SITA Australia

Lucas Heights Resource Recovery Park Project

Environmental Impact Statement

VOLUME 8 – APPENDICES

October 2015

SITA Australia is changing brand to SUEZ

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VOLUME 8 – APPENDICES

Appendix **S** – Landfill Operation Environmental Management Plan

LH-EMP-001

OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

Lucas Heights Resource Recovery Park

ADDRESS: New Illawarra Rd, Lucas Heights NSW 2234

THE LEADER IN RESOURCE RECOVERY

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ABBREVIATIONS

µS/cm	Micro siemens per centimeter
^{0}C	Degrees Celsius
AHD	Australian Height Datum
ANSTO	Australian Nuclear Science and Technology Organisation
ARI	Average Recurrence Internval
ARRT	Advanced Resource Recovery Technology Facility
AS	Australian Standard
BOD	Biochemical Oxygen Demand
cm	Centimeters
COC	Condition of Consent
CRG	Community Reference Group
DA	Development Application
dB	Decibel
DoPE	New South Wales Department of Planning & Environment (formerly known as the New South Wales Department of Planning & Infrastructure)
EDL	Energy Developments Limited
EIS	Environmental Impact Statement
EMR	Environmental Management Representative
EMTG	Environmental Management Technical Group
EPL	Environmental Protection Licence
ERP	Emergency Response Plan
FID	Flame Ionization Detector
GO	Garden Organics facility
GWPCF	Green Waste Processing and Composting Facility
ha	Hectare
HDPE	High Density Polyethylene

HVS	High Volume Sprayer
IMS	Information Management System
JSEA	Job Safety and Environmental Analysis
kg	Kilograms
km	Kilometre
L	Litre
LHCA	Lucas Heights Conservation Area
LHRRP	Lucas Heights Resource Recovery Park
LLDPE	Linear low-density polyethylene
m	Metre
m/s	Meters per second
MB	Monitoring Bore
mg/L	Milligrams per litre
mm	Millimetre
NECS	National Environmental Consulting Services
NPWS	National Parks and Wildlife Service
NSW	New South Wales
EPA	Environment Protection Authority
OEMP	Operational Environmental Management Plan
OU	Odour Units
PET	Polyethylene Terephthalate
PIMRP	Pollution Incident Management Response Plans
PPM	Parts Per Million
RRC	Resource Recovery Centre
SICTA	Sydney International Clay Target Association
SITA	SITA Australia
SOP	Standard Operating Procedures

SSC	Sutherland Shire Council
SSPCYC	Sutherland Shire Police Citizens Youth Club
TSC Act	Threatened Species Conservation Act
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
RRC	Resource Recovery Centre
VPA	Voluntary Planning Agreement
WH&S	Work Health and Safety

SECTION 1
INTRODUCTION

1.1 OVERVIEW

SITA Australia (SITA) is a leader in resource recovery, providing integrated waste management and resource recovery solutions. Its core business is to provide end-to-end waste management solutions including the collection, resource recovery, recycling and disposal of residual waste at over 100 sites and facilities around Australia.

SITA operates a solid waste landfill at Lucas Heights Resource Recovery Park (LHRRP). LHRRP is licensed to accept solid waste from domestic and commercial sources that are suitable for disposal in a general solid (putrescible) waste landfill.

Activities on the site include waste receival and recycling, waste compaction and covering, environmental monitoring and environmental management.

Waste receival activities will cease at the LHRRP in 2037. The site will then be rehabilitated and made available from 2039 to the community as a parkland. SITA would continue to have responsibility for the environmental performance of the disposed waste for a minimum 30 year period after site closure and would monitor and manage the site in accordance with the closure requirements administered by the New South Wales Environment Protection Authority (NSW EPA). With this in mind, a Post Closure Environmental Management Plan (EMP) has been prepared to ensure that the site operates in accordance with community expectations and meets all applicable environmental standards. This current Operational Environmental Management Plan (OEMP) covers all activities until waste receival activities cease.

During the site's operational period the maximum quantity per annum of waste proposed to be processed / disposed at the LHRRP would be 1,140,000 tonnes per year, with a maximum of 850,000 tonnes per year being used for landfilling and re-profiling the site and 290,000 tonnes being processed by the resource recovery facilities (200,000 tonnes at the Advanced Resource Recovery Treatment (ARRT) facility, 80,000 tonnes at the Garden Organics (GO) facility and 10,000 at the Resource Recovery Centre (RRC)). Site specific OEMPs have been developed for the GO and the ARRT facilities.

During some years of the operational period, the quantities of waste received at the site and utilised for re-profiling will be less than the figures quoted above. These variations are difficult to predict due to the uncertain introduction of additional waste recovery facilities and market conditions. The total amount of waste utilised for re-profiling the site (landfill disposal) would be limited to 8.3 million cubic metres which is equivalent to approximately 8.3 million tonnes of waste assuming 1 tonne of waste utilises 1 cubic metre of waste disposal airspace.

1.2 SCOPE

The scope of this LHRRP OEMP includes all environmental and operational activities associated with waste receival, recycling and landfilling located at the landfill and RRC at the LHRRP site. This LHRRP OEMP also covers the cumulative environmental impacts (i.e. odour) arising from all of the activities at the LHRRP (e.g. GO and ARRT facilities). It also includes management of certain aspects of the Lucas Heights 1 (Former) Waste Management Centre which is required to support the environmental and operational activities at LHRRP. A separate Post Closure EMP will be

provided to SSC. The Post Closure EMP will activate when the LHRRP landfill closes, in 2037 or any date prior.

Renewable energy generation at the LHRRP is currently managed by Energy Developments Limited (EDL) through contractual arrangements with SITA. If there are any changes to the contractual conditions, this OEMP will be updated to reflect the new arrangements.

This draft version of the OEMP will be updated to address any additional requirements from the conditions of consent and EPL (post development consent for the project).

1.3 PURPOSE

SITA is committed to best practice, prevention, mitigation and rectification of the operation and management of the LHRRP. The purpose of this OEMP is to adopt and document a “Best Practice Approach” for the environmental management of the LHRRP. This OEMP also reflects the intention of the requirements of the Environmental Guidelines: Solid Waste Landfills (NSW EPA, 1996). One of the key aims of the OEMP is to have little or no impact on the community from operations at LHRRP.

This OEMP describes the operational activities on the site that have, or are likely to have, an impact on the environment and the community and the measures to be undertaken by SITA to minimise those impacts.

The OEMP provides:

- For best practice management of the LHRRP
- A basis for the New South Wales Environment Protection Authority (NSW EPA) to assess the environmental performance of the landfill and RRC at the LHRRP and to review the operational and monitoring activities that are covered by the site’s Environment Protection Licence (EPL No. 5065).
- Assurance to SSC that appropriate preventative, mitigation and rectification measures are integrated into future LHRRP operations.

1.4 BEST PRACTICE

The purpose of this OEMP is to adopt and document a “Best Practice Approach”. In addition, the environmental management of the landfill will also reflect the intention of the requirements of the Environmental Guidelines: Solid Waste Landfills which includes references to the environmental goals and benchmark techniques described within the guidelines.

Best Practice is defined as:

"*The best combination of eco-efficient techniques, methods, processes or technology used in a similar industry sector and environmental setting that demonstrably minimises the environmental impact and achieves the desired project goals for the local environmental setting*”

Eco-efficient is defined as:

"*The most effective means of achieving a particular goal or set of goals, taking into consideration environmental, economic and social factors*"

1.5 PREVENTION / MITIGATION / RECTIFICATION

This section describes the operational activities on the site that have, or are likely to have, an impact on the environment and the community and measures to be undertaken to manage those impacts.

Where applicable, the measures have been hierarchically categorised as follows:

- *Preventative measures* - aim to eliminate or reduce any environmental aspect that is likely to cause a negative impact
- *Mitigation measures* - aim to pre-emptively minimise any negative environmental impacts
- *Rectification measures* - aim to retrospectively control any negative environmental impacts

SITA will adopt the appropriate preventative, mitigation and/or rectification measures to address the site goals and objectives as required.

1.6 UPDATES

This OEMP is a "living document" and will be updated periodically as new technology emerges and new standards for environmental performance are adopted industry wide. Any proposed updates will be provided to SSC, the NSW EPA and the Community Reference Group (CRG) for discussion and comment.

This document is approved by SSC and any amendments must be approved by SSC.

1.7 LEGAL AND OTHER REQUIREMENTS

1.7.1 NSW Legislation

The procedure for maintaining compliance with legal and regulatory requirements at the LHRRP is outlined in the Legal and Other Requirements Integrated Management System (IMS) Procedure. The procedure designates responsibility for identifying applicable legal and regulatory requirements and ensuring access is maintained on site to applicable legal and regulatory requirements. The following NSW legislation applies to the operations of LHRRP:

- *Environmental Planning and Assessment Act, 1979 (EP&A Act)*
- *Protection of the Environment Operations Act, 1997 (PoEO Act 1997)*
- *Waste Avoidance and Resource Recovery Act, 2001*
- *Waste Recycling and Processing Corporation Act, 2010*
- *Ozone Protection Act, 1989*
- *National Environment Protection Council (New South Wales) Act, 1995*
- *Sydney Water Act, 1994*
- *Water Management Act, 2000*
- *Soil Conservation Act, 1938*
- *Public Health Act, 2010*
- *Work Health and Safety Act, 2011*
- *Road Transport Act 2013*
- *Contaminated Land Management Act 1997*
- *Heritage Act, 1977*
- *National Parks and Wildlife Act, 1974*

Specifically, NSW is covered by the EPA Environmental Guidelines: Solid Waste Guidelines (1996) and Environmental Guidelines: Waste Classification Guidelines (2008).

The *Commonwealth Environment Protection and Biodiversity Conservation Act, 1999* is also applicable to the operation of the site.

The *Commonwealth National Greenhouse and Energy Reporting Act, 2007* requires reporting of landfill gas emissions, and will be used to underpin the future Carbon Pollution Reduction Scheme.

The *Commonwealth National Environment Protection Council Act, 1994* requires reporting of pollutants annually through the National Pollutant Inventory National Environment Protection Measure. This reporting is to the NSW EPA, and supporting legislation including the *PoEO Act 1997* and regulations.

1.7.2 Conditions of Development Consent

THIS SECTION WILL BE UPDATED WITH THE NEW DEVELOPMENT CONSENT

Development Consent for landfilling activities on the LHRRP was granted by SSC in June 1985. Consent for the expansion of landfilling capacity was granted by the Minister for Urban Affairs and Planning in November 1999 and conditions for this consent have been issued (refer Appendix A). As a condition of this consent the development was carried out in accordance with:

- Development Application (DA) No 11-01-99
- The Environmental Impact Statement (EIS) prepared by National Environmental Consulting Services (NECS) dated December 1998
- Amended DA and accompanying Assessment Report prepared by NECS dated 27 April 1999, except as modified by the Conditions of Consent in Appendix A which have been incorporated into this OEMP
- The EIS prepared by GHD for the Lucas Heights Resource Recovery Park Projects dated 2014

There have been amendments to DA No. 11-01-99 in relation to LHRRP:

- 5 June 2001, three of the Conditions of Consent (No's 35, 36 and 122) were amended and one Condition of Consent was added (no 154) (Reference; DA No. 80-04-01)
- 22 September 2005, one Condition of Consent was removed (No. 36) (Reference, MOD-123-8-2005-i)
- 18 February 2009, modification for construction and operation of the LHRRP Truck Parking Area. Seven (7) Conditions of Consent were added (Condition No. 6e, 17b, 26, 125, 126a, 137a, 137b, 137c, 149 and 149a). Condition 17a was amended to require the Truck Parking Area to be incorporated into the OEMP. (Reference DA11-01-99 Mod 6)
- 28 June 2010, approval of Application 08-0163 for the Lucas Heights Alternative Waste Technology Facility Project
- On DA 11/01/1999 – modification for Truck Parking
- 18 January 2012 approval of modification Application 11-01-99 MOD 8 for the excavation of stages 5-2, 5-3 and stockpiling of soil
- 14 February 2014 approval of modification Application DA 11-01-99 MOD10 for the BMX bicycle facility

1.7.3 Environment Protection Licence

THIS SECTION WILL BE UPDATED WITH THE NEW EPL REQUIREMENTS

The LHRRP has been licensed by the NSW EPA under the PoEO Act 1997. This license is renewed annually and is reviewed every five years after the date of issue (refer Appendix B). The conditions of this EPL are addressed within this OEMP. A copy of the licence is kept at the LHRRP site office. There are separate EPLs for the GO facility, the Sutherland Shire Police Citizens Youth Club (SSPCYC) Minibike Club Area and the ARRT facility.

1.7.4 Conditions of Lease over ANSTO Land

The LHRRP consists of approximately 205 hectares in two ownerships - 89 hectares owned by SITA and 116 hectares owned by the Australian Nuclear Science and Technology Organisation (ANSTO) and leased to SITA for waste management or other agreed purposes. SITA will have ongoing access to the site until hand back of the land to ANSTO in 2025, when the lease is expected to end. Energy generation from landfill gas will still be ongoing after 2025 and is expected to continue for a number of years after 2037.

A lease was executed in January 1998 between ANSTO and SITA. The following are the conditions relating to environmental aspects of the development:

- The lessee (SITA) must comply with all notices issued by and all requirements made by any relevant authority affecting the land or the improvements
- The lessee shall be responsible for leachate control for as long as such control is considered necessary by any relevant authority
- The lessee shall observe all Commonwealth and State laws, regulations etc. with regard to control of pollutants, landfill gas, leachate discharges and discharges to sewer
- The lessee shall remediate the land to the standard identified in the DA
- The lessee shall install a fence around land adjacent to access roads and provide gates for fire-fighting and emergency access
- The lessee shall inspect the ANSTO buffer boundary along New Illawarra Road for litter and loose material three times per week and remove any litter and loose material weekly

This OEMP also reflects the above requirements. Until 2025, the ANSTO land would be progressively rehabilitated and maintained by SITA. This would involve capping and revegetation (grassed) of the final landform within the ANSTO portion of the LHRRP that is progressively landfilled. It will also be maintained and monitored in accordance with the standards set out in this OEMP (refer to section 8 and section 9). The relevant sections of this OEMP will apply to the ANSTO land from 2025 until 2037.

1.7.5 Voluntary Planning Agreement

In recognition of the critical role that the LHRRP plays in managing Sydney's waste, SITA would enter into a Voluntary Planning Agreement (VPA) with SSC in accordance with the requirements of the *EP&A Act*. The Minister for Planning would consider the VPA along with the DA and EIS and would be the consent authority for the proposal. All SITA entities (SembSITA, WSN Environmental Solutions and SITA Australia) and SSC would be signatories to the VPA.

The VPA commits SITA to providing significant financial resources to SSC and the community to enable it to develop community facilities like the Ridges Sporting Complex and golf course.

Under the VPA, SITA is committing to meet a number of environmental commitments in terms of actions it will take based on the site's environmental performance. This OEMP forms part of the VPA.

SECTION 2
SITE DESCRIPTION

2.1 BACKGROUND

2.1.1 Former Activities

Prior to the commencement of landfill activities, the LHRRP site had been used for logging, gravel extraction and trail bike riding. The majority of the site has now been utilised for waste disposal and recycling activities. No liquid, toxic, hazardous or restricted waste, including radioactive waste, has been accepted by the LHRRP.

2.1.2 Existing LHRRP Activities

SITA currently operates the site as a solid waste landfill with associated waste management and recycling activities. Activities on site include: waste receival, recycling, waste compaction and covering, environmental management and monitoring, leachate collection and disposal, landfill gas extraction, electricity generation and flaring of excess gas and truck parking and servicing. SITA also extracts material to create air space for landfilling and provide cover material.

EDL operates the landfill gas extraction system and gas-to-electricity power station.

2.1.3 Surrounding Land Use

Location of the LHRRP is shown in Figure 2.1. Land uses surrounding the landfill are as follows:

Direction	Description
North	• Sydney International Clay Target Association (SICTA)
North West	• Mill Creek is immediately adjacent to the boundary with the LHRRP landfill adjacent
South East	• Beyond the landfill is the SSPCYC Mini-Bike Club • ANSTO's research facilities are located across New Illawarra Road
South	• Heathcote Road and the Heathcote National Park
West	• Heathcote Road is immediately adjacent to the boundary • The Holsworthy Military Reserve is on the other side of Heathcote Road • ARRT facility • GO facility

To the north-east of the LHRRP is a quarry which has been rehabilitated, a former quarry which has been filled with solid waste (Harrington's Quarry), and a former privately operated liquid waste depot on Commonwealth land, a burial facility for low level radioactive waste, and the former SSC night soil depot. Menai and West Menai residential areas are located approximately 2 kilometres (km) north-east of the site, and the suburbs of Yarrawarrah and Engadine are located approximately 2 km south west of the site. The Lucas Heights Conservation Area (LHCA) is located directly to the north of the LHRRP and comprises mainly bushland. Heathcote National Park is located to the south of the LHRRP.

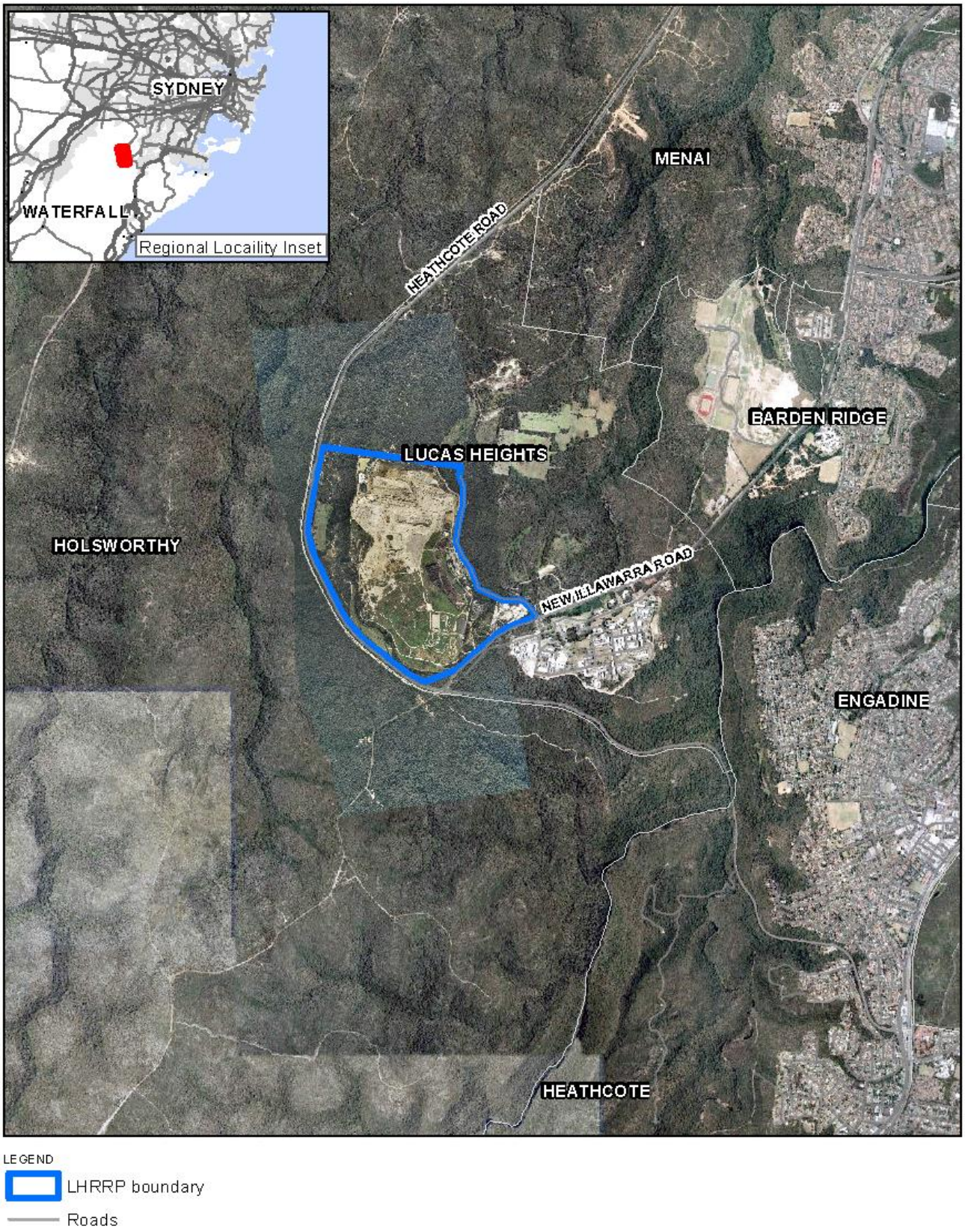

Figure 2.1 LHRRP location

2.2 ENVIRONMENTAL CHARACTERISTICS

2.2.1 Zoning and Surrounding Land Use

TO BE CONFIRMED

Under the Sutherland Local Environmental Plan 2015 (SLEP), the LHRRP is located in the following zones:

- SP1 – Special activities (Waste Recycling)
- RE1 – Public Recreation

The following outlines the objectives and permitted uses of each zone.

Under the SLEP, the LHRRP proposal can be defined as the following:

waste or resource management facility *means any of the following:*

(a) a resource recovery facility,

(b) a waste disposal facility,

(c) a waste or resource transfer station,

(d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).

The following definitions are relevant to the definition of a waste or resource management facility as outlined above:

resource recovery facility *means a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration*

waste disposal facility *means a building or place used for the disposal of waste by landfill, incineration or other means, including such works or activities as recycling, resource recovery and other resource management activities, energy generation from gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal.*

waste or resource transfer *station means a building or place used for the collection and transfer of waste material or resources, including the receipt, sorting, compacting, temporary storage and distribution of waste or resources and the loading or unloading of waste or resources onto or from road or rail transport.*

The reprofiling of the landfill would occur in both the SP1 – Special Activities and RE1 – Public Recreation zones. Reprofiling of the landfill (waste disposal facility) does not meet the definition of waste recycling (or any other permitted uses) and therefore is not permissible on the SP1 and RE1 zones.

The proposed ARRT and GO facilities are located in the RE1 – Public Recreation zone. Both of these uses can be defined as a resource recovery facility, however this use is not permitted within the RE1 zone.

A planning proposal has been prepared and would run in parallel with the State Significant Development Application. The planning proposal seeks to include new local provisions on the LHRRP site within the SLEP which would allow the proposal (a waste or resource management facility) to be undertaken on the proposal site. To permit development of a waste or resource

management facility, the consent authority must be satisfied that the objectives of the local provision for the site are met, these objectives are as follows:

(a) To improve the resource recovery capabilities of the Lucas Height Resource Recovery Park,

(b) To increase the waste disposal capacity of the Lucas Heights Resource Recovery Park to meet the needs of Sydney,

(c) To ensure that quality open space for recreation purposes is achieved following the closure of the Resource Recovery Park,

(d) To ensure landfill is of a type and degree of compaction that is capable of supporting the future use of the land for recreation purposes,

(e) To minimise the environmental impacts of the continued operation of the Lucas Heights Resource Recovery Park on local residents and the environment.

LHRRP activities are considered to be consistent with these objectives as they would improve the resource recovery capabilities and increase the waste disposal capacity of the LHRRP. The impacts of the proposal on the environment have been assessed through the environmental impact statement (EIS). The EIS concludes that there would be minimal additional impacts associated with the proposal. .

The proposal would permit the future use of the land for recreation purposes, which would have occurred when the existing LHRRP facility ceases operating. Once capped and landscaped, the final landfill surface would support future recreation land uses. A master plan has been developed for the future use of the site, which identifies a number of passive recreation land uses such as picnic areas (with facilities), grassed areas available for picnics and other passive uses and also a shared path for pedestrians and cyclists.

Sutherland Shire Council granted approval in 2009 for the SSPCYC Mini-Bike club to be located at the southern end of the LHRRP site.

2.2.2 Topography

The LHRRP represents a gently undulating plateau, 200-1000 metres (m) in width, dissected by two ridges. The ridges run parallel to Heathcote Road and form a shallow valley. The gradients of the site are typical of a dissected plateau, with the slopes becoming steeper close to Mill Creek. Mill Creek itself has a slope of approximately 2% as it travels through the site.

2.2.3 Climate

A warm temperate climate with strong maritime influence is experienced in the Lucas Heights area. Mean daily temperatures range from 26.0 ^{0}C to 17.0 ^{0}C in February and from 15.8 ^{0}C to 6.6 ^{0}C in July. Frost is not experienced in this area.

Seasonal variations occur in rainfall with a greater proportion being received during summer months. A generally even rainfall distribution is experienced over the region with a mean annual rainfall of 1015 millimetres (mm).

The most common winds are south-westerly in winter with southerly winds and sea breezes predominating during the remainder of the year. During the night, light winds are generated along

drainage lines. The air mass is directed back up the valley later in the day due to sea breezes off Botany Bay.

2.2.4 Geology and Soils

The geology of the LHRRP is mainly Hawkesbury Sandstone, which is commonly found in the region. A lens of clay / shale, several meters thick, occurs near the LHRRP. There is an area of clay / shale on the north-eastern corner of the site in the Little Forest area, and also along the eastern side of adjoining SITA land. A clay quarry formerly operated on the eastern boundary of the LHCA. The shale is weathered, grey, silty clay with many fine sandy particles.

The soil in the LHRRP has been disturbed due to ongoing waste disposal and clay / shale extraction, and also because of gravel quarrying that took place here prior to these activities.

Ridges and Plateau Crests

The ridges and plateau crests on the site have lateritic podzolic soils which have a moderate depth of 0.5 to 1.5 m. These soils are bleached and stony sandy clay loams, setting hard when exposed. They have a fine sandy clay loam texture with coherent structure, showing no distinct arrangements of soil particles.

Crests and Plateau Ridges

Yellowish brown sandy clay of a maximum of 1 m in depth underlies topsoils on crests and plateau ridges. This clay has strong pedal structure, which means it contains soil aggregates or peds. Ironstone is commonly found in elevated positions.

Plateau Ridges

The dominant subsoils on the plateau ridges are Yellow Earths, which are earthy, porous, yellowish brown sandy clay loams.

Northern Extremity

The northern extremity of the site has soils ranging from loose, coarse quartz sand to earthy, yellowish brown sandy clay loam, to pale strongly pedal light clay. The soil depth is less than 1 metre; however, in the valley flats the depositional sand can be greater than 1 m (Soil Conservation Service, 1990 cited in Waste Service NSW, 1997).

Fill

The LHRRP has received both putrescible and non-putrescible waste, mainly consisting of household, commercial and some industrial waste since 1986 (Woodward, 1996).

2.2.5 Surface Hydrology and Groundwater

Surface Water

Most of the LHRRP site lies within the Mill Creek catchment. Mill Creek originates from the LHRRP and flows north along the western boundary towards Georges River. The gradients of the LHRRP are typical of a dissected plateau, with the slopes becoming steeper close to Mill Creek. Mill Creek itself has a slope of 2% as it travels through the site. Baseflow for the perennial rivers and streams are generally sourced from seeps and springs derived from groundwater.

There are a number of surface water management features currently in place at the site. Surface water diversion drainage is constructed around the rim of each active waste disposal cell to control surface water runoff flowing into or from the cells. The drainage typically comprises open channel drains on the outer edge of earthen bunds. Surface water is collected in drains, swales and ponds and diverted to sediment dams. The dams are designed to allow for settlement of suspended solids before discharging offsite following large rainfall events when stormwater has reached capacity.

Most of the LHRRP (the landfilled portion) lies within the catchment area of Mill Creek, with the exception of the area bounded by New Illawarra Road and Little Forest Road in the south-east and the administration facilities, which drains to Bardens Creek. As this area is not impacted by this proposal, impacts to Bardens Creek are not assessed in this report. Mill Creek originates from within the site and flows in a northerly direction through approximately the centre of the site, covering most of the length of the site. Towards the origin of the creek, the channel is not always clearly visible. Apart from small overflows, flooding is not expected to occur over the site because the gradients of the site allow good drainage.

Groundwater

The Hawkesbury Sandstone is generally well-cemented by authigenic quartz and siderite and is infilled with varying proportions of clay. The unweathered sandstone has a very low primary or intergranular permeability. The formation has a complex aquifer system due to sub-vertical joints and sub-horizontal bedding planes and the lithology associated with variable weathering. There is 20 to 25 m of low permeability medium and high strength sandstone above the fracture zone (Douglas Partners, 1994).

Perched water tables, ‘leaky’ aquifers and pressurised zones are a feature of the hydrogeological environment due to the discontinuous shale and clay layers (Knight, 1992). Weathering has produced spatially and vertically variable aquifer material which influences the groundwater flow paths and hydraulic conductivity in different layers and areas.

2.2.6 Flora and Fauna

Flora

The LHRRP is surrounded by areas of natural vegetation which have been disturbed to varying degrees. Adjacent to the site to the north-west, is the site occupied by the SICTA. The vegetation on the SICTA site comprises the Scribbly Gum / Red Bloodwood woodland community and the Mallee / Heathland community. There is an area of cleared land within the SICTA site, where facilities for clay target shooting have been constructed. To the north, adjacent to the LHRRP, is the LHCA, which contains mainly vegetation which is common to sandstone soils in the region and the eastern part of the site contains significant vegetation on shale soils. Several trail bike tracks dissect the

vegetation within the LHCA. On the eastern side of the site, to the east of Little Forest Road, there are former waste disposal areas which have been rehabilitated, as well as vegetation common to sandstone soils, which form the upper reaches of the Bardens Creek catchment. Remnant vegetation screens the LHRRP from Heathcote Road to the south.

Over 90% of the original vegetation has been cleared from the LHRRP site. The vegetation at the LHRRP site, prior to its use for waste disposal, was likely to have been a continuation of the vegetation existing within the LHCA. The vegetation that remains on the site is mainly fragments of Scribbly Gum / Red Bloodwood woodland along the boundaries of the site. An area of approximately 3 ha of shale / sandstone Transition Forest (Transition Forest) on shale soils occurs in the north-east corner of the site, continuing from the LHCA. The Transition Forest was listed on Part 3 of Schedule 1 of the *Threatened Species Conservation Act 1995* (TSC Act 1995) as an endangered ecological community in September 1998.

Kevin Mills & Associates (1994) identifies several distinct vegetation areas at the site. They include:

- A natural area of bushland bordering the landfill area
- An older regeneration area along the far eastern end of the landfill site
- A more recent regeneration area along the southern edge of the landfill site
- The broad regeneration area over the completed landfill

Presence of Significant Flora

Very little of the site has been unaffected by landfill activities. The presence of significant species such as *Melaleuca deanei* and *Darwinia diminuta* is the result of propagation and planting undertaken at the site. Both *Melaleuca deanei* and *Darwinia diminuta* are classified as Rare or Threatened Australian Plant species under the Briggs and Leigh (1988) classification system, however, the legal status of these species is “Protected”. These species are not listed in schedules of the *TSC Act 1995*. Neither of these species were recorded at the site in a search of the NPWS Atlas of NSW Wildlife database (NPWS, June 1997).

The Transition Forest is an endangered ecological community under the Threatened Species Conservation Act (Cth). As mentioned previously, approximately 3 ha of this community can be found in the north-eastern part of the site.

Fauna

Mammals are not likely to be common in the areas where landfilling activities are currently taking place. Mammals are more likely to occur in vegetation near the northern boundary of the site close to the LHCA, however, the site is fenced and access is restricted for some species. The Fox *Vulpes vulpes,* Rabbit *Oryctolagus cuniculus,* Swamp Wallaby *Wallabia bicolor*, Bush Rat *Rattus fuscipes*, Black Rat *Rattus rattus*, House Mouse *Mus musculus* and Feral Cat *Felis catus* are likely to be found at the site.

Kevin Mills & Associates (1991) stated that arboreal mammals were uncommon in the area, which is consistent with other sandstone regions. It is unlikely that arboreal mammals would use the remnant woodland located near the boundary of the site, near the main roads. Arboreal mammals could occur in the woodland and open forest located near the northern boundary of the LHRRP, or are likely to venture into this vegetated area from the LHCA.

The birds at the LHRRP are likely to be mainly woodland birds, with some forest birds utilising the habitat provided by the open forest to the north of the site.
Snakes and lizards can also be expected to be found at the site. Evidence of a Lace Monitor *Varanus varius* was seen in the LHCA, near the fence of the LHRRP.

Frogs were recorded within the LHRRP (Waste Service NSW, 1997). These frogs were not identified by the study.

Presence of Significant Species

No significant species have been recorded or observed at the LHRRP. Given the extensive disturbance at the site, it is highly unlikely that threatened fauna occur at the site.

2.2.7 Archaeology and Heritage

An archaeological assessment of the LHRRP has been undertaken by Australian Archaeological Survey Consultants (1997) on behalf of NECS. Discussions were held on site with the representatives from the Gandangara Local Aboriginal Land Council, regarding the potential archaeological sensitivity of the LHRRP area. There was agreement on the very low archaeological sensitivity on the basis that:

- There is no possibility that Aboriginal sites would still be present within the disturbed portions of the study area
- The remainder of the study area has already been subject to an intensive archaeological survey. It is highly unlikely that any undetected Aboriginal sites are present within this portion of the study area

Unexpected finds
Any unexpected finds would follow procedures developed in the CEMP *(TO BE DEVELOPED)*

2.2.8 Physical Constraints

Landfilling activities and associated impacts are to be confined to the LHRRP site. The LHCA to the north of the site and downstream of Mill Creek has an increased level of protection and monitoring will be undertaken to ensure any off-site impacts from the LHRRP, including leachate, are identified and mitigated.

2.3 SITE FACILITIES AND SERVICES

Figure 2.2 shows the site layout. The area enclosed by the boundary titled “Operational Environmental Management Plan Boundary” depicts the area where the LHRRP OEMPs (including this LHRRP OEMP, GO Facility OEMP and ARRT OEMP) is applicable.

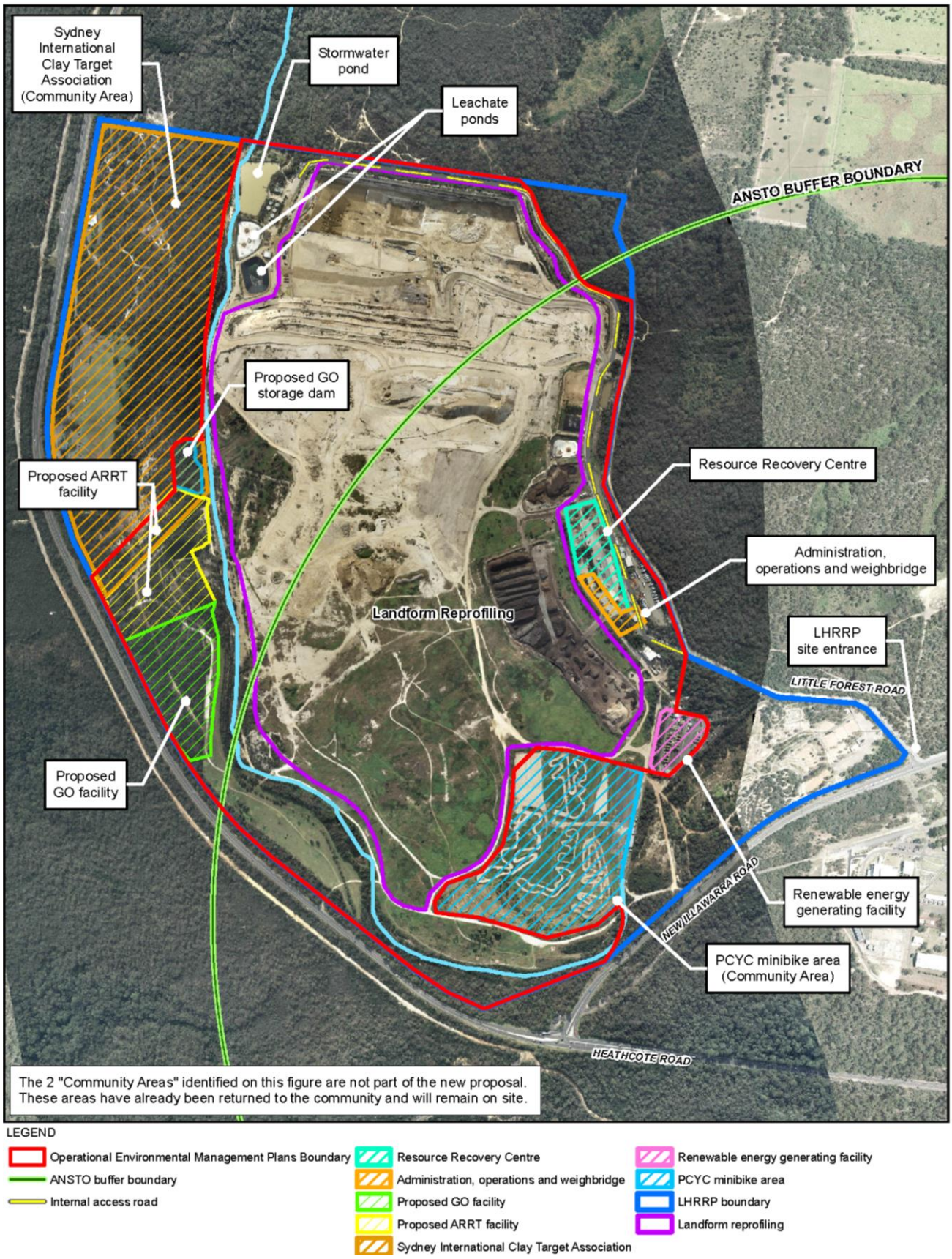

Figure 2.2 Site Layout

The LHRRP facilities are accessed via Little Forest Road, which intersects New Illawarra Road opposite the ANSTO facility.

LHRRP facilities include:

- Office / amenities building
- Workshop
- Workshop plant
- Nursery
- Recycling building
- Resource Recovery Centre
- Three weighbridges
- Truck washing bay
- Water tower
- Fuel storage area
- Parking area for staff and machinery

2.3.1 Site access roads

A sealed road leads to the north-west corner of the site where there is leachate storage dam, sediment dam and stormwater treatment plant. Water, sewerage, electricity and telephone lines are provided to the site.

Sealed roads are nominally 7 m wide and lead through the site to the edge of the landfill where, because of frequent realignment, roads are not sealed. Temporary access roads are realigned as required to facilitate movement of cover material and access to the tipping face.

Access to the landfill is via Little Forest Road and an internal roadway.

Near Little Forest Road, two weighbridges are installed, one on each side of the weigh bridge office, for incoming and outgoing traffic. The office contains the weighbridge computers, printout equipment, two-way radio and telephone communications. The weighbridges are used to monitor and measure incoming and outgoing loads for the entire LHRRP.

2.3.2 Signs

Signs providing information to access, site control, charging structure, operating hours and waste acceptance are displayed at the site entrance and other prominent on site locations within the LHRRP. On site signs providing information relating to environmental and Work Health and Safety (WH&S) issues (e.g. gas pipes, chemicals, electrical hazards etc.) are also prominently displayed and maintained in a visible and readable condition. Signs and site notices are maintained and upgraded as required by the SITA Signs, Site Notices and Labeling standard operating procedure (SOP).

2.3.3 Fencing

The existing facility has been fenced along the boundary with a 1.8 m high chain wire fence. Provision has been made for animals to pass through the fence at the Mill Creek crossing. The SSPCYC has been fenced independently within the boundaries of the LHRRP, covering approximately 11 hectares. The perimeter fence around the SSPCYC is approximately 1.3 km in length.

Vehicular gates have been provided for access to monitoring points outside the property and to provide access for the bushfire brigade. These gates are kept locked at all times except during an emergency or when in use. The boundary fence is inspected regularly for deterioration and vandalism.

2.3.4 Screening

The site is visible from numerous locations from outside of the site boundary. To limit external views, revegetation and buffer zone maintenance are promoted on the site.

2.3.5 Drainage

Drainage on site consists of a number of surface water diversion drains, catch drains and temporary sedimentation ponds.

2.3.6 Security

The LHRRP is surrounded by a fence with lockable security gates installed on access roads. SITA controls the access to the site during operational hours and after hours security. Staff are on duty to supervise delivery of waste at all times when the facility is open.

Lockable security gates are maintained on site.

SECTION 3
SITE MANAGEMENT STRUCTURE

3.1 SITE MANAGEMENT STRUCTURE

3.1.1 SITA Management Systems

SITA manages its environmental and WH&S performance on site through its Corporate Information Management System (IMS). The SITA IMS is structured on the requirements of AS/NZS 4801:2001 and AS/NZS 14001:2004 and contains policies, procedures, management plans, Emergency Response Plans (ERPs), SOPs and forms.

This OEMP is a key component of the SITA IMS.

3.1.2 Change in management over time

The development of the LHRRP site for the proposed use as a recreational facility involves the development of the site so that it is made available to the public in 2039. During this period and as required, SITA will maintain responsibility for the management of the proposed landfill activities and finishing works in terms of environmental management. SITA will also maintain responsibility for environmental management of aspects relating to the landfilling activities and post closure environmental management responsibilities relating to the landfill after 2039.

SITA would continue to have responsibility for the environmental performance of the disposed waste for a minimum 30 year period after site closure and in accordance with the closure requirements administered by the NSW EPA. This would include both the monitoring and management of landfill gas, groundwater quality and leachate.

The current management structure of the LHRRP landfill is described below.

Management	Role
Site manager	Overall responsibility for the management of operational issues on site.
Compliance officers	Establishment and management of environmental monitoring contract, wet weather monitoring and ad-hoc sampling as required and interpretation and management of monitoring data. Quarterly reporting to CRG, SSC and the NSW EPA as required
Site supervisor	Supervision of site activities, ensuring that necessary water environmental controls are maintained and operated to achieve the environmental objectives.
Site personnel	Day to day implementation of environmental controls and visual monitoring as required

3.1.3 Management roles from the Planning instruments

Based on the existing Conditions issued by the Minister for Urban Affairs and Planning it is expected that the new conditions of consent will still require the following management structure to continue for the LHRRP:

- Environmental Management Representative (EMR)

- Environmental Management Technical Group (EMTG)
- Community Reference Group (CRG)
- Compliance officer

Environmental Management Representative

SITA will employ or contract qualified environmental services throughout the duration of the landfilling activities at the LHRRP. The site manager is the nominated EMR and is supported by compliance officers.

The EMR is responsible for overseeing the environmental management of the project and supervision of environmental services. The EMR has the authority to stop work if an adverse impact on the environment has occurred or is likely to occur.

The EMR will:

- Be responsible for the presentation or certification of all OEMP's and procedures
- Be responsible for considering and advising on matters specified in the conditions of this consent and compliance with such matters
- Oversee the receipt and response to complaints about the environmental performance of the project
- Facilitate an introduction and training program for all persons involved with construction, landfilling and rehabilitation activities
- Be present on site during any critical construction or operational activities as defined in the relevant OEMP

Environmental Management Technical Group

The EMTG, which will include SSC, SITA and the NSW EPA and will have regular meetings (quarterly, or as indicated per the VPA - Exhibit 1) during the initial landfill reprofiling works.

Community Reference Group

A CRG has been established for LHRRP, comprising of SITA representatives and the community. The CRG will meet on a quarterly basis to discuss matters of concern associated with the environmental impact of the development and to promote mutually satisfactory solutions. The group will be kept informed of proposed works for LHRRP.

Compliance officer

SITA will employ or nominate a compliance officer for the LHRRP.

The compliance officer will:

- Be in charge of establishment and management of environmental monitoring contract, wet weather monitoring and ad-hoc sampling as required and interpretation and management of monitoring data
- Report on a quarterly basis to CRG, SSC and the NSW EPA as required

SECTION 4
STAFFING AND TRAINING REQUIREMENTS

4.1 STAFFING AND TRAINING REQUIREMENTS

SITA is responsible for providing sufficient staff on site to meet all the requirements described in this OEMP. It is also the SITA's responsibility to provide adequate training to all staff performing critical tasks such as inspection and direction of incoming wastes, operation of compaction or earthworks equipment and environmental management on site.

The Induction, Training and Competency Procedure provides instruction to ensure that staff are trained and competent to perform their required duties in a safe and environmentally sound manner and that appropriate training records are retained. Appropriate environmental and WH&S training will also be given to suppliers and contractors to ensure their performance meets SITA requirements.

Environmental and WH&S Due Diligence training will also be provided to employees and nominated contractors. It is designed to provide employees and contractors with information about their environmental and WH&S responsibilities.

The training is focused on the following issues:

- Environmental legislation - NSW
- Environmental aspects and impacts of the operational activities
- SITA policies
- Environmental management
- Environmental due diligence

The LHRRP Training Matrix identifies the internal training needs (Induction, Environmental Due Diligence, IMS Awareness, IMS Procedures and SOPs) and the external training needs (first aid etc.) for on site staff. Contractors are required to provide ongoing training which is discussed at the monthly contractor meetings.

SECTION 5
REPORTING

5.1 RECORDS AND REPORTING

5.1.1 Monitoring Results

Environmental monitoring data are stored in electronic format on the SITA computer network. Summaries of monitoring data from LHRRP are available.

Monitoring results are reviewed and communicated on a monthly basis at the site meetings. This provides an ongoing mechanism for assessing the environmental performance over time. Monitoring results are also provided to the CRG meetings and SSC on a quarterly basis.

An annual return with the results from surface water, groundwater, surface gas, subsurface gas and leachate monitoring is provided to the NSW EPA within eight weeks of the licence renewal date. The report includes all monitoring results, the number of complaints and details of non-compliance against the EPL.

As required by the *Protection of the Environment Legislation Amendment Act 2011*, monitoring results required by the licence will be posted on the company website within 14 days (or made available on request).

The records of all complaints received will be stored. The records include details of the following:

- Date and time of the complaint
- Method by which complaint was made
- Personal details of the complainant which were provided by complainant or, if no details were provided, a note to that effect
- Nature of the complaint
- The action taken by the licensee, including any follow-up contact with the complainant; and
- If no action was taken by the licensee, the reasons why no action was taken

The record of each complaint must be kept for at least four years after the complaint was received and must be made available to any authorised officer of the NSW EPA on request.

SITA provide a number of feedback mechanisms for complaints.

Community members can register complaints via the SITA free-call 24-hour odour hotline in writing or through the SITA website.

SITA, its employees and the contractor's employees must notify the NSW EPA of incidents causing or threatening material harm to the environment as soon as possible. Notifications must be made by telephoning the EPA Pollution Hotline on 131 555. Written details of the notification to the NSW EPA must be made within seven days of the date of the incident.

5.1.2 Reporting Template

In addition to report to the NSW EPA. SITA will also report to SSC in accordance with the LHRRP Reporting Template. The Reporting Template is attached in Appendix C.

SECTION 6
ENVIRONMENTAL AUDITING AND REVIEW

6.1 ENVIRONMENTAL REVIEW

SITA evaluates the success of its environmental management approach on a regular basis. While individual components of the monitoring programme will be reviewed at set intervals as required by the NSW EPA, an overall evaluation of the environmental performance of the LHRRP is conducted on an annual basis in accordance with SITA's Environmental and WH&S Risk Assessment IMS Procedure. SITA's Statement of Environmental and WH&S Responsibilities and Accountabilities also provides the responsibilities for all SITA staff and contractors.

The Environmental and WH&S Risk Assessment Procedure aims to effectively identify and assess the current controls for WH&S hazards and environmental impacts and aspects and assists in the following objectives:

- To quantitatively evaluate the significance of the environmental impacts associated with waste disposal activities
- To formulate and periodically review environmental objectives, targets and programs for the LHRRP
- To evaluate the effectiveness of existing environmental management practices to ensure compliance with current environmental legislation and guidelines
- To assist in the continual improvement and optimisation of the site's existing environmental management practices
- To provide confidence to the general public, community groups and regulatory agencies that waste disposal operations are being effectively managed in a way that minimises environmental impacts

6.2 MANAGEMENT SYSTEM AUDITS

The SITA Audit Procedure provides detailed instruction on weekly inspections and management system audits conducted on a regular basis to verify that site's operations comply with the requirements of this OEMP. The results of the audits are recorded and recommendations for improvement are communicated to the relevant management personnel as well as to the contractors.

6.3 COMPLAINT INVESTIGATION AND RECTIFICATION PROCESS

SITA is committed to best practice, prevention, mitigation and rectification of the operation and management of the LHRRP and post closure management obligations.

SITA and SSC have established an Agreed Methodology for assessing complaints. It will be reviewed every two years and at the request of any party, but any changes to the Agreed Methodology will only be made by agreement between the parties.

The Complaint Investigation and Rectification Process is included in Appendix S.

SECTION 7
SITE OPERATIONS

7.1 OPERATIONAL CONDITIONS

The LHRRP is certified as meeting a range of national and international certifications including ISO 14001 Environmental Management, ISO 9001 Quality Management and AS 4801 Occupational Health & Safety Management. As part of obtaining these accreditations, SITA is subject to a range of internal and external audits.

In addition to the above accreditations, SITA also has an interlinked system to govern the operations of each site as discussed in sections previously. This includes:

- SOPs
- Operational Environmental Management Plans
- Frequent meetings with stakeholders (including SSC, NSW EPA, refer to SECTION 3 for details)
- Environmental reporting programs (refer to SECTION 5 for details)
- Complaint handling programs (refer to SECTION 6 for details)
- Environmental monitoring programs (refer to SECTION 9 for details)

All these safeguards are in-place to evaluate the effectiveness of existing environmental and operational practices to ensure SITA operates in compliance with the licence conditions applicable at each site.

This section describes the operations of the LHRRP.

7.1.1 Operating Hours

The landfill is staffed and open for the acceptance of materials during the following hours

Activity	Day	Operating hours
Waste receival	Monday - Friday Saturday and Sunday	6am – 4pm 8am – 4pm
Construction & landfilling operations	Monday - Friday Saturday and Sunday	6am – 5pm 8am – 5pm
Other operations	Monday - Sunday	Anytime

7.2 WASTE CONTROL

The Waste Acceptance Criteria SOP provides detailed instruction on the acceptance of waste and recycling materials at the LHRRP and outlines the requirements to ensure compliance with the site EPL and other applicable legislation. Transfer trailers, council vehicles and larger private vehicles are directed to the landfill. Small vehicles are directed to the RRC.

7.2.1 Permitted Wastes

LHRRP is licensed for waste storage and waste disposal (application to land) and accepts wastes listed in the licence and other wastes approved by the NSW EPA. Waste disposal includes:

- General solid waste (putrescible)
- General solid waste (non-putrescible)
- Asbestos waste
- Tyres
- Immobilized wastes able to be landfilled
- Any waste received on site that is below licensing thresholds in Schedule 1 of the *PoEO Act 1997*, as in force from time to time

7.2.2 Excluded Wastes

The following wastes are not accepted at LHRRP: (From Schedule 1, Part 3, Division 1 Waste Classifications of the *PoEO Act 1997*)

- Hazardous Waste (other than special waste or liquid waste)
- Liquid Waste (other than special waste)
- Restricted Solid Waste (other than special waste, hazardous waste, or liquid waste)
- Special Waste (other than special wastes allowed in Condition L5 in EPL)

Hazardous waste means waste (other than special waste or liquid waste) that includes any of the following:

a) anything that is classified as:
(i) a substance of Class 1, 2, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or
(ii) a substance to which Division 4.1, 4.2, 4.3 or 6.1 of the Transport of Dangerous Goods Code applies,

(b) containers, having previously contained:
(i) a substance of Class 1, 3, 4, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or
(ii) a substance to which Division 6.1 of the Transport of Dangerous Goods Code applies,
from which residues have not been removed by washing or vacuuming

(c) coal tar or coal tar pitch waste (being the tarry residue from the heating, processing or burning of coal or coke) comprising more than 1% (by weight) of coal tar or coal tar pitch waste

(d) lead-acid or nickel-cadmium batteries (being waste generated or separately collected by activities carried out for business, commercial or community services purposes)

(e) lead paint waste arising otherwise than from residential premises or educational or child care institutions

(f) anything that is classified as hazardous waste pursuant to an EPA Gazettal notice

(g) anything that is hazardous waste within the meaning of the Waste Classification Guidelines,

(h) a mixture of anything referred to in paragraphs (a)–(g)

Liquid waste means any waste (other than special waste) that includes any of the following:

(a) anything that:
(i) has an angle of repose of less than 5 degrees above horizontal, or
(ii) becomes free-flowing at or below 60°C or when it is transported, or
(iii) is generally not capable of being picked up by a spade or shovel

(b) anything that is classified as liquid waste pursuant to an EPA Gazettal notice

Restricted solid waste means any waste (other than special waste, hazardous waste or liquid waste) that includes any of the following:

(a) anything that is restricted solid waste within the meaning of the Waste Classification Guidelines
(b) anything that is classified as restricted solid waste pursuant to an NSW EPA Gazettal notice

Special waste means any of the following:

(a) clinical and related waste
(b) asbestos waste
(c) waste tyres
(d) anything that is classified as special waste pursuant to an NSW EPA Gazettal notice

7.2.3 Chemicals

LHRRP does not accept household chemicals with the exception of small quantities of paints as described below. Historically small quantities, up to 20 litres (L) or 20 kilograms (kg), of household chemical were permitted under the Chemical Clean Out program. This program is now run by specific Councils and the NSW EPA.

7.2.4 Paints

Small quantities of paints (up to 20 kg), from households can be accepted at the LHRRP for a nominated fee but are to be kept separate from the general waste. Any user of RRC who wishes to dispose of these materials will be directed to an undercover storage location where collection bins are supplied. Materials collected in this manner are separately disposed of in accordance with proper procedures depending on the nature of the waste.

7.2.5 Acceptance of Special Waste

Special Waste is waste that will require attention additional to that for ordinary waste to ensure nuisance-free, safe and proper storage, and correct transportation and disposal. These additional requirements include prior booking and preparation, particular supervision and the careful use of machinery.

NOTE: The Special Wastes may include wastes classified as special wastes in Schedule 1, Part 3 of the PoEO Act 1997. Requirements relating to the transport and disposal of these special wastes are detailed in the PoEO (Waste) Regulation 2014.

Categories of Special Waste that may be accepted at LHRRP must not contain materials with contaminant concentrations exceeding the limits for general solid waste within the NSW EPA's Waste Classification Guidelines Part 1: Classifying Waste (November 2014).

One-off and new Special Wastes require assessment by SITA staff to ensure that acceptance is within LHRRP license conditions and the waste is presented to meet SITA's requirements.

Bookings are required the day prior for Special Waste or Security Waste to be disposed of at LHRRP. Small domestic quantities may be permitted without a booking depending on the space availability. The following information is recorded:

- Date of disposal
- Name and address of waste generator
- Waste description
- Estimated mass

- Transporter name, contact and telephone.

The requirements for the proper handling and disposal of Special and Security Wastes at the LHRRP are described within the Waste Acceptance Criteria SOP.

7.2.6 Screening of Wastes

The following practices are applied in screening of incoming wastes at the LHRRP:

- Signs at the entrance clearly indicate the type of wastes that are accepted and those that are not accepted
- The weighbridge operator weighs an incoming vehicle, records the data and asks the driver to describe the content of the load. If the content of the load cannot be clearly described or identified, the weighbridge operator will direct the load to a separate area for closer examination or inspect the waste before it leaves the weighbridge
- Hand unloaded vehicles at the small vehicle area at the RRC and mechanically unloaded and hand unloaded vehicles at the tipping face are constantly monitored by site operational personnel. Their responsibility is to identify and remove unacceptable wastes from the waste stream for subsequent disposal at an appropriate facility
- Training is provided to the weighbridge operators, the landfill supervisors and site operational personnel to ensure they have the ability to recognise and manage unacceptable wastes

7.2.7 Measurement and Recording of Quantities, Types and Sources of Wastes Received

A computerised system is installed at the weighbridge to record quantities, types and sources of wastes received. This system is designed to prevent vehicles delivering waste from entering and exiting the site without generating a permanent record. The weighbridge is used in accordance with Division 2 of the Protection of the Environment Operations (Waste) Regulations 2005.

The following information is obtained for most vehicles entering the weighbridge:

- Vehicle registration number
- Type of waste
- Amount of waste

Each month a report on the amount, type and source of waste is provided to the NSW EPA. Regular surveys are conducted to measure the volume of landfill space consumed and these results are also reported to the NSW EPA on a six-monthly basis.

7.2.8 Resource Recovery Centre

An RRC for the acceptance of pre-sorted recyclable materials is operated at the LHRRP. The centre contains separate bins for the acceptance of glass containers, aluminium and steel cans, plastic containers (e.g. bottles and containers with the polyethylene terephthalate (PET) or High-density polyethylene (HDPE) markings), paper and cardboard and batteries.

Sump oil (up to 20 L) and scrap metal (e.g. aluminium, copper, brass, steel and whitegoods) are collected in outdoor containers. Gas bottles and fire extinguishers (up to 2 cylinders and 9kg per day) are also collected at separate undercover enclosures and taken away by contractors for venting and reuse or reprocessing of the bottles.

Outdoor facilities are provided for tipping separated wastes, including building materials (e.g. pre-sorted loads of bricks, concrete, asphalt, roof tiles, terracotta pipes), garden waste (e.g. grass clippings, pruning's, weeds, tree branches up to 1 m long and 150 mm in diameter), untreated wood (e.g. pallets, crates, fence palings and timber). Materials collected at the LHRRP are dispatched to appropriate organisations for recycling or may be processed and used on site for construction purposes.

7.3 WASTE DELIVERY

All large vehicles are directed to the landfill working face. Mechanically unloaded vehicles and hand unloaded vehicles are separated at working face. Small vehicles are directed to the RRC. Special wastes are received at a designated area of the working face.

When unacceptable waste is detected in the load at the weighbridge, the weighbridge operator asks the driver to park the vehicle and wait for instructions from the landfill supervisor or manager. If unacceptable waste is noticed during or after tipping, the transporter or the generator is required to remove the waste from the site, or if this is not possible SITA will make arrangements for its appropriate disposal. All events involving the removal of any waste that is brought to the site which is not permitted to be disposed of at the site will be recorded.

7.4 LANDFILLING STRATEGY

7.4.1 Waste Stream

The maximum quantities of waste material and recyclables that can be accepted at the landfill is 850,000 tonnes per annum. This would provide up to 8.3 million cubic metres of additional landfill airspace capacity (equivalent to approximately 8.3 million tonnes of waste assuming 1 tonne of waste utilises 1 cubic metre of waste disposal airspace) compared to what is already approved (in 2015). .

SITA will also continue to operate a RRC at the LHRRP predominately for use by small vehicles, until 2037. All materials received at the RRC are subsequently either sent to the ARRT or other facilities for recycling, the GO facility for processing of vegetation, or the landfill for disposal. Currently the volumes of material received at the LHRRP are relatively small and are of the order of 10,000 tonnes per year.

7.4.2 Material Usage

The NSW Government's strategy for waste management is underpinned by the philosophies of Ecologically Sustainable Development and the waste management hierarchy, which encourage conservation and more efficient use of natural resources.

Part of SITA's strategy to assist local government, industry and the community to reach this target is the reuse, reprocessing and recycling of materials that would otherwise go to waste. SITA separates certain waste materials from the waste stream and stockpiles materials for reuse, reprocessing and recycling including the following:

- Concrete (for filter media stormwater barriers, aggregate hardstand construction, access road construction)
- Bricks (for filter media stormwater barriers, aggregate hardstand construction and access road construction)
- Clay tiles and pipes (for aggregate and landscaping)

- Excavated road materials (for road and hardstand construction and base material for pipeworks)
- Garden organics (for landscaping and rehabilitation)

7.4.3 Staging

A staging strategy has been developed for site landfilling, reprofiling and rehabilitation of the LHRRP. This is contained in Appendix D.

Landfilling - Landfilling will occur within the active cells along the northern boundary of the site.

Re-profiling - Re-profiling of existing filled areas of the site using waste will occur over the remainder of the precinct footprint

Rehabilitation – Capping and rehabilitation of the site will occur progressively after significant stages of re-profiling are complete and the land has been contoured to its final profile.

7.4.4 Volumetric survey

SITA will undertake bi-annual volumetric surveys to determine the amount of airspace remaining, and enable the likely life of the landfill to be managed to meet the landfill closure deadline.

7.4.5 Preparation of areas for landfilling and re-profiling

Preparation of areas for landfilling and re-profiling will consist generally of one or more of the following activities:

- Stormwater diversion drainage
- Stormwater collection
- Access and haul road construction
- Bund wall construction
- Landfill cover strip back
- Leachate management
- Landfill gas management
- Odour management

The above activities are described below.

Stormwater Diversion Drainage

Stormwater diversion drainage will be constructed around the rim of each active landfilling or re-profiling area to prevent stormwater runoff flowing into or from the areas. The diversion drainage will typically comprise open channel drains and be on the outer edge of an earthen bund. The construction of bund walls also enables the diversion of stormwater runoff from the active areas. This stormwater from the disturbed areas is kept separate from the finished are of the landfill.

A permit issued under Part 3A of the *Rivers and Foreshores Improvement Act 1948* was required before any excavations, construction of a sediment basin, stream realignment, stream diversion and riparian zone restoration in and within 40 metres of the top of the bank of Mill Creek occurs. The permit was issued in 2006 with a number of conditions including the preparation of stream works and vegetation management plans. The permit is no longer required to be renewed under Part 3A of the *Rivers and Foreshores Improvement Act 1948.*

Stormwater Collection

Surface water management would involve diversion of clean surface water around active filling and disturbed areas. This prevents the surface water from coming into contact with uncovered waste.

Stormwater runoff is collected in drains, swales and ponds and diverted to sediment basins on the LHRRP – western sediment & water reuse basin (sediment dam 1), main sediment & water reuse basin (sediment dam 5) and the PCYC basin. The Soil and Water Management Plan is included in Appendix E.

The main sediment & water reuse basin is located on the north western boundary of the LHRRP. The PCYC basin is located on the eastern boundary of the LHRRP. The western sediment & water reuse basin is located on the western edge of the LHRRP and would be removed when the ARRT facility is constructed.

Drains are constructed progressively during the reprofiling stages and connect to the clean water and dirty water channels located at the perimeter of the LHRRP. Clean water from the undisturbed catchments (finished areas of the landfill) is diverted to the clean water channel and enters Mill Creek. Water from disturbed catchment areas would be diverted to the main sediment & water reuse basin via the dirty water channels and is used to supplement the water collected in the basin for reuse. The water collected in this basin is used for onsite dust suppression.

The main sediment & water reuse basin is designed to allow for settlement of suspended solids before discharging offsite following large rainfall events when stormwater storage reaches capacity. In addition, a stormwater treatment facility is located at the LHRRP which treats sediment laden stormwater in the main sedimentation basin prior to any discharging to Mill Creek. The treated water is then discharged to Mill Creek (in accordance with the EPL conditions) or reused at the LHRRP. As a licence condition, monitoring is required following discharge from main sediment & water reuse basin

SITA takes a proactive approach to managing surface water quality at the LHRRP. Since SITA acquired the site, a number of surface water management works have been completed or have been included as part of routine maintenance works. To protect rehabilitated areas and those undergoing rehabilitation, silt fences will be constructed along the cell boundary and drainage lines to minimise runoff into the stormwater system.

Access and Haul Road Construction

A permanent sealed access road exists along the northern boundary to provide access to the leachate pond and Sediment Dam 5 in the north-west corner of the site.

Temporary haul roads will be constructed, where necessary, around completed areas and stages to provide access to the active filling areas. The haul roads may be composed of compacted waste, where appropriate. A layer of approximately 300 mm of clean fill will be placed above underlying waste to form the road surface.

The overall quality and design of the road will depend upon the expected traffic loading and life of the road. Due to the frequent realignment of the roads required to facilitate access to the tipping face and movement of cover material, the temporary haul roads will not be sealed. The roads will be regularly graded to allow safe access to the current filling areas.

Bund Wall Construction

Where necessary, bund walls will be constructed along exterior edges of waste disposal areas to provide areas to fill and compact against. The walls will be constructed from clean excavated material. Bund walls will not be required where adjoining areas are already filled or where filling is

against an existing excavation wall. The bund wall around the outer areas will reflect the shape of the final landform.

Landfill Cover Strip Back

The areas of the existing landfill (south of Area 5) would be removed in segments with approximately 1 hectare (10,000 m^2) of cover material stripped in advance of the active tipping area. Waste would not be exposed as a small thickness of cover soil would be left in place.

A maximum of 2,500 m^2 of this stripped back area would be less than one day old to minimise odour emissions from the stripped surface. At the commencement of each day's landfilling the stripped surface will extend to the landfilled waste over an area equivalent to the active tipping area. The stripped material will be kept separate from waste so that it is available for reuse as daily cover.

Where areas of excessively thick cover soil are identified, localised investigations will be undertaken and additional capping or intermediate cover will be stripped back so that previously land filled waste is not exposed

The depth of the strip back is described as follows:

- Existing areas which are capped and revegetated will be stripped back to a depth of no more than 1.3 m. This will not expose previously landfilled waste
- Existing areas of intermediate cover (south of the existing active landfilling area) will be stripped back to a depth of no more than 0.45 m. This will not expose previously landfilled waste

Each morning, equivalent to a day's waste disposal operations of the already pre-stripped surface will be further stripped back to expose waste. Waste will then be placed directly over this area to minimise the potential for the perching of leachate. This will ensure there is no exposed waste during the night when the potential for odour issues off site is higher

The stripping arrangement will continue to be examined to ensure that it optimises the recovery and reuse of cover materials and does not cause off-site odour complaints.

Leachate Management

Leachate is the contaminated water generated when rainwater comes into contact with waste that is being landfilled, or has been landfilled, but not yet capped/protected by a layer of soil.

The leachate drains to the bottom of the landfill, where it is collected from above the impermeable landfill liner at the northern extent of the site.

Leachate is currently extracted from the base of the landfill through a series of riser pipes and transferred to the main leachate pond located in the northwest corner of the site via a dedicated leachate pipe system. To prevent the leachate from becoming odorous, the pond is kept aerated.

The leachate is conveyed to a leachate treatment plant at the Lucas Heights 1 (former landfill) site. Treated leachate is disposed to sewer as controlled by a Sydney Water Trade Waste Agreement.

Additional leachate controls would be installed prior to landfilling above previously landfilled areas which themselves are above the surrounding natural land's surface, including a dual gas/leachate trench near the perimeter of the newly deposited waste. The trench would contain a perforated pipe and be backfilled with a high permeability material such as gravel. The pipe would have risers at regular spacings to allow for extraction of any leachate, which would be drained into the existing leachate ring main. This would permit collection and extraction of any leachate moving horizontally near the interface of the existing and newly landfilled waste.

The trench will be nominally 1.5m – 2m deep backfilled with site-generated crushed sandstone and perforated pipe. This is to be confirmed post detailed-design.

Base Liner

The LHRRP is located on a geomorphological unit known as the Woronora Plateau which is formed of Triassic Age Hawkesbury Sandstone which, in the Lucas Heights area, is thought to be about 200 m thick (Waste Service NSW, 1997).

A detailed hydrogeological investigation (Douglas Partners and Coffey Partners, 1994) was carried out at the site and found that the site is underlain by massive Hawkesbury Sandstone which is generally well cemented by authigenic quartz and siderite and is infilled with varying proportions of clay. Because of these intergranular features, the unweathered sandstone has a very low primary or intergranular permeability.

Currently the combination of the rock and a comprehensive leachate drainage system is used to protect the groundwater environment in Areas 1 to 3. Area 4 has a compacted clay liner and a comprehensive leachate drainage system.

A double lined system has been voluntarily installed by SITA under Area 5-1 and Area 5-2 and is being installed in Area 5-3, as per the EPL. According to the EPL, Cell 5.3B and Cell 5.3C of Cell 5 must be constructed in accordance with the design documents prepared by GHD Pty Ltd:

- Design Basis Memorandum (Ref 21/20508/182482) dated 19 November 2012),
- Detailed Drawings for tender (21-20508 series) dated 14 November 2012,
- Specification (Ref 21/20508/182575) Rev 0 dated 19 November 2012,
- Construction Quality Assurance Plan (Ref 21/20508/182994) Rev 0 dated 19 November 2012.

The groundwater conditions of the site are monitored on a quarterly basis and reported regularly to the NSW EPA.

Leachate Collection

There are a number of leachate systems constructed at the LHRRP landfill:

- *Area 1, 2, and 3*
  The original areas designated as Area 1, 2 and 3 are currently serviced by a single leachate collection pipe on the sandstone base. The pipe flows to the leachate collection pond in the north-west corner of the site. A separate leachate collection system has been installed for the previous overtopping waste for Area 1, 2 and 3. The outer ring collection main and central and eastern ring mains drain to the leachate collection pond. The current method and arrangement for leachate collection in Areas 1, 2 and 3 will continue and remain in operation.

- Area *4*
  The original area designated as Area 4 is serviced by a pattern of leachate collection drains which flow to the leachate collection pond in the north-west corner of the site. The eastern section of previously overtopped sections of Area 4 drains to the eastern ring main. The current method and arrangement for leachate collection in Area 4 will continue and remain in operation.

- Area *5*
  Collected leachate flows by gravity to a sump on the Southern edge of Area 5-3 before being pumped to the leachate collection dam on the western boundary near Area 5.

Leachate from the LHRRP leachate collection dam is transferred to Lucas Heights 1 for treatment and disposal via the LH1 Liquid Treatment Plant and Sydney Water Corporation sewer connection determined by Sydney Water Corporation Trade Waste Agreement.

Any subsurface groundwater collected under Area 5 can also be directed to the leachate collection system if the quality analysis during quarterly groundwater monitoring indicates leachate contamination. It is not proposed to actively pump ground water unless absolutely necessary. Should this be required an appropriate licence will be obtained.

Leachate is acknowledged as a potential source of odour which will be considered as part of the overall site odour management strategy for the LHRRP.

A review of the integrity of the basal leachate collection system of Lucas Heights Resource Recover Park was undertaken in 2005. It was concluded that the leachate drainage pipe network within Area 5 of the Lucas Heights WRC landfill is unlikely to fail due to buckling and will perform its intended function satisfactorily. Details are contained in Appendix F.

Landfill gas management

The existing site has an active gas extraction system, where landfill gas is extracted from deposited waste by a network of wells bored into the waste and combusted to generate electricity. The existing wells cover the majority of the former landfilled areas where reprofiling of the surface with new waste is proposed. The existing landfill gas wells and connecting pipes would be protected, maintained and extended to allow gas extraction from the old waste to continue and the newly landfilled waste to be serviced by the existing wells (and additional wells where needed).

Additional gas controls would be installed prior to landfilling above previously landfilled areas, including a dual gas/leachate trench near the perimeter of the newly deposited waste. The trench would contain a perforated pipe and be backfilled with a high permeability material such as gravel.

This would provide a means for depressurising any areas where gas has accumulated at the interface of the existing and newly landfilled waste.

The additional gas capture would generate more electricity over a longer period.

Odour management

To minimise the potential for odours, limited areas would be stripped back at any one time and waste covering materials would only be removed progressively. These areas would then be filled with waste, and the covering soil used for daily covering of waste in these areas. Once the final landfill levels are reached, the final landfill capping soil would be placed on these areas, to assist in landfill gas management and minimise stormwater infiltration.

During the course of the odour impact assessment undertaken as part of the 2015 EIS, three landfill areas were also identified as the potential main contributors of odour from the proposal site. A range of progressive controls are being applied to these areas as part of current operations to reduce offensive odour off-site in order to assist in limiting odour levels at the nearest receptors to 2 OU.

7.5 WASTE DEPOSITION

Waste will be deposited in a manner which minimises any nuisance or environmental impact and achieves maximum practical in situ density. Separate areas on the landfilling working face are provided for mechanically unloaded vehicles, hand unloaded vehicles and special wastes. Waste will be deposited, spread and compacted in layers. Each layer will generally have a maximum

compacted depth of 600 mm to achieve a compacted lift thickness of 3 to 5 metres. Waste will be placed and compacted initially to achieve a target average density of 850 kg of waste per cubic metre of landfill air space. The compactor will not operate on slopes exceeding 25% due to reduced compaction and operational safety considerations.

When the active tipping face is close to a leachate or gas well, a visual marker will be attached to the well and a steel sleeve will be placed around the well for the well's protection during the waste compaction phase.

Every layer of waste deposited in the landfill will be evenly and properly compacted by a steel wheel landfill compactor to achieve the target waste density. Where practicable, large bulky wastes will be broken up before covering. Each active waste disposal area will be maintained in a dry condition, as far as is practical. All weather access will be provided and maintained within the waste disposal area for all user vehicles from the sealed access road to the active tipping face.

Separate areas will be provided for the supervised disposal of special waste. These small areas will be covered without compaction to minimise disturbance of the waste and may reduce occupational health and safety issues arising from the waste and landfilling activities.

7.6 STOCKPILING

Excavation of sandstone from Area 5-3 will be completed by the time the development consent is granted based on the 2014 EIS.

Stockpiles of excavated material are to be crop-covered to minimise erosion. All stockpiles are maintained with silt fences and located within the areas that drain to sedimentation ponds.

The Modification 8 of Condition 40 of the Conditions of Consent permitted an extra depth of 10 m to be excavated from Area 5-2 (western end) and Area 5-3. As a result of this, a single stockpile of up to 1.5 million tonnes of excavated spoil was approved to be placed on site in Area 5-1. This stockpile will eventually be removed as the material is progressively used for covering waste. Material stockpiled was obtained from Stage 5 of the landfilling operations and is predominantly medium and high strength Hawkesbury Sandstone.

The stockpile has a maximum height of approximately 11 metres above the landfill surface, with the base of the material located more than 20 metres from the Stage 5 excavations to the north. The footprint of the stockpile is approximately 600 m by 300 m..

The stockpile (including the western side) will be hydroseeded (with grass seed) to minimise the visual impact of the stockpile for nearby residents during the period of operations, and to minimise dust and stormwater impacts.

To control any additional dust produced from this stockpile, grass spraying of the stockpiled material has commenced, and the material is kept watered using a sprinkler system until vegetation is established. Drainage channels will also be grassed on each side of the stockpile to minimise erosion. Further dust suppression control measures can be seen outlined in Section 4.5 of this document and in the Dust Management and Monitoring Program (Appendix G).

Measures taken to address and prevent detrimental impacts from occurring on adjacent land and drainage lines downstream are detailed in the Soil and Water Management Plan for the LHRRP (Appendix E).

To further reduce any environmental issues from the stockpile the following measures will be carried out;

- limiting the size and location of the stockpile over time
- ensuring that all temporary stockpiled material is utilised for onsite covering, capping and rehabilitation works
- modifying the landfill gas extraction system as required
- monitoring the landfill gas extraction system and installing additional wells where necessary
- monitoring the landfill capped areas for, and rectifying, any leachate bleeds

7.7 COVERING LAYERS

7.7.1 Daily Cover

At the end of each working day, all exposed waste surfaces will be covered with a layer of compacted soil or other suitable material not less than 150 mm in depth. The daily cover layer will be graded to prevent ponding of water. Waste may be covered throughout the working day, as well as at the end of the day if necessary to prevent environmental impact, such as litter or odour.

The cover material used is inert, non-combustible material primarily from onsite excavation. Any alternative daily cover materials will be approved by the NSW EPA before their application at the site. A “tarpomatic” is currently approved for use as alternative daily cover. SITA will ensure there is, at all times, sufficient cover material as daily covering of the deposited waste is required at all times. No residual waste from the ARRT will be used for daily cover

In addition, cover material used for daily covering may be stockpiled at a location convenient to the active waste disposal area. Silt fences and other approved sediment erosion control measures will be provided around the stockpiles as required.

In the interest of conserving landfill airspace, and permitting free drainage through the landfilled waste, daily cover material will be stripped back prior to landfilling new waste in specific areas (refer Section 7.4.5 for details of the stripping back process). The area of uncovered waste will be minimised at any given time as described in this section.

7.7.2 Intermediate Cover

Where a filled area has not reached the final landform level, but will remain inactive for a period greater than 90 days (due to the staging of filling), an intermediate covering layer will be applied. The intermediate covering layer will comprise an additional 300 mm layer of compacted daily cover material including the original daily cover layer. The area will be graded to promote runoff.

In the interest of conserving landfill airspace, and permitting free drainage through the landfilled waste, intermediate material will be stripped back prior to landfilling new waste in specific areas (refer Section 7.4.5 for details of the stripping back process). The area of uncovered waste will be minimised at any given time as described in this section.

7.7.3 Final Cover

The final cover, including the capping layer, will be progressively constructed as soon as practicable after reaching final landform levels. The Lucas Heights Landfill Capping and Quality Assurance Plan is detailed in Appendix H.

The volume of cover material available for the future landfilling activities is reviewed every six months.

7.7.4 Removal of Daily and Intermediate Cover

In order to optimise the use of landfill space and facilitate efficient leachate drainage, the daily and intermediate cover material will be removed and stockpiled for reuse prior to placement of further waste.

Because of the form of the waste surface when covered it will not be possible to remove all cover material, but the removal operation shall be sufficient to expose at least 50% of the waste surface area below to facilitate leachate drainage through the waste layers.

Any cover removed, will be removed in layers. Top layers not in contact with waste can be used for daily, intermediate or final capping. Any cover removed that has come in contact with waste will be used for daily cover only so as to remove the possibility of surface water contamination through waste combined in the cover.

7.7.5 Alternative Daily Cover

Tarpomatic is approved for use as an alternative daily covering method. Other alternative daily cover (ADC) will be used if approved, including polymer and fibre based and/or foam based products as well as Tarpomatic. No residual waste from the ARRT will be used as daily cover.

7.8 SITE SUPERVISION AND CONTROL

Active areas of the landfill will be supervised by suitably experienced staff at all times during hours of operation.

The landfill supervisor will:

- Ensure the effective control of traffic within the landfill and in particular at the active tipping face of the waste disposal area
- Ensure that the equipment used for the movement, spreading, compaction and covering of deposited waste at the active tipping face is not operated in such a way as to constitute a risk to persons disposing or delivering waste
- Be responsible for the supply and placing of barricades and/or signs, in order that the above requirements are maintained at all times
- Keep a logbook for recording activities and incidents that occur during the operation of the landfill
- Provide site notices and incident reports covering all activities on site

7.9 STAFFING

The landfill will be appropriately staffed by qualified and experienced personnel. Existing staffing levels are expected to be maintained throughout the new operations. When the landfill is open the weighbridge will be staffed and the active landfill area and the RRC will be supervised.

At a minimum, staff training will be undertaken to ensure that:

- Staff are appropriately trained in their nominated roles to undertake task required of them

- All operators of compaction or earthworks equipment are experienced at undertaking all tasks required of them and maintain up to date accreditation for the operation of machinery
- All those that operate gas testing, water sampling or water testing apparatus are familiar with required testing and sample retention protocols to a standard approved by the NSW EPA under the EPL
- All those inspecting incoming wastes are skilled at identifying wastes that are unacceptable and accurate data recording

7.10 EQUIPMENT

Sufficient and appropriate machinery, plant and equipment will be maintained to meet the requirements of the OEMP. This will include, but is not limited to, equipment for:

- Winning and/or retrieving of cover material
- Spreading, compaction and covering of deposited waste
- Compacting, trimming, shaping, grading and levelling of cover layers
- Grading and shaping of haul roads
- Dust suppression
- Fire control and fire-fighting
- Any other operation required for the proper and efficient operation of the landfill

Notwithstanding the above, the minimum requirements at the landfill, at all times, will be:

- A landfill compactor for spreading, compaction and covering of deposited waste
- A dozer / loader to assist in the waste disposal operations
- A water cart for dust suppression and fire-fighting

All equipment will conform to the relevant Australian Standards.

All machinery and equipment will be maintained in proper working order in accordance with the manufacturers' requirements. In the event of machinery or equipment failure replacement plant or equipment will be organised as soon as practicable to ensure the requirements of the OEMP are fully complied with at all times.

7.11 SECURITY

Public access to the landfill will only be permitted during opening hours. The site is fenced and outside opening hours all access gates will be locked and the security contractor will maintain the security of the site.

7.12 HEALTH AND SAFETY PROCEDURES

All necessary precautions will be taken to ensure the safety of all personnel engaged at the landfill and all public visiting the site.

All employees are inducted and instructed about potential hazards at the landfill and that safe working practices are to be observed.

A first aid treatment station will be equipped and maintained at the landfill and a person trained in first aid will be on site, during all operating times in accordance with the appropriate statutory regulations.

It is SITA's responsibility to be familiar with the provisions of the *Work Health and Safety Act 2011*.

All necessary protective clothing and safety equipment will be made available and/or issued to employees, is maintained in good condition and used effectively.

The landfill is operated in accordance with AS/NZS 4801 Occupational Health and Safety Management System and ISO 14001 Environmental Management System.

7.13 COMMUNITY COMPLAINTS

A free call telephone line through SITA's customer service department operates 24 hours a day 7 days per week. Complaints about the LHRRP can be registered on this line. The details of all complaints received and actions taken in response to the complaints are kept on the SITA database. Complainants receive a detailed response within 24 hours of the complaint being lodged if requested.

Complaints received via the NSW EPA Environment line or SSC that are subsequently reported to SITA are investigated and responded to within the allocated time frame.

The complaints register is available for inspection upon request by the NSW Department of Planning & Environment (DoPE), the NSW EPA and SSC.

7.14 WET WEATHER OPERATION

The landfill operates to enable the acceptance of waste under all reasonable weather conditions without compromising the environmental management of the landfill. In the event that wet weather prevents access to and/or operation of the waste disposal area, alternative temporary waste disposal services will be sought.

7.15 ACCESS ROAD MAINTENANCE

Little Forest Road (Heathcote Road, post 2025) and temporary internal access roads within the waste disposal areas will be constructed so as to minimise damage to vehicles and to provide effective access across the waste disposal area. Materials suitable for the construction of such roads, for example, building and demolition rubble, will be stockpiled for use when required. Access roads will be wide enough to permit safe two-way movement by all vehicles using the landfill. Controls will be in place to provide access to the waste disposal area during wet weather to provide a safe area for landfilling vehicles and minimise tracking of clay and waste.

The use of steel wheel compacters and other heavy earth moving machinery on site access roads will be minimised.

7.16 FIRE CONTROL

Current fire management of the LHRRP site is undertaken in accordance with the LHRRP ERP.

A water tanker and pumping equipment capable of being used for fire-fighting as well as dust suppression will be kept on site at all times and maintained in working condition. Water will be supplied from the onsite stormwater basins or potable town water as required.

SITA will comply with all requirements of the *PoEO Act 1997*, and therefore prevent fires to minimise emissions to the atmosphere. No waste will be burnt at the site and no fires will be deliberately lit on the site, without the permission of the NSW EPA.

Incoming wastes which are found during inspection to be hot or on fire prior to deposition will be directed away from the active landfilling areas to a location where the material can be extinguished without risk of causing a fire on site.

In the event of a fire occurring at the site, prompt action will be taken to extinguish the fire. The NSW fire brigade will be immediately notified of all fires irrespective expect those that are promptly extinguished. Full cooperation will be given to the fire brigade in fighting fires on the site.

All fire events will be recorded in detail including the date, time, location, expected cause of the fire, time it was extinguished, prevailing weather conditions, observations with regard to smoke direction and dispersion, amount of waste burnt, action taken to extinguish the fire and action taken to prevent a recurrence.

In the event of a surface fire occurring at the site, water and earth will be used as appropriate to extinguish the fire.

A firebreak, not less than 20 m wide and cleared of all flammable material will be provided and maintained around the boundaries of the waste disposal area. All sections of the firebreak will be maintained to allow access for fire-fighting vehicles in accordance with the requirements of the fire brigade. SITA will liaise with the Fire Brigade to establish and maintain these requirements.

All new employees will receive fire prevention, protection, fire-fighting and emergency procedures training. Training assistance will be sought from the fire protection section of the NSW fire brigade. All employees will be given refresher training courses at regular intervals.

SITA will ensure that each employee is conscious of the fire safety standards required to operate safely.

Other measures that will be taken to prevent fire include:

- A ban on smoking around the active landfilling area, with clear posted signs indicating designated smoking areas
- Clear posted signs on display to the public advising that waste flammable liquids are not permitted on the site
- Cell construction, compaction and use of cover material should be undertaken in a manner that prevents fire
- All sealed or contaminated drums should not be accepted unless they are delivered as a special waste whose contents are clearly identified and suitable for acceptance
- All fuels or flammable solvents for operational use will be stored in an appropriately ventilated and secure store that complies with the Act covering storage of dangerous goods
- Hot Works Permits will be used where appropriate

7.17 RECORD KEEPING

All vehicles entering the landfill will be recorded, along with the tonnage of waste weighed over the weighbridge. Each month details of the amount, type and source of waste will be reported to the NSW EPA. Waste tonnage data is also provided to SSC. The format of the data will be in accordance with the NSW EPA requirements.

Periodic surveys of the site, carried out by a registered surveyor, will be used to calculate the amount of landfill space that has been used in the preceding period. The survey results and records of tonnages deposited will be used to determine the compaction density that is being achieved. These results will be included in the annual report to the NSW EPA and Council.

Controls will be established to prevent unrecorded vehicular access to the active areas. Details regarding reporting and review are documented in Section 5.

7.18 VEHICLE WHEEL AND EQUIPMENT WASHING

A wheel wash facility for cleaning the wheels of the vehicles leaving the site will operate during wet weather. Signs will be displayed during wet weather when the wheel wash is operational. The wheel wash has a treatment system and recycles the water used in the process. A small amount is wasted and will be directed to the LHRRP sewer connection via ANSTO. Collected solids are removed to the 'specials' area of the landfill as required.

Washing and servicing of equipment will be conducted in a washbay / workbay, which will be bunded to exclude rainwater. All of the wastewater from the washdown / service area will be discharged to sewer.

7.19 DANGEROUS GOODS MANAGEMENT

The only Dangerous Goods identified are diesel, sodium hypochlorite and sodium hydroxide. These chemicals would be transported to site and stored in accordance with the Commonwealth Government (214) 'Australian Code for the Transport of Dangerous Goods by Road and Rail'.

Appropriate safe work procedures would be implemented including spill prevention and clean up requirements.

Any smaller quantities of Dangerous Goods (aerosols, paint, cleaners etc.) that may be used on site for maintenance purposes would be stored and used in accordance with the Australian Dangerous Goods Code, including appropriate labelling, separation where necessary and disposal.

SECTION 8
MANAGEMENT

8.1 OVERVIEW

In the waste that SITA handles every day on behalf of its many customers, SITA strives to increase the proportion which is reused, recycled or recovered. Waste that cannot be converted into resources are eliminated under conditions that respect our environment.

SITA provides environmental services for the well-being of the Australian population, and aims to manage natural resources by reinjecting them into the economy in the form of raw materials and energy. This is to avoid wastage of precious virgin resources.

SITA is committed to:

- Optimising recycling and recovery rates
- Reducing greenhouse gas emissions
- Improving energy efficiency through all operations
- Increasing and promote renewable energy production
- Reducing the degradation of Australia's agricultural soils

The following sections describe SITA's strategy to management at the LHRRP. Complaints will also trigger the complaints and auditing procedures as noted in section 6.3.

8.2 SURFACE WATER MANAGEMENT

8.2.1 Environmental Goals and Principles

Operational activities on the site have the potential to exacerbate erosion processes and sediment generation. The surface water management system provides mechanisms for controlling these processes and minimising the potential for contamination of waterways within the site and beyond its boundaries. It also enables water to be collected on site for uses such as temporary irrigation and dust control. Except as expressly specified in the EPL, LHRRP will comply with Section 120 of the *PoEO Act 1997*, prohibiting the pollution of waters at the site.

The environmental goals for surface water management on site are (as based on the NSW EPA (1996) Environmental Guidelines: Solid Waste Landfills: Section 2.1):

- Prevention of surface water contamination by leachate
- Prevention of surface water contamination by site runoff
- Prevention of water from entering an active landfill cell
- Prevention of soil erosion
- Prevention of flooding of the landfill
- Prevention of flooding of landfill site
- Minimising sediment generation and transport off the site
- Storage of sufficient water to meet operational requirements on the site
- No significant impact to downstream flow conditions

The surface water management system is based on the following principles:

- Handle and treat all water that has been in contact with waste or contaminated by leachate as leachate (as based on the NSW EPA (1996) Environmental Guidelines: Solid Waste Landfills: Surface Water Controls)
- Minimise the area of soil disturbance and the length of time that the soil is left in a disturbed (uncovered state)
- Progressively revegetate completed reprofiling areas
- Where sediment is generated, capturing the majority of sediments as close as possible to the point of generation through sediment traps
- Surface water dams will be de-silted in accordance with the LHRRP EIS Surface Water Assessment (GHD, 2015). The sediment control "settling" zone needs to be maintained below at 10 ML
- Carry out drainage and sediment control designs in accordance with the Blue Book (Landcom 2004) and Blue Book Volume 2b (DECC 2008). Clean water run-on is diverted away from "disturbed areas" and sediment laden water is collected for appropriate management and treatment for rainfall events up to the 20-year Average Recurrence Interval (ARI) event
- Discharge of disturbed area drainage lines into a sediment basin(s) designed in accordance with Blue Book (Landcom 2004) and Blue Book Volume 2b (DECC 2008)
- Maintain erosion and sediment control measures until the site is stabilised
- Use the poorest quality of water acceptable for each particular task to reduce the volume of contaminated water required to be treated and discharged

8.2.2 Management Strategy

The Soil and Water Management Plan for LHRRP addresses control measures related to both the completed and active waste disposal areas, and describes the basic design of various basins and drains (Refer to Appendix E).

The primary objective for water management is to ensure that controlled discharges from the site are in accordance with discharge license limits, or other appropriate guidelines. The strategy to deliver this objective comprises the following:

Preventative measures

- Drainage and sediment control measures for the stormwater basins are designed in accordance with the Blue Book (Landcom 2004)
- Sedimentation basins are designed to retain the 90th percentile 2 day rain event
- Construct stormwater drains to divert run-off before any clearing and/or excavation
- Construct stormwater diversion drains around the perimeter of each section of the landfill and reprofiling stages
- Construct bunds to keep stormwater run-off from working areas, and to ensure that any contaminated surface run-off is contained within the working area
- Bund the refueling areas, roof and bund collection area for paints and household chemicals

Mitigation measures

- Maximise use of collected water on site for dust suppression, irrigation, composting, maintenance of haul roads etc.
- Pump water collected in excavation areas that has not come into contact with waste to sedimentation basins during rain events, for settlement of solids. Consider water that has come into contact with waste as leachate and pump to leachate collection system
- Cover each successive lift with compacted earth trimmed and graded to encourage the shedding of rainwater
- Contour completed areas to assist water shedding

- Activate the Stormwater Treatment Plant prior to discharge from main sediment & water reuse basin (sediment dam 5), except as expressed in the EPL
- Maintain all drainage channels and sediment traps in areas of fill
- Provide scour protection, lining or vegetating of drainage channels and waterways when flow velocities exceed 0.5 m/s
- Regularly dig out and de-silted stormwater basins
- Regularly inspect stormwater drains and basins
- Keep stormwater drainage channels free of litter

Rectification measures

- Check and dewater excavation area whenever ponding is detected
- Ensure drainage bunds have been installed and realigned
- Maintain vegetation in drains to ensure adequate flow
- Remove any built up litter from surface water drains

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of the soils and surface water impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that:

- With the implementation of the mitigation measures proposed in the EIS, it is not expected that the proposal would result in an unacceptable impact in terms of sediment discharge to downstream waterways
- It is not expected that the activities associated with the proposal would result in a major increase in potable water demand
- Stormwater discharged from the site is not expected to have any unacceptable impacts on flooding conditions downstream
- Re-profiling and re-capping of areas would reduce the potential risk of leachate entering the surface water system
- Therefore, the proposed works are not expected to result in any unacceptable impacts relating to surface waters.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below.

- Diversion of clean upstream runoff around the site to avoid mixing with runoff from disturbed areas
- Appropriate management of vehicle movements to minimise generation and transport of sediment
- Appropriate management of material stockpiles including locating them as far from drainage lines as possible
- Employ general flood management practices on site including keeping drainage lines free of waste and debris and monitoring drainage lines during periods of heavy rainfall
- Separate runoff from disturbed areas will be from undisturbed areas where possible
- Design and operate sediment basins and sediment traps to promote sedimentation
- Maintenance of drains to prevent weed build up
- Diversion of surface water in suitably sized stormwater diversion channels and berms
- Separate clean and sediment laden water with clean water diverted offsite and disturbed area runoff managed in the site surface water management

- Minimise exposed areas over which sediment would be generated through maintenance of both natural and artificial ground cover such as grass or erosion control cover products
- Utilise the main sediment basin as both a Type D sediment basin as well as water reuse to limit reliance on potable water
- All surface water from the site would be treated in sediment basins before it is discharged off site
- Continue to undertake surface water monitoring as prescribed in EPL 5065
- Further investigation of the habitat condition and macroinvertebrate populations to confirm the preliminary findings stated in the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015). This work be undertaken every three years commencing soon after reprofiling works commence in Area E.

8.2.3 Activities/Frequency

The on-site sediment and water management infrastructure consists of erosion control measures, stormwater collection and transport, sedimentation basins, truck and wheel wash facilities and a treatment plant.

The main activities and frequencies for surface water management are:

- Check for water ponding in completed areas - *after rain*
- Install surface water measuring device(s) - *within 3 months of the NSW EPA request*
- Report on surface water monitoring – *within one month of sampling*
- Operate and maintain the stormwater treatment plant – *as required*
- De-silt sediment ponds – *as required*

8.2.4 Performance Indicators/Targets

Surface water released from sedimentation dam 5 during wet weather overflow events or diverted through the stormwater treatment plant are monitored as required under the EPL to ensure water discharged offsite meets the following license limits:

- Have a pH value between 5.5 and 8.5
- Contain more than 6 milligrams per litre (mg/L) of dissolved oxygen
- Have a conductivity less than 1,500 micro Siemens per centimetre (µS/cm)
- Contain less than 2.5 mg/L of total ammonia (NH_3 -N) (both $NH_{3(aq)}$ and NH_4^+)
- Contain less than 50 mg/L Total Suspended Solids (TSS) (except during wet weather overflow events)

8.2.5 Reporting and Review

Daily operational checklists are completed on site by the site supervisor and weekly checklists are completed by the site manager. The compliance officer is responsible for completion of the Environment weekly checklist. The checklists are reviewed by the site manager for the LHRRP. Maintaining environmentally electronic checklists is the responsibility of the compliance officer.

Additional reporting and review functions include:

- Monthly review of monitoring results with the contractor
- Reporting to the appropriate regulatory authority (SSC or the NSW EPA), the NSW EPA, WorkCover Authority, the Ministry of Health Public Health Unit, the local authority (if not the

appropriate regulatory authority) and Fire and Rescue NSW immediately of incidents related to pollution incidents where material harm to the environment is caused or threatened. Material harm includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial or that results in actual or potential loss or property damage of an amount over $10,000. (This is an amendment in Section 148 of the POEO Act took place on 6 Feb 2012)

- Annual Reporting to the NSW EPA as part of licence requirements

The NSW EPA (or authorised officers of Department) will have full access to the works either during or after construction, to allow inspection and testing of the works and its fittings. Any work or alterations that are deemed necessary by NSW EPA arising from the visit for the protection or proper maintenance of the works, or the control of the water extracted, and for the protection of the quality and the prevention from pollution or contamination of sub-surface water will be carried out.

8.3 LEACHATE MANAGEMENT

8.3.1 Environmental Goals and Principles

The design and operation of the landfill cells and prompt covering of waste assists in minimising infiltration of rainwater into the landfill and the shedding of rainwater away from landfilled areas. The completed areas are revegetated progressively which improves the stormwater management on site. Combined, these factors significantly reduce the quantities of leachate produced on site.

Leachate (from both the LHRRP and Lucas Heights 1) is acknowledged as a potential odour source. Odour issues are addressed in section 8.5.

Based on the NSW EPA Environmental Guidelines: Solid Waste Landfills: Leachate Barrier System, Leachate Collection System, leachate management on site is aimed at:

- Prevention of groundwater pollution by leachate
- Prevention of surface water pollution by leachate
- Prevention of the degradation of local amenity in particular Mill Creek and the Georges River

The following principles are adopted in leachate management:

- Leachate shall not pollute groundwater at the LHRRP, unless otherwise permitted by the EPL
- Proper management of the leachate will minimise the potential for surface water and groundwater pollution by leachate
- Re-profiling the final landform would assist in reducing leachate generation. Re-profiling the final landform to increase its slopes to reduce infiltration and thereby leachate generation represents a sensible reduction in environmental risk

8.3.2 Management Strategy

Leachate is formed from the degradation of waste and percolation of water through waste. The composition of landfill leachate is determined by physical, chemical and biological processes. The quality of leachate is influenced by the type and age of waste, the physical and chemical conditions inside the landfill, and microbiological activity.

The leachate drainage system will be maintained in an operable and effective condition at all times. Care will be taken to ensure the leachate drainage pipes are not damaged by waste disposal or other operational activities. The leachate collection system is designed and operated to effectively collect and drain leachate from the landfilled waste to a specific leachate collection point.

The following leachate management strategy is in place:

Preventative measures

- Leachate management consists of leachate collection for both existing waste and proposed waste filling areas
- Perforated pipes are laid in the base of the landfill that lead to a number of junction pits constructed of large diameter concrete pipes standing on end. As the landfill is raised, junction pits are extended vertically by adding pipe sections to provide for collection of leachate from higher levels of fill
- Collection systems are located in each layer of waste to reduce the potential for leachate to perch
- Leachate is removed from a number of gas extraction wells using air lift pumps, flowing by gravity to the leachate collection dam
- The leachate collection dam has a holding capacity of 10 ML and allows for the collection of leachate from the western ring main, central ring main, eastern ring main, Area 5-1 and Areas 5-2/5-3
- A further emergency leachate storage dam is available with a storage capacity of 9.2 ML and is available to store leachate in extended wet weather events
- The leachate collection dams are lined to prevent seepage of leachate into the groundwater
- Levels in the leachate storage dams are actively managed so they have sufficient capacity to cope with leachate arising from wet weather events
- Leachate is transferred from Lucas Heights 2 leachate collection dam to Lucas Heights 1 holding dam via the leachate transfer line. The line follows the sealed road back to the entrance to the LHRRP and then travels across country to Lucas Heights 1
- The holding dam at Lucas Heights 1 has a holding capacity of 2.2 ML. Lucas Heights 1 has a sequencing batch reactor which allows for biological treatment, specifically ammonia removal, prior to pumping to sewer

Mitigation measures

- Waste is compacted and covered with daily and intermediate cover material to minimise infiltration of stormwater and further leachate generation
- Effluent from the truck wash bay and staff amenities is pumped separately to ANSTO for discharge to the ANSTO sewer connection
- Quality of leachate in the holding dam is inspected regularly
- The leachate transfer pipes to storage dams and treatment facilities are monitored and inspected

Rectification measures

- Chemical treatment of leachate dams
- Review of storage and treatment capacity
- De-sludging of dams as required
- Increase in aeration as required

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of leachate impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that the reprofilling works will:

- Provide a final landform which increases the proportion of rainfall which will run off the surface
- Provide a final capping system which will decrease the proportion of rainfall which will infiltrate into the waste
- Overall, generate less leachate than the current site arrangement

Through the reduction in leachate generation and the improvement of the cap, the reprofilling works will also reduce the potential to impact the environment through surface water and groundwater.

The assessment also concluded that the existing leachate management system has the capacity to manage the volumes of leachate estimated to be generated in the modelled average rainfall and wet rainfall years through the use of emergency leachate containment in the double lined emergency leachate containment dam. On occasion there may be some temporary leachate level fluctuation in Cell 5.2 and Cell. 5.3. These containment structures were designed for this purpose.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below.

- Ongoing monitoring of surface water and leachate as required by EPL
- Daily review of leachate levels
- Daily site inspections and pumping/discharge records
- Update of standard operating procedures as site develops
- Maintain relevant emergency procedures
- Take action as leachate volumes and levels increase
- Document corrective and preventative actions taken
- Undertake regular inspections and repairs of infrastructure including removal of sludge from dams and maintenance of pumps and aerators
- Ongoing monitoring of down-gradient groundwater wells
- Ongoing assessment of leachate generation volumes during re-profiling, periodic updating of landfill water balance model
- Charaterisation and monitoring of leachate levels in dual purpose gas / leachate wells
- Monitor yields from the dual purpose wells

8.3.3 Activities/Frequency

- Waste compaction - *ongoing*
- Installation of leachate collection pipes in accordance with design - *ongoing*
- Leachate pumping to Lucas Heights 1 - *daily,*
- Ensure adequate storage within leachate dams - *daily*
- Maintenance of automated leachate storage and transfer devices– *ongoing*
- Monitoring compliance with Environment Protection Licence – *three monthly*
- Monitoring compliance with Sydney Water Trade Waste Agreement for discharged treated leachate from Lucas Heights 1 leachate treatment plant – *every 4 days*
- Site inspections for leachate seepage - *daily*
- Any leachate seepage detected to be contained and controlled within 24 hours - *as required*

8.3.4 Performance Indicators/Targets

- No deterioration of surface water quality
- No deterioration of groundwater quality
- Signs of leachate seepage
- No overflow from leachate dam (below deign rainfall)
- Compliance with discharge licence

Groundwater monitoring bores assist in determining any impacts on groundwater from landfill operations, and also to provide information to assist in leachate management. The target is to maintain or improve the existing surface water and have no impact on the groundwater quality.

8.3.5 Reporting and Review

Daily operational checklists are completed on site by the site supervisor and weekly checklists are completed by the site manager. The compliance officer is responsible for completion of the environment weekly checklist. The checklists are reviewed by the site manager. Maintaining environmental electronic checklists is the responsibility of the site manager.

Additional reporting and review functions include:

- Monthly review of monitoring results
- Reporting to the NSW EPA within 14 days if ammonia concentrations in groundwater exceed 1.0 mg/L
- Annual reporting to the NSW EPA as part of licence requirements

8.4 LANDFILL GAS MANAGEMENT

8.4.1 Environmental Goals and Principles

Decomposition of organic material in a landfill generates landfill gas, which typically consists of 45-60% methane, 40-60% carbon dioxide and traces of other organic compounds (less than 1%). If not controlled, the organic compounds can cause odour nuisance, offsite gas migration and escaping landfill gas can reduce the oxygen content in soil to limit plant growth.

Odour is addressed in section 8.5.

Landfill gas may increase the risk of a landfill fire. Landfill fire is addressed in section 8.11.

The goals of on-site landfill gas management include:

- Preventing landfill gas emissions into the atmosphere
- Preventing subsurface off-site migration
- Minimising odorous emissions associated with landfill gas
- Recovery of energy from the gas
- Extract landfill gas efficiently
- Improving site gas capture and destruction either by power generation activities or gas flaring as required

The following principles are adopted in landfill gas management:

- A collection system is installed to extract landfill gas utilizing ring mains, sub mains gas wells and dual gas / leachate wells with some horizontal wells remaining from the early stages of the landfill
- Landfill gas is transferred to the power stations and transformed into energy for power generation

8.4.2 Management Strategy

EDL has a contract with SITA for gas management at LHRRP. It is managed in accordance with the requirements of the EPL. Primary objectives of the contract include:

- Controlling landfill gas emissions from LHRRP
- To design and progressively install the gas extraction system on SITA's behalf as directed

If there are any changes to the contractual conditions, this OEMP will be updated to reflect the new arrangements.

EDL provides SITA with a monthly and quarterly gas field performance report that details the following type of information:

- Number of gas wells installed
- Number of gas wells that are on line and active
- Gas well flow rates
- Gas composition at each well station
- Diagrams showing methane concentrations surrounding well stations
- Gas field efficiency
- Technical issues with gas field
- Recently completed works and proposed future work

EDL and SITA undertake three monthly gas group meetings to further discuss the information provided in the monthly performance reports.

Aspects of the landfill gas management system and collection strategy include:

Preventative Measures

- Install landfill gas extraction wells are installed in the completed areas to control gas migration
- Allow for overlap of the radius of influence for extraction wells located at the border perimeter of the landfill, to assist effective control of offsite gas migration
- Ensure that inter-well spacing is equal to or less than twice the estimated radius of influence
- Install and operate a landfill gas collection system progressively to minimise odour as a result of landfill gas seepage
- Collecting and recirculating landfill gas condensate into the landfill
- Extract leachate via dual extraction wells and direct it via flow lines to adjacent leachate risers and into the leachate collection system
- Designing new leachate collection sumps / points to be gas tight at ground level
- Design leachate collection sumps / points to enable them to be connected into the landfill gas collection and treatment system if required
- Transfer collected gas to the power station located at the south-eastern edge of the site to be transformed to electricity with flaring of excess landfill gas as required
- In addition to the provision of a clean fill capping to cover the waste landfill material on a daily basis, undertake interim capping operations during the day on a needs basis, to ensure odour

performance meets the NSW EPA Draft Odour Policy - Assessment and Management of Odour from Stationary Sources in NSW (2001)
- Review gas collection infrastructure and ensure adequate amount is in place
- Review capacity for gas collection and destruction (including flaring)
- Maximise gas extraction irrespective of quality

A summary of the gas extraction system is included in Appendix I and covers:
- The design, construction, operation/control and monitoring of the existing and proposed landfill gas extraction well network and oxidation system
- Information on the design, construction, operation/control and monitoring of gas collection infrastructure at leachate risers
- Information on the agreement/contract for the collection and management of landfill gas

Mitigation Measures
- Prepare and regularly review emergency plan and emergency procedures
- Continual implementation of a regular program for monitoring landfill gas

Rectification measures
- Implement emergency plan and emergency procedures
- Review gas collection efficiency and capacity
- Daily covering of any exposed landfilled waste to minimise rainfall infiltration into the landfilled waste - which can reduce the rate of landfill gas generation - and to minimise uncontrolled fugitive emissions to the atmosphere

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)
The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of greenhouse gas and air quality impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that the reprofilling works will:

- Have no significant impact on the community or environment
- Allow recovery of energy from gas
- Promote efficient landfill gas extraction

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below.

- Protect, maintain and extend the existing landfill gas wells and connecting pipes to allow gas extraction from the old waste to continue and the newly landfilled waste to be serviced by the existing wells (and additional wells where needed)
- Install additional gas controls prior to landfilling above previously landfilled areas, including a dual gas/leachate trench near the perimeter of the newly deposited waste. The trench would contain a perforated pipe and be backfilled with a high permeability material such as gravel. This would provide a means for depressurising any areas where gas has accumulated at the interface of the existing and newly landfilled waste
- Continue to undertake regular testing and monitoring to identify any other major emissions
- Should gas monitoring identify other emission contributing areas, implement measures to improve gas extraction and oxidation

8.4.3 Activities/Frequency

The following activities are undertaken:

- Extension and modification of the existing landfill gas collection system - *as required*
- Maintaining the gas collection system - *as required*
- Surface gas emission monitoring - *quarterly or as required*
- Subsurface gas monitoring - *quarterly or as required*
- Accumulation gas monitoring - *quarterly or as required*

8.4.4 Performance Indicators/Targets

- No detectable sub-surface off-site migration of landfill gas
- No detectable surface emissions of landfill gas above 500 parts per million (ppm) (the NSW EPA *Environmental Guidelines: Solid Waste Landfills:* Surface Gas Emission Monitoring)
- Thermal oxidation (flaring or electricity generation) should have greater than 98% destruction efficiency for non-methane organic compounds prior to atmospheric emission

8.4.5 Reporting and Review

Daily operational checklists are completed on site by the site supervisor and weekly checklists are completed by the compliance officer. The compliance officer is responsible for completion of the environment weekly checklist. The checklists are reviewed by the site manager. Maintaining environmental electronic checklists is the responsibility of the landfill manager.

Additional reporting and review functions include:

- Monthly review of monitoring results
- Quarterly reporting of results from activities specified in section 9.2.5 to SSC
- Reporting to the NSW EPA as part of licence requirements all surface points on finished areas above 500 ppm detected during quarterly surface gas monitoring.

8.5 ODOUR CONTROL

8.5.1 Environmental Goals and Principles

Landfilling of putrescible waste is likely to generate some odour on the site. The level of odour can be reduced by measures such as covering waste daily and maintaining a vegetation buffer zone around the landfill area.

Leachate and landfill gas are sources of odour. Management of leachate is discussed in section 8.3 and management of landfill gas is discussed in section 8.3.

Odour control on site is aimed at (as based on the NSW *EPA Environmental Guidelines: Solid Waste Landfills:* Odour Control):

- Prevention of degradation of local amenity
- Prevention of landfill gas emissions

- Achieving no detectable odours (less than 2 Odour Units (OU), cumulative) at the nearest residential receptor
- Improving site gas capture and destruction either by power generation activities or gas flaring as required

The following principles are adopted to control odour on site:

- The LHRRP site will not emit offensive odour in accordance with the provision of the *PoEO Act 1997*
- Conducting landfill operations in a suitable manner to minimise impact on closest residential areas
- Installation and operation of a weather station that monitors wind speed and wind direction to allow correlation of odour complaints with weather conditions and assist in rectifying the problem
- On site gas capture and destruction either by power generation activities or gas flaring as required

8.5.2 Management Strategy

The main features of the odour management strategy, which are based on prevention of mitigation and rectification. The mitigation and rectification measures will be implemented as required and their exact details will be based on a case by case situation depending on the issue and technical solutions available at the time. The odour management strategies are described as follows:

Prevention measures

- Place prominent signs at the entrance to the landfill defining acceptable solid wastes
- Undertake random monitoring and inspection of incoming vehicles to determine waste composition, as waste is deposited from vehicles at the waste disposal area and monitoring of deposited waste during spreading, compaction and covering
- Schedule transfer station deliveries toward mid to late afternoon
- Operate a wheel washing facility for trucks leaving the site to minimise the transport of potentially odorous soil particles and debris onto adjacent roads
- Undertake regular washing and deordorising of SITA delivery vehicles at the vehicle depot
- Cover odorous wastes as soon as possible after delivery in accordance with the requirements of the site's environment protection licence
- Cover waste during daily operations as required and at the end of day
- Minimise the size of the active landfill face, taking into account the practicalities, safety, access, traffic management, etc.
- Provide sufficient leachate storage capacity in the site's above ground dams to deal with greater than average wet weather
- Install leachate capture infrastructure on areas of the site being reprofiled
- Minimise the area of cap removed prior to placement of additional waste
- Use intermediate cover as required by the site's EPL
- Progressively install a suitably engineered capping layer as areas of the site are reprofiled
- Reprofile the landform to provide a minimum of 5% slope (pre and post settlement)
- Undertake regular inspection and monitoring of the capping layer
- Monitor landfill gas extraction flow rates and gas quality
- Develop of SOPs incorporating odour prevention techniques (see Appendix K)
- Train staff (internal and contractors) on odour management strategy and all relevant procedures
- Staff employment contracts to reference SOPs

An on site meteorological station that monitors wind speed, wind direction and temperature helps correlate odour complaints with weather conditions and assist in rectification (as based on the NSW EPA Environmental Guidelines: Solid Waste Landfills: Odour Control).

Mitigation measures

- Maintain a vegetated buffer zone around the site to act as a buffer against odours and assist dispersion of any fugitive emissions (as based on the NSW EPA Environmental Guidelines: Solid Waste Landfills: Odour Control)
- Provide a sealing layer in the capping profile (in accordance with the NSW EPA's Environmental Guidelines: Solid Waste Landfills)
- Progressively install and operate a landfill gas collection system to minimise odour as a result of landfill gas seepage
- Install additional landfill gas extraction infrastructure
- Flare gas temporarily when power generation plants are shut down
- Apply odour suppressants when stripping back existing capped areas
- Apply odour control spray system adjacent to areas that have had the existing cap removed prior placement of new waste
- Aerate the leachate dams as needed
- Minimise the time for which leachate is stored at the site before it is transferred for treatment and off site for disposal
- Daily site inspections of the areas being filled and at the site boundary to detect odour levels
- Record all incidents of identification and/or rejection of unacceptable waste
- Investigated complaints from neightbours and record in database
- Undertake odour patrols including visits to the residential areas (if known)
- Reduce temporary steep batter slopes and the overall area of batters
- Include environmental KPIs in staff reviews

Rectification measures

- Reduce the size of the active landfill face
- Increase equipment and personnel for daily cover operations
- Consider additional gas infrastructure when installing the capping layer after reprofiling areas of the site
- Place cover material if needed should the existing cap be stripped to previously landfilled waste
- Install additional aerators in the leachate storage dams
- Remove leachate from the dams
- Provide additional leachate storage
- Install linear low-density polyethylene (LLDPE) membrane or clay capping on batter slopes
- Increase the disposal capacity of the leachate pre-treatment plant
- Install odour control cannon or curtain

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of air quality impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that the reprofilling works will:

- Result in lowering the potential for odour impacts in the future by retaining the general proportion of capped and revegetated areas of the site and increasing these areas in time
- Have no significant impacts on the community or environment
- Achieve the 2 OU odour performance criteria cumulatively at the nearest residential receptor

- Improve site gas capture and destruction either by power generation activities or gas flaring as required

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below.

- The landfill gas extraction system would be extended to account for the reprofiling of waste. This is standard practice already in place at the site when each new lift of waste is placed on areas with an active gas extraction system
- In some areas and on a needs basis additional landfill gas extraction infrastructure would be installed and operated to effectively extract landfills gas from the landfilled waste and thereby minimise the potential for odourous emissions from the site
- Reprofile the landform to provide a minimum of 5% slope (post settlement)
- Re-testing of the rectified localised emission points, the v section, area south of the excavation stockpile and batters in 2015/16 to confirm odour modelling predictions
- Strict adherence to the landfilling strategy as described in Section 7.4, in particular the strategy related to landfill cover strip back

8.5.3 Activities/Frequency

SITA will undertake the following activities:

- Site inspections for odour levels at the boundary of the site - *daily*
- Inspection of incoming waste for particularly odorous waste - *daily*
- Recording instances of unacceptable odorous waste brought to the site – *immediately following the occurrence*

As part of the reporting system all odour complaints will be investigated and responded to if requested. This will include identification of the source if possible and remedial action if required.

8.5.4 Performance Indicators/Targets

- Meet the requirements of Section 129 of the PoEO Act 1997
- Achieving no detectable odours (less than 2 OU, cumulative) at the nearest residential receptor
- No odour complaints

8.5.5 Reporting and Review

Daily operational checklists are completed on site by the site supervisor and weekly checklists are completed by the compliance officer. The compliance officer is responsible for completion of the Environment weekly checklist. The checklists are reviewed by the site manager. Maintaining environmental electronic checklists is the responsibility of the site manager.

Additional reporting and review functions include:

- Review of monitoring and gas well installation results
- Site and off-site odour patrols

- Reporting of odour complaints
- Review of surface gas and odour monitoring results

Odour complaints will also trigger the complaints and auditing procedures as noted in section 6.3.

8.6 DUST CONTROL

8.6.1 Environmental Goals and Principles

Based on the NSW EPA Environmental Guidelines: Solid Waste Landfills: Dust Controls, dust control is aimed at:

- Prevention of air pollution
- Prevention of the degradation of local amenity

The following principles are adopted in dust control:

- Restricting vehicle movements to specified routes in unsealed areas
- Restricting access to and progressively rehabilitating unvegetated areas
- Regular watering of areas that have the potential to generate dust
- Regular watering of stockpiles and excavation area; and seeding to encourage vegetation growth as necessary
- Regular sweeping of sealed haul roads

A Dust Management Plan has been prepared for the site and its requirements have been included in the OEMP. The management plan is included in Appendix G.

8.6.2 Management Strategy

The main features of the dust management strategy are based on prevention, mitigation and rectification. The mitigation and rectification measures will be implemented as required and their exact details will be based on a case by case situation depending on the issue and technical solutions available at the time. The dust management strategies are described as follows:

Preventative measures

- Plan earthworks, landfill operations, rehabilitation and construction activities to keep exposed areas to a minimum
- Implement on site traffic and operational controls to prevent unnecessary dust generation
- Seal frequently used roadways
- Do not undertake dust generating activities during adverse weather conditions
- Progressively remove soil stockpile (which will occur in time with the utilisation of this material for covering the waste)
- Cesate operations if unsafe (e.g. during strong winds)
- Undertake monthly dust deposition monitoring at 6 boundary locations on site
- Inspect incoming trucks, ensuring that trucks transporting material are covered and that tailgates are firmly fixed
- Limit vehicles to specified routes around the site and ensure speed limits are adhered to
- Operate wheel washing facilities at exits from unsealed roads for use during wet conditions
- Maintain watering truck filling facilities

Mitigation measures

- Use dust suppression techniques (such as watering) to maintain moist conditions on exposed areas and unsealed roadways
- Undertake visual monitoring of dust emissions
- Undertake monthly dust deposition monitoring at six boundary locations on site
- Undertake periodic Total Suspended Particulate (TSP) monitoring
- Implement watering of exposed areas, roadways and rehabilitation areas using watering trucks and/or sprinkler systems as necessary to suppress dust

Rectification measures

- Record environmental complaints and regular review and reporting of performance;
- Consider spraying dust suppressants on the soil stockpile
- Increase the amount of sprinklers on stockpiles and water cart equipment for operational areas if required

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) undertook an assessment on air quality associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that:

- The reprofiling works will have no significant impacts on the community or environment
- Dust dispersion modelling undertaken found that the maximum predicted dust impact complies with the dust criteria at all receptors.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. No additional mitigation measures and strategies are required for dust management.

8.6.3 Activities/Frequency

- Restrict vehicle movements to specifies routes in unsealed areas and ensure posted vehicle speed limits are observed - *daily*
- Train staff on the dust management plan objectives, actions, monitoring and reporting requirements, and on site dust suppression techniques – *ongoing*
- Treat dusty wastes as Special wastes – o*ngoing*
- Implement daily inspection of dust generating sources and use of dust suppression techniques, with inspection results recorded in the Site Checklists - *ongoing*
- Implement dust deposition monitoring at site boundaries – *ongoing*
- Implement TSP monitoring at suitable downwind location – *ongoing*

8.6.4 Performance Indicators/Targets

- No visible dust from the site beyond the boundary of the site
- Maximum level of dust deposition shall not exceed 4 grams per metre squared (g/m^2) per month as an annual mean
- TSP monitoring results shall not exceed 90 $\mu g/m^3$ annual average
- All on site staff adequately trained in dust minimisation procedures and techniques
- No complaints from neighbouring landholders

8.6.5 Reporting and Review

Daily operational checklists are completed on site by the site supervisor. The compliance officer is responsible for completion of the environmental weekly checklist.

Additional reporting and review functions include:

- Monthly review of monitoring results

8.7 LITTER CONTROL

8.7.1 Environmental Goals and Principles

Based on the NSW EPA *Environmental Guidelines: Solid Waste Landfills*: Litter Control, litter control is aimed at:

- Prevention of surface water contamination
- Prevention of the degradation of local amenity
- Maintenance of the site aesthetics

Transportation of waste to the LHRRP has the potential to generate litter via improper containment of loads. It is also possible for wind-blown material from the landfill to escape from the site. Litter can spread throughout the surrounding area during windy conditions. In addition, the relatively isolated nature of the LHRRP means that illegal dumping can occur in the surrounding area.

By taking precautions during landfilling operations, some wind-blown litter can be restricted to the landfill area. It is more difficult to control illegal dumping and materials that emanates from transportation. However, it is SITA's goal to prevent litter from entering Mill Creek, spreading off the site into bushland and other areas adjacent to the site including sections of Heathcote Road and New Illawarra Road.

In addition to specific actions undertaken by SITA, a joint litter campaign between SITA and SSC will also contribute towards the achievement of the above goal. SSC and SITA has agree to the establishment of a Litter and Illegal Dumping Fund dedicating in excess of $60,000 per annum for five years for preventing and combatting illegal dumping and litter in the Sutherland Shire. SSC and SITA will form a committee to determine how the Fund will be utilised on an annual basis.

The funds would be specifically directed towards a Litter and Illegal Dumping Program to be undertaken along New Illawarra Road and Heathcote Road as well as illegal dumping hotspots within the Sutherland Shire Council area. Fund initiatives may include:

- Establish anti-litter and illegal dumping signage on major roads
- Establish awareness signages
- Intelligence gathering and increase surveillance through patrols and/or camera surveillance to identify illegal dumping hot spots
- Community education programs and promotion campaigns for local residents to communicate key information to residents. This may be in the form of distributing pamphlets and other general advertisements to deter littering and illegal dumping. Key messages would be in line with the recommendations stated within the Illegal Dumping Research Report (NSW EPA, 2015):
    - reinforce the social norm that illegal dumping is unacceptable

- create a social norm around reporting illegal dumping
- raise the profile of the personal consequences (i.e. magnitude of fines, prison sentences)

- Communication to LHRRP customers via pamphlets and signage at the weighbridge

8.7.2 Management Strategy

The main features of the litter management strategy are outlined below.

Preventative measures

- Monitor weather conditions to anticipate upcoming high wind periods
- Continuous waste compaction and daily covering of all waste
- Operate wheel wash facility to remove any mud and potential litter from landfilling-related transport vehicles leaving the site during wet weather
- Ensure that trucks transporting material from the premises have their loads covered and tailgates securely fixed
- Implement a customer awareness campaign including signs and handouts
- Cover all loads during transport to and within the site
- Take all actions necessary to prevent the generation of litter
- Provide litter bins for personnel on the site
- Implement a user awareness campaign including signs and handouts
- Undertake screening in and around the site
- Implement joint litter campaign between SITA and SSC

Mitigation measures

- Place relocatable fencing near the working face to catch any windblown litter
- Place temporary fencing near long term active tipping areas

Rectification measures

- Undertake regular litter patrols and removal along the boundary of the landfilling area and along roads leading to the area being filled
- Clear litter from litter screens / fences near the active filling area on a daily basis
- Clear litter from all other site fencing on a daily basis

KPI for litter
No litter arising from landfill operations or the transportation of waste to and from the facility, in the surrounding areas including:

- Mill Creek, Environmental Buffer Area and Lucas Heights Conservation Area
- New Illawarra Road (both sides from Heathcote Road to the hill past the ANSTO entrance gate)
- Heathcote Road (the LHRRP side along the site boundary)
- Little Forest Road (main entrance road)
- General site and boundary fence

Council clean up
If Council identifies a need for litter, in accordance with the KPI for litter, to be removed, then Council is to contact the LHRRP Landfill Manager advising the of type of litter to be removed and its location.

If the litter is not removed within a time period agreed with council (but not less than one day), then, council may serve a clean up notice on SITA which defines the litter to be collected and its location.

Should SITA not comply with the notice within 14 days, then Council may collect the defined litter and seek cost recovery from SITA. Cost recovery is limited to the operational costs associated with the collection of the litter identified in the clean up notice.

The above does not replace SITA's obligations under the OEMPs for daily litter collection along the identified roads.

8.7.3 Activities/Frequency

- Waste compaction and covering - *daily*
- Installation of temporary litter fencing near the working face – *ongoing*
- Clearing litter bins - *daily*
- Site inspection and litter collection within the landfill site – *as required*
- The site manager inspects Little Forest Road - *at least twice a week*
- Site inspection and litter collection in the following areas – *daily*
  - New Illawarra Road (both sides from Heathcote Road to the hill past the ANSTO entrance gate)
  - The LHRRP side of Heathcote Road along the site boundary
  - General site and boundary fence
  - Main entrance road
  - Other areas off-site if windblown litter results from the operation
- Notify Roads and Maritime Services if any illegal dumping observed on Heathcote Road and New Illawarra Road – *as required*
- Notify SCC if any illegal dumping observed – *as required*

8.7.4 Performance Indicators/Targets

- No litter on the site, including the Environmental Buffer Area
- No litter arising from the landfill operations in surrounding areas, including Mill Creek, sections of Heathcote and New Illawarra Roadss, Little Forest Road, environmental buffer area and the Lucas Heights Conservation Area

- No litter arising from the transportation of waste to the LHRRP

8.7.5 Reporting and Review

Daily operational checklists are completed by the site supervisor and the environmental weekly checklist is completed by the compliance officer.

Additional reporting and review functions include:

- Monthly review of monitoring results
- Quarterly report to the CRG
- Maintaining site environmental checklists

8.8 NOISE CONTROL

8.8.1 Environmental Goals and Principles

The major sources of noise on site include operating equipment such as waste compacting and covering machinery and transport vehicles. Based on the NSW EPA Environmental Guidelines: Solid Waste Landfills: Noise Control, is aimed at:

- Prevention of noise pollution
- Prevention of the degradation of local amenity
- No significant impact on the community or environment

8.8.2 Management Strategy

The main features of the noise management strategy, which are based on prevention, mitigation and rectification. The mitigation and rectification measures will be implemented as required and their exact details will be based on a case by case situation depending on the issue and technical solutions available at the time. The noise management strategies are described as follows:

Preventative Measures

- Limit waste receival hours
- Restrict waste receival operations on site. Cease to receive waste at the LHRRP an hour before closing time to allow for compaction and the application of cover material
- Ensure all vehicles accessing the site use designated access roadways
- Demonstrate equipment will not cause excessive noise generation (based on the NSW EPA Environmental Guidelines: Solid Waste Landfills*:* Noise Control)
- Select plant and equipment to minimise noise emissions where possible, whilst maintaining efficiency of function. Residential grade silencers will be fitted and all noise control equipment will be maintained in good order
- Maintain all machinery and equipment in proper working order in accordance with the manufacturer's requirements
- No activities of heavy machinery outside site operating hours
- Include a noise awareness component in site induction trainings

Mitigation measures

- Include a noise management component in site induction trainings
- Inspect key areas of the site daily for excessive noise levels. Such areas would include the vicinity of the working face and the site entrance
- Construct temporary earth bunding/vegetation screening as required to attenuate noise emissions

Rectification measures

- In the event that noise monitoring indicates an exceedance of the noise limits, the source of the noise will be identified and appropriate action taken including (but not limited to) the replacement of plant and equipment with quieter units, noise barriers or shielding around the work site
- Review timing for the receipt of waste from the SITA transfer station network so that the times have the least noise impact

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of noise impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that:

- The reprofiling works will have no significant impacts on the community or environment
- The predicted operational noise levels at all surrounding residential sensitive receivers are below the recommended maximum operational noise criteria.
- The additional traffic generation is predicted to increase road traffic noise emission levels by less than 2 dB(A). Therefore, road traffic noise levels are predicted to comply with the noise criteria at sensitive receivers along the traffic routes.
- No additional mitigation measures and strategies are required for noise management.

8.8.3 Activities/Frequency

- The site is inspected for excessive noise levels - *daily*
- Maintenance of machinery – *as required*
- Checking machinery for excessive noise - *quarterly*
- Recording noise complaints - *on occurrence*
- Recording of noise volumes at strategic points across the site – *as required*

8.8.4 Performance Indicators/Targets

- Noise emanating from the site must not exceed a LA10, T sound pressure level of 50 dB(A) when measured or computed at any point within 1 m of any residential boundary or any other noise sensitive areas, over any 10 to 15 minute period, using the 'FAST' response on the sound level meter during the day. Noise emanating from site must not exceed LA10, T of 35dB (A) at night. 5 dB(A) must be added to the measured level if the noise is substantially tonal or impulsive in character
- No noise complaints from surrounding landholders

8.8.5 Reporting and Review

Daily operational checklists are completed by the site supervisor. The compliance officer is responsible for completion of the environmental weekly checklist.

Additional reporting and review functions include:

- Monthly review of monitoring results
- Quarterly report to the CRG
- Maintaining site environmental checklists

8.9 PEST, VERMIN AND NOXIOUS WEED CONTROL

8.9.1 Environmental Goals and Principles

Based on the NSW EPA *Environmental Guidelines: Solid Waste Landfills*: Pest, Vermin and Noxious Weed Control) pest, vermin and weed control is aimed at:

- To minimise the sources of food and habitat
- To employ professional exterminators if an outbreak is detected
- No spread of weeds off site to surrounding areas

As well as eliminating noxious weeds, other weed species will be controlled to stop them being introduced into the LHCA.

8.9.2 Management Strategy

The main features of the pest, vermin and noxious weeds management strategy are as follows:

Weeds

A weed management plan has been developed using SSC requirements for noxious weeds in the Sutherland Shire Area. The plan is included in Appendix L.

Preventative measures

- Identify and control noxious weeds by engaging a specialist contractor
- Progressively rehabilitate the site which includes initial establishment of a ground cover to minimise erosion and weed infestation
- Monitor whether mosquitos are a problem associated with existing dams

Mitigation measures

- Incorporate measures to restrict high nutrient runoff and excess drainage from entering the Environmental Buffer Area and the LHCA

Rectification measures

- Routine removal of noxious weed species
- Where weeds cannot be removed efficiently by hand they will be controlled through the application of a biodegradable herbicide. Weeds will be sprayed using a knapsack spray or with a marker dye in spring when weeds are growing and before flowering. Care will be taken to accurately spray weeds only and not permit drift spray to go outside of the site boundary
- Ensure habitat conditions after rehabilitation favour native flora over weeds

Pest, Vermin and Noxious Weeds

Preventative measures

- compaction and cover waste daily
- Keep amount of exposed waste to a practicably minimum
- Treat any pest and insect infestations detected in incoming waste or within the LHRRP immediately
- Engage registered pest exterminator to inspected the LHRRP annually and carry out any recommended actions
- Liaise with SSC and involve them in a combined strategy with neighbouring landholders for pest and vermin control
- Conduct site inspections for new weed outbreaks
- Run joint programs with SSC, Crown Lands, Department of Defence and ANSTO to control high risk noxious weeds such as Boneseed, Ludwigia, Pampas Grass, and Bitou Bush within the LHRRP
- Continue existing feral animal control program (in place since 2008)

Mitigation and Rectification measures

- Install baits/traps around the site amenities building
- Report any weed outbreaks or control attempts to regional weed committees

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)
The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of biodiversity impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that the reprofilling works will:

- Have no significant impacts on the natural environment and threatened biota
- Avoid or further reduce impacts on biodiversity values as far as is practicable
- Minimise the occurance of pests, vermin and noxious weeds

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below.

- Ongoing management of noxious weeds according to legislative requirements.
- Ongoing suppression of dust within the landfill
- Ongoing water quality management.
- Monitoring of revegetation of realigned Mill Creek to ensure planted individuals are thriving.
- Ongoing control of feral animals.
- Minimise sources of food and habitat for pest species.

8.9.3 Activities/Frequency

The following will be undertaken:

- Site inspections for pest/vermin/weed on the site – *6 monthly*
- Weed control – *annually as a minimum*

- Pest inspection by Pest Exterminator - *annually*
- Treatment of any detected pest/vermin/weed infestations - *on occurrence*
- Liaison with adjacent landholders including Sutherland Shire Council – *ongoing*

8.9.4 Performance Indicators/Targets

- No pest, vermin and weeds on the site
- No evidence of high nutrient sediment runoff

8.9.5 Reporting and Review

Daily operational checklists and weekly checklists are completed by the site supervisor. The compliance officer is responsible for completion of the environment weekly checklist.

Additional reporting and review functions include:

- Reporting at site meetings if problems occur
- Reporting problems that occur to the CRG
- Maintaining site environmental checklists

8.10 TRAFFIC

8.10.1 Environmental Goals and Principles

The goals for traffic management are:

- To minimise disruption to local traffic
- No queuing on public roads
- To ensure road safety

8.10.2 Management Strategy

Preventative measures

- Manage queuing and prevent long queues at site entrance
- Actively monitor area and have in place traffic control

Mitigation measures

- Delay trucks when required
- Manage dispatch timing for vehicles from SITA controlled facilities

Rectification measures

- Review turning lane and traffic management

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)
The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of traffic impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that

- Overall, traffic generation is therefore expected to be similar to traffic generation predicted by the 1999 consent.
- There would be minimal disruption to local traffic
- There would be no queuing on public roads

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below. These measures would be incorporated into the Traffic Management Plan:

- Consultation with RMS and SCC to ensure that general signposting of construction access roads are appropriate and provide adequate warning of heavy vehicle and construction activity
- Review signposted and non-signposted speed restrictions along the road network and where necessary, provide additional signposting of speed limitations
- Distribute construction activity warning notices to advise local road users of scheduled construction activities
- Provide advance notice of road/lane closures and advice on alternative routes (if required)
- Consult with schools and school bus services to determine and mitigate if any school bus service uses any of the rural forestry roads used for accessing the LHRRP
- Install appropriate traffic control and warning signs for areas identified to have existing potential safety risks
- Manage the transportation of construction materials to maximise vehicle loads and minimise vehicle movements in consultation with RMS and SSC and the NSW Police Services
- Consult with the NSW Police Service to mitigate impacts of heavy (multi-dimensional) vehicles on the roads
- Whenever practical, promote the use internal and haulage access roads rather than public roads by construction vehicles
- Provide project induction training for truck and vehicle operators
- Manage queuing and prevent long queues at site entrance
- Actively monitor areas and have in place traffic control
- Delay trucks when required
- Manage dispatch timing for vehicles from SITA controlled facilities
- Instruct SITA owned waste transfer vehicles are to travel on arterial or sub-arterial roads rather than local roads (with the exception of Little Forest Road)
- Discourage customer's transfer trailers and B doubles from travelling on local roads

Safety review

SITA would perform a safety review in both 2020 and 2025 on the safety of the intersection of New Illawarra Road and Little Forest Road. The report would include analysis of the relevant peak periods and include the following:

- Vehicle turn counts using video surveillance
- Measured average delay per vehicle for vehicles turning into and out of Little Forest Road based on the video surveillance
- Crash data
- Benefit Cost Ratio Analysis for the provision of a controlled intersection using the RMS Road Safety Project Nomination Benefit Cost Ratio (BCR) model

Subject to the approval of RMS and SSC, SITA would provide remedial measures at the New Illawarra Road and Little Forest Road intersection should the report indicate either of the following:

- That the measured average delay per vehicle is equal to or greater than 56 seconds for any of the turning movements to and from Little Forest Road from New Illawarra Road
- That the BCR for the provision of a controlled intersection is equal to or greater than 1

The appropriate remedial measure(s) would be determined by the expert and all costs associated with the provision of that measure would be borne by SITA.

8.10.3 Activities/Frequency

The following will be undertaken:

- Liaison with contractors – *ongoing*
- Inspect truck queues - *ongoing*

8.10.4 Performance Indicators/Targets

- No queuing

8.10.5 Reporting and Review

Daily operational checklists and weekly checklists are completed by the site supervisor. The compliance officer is responsible for completion of the environment weekly checklist.

Additional reporting and review functions include:

- Reporting at site meetings if problems occur
- Reporting problems that occur to the CRG
- Maintaining site environmental checklists

8.11 EMERGENCY PREPAREDNESS

8.11.1 Environmental Goals and Principles

An ERP for the LHRRP has been developed. The plan describes the general policy and approach that should be followed when dealing with an emergency or incident, such as fire, spill of liquids, leachate escape, explosion of liquid fuels, vehicular accidents, personal injury, and emergency at ANSTO or civil disturbances (e.g. bomb threat). The ERP is aimed at:

- Minimising risk to any staff working at the landfilling area, other site staff and the public
- Controlling any incident to minimise injury to persons and damage to equipment, property and the environment.

This ERP was developed in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 1 Industry Emergency Planning Guidelines.

The emergency preparedness management strategy is based on the following principle:

- By updating the ERP and undertaking appropriate emergency preparedness measures the potential for an emergency to occur is reduced and if an emergency does occur, the risk to persons, equipment and buildings on site and on surrounding properties is minimised.

Pollution Incident Management Response Plans (PIMRP) are required to be in place by the *Protection of the Environment Legislation Amendment Act 2011*.

The ERP is contained in Appendix M and the PIMRP is contained in Appendix N.

8.11.2 Management Strategy

The main features of the emergency management strategy are as follows:

General

- Continuously review and update the ERP. The ERP covers:
  - The site emergency warning system. This describes the method of reporting on site emergencies during normal working hours and after hours
  - The contact details of site staff who will be the main contacts during an emergency
  - Duties and actions to be undertaken during specific emergencies, including fires, bomb threats and emergency at ANSTO
  - Evacuation procedures
  - Internal emergency procedures
  - Nature of all emergency equipment and its location
  - Training and evaluation details
  - Media response
  - Written report on emergency
  - Review of ERP
- Take all necessary precautions to ensure the safety of all personnel engaged at the landfill and all public visiting the site
- Training of staff so that a high level of preparedness is maintained by all people who could be involved in an emergency. Staff would be made aware of potential hazards at the landfill and of safe working practices
- Conduct regular drills to ensure understanding of the ERP
- Periodically review and update the emergency procedures and equipment for the site
- Provide equip and maintain first aid treatment posts, at the site, and ensure that at all times, at least one staff member trained and certificated in first aid is on site
- Liaise with ANSTO with regard to the safety requirements of the ANSTO 1.6 km exclusion zone
- Only permit public access to the landfill during opening hours. Ensure that the site is fenced and locked outside opening hours

Fires

- Providing adequate resources including trained staff and fire-fighting equipment
- A water tanker and pumping equipment capable of being used for fire-fighting as well as dust suppression will be kept on site at all times and maintained in good working condition. This will be provided with an adequate water supply
- Clear signposting of, and access to, all fire-fighting equipment
- A maintenance schedule for all fire-fighting equipment and facilities has been created
- All fire prevention and control measures will be in accordance with the requirements of the local fire brigade

- A ban on smoking around the active landfilling area, with clear posted signs indicating designated smoking areas
- Clear posted signs on display to the public advising that flammable liquids are not permitted on the site
- All fuels or flammable solvents for operational use will be stored in an appropriately licensed, ventilated and secure store
- Cell construction, compaction and use of cover material is undertaken in a manner that prevents fire
- In the event of a fire occurring at the site, prompt action will be undertaken to minimise the risk of harm to on site persons and the community and then to extinguish the fire. The local fire brigade will be immediately notified of all fires except those that are immediately extinguished and the site personnel will cooperate fully with the local fire brigade in fighting fires on the site
- The NSW EPA will also be advised of any fires on the site as soon as practicable as required under the EPL
- In the event of a surface fire occurring at the site, water will be used as appropriate to extinguish the fire
- If a fire were to develop on an area being filled, the first procedure would be to apply additional thickness of heavily compacted cover. This may be sufficient to prevent oxygen from reaching the burning area and the fire would die out. If this did not prove sufficient to extinguish the fire, the affected area would be dug out systematically and the exhumed material spread thinly and/or wetted until the fire was extinguished. After the fire was extinguished, the refuse cell would be reformed
- Construction and maintenance of appropriate firebreaks
- A firebreak, not less than 20 m wide and cleared of all flammable material will be provided and maintained around the boundaries of the waste disposal area. All sections of the firebreak will be maintained to allow access for fire-fighting vehicles in accordance with the requirements of the local Fire Brigade. The contractor will liaise with the fire brigade to establish and maintain these requirements
- All fire events will be recorded in detail including the date, time, location, cause of the fire, time it was extinguished, notification of authorities and what future preventative measures are appropriate to be, or have been taken
- Regularly monitoring of the landfill gas and gas collection system, in order to prevent any fire risk
- The *PoEO Act 1997* requires prevention of fires to minimise emissions to the atmosphere. No waste will be burnt at the site and no fire will be deliberately lit on the site, without the permission of the NSW EPA
- Incoming wastes, which are found during inspection to be hot or on fire prior to deposition, will be directed away from the active landfilling areas to a location where the material can be extinguished without risk of causing a fire on the site
- Based on the effective slope in the GO and ARRT facility area and adjoining land north and west (0-5%), a 10 m specific asset protection zone (APZ) has been identified as being appropriate to be provided in the area adjoining Heathcote Road adjacent to buildings and on the northern side of the composting hall. This has been included in the proposal design. An APZ is the area between a building and vegetation hazard, in which active ongoing vegetation management is required. This includes minimising landscaping and not placing flammable fuels (such as woodchip or mulch) in areas identified as APZs. An APZ can incorporate hardstand areas such as carparks and roads.
- Provide fire prevention, detection, protection and fighting measures that are appropriate for the specific fire hazard and adequate to meet the extent of potential fires. Specifically, for any buildings, the fire safety requirements of the Building Code of Australia would be applicable.

This includes the provision of smoke detectors, fire extinguishers, fire blankets, fire hose reels and sprinklers.

- All fire protection systems would be inspected and maintained in accordance with AS1851-2012 Routine Service of Fire Protection Systems and Equipment.
- Waste stockpiles (including any garden organics or paper based waste material) would be kept in a tidy manner prior to processing and all efforts would be made to limit exposure to ignition sources.
- All hot works would be undertaken in accordance with SITA's hot work procedure and permit system as per existing operations procedures in order to minimise the potential for flammable materials to be ignited.
- Regular maintenance of all mechanical components associated with the raw material delivery, shredding and mixing processes would also be undertaken to prevent overheating.
- Fires would be managed in accordance with SITA's emergency response procedures. If the fire cannot be extinguished immediately, local emergency services would be contacted to provide assistance.

Chemical Spill

- All chemicals will be stored in accordance with the AS 1940 - 2004 The Storage and Handling of Flammable and Combustible Liquids and the NSW EPA's Environment Protection Manual for Authorised Officers: Technical Section (Bunding and Spill Management)
- Sufficient supplies of appropriate absorbent materials will be kept on site to recover any liquid spillage. Liquid spills shall be cleaned up using dry methods. Adsorbent materials used to clean up will be disposed of to an appropriate licensed facility

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)

The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) includes an assessment of hazards and risk impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that:

- There would be no significant impact on the community or environment
- No hazards with potential for significant offsite impact that would not be suitably controlled
- Risks are controlled to an acceptable level.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below:

- Continue updating of the existing ERP
- Training of staff
- Regular drills to ensure understanding of the ERP
- Provision of first aid treatment posts, which are equipped and maintained, and at all times, at least one staff member trained and certified in first aid to be on site

8.11.3 Activities/Frequency

- Visual checking of fire-fighting equipment - *monthly*
- Testing of fire-fighting equipment – *six monthly*
- Update ERP - *annually or as required*
- Safety inductions for all staff on commencement and updated regularly – *ongoing*

- Liaison with ANSTO - *ongoing*
- Inspection of waste - *daily*
- Recording of all incidents - *on occurrence*
- Emergency Response Drill – *annually*

8.11.4 Performance Indicators/Targets

- Satisfactory performance of ERP by simulating or controlling an emergency situation on site at least once a year.

8.11.5 Reporting and Review

- Immediate reporting is required to any incident or near incident with actual or potential significant off-site impacts on people or the biophysical environment, a report shall be supplied to DoPE or the NSW EPA outlining the basic facts as required. A further detailed report shall be prepared and submitted following investigations of the causes, and identification of necessary additional preventative measures
- In accordance with the PIMRP, reporting to the appropriate regulatory authority (ARA - local SSC or the NSW EPA), the NSW EPA, WorkCover Authority, the Ministry of Health Public Health Unit, the local authority (if not the ARA) and Fire and Rescue NSW immediately of incidents related to pollution incidents where material harm to the environment is caused or threatened. Material harm includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial or that results in actual or potential loss or property damage of an amount over $10,000
- Reporting to the NSW EPA Manager Waste Operations, or after hours to the Pollution Control Hotline, where the incident may have environmental ramifications
- Preparation of an incident report for serious incidents
- Maintaining site checklists

8.12 SITE MAINTENANCE AND VISUAL AMENITY

8.12.1 Environmental Goals and Principles

The goals for site maintenance and visual amenity are:

- Maintenance of the site aesthetics
- No significant impact on the community

8.12.2 Management Strategy

Preventative measures

- Implement 'early works' rehabilitation and maintenance measures – this involves substantial woodland and understory planting to screen the LHRRP from ANSTO land and adjacent roads including along Heathcote Road and around the boundary of the existing PCYC area. The screening would reduce the visual impacts of LHRRP operations from adjacent areas.
- Maintenance of fences and other site infrastructure
- Maintenance of Little Forest Road
- Screening and screen maintenance
- Progressive rehabilitation and revegetation

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)
The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) undertook an assessment of visual impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that there would be no significant impact on the community.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below:

- Applying hydromulch on exposed batter areas
- Grassing the final capping layer as the reprofiling works occur to further minimise visual impacts
- Ensure that filling does not exceed proposed final landform heights

8.12.3 Activities/Frequency

The following will be undertaken:

- Maintenance of fences – *ongoing*
- Screening and beautification design maintenance - *ongoing*

8.12.4 Performance Indicators/Targets

- No complaints

8.12.5 Reporting and Review

Daily operational checklists and weekly checklists are completed by the site supervisor. The compliance officer is responsible for completion of the environment weekly checklist.

Additional reporting and review functions include:

- Reporting at site meetings if problems occur
- Reporting problems that occur to the CRG
- Maintaining site environmental checklists

8.13 GROUNDWATER

8.13.1 Environmental Goals and Principles

The goals for groundwater are:

- No significant impact on groundwater quality
- No significant impact on the community

8.13.2 Management Strategy

Groundwater quality is influenced by surface water runoff and leachate seepage from the landfill. Refer to Section 8.2 and Section 8.3 for surface water and leachate management strategies respectively.

Reprofiling strategies - Lucas Heights Resource Recovery Park Project EIS (GHD, 2015)
The Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) undertook an assessment of groundwater impacts associated with the reprofiling works, GO facility and the ARRT facility. It was concluded that there would be no significant impact to the e the community.

Comprehensive mitigation measures are proposed relating to both the design and the operations of the facilities. The additional mitigation measures and strategies related to operations for the reprofiling works that were developed as part of the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015) are summarised below:

- Continue or improve on current practices (i.e. reduce the working area and time periods of active landfilling, which will maintain and/or reduce the potential for leachate generation
- Re-profile the landfill with improved slopes and capping design that is in accordance with, or improves on benchmark techniques will be adopted to reduce the overall recharge into the landfill
- After closure there will be no open landfilling area which will reduce the potential for infiltration and leachate generation further
- To understand and offset potential loss in collection capacity/efficiency associated with increased loading on the landfill a monitoring plan will be developed to assess the performance of the landfill collection system during re-profiling. This may include one or a combination of the following:
  - Ongoing assessment of the leachate generation volumes within the Stage 1 to 4 landfill areas during re-profiling via development and ongoing updating of a landfill water balance model that compares expected infiltration volumes against collected leachate volumes
  - Characterisation and monitoring of leachate levels in dual purpose gas/leachate collection wells for increasing water levels
  - Monitoring of the yields from dual purpose gas/leachate collection wells to assess yield reductions over time
  - Implementation of an improved collection system if water balance discrepancies are interpreted and/or overall changes in leachate levels and yields are observed
- The Stage 5 leachate control measures have been designed in accordance with or better than benchmark techniques which will further limit the potential for impacts to underlying groundwater systems
- The groundwater drainage system located beneath Stage 5 will provide additional capacity for collection of impacted groundwater if adverse groundwater impacts emerge
- Ongoing monitoring

8.13.3 Activities/Frequency

The following will be undertaken:

- Monitoring – *ongoing*

8.13.4 Performance Indicators/Targets

In accordance with the EPL condition R2.3, the criteria for groundwater ammonia concentration is 1 mg/L

8.13.5 Reporting and Review

Daily operational checklists and weekly checklists are completed by the site supervisor. The compliance officer is responsible for completion of the environment weekly checklist.

Additional reporting and review functions include:

- Reporting at site meetings if problems occur
- Reporting problems that occur to the CRG
- Maintaining site environmental checklists

8.14 COMPLIANCE WITH THE CONDITIONS OF CONSENT

Every three years following the date of consent or at periods otherwise agreed to by DoPE, SITA will arrange for an independent audit of the environmental performance of the development at GO Facility. The audits will:

- Be conducted pursuant to ISO 14010 - Guidelines and General Principles for Environmental Auditing, ISO 14011 - Procedures for Environmental Monitoring and any specifications DoPE
- Be conducted by a suitable qualified independent person approved by DoPE
- Assess compliance with the requirements of the consent (refer Appendix A)
- Assess the implementation of the EMPs and review the effectiveness of the environmental management of the proposal
- Be carried out at SITA's expense

SITA will comply with all reasonable requirements of DoPE in respect of any measures arising from or recommended by the audits.

SECTION 9
MONITORING

THIS SECTION WILL RESPOND DIRECTLY TO THE REQUIREMENTS OF THE MEASURES WHEN THEY ARE UPDATED, INCLUDING CONSENT CONDITIONS, EPL AND OTHER STATUTORY INSTRUMENTS.

IT WILL BE UPDATED TO INCORPORATE ALL MONITORING REQUIREMENTS IN THE EPL.

Monitoring at the LHRRP incorporates surface water, leachate, landfill gas, groundwater, dust, noise and any other environmental performance indicator in accordance with the relevant EPL. The results of all monitoring carried out on the LHRRP site is recorded and retained as set out in the relevant EPL. This section must be read in conjunction with the EPL attached in Appendix B. The following section describes those monitoring activities. Figure 5.1 shows the indicative location of the monitoring points.

Figure 9.1 Indicative locations of monitoring points

9.1 METEOROLOGICAL MONITORING

An automatic weather station is installed at LHRRP to measure the following parameters:

- Air temperature
- Humidity
- Solar radiation
- Barometric pressure
- Rainfall
- Wind speed
- Wind direction and sigma theta

Data from the weather station are collected monthly by a contractor and a quarterly report is provided to SITA. The data are also provided in electronic format and incorporated by the Compliance Officer into the environmental monitoring database.

The weather station is remotely accessible by the monitoring contractor and by SITA. Access to the weather station is for eleven hours per day, to prevent the battery being drained and to maximise the solar recharge of the battery during daylight.

9.2 ENVIRONMENTAL MONITORING

9.2.1 Surface Water Monitoring

Surface water samples are analysed for the following analytes:

- pH (field)
- Electrical Conductivity (field)
- Turbidity (field)
- Biochemical Oxygen Demand (BOD) (quarterly only)
- TSS
- Ammonia as N
- Dissolved Oxygen (field)

The EPL 5065 requires monitoring at MC1 on a weekly basis during wet weather discharges from main sediment & water reuse basin (sediment dam 5) or when the surface water treatment plant is in operation. Wet weather surface water monitoring is undertaken as required by the site compliance officer. Wet weather samples are analysed for the above parameters with the exception of BOD and the addition of speciated and total phenolics.

Surface Water monitoring results are included in the EPL Annual Return. Monitoring locations are shown on Figure 9.1.

9.2.2 Groundwater Monitoring

Samples of groundwater are collected on a quarterly basis from the 13 groundwater monitoring bores from around the landfill area and shown on Figure 9.1. (11 listed on the EPL 5065). The details on the purpose and depth of the bores are found in Table 5.2:

Table 9.2 Groundwater Monitoring Bores (MB)

Bore Number	Purpose	Bore Depth (m)	Water Level (m) (From top of casing)
MB008	Background	51.0	14.87
MB023	Background	29.95	4.91
MB032	Downstream of landfill	50	9.94
MB033	Downstream of landfill	30.5	0.81
MB034	Downstream of landfill	14.5	2.82
MB035	Downstream of landfill	8.8	2.67
MB038	Downstream of landfill	27	30.26
MB039	Downstream of landfill	13.5	13.56
MB040	Downstream of landfill	25	11.14
MB041	Downstream of landfill	12	6.97
MB044*	Background	47	18.92
MB045*	Background	23.5	15.5
MB305	Downstream of SICTA	41.5	8.95
MB306	Downstream of SICTA	19.4	5.04

* Not required under EPL 5065 but undertaken to determine background levels.

A Groundwater Remediation Action Plan (RAP) has been prepared in accordance with Development Consent no. 67. This condition states “A groundwater contamination remediation action plan shall be prepared and incorporated into the amended EMP for the LHWMC site”. The Groundwater RAP details the methods and procedures that will be adopted to ensure that if groundwater contamination occurs at LHWRC, it is remediated to an acceptable condition. A copy of the Groundwater RAP is contained in Appendix O.

If emergency of impacts occur then further investigation and remediation would be required and would include:

- Additional investigations to isolate the source of impact and characterise the significance of the impact
- Implementation of additional controls. This may include:
    - Additional monitoring wells to assess the emergence of significant impacts
    - Additional wells to capture and treat impacted groundwater

In accordance with the EPL condition R2.3, the criteria for groundwater ammonia concentration is 1 mg/L.

9.2.3 Leachate Monitoring

Samples of leachate are collected on a quarterly basis from the leachate dam shown on Figure 9.1 as per the EPL 5065.

9.2.4 Dust Monitoring

Dust deposition is monitored (in accordance with Australian Standard 3580.10.1-2003) at six sites shown on Figure 9.1. (DG1 to DG6).

Dust levels are also monitored visually by the LHRRP staff on a daily basis. Dust suppression is carried out on a regular basis on all haul roads throughout the site. The wheel wash is utlised during wet weather events to minimise tracking of mud and debris onto Little Forest Road.

9.2.5 Landfill Gas Monitoring

There is landfill gas collection and electricity generation system at the site, which is modified and extended as necessary. The system collects gas via negative pressure applied to the gas field. The gas-to-electricity power station has back-up flaring capability for use in emergencies when the power station cannot operate.

There is a pipeline constructed between LHRRP and Lucas Heights 1 to transfer gas between the power stations when there is excess capacity available.

9.2.5.1 Surface gas monitoring

Surface landfill gas emissions are monitored quarterly in accordance with the Landfill Gas Surface Monitoring Program February 2006 and EPL section M8.1 *(references to be updated once the new EPL is issued)*. The monitoring program is outlined in Appendix P. Monitoring is undertaken by the Environment and Workforce Safety Officer using a flame ionization detector (FID) or other similar equipment to measure methane gas equivalent concentrations. Samples of the atmosphere are taken 5 cm above the landfill surface in a grid pattern across the site, and depressions and fissures are also targeted. The threshold for corrective action is 500 ppm of methane. If an odour is detected during the monitoring, the odour is tracked upwind to the source of the odour where it is further monitored and noted for investigation.

If any exceedance of the threshold is found then the site contractors EDL are informed and remediation works will take place on the source of the exceedance. If the exceedance is repeated and the source is still not rectified then more detailed investigations and monitoring will be undertaken. It is a requirement of the EPL that the NSW EPA is notified within 24 hours of a result over 500 ppm on the finished areas of the landfill.

9.2.5.2 Accumulation monitoring

Gas accumulation monitoring is conducted in accordance with EPL section M8.2 *(references to be updated once the new EPL is issued)* to ensure landfill gas concentrations do not accumulate to unsafe levels within onsite buildings. If any exceedance of the threshold level is detected then necessary actions are taken to mitigate and ensure the safety of staff and customers on site.

9.2.5.4 Subsurface Gas Monitoring

A monitoring program was submitted to the NSW EPA in 2006. The program has since been accepted and referenced in the EPL section M8.2 *(references to be updated once the new EPL is issued)*. A copy of the updated document is included in Appendix Q.

Subsurface Gas Monitoring is therefore conducted in accordance with EPL section M8.2 *(references to be updated once the new EPL is issued)* with the subsurface gas monitoring program at six subsurface gas bores on the boundary of the site listed in EPL section P1.1 *(references to be updated once the new EPL is issued)*. Any exceedances above 1.25% volume/volume are reported to the NSW EPA within 24 hours of results being received.

9.2.5.3 Gas capture monitoring

Gas volumes captured and destroyed at the LHRRP will also be monitored quarterly.

9.2.6 Odour Monitoring

In addition to regular site inspections by the site manager, members of the community will notify SITA or the NSW EPA pollution hotline when odour incidents occur. Records of these complaints will be kept and used to identify future odour management work required. The site manager will respond to the community member if a response is requested or required. Formal responses will be returned to the NSW EPA with information on prevailing weather and landfill conditions.

To ensure the goal of no detectable odours (less than 2 Odour Units (OU), cumulative) at the nearest residential receptor is achieved, SITA will measure / undertake odour monitoring as part of the external audit process defined in the VPA Schedule 1D – Environmental Undertakings.

9.2.7 Noise Monitoring

Noise monitoring of landfill operations is undertaken monthly by the Contractor to confirm that the site is not exceeding the criteria of 5dBA above background levels. In addition to the noise monitoring undertaken by the contractor, the Lucas Heights Waste and Recycling Area Truck Parking Area Noise Management Plan prepared by Heggies in 2010 outlines further monitoring requirements for nearby noise and vibration sensitive receptors (Appendix R). The Noise Management Plan states that noise monitoring will be conducted at locations representative of the nearest residences in North Engadine and Barton Ridge.

The initial noise measurements will be conducted by a suitably qualified person and will quantify and characterise the (LA10(15minutes)) intrusive noise from the landfill and truck parking area over a 15 minute measurement period. In addition the operator will quantify and characterise the overall levels of ambient noise (i.e. L_{Amax}, L_{A1}, L_{A10}, L_{A90}, L_{Aeq}) over the 15 minute interval period. Noise monitoring will be conducted at locations representative of the nearby residents in North Engadine and Barden Ridge.

After the initial monitoring is undertaken as prescribed in the Noise Management Plan, within 3 months of monitoring the results will be reviewed for comparison with the noise limits and complaints register.

9.2.8 Litter

SITA is highly committed to ensuring minimal litter impact arising from the site operations as well as the transport of waste to the LHRRP. An important part of the process of managing litter is to proactive monitor the site and surrounds. The landfill site is continuously monitored for windblown litter and Little Forest Road is inspected two times a week by the Site Manager. The most visible section of this road which is also most vulnerable to litter impact is the section from New Illawarra Road leading to the main site entrance. This section is scrutinised by majority of SITA staff entering and leaving the site. This section is continuously maintained to a high standard to reflect SITA's commitment towards litter management.

The following areas are also inspected daily:

- New Illawarra Road (both sides from Heathcote Road to the hill past the ANSTO entrance gate)
- The LHRRP side of Heathcote Road along the site boundary
- General site and boundary fence
- Main entrance road
- Other areas off-site if windblown litter results from the operation

Weather conditions are monitored to anticipate upcoming high wind periods when specific preventative actions need to be implemented and additional checks undertaken.

9.2.9 Vermin and Insects and Weeds

A qualified pest exterminator inspects the site quarterly for evidence of pests and advises SITA of any control measures necessary. The inspection includes all buildings and storage areas. LHRRP is involved in a program with SSC in the control of foxes and rabbits on the RRP and neighbouring landholders.

An annual program to control noxious and environmental weeds will assist in a cooperative landscape approach to weed control at the LHRRP, meeting SITA's obligations under the Noxious Weed Act 1993 and assisting in achieving regional targets set by the South West Sydney Regional Weeds Committee and the Department of Primary Industries.

A summary of the monitoring program is shown in table below.

Table 9.3 Summary of weeds monitoring program

WEED TYPE	NOXIOUS WEED	ACTION	LOCATION	WHEN TO TREAT (Flowering season)
Aquatic	Ludwigia Peruviana (Class 3)	• High Volume Sprayer (HVS)	• Wetlands / Dam	November – March *Spray twice per season
Terrestrial	Bitou Bush (Class 4)	• HVS	• Bushland • Boundary track	May - August
Terrestrial	Boneseed (Class 1)	• HVS • Cut and Paint	• Old Mini Bike area • Little Forest Road	July – September / October
Terrestrial	Pampas Grass (Class 3)	• HVS • Back pack spray • De-seed Flowers	• Track edges, Bushland and creek lines • Old Mini Bike area	January - April
Terrestrial	Lantana Castor Oil Plant (Class 4)	• HVS • Cut and Paint	• Little Forest Road • Bushland • Boundary track	All year around

9.2.10 Record of Rainfall

Rainfall at the site is measured daily using a rain gauge located at the weighbridge and recorded in a logbook kept on the site. Results are supplied to SITA by the contractor on request and for monthly

site meetings. The automatic weather station also records rainfall at 15 minute and daily intervals. These results can be downloaded from the website instantaneously.

9.2.11 Traffic

All vehicles entering the site are recorded at the weighbridge and categorised by vehicle type and/or type of waste being carried. Vehicle numbers are collated to indicate daily, weekly and annual traffic levels generated by the RRP.

Traffic will also be monitored to make sure there is no queuing on New Illawarra Road, or beyond the deceleration lanes.

9.2.12 Site maintenance and visual amenity

Overall, SITA believes that the LHRRP should present a positive image to the community which is consistent with the LHRRP's role as a major resource recovery site and SITA's role as a major international waste and resource recovery organisation.

All site facilities will be maintained in a proactive manner so they are in good working order and fit for purpose. For example, gates and fences will be checked for damage and repaired as required.

To demonstrate SITA's confidence in maintaining the site's visual amenity, SITA invites SSC staff and councillors to visit the site. This would be facilitated by providing SITA with written requests providing sufficient notice (e.g. two weeks) to enable key staff to be available to accompany visitors.

SECTION 10
RISK MANAGEMENT

SITA ensures the effective control of environmental hazards across its facilities so that environmental impacts are prevented or minimised. Two main types of risk assessment are used by SITA at operational / project level to assess environmental and WH&S risk:

10.1 JOB SAFETY AND ENVIRONMENTAL ANALYSIS (JSEA)

The JSEA process is used for new projects, new tasks, any unusual, abnormal or non-routine work or projects and tasks where there is likely to be an increase in the level of risk. This may include but is not limited to any unusual task not normally executed in day-to-day operations. All contractors are required to complete the JSEA process prior to commencing any work on the site.

10.2 PROJECT / SITE BASED RISK ASSESSMENTS

Project based risk assessments are carried out to assist in identifying additional environmental risks that may not have been assessed in the preparation of the OEMP for the site (following commencement of operations).

Site or project based risk assessments are performed when:

- A change in legislation requires a change in SITA practices and processes
- Additional processes or activities are introduced that may increase the level of environmental risk
- When new and additional information concerning an environmental hazard becomes available
- When required by existing legislative requirements

SECTION 11
REFERENCES

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Appendix C – Reporting Template

Appendix S - Complaint Investigation and Rectification Process

1 Definitions

Agreed Methodology means the methodology for the assessment of Complaints as agreed by SITA and Sutherland Shire Council in accordance with clause 3.

Area of Concern means a potential environmental impact that may result from the 2014 Development and that is identified and proposed to be managed under an EMP including but not limited to any or all of the following:

(a) odour;

(b) noise;

(c) dust; and

(d) litter.

Complaint means any complaint originating from a residence or business located within the Sutherland Shire Council local government area in relation to an Area of Concern in the operation of the LHRRP.

Compliance Officer means the compliance officer employed at the LHRRP.

External Auditor means an independent external auditor appointed by SITA under clause 3.5 who has appropriate skills and expertise in relation to the relevant Area of Concern.

2. Agreed Methodology for assessing Complaints

2.1 SITA and Council will negotiate and agree on the methodology to be applied in the assessment of Complaints.

2.2 The Agreed Methodology will include:

(a) the process to be followed with respect to the assessment of a Complaint; and

(b) the standards against which SITA, SITA's Compliance Officer, SITA's internal technical team and the auditor will assess Complaints.

2.3 SITA and Council will review the Agreed Methodology every two years and at the request of the Other Party, but any changes to the Agreed Methodology will only be made by agreement between the Parties.

3 Complaints process

3.1 Complaints may be lodged with respect to the operation of the LHRRP by contacting SITA on 1800 ENV REP (1800 368 737), SITA through SITA's website, or to the EPA or Council. Council will notify SITA of any such complaint within 5 business days of receipt.

3.2 The Compliance Officer will investigate every Complaint lodged with SITA or referred to it by Council in accordance with clause 3.1of this schedule in accordance with the Agreed Methodology

3.3 Following the investigation, the Compliance Officer will:

(a) identify the cause of the Complaint;

(b) determine whether SITA is meeting its obligations under the Agreed Methodology in relation to the relevant Area of Concern;

(c) recommend that corrective action be taken with respect to a Complaint, if required; and

(d) prepare and provide to Council such reports in relation to a Complaint as required under Part B of Schedule 1D.

3.4 If there are 15 or more Complaints in any calendar month in relation to an individual Area of Concern (known as the **First Month**), then:

(a) SITA will appoint an internal technical team to undertake a compliance audit of the LHRRP with respect to that Area of Concern in accordance with SITA's internal procedures and the Agreed Methodology; and

(b) following the investigation, the internal technical team will:

(i) identify the cause of the issue in relation to the Area of Concern that was the subject of the Complaint;

(ii) determine whether SITA is meeting its obligations under the Agreed Methodology in relation to that Area of Concern;

(iii) recommend that corrective action be taken with respect to the causes of the Complaint in relation to that Area of Concern, if required; and

(iv) prepare a report in relation to any Complaint and provide a copy of that report to Council within the calendar month after the First Month (known as the **Second Month**);

(c) SITA will implement any reasonable recommendations made by the internal technical team within the calendar month after the Second Month (known as the **Third Month**).

3.5 Subject to clause 3.6 of this schedule, if there are more than 20 Complaints in the calendar month after the Third Month (known as the **Fourth Month**) in relation to that Area of Concern, then:

(a) SITA will retain an External Auditor to undertake a compliance audit of the LHRRP with respect to the Area of Concern in accordance with the Agreed Methodology;

(b) SITA will direct the External Auditor to prepare a report in relation to the causes of the Complaint the subject of the External Auditor's investigation within the calendar month following the Fourth Month;

(c) SITA will provide Council with a copy of the External Auditor's report as soon as reasonably practicable after receipt; and

(d) subject to clause (e) and (e1) of this schedule, SITA will implement any recommendations made by (and within the timeframes set by) the External Auditor in their report as to measures that could be adopted to address the cause of the Complaint the subject of the audit;

(e) if SITA considers that the recommendations made by the External Auditor are not the most practical or cost effective means of addressing the cause of the Complaint

the subject of the audit,, or that the time frames proposed by the External Auditor are unreasonable or unrealistic, then SITA will issue a written notice to Council within 30 days of receipt of the external audit report that:

(i) SITA does not intend to implement those recommendations; and

(ii) includes details of one or more alternative measures, including time frames for implementation;

(e1) If SITA issues a written notice under paragraph (e), then at a date and time specified by Council, the parties will meet to discuss in good faith the alternative measures set out in the written notice, and SITA will implement those alternative measures that are agreed with Council (for the avoidance of doubt it is made clear that, in the event that SITA and Council do not agree on alternative measures then SITA will implement the recommendations made by the External Auditor); and

(f) SITA will prepare a report for Council on the measures taken by SITA to address the cause of the Complaint the subject of the audit and, if it takes more than one month from the date of the audit report to effect measures to address any causes, will provide Council with monthly reports until implementation is complete (the first monthly report to be provided within one month after the date of the audit report).

3.6 If the report of an internal technical team prepared in accordance with clause 3.4 of this schedule concludes that the cause of a Complaint has been the subject of an External Auditor's report prepared in accordance with clause 3.5 of this schedule and SITA has not yet implemented either the recommendations of the auditor or the alternative measures as agreed with Council, then clause 3.5 of this schedule will not apply in relation to the Complaint the subject of that report of the internal technical team.

4 Review of complaints process

4.1 SITA and Sutherland Shire Council will hold talks every two years with a view to assess the complaints process described in clause 2 of this schedule and alter that process as required.

4.2 If there is evidence that the complaints process described in clause 2 of this schedule is being abused by members of the public or by either of the parties, then:

(a) a Party may provide a notice to the Other Party that it is their opinion that this is the case;

(b) within one week of the issue of the notice under paragraph (a), the Parties will meet to discuss in good faith appropriate amendments to the complaints process that seek to eliminate or mitigate the abuse; and

(c) if the Other Party fails to attend the meeting referred to in clause (b), then both clause 3 and 4 will be suspended until they attend a reschedule of that meeting;

(d) if the Other Party fails to respond to any amendments proposed at the meeting referred to in clause (b) within 30 days of the meeting, then both clause 3 and 4 will be suspended until they do so respond; and

(e) if the Parties are unable to reach agreement on amendments to the complaints process within 30 days of the meeting referred to in paragraph (b), then the issue will be referred to the Chief Executive Officers (or equivalent) for resolution.

4.3 The parties agree to act reasonably during the discussions referred to in clause 4.2(b).

5 Council retains statutory powers

5.1 For the avoidance of doubt, the parties acknowledge that Council retains all rights to issue orders and make directions under the EPA Act and other legislation in relation to WSN and SITA's activities at the LHRRP. Nothing in this agreement fetters the discretion of Council as a regulator or as a consent authority.