

# Appendix K – Contamination assessment





# SITA Australia Pty Ltd

## Lucas Heights Resource Recover Park Project

### Contamination Assessment

August 2015



# Executive summary

## Background

SITA Australia (SITA) is proposing a number of activities at the Lucas Heights Resource Recovery Park (LHRRP) in Lucas Heights. This report has been prepared by GHD Pty Ltd to provide information on the current and historical setting of the LHRRP in order to identify the potential for contamination to pose a constraint to the areas proposed to be developed.

The LHRRP consists of approximately 205 hectares (ha) in two ownerships. 89 ha is owned by SITA and 116 ha owned by Australian Nuclear Science and Technology Organisation (ANSTO) and leased to SITA for waste management or other agreed purposes. The proposal includes the following key activities:

- Reprofilling of existing landfill areas to provide up to 8.3 million cubic metres of additional landfill airspace capacity
- Relocation and expansion of the existing garden organics (GO) facility
- Construction and operation of a fully enclosed advanced resource recovery technology (ARRT) facility on the western side of the LHRRP site adjacent to the GO facility
- Creation of a community parkland for future passive recreation following site closure

This report was developed with consideration of *State Environmental Planning Policy No. 55 - Remediation of Land 1998* under the *Environmental Planning and Assessment Act 1979*.

## Scope of this report

Considering the GO and ARRT facilities as well as the broader landfill area, the following was undertaken:

- Review of historical aerial photography to assess historical land uses and historic potentially contaminating activities
- Search of EPA contaminated land and licensing records
- Review of published information on site setting in terms of sensitivity to contamination (geology, topography, hydrogeology)
- Review of WorkCover NSW records in respect of any dangerous goods stored at LHRRP.
- Based on information gathered, development of conclusions and recommendations.

## Summary of key findings

Based on the findings of this limited Contaminated Site Assessment, and in accordance with the limitations presented in Chapter 7, the following conclusions and recommendations have been made:

- The existing area containing the landfill is considered to be contaminated, as it is filled with waste. However this contamination is managed by: lining of the newer landfill cells, suitable existing geology (all cells), landfill gas extraction, active management of leachate and monitoring of groundwater within the LHRRP, and intermediate cover placed over the completed landfill cells. These measures prevent site occupants from coming into contact with contaminated material, and also prevent the surrounding environment from being adversely affected by landfilled waste material.

- The area proposed for landfill reprofiling is known to contain landfilled general solid and special waste as it is an active landfill that has been operating for many years. Given the current land use of majority of this area as a landfill and the detailed management requirements currently in place, the landfill area is considered suitable for the proposed development however the nature of potential contaminants encountered during development is unclear. A detailed site inspection is recommended to identify any visual or olfactory signs of potential contamination on the GO/ARRT facility areas.
- The proposed GO/ARRT facility area is currently undeveloped and comprises bushland containing a number of unsealed tracks traversing the area. There is no indication that the existing landfilling activities have impacted on this area.
- SICTA, located north of the proposed GO/ARRT facility area, is possibly subject to lead contamination in the soil. Target soil sampling and subsequent lead analysis is recommended on the proposed ARRT facility area to evaluate potential risks and assist with waste classification of materials in the event that disposal of materials is required during the works. A detailed plan for testing would be required prior to construction of the ARRT facility. Any remedial plans would be developed approved by the appropriate agencies prior to the construction of the ARRT facility.
- Potentially contaminating land use activities were not noted on the GO facility and ARRT facility area during previous inspections undertaken by GHD.

### Recommendations

The following recommendations are made:

- Targeted soil sampling and subsequent lead analysis should be conducted on the future ARRT facility area to assess suitability from human health and environmental perspectives and provide waste classification for waste material generated during excavation works. A detailed plan for testing should be prepared prior to construction of the ARRT facility . Should excess levels of lead be identified, a plan (including specific remediation measures if required) should be developed in accordance with regulatory requirements by an appropriately qualified Environmental Consultant.
- As recommended in the groundwater study, a series of monitoring wells should be installed around the GO/ARRT facility prior to construction to monitor potential landfill gas generation and groundwater conditions.
- A detailed site inspection should be undertaken in conjunction with the soil sampling and well installation to identify any visual or olfactory signs of potential contamination on the GO/ARRT facility areas, primarily in the form of stockpiled materials or previously unknown land use activities. During the inspection, the nature and condition of the pond should be documented. Should the pond require draining, water samples should be collected to allow appropriate management to be arranged. Should rubbish or contaminant indicators be identified on the proposal site, soil sampling should be undertaken to characterise the potential risk prior to development.
- During development works, if unexpected material (including waste materials or evidence of filling) is encountered, it is recommended that advice be sought from an appropriately qualified Environmental Consultant in regards to the management of this material.
- To minimise water quality impacts associated with ARRT/GO facility construction, appropriate site management practices and emergency response procedures should be developed prior to construction and would be detailed in a construction and environmental management plan (CEMP).

- If required by the planning authorities, a Statutory Site Audit report should be prepared to approve any remediation works required to make the land suitable for construction of the ARRT or GO facilities. Until detailed design work has been completed, the extent of remediation works required would not be known, so preparation of this report should be delayed until this work has been completed.

## Conclusions

The overall conclusion of this study is that the proposal site is suitable for its intended future uses, which is for landfilling/reprofiling of the existing surfaces, and construction and operation of the ARRT and GO facilities, followed by decommissioning of these facilities and landscaping to create a community parkland.

Assuming the capping layer remains in place and is maintained and that the Closure Plan and post-closure monitoring programs are appropriately implemented, it is unlikely that future users of the park would come into contact with the contaminated material that underlies the LHRRP site.

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# Glossary

Term	Definition
ANSTO	Australian Nuclear Science and Technology Organisation
ARRT facility	Advanced Resource Recovery Technology facility
CSM	Conceptual Site Model
Disturbed Runoff	Runoff from unsealed areas where mobilisation of sediment is likely
EIS	Environmental Impact Statement
EPA	New South Wales Environment Protection Authority and any successor body
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
Currently approved landform	The currently approved landform heights and contours outlined in the 1999 EIS
GIS	Geographic Information Systems
GO facility	The Garden Organics facility at LHRRP, that undertakes composting of waste including green and garden waste, but excluding waste types such as food waste and biosolids
Landform reprofiling	Proposed changes to currently approved landform at the LHRRP.
LHRRP	Lucas Heights Resource Recovery Park
Mitigation	The application of techniques to reduce environmental impacts arising from the proposal
OEMP	Operational Environment Management Plan and all relevant future documents, these would be provided for the landfill, GO and ARRT and would detail how these projects can be managed to meet the environmental outcomes for the site
PCYC Mini-Bike Club	The mini-bike club operated by the Police and Community Youth Clubs NSW Limited (PCYC).
SSC	Sutherland Shire Council
SEAR	Secretary's Environmental Assessment Requirements (formerly known as Director-General's Requirements or DGRs)
SICTA	Sydney International Clay Target Association and any successor body
SITA	SembSITA Australia Pty Ltd (SembSITA) is the holding company for the SITA Australia (SITA) group of companies in Australia. SembSITA is the parent company of both SITA and WSN Environmental Solutions Pty Ltd (WSN). WSN owns part of the land on which the LHRRP is situated, and leases the remainder from ANSTO. SITA holds the environmental protection licence (EPL), and so is the operator of the facilities at LHRRP. For simplicity, the term 'SITA' is used to refer to all of these organisations in this report.

# 1. Introduction

## 1.1 Purpose of this report

SITA Australia (SITA)<sup>1</sup> is proposing a number of activities at the Lucas Heights Resource Recovery Park (LHRRP) in Lucas Heights (referred to in this report as 'the proposal'). This report has been prepared by GHD Pty Ltd on behalf of SITA to provide an assessment of potential site contamination associated with the proposal as an input to the environmental impact statement. Due to the existing operational arrangements at LHRRP, Sutherland Shire Council (SSC) is a joint applicant for the proposal. The environmental impact statement is being prepared by GHD in accordance with the requirements of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (the EP&A Act).

The report addresses the requirements of the Secretary of the NSW Department of Planning and Environment (the Secretary's Environmental Assessment Requirements (SEARs No SSD-6835) dated 3 February 2015).

In addition to addressing the SEARs requirements, this report provides an assessment of how well the proposal design meets SITA's objectives of having no significant impacts on the community or environment. Environmental management and mitigation measures related to contamination are proposed (where necessary) to mitigate potential impacts and ensure that they are managed in accordance with statutory requirements, regulations and community expectations.

## 1.2 Objectives

The objective of this assessment is to provide information on the current and historical setting of the proposal site. This has been done in order to identify the potential for contamination to pose a constraint to the proposed redevelopment of these areas and to demonstrate that land that may be contaminated is suitable for development in accordance with *State Environmental Planning Policy No. 55 - Remediation of Land 1998* (SEPP55).

## 1.3 Proposal overview

The LHRRP consists of approximately 205 hectares (ha) in two ownerships. 89 ha is owned by SITA and 116 ha owned by Australian Nuclear Science and Technology Organisation (ANSTO) and leased to SITA for waste management or other agreed purposes. The following activities are proposed at the LHRRP and are collectively referred to as 'the proposal'. The proposal would not have a significant impact on the community. In addition to the proposal detailed below, SITA is committed to better environmental outcomes by the application of best practice prevention, mitigation and rectification measures:

- **Reprofiling of existing landfill areas to provide up to 8.3 million cubic metres of additional landfill airspace capacity.** This is equivalent to approximately 8.3 million tonnes of waste, assuming 1 tonne of waste utilises 1 cubic metre of waste disposal airspace. As the process of reprofiling would include removal and replacement of capping material over previously landfilled waste and augmentation of gas and leachate collection systems, the environmental performance of the site would be ultimately improved by reducing the infiltration of stormwater into the landfill (resulting in reduced

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<sup>1</sup> SembSITA Australia Pty Ltd (SembSITA) is the holding company for the SITA Australia (SITA) group of companies in Australia. SembSITA is the parent company of both SITA and WSN Environmental Solutions Pty Ltd (WSN). WSN owns part of the land on which the LHRRP is situated, and leases the remainder from ANSTO. SITA holds the environmental protection licence (EPL), and so is the operator of the facilities at LHRRP. For simplicity, the term 'SITA' is used to refer to all of these organisations in this report.

landfill leachate in the longer term) and increase the overall amount of landfill gas recovered from the site.

As part of the proposal, SITA is seeking permission to increase the approved quantity of waste landfilled at the site from 575,000 to 850,000 tonnes per year. This would enable the reprofiling of the site to be completed in 2037.

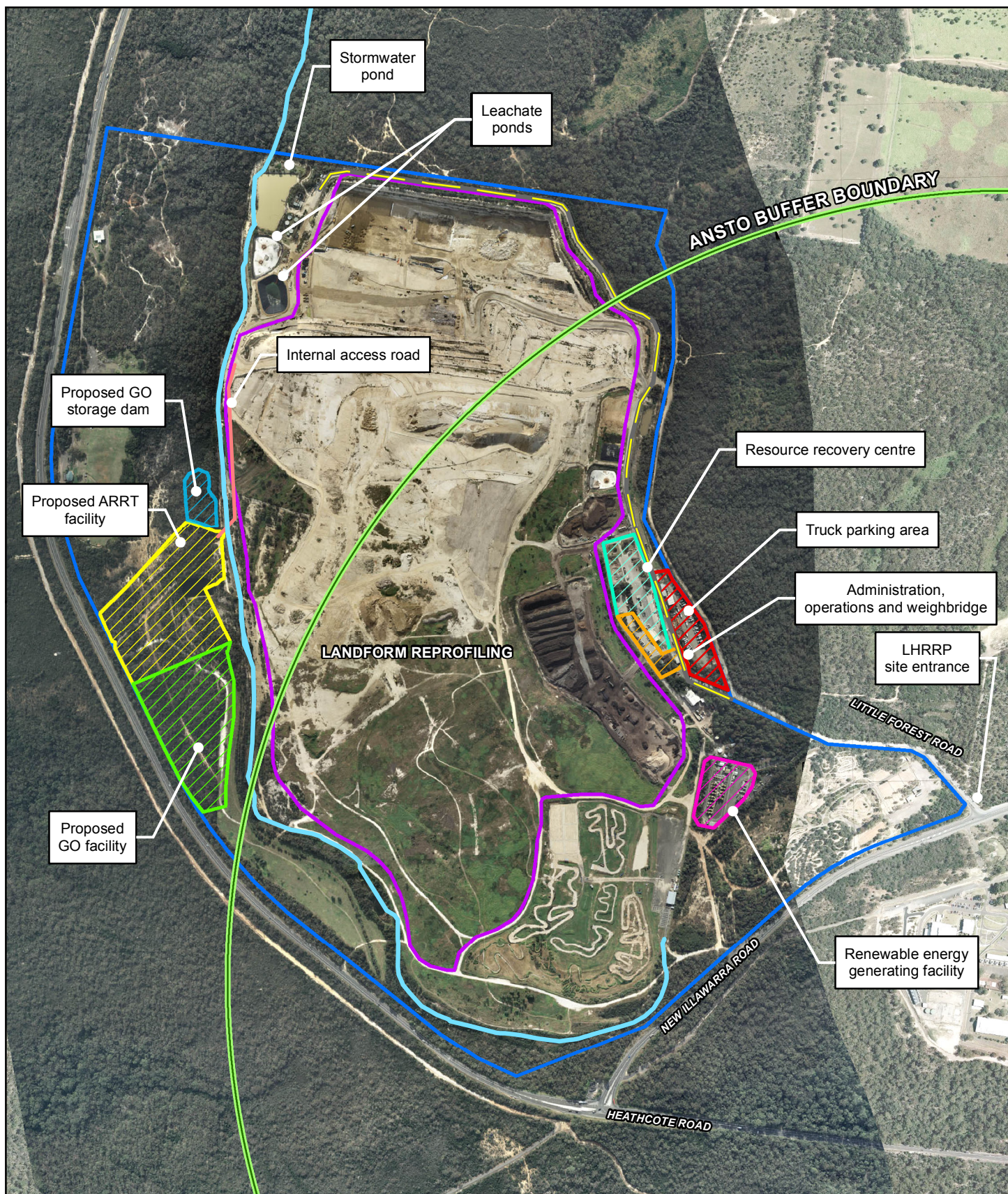
- **Relocation and expansion of the existing garden organics (GO) facility.** The existing garden organics facility would be relocated to the western side of the site adjacent to Heathcote Road. Approval is being sought to increase the approved capacity from 55,000 to 80,000 tonnes of green waste and garden waste received per year at the facility. The new facility would include the partial enclosure, active aeration and covering of the first four weeks of the active composting process, which coincides with the period of highest potential for odour generation, to enable more effective control of odour. Relocation of the facility would result in increased separation distances from the current nearest occupied land at ANSTO, existing residential areas and the proposed new residential area at West Menai.
- **Construction and operation of a fully enclosed advanced resource recovery technology (ARRT) facility.** The ARRT would be located on the western side of the site adjacent to the GO facility and would process and recover valuable resources from up to 200,000 tonnes of general solid waste per year, reducing the amount of waste disposed to landfill to approximately 60,000 tonnes per year. This would divert up to 140,000 tonnes of waste per year from landfill. SSC and other councils would have the opportunity to have their municipal waste processed by the ARRT facility.
- **Community parkland.** The landfill reprofiling would increase the area available for future passive recreation following site closure from 124 ha (existing approved parkland) to a total of 149 ha, an increase of approximately 25 ha. Landfilling would cease in 2037 after which time the site would be rehabilitated and converted to a community parkland, with capping and landscaping to be completed and the site made available for community use in 2039.

As part of the proposal SITA has committed to entering into an agreement with SCC in the form of a Voluntary Planning Agreement which includes 'environmental undertakings'. In addition operational environmental management plans have been prepared for the landfill, GO facility, ARRT facility and post closure measures to manage potential environmental impacts, reflect regulatory requirements and provide guidance for site operators to undertake activities in an environmentally sound manner.

A Planning Proposal is being submitted in parallel with this State Significant Development Application. The Planning Proposal seeks to include new local provisions on the LHRRP site within the Sutherland Local Environmental Plan 2015 (SLEP), which would allow the proposal (a waste or resource management facility) to be undertaken on the proposal site.

The expansion of the LHRRP which is outlined in this EIS would permit the proposed future use of the land for recreational purposes, which is currently approved and would occur when the existing facility ceases operation in 2025. The proposal would however extend the timeframe for which the land would be unavailable for recreational purposes until 2037, due to the extension of operations at the proposed LHRRP.

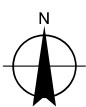
These key components of the proposal are shown on Figure 1.1. The proposed final landform and preliminary masterplan for the parkland is shown in Figure 1.2.



#### LEGEND

ANSTO buffer boundary	Proposed GO facility	Renewable energy generating facility
Mill Creek	Proposed ARRT facility	Lucas Heights Resource Recovery Park boundary
Internal access road	Resource Recovery Centre	Landform reprofiling boundary
Existing access road	Administration, operations and weighbridge	Truck parking area

Paper Size A4  
0 100 200 400  
Metres  
Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



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Lucas Heights Resource Recovery Park

Job Number 21-23482  
Revision A  
Date 28 May 2015

#### Key existing infrastructure and proposed facility layout

Figure 1.1

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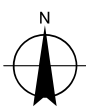
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Aerial Imagery: ESRI, 2014. Works: GHD/SITA, 2014. Roads: NSW LPMA, 2012. Created by: jrichardson



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Revision	A
Date	24 June 2015

Proposed parkland master plan **Figure 1.2**

Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmall@ghd.com.au W www.ghd.com.au

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Data source: Taylor Brammer Landscape Architects Pty Ltd. Created by:jrichardson

## 1.4 Definitions

The following terms are used within this report when referring to the proposal site and surrounding areas:

- The 'LHRRP' refers to the entire Lucas Heights Resource Recovery Park. The boundary of the LHRRP is shown as the blue line on Figure 1.3.
- The 'proposal site' refers to the areas where the activities described in Section 1.2 would be located. The boundary of the proposal site is shown as the red line on Figure 1.3.

## 1.5 Location of the proposal

### 1.5.1 Existing

The proposal would be located within the boundary of the existing LHRRP. The LHRRP is located within the Sutherland local government area, approximately 30 kilometres (km) south west of the Sydney city centre. The LHRRP is bound to the west by Heathcote Road and New Illawarra Road to the south.

Specifically, the proposal would be located on:

- Lot 101 DP 1009354
- Lot 3 DP 1032102
- Lot 2 DP 605077

It is noted that the proposal directly affects only a portion of each of these lots. There is minimal encroachment into the SICTA leased land (part of Lot 3 DP 1032102).

The proposal site, within the boundary of the LHRRP, is shown on Figure 1.3.

The site is currently accessed from Little Forest Road, off New Illawarra Road.

Current facilities at the LHRRP include:

- Landfill
- Resource recovery centre and waste collection point
- GO facility for processing garden organics
- Renewable energy production (operated by Energy Developments Ltd)
- Truck parking area
- Community use areas (mini bike area at the southern extent of the site run by the Sutherland Police Citizens Youth Club and the Sydney International Clay Target Association (SICTA) leased land on the north western side of the site)

There are also several ancillary buildings and structures (e.g. weighbridge, machinery workshop, administration offices, stormwater and leachate dams).

The following land uses are located in the immediate vicinity of the LHRRP:

- Bushland areas that form part of ANSTO's exclusion zone (to the east and south)
- ANSTO's facilities (to the east on the opposite side of New Illawarra Road)

Land uses in the surrounding area include:

- Holsworthy Military Reserve (to the west, northwest and southwest)

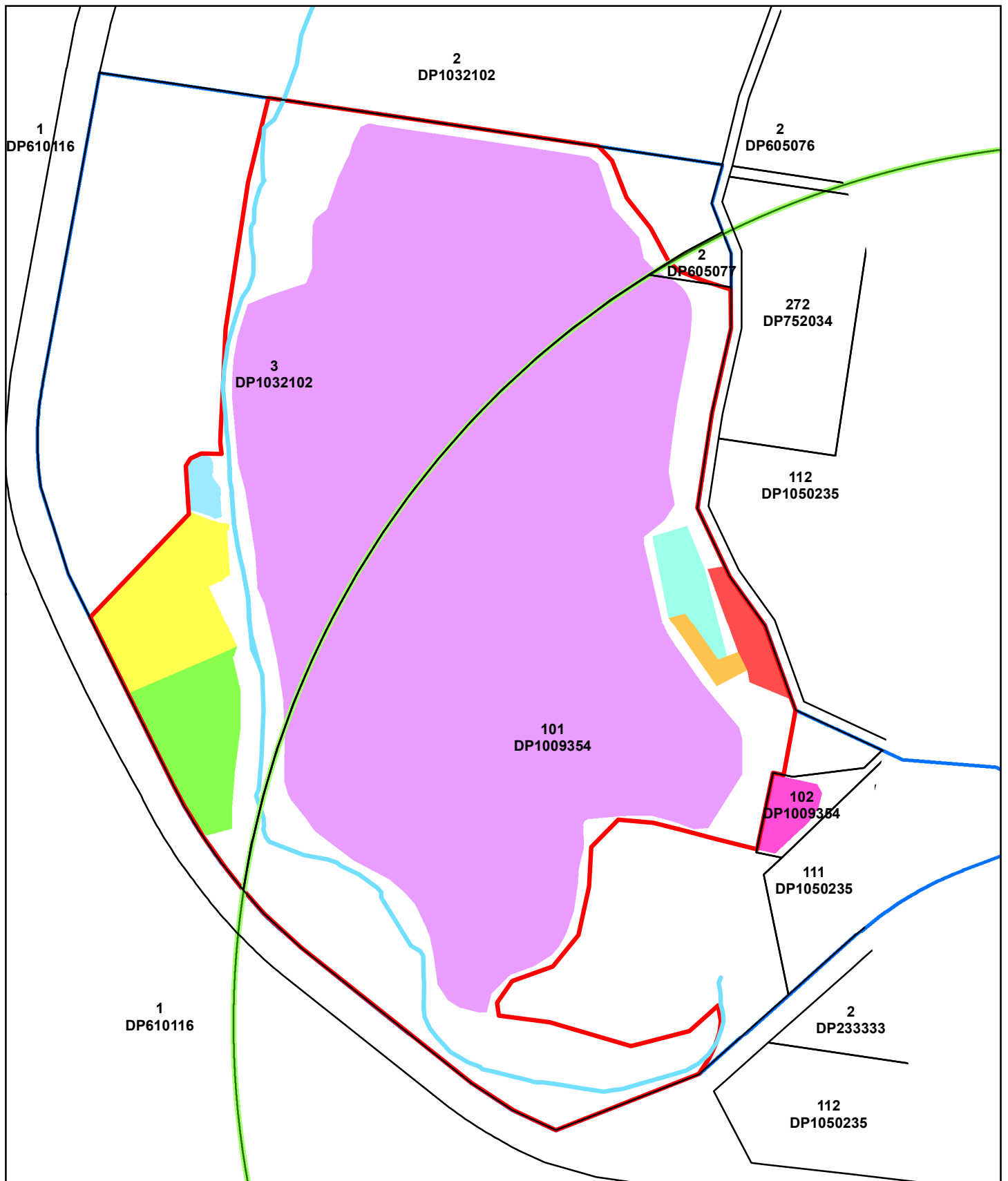
- The Ridge Sports Complex, a major regional sporting facility being developed on the site of the former Lucas Heights Waste and Recycling Centre (approximately 2.5 km to the north east)
- Lucas Heights Conservation Area (immediately to the north of the LHRRP)
- The suburbs of North Engadine (approximately 2 km to the east) and Barden Ridge (approximately 3 km to the north east)

Figure 1.4 shows these key areas.

#### 1.5.2 Potential future surrounding land uses

The Gandangara Local Aboriginal Land Council (GALC) is proposing a development in the West Menai area. The West Menai State Significant Site contains 849 ha of mostly undeveloped land, covering parts of Menai, Barden Ridge and Lucas Heights.

The western boundary of the proposed development is Heathcote Road and the site extends east across Mill Creek to the edge of the existing Menai residential area close to New Illawarra Road. The location of the proposed West Menai State Significant Site is shown on Figure 1.4.



#### LEGEND

ANSTO buffer boundary

Mill Creek

Cadastre

Proposal site boundary

Lucas Heights Resource Recovery Park boundary

Truck parking area

Proposed GO facility

Proposed ARRT facility

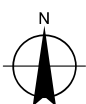
Resource Recovery Centre

Administration, operations and weighbridge

Renewable energy generating facility

Landform reprofiling boundary

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Metres  
Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



SITA Australia  
Lucas Heights Resource Recovery Park

Job Number 21-23482  
Revision A  
Date 25 Jun 2015

The proposal site

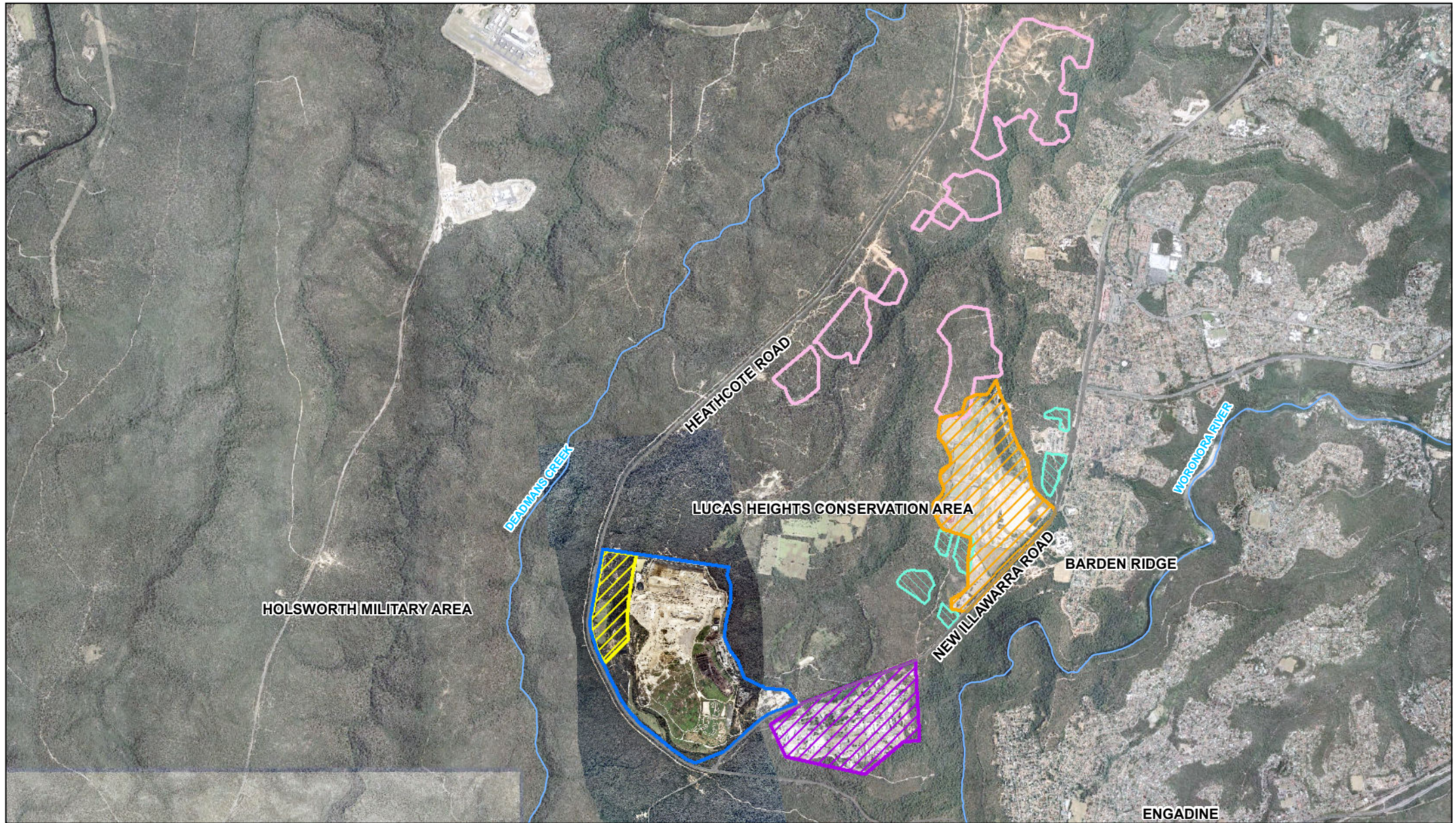
Figure 1.3

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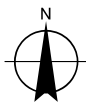
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Metres  
Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



#### Legend

- LHRP boundary
- SICTA boundary
- ANSTO
- Barden Ridge Sports Complex

- Potential future receptors
- Future receptors – Residential



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Date	14 Aug 2015

Surrounding landuses

Figure 1.4

## 1.6 Secretary's Environmental Assessment Requirements

The specific SEARs and agency requirements addressed in this report are summarised in Table 1.1.

Table 1.1 Secretary's Environmental Assessment Requirements and agency requirements

Assessment requirements	Where addressed in report
Consideration of the potential salinity, contamination, flooding and acid sulphate soil impacts of the development	Acid sulfate soils – Section 2.3.2
Agency requirements	
NSW EPA	
<b>Cover letter</b> The proponents should refer to the relevant guidelines as listed in Attachment B and any industry codes of practice and best practice management guidelines With regard to contamination these references include: <ul style="list-style-type: none"> <li>• Contaminated Land Management Act 1997</li> <li>• Waste Classification Guidelines (DECC, 2009)</li> <li>• Acid Sulfate Soils Planning Maps</li> <li>• Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land</li> <li>• Guidelines for Consultants Reporting on Contaminated Sites (EPA 2000)</li> <li>• Guidelines for the NSW Site Auditor Scheme – 2<sup>nd</sup> Editions (DEC 2009)</li> <li>• Sampling Guidelines (EPA, 1995)</li> <li>• National Environment Protection (Assessment of Site Contamination Measure 1999 or update)</li> <li>• Guidelines for the Assessment and Management of Groundwater Contamination.</li> </ul>	References – Section 6
<b>B. The proposal</b> Outline cleaner production actions including <ul style="list-style-type: none"> <li>f) soil contamination treatment and prevention systems</li> </ul>	
Outline construction works including: <ul style="list-style-type: none"> <li>a) actions to address any existing soil contamination</li> </ul>	Recommendations – Section 5.2
<b>C. The location</b> 5. Soil Contamination Issues Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination, for example if the site was previously a landfill site or if irrigation of effluent has occurred.	Site Historical Records – Section 3
<b>E. The environmental issues</b> Provide a description of existing environmental conditions for any potential impacts	Environmental Setting – Section 2
5. Soils and contamination <ul style="list-style-type: none"> <li>• Provide any details (in addition to those provided in the location description – Section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination</li> </ul>	Soils – Section 2.3
<ul style="list-style-type: none"> <li>• Identify any likely impacts resulting from the</li> </ul>	Soils – Section 2.3

construction or operation of the proposal, including the likelihood of:	
a) Disturbing any existing contaminated soil	
b) Contamination of soil by operation of the activity	
e) Disturbing acid sulfate or potential acid sulfate soils	Acid sulfate soils – Section 2.3.2
<ul style="list-style-type: none"> <li>Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:</li> <li>Proposals for site remediation – see <i>Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land</i> (Department of Urban Affairs and Planning and Environment Protection Authority, 1998)</li> </ul>	
c) Proposals for the management of these soils – see <i>Assessing and Managing Acid Sulfate Soils</i> , Environment Protection Authority, 1995 (note that this is the only methodology accepted by the EPA)	Acid sulfate soils – Section 2.3.2
Sutherland Shire Council Review	
Section 5.8 Soils The site being contaminated is mentioned briefly but should it be considered in more depth in this area, particularly the treatment of the contaminated areas to prevent access to it in the final use of the site.	

## 1.7 Scope and structure of the report

### 1.7.1 Regulatory framework

This report was developed with consideration of *State Environmental Planning Policy No. 55 - Remediation of Land 1998* under the *Environmental Planning and Assessment Act 1979*. SEPP 55 requires consideration of contamination issues when rezoning land or changing its use through a development application process. If there is likely to be a change in use that may increase the risk to health or the environment from contamination, a planning authority must be satisfied that the land is suitable for the proposed use or can be remediated to make it suitable.

Additionally, guidelines “made or approved” by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997* were also considered. The primary guidelines include the following:

- NSW Office of Environment & Heritage (OEH) 2011, Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites; and
- NSW Department of Environment and Conservation (DEC) 2007, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.

### 1.7.2 Scope of work

This report investigates whether various areas of the LHRRP site are suitable for the proposed uses from a contamination perspective, or can be remediated to make them suitable for these uses. There should be no increase in risk to health or the environment related to existing

contamination issues (if any exist). As the LHRRP site currently contains a landfill, the adequacy of current measures to control contaminant migration from the landfill is also assessed.

The existing landfill area needs to be suitable for reprofiling, which involves landfilling of new waste, followed by capping. It needs to be made suitable by rehabilitation for its end use as parkland.

The western part of the LHRRP site would first be used for new processing facilities (the GO and ARRT facilities respectively). These facilities would then be decommissioned in 2037, and the areas turned into parkland. Therefore the suitability of this part of the site for both interim use (waste processing and composting), and end use (parkland) needs to be considered.

The following work was undertaken for the entire LHRRP site:

- Review of historical aerial photography to assess historical land uses and historic potentially contaminating activities
- Search of EPA contaminated land and licensing records
- Review of published information on site setting in terms of sensitivity to contamination (geology, topography, hydrogeology)
- Review of WorkCover NSW records in respect of any dangerous goods stored at the site
- Based on information gathered, development of conclusions and recommendations.

#### 1.7.3 Structure of report

- **Chapter 1 – Introduction** – this chapter introduces the proposal, the proponent and describes the proposal area.
- **Chapter 2 –Environmental Setting** – this chapter describe the environmental features of the current site area.
- **Chapter 3 – Site History Records** – this chapter provides historical information about the site from online databases and historical aerial photographs.
- **Chapter 4 – Conceptual Site Model** – this chapter outlines and discusses the potential contaminant source – pathways – receptor relationships.
- **Chapter 5 – Conclusions and Recommendations**
- **Chapter 6 – References** – this chapter provides a reference list.

Limitations associated with GHD's work are provided in Section 7 and should read in conjunction with the findings of this assessment.

## 2. Environmental setting

### 2.1 Site identification

The land titles affected by the proposal and the current existing land uses have been outlined in Section 1.5. The potential future surrounding land uses are also discussed in this section.

In summary, the area proposed for landfill reprofiling (which is the existing landfill footprint) already contains large quantities of landfilled general solid waste. It is an active landfilling site that has been operating for many years.

The GO/ARRT facility area comprises mostly previously disturbed bushland with a number of unsealed tracks traversing the area. No formalised infrastructure or land use currently occurs on this portion of the LHRRP. The proposed GO/ARRT facility areas are located outside the ANSTO buffer zone, however a large portion of the landfill reprofiling area is located within this boundary (shown on Figure 1.1).

In addition, a small section of the proposed GO/ARRT facility would extend into the southern portion of the site occupied and leased by Sydney International Clay Target Association (SICTA) site. The SICTA site is part of the LHRRP.

The following land uses surround the GO/ARRT facility area:

- North: continuation of Sydney International Clay Target Association (SICTA).
- South: Heathcote Road with Holsworthy Military Reserve beyond.
- East: LHRRP.
- West: Heathcote Road with Holsworthy Military Reserve beyond.

The landfill area is a potential source of contamination for the GO/ARRT facility area due to its close proximity and nature of the activities occurring on this portion of the LHRRP. Refer to Section 3.5 for a review of existing information pertaining to the landfill area and its potential impacts on the GO/ARRT facility area.

Land currently used by SICTA also poses a potential contamination risk as lead shot is currently used across the proposed ARRT facility area and this material has been observed on the ground surface.

### 2.2 Topography

The LHRRP elevation as observed on the Spatial Information Exchange (SIX) website varies around approximately 150 metres Australian height datum (mAHD). The GO/ARRT facility area has a gentle grade to the east commencing from a localised high point located in the vicinity of the GO/ARRT facility area. The natural surrounding land (including the landfill area) slopes gradually to moderately downwards in an approximate north-easterly direction, however the landfill surface would vary until the final proposed landform shown in Figure 1.2 is achieved.

### 2.3 Soils

#### 2.3.1 General

The *Wollongong – Port Hacking Soil Landscape Series Sheet* (1:100,000) describes the soil and landscape in the vicinity of the LHRRP as follows:

- Landscape: gently undulating crests, ridges and plateau surfaces of the Mittagong Formation (alternating bands of shale and fine-grained sandstones). Local relief 10-50 m,

slopes <10%. Rock outcrop is absent. Extensively to completely cleared, dry sclerophyll low open forest and low woodland.

- Soil: moderately deep (50-150 cm), hard-setting *Yellow Podzolic Soils* and *Yellow Soloths* on ridges and plateau surfaces. *Lateritic Podzolic Soils* on crests; *Yellow Earths* on shoulders of plateaux and ridges; and *Earthy Sands* in valley flats.
- Limitations: Stoniness, hard-setting surfaces, low soil fertility.

It should be noted that natural soils are not expected to be encountered during landfill reprofiling due to the presence of landfilled waste. The waste is of unknown composition and must therefore be appropriately managed during the proposed re profiling works from both an environmental and human health/safety perspective.

#### 2.3.2 Acid sulfate soils

There is an extremely low probability of acid sulfate soil occurrence within the soil profile in the vicinity of the GO/ARRT facility area according to the Australian Soil Resource Information System (ASRIS) website (accessed August 2014). The landfill reprofiling works would take place within the existing landfill area and would therefore not encounter natural soils. Construction of the ARRT and GO facilities would not involve disturbing acid sulfate soils.

### 2.4 Hydrology

Initially, the headwaters of Mill Creek would have started in the valley adjacent to the eastern boundary of the GO/ARRT facility area. However, portions of this valley have been filled, subsequently altering the surface water drainage patterns. Mill Creek is considered a disturbed system however it remains the closest surface water receptor to the LHRRP.

The creek drains in a northerly direction to the Georges River and is unlikely to impact the proposed area. Melinga Molong Gully Creek is also located close to the LHRRP, approximately 1,200 metres to the south-east. This creek joins the Woronora River a further 1,000 metres south-east of GO/ARRT facility area. The Melinga Molong Gully Creek is unlikely to be relevant to this investigation due to separation by the local high point referred to in Section 2.2.

### 2.5 Geology

The Geological Survey of New South Wales, 1:100,000 *Wollongong-Port Hacking Series Sheet* (1985) indicates that the LHRRP is underlain by Hawkesbury Sandstone (Triassic period) which is described as “medium to coarse-grained quartz sandstone, very minor shale and laminite lenses”.

North east of the LHRRP, another type of Hawkesbury sandstone was noted; described as “claystone, siltstone, and laminite (shale lenses)”. Two dykes were also noted with a north-south orientation, located both east and west of the LHRRP.

### 2.6 Existing groundwater bores

GHD conducted a review of existing registered groundwater borehole records using the NSW Water Information Database (accessed August 2014). The search was conducted to identify registered groundwater boreholes in close proximity to the proposal site and to record information such as bore use and standing water level. A summary of the bore details is presented in Appendix A with a map showing their location.

A total of 87 groundwater boreholes were identified within a five kilometre radius of the LHRRP, the vast majority of these are registered as Monitoring Bores for the current and former landfill

areas. No registered bores are located on the GO/ARRT facility areas but are located within one kilometre to the north and east in the LHRRP.

The recorded standing water levels varied, however were generally recorded at depths of approximately 5 m to 8 m below ground level in the close vicinity of the GO/ARRT facility area. No salinity or groundwater yield information was provided within any of the bore records.

#### 2.6.1 Groundwater risk map

The 1:2,000,000 *Groundwater in New South Wales, Assessment and Pollution Risk Map* indicated that the LHRRP is likely to be underlain by fractured pre-Permian rocks, mainly of igneous and metamorphic origins; with a low to medium potential for groundwater movement. The map also indicated that groundwater salinity is likely to be between 0 mg/L and 1,000 mg/L, which is suitable for stock, domestic and some irrigation purposes.

## 3. Site history records

### 3.1 Previous activities

The LHRRP is located within a forested area. The nearest residential areas are Menai and Lucas Heights located approximately 3 to 4 km to the north east of the LHRRP. The area surrounding the LHRRP has had historical landfilling activities associated with municipal and industrial waste disposal. Previous landfill sites are listed below:

- Harrington's Quarry landfill which is understood to have briefly operated in 1987 and received municipal waste (NSW WAMC, 2012).
- Industrial Waste Collection (IWC) Landfill which operated between 1968 and 1976 and received liquid industrial wastes.
- Night Soil and Sludge Landfill which operated between 1965 and 1980<sup>3</sup> and received sludge and night soil from sewage treatment activities.
- Little Forest Burial Ground, which operated between 1958 and 1968<sup>3</sup> and was filled with waste from ANSTO.

The LHRRP originally opened in 1987 (Mitchell McCotter & Associates Pty Ltd, 1991) based on a development consent received in 1985 permitting waste disposal operations. A development application was submitted and approved in 1999 which permitted the expansion of waste disposal operations and also the development of composting and other resource recovery operations at the LHRRP. The final land-use was approved to be parkland over the majority of the LHRRP area with potential on-going composting and other resource recovery operations located on the eastern side of the site.

### 3.2 Historical aerial photographs

A selection of aerial photographs were examined in order to ascertain past activities and land uses at the LHRRP and surrounding land. Photograph from the years 1947, 1961, 1970, 1984, 1994, 2005 and 2014 were examined. A summary of observations from the review of historical aerial photography is provided in Table 3.1. Photographs are provided in Appendix B.

Table 3.1 Summary of historical aerial photograph review

Photograph details	Description
1947 (black and white)	The approximate GO/ARRT facility area and LHRRP appeared undeveloped and covered in sparse vegetation. Mill Creek was clearly observed through the centre of the LHRRP. A minor vehicle track was observed in the western extent of the LHRRP site boundary, beyond which Heathcote Road was observed. A minor surface water drainage line was observed at the northern extent of the GO/ARRT facility area. The land surrounding the GO/ARRT facility area in all directions also appeared to be undeveloped and covered in sparse vegetation.
1961 (black and white)	The majority of the GO/ARRT facility area and the south eastern portion of the LHRRP had been cleared of vegetation and appeared as bare and undeveloped. The vegetation clearing extended a beyond the GO/ARRT facility area boundary to the north and south along Heathcote Road. The surrounding area appeared predominantly vegetated and undeveloped with the exception of vegetation clearing which had occurred along Little Forest Road, further east of the LHRRP.
1970 (black and white)	The GO/ARRT facility area remained clear of vegetation; with possible minor development or land use observed, the nature of

	which cannot be determined. An oval track appears towards the central-southern portion of this area. Clearing and development appeared to have extended along the eastern boarder of the LHRRP to the northern boundary. The central portions of the LHRRP remained as natural vegetation. The surrounds remained unchanged from the 1961 photograph (i.e. predominantly vegetated and undeveloped) with the exception of industrial appearing development to the south-eastern surrounds, assumed to be the development of ANSTO.
1984 (colour)	Vegetation had regrown throughout much of the GO/ARRT facility area and the landuse along the eastern portion of the LHRRP appeared unchanged. The oval track remained in the central-southern portion of the GO/ARRT facility area and other unsealed tracks extended in a north-south direction. The vegetation north of the area appeared thinned, however the remaining land surrounding the LHRRP appeared unchanged from the 1970 photograph.
1994 (colour)	The LHRRP landfill area was observed to extend across majority of the LHRRP. Extensive land clearing and topographical reforming had occurred between Heathcote Road and Little Forest Road. Vegetation had further regrown throughout most of the GO/ARRT facility area and the Sydney International Clay Target Association (SITCA) gun club on the western portion of the LHRRP was identifiable. Substantial dirt tracks throughout the GO/ARRT facility area had been widened and extended. The land surrounding the LHRRP appeared to remain predominantly vegetated.
2005 (colour)	The majority of the GO/ARRT facility area appeared unchanged from the 1994 photograph, with the exception of a small rounded pond towards the north-eastern extent of the LHRRP. Dirt tracks within the GO/ARRT facility area had a slightly changed layout. Landfill operations remained identifiable across majority of the LHRRP. A cleared portion of land on the north west portion of the site was noted and assumed to be the SICTA firing range.
2014 (colour)	The LHRRP appeared largely unchanged from the 2005 photograph (i.e. GO/ARRT facility area primarily vegetated with a number of dirt tracks and a pond, and landfill operations east of Mill Creek). Capping works were noted to be completed on the southern portions of the landfill area. The surrounds remained predominantly unchanged from the 2005 photograph.

In summary, the GO/ARRT facility area appeared vegetated in the earliest available photograph before being largely cleared of vegetation between 1947 and 1961. The GO/ARRT facility area remained predominantly cleared until the 1982 photograph where vegetation was observed.

During this time, the only land use appeared to be an oval track towards the central-southern portion of the GO/ARRT facility area. A number of other dirt tracks traversed the GO/ARRT facility area during its history; the nature of which changed over time. A pond was observed in the 2005 and 2014 photographs. The use and nature of this pond is unknown, however SITA Australia have suggested that it may be a temporary sediment basin.

It is noted that this pond is currently located in the north eastern corner of the proposed GO facility and ARRT facility area may be susceptible to run off from the adjacent landfill. However as part of the area's development this pond would be made redundant and be part of the ARRT facility. This is addressed in the surface water assessment.

Landfill operations were apparent from the 1994 photograph onwards. Landfill operations appear to have occurred from the southern portions of the LHRRP towards the north.

The Sydney International Clay Target Association (SICTA) was present north of the GO/ARRT facility area from the 1994 photograph. As previously identified, properties of this nature are

often associated with lead contamination in the soil due to the bullets used and debris on the ground surface.

The land surrounding the LHRRP appeared generally vegetated and therefore is unlikely to pose a contamination risk to the proposal site.

### 3.3 Office of the Environment and Heritage

Under provisions of the NSW *Contaminated Land Management Act* (1997, Section 58, Subsection 2 'CLM' Act) a public register of current NSW declarations and orders in force is maintained by the EPA. Under the NSW *Protection of the Environment Operations Act* (1997, the 'POEO Act') a register of current and surrendered licences is also maintained by the OEH.

A search of the register was undertaken on a suburb basis (i.e. Lucas Heights). The search results of the Contaminated Site Register and POEO Register are contained in Appendix C.

#### 3.3.1 Contaminated sites register

The Contaminated Land Record of Notices under the *Contaminated Land Management Act* 1997 (CLM Act), is a public record of contaminated land which displays:

- Orders made under Part 3 of the CLM Act;
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked;
- Site audit statements provided to the EPA under Section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record; and
- Actions taken by the EPA under Section 35 or 36 of the Environmentally Hazardous Chemicals Act 1985 (EHC Act).

GHD notes that the absence of a site from the register does not however mean that the site is not potentially contaminated, more so that the site has not been notified and is not under management or review by the EPA. A search of the register in August 2014 identified two registered premises within a one kilometre radius of the LHRRP. A summary of the available information is provided in Table 3.2.

Table 3.2 Contaminated land register summary

Premises name and occupier	Address	Recipient	Record status and notice type
Harrington's Quarry – Waste Services NSW	Little Forest Road, Lucas Heights	Waste Recycling and Processing Corporation	Current (issued March 2005). Former licences date back to 1987. Agreed Voluntary Investigation Proposal, Declaration of Remediation Site and Agreed Voluntary Remediation Proposal.
IWC Landfill – Commonwealth Department of Administrative Services	Heathcote and New Illawarra Roads, Lucas Heights	Commonwealth Department of Administrative Services	Current (issued January 2003). Former licences date back to 1987. Declaration of Remediation Site.

Both the Harrington's Quarry property and IWC Landfill area are located more than one kilometre north-east of the LHRRP site. Due to the distance, localised topography and inferred hydraulic gradient meaning they are likely down-gradient of the LHRRP site, the potential for impact the proposed development areas is considered to be unlikely.

### 3.3.2 POEO licence register

The POEO license register identifies premises that are licensed for certain activities under the POEO Act. Information of particular relevance to this assessment which is listed on the register includes site location, activity type, relevant clean up notice, non-compliance information and load-based licensing data. Each licence provides information on potential point and non-point sources of soil and groundwater contamination that may be generated on-site through standard operations, accidental spills and leaks.

A search of the register in August 2014 identified five premises with a POEO licence within a one kilometre radius of the LHRRP. A summary of the available POEO licence information is provided in Table 3.3

Table 3.3 Summary of POEO licences

Item number	Licence Holder Name	Premises	Site Address	Activity type	Licence status	Proximity to LHRRP (approximate)
1	Concrete Pty Ltd	Concrete Pty Ltd	New Illawarra Road	Concrete works	No longer in force	1000 metres
2	EDL LFG (NSW) PTY LTD	Lucas Heights 2 LFG Power Station	Little Forest Road	Generation of electrical power from gas	Issued	Within LHRRP
3	Hanson Construction Materials Pty Ltd	Pioneer Construction Material Pty Ltd	New Illawarra Road	Concrete Works	Surrendered (2003)	Unknown
4	SITA Australia Pty Ltd	Lucas Heights waste and recycling centre	New Illawarra Road	Waste storage and disposal (by application to land)	Issued	Within LHRRP
5	Waste Assets Management Corporation	Lucas Heights waste and recycling centre	New Illawarra Road	Waste storage and disposal (by application to land)	Issued	Within LHRRP

The Lucas Heights waste and recycling centre (items 4 and 5 in Table 3.3) are located within the LHRRP footprint, and to the immediate east of the GO/ARRT facility area. Owing to the proximity of the facility to the GO/ARRT facility area, and the nature of the activities currently in operation (waste disposal), the Lucas Heights waste and recycling centre is considered to pose a potential risk of contamination to the GO/ARRT facility area.

The EDL Landfill Gas power station (item 2) is also noted to be within the footprint of LHRRP, located east of the landfill reprofiling area (shown in Figure 1.1). According to the Lucas Heights EMP – *Landfill Gas Extraction System* (February 2012), EDL operates two landfill gas to electricity power plants. The one at LHRRP consists of 16 internal combustion engines each generating 1.25 MW. Each module is a self-contained unit consisting of the following components:

- A landfill gas fuelled reciprocating engine and transformer
- A module enclosure incorporating all ancillary electrical, cooling and venting equipment.

The modules are approximately 10 m by 3 m by 5 m high with 7 m exhaust stacks. Lean burn technology is used as an exhaust emission control aimed at keeping emissions low to meet the current and projected emission criteria. Gas extraction systems located throughout the landfill area collect and transport landfill gas to the power station. Subsurface gas migration from this premises may pose a potential contamination risk to the landfill reprofiling area due to its proximity. Particulate matter from the exhaust may also pose a risk to the proposed reprofiling

area and the proposed GO/ARRT facility area, however this is considered unlikely due to the lean burn technology employed to ensure that emissions meet health criteria.

The remaining premises outlined above are not considered to pose a significant risk of contamination to the development area due to the distance between the properties and the nature of the licences and activities.

### 3.4 WorkCover NSW

A search of the WorkCover NSW Dangerous Goods Record was undertaken for the site (LHRRP, inclusive of the GO/ARRT facility area) in October 2013 by SITA Australia.

GHD reviewed the Dangerous Goods Record, which indicated that three above ground storage tanks have been registered for the LHRRP as follows:

- ID 1 (UN Number 1791): with a capacity of 1,200 litres; holding hypochlorite solution.
- ID 2 (UN Number 1824): with a capacity of 1,200 litres; holding sodium hydroxide solution.
- ID 3 (UN Number 1824): with a capacity of 10,000 litres; holding sodium hydroxide solution.

Discussions between GHD and a SITA representative in August 2014 (pers. comm.) indicated that the tanks:

- Are located on the wider LHRRP area (not in the GO and ARRT facility areas)
- Are understood to be bunded to 110% of tank capacity; and
- Contain an epoxy coating for added protection against corrosion.

Further, no new tanks have been installed within the LHRRP premises between October 2013 and November 2014.

The presence of above ground fuel storage infrastructure on the broader LHRRP site is not considered to present a significant risk of potential contamination for the GO/ARRT facility area, given the tank protection measures which are in place, distance from the GO/ARRT facility area, local topography and the relatively limited storage capacity of the tanks.

### 3.5 Review of existing information

Where available, a review of existing reports was undertaken and is summarised below in the context of this investigation.

#### 3.5.1 Subsurface gas

The LHRRP has an active gas extraction system operating in all stages except for Stage 5 which has a limited system due to filling currently occurring. The active gas system primarily consists of vertical gas collection wells of 80 m (approximately). The Environmental Protection Licence for the LHRRP landfill requires that quarterly surface landfill gas and annual accumulated subsurface monitoring is conducted.

There are no subsurface gas monitoring bores in the proposed GO/ARRT facility area. Due to the sandstone geology across the LHRRP, subsurface gas migration to the GO/ARRT facility area is considered unlikely. This likelihood is further reduced by the local topography and the separation of the GO/ARRT facility area from the landfill area by Mill Creek. Subsurface gas therefore presents a low risk to the proposed GO/ARRT facilities, however this should be confirmed through installation of monitoring bores post development approval.

### 3.5.2 Groundwater

GHD conducted a detailed groundwater study of the LHRRP as part of this EIS. A summary of relevant findings has been presented below for consideration. Observed groundwater elevations suggest that the general groundwater flow direction is northerly.

The report also suggests that the direction of shallow groundwater flow is significantly influenced by topography. It is noted that limited groundwater data exists at the location of the proposed ARRT and GO facilities on the western boundary of the LHRRP.

It is expected that the landfill (being lined) would reduce groundwater recharge to the system, however there does not appear to be a significant reduction in groundwater elevations in the catchment in response to the northerly expansion of landfill cells over time.

The ARRT facility would be located on a platform and includes water detention ponds. All leachate generated by the ARRT facility would be kept in tanks within the building and taken offsite for disposal. Once in operation the ARRT facility would potentially have infrastructure that could have the following interactions with groundwater:

- Infiltration of dirty waste streams into the underlying groundwater systems. This could occur via leakage to groundwater through the waste collection and treatment scheme. This may primarily occur in areas of waste storage such as detention basins and leachate ponds.
- Reduction in groundwater recharge associated with the emplacement of impermeable surfaces such as buildings and impermeable surfaces for processing waste. This may result in a decrease in groundwater elevations beneath the proposed development area.

The GO facility would be located adjacent to the ARRT facility on the western side of the LHRRP. A system would be implemented to capture and manage clean and dirty water generated on the GO facility site.

The construction of the new ARRT/GO facilities would involve excavation works, however these works are not expected at depths which would intercept groundwater. During construction, the ARRT/GO facilities would not be processing waste and the primary potential for interaction of the proposal site with groundwater would occur via spills and releases of chemicals that could infiltrate into the underlying groundwater system. These impacts would be minimised by developing appropriate site management practices and emergency response procedures. These would be detailed in a construction and environmental management plan (CEMP).

### 3.5.3 Leachate

Leachate from the landfill adjacent to the GO/ARRT facility area was considered as part of the groundwater study conducted for this EIS. Leachate contamination is closely linked to groundwater flows as this is the major transport vector. Leachate generated by the landfill is stored within a lined leachate pond and partially treated before being transported to a treatment plant located offsite. Stages 1 to 3 of the landfill are unlined. However, Stage 4 has a compact clay liner and Stage 5 (still being developed) would include an impermeable lining with an extensive drainage network that would direct infiltrating leachate to a sump and pump system that would also extract and control leachate levels within this stage.

Conversations with site staff (Kim Ross *pers. comm.*) suggest that leachate from the current landfill does not pond as a singularly saturated leachate body at the base of the landfill. Instead the leachate tends to pond above or be re-directed by lower permeability zones created by the anisotropic environment. This results in variably saturated conditions horizontally and vertically throughout the landfill, preventing the establishment of a valid relationship between surrounding groundwater elevations and landfill leachate levels. Leachate that bypasses the well extraction

system infiltrates to the base of the landfill and is captured within the basal drainage network. Leachate levels in these locations would control the primary interaction with the surrounding groundwater system.

At present there is no known data that characterise leachate levels at the landfill base other than this temporary testing undertaken in wells P1 to P5 reported in Thom and Knight (1995). These wells are expected to have been destroyed or decommissioned during infilling of the landfill area. The report concluded that there was minimal leachate leaving the landfill areas and that the leachate collection system along with the impermeable bedrock is preventing the leachate from entering the groundwater beneath the landfill. It is noted that this testing was completed in the unlined areas associated with Stages 1 to 3.

Woodward and Jewell (1999) indicates that there is leachate emerging from Harrington's Quarry Landfill, however the effects at Mill Creek are expected to be minimal due to attenuation along the flow paths between the former Quarry and the Creek. The water quality data used in the Woodward and Jewell (1999) report was from a number of groundwater wells located in, surrounding and down gradient of the LHRRP landfill. Additionally, surface water quality data was taken from Mill Creek which groundwater elevation data had indicated to be the primary discharge point for groundwater migrating beneath the landfill.

Overall, the data made available to GHD (1987 – 2014) suggests that there is no breakthrough or increasing trends of leachate influence on down gradient groundwater and surface water locations. The data suggests that the current landfill and leachate management practices implemented (including the current leachate collection system) are preventing down gradient impacts to groundwater and surface water systems. As such on-going operation of the system under the current conditions is not anticipated to result on the development of impacts to down gradient receptors currently monitored.

During reprofiling works the existing cap would be stripped back in stages to allow infilling of new waste. Subsequent capping would occur as the each section is finished. It is expected that this would result in localised greater potential for infiltration of rainfall and therefore potentially higher localised leachate generation, however the overall infiltration rates would remain relatively similar.

Reprofiling in Stages 1 to 3 may be more sensitive to increased infiltration than in other areas as basal liners are not present so any localised generation of additional leachate could have a relatively easier path to the underlying groundwater system. Once the landfilling is completed, the landfill would be capped with a high quality better designed capping system than present. This would tend to reduce overall infiltration to the landfill and would result in a reduced potential for leachate generation and a reduced potential for impact to underlying groundwater and down gradient receptors. Additional landfill capping modelling is being undertaken to quantify the likely reduction.

As stated in Section 3.5.2, the GO/ARRT facilities may result in decreased recharge to groundwater systems due to installation of low permeable surfaces. The development may therefore induce an interaction effect between reduced groundwater infiltration and the potential for migration of leachate from the landfill due to changes in vertical head gradients. However, this interaction seems unlikely as there would have to be a very large reduction in groundwater elevations to facilitate outward leachate migration. Further to this, there appears to be a pre-existing downward hydraulic head gradient in the sandstone aquifer system in the area, which would not be influenced by a small reduction in groundwater elevations beneath the GO/ARRT facilities.

### 3.5.4 Draft Post Closure EMP

The Draft Post Closure Environmental Management Plan (EMP) includes the relevant environmental and operational activities associated with the management of leachate, landfill gas, landfill cap and stormwater at the LHRRP site post closure.

Following final site closure in 2037, by 31 December 2039, SITA would establish a parkland area available for passive recreation as per the landscape plan developed for LHRRP. The parkland would be approximately 149 ha in area. The GO facility and the ARRT facility would be decommissioned.

The EMP states that, SSC would be responsible for maintaining the parkland, SITA would continue to have responsibility for the environmental performance of the disposed waste for a minimum 30 year period after the LHRRP site closure and in accordance with the closure requirements administered by the New South Wales Environment Protection Authority (NSW EPA).

Key aspects of the post closure plan are:

- A stormwater monitoring and maintenance program would be developed to describe details requirements such as inspection locations, inspection frequencies and corrective actions.
- Erosion and sediment control measures would be maintained until the LHRRP site is stabilised
- Maintain leachate infrastructure on the LHRRP site to minimise the potential for surface water and groundwater pollution by leachate. This includes maintaining the integrity of the final capping profile and final surface/storm water drainage works
- The landfill gas extraction system and gas-to-electricity power station would continue to operate. Additionally, a gas monitoring and maintenance program would be developed for the post closure period to describe detailed requirements such as inspection locations, inspection frequencies and corrective actions.
- Landfill capping and revegetation should ensure that the final surface provides a barrier to the migration of water into the waste, controls emissions to water and atmosphere, promotes sound land management and conservation, and prevents hazards and protects amenity.

The extent and frequency of environmental monitoring post closure of the LHRRP site would be in accordance with the site Closure Plan (still to be developed), which generally includes the following:

- **Ground and Surface Waters**  
Surface water sample locations and testing procedures would be similar to those described for the operational phase of LHRRP. Post closure groundwater monitoring and surface water monitoring is still to be determined.
- **Gas and Leachate**  
Monitoring and testing procedures would be similar to those used during site operations. Monitoring frequency would increase if significant increases in gas or leachate generation are observed or as required due to odour complaints received, or decrease as the longer-term gas and leachate production levels decline.
- **Rehabilitation and Pollution Controls**

Regular inspections would continue until rehabilitation is satisfactorily completed, as per the Post Closure EMP. Pollution and drainage controls would continue to be inspected until areas are regarded as stable.

The EMP also outlines goals and a management strategy for emergency incidents such as fires, spill of liquids, leachate escape, explosion of liquid fuels, vehicular accidents, personal injury, and emergency at ANSTO.

The key aspects, proposed monitoring programs and the management strategies for emergency incidents are important for assessing the appropriateness of the intended future uses of the LHRRP site. Assuming the capping layer remains in place and is maintained and that the Closure Plan and post-closure monitoring programs are appropriately implemented, it is unlikely that future users of the park would come into contact with the contamination that underlies the landfilled portions of the LHRRP site.

## 4. Conceptual site model

### 4.1 Preliminary CSM overview

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments and provides the framework for identifying contamination sources and how potential receptors may be exposed to contamination.

Based on the information collected as part of this assessment, the following preliminary CSM has been developed for the LHRRP with consideration of the areas proposed for the GO/ARRT facility development and final land use as park.

The potential contaminant source, pathways and receptors applicable to the proposal site are outlined in Sections 4.2 to 4.4, and in Section 4.5 is an overview of the potential contaminant source – pathways – receptor relationships.

Where the pathway between a source and a receptor is incomplete, the potential for exposure to chemical substances via that pathway is unlikely occur. However, GHD notes that these pathways are still considered for completion of the CSM. Further discussion regarding the complete pathways which are considered applicable to the proposal site is provided in Section 4.5.

### 4.2 Sources

Potential sources of contamination at the proposal site could include:

- Historical landfill waste (including putrescible, commercial and industrial wastes) in the LHRRP
- Historical and any current leaks and spills from vehicles coming onto the site
- Lead bullets on the ground surface of the GO and ARRT area from SICTA.

### 4.3 Pathways

The primary potential pathways by which future receptors could be exposed to the sources of contamination outlined above are considered to be:

- Direct contact or inhalation with/of soil, groundwater, or surface waters
- Ingestion of soils, groundwater, or surface waters
- Inhalation of landfill gases or volatile organics
- Migration in groundwater, and
- Surface water runoff and migration in surface water.

As discussed in Section 4.1, not all pathways are complete within the proposal site. Further discussion is provided in Section 4.5.

### 4.4 Receptors

When evaluating potential adverse health / environmental effects from exposure to a contaminated site, all potentially exposed populations should be considered. For the proposal site, the key populations or receptors of interest are considered to include:

- Future construction and on-site maintenance workers

- Future users of the park facilities
- Potential future users of groundwater (e.g. Irrigation of park lands)
- Ecological systems (Mill Creek and vegetated areas surrounding the LHRRP site).

#### 4.5 Potential source-pathway-receptor linkages

Based on the current information, a preliminary CSM has been developed in Table 4.1 outlining the potential source-pathway-receptors likely to be associated with the proposal site should they be redeveloped. Linkages which are considered to be potentially complete are highlighted in bold.

In summary, the following linkages could potentially be complete within the proposal site:

- Future construction and maintenance workers at the site coming into contact with contaminants in soil and groundwater should they undertake excavations or the capping layer is disturbed; and
- Potential contaminants in groundwater beneath the proposal site migrating into the wider aquifer and entering nearby surface waters (such as Mill Creek).

Table 4.1 Preliminary conceptual site model

Potential sources	Potential receptors	Potential pathways	Linkage complete?
Potential contamination in soil from landfill area, SICTA lead shots, and potential leaks and spills from vehicles	Human: <ul style="list-style-type: none"> <li>Future on-site construction workers and maintenance workers.</li> <li>Future users of the park.</li> </ul> Environment: <ul style="list-style-type: none"> <li>Groundwater on and off site.</li> <li>Surface water and associated ecosystems (Mill Creek).</li> <li>Terrestrial ecosystems (vegetated areas surrounding the LHRRP site).</li> </ul>	Direct contact on site (including incidental ingestion) with potentially contaminated soils.	Landfill is to be fully capped with VENM and revegetated. As long as the capping layer is maintained, future park users being directly exposed to the underlying landfill contamination is unlikely. <b>Construction and maintenance workers could come into contact with contamination in soil, particularly if the capping layer above the landfill area is disturbed or they undertake excavations within the proposal site.</b>
		Inhalation on site of contaminated soils/dust.	
		Inhalation on site of landfill gases or volatile organics.	Continued operation of the landfill gas extraction system and monitoring of landfill gases at the proposal site would reduce the risk of exposure. Potential future emissions that migrate through the capping layer would likely attenuate significantly and disperse into the atmosphere.
		Surface Water runoff.	Before closure, the remaining parts of the landfill are to be capped with VENM. Stormwater management systems would be installed. Exposure pathway incomplete.
Potential contamination in groundwater from landfill area, SICTA	Human: <ul style="list-style-type: none"> <li>Future users of the recreational park.</li> <li>Future on-site maintenance workers.</li> </ul>	Vertical and lateral migration into the groundwater.	Impermeable capping layer would reduce infiltration of rainwater into soil, and a leachate collection system is in place to reduce the possibility of contaminants entering the groundwater from the landfill area. Assuming the cell construction of the landfill remains intact and the leachate control measures are maintained, migration of contaminants into groundwater is unlikely in the landfill area. <b>There is little information about the groundwater in the GO/ARRT facility area. Construction and maintenance workers could possibly come into contact with contaminated groundwater.</b>
		Direct contact on site (including incidental ingestion) with potentially contaminated groundwater.	Future users are unlikely to come into contact with groundwater given the LHRRP site would be capped. <b>Potentially complete linkage for future construction and intrusive maintenance workers if they encounter contaminated groundwater in excavations at the site.</b>

Potential sources	Potential receptors	Potential pathways	Linkage complete?
lead shots, and potential leaks and spills from vehicles	Environmental: <ul style="list-style-type: none"> <li>Groundwater on and off site.</li> <li>Surface water and associated ecosystems (Mill Creek).</li> <li>Terrestrial ecosystems (vegetated areas surrounding the LHRRP site).</li> </ul>	Inhalation of volatile compounds associated with potential contaminants in groundwater.	Unlikely to be a complete linkage assuming continued operation of the landfill gas plant and monitoring program. Any fugitive vapour or gas emissions through the cap would likely disperse into the atmosphere.
		Migration of contaminants in groundwater/surface waters.	There is potential for contaminants to be present in groundwater beneath the site (LHRRP and the proposal site) and these could migrate into the wider environment. However, cell lining and a leachate collection system is in place to control horizontal and vertical migration from the landfill, and the quality of groundwater and nearby surface waters is monitored regularly to assess for potential impact. This pathway is therefore unlikely to be complete, however GHD notes there is little information about groundwater beneath the GO/ARRT facility areas.

## 5. Conclusions and recommendations

### 5.1 Assessment of potential impacts

An overall assessment of the contamination status of the LHRRP is as follows:

- The existing area containing the landfill is considered to be contaminated, as it is filled with waste. However this contamination is managed by: lining of the newer landfill cells, suitable existing geology (all cells), landfill gas extraction, active management of leachate and monitoring of groundwater within the LHRRP, and intermediate cover placed over the completed landfill cells. These measures prevent site occupants from coming into contact with contaminated material, and also prevent the surrounding environment from being adversely affected by landfilled waste material.
- The proposed GO/ARRT facility area is currently undeveloped and comprises bushland containing a number of unsealed tracks traversing the area. There is no indication that the existing landfilling activities have impacted on this area.
- A review of aerial photographs dating back to 1947 indicates the GO/ARRT facility area was formerly cleared of vegetation and contained an oval track of unknown use. A pond of unknown origin and use was also observed within the two most recent historical aerial photographs. The landfill operations were apparent from the 1994 photograph onwards and appear to have occurred from the southern portions of the LHRRP towards the north.
- The SICTA land, located north-west of the proposal site, is potentially subject to lead contamination in the soil.
- Potentially contaminating land use activities were not noted on the GO facility and ARRT facility areas during previous inspections undertaken by GHD.

The potential for contamination of groundwater associated with the construction and operation of the proposal has been considered in detail in the groundwater report. Leachate from the proposed landfill reprofiling and continued operation, adjacent to the GO facility and ARRT facility area, was also considered as part of this groundwater assessment.

The overall conclusion of this study is that the proposal site is suitable for its intended future uses, namely landfill reprofiling, and construction and operation of the ARRT and GO facilities, followed by decommissioning of these facilities and landscaping to create a community parkland.

Assuming the capping layer remains in place and is maintained and that the Closure Plan and post-closure monitoring programs are appropriately implemented, it is unlikely that future users of the park would come into contact with the contamination that underlies the LHRRP site.

### 5.2 Recommendations and key mitigation measures

Post development approval and prior to the GO/ARRT development, GHD recommends that targeted soil sampling and subsequent lead analysis should be conducted on the ARRT facility area which is adjacent to, and proposed to extend onto SICTA. A detailed plan for testing would be required prior to construction of the ARRT facility. This would address any concerns raised about the areas suitability from human health and environmental perspectives, as well as provide waste classification for waste material generated during excavation works in this area. Should excess levels of lead be identified, a plan (including specific remediation measures if required) would be developed in accordance with regulatory requirements and approved by the appropriate agencies prior to the construction of the ARRT facility.

As recommended in the groundwater study, a series of monitoring wells should be installed around the GO/ARRT facility prior to construction. These would be used to monitor any potential landfill gas and groundwater, as there is currently minimal data for these two aspects in this region. Monitoring of these wells during construction and operation of the GO/ARRT facilities would provide early indication of any additional impacts from construction or operation on the proposal site.

GHD also recommends a general site inspection be undertaken in conjunction with the soil sampling and well installation to identify any visual or olfactory signs of potential contamination on the GO/ARRT facility areas, primarily in the form of stockpiled materials or previously unknown land use activities.

During the inspection, the nature and condition of the pond should be documented. Should the pond require draining, water samples should be collected to allow appropriate management to be arranged. Should rubbish or contaminant indicators be identified on the proposal site, soil sampling should be undertaken to characterise the potential risk prior to development.

During development works, if unexpected material (including waste materials or evidence of filling) is encountered, GHD recommends advice is sought from an appropriately qualified Environmental Consultant in regards to the management of this material.

To minimise water quality impacts associated with ARRT/GO facility construction, appropriate site management practices and emergency response procedures should be developed prior to construction and would be detailed in a CEMP.

If required by the planning authorities, a Statutory Site Audit report should be prepared to approve any remediation works required to make the land suitable for construction of the ARRT or GO facilities. Until detailed design work has been completed, the extent of remediation works required would not be known, so preparation of this report should be delayed until this work has been completed.

### 5.3 Overall conclusions

The overall conclusion of this study is that the proposal site is suitable for its intended future uses, which is for landfilling/reprofiling of the existing surfaces, and construction and operation of the ARRT and GO facilities, followed by decommissioning of these facilities and landscaping to create a community parkland.

Assuming the capping layer remains in place and is maintained and that the Closure Plan and post-closure monitoring programs are appropriately implemented, it is unlikely that future users of the park would come into contact with the contamination that underlies the LHRRP site.

## 6. References

<http://maps.six.nsw.gov.au/>

[www.nratlas.nsw.gov.au/](http://www.nratlas.nsw.gov.au/) (accessed August 2014)

Chapman and Murphy (1989), Soil Landscapes of the Sydney 1:100 000 Sheet. Soil Conservation Service of NSW, Sydney

Herbert, C. (1983), Geology of the 1:100 000 Sheet 9130. Geological Survey of NSW, Sydney

NSW Department of Environment and Conservation (DEC 2007), Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination

NSW Department of Urban Affairs and Planning/NSW Environment Protection Authority (1998), *Managing Land Contamination - Planning Guidelines - SEPP 55–Remediation of Land*.

## 7. Limitations

This report has been prepared by GHD Pty Ltd (GHD) for SITA Australia and may only be used and relied on by SITA Australia for the purpose agreed between GHD and SITA Australia.

GHD otherwise disclaims responsibility to any person other than SITA Australia arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by SITA Australia and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.



# Appendices



## Appendix A – Groundwater bores



## Summary of Existing Registered Bores

Borehole ID	Purpose	Installation Date	Property	Depth (m)	Standing Water Level (mbgl)	Latitude and Longitude
GW046782	Test Bore / Groundwater Exploration	January 1997	-	30.00	Not provided	34 2' 17" S, 150 59' 49" E
GW100907	Monitoring Bore	January 2004	WSN Environmental Solutions	32.50	Not provided	34 2' 14" S, 150 57' 53" E
GW100908	Monitoring Bore	January 2004	WSN Environmental Solutions	12.50	1.50	34 2' 16" S, 150 57' 53" E
GW102116	Monitoring Bore	June 1996	-	23.00	9.50	34 1' 46" S, 151 0' 7" E
GW103176	Monitoring Bore	May 1998	-	45.00	18.42	34 2' 48" S, 150 59' 5" E
GW103177	Monitoring Bore	May 1998	-	9.00	Not provided	34 2' 49" S, 150 59' 5" E
GW103180	Monitoring Bore	May 1998	-	24.00	15.00	34 2' 48" S, 150 59' 4" E
GW103182	Monitoring Bore	May 1998	-	30.00	Not provided	34 2' 48" S, 150 59' 4" E
GW103502	Monitoring Bore	July 1999	Lucas Heights 1 Landfill	23.00	Not provided	34 1' 60" S, 151 0' 2" E
GW105274	Monitoring Bore	January 1997	Lucas Heights	13.30	Not provided	34 1' 46" S, 150 59' 58" E
GW105275	Monitoring Bore	January 1997	Lucas Heights	21.30	7.00	34 1' 51" S, 150 59' 56" E
GW105276	Monitoring Bore	January 1997	Lucas Heights	30.20	17.00	34 1' 55" S, 151 0' 2" E
GW105277	Monitoring Bore	January 1997	Lucas Heights	22.90	4.00	34 1' 59" S, 150 0' 8" E
GW109351	Monitoring Bore	September 2008	WSN Environmental Solutions	38.00	Not provided	34 2' 10" S, 150 57' 53" E
GW109909	Monitoring Bore	January 2004	WSN Environmental Solutions	25.50	20.20	34 2' 13" S, 150 58' 22" E
GW109910	Monitoring Bore	January 2004	WSN Environmental Solutions	8.40	7.60	34 2' 14" S, 150 58' 22" E
GW109911	Monitoring Bore	January 2004	WSN Environmental Solutions	32.80	8.60	34 1' 52" S, 150 58' 27" E
GW109912	Monitoring Bore	January 2004	WSN Environmental Solutions	30.15	11.40	34 1' 48" S, 150 58' 38" E
GW109913	Monitoring Bore	January 2004	WSN Environmental Solutions	41.50	8.20	34 2' 26" S, 150 57' 46" E
GW109914	Monitoring Bore	March 2009	WSN Environmental Solutions	19.40	5.60	34 2' 28" S, 150 57' 46" E
GW110040	Monitoring Bore	January 1992	Waste Services NSW	10.00	0.77	34 2' 19" S, 150 57' 52" E
GW110041	Monitoring Bore	January 1992	Waste Services NSW	50.95	15.00	34 1' 47" S, 150 58' 27" E
GW110042	Monitoring Bore	January 1992	Waste Services NSW	52.00	4.77	34 2' 52" S, 150 58' 32" E
GW110043	Monitoring Bore	January 1992	Waste Services NSW	30.00	6.72	34 2' 32" S, 150 58' 19" E

Borehole ID	Purpose	Installation Date	Property	Depth (m)	Standing Water Level (mbgl)	Latitude and Longitude
GW110044	Monitoring Bore	January 1992	Waste Services NSW	53.60	26.00	34 2' 12" S, 150 58' 21" E
GW110045	Monitoring Bore	January 1992	Waste Services NSW	53.60	26.00	34 2' 8" S, 150 57' 45" E
GW110046	Monitoring Bore	January 1992	Waste Services NSW	25.00	20.14	34 1' 44" S, 150 57' 55" E
GW110047	Monitoring Bore	April 2008	Waste Services NSW	81.00	11.37	34 2' 6" S, 150 58' 11" E
GW110048	Monitoring Bore	January 1992	Waste Services NSW	29.95	7.67	34 1' 57" S, 150 58' 22" E
GW110049	Monitoring Bore	January 1992	Waste Services NSW	48.00	9.00	34 1' 48" S, 150 58' 12" E
GW110050	Monitoring Bore	January 1992	Waste Services NSW	84.00	18.57	34 2' 5" S, 150 58' 24" E
GW110051	Monitoring Bore	January 1992	Waste Services NSW	84.00	18.57	34 2' 12" S, 150 57' 53" E
GW110052	Monitoring Bore	January 1992	Waste Services NSW	51.00	27.58	34 2' 2" S, 150 57' 45" E
GW110053	Monitoring Bore	January 1992	Waste Services NSW	21.00	8.51	34 2' 17" S, 150 57' 39" E
GW110054	Monitoring Bore	January 2003	Waste Services NSW	2.80	1.90	34 1' 39" S, 150 58' 13" E
GW110055	Monitoring Bore	January 2003	Waste Services NSW	30.00	1.80	34 1' 37" S, 150 58' 15" E
GW110056	Monitoring Bore	January 2003	Waste Services NSW	50.00	14.20	34 1' 35" S, 150 58' 17" E
GW111094	Monitoring Bore	May 2010	7-Eleven	8.00	Not provided	34 0' 56" S, 151 0' 48" E
GW111095	Monitoring Bore	May 2010	7-Eleven	8.00	Not provided	34 0' 56" S, 151 0' 48" E
GW111096	Monitoring Bore	May 2010	ANSTO	12.10	Not provided	34 2' 59" S, 150 58' 39" E
GW111097	Monitoring Bore	May 2010	ANSTO	25.00	Not provided	34 3' 3" S, 150 58' 41" E
GW111098	Monitoring Bore	May 2010	ANSTO	27.50	Not provided	34 3' 3" S, 150 58' 43" E
GW111198	Monitoring Bore	September 2006	BP Refinery	6.00	Not provided	34 4' 39" S, 151 0' 40" E
GW111200	Monitoring Bore	September 2006	BP Refinery	6.20	Not provided	34 4' 38" S, 151 0' 40" E
GW111201	Monitoring Bore	September 2006	BP Refinery	7.00	Not provided	34 4' 38" S, 151 0' 41" E
GW111202	Monitoring Bore	September 2006	BP Refinery	7.00	Not provided	34 4' 39" S, 151 0' 40" E
GW112538	Monitoring Bore	November 2011	The Shell Company of Australia Ltd	8.50	2.87	34 5' 16" S, 151 0' 26" E
GW112539	Monitoring Bore	November 2007	The Shell Company of Australia ltd	8.00	2.94	34 5' 16" S, 151 0' 24" E
GW112696	Monitoring Bore	July 1992	WSN Environmental Solutions	29.55	Not provided	34 1' 60" S, 150 58' 28" E
GW112697	Monitoring Bore	July 1992	WSN Environmental Solutions	51.00	Not provided	34 2' 27" S, 150 57' 52" E
GW112699	Monitoring Bore	April 2007	WSN Environmental Solutions	50.00	Not provided	34 2' 25" S, 150 57' 51" E
GW112700	Monitoring	April 2008	WSN	35.00	Not provided	34 2' 25" S, 150

Borehole ID	Purpose	Installation Date	Property	Depth (m)	Standing Water Level (mbgl)	Latitude and Longitude
	Bore		Environmental Solutions			57' 54" E
GW112701	Monitoring Bore	June 2004	WSN Environmental Solutions	9.05	Not provided	34 2' 27" S, 57' 54" E 150
GW112702	Monitoring Bore	June 2004	WSN Environmental Solutions	19.40	Not provided	34 2' 25" S, 57' 53" E 150
GW113194	Monitoring Bore	April 2008	WSN Environmental Solutions	35.00	Not provided	34 1' 60" S, 57' 58" E 150
GW113195	Monitoring Bore	April 2008	WSN Environmental Solutions	35.00	Not provided	34 2' 2" S, 58' 6" E 150
GW113196	Monitoring Bore	September 2008	WSN Environmental Solutions	25.00	Not provided	34 2' 00" S, 58' 11" E 150
GW113197	Monitoring Bore	April 2008	WSN Environmental Solutions	12.00	Not provided	34 1' 56" S, 58' 7" E 150
GW113198	Monitoring Bore	April 2008	WSN Environmental Solutions	47.50	9.00	34 1' 55" S, 58' 5" E 150
GW113199	Monitoring Bore	April 2008	WSN Environmental Solutions	23.50	Not provided	34 1' 56" S, 58' 10" E 150
GW113443	Monitoring Bore	October 2010	BP Refinery (Bulwer Island)	6.50	Not provided	34 4' 37" S, 0' 41" E 151
GW113448	Monitoring Bore	December 2008	BP Refinery (Bulwer Island)	6.00	Not provided	34 4' 38" S, 0' 39" E 151
GW113449	Monitoring Bore	December 2008	BP Refinery	6.00	Not provided	34 4' 39" S, 0' 38" E 151
GW113545	Monitoring Bore	July 2007	Caltex Oil (Australia) Pty Ltd	6.80	Not provided	34 3' 50" S, 0' 56" E 151
GW113546	Monitoring Bore	July 2010	Caltex Oil (Australia) Pty Ltd	6.30	Not provided	34 3' 50" S, 0' 57" E 151
GW113547	Monitoring Bore	July 2010	Caltex oil (Australia) Pty Ltd	6.20	Not provided	34 3' 51" S, 0' 57" E 151
GW113551	Monitoring Bore	July 2010	Caltex Oil (Australia) Pty Ltd	5.00	Not provided	34 1' 51" S, 0' 55" E 151
GW113585	Monitoring Bore	July 2010	BP Engadine	6.00	Not provided	34 4' 38" S, 0' 41" E 151
GW113699	Monitoring Bore	September 2010	ANSTO	6.50	Not provided	34 1' 57" S, 58' 39" E 150
GW113700	Monitoring Bore	September 2010	ANSTO	20.50	Not provided	34 1' 58" S, 150 58' 42" E
GW113701	Monitoring Bore	September 2010	ANSTO	13.50	Not provided	34 1' 59" S, 150 58' 38" E
GW113702	Monitoring Bore	September 2010	ANSTO	5.00	Not provided	34 1' 58" S, 150 58' 42" E
GW113703	Monitoring Bore	September 2010	ANSTO	7.00	Not provided	34 1' 58" S, 150 58' 52" E
GW113704	Monitoring Bore	September 2010	ANSTO	5.50	Not provided	34 2' 4" S, 58' 50" E 150
GW113705	Monitoring Bore	February 2014	ANSTO	4.30	Not provided	34 2' 15" S, 150 58' 51" E

Borehole ID	Purpose	Installation Date	Property	Depth (m)	Standing Water Level (mbgl)	Latitude and Longitude
GW113706	Monitoring Bore	February 2014	ANSTO	5.80	Not provided	34 2' 7" S, 150 58' 45" E
GW113707	Monitoring Bore	September 2010	ANSTO	6.00	Not provided	34 2' 16" S, 150 58' 48" E
GW113708	Monitoring Bore	September 2010	ANSTO	7.00	Not provided	34 2' 11" S, 150 58' 46" E
GW113710	Monitoring Bore	September 2010	ANSTO	3.50	Not provided	34 2' 10" S, 150 58' 45" E
GW113711	Monitoring Bore	September 2010	ANSTO	4.80	Not provided	34 2' 9" S, 150 58' 43" E
GW113714	Monitoring Bore	September 2010	ANSTO	5.50	Not provided	34 2' 4" S, 150 58' 44" E
GW113715	Monitoring Bore	September 2010	ANSTO	9.00	Not provided	34 2' 7" S, 150 58' 43" E
GW113716	Monitoring Bore	September 2010	ANSTO	7.00	Not provided	34 2' 7" S, 150 58' 49" E

# Groundwater

Map tools

Map Topics

Add to map Sort map layers Find a place Legend Map layer control



## Symbols & map layers

- registered groundwater bores
- Approximate 5 km radius around LHRRP

GW110056  
GW110055  
GW110054  
GW110046  
GW110049  
GW113198  
GW113197  
GW113199  
GW113194  
GW110052  
GW110045  
GW109351  
GW110051  
GW110053  
GW100907  
GW100908  
GW109913  
GW109914  
GW112699  
GW112702  
GW112700  
GW112697  
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GW110042  
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GW111097  
GW111098

GW113195  
GW113196  
GW110047  
GW110048  
GW110041  
GW109911  
GW112696  
GW110050  
GW109912  
GW113701  
GW113699  
GW113700  
GW113702

GW111094, GW111095

GW105274  
GW102116  
GW105275  
GW105276  
GW105277  
GW103502  
GW113703  
GW113704  
GW046782

GW113716, GW113714  
GW113715, GW113706  
GW113711, GW113712  
GW113710, GW113708

GW103182, GW103176

GW103177, GW103180

GW113547, GW113546  
GW113545, GW113551

GW113443, GW111201  
GW111200, GW111202  
GW111198, GW113585  
GW113449, GW113448

GW112538  
GW112539

Approximate location of the GO/ARRT area



## Appendix B – Historical aerial photographs



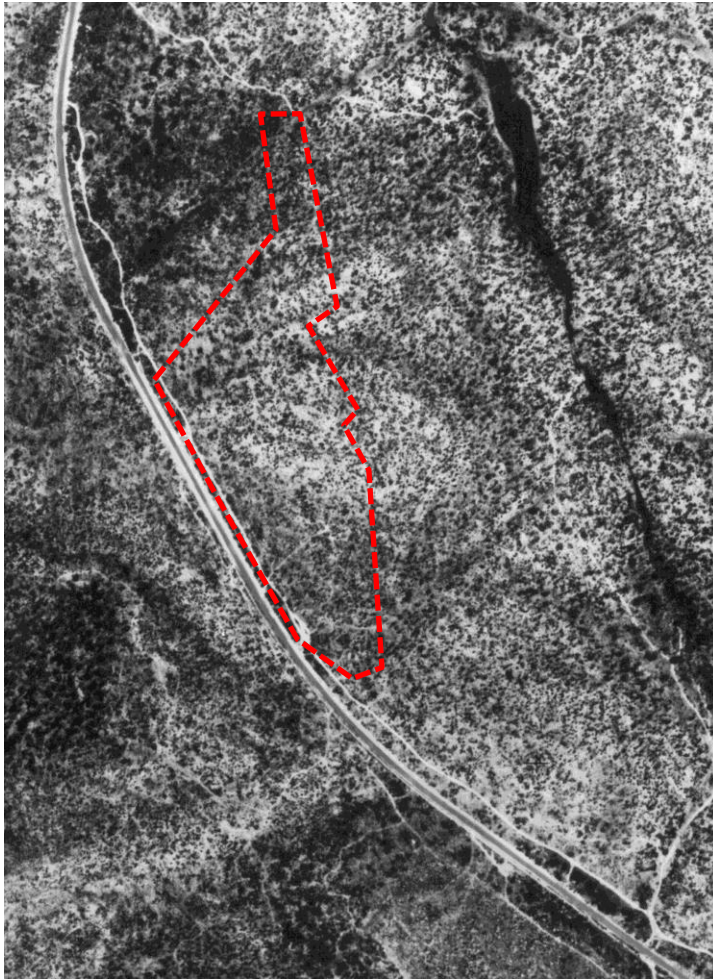


**1947**

Approximate GO/ARRT location



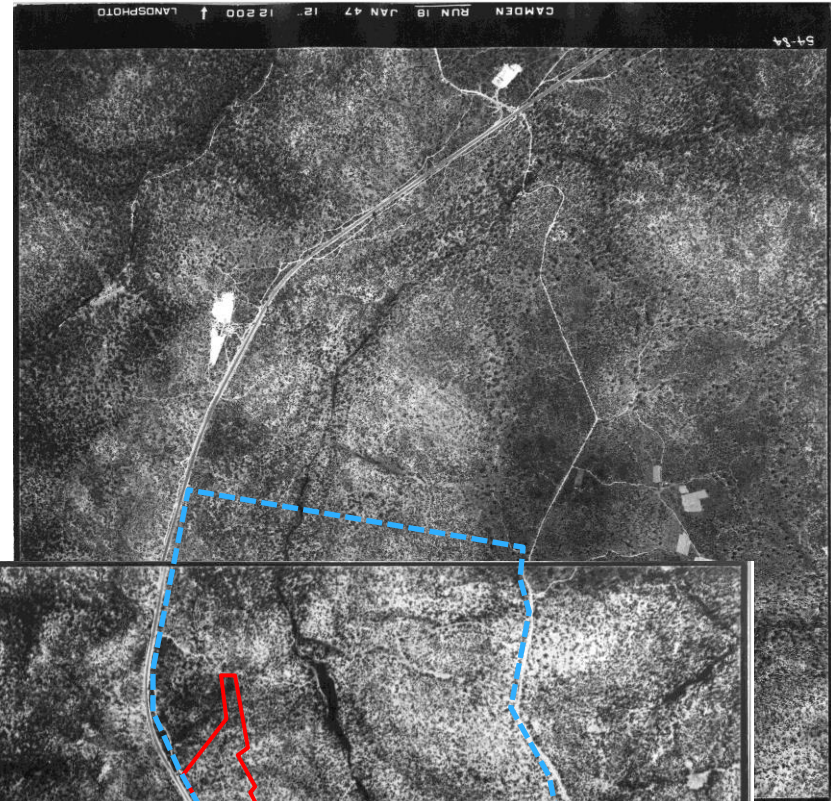
Approximate LHRRP



Right: full photograph provided.  
Above: close up of site



North

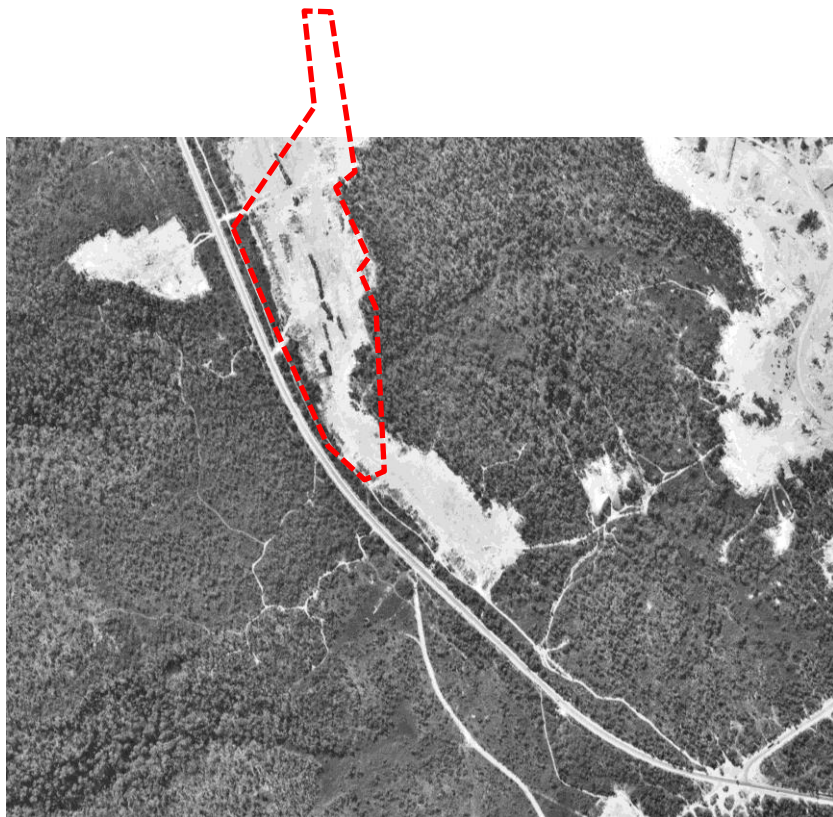




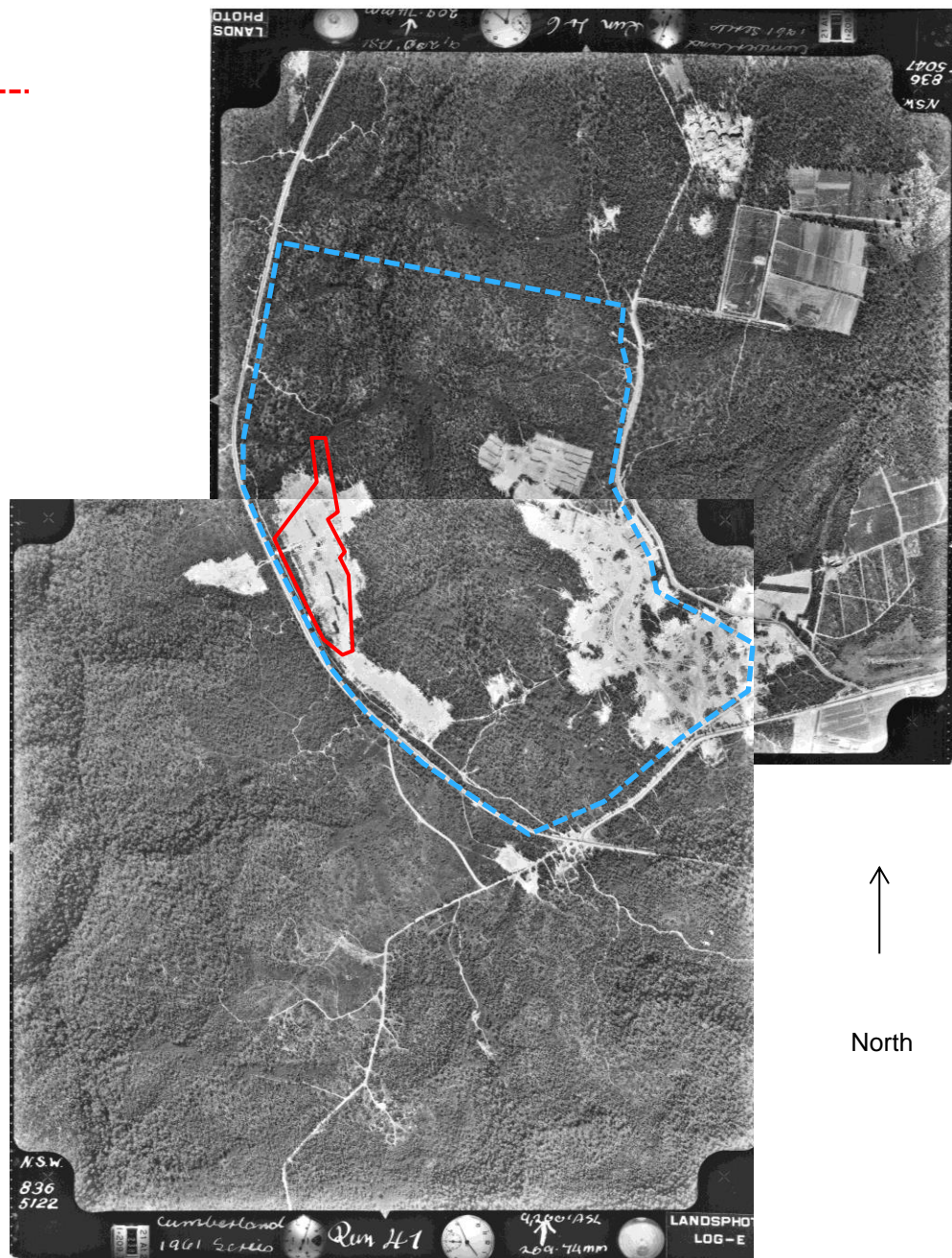
**1961**

Approximate site location ————

Approximate LHRRP ————



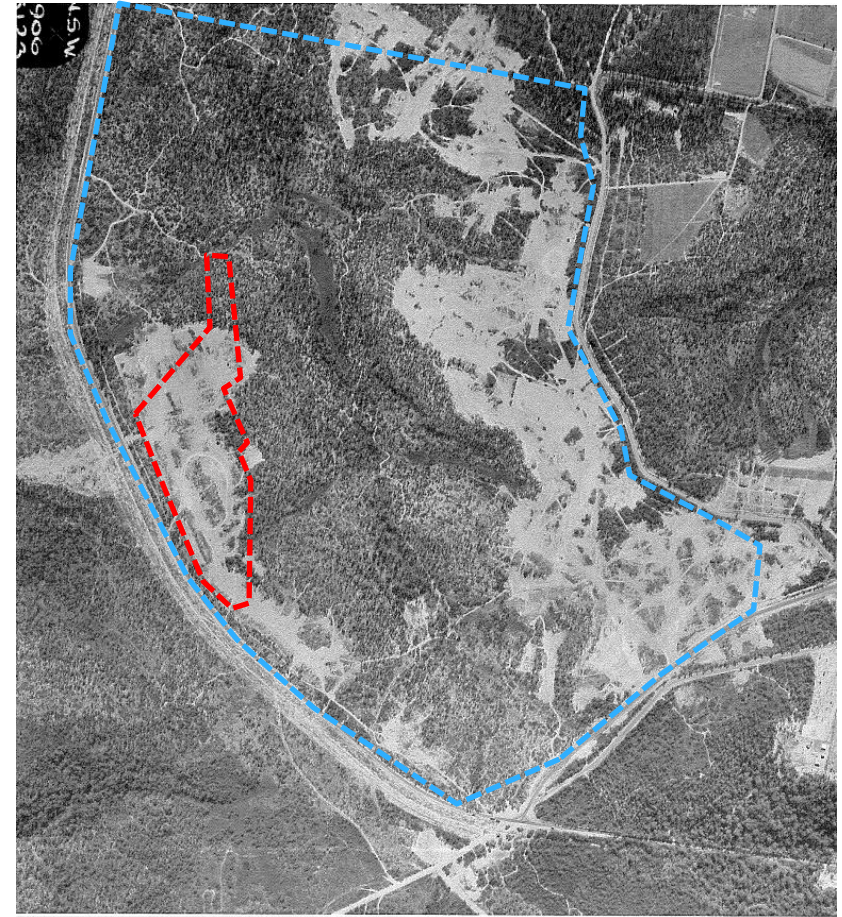
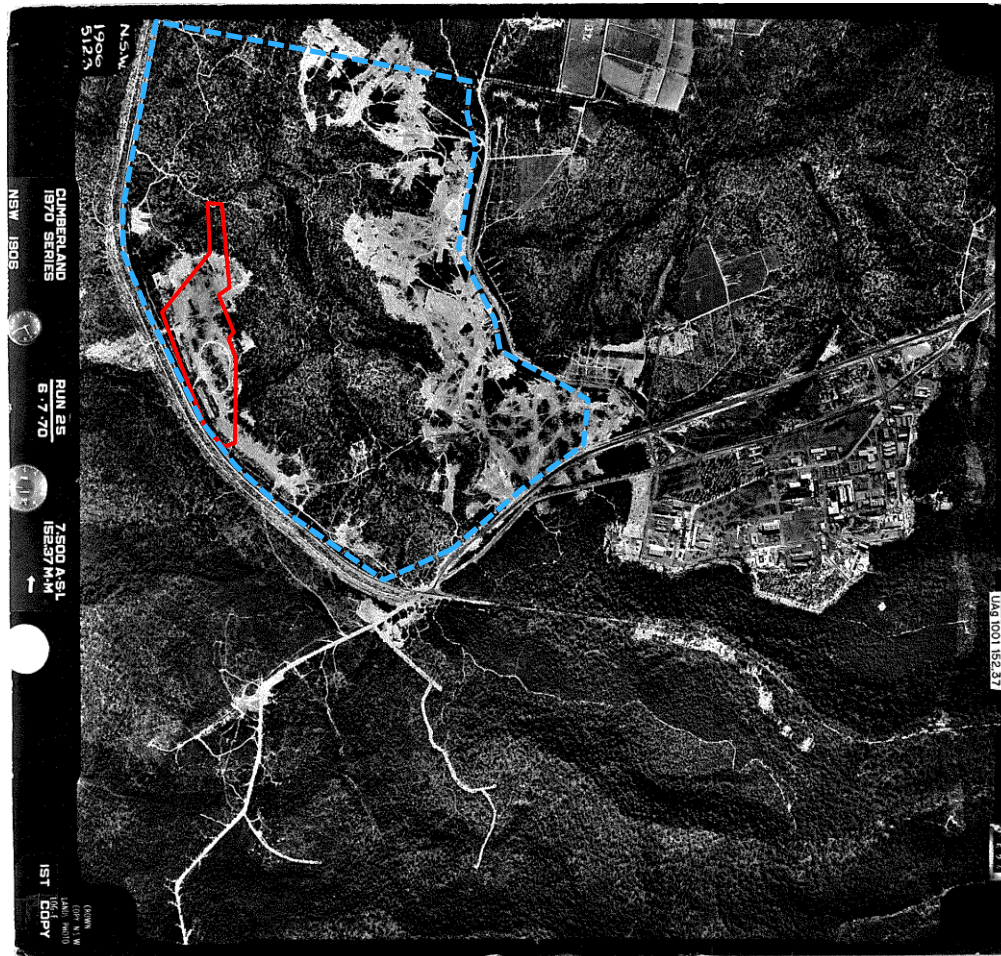
Right: full photograph provided.  
Above: close up of site





**1970**

Approximate site location -----  
Approximate LHRRP -----



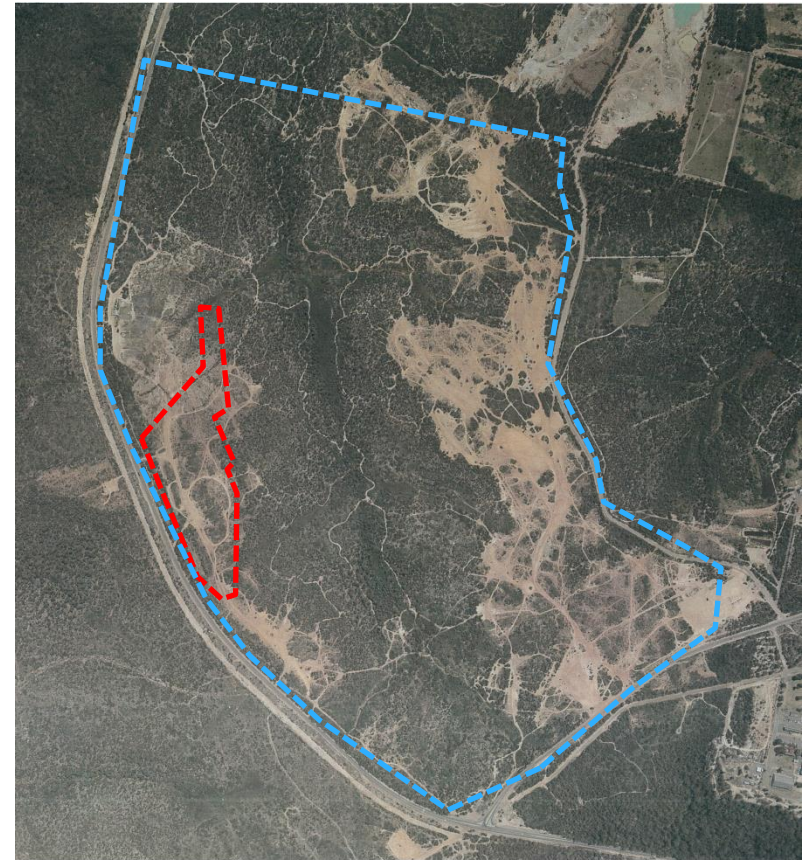
Left: full photograph provided.  
Above: close up of site





**1984**

Approximate site location -----  
Approximate LHRRP -----



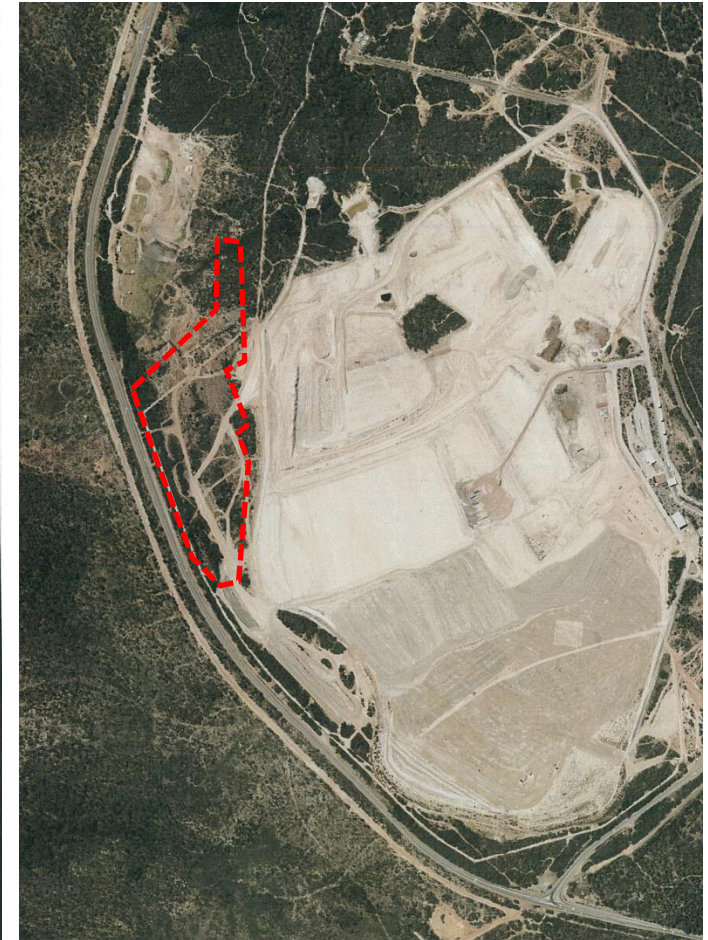
Left: full photograph provided.  
Above: close up of site





**1994**

Approximate site location -----  
Approximate LHRRP -----



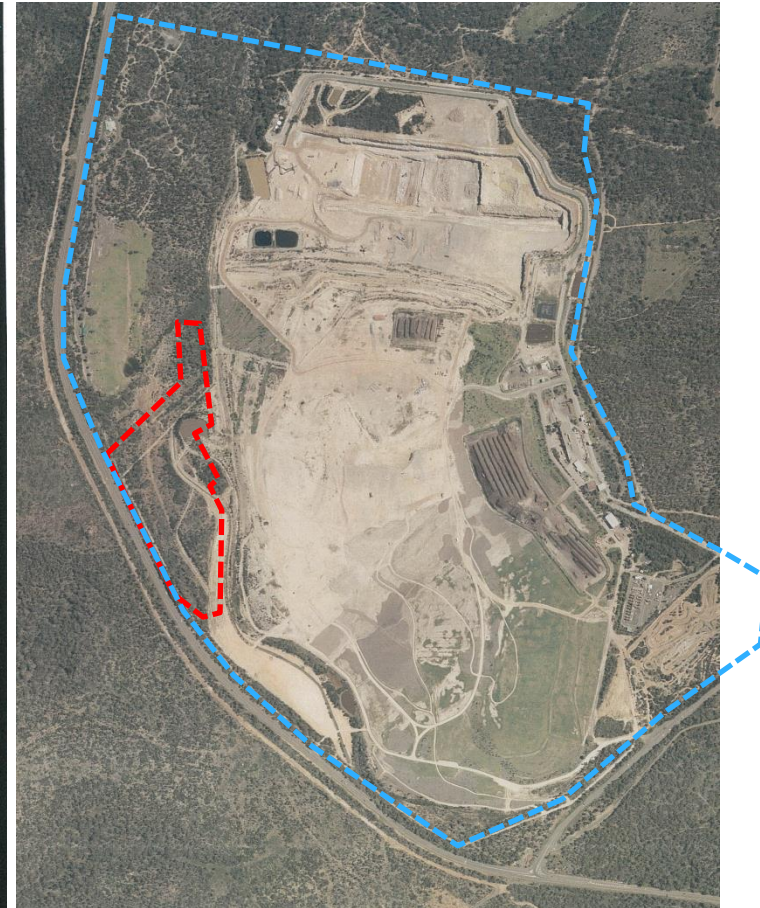
Left: full photograph provided.  
Above: close up of site





**2005**

Approximate site location -----  
Approximate LHRRP -----



Left: full photograph provided.  
Above: close up of site





**2014 (Current)**

Approximate site location    - - - - -

Approximate LHRRP    - - - - -



Left: full photograph provided.  
Above: close up of site





## Appendix C – Search results



Healthy Environment, Healthy Community, Healthy Business

[Home](#) > [Contaminated land](#) > [Record of notices](#)

## Search results

Your search for: Suburb: Lucas Heights

Matched 7 notices  
relating to 2 sites.

[Search Again](#)

[Refine Search](#)

Suburb	Address	Site Name	Notices related to this site
Lucas Heights	Little Forest Road	<a href="#">Harrington's Quarry</a>	3 current and 1 former
Lucas Heights	Heathcote and New Illawarra Roads	<a href="#">IWC Landfill</a>	2 current and 2 former

Page 1 of 1

14 August 2014

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## Site and notice details

Your search for: Suburb: Lucas Heights 7 notices on 2 sites were matched.

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<b>Area No: 3185</b>			
The information below was correct at the time the notices were issued.			
<b>Site:</b> Harrington's Quarry			
<b>Address:</b> Little Forest Road, Lucas Heights, 2234			
<b>LGA:</b> Sutherland Shire Council			
<b>Occupier:</b> Waste Service NSW			
<b>Owner:</b> Dept. Finance and Administration, C. of A. Lot 2 DP 605076			
<b>Notices relating to this site (3 current and 1 former)</b>			
(Map) where available, maps show the part of the site affected by the notice *notice matched search criteria			
Notice recipient	Notice type & number	Status	Date
Waste Recycling and Processing Corporation	Agreed Voluntary Remediation Proposal* <a href="#">26067</a>	Current	Issued 15 Mar 2005
Not Applicable	Declaration of Remediation Site* <a href="#">21062</a>	Current	Issued 22 Nov 2004
Waste Recycling and Processing Corporation	Agreed Voluntary Investigation Proposal* <a href="#">19017</a>	Current	Issued 29 Apr 2003
Brambles Holdings Ltd (Cleanway)	Section 35 EHC Act Order* <a href="#">105</a> <a href="#">Map</a>	Former	Issued 04 Aug 1987 Expired 04 Aug 1988

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## Site and notice details

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<b>Area No: 3083</b>					
The information below was correct at the time the notices were issued.					
<b>Site:</b> IWC Landfill					
<b>Address:</b> Heathcote and New Illawarra Roads, Lucas Heights, 2234					
<b>LGA:</b> Sutherland Shire Council					
<b>Owner:</b> Commonwealth Department of Administrative Services					
DP 106967	Lot 1 DP 605076	Lot 2 DP 605076	Lot 21 DP 818821	Lot 22 DP 818821	Lot 25 DP 874608
Lot 2 DP 1032102					
<b>Notices relating to this site (2 current and 2 former)</b>					
(Map) where available, maps show the part of the site affected by the notice					
*notice matched search criteria					
Notice recipient	Notice type & number	Status	Date		
Not Applicable	Declaration of Remediation Site* <a href="#">21036</a> <a href="#">Map</a>	Current	Issued 14 Jan 2003		
Commonwealth (Dept of Administrative Services)	Section 35 EHC Act Order* <a href="#">333</a> <a href="#">Map</a>	Current	Issued 19 Jan 1993		
BIS Cleanaway Limited	Remediation Order* <a href="#">23020</a> <a href="#">Map</a>	Former	Issued 26 Feb 2007 Revoked 07 Feb 2008		
Brambles Holdings Ltd t/a Cleanaway	Section 35 EHC Act Order* <a href="#">105</a> <a href="#">Map</a>	Former	Issued 04 Aug 1987 Expired 04 Aug 1988		

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Number	Name	Location	Type	Status	Issued date
1065	CONCRITE PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	POEO licence	No longer in force	9-May-00
6345	EDL LFG (NSW) PTY LTD	LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW 2234	POEO licence	Issued	28-Sep-00
1002700	EDL LFG (NSW) PTY LTD	LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	10-Jan-01
1016444	EDL LFG (NSW) PTY LTD	LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	7-Nov-03
1037823	EDL LFG (NSW) PTY LTD	LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	22-Jul-04
1519628	EDL LFG (NSW) PTY LTD	LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	29-May-14
626	HANSON CONSTRUCTION MATERIALS PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	POEO licence	Surrendered	25-Feb-00
5065	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	POEO licence	Issued	12-Apr-01
1011080	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	10-Apr-02
1018739	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	4-Jul-02
1019721	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	30-Aug-02
1034582	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	17-Jun-04
1041728	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	22-Oct-04
1044509	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	15-Feb-05
1044945	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	22-Mar-05
1045900	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	22-Jun-05
1056254	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	2-Mar-06
1063380	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	17-Aug-06
12520	SITA AUSTRALIA PTY LTD	New Illawarra Road, LUCAS HEIGHTS, NSW 2234	POEO licence	Issued	17-Aug-06
1073111	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	13-Feb-08
1084039	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	26-Mar-08
1084652	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	22-Apr-08
1090406	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	3-Nov-08
1095396	SITA AUSTRALIA PTY LTD	New Illawarra Road, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	19-Dec-08
1095614	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	19-Dec-08
1096953	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	21-Jan-09
1101542	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	5-Jun-09
13114	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD , LUCAS HEIGHTS, NSW 2234	POEO licence	Issued	9-Jun-09
1119295	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD , LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	9-Sep-10
1119590	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	24-Dec-10
1123930	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	31-Jan-11
1126549	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	31-Mar-11
1126548	SITA AUSTRALIA PTY LTD	New Illawarra Road, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	31-Mar-11
1127070	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	13-Jul-11
1510055	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD , LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	12-Dec-12
1510954	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	16-Jan-13
1517539	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	21-Oct-13
1518984	SITA AUSTRALIA PTY LTD	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	24-Dec-13
1520046	SITA AUSTRALIA PTY LTD	New Illawarra Road, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	19-Mar-14

13384	WASTE ASSETS MANAGEMENT CORPORATION	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	POEO licence	Issued	31-Jan-11
1127050	WASTE ASSETS MANAGEMENT CORPORATION	NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW 2234	s.58 Licence Variation	Issued	7-Apr-11



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## Licence summary

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### Summary Licence No: 1065

[View this licence](#) (PDF document 102 kb)

**Licence holder:** CONCRITE PTY LTD

**Premises:** CONCRITE PTY LTD

NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW, 2234

**LGA:** SUTHERLAND SHIRE **Catchment:** Sydney Coast & Georges River

**Administrative fee:** \$5,500.00

**Licence status:** No longer in force

**Activity type:** Concrete works

**Licence review:** Complete date 07 May 2009

Complete date 07 May 2004

Complete date 09 May 2001

Due date 07 May 2014

**Pollution incident management plan:** Yet to be confirmed

### Annual Returns

<u>Start date</u>	<u>End date</u>	<u>Date received</u>	<u>Non-compliance</u>	<u>LBL data</u>
01-Feb-2008	31-Jan-2009	30-Mar-2009	No	Not available
01-Feb-2007	31-Jan-2008	22-Feb-2008	No	Not available
01-Feb-2006	31-Jan-2007	19-Feb-2007	No	Not available
01-Feb-2005	31-Jan-2006	06-Mar-2006	No	Not available
01-Feb-2004	31-Jan-2005	22-Feb-2005	No	Not available
01-Feb-2003	31-Jan-2004	10-Feb-2004	No	Not available
01-Feb-2002	31-Jan-2003	11-Feb-2003	<a href="#">yes</a>	Not available
01-Feb-2001	31-Jan-2002	18-Mar-2002	No	Not available
01-Feb-2000	31-Jan-2001	08-Mar-2001	No	Not available

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### Summary Licence No: 6345

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**Licence holder:** EDL LFG (NSW) PTY LTD

**Premises:** LUCAS HEIGHTS 2 LFG POWER STATION

LITTLE FOREST ROAD, LUCAS HEIGHTS, NSW, 2234

**LGA:** SUTHERLAND SHIRE **Catchment:** Sydney Coast & Georges River

**Administrative fee:** \$2,975.00

**Licence status:** Issued

**Activity type:** Generation of electrical power from gas

**Licence review:** Complete date 25 Jun 2013

Complete date 15 Aug 2008

Complete date 07 Nov 2003

Due date 25 Jun 2018

**Pollution incident** Last tested 01 Jan 2014

**management plan:** Last updated 01 Jan 2014

### Applications

<u>Number</u>	<u>Application type</u>	<u>Current status</u>	<u>Date received</u>
<a href="#">140027</a>	s.55 Licence Transfer	Approved	09 Oct 2000

### Notices

<u>Number</u>	<u>Issue date</u>	<u>Notice type</u>
<a href="#">1002700</a>	10 Jan 2001	s.58 Licence Variation
<a href="#">1016444</a>	07 Nov 2003	s.58 Licence Variation
<a href="#">1037823</a>	22 Jul 2004	s.58 Licence Variation
<a href="#">1519628</a>	29 May 2014	s.58 Licence Variation

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### Annual Returns

<u>Start date</u>	<u>End date</u>	<u>Date received</u>	<u>Non-compliance</u>	<u>LBL data</u>
01-Apr-2013	31-Mar-2014	21-May-2014	No	Not available
01-Apr-2012	31-Mar-2013	29-May-2013	No	Not available
01-Apr-2011	31-Mar-2012	29-May-2012	No	Not available
01-Apr-2010	31-Mar-2011	31-May-2011		Not available
01-Apr-2009	31-Mar-2010	31-May-2010		Not available
01-Apr-2008	31-Mar-2009	29-May-2009	No	Not available
01-Apr-2007	31-Mar-2008	29-May-2008	No	Not available
01-Apr-2006	31-Mar-2007	01-Jun-2007	No	Not available
01-Apr-2005	31-Mar-2006	30-May-2006	No	Not available
01-Apr-2004	31-Mar-2005	01-Jun-2005	<a href="#">yes</a>	Not available
01-Apr-2003	31-Mar-2004	28-May-2004	<a href="#">yes</a>	Not available
01-Apr-2002	31-Mar-2003	02-Jun-2003	No	Not available
01-Apr-2001	31-Mar-2002	28-May-2002	No	Not available
01-Apr-2000	31-Mar-2001	01-May-2001	No	Not available



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## Licence summary

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### Summary Licence No: 626

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**Licence holder:** HANSON CONSTRUCTION MATERIALS PTY LTD  
**Trading as:** HANSON CONSTRUCTION MATERIALS  
**Premises:** PIONEER CONSTRUCTION MATERIALS PTY LTD  
 NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW, 2234  
**LGA:** SUTHERLAND SHIRE **Catchment:** Sydney Coast & Georges River  
**Administrative fee:** \$475.00  
**Licence status:** Surrendered  
**Activity type:** Concrete works  
**Licence review:** Complete date 09 Apr 2001  
 Due date 09 Apr 2004  
**Pollution incident management plan:** Yet to be confirmed

### Applications

<u>Number</u>	<u>Application type</u>	<u>Current status</u>	<u>Date received</u>
<a href="#">1018970</a>	s.58 Licence Variation	Issued	01 Jul 2002
<a href="#">1029102</a>	s.80 Surrender of a Licence	Issued	06 Jun 2003

### Notices

<u>Number</u>	<u>Issue date</u>	<u>Notice type</u>
<a href="#">1018970</a>	14 Aug 2002	s.58 Licence Variation
<a href="#">1029102</a>	15 Jul 2003	s.80 Surrender of a Licence

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### Annual Returns

<u>Start date</u>	<u>End date</u>	<u>Date received</u>	<u>Non-compliance</u>	<u>LBL data</u>
08-Nov-2002	06-Aug-2003	03-Oct-2003	No	Not available
08-Nov-2001	07-Nov-2002	17-Dec-2002	No	Not available
08-Nov-2000	07-Nov-2001	24-Dec-2001	No	Not available
08-Nov-1999	07-Nov-2000	15-Nov-2000	No	Not available



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## Licence summary

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### Summary Licence No: 5065

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**Licence holder:** SITA AUSTRALIA PTY LTD  
**Premises:** LUCAS HEIGHTS WASTE & RECYCLING CENTRE  
 NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW, 2234  
**LGA:** SUTHERLAND SHIRE **Catchment:** Sydney Coast & Georges River  
**Administrative fee:** \$3,808.00  
**Licence status:** Issued  
**Activity type:** Waste storage - waste tyres  
 Waste storage - other types of waste  
 Waste disposal by application to land  
**Licence review:** Complete date 22 Jun 2010  
 Complete date 22 Jun 2005  
 Complete date 02 Sep 2003  
 Due date 22 Jun 2015  
**Pollution incident management plan:** Yet to be confirmed

### Applications

<u>Number</u>	<u>Application type</u>	<u>Current status</u>	<u>Date received</u>
<a href="#">146428</a>	s.55 Licence Transfer	Approved	23 Feb 2011

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### Notices

<u>Number</u>	<u>Issue date</u>	<u>Notice type</u>
<a href="#">1011080</a>	10 Apr 2002	s.58 Licence Variation
<a href="#">1018739</a>	04 Jul 2002	s.58 Licence Variation
<a href="#">1019721</a>	30 Aug 2002	s.58 Licence Variation
<a href="#">1034582</a>	17 Jun 2004	s.58 Licence Variation
<a href="#">1041728</a>	22 Oct 2004	s.58 Licence Variation
<a href="#">1044509</a>	15 Feb 2005	s.58 Licence Variation
<a href="#">1044945</a>	22 Mar 2005	s.58 Licence Variation
<a href="#">1045900</a>	22 Jun 2005	s.58 Licence Variation
<a href="#">1056254</a>	02 Mar 2006	s.58 Licence Variation
<a href="#">1063380</a>	17 Aug 2006	s.58 Licence Variation
<a href="#">1073111</a>	13 Feb 2008	s.58 Licence Variation
<a href="#">1084039</a>	26 Mar 2008	s.58 Licence Variation
<a href="#">1084652</a>	22 Apr 2008	s.58 Licence Variation
<a href="#">1090406</a>	03 Nov 2008	s.58 Licence Variation
<a href="#">1095614</a>	19 Dec 2008	s.58 Licence Variation
<a href="#">1096953</a>	21 Jan 2009	s.58 Licence Variation
<a href="#">1101542</a>	05 Jun 2009	s.58 Licence Variation
<a href="#">1119590</a>	24 Dec 2010	s.58 Licence Variation
<a href="#">1123930</a>	31 Jan 2011	s.58 Licence Variation
<a href="#">1126549</a>	31 Mar 2011	s.58 Licence Variation
<a href="#">1127070</a>	13 Jul 2011	s.58 Licence Variation
<a href="#">1510954</a>	16 Jan 2013	s.58 Licence Variation
<a href="#">1517539</a>	21 Oct 2013	s.58 Licence Variation
<a href="#">1518984</a>	24 Dec 2013	s.58 Licence Variation

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**Annual Returns**

<u>Start date</u>	<u>End date</u>	<u>Date received</u>	<u>Non-compliance</u>	<u>LBL data</u>
21-Aug-2012	20-Aug-2013	02-Oct-2013		Not available
21-Aug-2011	20-Aug-2012	22-Oct-2012		Not available
21-Aug-2010	20-Aug-2011	20-Oct-2011		Not available
21-Aug-2009	20-Aug-2010	25-Oct-2010		Not available
21-Aug-2008	20-Aug-2009	20-Oct-2009		Not available
21-Aug-2007	20-Aug-2008	21-Oct-2008		Not available
21-Aug-2006	20-Aug-2007	08-Oct-2007	<a href="#">yes</a>	Not available
21-Aug-2005	20-Aug-2006	18-Oct-2006		Not available
21-Aug-2004	20-Aug-2005	21-Oct-2005	<a href="#">yes</a>	Not available
21-Aug-2003	20-Aug-2004	22-Oct-2004	<a href="#">yes</a>	Not available
23-Nov-2002	20-Aug-2003	21-Oct-2003	<a href="#">yes</a>	Not available
23-Nov-2001	22-Nov-2002	17-Jan-2003	<a href="#">yes</a>	Not available
23-Nov-2000	22-Nov-2001	22-Jan-2002	<a href="#">yes</a>	Not available
23-Nov-1999	22-Nov-2000	01-Mar-2001	No	Not available



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### Summary Licence No: 13384

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**Licence holder:** WASTE ASSETS MANAGEMENT CORPORATION  
**Premises:** LUCAS HEIGHTS WASTE AND RECYCLING CENTRE  
NEW ILLAWARRA ROAD, LUCAS HEIGHTS, NSW, 2234  
**LGA:** SUTHERLAND SHIRE **Catchment:** Sydney Coast & Georges River  
**Administrative fee:** \$3,808.00  
**Licence status:** Issued  
**Activity type:** Waste storage - waste tyres  
Waste disposal by application to land  
Waste storage - other types of waste  
**Licence review:** Due date 31 Jan 2016  
**Pollution incident management plan:** Yet to be confirmed

### Notices

<u>Number</u>	<u>Issue date</u>	<u>Notice type</u>
<a href="#">1127050</a>	07 Apr 2011	s.58 Licence Variation

### Annual Returns

<u>Start date</u>	<u>End date</u>	<u>Date received</u>	<u>Non-compliance</u>	<u>LBL data</u>
21-Aug-2012	20-Aug-2013	18-Oct-2013	No	Not available
31-Jan-2012	20-Aug-2012	23-Oct-2012	No	Not available
31-Jan-2011	30-Jan-2012	03-Apr-2012	No	Not available

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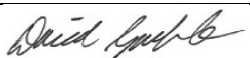
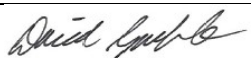
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