Construction Environmental Management Plan

3.2 Key Personnel and Responsibilities

The responsibilities for the implementation of the CEMP are shared across the proposed role structure in Figure 2, and are further described in Table 2.

Table 2 Summary of Responsibilities

Person	Responsibilities
Waste Manager	<ul style="list-style-type: none"> - Responsible and accountable for the overall environmental performance of the landfill site and the implementation of the CEMP; - Commit to and lead a positive environmental management culture; - Regularly communicate expectations and ensure works and others understand and comply with the CEMP; - Undertake review of the CEMP as required; - Ensure adequate resources are provided to support the implementation, maintenance and continual improvement of the CEMP; and - Authorise and confirm the implementation of mitigation measures.
Superintendent's Representative	<ul style="list-style-type: none"> - The designated Environment Officer for the duration of construction; - Responsible for the implementation of the CEMP, including undertaking training and toolbox talks; - Conduct monthly inspections to monitor environmental performance and compliance with the CEMP; - Maintain internal records of monitoring; - Collate and maintain records of complaints and respond to complaints; and - Identify non-conformances and notify Waste Manager.
Contractor / Contractor's Representative	<ul style="list-style-type: none"> - Understand and participate in a positive environmental management culture; - Understand and adhere to mitigation measures in the CEMP; - Ensure construction meets the Construction Quality Assurance Plan. - Identify improvements or initiatives for environmental management; - Immediately report incidents and possible harmful environmental conditions; - Identify non-conformances and notify Waste Manager and Superintendent's Representative; and - Supervise, train and manage staff on a daily basis.
Other Consultants (Environmental and engineering)	<ul style="list-style-type: none"> - Understand and adhere to mitigation measures in CEMP; - Identify non-conformances and notify Waste Manager and Superintendent's Representative; - Immediately report incidents and possible harmful environmental conditions; and - Advisory role to Contractor, Sub-Contractors and staff.
Personnel (Council and Contractors)	<ul style="list-style-type: none"> - Understand and adhere to mitigation measures in CEMP; and - Immediately report incidents and possible harmful environmental conditions.

4.0 Construction Activities

4.1 Overview and Staging

The project involves the construction of a landfill comprising five cells, each cell with a maximum volume of 211,000m³. Construction activities associated with the proposed landfill will be undertaken in the following general stages:

- 1) Site preparation works.
- 2) Construction of site services and amenities.
- 3) Cell preparation (excavation and lining).
- 4) Leachate collection system construction.
- 5) Filling and cover (not subject of this CEMP; contained within LEMP).
- 6) Final capping and site remediation (not subject of this CEMP, contained within the Landscape and Rehabilitation Management Plan).

The detailed design has been completed for Cell 1 only, which is the initial cell to be constructed. Cell 1 is anticipated to have a lifespan of 10 – 15 years depending on filling rates during operation. It is intended that this CEMP would be updated as required, as the detailed design for Cells 2 – 5 are completed in future decades.

4.2 Timing and Duration

Construction of Cell 1 will occur first followed by Cells 2, 3, 4 and 5. Construction works for Cell 1 are anticipated to commence from late 2015/early 2016 and be carried out over a total of approximately 10 months.

4.3 Description of Construction Activities

This section describes the construction activities that are the subject of this CEMP::

- 1) Site preparation works
- 2) Construction of site services and amenities.
- 3) Landfill construction works – cell preparation, liner installation, leachate collection system and dirty and clean water drainage system.

4.3.1 Site Preparation Works

Site preparation works will aim to minimise the area to be disturbed and will include the following specific activities:

- Removal of existing fences, where necessary.
- Installation of new fences around the boundary of the site.
- Progressive removal of vegetation, where necessary (for example, to facilitate the installation of new fences).
- Upgrade works at the intersection of the landfill site entrance with Waterfall Way.
- Clearing, grubbing and topsoil stripping.
- Installation of erosion and sediment control measures.

4.3.2 Installation of Site Services and Amenities

The following will be undertaken for the installation of services and amenities:

- Establishment of building infrastructure including site office, and storage compound.
- Installation of power, telephone, sheds, water tanks and septic system.
- Installation of the wheel wash and weighbridge.

4.3.3 Landfill Construction Works

Landfill construction works encompasses earthworks such as excavating areas required for the construction of the landfill cell and associated leachate collection basins ; placing and compacting the landfill clay liner; installing the leachate drainage layer and collection system; and the surface water and dirty and clean water drainage works. The landfill will be constructed in accordance with the Construction Quality Assurance Plan (refer Appendix A). Landfill Cell 1: Excavation and Liner System

Landfill Cells will be progressively constructed, commencing with Cell 1 at the southern (upslope) end of the site to minimise the overall level of disturbance to existing site vegetation. Cell preparation activities will involve the following:

- Excavation of the Cell 1 area.
- Recovery and stockpiling of clay fill materials within the cell footprint suitable for use in the compacted cell liner.
- Recovery and stockpiling of other excess soil material for suitable future use as cover material.
- Preparation of cell foundation including surface grading and profiling works.
- Construction of external perimeter bunds.
- Construction of the landfill cell liner comprising a 900mm thick compacted clay layer with an overlying 2mm thick HDPE layer.

Landfill Cell 1: Leachate Collection System

Construction works for the leachate collection system will involve the following:

- Placement of polyethylene leachate collection pipes across the landfill cell.
- Installation of a 300mm thick leachate drainage layer and protective geofabric.
- Construction of a leachate collection sump at the low point within the cell with a rising main to the Leachate Storage Pond.

Surface Water and Leachate Management System

It is anticipated that the establishment of the surface water and leachate management systems will occur concurrently with other construction activities. Establishment will involve:

- Recovery and stockpiling of clay and earth fill materials within the pond and basin footprint areas suitable for use in the liner and embankment construction.
- Construction of embankments for the Leachate Storage Pond, Sedimentation Basin and Dry Basin, including inlet/outlet drainage works.
- Installation of the Leachate Storage Pond liner comprising a 900mm thick compacted clay layer with an overlying 2mm thick HDPE layer.
- Construction of perimeter clean water drains and an outlet dissipation basins.
- Construction of internal dirty water drains from the landfill to the Sedimentation Basin.
- Stabilisation of the perimeter clean water drains for erosion control.
- Stabilisation of the basin inlet/outlet drainage works.

4.4 Construction Hours

Construction hours for the landfill are limited to those specified in Table 3.

Table 3 Operating Hours

Activity	Day	Hours
Construction	Monday – Friday	7 am – 5 pm
	Saturday	8 am – 1 pm
	Any Other Time	Only with the prior written approval of OEH and subject to any conditions that may be imposed.

4.5 Construction Equipment and Machinery

It is anticipated that the following plant and machinery will be used on site during construction:

- Heavy vehicle trucks for the delivery and removal of construction materials
- Compactors
- Graders
- Excavators
- Dozers
- Scrapers
- Water carts
- Utility vehicles.

All construction equipment and machinery will be regularly inspected and maintained in good condition and operated in a proper and efficient manner.

4.6 Location of Site Facilities and Work Compounds

The locations of site facilities are shown in the General Arrangement Plan (ref. Drawing 60011672-SHT-CI-0011 provided in the CQAP, Appendix A). The work compounds for construction will be determined by the Contractor and are to be specified on a construction site plan.

5.0 Management Measures

5.1 Environmental Training and Awareness

This section outlines the training and awareness activities and tools that will be implemented during construction.

5.1.1 Site Induction and Training

Description

The process for inducting new personnel including contractors onto the site.

Roles

Superintendent's Representative, Contractor's Representative, Personnel.

Process / Implementation

All personnel on site must be suitably qualified and trained in the tasks that are assigned to them during construction.

Before a person is permitted to commence work, including contractors, they will be given a site induction, which includes induction to safety, environment, quality and community content relevant to the site and the construction activities. The induction will ensure that all workers and others are aware of their environmental obligations and required mitigation and management measures within the landfill site.

The induction will be delivered by the Contractor's Representative, or delegate. All visitors to the site are to be given a visitor specific induction.

The site induction will include:

- General site awareness, including site access, hours of work, and any relevant Council policies/rules.
- Familiarisation with the requirements of the CEMP.
- Environmental emergency response training and incident management and reporting process.
- Health and safety measures (including the specific Safety Plan provided by the contractor).
- Familiarisation with site environmental issues and their controls as identified in the CEMP. In particular:
 - Measures pertaining to the Biodiversity Offset Area and key threatened species known to occur on the site (i.e. Little Eagle).
 - Avoidance of GL ISO2 Aboriginal heritage site.
 - Noise minimisation techniques.
 - Sediment and erosion control measures.
 - Environmental emergency response procedures and incident reporting protocols.

Records of all site induction and training carried out will be retained by the Contractor for a minimum of five years and will include details on the following:

- Who was trained/inducted;
- When the person was trained/inducted;
- The name of the supervisor/inductor; and
- A general description of the induction content.

Continuous monitoring will determine the need for any additional or revised training. Re-training will be undertaken if there are any changes to procedures or if any non-conformances are noted by a site inspection, a regulatory authority or public complaint. On-going training and communication will also be provided to ensure that industry best environmental management practices are being followed.

Tools / Reference Documents

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Workplace Health and Safety Induction Protocols

Environmental Control Plans or Maps

General Arrangement Plan (Ref. Drawing 60011672-SHT-CI-0011)

5.1.2 Pre-Start Meetings/Toolbox Talks

Description

The pre-start meeting/toolbox talk is a tool for informing staff of the day's activities, including environmental protection practices, work restrictions and other information that may be relevant to the day's activities.

Roles

Contractor's Representative, Personnel, Consultants

Process / Implementation

The Contractor's Representative will be responsible for preparing and conducting pre-start meetings/toolbox talks for all personnel under their control on a regular basis. They may also seek assistance in preparing and delivering the talks from time to time, e.g. from consultants or other delegates.

Tools / Reference Documents

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

5.1.3 Issue Alerts and Bulletins

Description

Describes the purpose of safety, environment, quality and community alerts and bulletins and how they are to be communicated when received by the project.

Roles

Waste Manager, Superintendent's Representative, Contractor's Representative.

Process / Implementation

Where considered necessary, the Waste Manager will inform the Superintendent's Representative and the Contractor's Representative of relevant incidents that occur in the industry in the form of a memorandum or safety, environment or community alert.

Upon receipt of an alert, the Superintendent's Representative and the Contractor's Representative will communicate lessons learnt to all project personnel, including contractors, through pre-start meetings or toolbox talks.

Bulletins will be used to provide relevant information to all relevant personnel from time to time, where the information is pertinent to activities on site. This information can include:

- Reiteration of best environmental practices (internal and external).
- Changes to the workplace environment, e.g. traffic management.
- Changes to legislation.

Bulletins may be sent out from the Waste Manager or directly from an industry association or regulatory body.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Internal alerts/bulletins

5.1.4 Special Meetings

The Waste Manager may direct additional site meetings to be conducted as required to discuss major problems or deficiencies and to formulate comprehensive solutions.

Records of special meetings will be documented by the Superintendent.

5.2 Site Security and Maintenance

This section outlines the controls that will be implemented to ensure the security and maintain the site, including all plant, machinery and equipment operated and stored within the site.

Description

Management measures to establish the site as a construction work area, to prevent unauthorised access and ensure maintenance of the site is cognisant of environmental issues.

Roles

Superintendent's Representative, Personnel

Process / Implementation

- Site establishment will be carried out as specified in the Construction Quality Assurance Plan (ARLF-LEMP-RP-0011-CAQP).
- Security gates will be locked at all times when the site is unattended.
- The training and induction in Section 5.1 of this CEMP will be followed prior to any personnel being authorised to work on site.
- Any unauthorised entry onto the site is to be classed as an incident and reported in accordance with the reporting procedure outlined in Section 7.2 of this CEMP.
- The Contractor shall ensure that all trucks leaving the site comply with all regulations regarding the covering of loads.
- All vehicles, plant and machinery used on site are to be maintained in a proper and efficient condition.
- All vehicles, plant and machinery are to be operated in a proper and efficient manner consistent with the environmental controls outlined in this CEMP.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Construction Quality Assurance Plan (ARLF-LEMP-RP-0011-CAQP)

Protection of the Environment Operations Act 1997

5.3 Biodiversity

This section outlines the controls that will be implemented to manage biodiversity during construction. The Property Vegetation Plan (PVP) that applies to the site is provided in Appendix B. The Contractor is to incorporate the information and controls within the PVP into all environmental training and awareness controls, and is to act in a way that protects the biodiversity offset areas specified in the PVP at all times.

5.3.1 General Biodiversity Controls

Description

Describes how to manage and control biodiversity impacts during construction of the landfill. Key potential biodiversity issues include impacts to vegetation and listed threatened species.

Roles

Waste Manager, Superintendent's Representative, Contractor's Representative, Personnel, Consultants.

Process / Implementation

The following general flora and fauna management principles will apply:

- Personnel identified above to have knowledge and awareness of the threatened flora and fauna species present within and around the site as well as any pests and weeds that may impact on these species.

- Designing disturbance activities in a manner that minimises impacts on threatened flora and fauna species.
- Engage an accredited Spotter/Catcher to monitor the impact on flora and fauna when clearance activities are being undertaken.
- At other times during construction consulting with an Arborist and/or Ecologist regarding the methodology to be applied should the work impact on flora and fauna.
- Avoiding the clearance of areas not immediately required for construction.
- Installing sediment fences or other appropriately designed structures immediately downslope of all clearance activities prior to the commencement of clearing operations.
- Regularly surveying the site in order to identify whether there are any threatened flora and fauna that may be impacted by particular construction activities on the site.
- In order to preserve the offset area, clearance and other activities associated with the construction of the landfill will only occur within designated areas. The Contractor is to refer to the sites PVP and comply with all measures identified within it.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Biodiversity Offset Management Plan (Ref. Report 22678.38513)

Vegetation Management Plan and Vegetation Clearing Protocol (Ref. Report 23464.62561)

Weed Management Plan (Ref. Report 23464.62571)

Pest Management Plan (Ref. Report 23464.62586)

Native Fauna Management Plan (Ref. Report 23464.62576)

Disease Monitoring Protocol (Ref. Report 23464.62581)

Conservation Property Vegetation Plan (Local Land Services, under the *Native Vegetation Act, 2003*) included as Appendix B.

5.3.2 Clearing of Vegetation

Description

Describes the measures to be taken to minimise the impacts of vegetation clearance and to ensure vegetation clearance is undertaken in accordance with the Biodiversity Offset Management Plan.

Roles

Waste Manager, Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- All environmental controls will put in place prior to vegetation clearance, and where possible, water diverted to catch drains or sediment basins.
- Areas to be cleared will be delineated prior to clearance.
- A two-stage approach to clearing will be applied:
 1. Under scrubbing (i.e. ground vegetation and shrubs) and non-habitat /non-hollow bearing trees, followed by
 2. Overstorey (i.e. habitat and hollow bearing trees)
- The extent of clearing is to be minimised where possible with initial clearing restricted to Cell 1, ponds, basins and ancillary infrastructure.
- No vegetation clearance will occur until the initial vegetation offset area has been identified and the establishment of artificial nest boxes and relocation of stags has been carried out.
- Areas occupied by *Eucalyptus nicholii* and *E. elliptica* will be clearly marked prior to any clearing or construction works. A minimum buffer of at least 2 metres will be designated around these species and these areas are to be avoided during construction.

- Prior to any vegetation clearance, the large Yellow Box tree in the southwest area of the site will be inspected to determine if there is a Little Eagle nest present. If a nest is present, the following procedures will be followed:
 - 1) If necessary remove the nest tree in the non-breeding season after fledgling has left the nest (February-July);
 - 2) Clear the development site in stages, gradually approaching the nest tree before the breeding season (August-January);
 - 3) Avoid highly disturbing activities within 100m of the nest in the breeding season (August- January). If impractical, consult with an ecologist for alternative solutions;
 - 4) Retain the 2009 nest tree with a surrounding 50m buffer or, if retention is impractical, ensure a tree with similar characteristics is available in the offset area and proceed with the above measures.

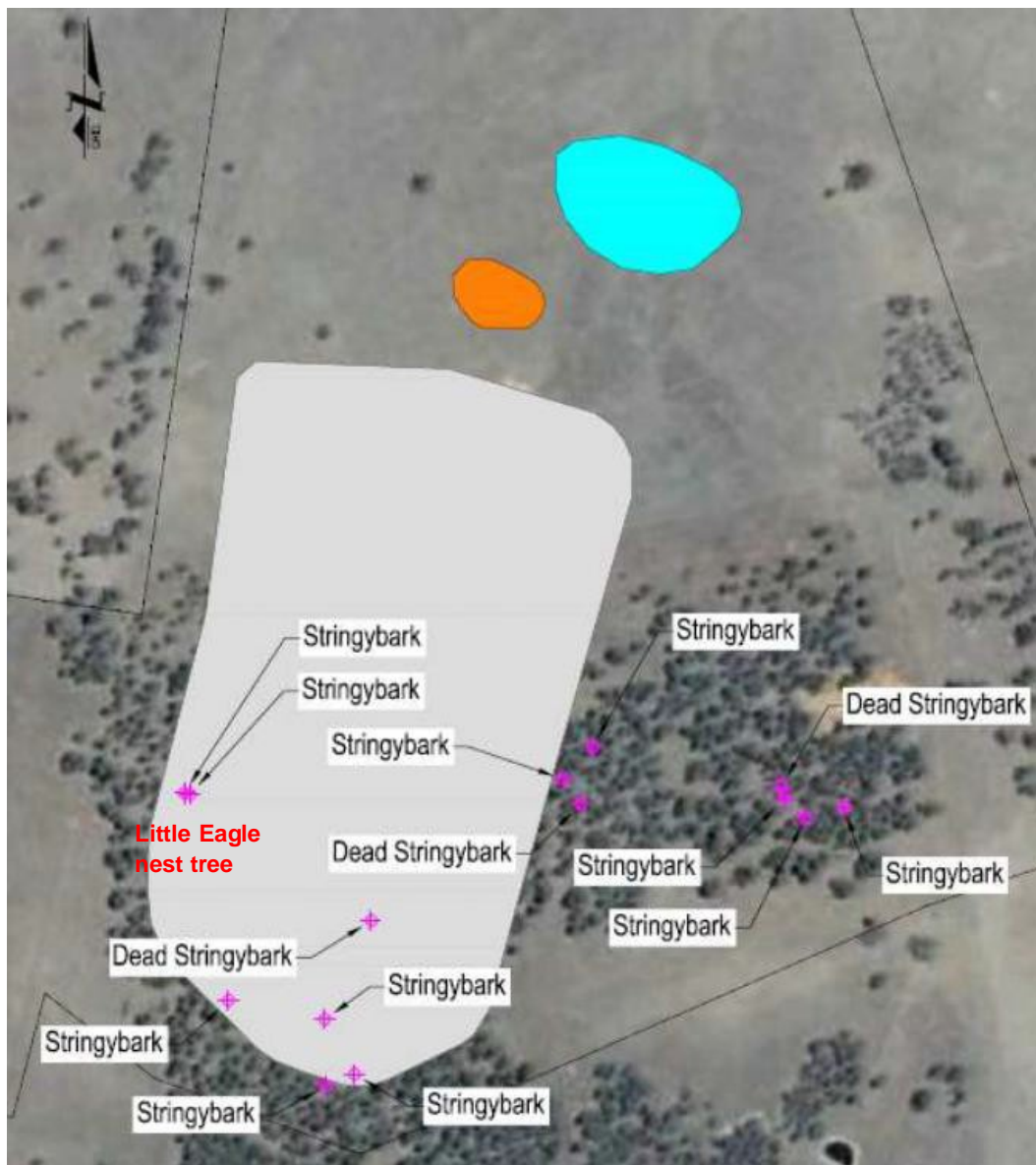


Figure 3 Little Eagle nest tree location

- Where habitat trees are to be cleared, prior to felling, hollow trees will be inspected for fauna habitation. A project ecologist, a spotter/catcher will be on-site to supervise the felling of hollow trees.
- Dead trees and logs within the preserved woodlands that have not been pushed into piles will be retained.
- Any felled trees will be left overnight and inspected by a suitably qualified person prior to being relocated.

- After felling, all logs and hollow bearing trees will be relocated to the offset area as single logs. All logs with a diameter of <20cm will be relocated into the designated offset area after clearing.
- Inspections will be carried out weekly during clearing to ensure the vegetation clearance protocol is being followed.
- The following measures will be applied for works around trees:
 - For those trees to be retained on site, construction works will avoid the area around the tree classified as the tree protection zone (TPZ). Tree protection will be undertaken in accordance with Australian Standard AS4970 *Protection of trees on development sites*.
 - Branches that may obstruct work will be tied back.
 - Any tree trimming required will be reported to the Contractor's Representative / Waste Manager who will engage an ecologist or arborist if required.
 - Any unauthorised tree damage will be reported to the Contractor's Representative / Waste Manager.
- Any excavation required around trees will be carried out as follows to avoid damage to roots:
 - Where possible, drainage will be re-designed to avoid impact within dripline of retained vegetation.
 - After set out of the works, consultation will be carried out with the Superintendent's Representative for advice prior to excavation.
 - Excavation will occur outside the dripline of trees where possible.
 - Any works necessary within the dripline and Critical Root Zone will be carried out either by hand trenching to avoid machinery hitting roots or by under boring if underground pipes are to be installed.
 - All works carried out near trees will be carried out with caution and roots greater than 50mm in diameter will be identified and monitored. Roots greater than 50mm in diameter must not be damaged unless approved by a suitably qualified person, after consultation with an arborist.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Vegetation Management Plan and Vegetation Clearing Protocol (Ref. Report 23464.62561)

5.3.3 Native Fauna Management

Description

Describes the measures to be taken to manage native fauna on site and to ensure works are undertaken in accordance with the Biodiversity Offset Management Plan.

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- No domestic animals will be permitted on site.
- A site speed limit of 40km/hour will apply to vehicles during construction.
- Any sightings of native fauna (including threatened and key species) will be recorded and provided to the Superintendent's Representative or Waste Manager. Records will include: species (if known), sex, location, weather conditions, nearby vegetation type, reliability of identification, date/time of sighting and name of observer.
- Vehicles and machinery are to yield right of way to wildlife.
- Any required lighting devices will be positioned and shielded (where possible) to ensure that they do not cause any glare or light nuisance beyond the required work area.
- External lighting will be, where possible, red or low-pressure sodium lights or LEDs. Bright white lights are to be avoided.

- Control of invasive species will be carried out and conducted in accordance with the Pest Management Plan (Ref. Report 23464.62586). Target species include foxes, cats, rabbits and non-native beehives.
- Artificial nest boxes (appropriate to the fauna species in the area) will be installed in the offset areas prior to construction to improve habitat quality and provide refuge for displaced animals.
- Spotter/Catcher 'Standard Operating Procedures' will be followed during any vegetation clearance:
 1. Reduction of wildlife load prior to clearing, i.e. fauna trapping, erection of fencing, use of fauna aversion techniques and manual/pharmacological capture and removal of fauna.
 2. A pre-clearance survey report, including date/time, weather conditions, methods to be applied during pre-clearance surveys/clearance operations, location of fauna within the footprint and release locations, hollow bearing tree register and effectiveness of measures applied.
- A protocol will be established for responding to the detection of native fauna present in trees and log piles prior to clearing.
- The Little Eagle nest tree will be retained if possible. Construction will approach the nest site gradually from a more distant starting point to minimise the impact.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Native Fauna Management Plan (Ref. Report 23464.62576)

5.3.4 Weed Management

Description

Describes the measures to be taken to control the spread of weeds during construction and to ensure weed management is undertaken in accordance with the Biodiversity Offset Management Plan.

Roles

Waste Manager, Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- Existing weed infestations, in particular, blackberry and hawthorn, will be controlled on site using a combination of chemical and mechanical removal methods as described in the Weed Management Plan (EnviroAg Document #2346462571).
- Strict enforcement of wheel wash facilities will be applied to all vehicles leaving the site to prevent inadvertent transport of weed seeds attached to mud and or other plant material adhering to the underside of vehicles.
- Local topsoil and mulch stockpiles, for use in landscaping and rehabilitation works, will be located within the landfill footprint in areas already cleared of vegetation.
- The volume of imported topsoil will be minimised to reduce the risk of introducing weed propagules.
- Drainage and run-off will be controlled to prevent the spread of weed seeds or high levels of nutrients.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Weed Management Plan (Ref. Report 23464.62571) and attached Weed Control Procedures

5.4 Noise and Vibration

This section outlines the controls that will be implemented to manage noise and vibration during construction.

Description

The purpose of this section is to describe how to manage and control noise and vibration impacts associated with the construction of the landfill.

Noise generated by construction must not exceed levels indicated by the emission limits for construction in Table 4.

Table 4 Noise Emission Limits dB(A) set by Project Approval

Receiver	Limit -
Residences on privately-owned land during construction	$L_{Aeq(15\text{ minute})}$ 40dB(A)

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- Toolbox talks will be carried out on the topic of environmental requirements relating to noise and the location of the nearest sensitive receivers.
- Construction will only take place during normal daytime construction hours noted in Section 4.4.
- Workers will be regularly trained to use equipment in ways to minimise noise.
- The offset distance between noisy plant items and nearby noise sensitive receivers will be maximised.
- The co-occurrence of noisy plant working close together and adjacent to sensitive receivers will be avoided.
- Equipment will be oriented away from sensitive receivers where possible.
- Loading and unloading will be carried out away from noise sensitive areas.
- Vehicles required on site will not 'queue' outside the worksite prior to the morning start time.
- All construction vehicles will enter and leave the site in accordance with site entry controls.
- Trucks on site will not be left standing with engines idling.
- All equipment including bulldozers, graders, excavators and trucks will have all reasonable and feasible noise controls fitted to reduce noise emissions.
- The surrounding community will be notified via letter drops and/or local media announcements of any forthcoming unusual construction activities.
- Affected residences will be consulted prior to and throughout the construction phase.
- Any complaints received will be provided to the Superintendent's Representative or the Waste Manager who will action the complaints handling and response protocol.

Tools

Construction Environmental Management Plan(ARLF-LEMP-RP-0002-CEMP)

Noise Management Plan (ARLF-LEMP-RP-0007-NMP)

5.5 Air Quality and Dust Control

This section outlines the controls that will be implemented to manage air quality and dust during construction.

Description

The process for managing and controlling air quality impacts during construction works associated with the landfill. Air quality will be managed in accordance with the POEO Act 1997.

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- Water sprays and/or water carts will be used as required across all construction areas to suppress dust. If necessary, the water spray equipment will be on site and available for use from the first mobilisation until practical completion.
- Water spraying will be carried out to suppress dust generated on unsealed roads and will be employed at the site where required in areas of fine soils during windy conditions.
- Dust gauges will be installed across the site in accordance with the site's Air Quality Management and Monitoring Plan (ARLF-LEMP-RP-0006-AQ) and monitoring will be undertaken as required by the plan.
- Truck movements on-site will be limited and truck speed will be kept as low as practicable.
- The Contractor shall ensure that all trucks leaving the site comply with all regulations regarding the covering of loads.
- The wheel-wash will be used to remove soil/contaminated material from site vehicles prior to leaving the site.
- All construction-related access roads not retained for operational purposes and any other areas cleared for the construction works (e.g. for stockpiles or hydrology management) will be ripped and re-vegetated prior to the landfill becoming operational.
- Any complaints received will be provided to the Superintendent's Representative or the Waste Manager who will action the complaints handling and response protocol.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Air Quality Management and Monitoring Plan (ARLF-LEMP-RP-0006-AQ)

Protection of the Environment Operations Act 1997

AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air: Guide to siting air monitoring equipment.

5.6 Water Quality, Erosion and Sediment Control

This section outlines the controls that will be implemented to manage water quality, erosion and sedimentation during construction.

Description

Management measures to limit sediment run-off during construction works. All measures will be implemented in accordance with the requirements of the *Managing Urban Stormwater: Soils and Construction* (2004)

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

- Disturbance of the existing topsoil and vegetation will be delayed until immediately before earthworks occur.
- Areas of disturbance will be minimised, wherever feasible.
- Vegetation clearance and soil disturbance will be confined to those areas required for the construction of the landfill, ponds and basins, carpark, access road and amenity facilities. Vegetation clearance will be limited to the minimum required for the purpose of construction.
- The access road onto the site will be stabilised and a 7mm bitumen seal applied as soon as possible in order to minimise soil disturbance and dust generation during construction.
- During the initial construction period, suitable erosion and sediment control measures will be installed, including a perimeter diversion drains/bunds and sediment fences around the perimeter of the site and soil stockpiles as shown on the Erosion and Sediment Control Plan (60011672-SHT-CI-0018). Sediment fences will be installed perpendicular to the direction of surface water runoff flow and will be appropriately maintained in order to ensure optimal sediment trapping/removal at all times. Appropriate ongoing measures will also be applied during the progressive development and ultimate closure of each new landfill cell.
- Appropriate landscaping measures will be provided adjacent to the new access road, including the planting of turf, grass or hydroseeding during construction, in order to stabilise the embankments created.
- Clean surface runoff water from upstream around the site will be diverted in accordance with the Drainage Plan (60011672-SHT-CI-0301).
- Soil disturbance activities will be minimised during wet weather.
- Vehicular access to authorized entry/exits points will be restricted and controls installed, including a wheel wash, to reduce the export of soil attached to excavators and truck tyres exiting the site.
- Access to sensitive areas that do not require land disturbance will be restricted using barrier fences as shown on the Erosion and Sediment Control Plan (60011672-SHT-CI-0018).
- The culverts within the two creek locations along the access road will be installed in a period when the creeks are dry and when significant rainfall isn't forecast for the construction period.
- The following erosion and sediment control structures will be used on site and laid out in accordance with the Erosion and Sediment Control Plan (Ref. Drawing 60011672-SHT-CI-0018 and Ref. Drawing 60011672-SHT-CI-0019):
 - Sediment fences to contain the coarser sediment fraction (including aggregated fines) as near to as possible to their source. The height of the fence will be approximately 600 – 900 mm (depending on the type of the fence to be installed). The fences will be checked after each storm for damage or clogging by silt or debris and appropriate action will be taken
 - Barrier fences to define those areas on site that should not be entered to avoid unnecessary soil/land disturbance. Prior permission from the site engineer will be required before entering any of these areas. The fence will be 1200 mm high and constructed of yellow or orange high visibility clearing limits fence material with yellow safety caps on all exposed posts.
 - Weed free straw bale sediment filters wrapped in geotextile fabric, which will be installed instead of sediment fences, at the discretion of the Superintendent's Representative, to contain the coarser sediment fraction (including aggregated fines).

- Diversion drains, banks or channels to divert upstream runoff away from cleared and construction areas. The final stormwater diversion drains as shown on the Drainage Plan (Ref. 60011672-SHT-CI-0301) will be used for this purpose where possible. Others will be constructed at the discretion of the Superintendent's Representative as required.
 - Gravel protection cover for temporary access tracks.
 - A wheel wash facility.
- Other site controls will be applied as needed and as described in the Blue Book (*Managing Urban Stormwater: Soils and Construction, 2004*).
 - A permanent Sedimentation Basin is required for the operation of the landfill. However it will be constructed as early as possible to begin utilising the pond from an early stage in the landfill construction process. The Sedimentation Basin will be constructed in accordance with the Sediment Basin Layout Plan (Ref. Drawing 60011672-SHT-CI-0023), Sedimentation Basin Typical Details (Ref. Drawing 60011672-SHT-CI-0141) and Sedimentation Basin Typical Details (Ref. Drawing 60011672-SHT-CI-0142).
 - The permanent Outlet Dissipation Basins will also be constructed as early as possible to capture sediments from the clean water drains prior to channel lining and stabilisation works.
 - The topsoil removed during site stripping will be stockpiled and preserved for reinstatement. The stockpiled topsoil will be re-spread to a minimum depth of 150mm over those areas of the site to be rehabilitated.
 - Temporary stockpiles will be protected from erosion.
 - Stockpiles will be constructed away from hazardous areas, particularly likely areas of concentrated water flows.
 - On completion of construction activities stockpiles will be stabilised using an approved grass seed mixture. Additionally, a light bitumen emulsion may be used to assist in stabilisation and to act as a growing medium.
 - All excavated material and fill will be stockpiled in designated stockpile areas at the project site as shown on the Material Stockpile Plan (Ref. Drawing 60011672-SHT-CI-0017). Material will be stockpiled according to type, i.e. clay for embankment construction or liner formation, material suitable for daily cover and unsuitable material and will vary in volume, height and area.
 - A temporary wheel wash facility will be established as soon as practical to facilitate construction. The wheel wash will be designed and installed by the Contractor subject to approval by Council. It will be superseded by a permanent wheel wash during the final phase of construction.
 - Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.
 - When clearing vegetation occupying the mid-slopes of the site, bunding (or similar) will be employed to minimise surface water run-on onto the cleared areas.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Erosion and Sediment Control Plan (Ref. Drawing 60011672-SHT-CI-0018)

Erosion and Sediment Control Details (Ref. Drawing 60011672-SHT-CI-0019)

Drainage Plan (Ref. Drawing 60011672-SHT-CI-0301)

Drainage Typical Details Plan (Ref. Drawing 60011672-SHT-CI-0341)

Sediment Basin Layout Plan (Ref. Drawing 60011672-SHT-CI-0023)

Sedimentation Basin Typical Details (Ref. 60011672-SHT-CI-0141)

Sedimentation Basin Typical Details (Ref. 60011672-SHT-CI-0142)

Material Stockpile Plan (Ref. Drawing 60011672-SHT-CI-0017)

Managing Urban Stormwater: Soils and Construction (2004)

5.7 Waste Management and Storage of Hazardous Materials

This section outlines the controls that will be implemented during construction to manage waste and hazardous materials.

Description

Processes to control waste associated with construction works and to control hazardous substances and dangerous goods used during construction. Waste management will be addressed on a daily basis during construction to ensure waste or other hazardous materials does not disperse outside of the site (including waterways), create a fire risk or end up in biodiversity offset areas.

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

Waste

- All waste generated during construction will be reused and recycled if possible. All other waste (excluding steel) will be disposed of in bins located on-site. Daily inspections will be undertaken on all waste collection areas.
- Windblown litter that leaves the site will be retrieved.
- All vehicles will be cleaned at the wheel wash facility prior to leaving the site.
- Scrap metal and metal offcuts will be collected for recycling.
- The appropriate number and type of collection bins will be provided on-site.
- Waste for external disposal will be transported to the Armidale Waste Management Facility on Long Swamp Road.
- Disposal of hazardous wastes will be carried out according to NSW Government requirements.

Hazardous Substances and Dangerous Goods

- All current MSDS will be made available for any hazardous substance or dangerous goods stored and handled at the site.
- Prior to bringing any hazardous material onto the site, licensing requirements to store the material will be determined from the:
 - Australian Standard for Storage and Handling of Hazardous Substances (AS1940-2004)
 - Australian Dangerous Goods Code
 - Material Safety Data Sheets (MSDS)
- Quantities of hazardous substances stored on site will be kept to a minimum.
- Spill containment and other safety equipment will be installed, including bunds around storage tanks, fire extinguishers and drains.
- When transferring dangerous goods, measures will be taken to control spills, overflows and leaks, minimise static electricity and control vapour generation. If significant quantities are being transported, local authorities will be notified in case of an emergency situation or spill during transit.
- Flammable liquids will be stored within a bunded area, of 110% capacity of the volume of the liquids stored. No smoking will be permitted in the vicinity of the flammable liquids storage area.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Landfill Environmental Management Plan (ARLF-LEMP-RP-0001)

Australian Standard for Storage and Handling of Hazardous Substances (AS1940-2004)

Australian Dangerous Goods Code

Material Safety Data Sheets (MSDS)

5.8 Heritage

This section outlines the controls that will be implemented during construction to manage heritage.

Description

Process to manage and control heritage impacts associated with construction works for the landfill site. Two sites have been previously recorded in proximity to or within the site as shown in Table 5 and Figure 4. GL ISO2 is located within the drainage line near the landfill access road. GL ISO1 is located outside of the site and will be protected by the boundary fence.

Table 5 Existing sites identified within the Armidale Landfill Facility boundaries

AHIMS #	Site Name	Description	Coordinates (AMG, zone 56)	
			Eastings	Northings
21-4-0095	GL ISO2	Isolated silcrete flake (dimensions of 31 x 46 x 15 mm)	383235	6618414
21-4-0095	GL ISO1	Isolated silcrete flake (dimensions of 62 x 52 x 24 mm)	383143	6619426

Roles

Superintendent's Representative, Contractor's Representative, Personnel

Process / Implementation

All work is to be undertaken in accordance with the Aboriginal Heritage Management Plan (AHMP) (ARLF-LEMP-RP-0004-AHMP). The management process includes the following actions:

- The identified site (GL ISO2) will be fenced off and appropriately signed. Metal signage will be affixed to the fencing panels at the site and will include the following words as a minimum: 'Environmentally Sensitive Area, Exclusion Zone, Waste Manager (contact details)'. The fence will comprise a series of vertical posts, chain link, or other suitable barrier to ensure long-term protection of the site.
- Fencing will be undertaken prior to any construction activities occurring on the site. An archaeologist and at least two Aboriginal representatives will be engaged to determine the archaeological site extents for fencing.
- Fencing of GL ISO2 will consist of a circle of vertical posts at a radius of 10 metres from artefact GLISO2.
- The fenced off area will be an exclusion zone and no personnel will be permitted to access the area.
- Care will be taken when undertaking clearance for the boundary fence in the area of GLISO1.
- Aboriginal Heritage Induction and Cultural Awareness Training will be carried out prior to construction commencing on the site, making staff aware of existing sites and the process in the event new finds are discovered.
- In the event personnel encounter or unearth any bone or stone artefacts, discrete distributions of shell or any other objects of potential cultural association during earthmoving or other activities, work will cease immediately in the area of the find. A qualified archaeologist will be engaged to make an assessment of the object(s) and advise on an appropriate course of action to be undertaken prior to any further work being conducted within the vicinity of that location.

Tools

Construction Environmental Management Plan (ARLF-LEMP-RP-0002-CEMP)

Aboriginal Heritage Management Plan (AHMP) (ARLF-LEMP-RP-0004-AHMP)

NSW Department of Environment & Conservation. (2006). *Manual for the Identification of Aboriginal Remains*. South Sydney: NSW Department of Environment and Conservation.

NSW Heritage Office. (1998). *Skeletal Remains: Guidelines for the management of human skeletal remains under the Heritage Act 1977*. Parramatta: NSW Heritage Office.

NSW National Parks and Wildlife Service. (1997). *Aboriginal Cultural Heritage Standards and Guidelines Kit (First.)*. Sydney: NSW National Parks and Wildlife Service.



Figure 4 Identified Aboriginal Heritage Sites recorded near the Armidale Landfill facility

6.0 Monitoring

6.1 Site Inspections

Description

Site inspections will be used to identify workplace hazards and deficiencies and assess safety and environmental compliance against regulatory requirements and best practice processes and initiatives.

Roles

Waste Manager, Superintendent's Representative, Personnel

Process / Implementation

Daily Monitoring / Inspections

- All personnel will conduct a daily visual site inspection of their work area and report any hazards to the Contractor's Representative.
- The Contractor's Representative will conduct a daily visual site inspection to ensure that any potential hazards and deficiencies are identified, assessed and controlled as required. The inspection will include:
 - Safety and health issues
 - Environmental issues (fauna, flora, hazardous substances, air quality)
 - Working practices
 - Effectiveness of erosion and sediment control measures.
- Inspections will be recorded in a Daily Site Report / Diary.
- Any hazards identified during the inspection will be managed and recorded.

Weekly Monitoring / Inspections

- Weekly inspections will be undertaken by the Superintendent's Representative and will include any hazards and/or management measure deficiencies identified during the daily inspections.
- The Weekly Site Inspection Checklist will be completed as a record of the inspection.

Monthly Monitoring / Inspections

- The Superintendent's Representative or the Waste Manager will perform a monthly inspection which details work practices, environmental compliance and adherence to this CEMP.

Tools

Construction Environment Management Plan (ARLF-LEMP-RP-0002-CEMP)

Daily Site Report / Diary

Weekly Site Inspection Checklist

6.2 Emissions Monitoring

Description

Describes the monitoring of noise and air quality emissions required during construction.

Roles

Superintendent's Representative, Accredited Consultant

Process / Implementation

- Equipment Noise Audit - Noise emission levels of all critical items of equipment would be checked for compliance with appropriate noise limits.
- Monitoring of weather conditions will be carried out by the Superintendent's Representative, so that activities with dust generation potential can be halted under extreme adverse weather circumstances.
- Monitoring of dust gauges will be undertaken in accordance with the Air Quality Management and Monitoring Plan (ARLF-LEMP-RP-0006-AQ).
- Should significant dust be generated during construction activities or if a complaint is made, an accredited consultant will monitor dust deposition using DustTrak to measure immediate particular matter concentration to ensure compliance with site air quality criteria. Remedial measures will be implemented should exceedances be noted.

Tools

Construction Environment Management Plan (ARLF-LEMP-RP-0002-CEMP)

Air Quality Management and Monitoring Plan (ARLF-LEMP-RP-0006-AQ)

Noise Management Plan (ARLF-LEMP-RP-0007-NMP)

7.0 Complaints Handling and Incident Response

7.1 Complaints Handling

Description

The process for handling and managing complaints during construction works associated with the landfill.

Roles

Waste Manager, Superintendent's Representative, Contractor's Representative

Process / Implementation

- The surrounding community will be notified via letter drops and/or local media announcements of any forthcoming unusual construction activities prior to construction commencing.
- The community will be consulted prior to and throughout the construction phase.
- Council or the Contractor will provide a telephone hotline for the reporting of complaints or emergencies. Complaints received by the hotline will be recorded and immediately addressed.
- When a complaint is received, the following information will be recorded:
 - Details of the complainant, including the complainant's name, address and contact number.
 - A summary of the complaint: complainant location, time of day, notes regarding the event, notes regarding the duration (seconds, minutes, hours) of the period when the issue was perceived.
 - Details of the response to the complaint.
 - Details of any construction activities that were occurring at the time of the complaint.
- Following a complaint, the Superintendent's Representative will be responsible for investigating the event and implementing any remedial measures required, including supplementary monitoring and corrective action.

The Superintendent's Representative will record details of all complaints received in an up-to-date log to ensure that a response is provided to the complainant within 24 hours. The corrective action may involve supplementary monitoring to identify the source of the non-conformance, and/or may involve modification of construction or operational techniques to avoid any recurrence or to minimise its adverse effects.

Tools

Complaint Register

Contact Register:

Contact Name	Phone
Environment Protection Authority (EPA) Environment Line	131 555
NSW Health (Local Public Health Unit)	(02) 6764 8000
WorkCover	13 10 50
Fire and Rescue NSW	000
Armidale-Dumaresq Council	(02) 6770 3600

7.2 Incident Response Procedures

7.2.1 Environmental Incident

Person Discovering Incident

1) Contact the Superintendent's Representative and/or the Contractor's Representative and inform them of:

- the nature of the incident, for example:
 - Ground water contamination
 - Fire in incoming load or on site
 - Chemical spill
 - Oil / fuel spill
 - Failure of hazardous material containment tanks / bund / storage
 - Odour
 - Dust
- the exact location of the incident.

Incident Notification

1) Small Area / Minor Incidents

- Incidents such as small chemical spills will be notified immediately to the Superintendent's Representative and/or the Contractor's Representative.
- These incidents will generally not require the notification of outside agencies.
- An incident report notification form will be completed.

2) Major Incident

A major incident is where material harm to the environment is caused or threatened. In this instance the Superintendent's Representative and/or the Contractor's Representative will:

- Notify the:
 - EPA (131 555)
 - NSW Health via the local Public Health Unit
 - WorkCover
 - Armidale Dumaresq Council (Environmental Services)
 - Fire and Rescue NSW if not called for initial emergency response.
- Complete an incident report notification form.
- Within three months of the incident, review and if necessary revise the Construction Environmental Management Plan.

Tools

Construction Environment Management Plan (ARLF-LEMP-RP-0002-CEMP)

Council Incident Report Notification Forms

Council Pollution Incident Response Management Plan

8.0 CEMP review

This document, the Construction Environmental Management Plan, will be subject to review as per the relevant project approval conditions. Within three months of the submission of any report submitted to the Secretary concerning landfill management, a review and if necessary adjustment of this CEMP is required, to the satisfaction of the Secretary.

The CEMP is a live document and will be updated as required.

Appendix A

Construction Quality Assurance Plan (CQAP)

Appendix A Construction Quality Assurance Plan (CQAP)

Appendix B

Property Vegetation Plan for Armidale Regional Landfill

Appendix B Property Vegetation Plan for Armidale Regional Landfill