SITA Australia

Lucas Heights Resource Recovery Park Project
Environmental Impact Statement

VOLUME 1 – MAIN REPORT

October 2015

SITA Australia is changing brand to SUEZ

Submission of Environmental Impact Statement

Prepared under the *Environmental Planning and Assessment Act 1979*, Section 78A

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	In respect of:	Lucas Heights Resource Recovery Park
Development Application	Applicant name:	SITA Australia
	Applicant address:	70 Anzac Street Chullora NSW 2190 Australia
	Land to be developed:	The proposal is to be carried out on land as shown in the Environmental Impact Statement.
	Lot no, DP/MPS, vol/fol etc	Lot 3 DP 1032102 Lot 101 DP 1009354 Lt 2 DP 605077
Environmental Impact Statement	An Environmental Impact Statement is attached.	
Certificate	I certify that I have prepared the contents of this Environmental Impact Statement and to the best of my knowledge: • It is in accordance with the requirements of Part 4; • It contains all available information that is relevant to the Environmental Impact Statement of the development; and • That the information contained in the Environmental Impact Statement is neither false nor misleading.	
	Signature	
	Name	David Gamble
	Date	6 October 2015

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Executive summary

INTRODUCTION

SITA Australia (SITA)[1] currently operates the resource recovery park at Lucas Heights '2' referred to as the Lucas Heights Resource Recovery Park (LHRRP). SITA is proposing a number of activities at the LHRRP in Lucas Heights (referred to in this report as 'the proposal').

GHD Pty Ltd (GHD) has been engaged by SITA to prepare documentation to support a development application for approval of the proposal under Part 4 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (the EP&A Act). Due to the existing operational arrangements at LHRRP, Sutherland Shire Council (SSC) is a joint applicant for the proposal. This Environmental Impact Statement (EIS) has been prepared in accordance with the provisions of the EP&A Act. It addresses the requirements of the Secretary of the NSW Department of Planning and Environment (the Secretary's Environmental Assessment Requirements (SEAR No SSD-6835) dated 3 February 2015.

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

LOCATION OF THE PROPOSAL

The site of the proposal (referred to as 'the proposal site' for the purposes of the EIS) is located within the boundary of the existing LHRRP in the suburb of Lucas Heights. It is situated within the Sutherland local government area, approximately 30 km south west of the Sydney city centre. It is currently accessed from Little Forest Road, off New Illawarra Road. Approximately 55% of the LHRRP area is within the 1.6 km ANSTO buffer zone. Refer Figure E.1.

Specifically, the proposal would be located on:

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

It is noted that the proposal directly affects only a portion of each of these lots. There is minimal encroachment into the SICTA leased land (part of Lot 3 DP 1032102). The LHRRP consists of approximately 205 hectares (ha) in two ownerships. 89 ha is owned by SITA and 116 ha owned by ANSTO and leased to SITA for waste management or other agreed purposes.

The LHRRP refers to the entire Lucas Heights Resource Recovery Park. The boundary of the LHRRP is shown as the blue line on Figure E.2. The proposal site refers to the areas where the proposal activities would be located. The boundary of the proposal site is shown as the red line on Figure E.2.

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

LEGEND

- Lucas Heights Resource Recovery Park boundary
- ANSTO buffer boundary
- Roads

Paper Size A4

0 250 500 1,000

Metres

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

N

GHD

SITA Australia
Lucas Heights Resource Recovery Park

Job Number	21-23482
Revision	A
Date	27 Apr 2015

Site location

Figure E.1

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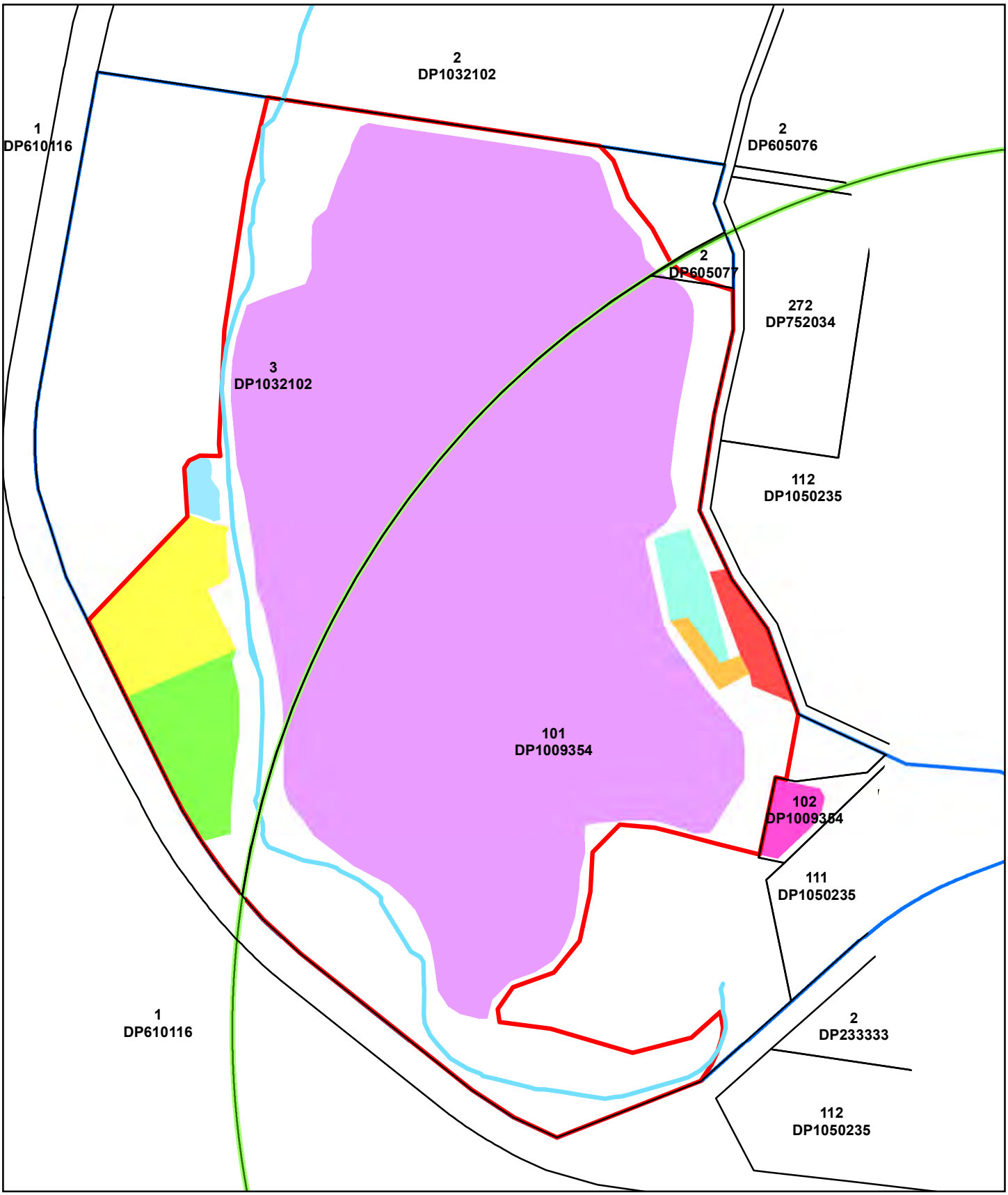
Aerial Imagery: Google, 2014. LHRRP Boundary: GHD, 2014. Roads/Suburbs: NSW LPMA 2012. Location Data: GEOSCIENCE AU 2014. Created by:jrichardson



LEGEND

- ANSTO buffer boundary
- Mill Creek
- Cadastre
- Proposal site boundary
- Lucas Heights Resource Recovery Park boundary
- Truck parking area
- Proposed GO facility
- Proposed ARRT facility
- Resource Recovery Centre
- Administration, operations and weighbridge
- Renewable energy generating facility
- Landform reprofiling boundary

Paper Size A4

0 45 90 180 270 360

Metres

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

N

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SITA Australia
Lucas Heights Resource Recovery Park

Job Number	21-23482
Revision	A
Date	25 Jun 2015

The proposal site

Figure E.2

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THE PROPOSAL

The following activities are proposed at the LHRRP and are collectively referred to as 'the proposal'. The activities are proposed to help the NSW Government achieve its waste strategy objectives and to improve environmental outcomes. The proposal would not have a significant impact on the community. In addition to the proposal detailed below, SITA is committed to better environmental outcomes by the application of best practice prevention, mitigation and rectification measures:

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

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

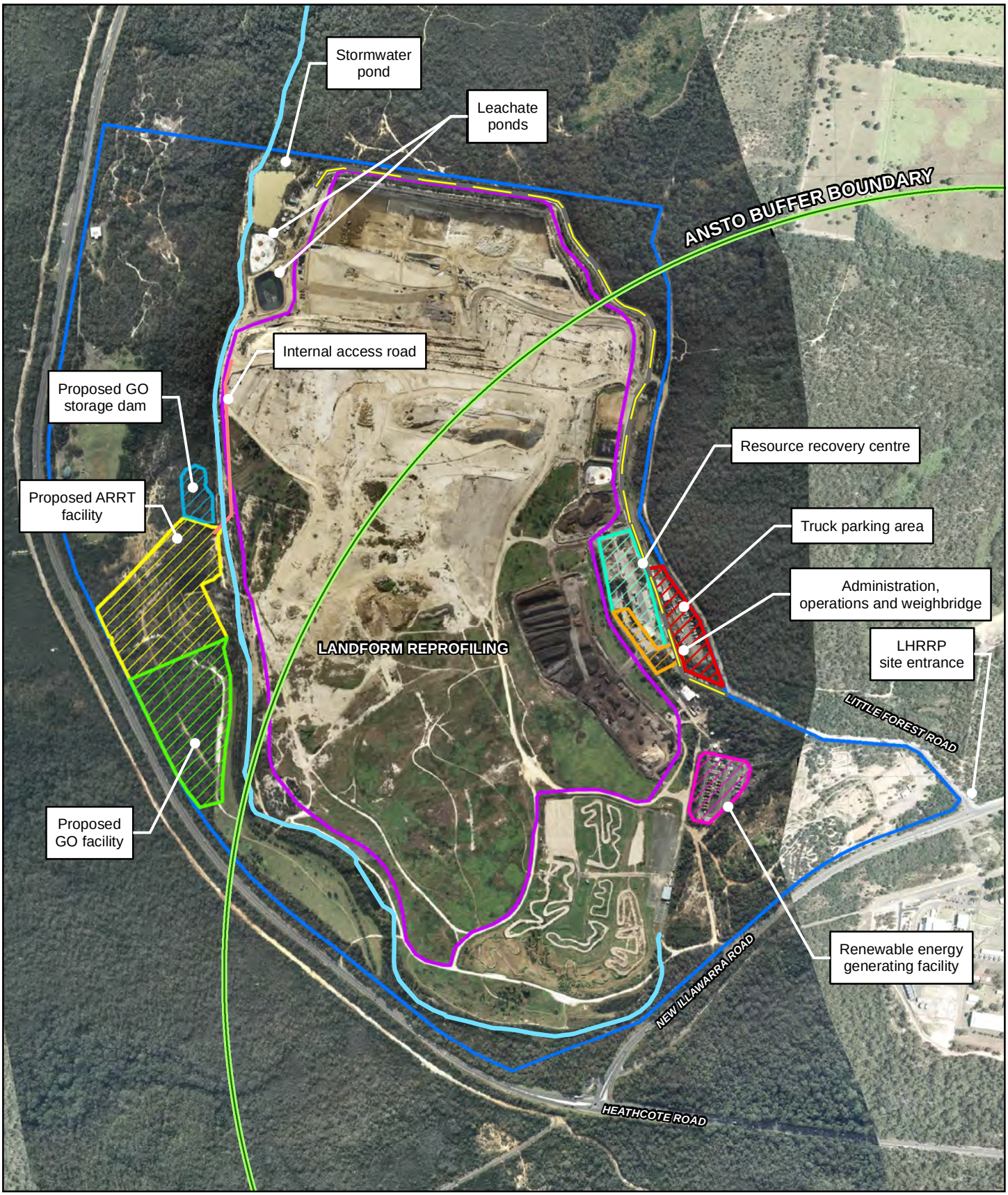
- **Relocation and expansion of the existing garden organics (GO) facility**. The existing garden organics facility would be relocated to the western side of the site adjacent to Heathcote Road. Approval is being sought to increase the approved capacity from 55,000 to 80,000 tonnes of green waste and garden waste received per year at the facility. The new facility would include the partial enclosure, active aeration and covering of the first four weeks of the active composting process, which coincides with the period of highest potential for odour generation, to enable more effective control of odour. Relocation of the facility would result in increased separation distances from the current nearest occupied land at ANSTO, existing residential areas and the proposed new residential area at West Menai.

- **Construction and operation of a fully enclosed advanced resource recovery technology (ARRT) facility**. The ARRT facility would be located on the western side of the site adjacent to the GO facility and would process and recover valuable resources from up to 200,000 tonnes of general solid waste per year, reducing the amount of waste disposed to landfill to approximately 60,000 tonnes per year. This would divert up to 140,000 tonnes of waste per year from landfill. SSC and other councils would have the opportunity to have their municipal waste processed by the ARRT facility.

- **Community parkland**. The landfill reprofiling would increase the area available for future passive recreation following site closure from 124 ha (existing approved parkland) to a total of 149 ha, an increase of approximately 25 ha. Landfilling would cease in 2037 after which time the site would be rehabilitated and converted to a community parkland, with capping and landscaping to be completed and the site made available for community use in 2039.

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

Figure E.3 shows the key proposed infrastructure.



LEGEND

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

Paper Size A4

0 100 200 400

Metres

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

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SITA Australia
Lucas Heights Resource Recovery Park

Key proposed infrastructure

Job Number 21-23482
Revision A
Date 28 May 2015

Figure E.3

N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z046_KeyProposedInfrastructure.mxd 15/133 Castlereagh Street Sydney NSW 2000 Australia **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

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

Landform reprofiling

Reprofiling of the landfill would involve increasing the slope of the final landform to meet the EPA (1996) guidelines, which requires the final settlement of the seal-bearing surface to leave a gradient of 5% to defined drainage points. That is, the proposal design would achieve a slope of at least 5% following settlement of the waste. The maximum waste input to the LHRRP would be capped at 8.3 million cubic metres above the existing approved tonnage of waste and based on predicted tonnage figures and the assumption that one tonne of waste utilises 1 cubic metre of landfill capacity, it is expected that the capacity of the landfill would be reached by 2037.

The constructed grade of the final landform would be a maximum of 1 (vertical) in 4 (horizontal). In order to facilitate the proposed grades, the proposed final landform would be constructed to a maximum level of RL 184.9 m AHD (including waste and capping works). It is predicted that this landform would settle to a level of RL 179.9 m AHD. These are approximately 12.9 m and 7.9 m higher than the existing proposed final landform, respectively.

Figure E.4 shows the proposed post-settlement final landform (includes waste and final cap).

GO facility

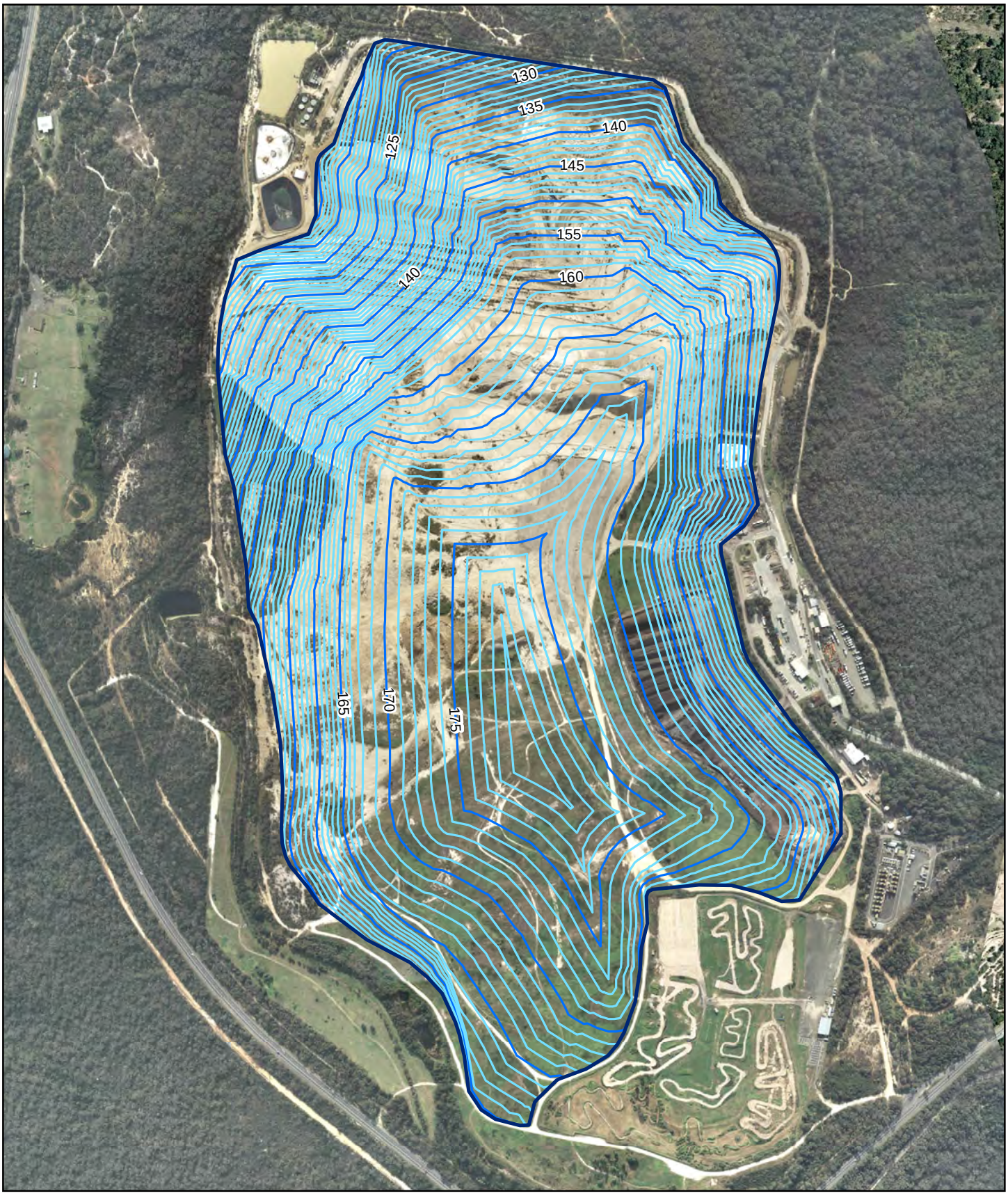
The GO facility would be relocated to an area on the western side of the LHRRP, adjacent to Heathcote Road on an approximate 3.7 ha parcel of land. Access to the GO facility would be via an internal access road around the perimeter of the landfill.

The proposed composting process to be undertaken at the new facility would be different from the current composting process and based on best practice. To reduce the potential for odour, the new facility would be partially enclosed, would use breathable membranes as part of the active composting phase and include use of aerated concrete ’bunkers’ during the active composting phase.

The GO facility layout is shown on Figure E.5 It would include a waste receivals/sorting/preparation area, active composting in bunkers, mulch storage area, maturation and finished compost storage areas, an amenities office, sump and storage pond and car park for seven vehicles.

ARRT facility

The ARRT facility would be located on the western side of the LHRRP on approximately 8 ha of land, immediately adjacent to the proposed GO facility. Part of the land proposed to be used is currently leased by SITA to SICTA, estimated to be approximately 1.2 ha. The facility would comprise a series of buildings, enclosed biofilters and stacks, fire water storage tanks, leachate storage tanks, internal roadways and car parking. The ARRT facility layout is shown on Figure E.5.



LEGEND

- Post settlement 5m contours
- Post settlement 1m contours
- Proposed landfill footprint boundary

Paper Size A4

0 25 50 100 150 200

Metres

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

N

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SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 05 May 2015

Proposed final landform
Post-settlement

Figure E.4

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

LEGEND

LHRRP boundary
SICTA boundary
Creek
Landfill area

Paper Size A4

0 15 30 60 90 120

Metres

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

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SITA Australia
Lucas Heights Resource Recovery Park

GO & ARRT Facility Layout

Job Number 21-23482
Revision A
Date 03 Jun 2015

Figure E.5

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\21\23482\GIS\Maps\MXD\21-23482-Z013_GOFacilityandARRT.mxd

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Aerial Imagery: GOOGLE, 2014. GO&ARRT: GHD/SITA, 2014. Roads/Suburb: NSW LPMA, 2012. Created by:apmiller

Community parkland

Following the completion of waste disposal and processing operations in 2037, the site would be transformed into a community parkland. The site would be opened for recreational use following the completion of rehabilitation and landscaping activities in 2038 and 2039. An extensive planting program would be undertaken using a range of trees and shrubs to create a pleasant setting for passive recreational uses. The proposed parkland would comprise extensive area of open space, which would primarily provide for passive recreational uses. The site would include open grassed picnic areas, viewing areas, bridges, ponds, a vehicle access route through the site and a pedestrian and cyclist route.

Future uses of the open space areas could include but are not limited to:

- model aeroplane flying areas (in a section on the northern boundary of the site in accordance with a SSC Council resolution on the matter)
- dog training or off-leash dog areas
- equestrian activities
- running/jogging/walking
- picnicing
- bicycling

The final uses of the each space would be determined by SSC based on community needs at the time. This would be done in 2035 in accordance with the VPA and in consultation with the community and ANSTO as appropriate.

The preliminary masterplan for the parkland is shown in Figure E.6.

The final landform provides grades which are appropriate for the proposed passive recreation uses. The landscape plans, prepared by Taylor Brammer Landscape Architects, have been based on this proposed post-settlement final landform surface (Figure E.4).

Paper Size A4

NOT TO SCALE

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SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 24 June 2015

Proposed parkland master plan **Figure E.6**

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N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z058_Parkland_Master.mxd

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

NEED FOR THE PROPOSAL

The proposal provides up to 8.3 million m^3 of additional waste disposal capacity in Sydney and extends the life of the LHRRP landfill from 2025 to 2037. The proposed increased input rate from 525,000 tonnes per annum to 850,000 tonnes per annum would ensure that Sydney's waste disposal arrangements are not interrupted by the closure of one of Sydney's major landfills, the Eastern Creek Resource Recovery Park, in mid-2018 at the latest.

The proposal also accommodates delays in provision of new advanced waste treatment (AWT) facilities and allows for future increases in waste generation due to Sydney's population growth. The proposal would also provide the physical and operational capacity for emergency putrescible waste disposal for Sydney from 2025 until 2037 should it be required. This would mitigate the risk of Sydney running out of landfill airspace in the event that long distance rail waste transportation out of Sydney is interrupted.

The proposed expansion of the GO facility and construction of the ARRT facility is also consistent with Government policies and objectives to increase resource recovery. With the implementation of best practice prevention, mitigation and rectification measures, the proposal offers a range of environmental improvements resulting in better environmental outcomes.

CONSULTATION

Due to the existing operational arrangements at LHRRP, SSC is a joint applicant for the proposal. SSC has been involved from the early stages, right through the development of the proposal and the preparation of the EIS. SSC has reviewed and endorsed the submission of all relevant key planning documents.

ANSTO is a federal government agency that operates the nuclear research facility to the south-east of the site. Part of the LHRRP site is owned by ANSTO and as such, is a key stakeholder and decision maker regarding changes at the site. ANSTO has also been involved from the early stages of the proposal development.

Extensive stakeholder and community consultation was undertaken for the proposal to raise awareness of the proposal and its merits, obtain the input of key stakeholders and increase awareness of SITA's best practice waste and recycling operations. SITA has used a variety of activities and tools to engage with government agencies, stakeholders and the community during development of the EIS. All issues raised during the consultation are addressed in the EIS.

ENVIRONMENTAL ASSESSMENT

Waste management

Construction

The following wastes may be generated during construction:

- Construction material including spoil/fill
- General waste from site personnel (such as food scraps, aluminium cans, glass bottles, plastic and paper containers, paper, cardboard and other office wastes)
- Paints and solvents
- Wastewater and sewage from site compounds.

Management of wastes generated during construction would be in accordance with relevant NSW legislation and the principles of the waste management hierarchy set out in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

Operation

The following table provides a summary of the proposed waste streams and quantities expected to be received at the proposal site and proposal facilities/components. It also lists the likely waste classifications of incoming waste streams according to EPA (2014b) 'Waste Classification Guidelines – Part 1: Classifying Waste'.

Table E.1 Summary of waste streams, quantities and classifications

Activity	Waste stream	Classification	Proposed quantity (t/yr)
GO facility	Garden organics	General solid waste (non-putrescible)	80,000*
ARRT facility	Source separated food and garden organics	General solid waste (putrescible)	190,000**
	Mixed waste	General solid waste (putrescible)	
	Biosolids	General solid waste (non-putrescible)	10,000**
Reprofiling (landfill disposal)	Municipal solid waste	General solid waste (putrescible)	850,000
	Dry waste (e.g. commercial, small vehicle drop off, council clean up)	General solid waste (non-putrescible)	
	Asbestos	Special waste	
Resource recovery centre and waste collection point	Dry waste (e.g. batteries, crushed sandstone, metals, oils, paint, paper, plastics, containers, shredded timber)	General solid waste (non-putrescible) Special waste Hazardous waste	10,000***
	Garden organics	General solid waste (non-putrescible)	
Maximum waste received at all facilities			**1,135,000**
Less internal transfer:			
ARRT residue to landfill			60,000
GO facility and RRC waste to landfill			8,000
Resource recovery centre waste to GO facility			2,000
Maximum waste received at LHRRP			**1,070,000**

* This does not include approximately 37,000 tonnes of imported blending materials
**A total of 200,000 t/yr of waste to the ARRT facility, with up to 10,000 t/yr of this total to be biosolids
***All waste received is removed from the RRC and either
- Recycled and removed from site (e.g. paints, batteries etc.)
- Delivered to the GO for processing, or
- Disposed to landfill

Note: The quantities of each of the above will be determined by the waste types delivered to the RRC.

Waste management during operations would be conducted in accordance with the operational environmental management plans which includes best practice techniques to minimise any potential impacts.

An onsite sewage package treatment tank or a storage tank with pump out capability would be provided to manage wastewater from amenities facilities at the GO facility and ARRT facility. The wastewater (partly treated or untreated) would be tankered to an external waste water treatment plant for disposal.

Traffic, transport and access

Construction

The impacts associated with the construction workers accessing the proposal site would be minimal, with both the Little Forest Road/New Illawarra Road intersection and the Heathcote

Road/New Illawarra Road intersection expected to operate within capacity during the construction period between 2016 and 2018.

A number of mitigation measures have been identified to ensure that transport and traffic impacts associated with the construction of the Lucas Heights Landfill Project are minimised. These measures include initiation of a community information and awareness program to be initiated prior to construction commencing and continue throughout the entire construction period to ensure that local residents are fully aware of the construction activities, with particular regard to construction traffic issues.

Operation

During operation there would be marginal increases to two-way traffic volumes along New Illawarra Road and Heathcote Road associated with the proposal.

The Traffic Impact Assessment report for the 1999 EIS provides estimated traffic generation for the current approved waste operations, including during the AM peak:

- 88 truck movements (44 arriving and 44 departing) during the AM peak hour between 7.30-8.30 AM, assuming the peak hour is 50 percent of the 7-9 AM two hour period.
- 30 light vehicle movements (15 arriving and 15 departing) during the AM peak hour, resulting in,
- 118 vehicle movements in total during the AM peak hour

The above traffic generation estimates of 118 vehicle movements includes only waste transferred to the site by bulk waste transfer vehicles and by council waste vehicles.

Based on the assessment undertaken as part of this proposal, the technical analysis indicates that 105 vehicle movements (trucks and light vehicles) in total would occur during the AM peak hour (for the year where maximum level of traffic movements is expected – 2027). This assessment has taken into consideration waste delivery vehicles as well as vehicles associated with operations and capping activities.

Therefore this proposal is expected to generate less traffic movements than that approved in the 1999 consent (105 compared to 118 vehicle movements during the AM peak hour).

A Traffic Impact Assessment (TIA) was undertaken. Traffic counts and weekday AM and PM peak hour intersection modelling using SIDRA 6 was undertaken for:

- Heathcote Road / New Illawarra Road intersection
- Little Forest Road / New Illawarra Road (site access) intersection

The assessment found that:

- As a result of the proposal, approximately 4% of the vehicles using New Illawarra Road would be accessing the LHRRP in 2027 which is the expected peak year for traffic movements
- Assuming all facilities are operated at maximum capacity (worst case), the forecast increase in the number of vehicles in 2027 using New Illawarra Road during the AM peak hour and PM peak hour respectively are 1.4% and 1.8%, or 63 additional vehicles during each period, above what would occur in the absence of the proposal
- Key intersections (Heathcote Road / New Illawarra Road and Little Forest Road / New Illawarra Road) are able to accommodate both the forecast growth in baseline traffic plus the additional traffic associated with the proposal
- SITA has invested in High Mass Load trailers to transport waste. These trailers can carry approximately 20% more waste than the older trailers.

- The proposal is expected to have negligible impacts to the operation of the ANSTO access/New Illawarra Road intersection

The assessment also concluded that the proposal is expected to have

- Negligible impacts to pedestrians
- Negligible impacts to cyclists
- No impacts to public transport operations.

In addition, SITA would engage an independent traffic expert to perform a safety review in both 2020 and 2025 on the safety of the intersection of New Illawarra Road and Little Forest Road. The expert would be jointly selected by SITA and SSC.

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, or
- That the Benefit Cost Ratio for the provision of a controlled intersection is equal to or greater than 1, then

SITA would modify the Little Forest Road / New Illawarra Road intersection to address any issues identified, subject to the approval of RMS and SSC. All costs associated with upgrading of the intersection (if required) would be borne by SITA.

The traffic, transport and access assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- Minimises disruption to local traffic
- No queuing on public roads
- Ensures road safety

Noise

Construction

Noise modelling shows that construction activities are predicted to comply with the *Interim Construction Noise Guideline* (DECC 2009) construction noise management levels at all sensitive receivers both during standard and outside of standard recommended hours. Furthermore, due to the distance of the nearest sensitive receivers from the proposal site (over 300 m), construction vibration impacts are not anticipated at any sensitive receiver.

Operation

The predicted operational noise levels at all surrounding residential sensitive receivers are predicted to comply with all noise criteria. The road traffic noise levels from the proposal are also predicted to comply with the noise criteria at sensitive receivers along the traffic routes.

Therefore there are not expected to be any significant operational noise impacts associated with the proposal.

This noise assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts on the community or environment
- Prevent the degradation of local amenity
- Prevent noise pollution.

Visual amenity

The visual assessment considered impacts on nine groups of receptors, including residential receptors, travellers on main roads, and users of nearby industrial and recreational facilities. It also considered the proposal's impact at different points in time in order to provide an assessment on the likely 'worst case'. All of the receptor groups were determined to have a sensitivity of moderate or less. This was largely due to limited outlooks, limited quality of views, limited interest in views towards the LHRRP, or distance from the LHRRP site which reduces its prominence in the view (compared to other elements).

The magnitude of impacts on each of the identified receptor groups was also determined to be moderate or less, largely due to interim topography or vegetation which limits visual accessibility of the proposal elements. Significant distance from receptors also reduces the visibility of the proposal. In addition, the proposed changes would be incremental over a long time scale rather than occurring rapidly over a short timeframe.

To ensure no significant visual impacts to the community, SITA would also implement initial rehabilitation and maintenance measures. These include perimeter screening of the LHRRP by understory planting in targeted areas. The LHRRP would also ultimately be rehabilitated to an attractive landscape that would be used as a public parkland.

The consequent assessment of impact significance found that all the identified receptors would be exposed to impacts of moderate, low, or negligible significance. By implementing the proposed mitigation measures, the proposal would not have any significant impacts on the community.

The visual impact assessment addresses the SEARs and concludes that the proposal would meet the objectives of having no significant impacts on the community and no significant visual impact.

Air quality

SITA is currently actively managing and reducing the odour from site, as reflected by the decreased number of odour complaints received in the past two years. Since the studies documented in this report were commenced SITA has installed twenty nine additional landfill gas collection wells at the LHRRP. These were installed to address the issues identified by this study and this is expected to reduce fugitive landfill gas emissions significantly.

Odour modelling undertaken using odour emission data obtained from a comprehensive odour sampling program at the LHRRP demonstrates that predicted odour levels for the proposal in 2021 (worst case year for potential odour impacts) comply with the odour criteria at all existing and proposed nearby sensitive receptors.

Odour modelling also shows that the total odour emissions and impacts associated with LHRRP activities would decrease in comparison with the existing situation. The predicted reduction in odour levels at odour receptors compared to levels currently experienced would occur because of a combination of actions being undertaken by SITA to address existing issues with the landfill, progressive increases in areas of final capping associated with the proposal, relocation of the GO facility further from sensitive receptors, and partial covering and aeration of garden organics composting windrows.

It is noted that the improvements to odour levels at nearby sensitive receptors would occur overtime, with some improvements realised in 2016 or potentially sooner. For the modelled scenario 2 (2016 – phase 1 reprofiling works), over 50% reduction was predicted at ANSTO when compared against existing odour levels. The improvements are expected to continue over the life of the proposal as an increasing area of landfill is capped and rehabilitated.

Dust dispersion modelling using NPI published emission factors shows that the proposal would not impact adversely on any sensitive receptors.

The air quality assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts on the community or environment
- Achieving the 2 OU odour performance criteria cumulatively at the nearest residential receptor
- Improving site gas capture and destruction either by power generation activities or gas flaring as required.

Soils and surface water

Existing sediment control practices would continue with the proposal, and hence no adverse impacts to downstream waterways are expected from the proposal.

During the construction of the ARRT and GO facilities, some temporary disturbed areas of a significant size would be created. Implementation of the proposed mitigation measures would prevent significant impacts on downstream water quality.

There would be no major increase in the demand for water needed for site activities as the LHRRP is progressively reprofiled, capped and revegetated. The primary demand for water would be for dust suppression, the need for which would decrease over time as exposed areas are capped.

Some temporary increases in the amount of water needed for dust suppression purposes would occur during construction of the GO and ARRT facilities. The amount of water collected on site and available for site controls would be limited due to the zone of water actively managed for erosion and sediment control in the main sediment and water reuse basin. Some additional water may be required from other sources during dry periods. However is not expected that the activities associated with the proposal would result in a significant increase in potable water demand.

The results of modelling shows that the proposal would increase the peak flow rate discharged from the proposal site by up to approximately 1%. At this level of increase, the potential for downstream flooding would not change significantly.

Flood modelling demonstrated that the proposed GO and ARRT facilities would be a minimum of 500 mm above the design 100-year flood level. Flood modelling also demonstrated that that inundation of the leachate ponds is not expected during the 100-year ARI event, which is the commonly adopted flood planning level in NSW.

Realignment of the creek is not expected to have a significant impact on downstream flow conditions.

The proposal is expected to improve water quality in Mill Creek through implementation of the proposed mitigation measures. These include the effective containment of water that comes into contact with organic material within the GO facility. This water would be collected in a sump and pumped to a storage dam for later re-use in the GO and ARRT composting processes. Any water that cannot be collected in the sump would flow to another storage dam downstream, from where it could be utilised for composting purposes. Excess water collected in this storage dam during high rainfall periods would be disposed of to sewer.

As the ARRT facility activities occur under cover, no leachate would be generated as a result of rainfall events. Any leachate generated from composting within the facility would be collected

within the building and recirculated during the composting process. Clean roof water from rainfall events would be diverted to Mill Creek.

After completion of landfilling, the proposal site would be converted to a parkland area including significant vegetated and landscaped areas. While SSC would be responsible for maintaining the parkland, SITA would continue to have responsibility for the environmental performance of the disposed waste. The proposed post-closure site uses would not result in any unacceptable impacts in terms of surface water.

The surface water assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts on the community or environment
- Prevention of surface water contamination
- Minimising sediment generation and transport off the proposal site
- Minimising soil erosion
- No significant impacts to downstream flow conditions

Groundwater

An extensive suite of existing groundwater monitoring data (approximately 25 years) suggests that the combination of the insitu geology and current leachate collection system is resulting in concentrations of parameters in groundwater which are below the level where impacts on the surrounding groundwater and surface water systems may occur. As similar conditions would be maintained with the proposal, it is expected that there would be no unacceptable influences on the groundwater from the proposed landfilling activities at the LHRRP.

The Stage 5 landfill leachate collection system and control measures have been designed and installed in accordance with best practice to facilitate preferential capture of leachate from up gradient landfill areas and further minimise the potential for impacts to underlying groundwater. The existing groundwater drainage system located beneath Stage 5 provides additional capacity for interception of groundwater in the unlikely event that adverse groundwater impacts are detected.

Groundwater elevation observations and the hydrogeological conditions identified around the existing landfill suggest that any reduction in groundwater recharge and hence flow associated with the proposal would be minimal during construction and operation and after closure. This is supported by the overall footprint of the landfill remaining similar to existing conditions. Current groundwater quality data confirms that there is limited interaction between leachate and the underlying groundwater system.

The proposed ARRT and GO facility operations include activities that require management and monitoring during construction and operation, to avoid impacting groundwater. The proposed design of these facilities which utilises impermeable surfaces for processing activities within the ARRT and GO facilities, and operations within buildings for the ARRT facility, minimises the potential for impacts on groundwater. After closure and removal of these facilities, the potential for groundwater contamination is minimal.

There would be a reduction in recharge associated with the development of impermeable surfaces at the ARRT and GO facilities to minimise the potential for groundwater contamination. Given already naturally low recharge rates and that recharge impacts would be highly localised, it is not expected that there would be overall adverse impacts to groundwater elevations and flows.

With the adoption of the proposed mitigation measures and a long term commitment to monitor for the emergence of impacts (should they occur) and respond if required, the potential for adverse impacts on groundwater would be acceptably minimised.

The groundwater assessment addresses the SEARs and concludes that the proposal would meet the identified objectives of:

- No significant impacts on the community or environment
- No significant impacts on groundwater quality.

Leachate

The leachate water balance for the landfill concluded that in all stages of the proposal, the containment and treatment capacity of the site would be sufficient to manage the leachate generated in the modelled average and wet rainfall years. Hence, the containment capacity of the site would be sufficient to contain the leachate generated beyond the monthly disposal capacity.

When considered over the projected life of the landfill, it can be seen that the works proposed would significantly reduce the volumes of leachate expected to be generated at the LHRRP landfill in future. Reshaping and capping works would reduce the predicted volume of leachate generated by at least 25% in the modelled weather scenarios when compared to the existing approval.

The leachate assessment and water balance model indicates that the proposal would:

- Provide a final landform which increases the proportion of rainfall which would run off the surface
- Provide a final capping system which would decrease the proportion of rainfall which would 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 proposal would also reduce the potential to impact the environment through surface water and groundwater.

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 and Cell 5.3. These containment structures were designed for this purpose.

The leachate assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts on the community or environment
- Prevention of groundwater pollution by leachate
- Prevention of surface water pollution by leachate, including Mill Creek
- Prevention of the degradation of local amenity

Contamination

The objective of the contamination assessment is to provide information on the current and historical setting of the proposal site to:

- identify the potential for contamination to pose a constraint to the proposed redevelopment of these areas and

- demonstrate that land that may be contaminated is suitable for development in accordance with *State Environmental Planning Policy No. 55 - Remediation of Land 1998* (SEPP55).

The area proposed for landfill reprofiling is known to contain landfilled general solid and special waste as it is an active landfill that has been operating for many years. Given the current land use of majority of this area as a landfill and the detailed long term management requirements currently in place (capping to meet EPA requirements, leachate collection, gas collection, and regular environmental monitoring), the landfill area is considered suitable for continued landfilling and reprofiling.

The proposed GO/ARRT area within the current operational area of the LHRRP is undeveloped bushland containing a number of unsealed tracks traversing the area. It does not appear to be contaminated or have a history of contaminating activities. However the area of the LHRRP leased to SICTA, located north-west of the current operational areas, is affected by lead shot, and may be subject to lead contamination in the soil, resulting from its long term use as a clay target shooting range.

The overall conclusion of the study was that the site is suitable for its intended future uses, namely landfill reprofiling, and construction and operation of the ARRT and GO facilities, followed by decommissioning of these facilities and landscaping to create a community parkland. A detailed plan for testing would be required prior to construction of the ARRT facility. Should excess levels of lead be identified, a plan (including specific remediation measures if required) would be developed in accordance with regulatory requirements and approved by the appropriate agencies prior to the construction of the ARRT facility.

Assuming that the Closure Plan and post-closure monitoring programs are appropriately implemented, the risk of future users of the park coming into contact with the contamination that underlies the site is minimal.

Hazards and risk

The results of the preliminary risk screening indicated that a Preliminary Hazard Assessment (PHA) is not required for the proposal. No materials or transportation frequencies exceeded the respective thresholds, and the proposal is therefore not considered potentially hazardous. The hazard identification process did not identify any significant hazards with potential for offsite impacts that could not be suitably controlled.

The hazards and risk assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts 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

Fire prevention and management

Based on the bushfire risk factors identified, a large scale high intensity bushfire has the potential to impact the site over the life of the proposal. Such risks highlight the need to develop effective strategies and procedures to manage bushfire risk in the construction and operation of the proposal, noting that bushfire risk would not be able to be avoided, due to the location of the LHRRP. A range of mitigation measures would be implemented along with SITA's fire control practices as documented in the OEMPs.

The main potential types of fires within the proposal facilities or landfill include:

- Fire in the landfill – waste or gas
- Fire in GO facility or ARRT facility – compost
- Other facility fires:
  - Fire in offices/buildings
  - Fire around fuel storage tanks
  - Fire involving site plant and equipment

Appropriate fire prevention, detection and suppression (fire fighting) measures would be provided. The fuel storage areas would be managed in accordance with site operational procedures. Site operational procedures would also include preventative measures and actions for plant and equipment. These measures would reduce the likelihood of facility fires and potential for damage to property and personnel should a facility fire occur.

Biodiversity

The majority of the proposal site is located within the existing landfill, which has been cleared and substantially modified. The proposed ARRT and GO facility have been positioned within vegetated land of which much had been previously cleared but is now regenerating. The proposal's impacts are therefore substantially less than would be associated with an undisturbed 'green field' site. The proposal has been purposefully designed to avoid or further reduce impacts on biodiversity values as far as is practicable. Other specific mitigation measures are also proposed to minimise impacts on the natural environment and threatened biota.

Despite measures taken to avoid and mitigate impacts, the proposal would result in some unavoidable residual adverse impacts imposed upon some elements of the natural environment, including removal of native vegetation, a threatened plant and ramets of a threatened population, fauna habitat resources and imposition of edge effects on adjoining areas of native vegetation. These residual impacts are small in extent and magnitude and would comprise a minor reduction in biodiversity values in the study area.

No threatened ecological communities would be directly impacted. The proposal may have a minor indirect impact on a nearby Coastal Upland Swamp, however this is unlikely to change the species composition of the community or reduce its extent. The stand of Shale Sandstone Transition Forest located to the north of the existing landfill is unlikely to be impacted by the proposal given its distance from the proposal footprint and lack of any clearing in this area.

One individual of the endangered plant *Acacia bynoeana* (listed as an endangered species under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999*) would be removed as a result of the proposal. 82 ramets of the *Allocasuarina diminuta* subsp. *mimica* ((listed as an endangered population under the TSC Act) that form part of the endangered population in the proposal footprint would be removed.

The proposal would remove a very small proportion of available habitat resources for local populations of native fauna. Impacts would include the removal of:

- 13.03 ha of potential foraging habitat for mobile threatened fauna species, including the Grey-headed Flying-fox, birds and microbats
- 13.03 ha of potential foraging, shelter and nest or den sites for the Eastern Pygmy-possum and the Spotted-tailed Quoll
- 13.03 ha of potential shelter, foraging and low quality potential breeding habitat for the Giant Burrowing Frog.

- The loss of five hollow-bearing trees and two rock outcrops
- The removal of one artificial dam and a section of Mill Creek. Mill Creek would be realigned to allow continued flow.

The proposal would not impact any threatened biota listed under the *Fisheries Management Act 1994*.

A Framework for Biodiversity Assessment (FBA) assessment and credit calculations have been performed in accordance with the methodology and using credit calculator Version 4.0. The FBA includes thresholds for assessing and offsetting impacts of development (see table 4 of OEH 2014a). The Biodiversity Offset Strategy for the proposal would include the purchase and retirement of the following biodiversity credits as calculated in accordance with the FBA:

- 459 ecosystem credits for impacts on Red Bloodwood - Scribbly Gum heathy woodland on sandstone plateaux (ME014).
- 77 species credits for *Acacia bynoeana*
- 169 species credits for the Giant Burrowing Frog
- 430 species credits for Rosenberg's Goanna
- 261 species credits for the Eastern Pygmy-possum.

The Biodiversity Offset Strategy would be developed by SITA in consultation with the determining authorities and SSC. The offset would be within Sutherland Shire where practicable. The biodiversity assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- 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.

Landuse

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

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

As a result of the potential impacts of the proposal on land currently occupied by ANSTO (Commonwealth-owned land), a referral under the EPBC Act was prepared and submitted to the Commonwealth Minister for the Environment.

On 13 April 2015 a decision was recorded that the proposal is not a controlled action and that no further assessment and approval under the EPBC Act is required before it can proceed (EPBC Ref: 2015/7432). Since this decision was received, the proposed stormwater pond to the north of the ARRT facility has been extended to the north slightly, and the Commonwealth Department of the Environment was advised in writing and given opportunity to respond. To date, no further advice has been received to contradict this original ruling. As the changes to pond size and shape were minor, it is concluded that the proposal continues not to be considered a controlled action. Should this not be the case, and advice is received from the

Department to this effect following or during exhibition of the EIS, this would be addressed in the Submissions Report.

Greenhouse gas

Two scenarios were included in the greenhouse gas assessment:

- Baseline scenario: do nothing scenario with the existing landfilling operating for a further 12 years
- Proposal scenario: landfill reprofiling, GO facility relocation and expansion and ARRT facility operation

The average annual emissions for 23 years of operations of the proposal (2015 to 2037) and 50 years of methane emissions post closure of the landfill was estimated at approximately 191,548 t CO_2-e per year. This is approximately 0.12 percent of total annual 2011/12 emissions in NSW and approximately 0.035 percent of Australia's annual emissions.

The emissions intensity of the proposal was estimated to be approximately 0.77 t $CO_{2\text{-}e}$ per tonne of waste received, which is lower than the estimated emissions intensity of the baseline scenario (1.24 t CO_2-e per tonne of waste received).

The greenhouse gas assessment addresses the SEARs and concludes that the proposal would meet the following objectives:

- No significant impacts on the community or environment
- Minimising landfill gas emissions to the atmosphere
- Recovery of energy from gas
- Efficient landfill gas extraction.

Other issues

Heritage

The heritage assessment found that there are no known Aboriginal objects within the study area and that the proposed impact area has a low archaeological potential. There are no known intangible or cultural Aboriginal heritage values associated with the proposal site as it has been a landfill site for many years. It is therefore unlikely that Aboriginal heritage values would be impacted by the proposal. One LEP listed item exists that is partially within the study area. This is a stand of *Eucalyptus Paniculata*, or Grey Ironbark, which would not be impacted by the proposal. As the proposal site has been used for a landfill for many years, additional visual impacts to the LEP item are unlikely.

The study area has been assessed as having low non-Aboriginal archaeological potential and therefore impacts to relics are unlikely.

Riparian corridors

Mill Creek is a first order waterway through the LHRRP. Under the NOW (2012) 'Guidelines for Riparian Corridors on Waterfront Land' (RC guideline), first order streamlines are to have minimum riparian corridor widths consisting of the channel zone which comprises the bed and banks of the watercourse (to the highest bank) and a 10 m vegetated riparian zone (VRZ) either side of the channel zone. The RC guideline also sets out certain works and activities that can occur on waterfront land and in the riparian corridors of first order streams.

Comparison of riparian corridor mapping with the proposal layout indicates that there would be a number of encroachments into the delineated riparian corridor.

All encroachments within the outer 50 % of the VRZ are considered permitted activities which would require offsetting on site. The encroachment of the bridge within the inner 50 % of the VRZ is also a permitted activity that would require offsetting. As a result, a minimum total area of 875 m^2 would require offsetting on site. These offsets would be integrated into the overall biodiversity offsets strategy for the proposal.

Litter and illegal dumping

SITA is committed to support the Local and State Government's goal to reduce litter and illegal dumping. It is SITA's goal to prevent litter from entering Mill Creek, spreading off the site into bushland such as the Lucas Heights Conservation Area and other areas adjacent to the site including sections of Little Forest Road, Heathcote Road and New Illawarra Road.

The potential for windblown litter from landfilling operations would not be increased by the proposal, however SITA would continue to implement and improve management/mitigation of litter in accordance with the existing and proposed measures documented in the LHRRP OEMP. SITA and SSC would also conduct joint litter campaigns.

Since receipt of mixed waste and processing at the ARRT would occur within buildings, therefore potential litter impacts from the ARRT would be low. The GO facility would continue to receive source separated garden organics, with low potential for litter to be generated from this source.

- SITA has in place a range of measures to preventing litter and support the reduction of illegal dumping in the Sutherland Shire:SITA will continue its participation in workshops and forums that involves a range of stakeholders including government agencies and community groups to combat litter and illegal dumping
- SITA's commitment is supported through various internal audits undertaken at the site which cover all licence and compliance related issues. The internal audits monitor a range of environmental parameters, with a key performance parameter for landfill operations being litter.
- SSC and SITA have agreed 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. 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 SSC area.

Socio-economic

Availability of the site for community uses would be delayed by 12 years, however the eventual size of the proposed parkland would be larger than the current approved parkland, due to the addition of the current GO facility area to the park area. The parkland would be handed back to the community once the site has been rehabilitated and landscaped. This is expected to occur in 2039.

SITA has committed to entering into a VPA with SSC. The VPA would include a $100 million financial contribution to help SSC fund community infrastructure for community use throughout the whole council area now and into the future. A minimum of 20% of the contribution would be spent within a 7.5 km radius of the proposal.

The proposal has an estimated capital investment value of $95 million (ex GST), current as at March 2015. This investment would be spent in the Sydney region through the design, construction and commissioning of the proposed new facilities and the ongoing landfilling operations.

Since the proposal would operate for up to 20 years, long term operational positions would be available. Most staff would be recruited locally rather than transferred from other SITA facilities.

VOLUNTARY PLANNING AGREEMENT

In recognition of the critical role that the LHRRP plays in managing Sydney's waste, SITA has committed to entering into a Voluntary Planning Agreement (VPA) with SSC in accordance with the requirements of the EP&A Act.

SITA is committed to meet a number of environmental commitments in terms of actions it would take based on the proposal site's environmental performance. Under the VPA, these commitments would be administered through the OEMPs, which describe SITA's approach to best practice, including prevention, mitigation and rectification of the operation and management of the LHRRP. OEMPs have been developed as part of the EIS preparation for the:

- LHRRP, superseding the existing Landfill Environmental Management Plan
- Proposed ARRT facility
- Relocated GO facility

A post-closure EMP for the proposal site has also been developed. Construction EMPs will be developed in consultation with SSC prior to the construction of the facilities.

The OEMPs and EMP would be updated and finalised upon receiving the Development Consent for this proposal (if approved). In the event that the Development Consent conditions differ from the OEMP conditions, the more onerous environmental obligation will apply. The OEMPs would only be amended with SSC approval.

The Minister for Planning would consider the VPA along with the Development Application 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.

PROJECT JUSTIFICATION AND CONCLUSIONS

The justification for the proposal is based on a number of factors:

- The proposal is consistent with the objects of the EP&A Act
- The proposal is consistent with the strategic direction for waste management in NSW and at a national level
- The proposal meets a number of identified needs
- The site is suitable for the proposal
- The proposal is in the public interest

The EIS has examined a number of key issues surrounding the proposal, including identification of potential adverse impacts.

The EIS also provides a summary of the assessment of the capacity provided by the proposed final landform and how the filling would be staged to minimise surface water interactions, leachate generation and odour impacts.

The EIS concludes that many of the potential issues identified would be effectively managed through proposal design features. To manage residual issues, and in some cases eliminate them completely, a number of mitigation and management measures (commitments) would be undertaken. The construction and operation of the proposal would be undertaken in accordance with all relevant legislative guidelines.

Part A
Introduction and Context

1. Introduction

1.1 Overview

SITA Australia (SITA) is proposing a number of activities at the Lucas Heights Resource Recovery Park (LHRRP) in Lucas Heights.

GHD Pty Ltd (GHD) has been engaged by SITA to prepare documentation to support a development application for approval of the proposal under Part 4 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (the EP&A Act). This Environmental Impact Statement (EIS) has been prepared in accordance with the provisions of the EP&A Act. It addresses the requirements of the Secretary of the NSW Department of Planning and Environment (the Secretary's Environmental Assessment Requirements (SEAR No SSD-6835) dated 3 February 2015 (provided in Appendix A).

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

1.2 Key features of the proposal

SITA currently operates the resource recovery park at Lucas Heights '2' referred to as LHRRP. A number of activities at the LHRRP are proposed to help the NSW Government achieve its waste strategy objectives and to improve environmental outcomes. The following activities, shown on Figure 4.4, are proposed at the LHRRP and are collectively referred to as 'the proposal'. The proposal would not have a significant impact on the community. In addition to the proposal detailed below, SITA is committed to better environmental outcomes by the application of best practice prevention, mitigation and rectification measures:

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

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

- **Relocation and expansion of the existing garden organics (GO) facility**. The existing garden organics facility would be relocated to the western side of the site adjacent to Heathcote Road. Approval is being sought to increase the approved capacity from 55,000 to 80,000 tonnes of green waste and garden waste received per year at the facility. The new facility would include the partial enclosure, active aeration and covering of the first four weeks of the active composting process, which coincides with the period of highest potential for odour generation, to enable more effective control of odour. Relocation of the facility would result in increased separation distances from the current nearest occupied

land at ANSTO, existing residential areas and the proposed new residential area at West Menai.

- **Construction and operation of a fully enclosed advanced resource recovery technology (ARRT) facility**. The ARRT facility would be located on the western side of the site adjacent to the GO facility and would process and recover valuable resources from up to 200,000 tonnes of general solid waste per year, reducing the amount of waste disposed to landfill to approximately 60,000 tonnes per year. This would divert up to 140,000 tonnes of waste per year from landfill. SSC and other councils would have the opportunity to have their municipal waste processed by the ARRT facility.
- **Community parkland**. The landfill reprofiling would increase the area available for future passive recreation following site closure from 124 ha (existing approved parkland) to a total of 149 ha, an increase of approximately 25 ha. Landfilling would cease in 2037 after which time the site would be rehabilitated and converted to a community parkland, with capping and landscaping to be completed and the site made available for community use in 2039.

A Planning Proposal is being submitted in parallel with this State Significant Development Application. The Planning Proposal seeks to include new local provisions on the LHRRP site within the Sutherland Local Environmental Plan 2013 (SLEP), which would allow the proposal (a waste or resource management facility) to be undertaken on the proposal site.

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

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

1.3 About the proponent

The proposal is being proposed by SITA[2]. Due to the existing operational arrangements at LHRRP, SSC is a joint applicant for the proposal. Although both SITA and SSC are joint applicants, the proposal would be constructed and operated by SITA.

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.

SSC is a local government organisation that manages the area of land called Sutherland Shire, an area of 370 km^2 stretching from the Georges River in the north, Deadman's Creek and Woronora Dam in the west, the Royal National Park in the south and the Pacific Ocean in the

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

east. SSC was established in 1906 and currently administers the Sutherland Shire on behalf of 210,000 residents and ratepayers, making it the second largest local government in NSW in terms of the number of people it serves.

1.4 Overview of the planning and approvals requirements

State Significant Development to which Division 4.1 of the EP&A Act applies is identified in the 'State Environmental Planning Policy (State and Regional Development) 2011' (State and Regional Development SEPP) and in declarations made by the Minister for Planning. The proposal is considered to be 'State Significant Development' as it is of a type listed in Schedule 1 of the State and Regional Development SEPP.

The NSW Minister for Planning is therefore the consent authority for the proposal and a development application is required to be lodged with the NSW Department of Planning and Environment, accompanied by an EIS. The EIS would be placed on public exhibition for a period of at least 30 days to allow public and agency submissions to be lodged, after which the proponent may be requested to respond to issues raised in the submissions.

1.5 Purpose and structure of this environmental impact statement

This EIS supports an application for development approval from the Minister for Planning under Part 4 of the EP&A Act. It has been prepared in accordance with the EP&A Act and the SEARs. The EIS provides:

- Information on the proposal, including need and alternatives considered
- An assessment of the potential key environmental impacts of the proposal as identified by the SEARs
- SITA's commitments in terms of measures to minimise and manage potential environmental impacts.

The EIS is structured as follows:

Volume 1 – Environmental impact statement (main report)

Volume 1 includes:

- Part A Introduction and Context - including:
  - An introduction to the EIS (Chapter 1)
  - Information on the statutory framework (Chapter 2)
  - A summary of the consultation that occurred during the assessment process (Chapter 3)
  - A description of the site including location, land ownership, land use and the environmental setting and information on the existing operations of the LHRRP (Chapter 4)
- Part B The Proposal - including:
  - An overview of strategic planning drivers, the proposal need and alternatives considered (Chapter 5)
  - A description of the proposal (Chapter 6) including plans of proposed building works, the ARRT and GO facility processes, construction activities and likely staging of construction works.
- Part C Environmental Assessment - including:

  - Identification and prioritisation of environmental issues (Chapter 7)
  - The results of the assessment of key environmental issues (Chapters 8 to 22).
- Part D Proposal Justification and Conclusions - including:
  - Proposed environmental management and monitoring and a compilation of proposed mitigation measures (Chapter 23)
  - The conclusion and justification for the proposal including an evaluation of the proposal with regard to social, economic and environmental considerations and the results of the environmental impact assessment (Chapter 25).
- Part E References, Glossary of Technical Terms and Abbreviations.

Volumes 2 to 8 – Appendices

Volumes 2 to 8 contain the specialist technical/background reports prepared as part of the environmental impact assessment process, supporting correspondence and consultation information:

Volume 2:

- Appendix A – Secretary's Environmental Assessment Requirements
- Appendix B – Consultation material
- Appendix C – Final landform design basis and settlement analysis
- Appendix D – Traffic, transport and access
- Appendix E – Noise assessment

Volume 3:

- Appendix F – Visual impact assessment
- Appendix G – Air quality assessment

Volume 4:

- Appendix H – Surface water assessment
- Appendix I – Groundwater assessment

Volume 5:

- Appendix J – Leachate assessment
- Appendix K – Contamination assessment
- Appendix L – Hazards and risks study

Volume 6:

- Appendix M – Biodiversity assessment
- Appendix N – Planning proposal
- Appendix O – Greenhouse gas assessment
- Appendix P – Heritage assessment
- Appendix Q – Capital costs estimates report

Volume 7:

- Appendix R – Parkland, Future Use and Post Closure Management

Volume 8:

- Appendix S – LHRRP Operational Environmental Management Plan
- Appendix T – Garden organics facility Operational Environmental Management Plan
- Appendix U – ARRT facility Operational Environmental Management Plan
- Appendix V – LHRRP Post Closure Environmental Management Plan
- Appendix W – Voluntary Planning Agreement

Volume 7 provides a description of the final landform, parkland design, landscaping, the potential future use of the site and the post closure management arrangements following the cessation of waste related activities.

1.6 SEARs

The SEARs and location of where each requirement is addressed in the EIS is provided in the following table.

SEARs	Location in EIS
General Requirements	
The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. The EIS must include:	
• A detailed description of the development including: – Need for the proposed development – Justification for the proposed development – Likely staging of the development – Likely interactions between the development and existing, approved and proposed developments within the site and in the vicinity – Plans of any proposed works	Chapters 5 and 6
• Consideration of all relevant environmental planning instruments including identification and justification of any inconsistencies with these instruments	Section 2.2
• Risk assessment of the potential environmental impacts of the development; identifying key issues for further assessment	Chapter 7
• Detailed assessment, where relevant, of the key issues below, and any other potential significant issues identified in the risk assessment	See below
• Consolidated summary of all the proposed environmental management monitoring measures, highlighting commitments included in the EIS	Chapter 24
The EIS must also be accompanied by a report from a qualified quantity surveyor providing: • A detailed calculation of the capital investment value (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000) of the proposal, including details of all assumptions and components from the CIV calculation is derived; • An estimate of the jobs that will be created during the construction and operational phases of the proposed development; and • A certification that the information provided is accurate at the date of preparation	Appendix Q

SEARs	Location in EIS
Key Issues	
Strategic Landuse Planning – including: • Demonstration that the proposal is generally consistent with the aims and objectives of all relevant environmental planning instruments and strategies including, but not limited to, State Environmental Planning Policy (Infrastructure) 2007, Sutherland Shire Local Environment Plan 2006, Waste and Resource Management Strategy 2011/14, NSW Waste Avoidance and Resource Recovery Strategy 2007 and relevant Development Control Plans; • Justification for any inconsistency between the proposed development and these plans; • Details on the suitability of the site for the proposed development; • Details of the performance of the existing site operations; and • A summary of the planning proposal that is needed to facilitate the development	Section 2.2 and Section 5.2 Section 25.1.6 Section 4.6 Section 2.2.2
Waste Management – including: • A detailed description of the likely waste streams that would be handled/stored/disposed of at the facility; • Details of how this waste would be stored and handled on site, and transported to and from the site; • Details of the location and size of stockpiles of unprocessed and processed recycled waste on the site; • Details of the landfill cell design and integrity in accordance with best practice industry standard guidelines such as the EPA's Guidelines for Solid Waste Landfills; • Details of the potential impacts associated with treating, storing, using and disposing of this waste and waste products • A description of the technology and timeframes for processing waste and the quality control measures that would be implemented; and • The measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2007.	Chapter 8 and Section 5.2
Rehabilitation – including: • A detailed description of how the site would be progressively rehabilitated, revegetated, and integrated into the surrounding landscape; • A detailed description of the final landform and the measures that would be in place to manage surface water impacts; • A justification for the proposed final landform and use, taking into consideration any relevant strategic land use planning or resource management plans or policies; and • A detailed description of the measures that would be put in place to ensure sufficient resources are available to implement the proposed rehabilitation measures, and the ongoing management of the site following the cessation of landfilling activities.	Section 6.5
Transport, Access and Parking – including: • Details of traffic types and volumes likely to be generated during construction and operation; • Details of key transport routes, site access, internal roadways and infrastructure works and parking; • Detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards;	Chapter 9

SEARs	Location in EIS
• An assessment of the predicted impacts of this traffic on the safety and capacity of the surrounding road network, including consideration of cumulative traffic impacts from other developments, using SIDRA or a similar traffic model; and • A description of the measures that would be implemented to upgrade and/or maintain the surrounding road network over time.	
Air Quality and Odour – including: • A description of all potential air emissions and odours and their sources, including construction, operational and transport sources; • A quantitative assessment of all potential air quality impacts and odour impacts for the development, including cumulative, on surrounding land and sensitive receptors under the relevant Environmental Protection Authority guidelines; • Details of any pollution control equipment and other impact mitigation measures for fugitive and point source emissions; and • Details of the proposed management and monitoring measures.	Chapter 12
Noise and Vibration – including: • A description of all potential noise sources, including construction, operational and transport sources; • A quantitative assessment of construction, operational and transport noise and vibration impacts to surrounding receivers from on site and off site activities in accordance with the relevant EPA guidelines; and • Details of the proposed management, mitigation and monitoring measures.	Chapter 10
Soil, Water and Leachate – including • A detailed water balance for the development, outlining the measures to minimise water use and any potential for a sustainable water supply; • The proposed erosion and sediment controls during construction and operation; • The proposed stormwater management system, including the capacity of onsite detention systems, and measures to treat, reuse or dispose of water; • The proposed leachate management system including the capacity of the system to treat and dispose of leachate; and • Consideration of the potential salinity, contamination, flooding and acid sulfate soil impacts of the development	Chapters 13, 14, 15 and 16
Greenhouse Gas - including • A quantitative assessment of potential scope 1 and 2 greenhouse gas emissions of the development, and a qualitative assessment of the potential impacts of these emissions on the environment; and • A detailed description of the measure that would be implemented on site to ensure that the development is energy efficient	Chapter 21
Visual – including an assessment of the potential visual impacts of the development on the amenity of the surrounding area	Chapter 11
Flora and Fauna – including: • Accurate estimates of any vegetation clearing associated with the project • A detailed assessment of the potential impacts of the project on any threatened species, populations, endangered ecological communities, groundwater dependent ecosystems or their habitats; and	Chapter 19

SEARs	Location in EIS
• Where impacts cannot be avoided, detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term, including proposed biodiversity offset measures and details of the provision and protection of land for conservation purposes.	
Hazards and Risks – including a preliminary risk screening completed in accordance with the State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the project. Should preliminary risk screening indicate that the project is "potentially hazardous", a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).	Chapter 17
Aboriginal Heritage – including tangible and intangible Aboriginal Cultural Heritage Values across the site, and addressing: • The Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW 2011; • The Aboriginal Cultural Heritage Consultation requirements for proponents 2010; • The details of conservation measures and measures to avoid or mitigate impacts	Section 22.1
Heritage – including heritage items and values of the site and surrounding area, taking into account the NSW Heritage Manual and Assessment Heritage Significance Guidelines.	Section 22.1
Voluntary Planning Agreement – the details of any voluntary planning agreement for the proposal	Chapter 23

Additional agency requirements and where each issue is addressed in the EIS are discussed in Section 3.5.2 and summarised in Table 3.2. Further detailed agency requirements for each key issue area are described in each of the relevant the technical studies, which can be found in Volumes 2 to 5.

2. Statutory framework

2.1 Environmental Planning and Assessment Act 1979

The EP&A Act contains the core legislation relating to planning and development activities in NSW. It is the principal law overseeing the assessment and determination of development proposals. All development in NSW is assessed in accordance with the provisions of the EP&A Act.

2.1.1 Part 4 of the EP&A Act

Part 4 of the EP&A Act provides for the control of development that requires development consent from a consent authority. Depending on the circumstances of the project, the consent authority may be the local Council or the Minister for Planning.

Part 4, Division 4.1 of the EP&A Act establishes an approval regime for development that is declared to be State Significant Development by either a State Environmental Planning Policy (SEPP) or Ministerial Order. In accordance with Section 89E of the EP&A Act, the Minister for Planning is the consent authority for State Significant Development. Pursuant to Clause 8A of Section 78A of the EP&A Act, an EIS is required to support a development application for State Significant Development.

2.1.2 Approval process

State Significant Development to which Division 4.1 of the EP&A Act applies is identified in the 'State Environmental Planning Policy (State and Regional Development) 2011' (State and Regional Development SEPP) and in declarations made by the Minister for Planning. The proposal is considered to be 'State Significant Development' as it is of a type listed in Schedule 1 of the State and Regional Development SEPP (refer to Section 2.2.1).

The NSW Minister for Planning is therefore the consent authority for the proposal and a development application is required to be lodged with the NSW Department of Planning and Environment, accompanied by an EIS. Before preparing the EIS the applicant must request SEARs. The request for SEARs is accompanied by a Supporting Document which includes details of the location, nature and scale of the proposal as well as a preliminary assessment of environmental issues to identify key issues for further assessment in the EIS.

The Department of Planning and Environment then consults with relevant public authorities to obtain input when preparing the SEARs. The Department then issues SEARs to the proponent.

The proponent prepares an EIS in accordance with the SEARs in addition to the form and content requirements set out in Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. The EIS will be submitted to the Department, which will review the information provided to ensure that adequate detail is available on the proposal for members of the community and other stakeholders to understand the proposal and its potential impacts.

Once the Department is satisfied that the EIS is adequate, the EIS would be placed on public exhibition for a period of at least 30 days to allow public and agency submissions to be lodged, after which the proponent may be requested to respond to issues raised in the submissions.

2.2 Environmental planning instruments

Environmental planning instruments (EPIs) are legal documents that are prepared under the EP&A Act to regulate land use and development. EPIs determine the relevant Part of the EP&A Act under which a development proposal must be assessed and therefore determine the need

or otherwise for development consent. EPIs consist of SEPPs and local environmental plans (LEPs).

2.2.1 State environmental planning polices

State Environmental Planning Policy (State and Regional Development) 2011

The State and Regional Development SEPP identifies development:

- To which the State Significant Development assessment and approval process under Part 4 of the EP&A Act applies
- That is State Significant Infrastructure and critical State Significant Infrastructure.

Development that is specified in Schedule 1 or Schedule 2 is declared to be State Significant Development. Clause 23 of Schedule 1 states that the following development is State Significant Development:

'(1) Development for the purpose of regional putrescible landfills or an extension to a regional putrescible landfill that:

(a) has a capacity to receive more than 75,000 tonnes per year of putrescible waste, or

(b) has a capacity to receive more than 650,000 tonnes of putrescible waste over the life of the site, or

(c) is located in an environmentally sensitive area of State significance.

(2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.

(3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

(4) Development for the purpose of waste incineration that handles more than 1,000 tonnes per year of waste.

(5) Development for the purpose of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste.

(6) Development for the purpose of any other liquid waste depot that treats, stores or disposes of industrial liquid waste and:

(a) handles more than 10,000 tonnes per year of liquid food or grease trap waste, or

(b) handles more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste.'

The proposal involves three distinct components; the applicability of the above for each component is as follows:

- Reprofiling of the existing waste disposal area – The reprofiling works would result in an increase to the waste disposed up to a maximum of about 850,000 tonnes per year and therefore would meet the criteria in Clause 23(1)(a) and (b). This component is therefore considered to be State Significant Development.
- Relocation and expansion of the GO facility – The GO facility would involve a resource recovery or recycling facility which handles up to 80,000 tonnes per year. This amount does not trigger the criteria listed in Clause 23(3). Under these circumstances this facility (when considered individually) is not considered to be State Significant Development, however

when grouped with the other components of the proposal is considered State Significant Development.

- Construction of ARRT facility – The ARRT facility would involve a resource recovery or recycling facility which handles up to 200,000 tonnes per year and therefore would meet the criteria in Clause 23(3). This component is therefore considered to be State Significant Development.

Overall the proposal is considered to be State Significant Development. As outlined in Section 2.2.2, the elements of the proposal are not permissible within some of the landuse zones outlined within the *Sutherland Local Environmental Plan 2015*. A planning proposal which seeks to include a new local provision only applying to the LHRRP is to be undertaken in parallel to the State Significant Development application. This planning proposal would make the waste management facility a permitted use under the *Sutherland Local Environmental Plan 2015*.

State Environmental Planning Policy (Infrastructure) 2007

The 'State Environmental Planning Policy (Infrastructure) 2007' (the Infrastructure SEPP) aims to facilitate the effective delivery of infrastructure across the State through increased regulatory certainty and improved efficiency and flexibility in the location of infrastructure and service facilities, while also providing for adequate stakeholder consultation.

Clause 121 of the Infrastructure SEPP outlines waste or resource management facilities which are permissible with consent. Clause 121(1) states:

> *'Development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone.'*

As outlined in Section 2.2.2 below, the proposal is located within the SP1 Special Activities (Waste Recycling) and RE1 Public Recreation under the *Sutherland Local Environmental Plan 2015*. The proposal is defined as a waste or resource management facility.

SP1 Special Activities (Waste Recycling) is considered to be a prescribed zone for the purposes of clause 121 of the Infrastructure SEPP and the proposal is therefore permissible with development consent within this zone.

RE1 Public Recreation is not a prescribed zone and, as a result, clause 121 of the Infrastructure SEPP would not apply to that zone and the proposal is not permissible with consent under the Infrastructure SEPP. The permissibility of the proposal within the RE1 Public Recreation under the Sutherland Local Environmental Plan 2015 is discussed further in Section 2.2.2.

Clause 123 of the Infrastructure SEPP outlines the matters a consent authority must take into consideration when determining a development for the purpose of the construction, operation or maintenance of a landfill for the disposal of waste. Table 2.1 provides a response to the matters for consideration outlined in Clause 123 of the Infrastructure SEPP.

Table 2.1 Matters for consideration (Clause 123 of Infrastructure SEPP)

Matter for consideration	Response
(a) whether there is a suitable level of recovery of waste, such as by using alternative waste treatment or the composting of food and garden waste, so that the amount of waste is minimised before it is placed in the landfill	The proposal includes a best practice ARRT facility which would treat up to 200,000 tonnes of waste per year. The ARRT facility would provide a high level of waste diversion from landfill and is a considerable improvement over existing practices. The proposal also involves the relocation and expansion of an existing GO facility so that it

	can handle 80,000 tonnes per year of organic waste. The relocated GO facility would incorporate best practice improved environmental controls including active aeration and partial enclosure of the composting process. Simultaneous operation of these two resource recovery facilities would result in a considerable reduction in the amount of waste requiring landfill disposal.
(b)(i) adopts best practice landfill design and operation	The design of the landfill would adopt best practices for landfill design and operation and be consistent with the NSW EPA's Draft Landfill Design Guidelines (2015). One of the main goals of the reprofiling works would be to increase the slope of the final landform to facilitate rainfall runoff and avoid the generation of excess leachate. This would also reduce potential greenhouse gas and odour emissions from the site.
(b)(ii) reduces the long term impacts of the disposal of waste, such as greenhouse gas emissions or the offsite impact of odours, by maximising landfill gas capture and energy recovery	The existing landfill has a gas capture and electricity generating system already in place. This system would continue to operate and be expanded following the changes to the landform profile. SITA will seek from ANSTO permission to continue to lease the land where this facility is located into the future to allow ongoing gas management during operation of the proposal and as required during the post-closure period as per the VPA. Operation of the two best practice resource recovery facilities (ARRT facility and GO facility) would also reduce the overall quantity of greenhouse gas generated and emitted in NSW, by composting organic materials that would otherwise be landfilled. The ARRT facility would be fully enclosed to minimise odour emissions. Relocation of the GO facility (along with aeration and partial enclosure) would reduce the potential for odour impacts from this operation. Reprofiling of the landfill would reduce the potential for stormwater ponding and ingress into buried waste, which is expected to minimise leachate and gas generation.
(c)(i) whether the land on which the development is located is degraded land such as a disused mine site	The proposal would be conducted on land that has been disturbed by waste disposal activities and therefore the land is considered to be degraded. Approximately 95 % of the proposed landform reprofiling would be within the existing approved landfill footprint, and it would all be located on land already utilised for landfill related operations. The areas outside the existing approved landfill footprint would be at the northern and eastern end of the site and are being sought to facilitate the construction of the remaining cells (as the existing excavation walls are very steep) and to facilitate reprofiling over the existing landfilled GO area. The area proposed to be reprofiled is depicted on Figure 6.4. Areas

	currently used for the weighbridge, office and RRC would not be disturbed as part of the proposed reprofiling.
(c)(ii) whether the development is located so as to avoid land use conflicts, including whether it is consistent with any regional planning strategies or locational principles included in the publication EIS Guideline: Landfilling (Department of Planning, 1996), as in force from time to time,	The proposal would be contained within the extent of the existing LHRRP. It is therefore expected that it would not be inconsistent with the regional planning strategies or locational principles in the EIS guideline. A planning proposal will be lodged to allow additional permitted uses, in consultation with SSC and ANSTO, with the planning proposal process expected to run parallel with the consent process for the overall development proposal.
(d) whether transport links to the landfill are optimised to reduce the environmental and social impacts associated with transporting waste to the landfill	On the basis of current negotiations with ANSTO to further lease the Existing Infrastructure Area (administration and weighbridge areas) post 2025, SITA proposes to utilise Little Forest Road as the main ingress/egress to the LHRRP. Potential impacts on Little Forest Road and the ANSTO site intersection have therefore been assessed in the EIS.

State Environmental Planning Policy No. 19 – Bushland in Urban Areas

'State Environmental Planning Policy No 19 – Bushland in Urban Areas' (SEPP 19) aims to protect and preserve bushland within urban areas. Schedule 1 of the SEPP 19 lists the local government areas to which SEPP 19 applies. The Sutherland local government area is listed in Schedule 1 and therefore the provisions of SEPP 19 apply to the proposal.

Clause 6(1) states that no person shall disturb bushland zoned or reserved for public open space purposes within the consent of council. As the site is zoned Zone 13 – Public Open Space consent would be required.

The proposal has where possible minimised the impacts to bushland areas with the majority of the works in areas already impacted by the construction and operation of the existing LHRRP. Vegetation likely to be impacted by the ARRT and GO facilities is also considered to have limited value due to the type of species which are commonly found elsewhere in the vicinity of the LHRRP (in areas that would not be affected by the proposal) and in the local area . The proposal is considered to be in the public interest as it would provide improved waste management services to the region and Sydney generally.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

The 'State Environmental Planning Policy No. 33 – Hazardous and Offensive Development' (SEPP 33) ensures that, in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise the impact.

Under SEPP 33, a potentially hazardous industry means a development for the purposes of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact, would pose a significant risk to human health, life or property, or to the biophysical environment. SEPP 33 requires developments that are potentially hazardous to have a preliminary hazard analysis (PHA) prepared to determine the risk to people, property and the biophysical environment at the proposed location and in the presence of controls.

An assessment of hazards and risks in accordance with the requirements of SEPP33 was undertaken. The results are provided in Chapter 17.

A potentially offensive development means a development for the purposes of an industry which, if the development were to operate without employing any measures to reduce or minimise its impact, would emit a polluting discharge in a manner which would have a significant adverse impact. Development that requires an environment protection licence (EPL) NSW EPA is considered to be potentially offensive. However, by definition, the level of offence is generally not considered to be significant if the relevant EPLs can be obtained.

The existing waste management facility holds a number of EPLs (EPL No. 5065, 12520 and 13114) from the EPA under the *Protection of the Environment Operations Act 1997* (POEO Act, refer to Section 2.3.1). EPL 12520 would be required to be amended as part of the proposal to account for the change in volumes being treated within the GO facility. The EPL 5065 would be required to be amended to reflect the proposed amended disposal rates and reprofiled landform. A new licence would also be required for the operation of the ARRT facility. As a result of the facility holding this licence it is considered to be a 'potentially offensive industry'.

It is therefore, considered to be a 'potentially offensive industry'. If EPA considers that the proposal can be issued with the required EPL, it would not be considered an offensive industry, and the requirements of SEPP 33 in terms of offence would be met.

It is not intended to make the part of the site available as parkland for passive recreation until after all waste receival activities cease in 2037 and landscaping works have been completed. The intended parkland would be established on rehabilitated areas of the landfill (and other areas of the site) and made available from 2039.

Therefore it is considered that use of the rehabilitated areas of the site for passive recreation (which is the most common use for closed waste disposal sites in Sydney and around the world) is not a potentially hazardous activity. Further details on the proposed parkland are provided in Section 6.5.

State Environmental Planning Policy No. 55 – Remediation of Land

The aims and objectives of 'State Environmental Planning Policy No. 55' (SEPP 55) are to provide a state-wide planning approach to contaminated land remediation and to promote the remediation of contaminated land to reduce risk of harm.

SEPP 55 restricts consent authorities from issuing development consent on land that may be contaminated, unless the consent authority is satisfied that the land in question is suitable for development, or would be suitable if the appropriate remediation was undertaken.

The LHRRP currently operates as a waste management facility and therefore there is "contamination" present on site arising from landfilling of waste. The proposed ARRT and GO facilities would be located on land that has not had waste disposed on it in the past and is would not likely be contaminated at present. The activities of the GO and ARRT facilities would be designed to minimise the possibility of site contamination occurring. Landfill reprofiling would occur mainly on land that has had waste placed upon it already, and would not extend to the land utilised for the GO and ARRT facilities. So these areas would remain uncontaminated.

The only areas outside the existing approved landfill footprint that would be used for landfilling would be at the northern and eastern end of the site. This would facilitate the construction of the remaining cells (as the existing excavation walls are very steep) and permit reprofiling over the existing landfilled GO area (which is a former landfilling area).

Once landfilling and reprofiling is complete, capping of all disturbed areas would provide a robust barrier to prevent future exposure of site occupants to contamination (buried waste). Revegetation of these capping areas and landscaping would stabilise the surface and enable these areas to be used for passive recreational uses, with minimal risk to future users of coming into contact with contamination.

Consideration of contamination of the land for the proposed development is provided in Chapter 16. Consideration of the proposal resulting in contamination of the surrounding landscape is outlined in Chapters 14 and 15.

2.2.2 Local environmental plans

Sutherland Local Environmental Plan 2015

The Sutherland Local Environmental Plan 2015 (the SLEP) was recently made. Under the SLEP, the proposal 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 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 proposed reprofiling of the landfill is located on 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 on 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 is being 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. In order to permit development for 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.

The proposal is considered to be consistent with these objectives as it 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 throughout this environmental impact statement, with it concluding that the continued operation of the LHRRP is to occur with minimal additional impacts.

The expansion of the LHRRP would permit the future use of the land for recreation purposes, as is currently planned when the existing facility was to cease operation. The proposal would change the timeframes in which the land would be able to be used for recreational purposes, however the proposal would ensure that the land is suitable for use for recreation purposes as the landfill area would be compacted to meet the EPA Benchmark technique requirements which call for a minimum airspace utilisation of 850 kilograms per cubic metre. Once capped, the final landfill surface would be capable of supporting future recreation land uses. A master plan (refer Section 6.5.3) has been developed for the future use of the site and this plan 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.

2.2.3 Voluntary planning agreement

In recognition of the critical role that the LHRRP plays in managing Sydney's waste, SITA has committed to entering into a VPA with SSC in accordance with the requirements of the EP&A Act. The Minister for Planning would consider the VPA along with the Development Application 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 is provided in Appendix W and a summary of the VPA is provided in Chapter 23.

2.3 Other applicable NSW legislation

2.3.1 Legislation to be applied consistently

Under Section 89K of the EP&A Act, the following authorisations cannot be refused if necessary for the carrying out of State Significant Development that is authorised by development consent and are to be substantially consistent with the consent:

- *Fisheries Management Act 1994* – aqua culture permit under Section 144.
- *Mine Subsidence Compensation Act 1961* – approval under Section 15.

- *Mining Act 1992* – a mining lease under this act.
- *Petroleum (Onshore) Act 1991* – a production lease under Division 5 of Part 3.
- *Protection of the Environment Operations Act 1997* – an EPL under Chapter 3 of the Act.
- *Roads Act 1993* – a permit under Section 138 to impact on public roads.
- *Pipelines Act 1967* – a licence under Section 11 to construct and/or operate a pipeline.

The above mentioned acts which are relevant to the proposal and have been applied consistently are discussed in the below sections.

Protection of the Environment Operation Act 1997

The POEO Act establishes, amongst other things, the procedures for issuing of licences for environmental protection on aspects such as waste, air, water and noise pollution control. The owner or occupier of premises engaged in scheduled activities is required to hold an EPL and comply with the conditions of that licence.

The existing LHRRP currently has three EPLs for land on which the proposal is to be located. A further EPL is held for land not impacted upon by the proposal. Table 2.2 outlines the EPL current applying to land impacted upon by the proposal.

Table 2.2 Existing EPL applying to the LHRRP

EPL	Activity
5065	Waste disposal (application to land)
	Waste storage (other types of waste)
	Waste storage (waste tyres)
12520	Composting
13114	PCYC minibike club

EPL 5065 would need to be amended to ensure it reflects the proposed waste disposal activities.

EPL 12520 would need to be amended as the proposed relocated GO facility would have an annual throughput of 80,000 tonnes. This is 30,000 tonnes above the volumes allowed by the current EPL (which permits 50,000 tonnes to be composted each year).

Construction of the ARRT facility on site is not currently covered by any of the existing EPLs. The proposed facility would meet the definitions in Clause 34 of the POEO Act for the recovery of general waste as it would treat greater than 30,000 tonnes of general waste per year (up to 200,000 tonnes per year) and therefore an EPL would be required to be obtained for these works. The existing approved Alternative Waste Treatment (AWT) location in the south-eastern corner of the LHRRP is considered no longer suitable for this facility.

2.3.2 Approvals that do not apply[3]

Section 89J of the EP&A Act specifies certain authorisations which are not required for State Significant Development that is authorised under a development consent. These include the following authorisations, which may otherwise have been relevant to this proposal:

- NSW *Fisheries Management Act 1994* – permit for work or structures within a waterway
- NSW *Heritage Act 1977* – approval to disturb an item or an excavation permit
- NSW *National Parks and Wildlife Act 1974* – an Aboriginal heritage impact permit under Section 90

[3] The EIS assesses the risks from fire its mitigation and heritage, flora and fauna and water issues.

- NSW *Native Vegetation Act 2003* – consent to clear native vegetation
- NSW *Rural Fires Act 1997* – a bush fire safety authority under Section 100B
- NSW *Water Management Act 2000* – water use approval, water management work approval or activity approval.

These approvals would not be required if the Minister grants development consent to carry out the proposal under Division 4.1 of Part 4 of the EP&A Act.

2.3.3 Other relevant legislation

Threatened Species Conservation Act 1995

The NSW *Threatened Species Conservation Act 1995* (TSC Act) requires that significance assessments be completed for all endangered ecological communities, threatened populations and species listed under the TSC Act that would be directly or indirectly affected by the proposal.

An ecological impact assessment has been undertaken as part of the EIS. The result of this assessment are summarised in Chapter 19.

Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) governs the strategic direction for waste management and resource recovery in NSW. Among the main objectives of the WARR Act are:

> *(b) to ensure that resource management options are considered in accordance with the following hierarchical order:*
>
> *(i) avoidance of unnecessary resource consumption,*
>
> *(ii) resource recovery (including reuse, reprocessing, recycling and energy recovery), or*
>
> *(iii) disposal*

The proposal by SITA to increase waste diversion through the use of organics processing at the ARRT facility and an expansion of the GO facilities capacity would be consistent with the objectives of the WARR Act.

2.4 Commonwealth legislation

2.4.1 Commonwealth Environmental Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, populations and communities, and heritage items. The approval of the Commonwealth Minister from the Department of the Environment is required for:

- An action which has, would have or is likely to have a significant impact on matters of national environmental significance (NES matters)
- An action likely to have a significant impact on the environment in general (for actions by Commonwealth agencies or actions on Commonwealth land) or the environment on Commonwealth land (for actions outside Commonwealth land).

A person must refer a proposed action to the Commonwealth Minister for the Environment if it has, will have, or is likely to have a significant impact on MNES. The referral must include a description of the proposed action and a description of the likely impacts on MNES. An action that the Minister decides is likely to have a significant impact on MNES is deemed a 'controlled action' and requires assessment under the provisions of the EPBC Act.

The proposal is not considered to impact upon any matters of national significance, as the works would be contained within areas which have been previously disturbed by the construction and operation of the existing waste management facility.

The proposal site is located partially on land which is owned by ANSTO which is a Commonwealth agency. This land surrounds the Open Pool Australian Lightwater (OPAL) reactor which is located to the south east of the proposal site. Figure 4.4 shows the location of the Commonwealth land in relation to the existing waste management facility and the proposal.

As part of the proposal would be undertaken on Commonwealth land, the proposal has the potential to impact upon Commonwealth land. Impacts to Commonwealth land are considered to be limited as the areas of Commonwealth land to be impacted have been previously disturbed for development of the existing landfill.

On 13 April 2015 a decision was recorded that the proposal is not a controlled action and that no further assessment and approval under the EPBC Act is required before it can proceed (EPBC Ref: 2015/7432). Since this decision was received, the proposed stormwater pond to the north of the ARRT facility has been extended to the north slightly, and the Commonwealth Department of the Environment was advised in writing and given opportunity to respond. To date, no further advice has been received to contradict this original ruling. As the changes to pond size and shape were minor, it is concluded that the proposal continues not to be considered a controlled action. Should this not be the case, and advice is received from the Department to this effect following or during exhibition of the EIS, this will be noted in the Submissions Report.

2.4.2 Australian Nuclear Science and Technology Organisation Act 1987

ANSTO is subject to the provisions of a number of Commonwealth Acts and Regulations, however the *Australia Nuclear Science and Technology Organisation Act 1987* (ANSTO Act) is the primary act which applies to ANSTO.

The ANSTO Act states:

> *'Subject to this Act, the Organisation has the power to do all things necessary or convenient to be done for or in connection with the performance of its functions and, in particular, has power:*
>
> *…*
>
> *(d) to erect buildings and structures and carry out works*
>
> …'

The ANSTO Act states that State and Territory laws do not apply to the undertakings of ANSTO in relation to the use or proposed use of land or premises and the environmental consequences of the use of the land or premises. Under this section, the planning requirements under NSW legislation do not apply to any works undertaken by ANSTO.

Regardless of the positioning of the proposal partially on Commonwealth land and within the ANSTO buffer zone, as the proposed works are not being undertaken by ANSTO and are not in connection with the performance of ANSTO's functions, the provisions of the ANSTO Act do not apply to the proposal

3. Stakeholder and community engagement

This chapter describes the consultation undertaken with the community and government stakeholders and the key issues raised during the consultation process. Relevant consultation material is provided in Appendix B.

3.1 Consultation objectives

Stakeholder and community consultation for the proposal aimed to:

- Raise awareness of the proposal and its merits
- Obtain the input of key stakeholders throughout the planning process
- Increase awareness of SITA's best practice waste and recycling operations

3.2 The role of SSC and ANSTO

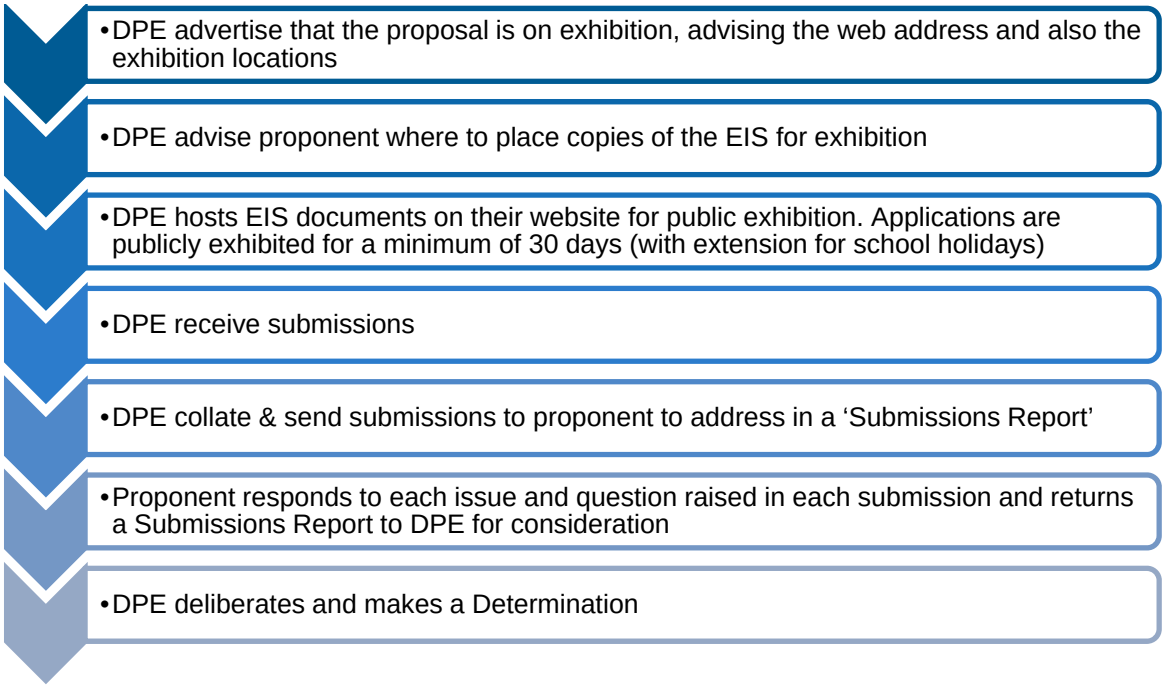
Due to the existing operational arrangements at LHRRP, SSC is a joint applicant for the proposal. SSC has been involved from the early stages, right through the development of the proposal and the preparation of the EIS. SSC has reviewed and endorsed the submission of all relevant key planning documents including the SSD Supporting Document, OEMPs, post closure EMP, and this EIS document and associated specialist reports. Details of briefings, meetings, review of documents, and other involvement of SSC are provided in Section 3.5.2.

ANSTO is a federal government agency that operates the nuclear research facility to the south-east of the site. Part of the LHRRP site is owned by ANSTO and as such, is a key stakeholder and decision maker regarding changes at the site. In addition, ANSTO must agree to a lease variation to facilitate the expansion of the LHRRP. ANSTO has also been involved from the early stages of proposal development via regular correspondence and updates, briefings and meetings. ANSTO and also reviewed and endorsed the lodgement of the SSD Supporting Document prior to submission to the Department of Planning and Environment (DPE) and this EIS document and associated specialist reports. Details of the briefings, meetings and other involvement of ANSTO are also provided in Section 3.5.2.

3.3 Communication activities proposed during public exhibition period

3.3.1 Communication through the NSW Department of Planning and Environment

The exhibition of the EIS is managed by the DPE, as summarised in the flow chart below. DPE will also host a copy of the entire EIS document and appendices on its web site: http://majorprojects.planning.nsw.gov.au/page/



3.3.2 Additional consultation activities

In addition to the usual proposal exhibition activity managed by the DPE, additional engagement activities are planned to provide additional opportunities for the community to gain further understanding of the proposal, ask questions, discuss issues with SITA representatives and receive information.

The list below has been developed in consultation with the Lucas Heights Community Reference Group (CRG).

The following engagement activities are proposed to be undertaken during the public exhibition of the EIS:

- Place advertisements in local newspapers, including:
  - Multiple advertisements in the St George and Sutherland Shire Leader during the display period
  - One advertisement in the monthly publication Shire News
- Place proposal brochures and display posters which include specific findings from the EIS at multiple Sutherland Shire Council locations (Engadine Community Centre, SSC administration building) and The Ridge Sports Complex
- Provide static display at Menai Marketplace for interested members of the community to view relevant EIS documentations during three weeks of the display period. This would include:
  - display of the posters
  - display of the proposal video running on a continuous loop
  - copies of the brochure
  - information on how to make a submission
- SITA project team members would be available at Menai Marketplace for a minimum of three weeks during the exhibition period on Tuesdays, Thursdays, Saturdays and selected Sundays to assist and respond to questions about the proposal. SITA project team members would also be available at the Ridge Sports Complex for a minimum of two weeks on Saturdays during the exhibition period. Interested stakeholders would be

encouraged to make formal submissions to the DPE. Copies of the EIS would be available during these times

- Facebook advertising to users in the project area (Barden Ridge, Menai, Woronora, Heathcote, Yarrawarrah and Engadine, estimated daily reach of 8, 800)
- Design, print and deliver flyers to all residents in the neighbouring suburbs of Barden Ridge, Engadine, Menai and Sandy Point (over 10,400 residences), to inform the closest residents about the proposal and the EIS displays
- Continue to maintain a dedicated proposal website. This website would be updated to provide links to the EIS on the DPE web site, and provide detail of the exhibition locations and the display at Menai Marketplace: suez-env.com.au/lucasheights
- Continue to maintain the proposal email address in order to answer questions and direct enquirers to the relevant EIS displays or online materials: lucas.heights@suez.com.au
- Continue to provide community guided tours of the LHRRP
- Continue to make available the proposal flyover video
- Continue to maintain the proposal contact number 1800 810 680 in order to answer questions and direct enquiries to the relevant EIS displays or online materials

3.4 Communication activities during construction and operations

SITA proposes to continue to engage with the community during construction and operation of the proposal. This would include:

- Weekly newspaper advertisements for site tours in St George and Sutherland Shire Leader
- Local newspaper outreach in St George and Sutherland Shire Leader and Shire News
- Continue to maintain dedicated proposal website: suez-env.com.au/lucasheights
- Continue to make available the proposal flyover video
- Continue to provide community tours of the site
- Establish permanent outdoor information display
- Advertise job vacancies in the St George and Sutherland Shire Leader

3.5 Consultation during EIS preparation

3.5.1 Community and stakeholder consultation mechanisms

SITA has used a variety of activities and tools to engage with stakeholders and the community during development of the EIS. This included:

- Community reference group meetings
- A dedicated proposal website, suez-env.com.au/lucasheights
- Drop-in sessions
- A community information centre
- Community information hotline
- One on one meetings with key stakeholders
- Developing and maintaining relationships with local media outlets

- Monitoring of social media for community sentiment and specific concerns regarding the proposal.

Community reference group meetings

A CRG has been established for LHRRP, comprising of SITA representatives and the community. The CRG meets 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 is kept informed of proposed works for LHRRP.

At the regular Lucas Heights CRG meetings, SITA staff briefed CRG members about the proposal, as information became available. During the latter part of the EIS preparation period, the following CRG meetings were held:

- 24 November 2014, 5:30 pm
- 11 December 2014, 5:30 pm
- 12 March 2015, 5:30 pm
- 11 June 2015, 5:30 pm
- 9 July 2015, 5.30 pm
- 10 September 2015, 9:00 am (including site tour)
- 29 September 2015, 5:30 pm

Copies of the draft EIS (overall document and relevant appendices) were provided to a number of the CRG members in May 2015, and the EIS findings were discussed at the June meeting. Written questions were invited from the CRG members. These were received in June and these responses were provided in writing, and discussed at the July meeting. A copy of the written questions and responses is provided in Appendix B. In addition, a series of general questions and responses arising from these specific questions was prepared for the July meeting. It was also intended to publish the material on the SITA website to assist in consultation about the proposal. This is also contained in Appendix B.

On 29 September 2015, the CRG was invited again to discuss matters of concern which they wished to see addressed in the EIS. Copies of the draft EIS executive summary and relevant appendices were provided to the attending CRG members, and a number of issues were discussed. SSC were also in attendance to provide confirmation that CRG member's concerns had been considered and, where relevant, addressed in the EIS document.

Following the announcement to expand LHRRP, SITA sent emails to the listed email addresses of 18 local organisations, inviting them to meet with SITA representatives to discuss the proposal and raise any questions/issues. The organisations were:

- West Menai Action Group
- Sutherland Shire Environment Centre
- Jenko Sutherland Shire Pony Club
- Cronulla Model Aero Club
- Menai Wildflower Group
- Barden Ridgebacks Football Club Inc
- Barden Ridgebacks Netball Club Inc
- Bangor Brumbies Football Club Inc
- Bangor Barden Ridge Comets Cricket Club Inc
- Menai Warriors Junior Rugby Union Football Club Inc
- Menai Roosters Junior Rugby League Football Club Inc
- Heathcote Ridge
- Marconi Clay Target Club
- Sydney Clay Target Club

- Menai Sand & Soil
- Shirewood Forest Archers Inc
- Sutherland PCYC
- Department of Defence

The email was sent on 28 November 2014, but unfortunately the response level was under 50%, with the following organisations responding:

- Bangor Barden Ridge Comets Cricket Club - no issues were raised.
- Barden Ridgebacks Football Club - generally not concerned about the proposal, but suggested that some people in the community may raise potential traffic impacts as a concern. Traffic impacts are assessed in Chapter 9.
- Bangor Brumbies Football Club - generally not concerned about the proposal, but suggested that some people in the community may raise potential traffic impacts as a concern. Traffic impacts are assessed in Chapter 9.
- Menai Warriors Junior Rugby Union Football Club - generally not concerned about the proposal, but suggested that some people in the community may raise potential traffic impacts as a concern. Traffic impacts are assessed in Chapter 9.
- Department of Defence - raised concerns about possible exacerbation of birdstrike risks and exhaust plumes from expansion of biogas operations posing hazards to aircraft operations conducted within the Holsworthy Training Area. Air quality impacts are assessed in Chapter 12.
- Barden Ridgebacks Netball Club Inc. - no issues were raised.
- Cronulla Model Aero Club (CMAC) - requested a meeting to discuss the development. SITA have been engaging with CMAC as part of the CRG

Proposal website

A website suez-env.com.au/lucasheights was developed to provide information on the proposal in order to:

- enable early widespread circulation of proposal information
- publish contact details to enable stakeholders and the community to submit early feedback and contact the proposal team

It was noted that unique visits to the web sub-site increased from an average of around 1000-1100 per month from July to September 2014, to 1400-1500 per month during December 2014 and January 2015. This timing coincided with the letterbox drop, advertising and other media.

Drop-in sessions

SITA has held three community drop-in sessions regarding the proposal:

- Session 1 - Tuesday, 2 December 2014. Engadine Community Centre, 2 pm - 5 pm
- Session 2 - Thursday, 4 December 2014. Menai Community Centre, 4 pm - 7 pm
- Session 3 - Saturday, 6 December 2014. Menai Community Centre, 1 pm - 4 pm

Two GHD staff attended each session to set up and record attendees. Between four and seven SITA staff also attended each session, including communications staff, project management, landfill management staff and senior management (Corporate Affairs Manager and the NSW Executive Director) in order to answer any questions from the community or stakeholders. A series of information posters were also on display at the drop-in sessions. These are provided in Appendix B.

There were five and four attendees at session 1 and 2 respectively, and no attendees at session 3. No objections or issues of concern regarding the proposal were raised, although some enquiries were made about the recovery process for the ARRT facility and suggestions for more resource recovery and recycling were taken.

A flysheet with invitation to the drop-in session and an information brochure were sent to 10,000 residents in the suburbs surrounding the LHRRP. A copy of the fly-sheet and information brochure is also attached in Appendix B.

Lucas Heights Site Visits

Local residents and stakeholders were invited to attend tours of the site on the following dates:

- Tuesday, 9 December 2014, 10 am - 12 pm
- Thursday, 11 December 2014, 3:30 pm - 5:30 pm
- Saturday, 13 December 2014, 10 am - 12 pm
- Tuesday 20 January 2015, 3:30 pm - 5:30 pm
- Tuesday 27 January 2015, 10 am - 12 pm
- Thursday 29 January 2015, 3:30 pm - 5:30 pm

There were two attendees each at the 9 and 11 December site visits and four attendees at the 13 December site visit. In January three people attended each of the 20 January and 27 January visits and there were two attendees at the 29 January site visit.

In addition to these, SITA have provided 26 site tours in 2015, comprising:

- 8 residents/community groups
- 4 Secondary Education groups
- 3 seniors groups
- 3 groups of SITA staff
- 3 Primary Education groups
- 2 Local Government groups
- 2 ESL/NESB Community Education groups
- 1 Tertiary Education groups

A total of 616 visitors toured the site in 2015.

Community information centre

A community information centre was established to:

- act as a central place to display plans, storyboards and to distribute proposal information such as fact sheets and newsletters
- be a meeting point for the community and a place that would facilitate media tours and information sessions
- be a direct point of contact to respond to community questions and provide accurate and timely information to counter and avoid the spread of misconceptions
- be a shared space for the proposal team to discuss to ensure a consistent approach across all proposal communications

The centre is located onsite at the LHRRP.

Community information hotline

A community information hotline was established to provide a mechanism to contact the proposal team. This phone line was used predominantly to book site visits/tours. Two phone calls to the hotline were to ask questions about composting. A further two phone calls were general calls to obtain information about the proposal.

One on one meetings with key stakeholders

SITA has briefed several Ministers and Members of Parliament including:

- Minister for Planning:
  - Initial briefing 21 July 2014
- Minister for the Environment, Minister for Heritage and Assistant Minister for Planning:
  - Initial briefing 4 June 2014
- Member for Menai:
  - Initial briefing 25 July 2014
- Member for Hughes
  - Initial briefing 21 July 2014

Local media

- St George & Sutherland Shire Leader
  - ‘Tip to be topped up 12 more years for Lucas Heights’ By Murray Trembath 25 November 2014
- Cronulla News
  - '$100 million from expanded Lucas Heights tip' by John Mulcair 25 September 2015
- Advertisements regarding proposal drop in sessions appeared on:
  - 25 November 2014
  - 27 November 2014
  - 2 December 2014
- Advertisements regarding proposal site visits appeared on:
  - 4 December 2014
  - 9 December 2014
  - 11 December 2014
- Engadine Pictorial News
- Advertisement regarding proposal drop in sessions appeared on:
  - 1 December 2014

Other media

Resource Recovery Biz (http://www.resourcerecovery.biz/news/sita-plans-90-million-awt-lucas-heights)

- SITA plans $90 million AWT for Lucas Heights
  - 26 November 2014

Social media

Lucas Heights Resource Recovery Park Development video by SITA available at: https://www.youtube.com/watch?v=AddRihQlLtw&feature=youtu.be

This four and a half minute video provides an overview of the current LHRRP site and details how it will change under the proposal.

3.5.2 Consultation with government agencies

Planning focus meeting

After SITA submitted the SSD application and supporting documentation, a Planning Focus Meeting (PFM) was held with the NSW Department of Planning and Environment to provide an overview of the proposal and discuss assessment scopes for key issues. The PFM was held at the Department's office at 23 – 33 Bridge Street, Sydney on 3 December 2014, and was attended by representatives from DPE, ANSTO, Urbis, SITA, EPA and SSC.

ANSTO briefings and meetings

SITA is currently negotiating the 'Heads of Agreement' and the Future Use Agreement with ANSTO. SITA provided ANSTO's representatives with regular correspondence and updates regarding the proposal.

Briefings and meetings with ANSTO were held on:

- 4 February 2014
- 20 February 2014
- 11 April 2014
- 17 April 2014
- 2 July 2014
- 18 July 2014
- 3 October 2014
- 9 April 2015

SSC briefings, meetings and review of planning documents

SSC is the proposal co-applicant and was thoroughly involved since early stages of the proposal. SITA held weekly meetings with SSC as well as teleconferences and workshops on key issues. SITA also provided key planning documents to SSC for review and comment, including:

- State Significant Development Supporting Document
- OEMPs for the LHRRP, GO facility and ARRT facility
- LHRRP post-closure EMP
- The VPA
- The deed of variation
- This EIS document and associated specialist reports

SSC and ANSTO endorsed the lodgement of the State Significant Development Supporting Document prior to submission to the Department of Planning and Environment.

Key workshops include:

- 10 September 2014 - OEMPs and EMP workshop held at SITA's office, 70 Anzac Street Chullora. The workshop was attended by SITA, GHD and SSC

Meetings with the SSC Subcommittee were held on:

- 18 October 2013
- 21 November 2013
- 6 December 2013
- 20 December 2013
- 10 January 2014
- 24 January 2014
- 7 February 2014
- 2 May 2014
- 19 May 2014
- 6 June 2014
- 19 June 2014
- 1 July 2014
- 17 July 2014
- 7 August 2014
- 23 September 2014
- 30 September 2014
- 14 October 2014
- 28 January 2015
- 14 April 2015

Other meetings with SSC and Baker & McKenzie were held on:

- 5 August 2014
- 14 August 2014
- 9 October 2014
- 16 October 2014

Other workshops

In order to align the requirements of both SSC and ANSTO, workshops were held with both parties and representatives in attendance. Key workshops include:

- 13 February 2015 - EIS technical studies findings presentation held at GHD's office, 133 Castlereagh Street, Sydney. The presentation was attended by SITA, GHD, SSC and representatives from ANSTO.
- 24 March 2015 – Follow up workshop for EIS technical studies held at GHD's office, 133 Castlereagh Street, Sydney. The presentation was attended by SITA, GHD and SSC ANSTO was not in attendance, but was given access to all documentation.

EPBC Act Referral to the Commonwealth Department of the Environment

The EPBC Act provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether the proposed action will need formal assessment and approval under the EPBC Act.

A referral is required as the proposal is partly located on Commonwealth land (land owned by ANSTO), and is in an area with listed threatened species and communities. The referral provided a summary of proposed actions as well as description of the environment and likely impacts. The EPBC referral was submitted to the Commonwealth Department of the Environment on 11 February 2015.

On 13 April 2015 a decision was recorded that the proposal is not a controlled action and that no further assessment and approval under the EPBC Act is required before it can proceed (EPBC Ref: 2015/7432). Since this decision was received, the proposed stormwater pond to the north of the ARRT facility has been extended to the north slightly, and the Commonwealth Department of the Environment was advised in writing and given opportunity to respond.

To date, no further advice has been received to contradict this original ruling. As the changes to pond size and shape were minor, it is concluded that the proposal continues not to be considered a controlled action. Should this not be the case, and advice is received from the Commonwealth Department of the Environment to this effect following or during exhibition of the EIS, this will be noted in the Submissions Report.

A copy of the correspondence is included in Appendix B.

Government agencies

The Department of Planning and Environment requested that the following agencies provide input to the SEARs:

- Environment Protection Authority
- Heritage Branch, Office of Environment and Heritage
- NSW Fire and Rescue
- NSW Office of Water
- Roads and Maritime Services
- Sutherland Shire Council

3.5.3 Summary of issues raised

The issues raised during consultation with the community and stakeholders and references to where these issues are addressed in the EIS are outlined in Table 3.1.

Table 3.1 Issues raised during consultation with stakeholders

Issue grouping	Issue raised	Response	Reference in the EIS
ANSTO	Visibility of ANSTO from final landform	Assessed as part of visual assessment	Chapter 11
Lucas Heights Community Reference Group	Potential odour	Moving garden organics Enclosing landfill and stormwater access that would increase odour Assessed as part of the air quality assessment	Chapter 12
	Traffic and trucks	Assessed as part of the traffic impact assessment	Chapter 9
	Local employment	Jobs available to those with correct skill levels Apprenticeship and traineeships available	Section 22.4
	Health and safety – moulds, air pollution, dust	Air quality assessed, hazard and risks assessed	Chapter 12 and Chapter 17
	Conservation land impacted	Conservation land will not be impacted	
Sutherland Shire Environment	Impact on traffic and the environment	Traffic assessment undertaken	Chapter 9

Issue grouping	Issue raised	Response	Reference in the EIS
Centre			
Sutherland Shire Council	Closure dates	31 December 2037	Section 6.5
	No impact on the community	Specialist reports and chapters detail the assessment of impacts and provide mitigation measure	Chapters 8 to 22 and Volume 2
	Improved environmental outcomes	Benefits and improved environmental outcomes resulting from proposal design and proposed mitigation measures.	Section 5.3
	Improved final landscape	Revised landscape plan	Section 6.5
	Not relying on other agencies for control of key environmental issues	VPA and environmental undertakings and reporting	Chapter 23
	Best practice	Proposal incorporates design and mitigation measures to achieve best practice	Section 24.2.1
	Odour	Assessed as part of the air quality assessment	Chapter 12
	Visual amenity	Assessed as part of the visual impact assessment	Chapter 11
	Illegal dumping and litter	Address in other issues	Section 22.3
	Traffic	Assessed as part of the traffic impact assessment	Chapter 9
	Hours of operation	Hours of operation clarified	Table 6.2
	Post closure	Details of post closure plans and uses included	Section 6.5 and 6
	Dual zoning	The proposal would permit future use of land for recreational purposes. Planning proposal prepared.	Section 2.2.2 and Appendix N
	Community involvement	Community included in consultation undertaken for the proposal	Chapter 3
	Local employment	Addressed in socio-economic issues section	Section 22.4
	Future waste disposal for the Shire	The proposal would provide ongoing future waste disposal capacity for Sutherland Shire	Chapter 5

The issues raised during consultation with Government agencies and references to where these issues are considered in the EIS are outlined in Table 3.2.

Table 3.2 Issues raised by agencies

Agency	Key issues	Reference in the EIS
Department of Planning and Environment	Refer SEARs (Section 1.6)	n/a
Ministers and members of parliament	Nil	n/a
NSW Environment Protection Authority	Letter received from the NSW EPA dated 18 December 2014 nominated the following key issues: 1. The Proponent should provide details about the new pollution controls, including biofilters and/or stacks etc. for the ARRT plant. The EIS should contain an assessment of the proposed pollution controls to determine whether they will effectively mitigate odour from the site.	Chapter 12
	2. All outdoor storage of organic materials, processed or unprocessed, must be clearly identified in the EIS with the type, their respective volumes and locations detailed on a site map. These outdoor stored materials must be included in the odour modelling.	Chapter 6 and Chapter 12
	3. Detailed information about the new facility buildings and compost storage building including the number of access points; details about the doors to be used at those access points; and how dust and odour from these buildings will be managed.	Chapter 6 and Chapter 12
	4. Odour modelling should consider the cumulative impacts from the existing operations, existing landfill and the proposed activities to ensure potential impacts on the local community are adequately determined.	Chapter 12
	5. Contingency plans for how odours will be managed should the proposed outdoor storage of final ARRT product and/or GO compost cause odour issues.	Chapter 12, Appendix T and Appendix U
	6. Assessment of the storm water controls for the landfill and whether the proposed storage capacity is adequate for the proposed additional waste.	Chapter 13
	7. Assessment of the proposed gas capture systems effectiveness to address odour emissions (in addition to electricity generation) from the proposed expansion to the landfill.	Chapter 12
	The EPA further raised EIS requirements in the attachment to the letter. These requirements have been addressed in the individual studies.	Refer Table 3.3
	Letter received from the NSW EPA dated 10 June 2015 nominated additional issues following review of draft environmental impact statement.	Refer Table 3.4
Office of Environment and Heritage	Letter received from the NSW OEH dated 18 December 2014 nominated the following key issues: Aboriginal cultural heritage	Section 22.1
	Biodiversity	Chapter 19
Sutherland Shire Council	Letter received from SSC dated 7 January 2015 nominated the following key issues: Section on future parkland to discuss water, leachate and gas management, landscape maintenance, ownership responsibilities and liability	Section 6.5

Agency	Key issues	Reference in the EIS
	Section on Waste Management to discuss waste types received and objectives under the Waste Avoidance and Resource Recovery Act 2001	Chapter 8
	Section on Hazards and Risks to discuss the potential for flooding, landslip and subsidence	Section 13.3.8
	Section on Social to include impact on the future development of surrounding area, i.e.: Gandangarra land that will be developed while LLRRP is operational. SITA to confirm arrangements for future community and school tours of the facility	Section 22.4 and Section 22.5
	Section on Soils and Contamination to in relation to final use	Section 13.3.9
	Section on Strategic Justification to expand on alternative to not extending the life of the LHRRP and impacts associated with waste transport	Chapter 5
Roads & Maritime Services	Letter received from the NSW RMS dated 11 December 2014 nominated the following key issues: 1. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need / associated funding for upgrading or road improvement works (if required). 2. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc). 3. Proposed number of car parking spaces and compliance with the appropriate parking codes. 4. Details of service vehicle movements (including vehicle type and likely arrival and departure times). 5. To ensure that the above requirements are fully addressed, Roads and Maritime requests that traffic modelling be undertaken for the resource recovery facility to properly ascertain the traffic impacts associated with the development. The traffic modelling process provides an opportunity to identify a package of infrastructure measures required to support the proposed development. This traffic modelling shall assess the existing levels of service of surrounding intersections and identify local intersection and road improvements, vehicular access options, the timing and cost of any infrastructure works and the identification of funding responsibilities associated with the development. 6. Roads and Maritime will require in due course the provision of a traffic management plan for all demolition and construction activities, detailing vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures.	Chapter 9 and Appendix D

Table 3.3 NSW EPA detailed requirements

Key issues			Reference in the EIS
A – Executive summary			
		The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental	Executive summary

Key issues	Reference in the EIS
outcomes.	
B – The proposal	
1 – Objectives of the proposal	
The objectives of the proposal should be clearly stated and refer to: a) the size and type of the operation, the nature of the processes and the products, by-products and wastes produced b) a life cycle approach to the production, use or disposal of products c) the anticipated level of performance in meeting required environmental standards and cleaner production principles d) the staging and timing of the proposal and any plans for future expansion e) the proposal's relationship to any other industry or facility.	Chapter 6
2 -Description of the proposal	
General	
Outline the production process including: a) the environmental "mass balance" for the process - quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc.) b) any life-cycle strategies for the products. Outline cleaner production actions, including: a) measures to minimise waste (typically through addressing source reduction) b) proposals for use or recycling of by-products c) proposed disposal methods for solid and liquid waste d) air management systems including all potential sources of air emissions, proposals to re-use or treat emissions, emission levels relative to relevant standards in regulations, discharge points e) water management system including all potential sources of water pollution, proposals for re-use, treatment etc. emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge . f) soil contamination treatment and prevention systems.	Chapters 6 and 8
Outline construction works including: a) actions to address any existing soil contamination b) any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site) c) construction timetable and staging; hours of construction; proposed construction methods d) environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures.	Sections 6.2.8, 6.3.8, 6.4.4, Chapter 16, Chapter 24
Air	
Identify all sources of air emissions from the development.	Section 12.3
Provide details of the project that are essential for predicting and assessing air impacts including : a) the quantities and physic-chemical parameters (e.g. concentration, moisture content, bulk density , particle sizes etc.) of materials to be used, transported, produced or stored b) an outline of procedures for handling, transport, production and storage c) the management of solid, liquid and gaseous waste streams with potential for significant air impacts.	Section 12.1 and 12.3

Key issues			Reference in the EIS
		Noise and Vibration	
		Identify all noise sources from the development (including' both construction and operation phases), detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials.	Section 10.2
		Specify the times of operation for all phases of the development and for all noise producing activities.	Section 10.3
		For projects with a significant potential traffic noise impact provide details of road alignment (include gradients, road surface, topography, bridges, culverts etc.), and land use along the proposed road and measurement locations - diagrams should be to a scale sufficient to delineate individual residential blocks.	Section 10.3
		Water	
		Provide details of the project that are essential for predicting and assessing impacts to waters: a) including the quantity and physic-chemical properties of all potential water pollutants and the risks they pose to the environment, and human health, including the risks they pose to Water Quality Objectives in the ambient waters b) the management of discharges with potential for water impacts c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.	Chapter 13, 14 and 15
		Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts e.g. effluent ponds) and showing potential areas of modification of contours , drainage etc.	Chapter 13, 14 and 15
		Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.	Chapter 13 and 15
		Waste and chemicals	
		Provide details of the quantity and type of both liquid waste and non-liquid waste generated, handled, processed or disposed of at the premises. Waste must be classified according to the Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes (NSW EPA, 1999).	Chapter 8
		Provide details of liquid waste and non-liquid waste management at the facility, including: a) the transportation, assessment and handling of waste arriving at or generated at the site b) any stockpiling of wastes or recovered materials at the site. c) any waste processing related to the facility, including reuse, recycling , reprocessing (including composting) or treatment both on- and off-site d) the method for disposing of all wastes or recovered materials at the facility e) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility f) the proposed controls for managing the environmental impacts of these activities.	Sections 8.1.3, 8.1.4, 8.1.5, 8.1.6, 8.2
		Provide details of spoil disposal with particular attention to: a) the quantity of spoil material likely to be generated b) proposed strategies for the handling, stockpiling, reuse/recycling	Not applicable. Any excess fill material would

Key issues			Reference in the EIS
		and disposal of spoil c) the need to maximise reuse of spoil material in the construction industry d) identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material e) designation of transportation routes for transport of spoil.	be reused on site
		Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.	Section 4.3
		Provide details of the type and quantity of any chemical substances to be used or stored and describe arrangements for their safe use and storage.	Section 14.3.2
		ESD	
		Demonstrate that the planning process and any subsequent development incorporates objectives and mechanisms for achieving ESD, including: an assessment of a range of options available for use of the resource, including the benefits of each option to future generations proper valuation and pricing of environmental resources identification of who will bear the environmental costs of the proposal.	Sections 5.2.1, 25.1.1, 25.2,
	3 – Rehabilitation		
		Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).	Section 6.5
	4 - Consideration of alternatives and justification for the proposal		
		Consider the environmental consequences of adopting alternatives, including alternative: a) sites and site layouts b} access modes and routes c) materials handling and production processes d) waste and water management e) impact mitigation measures f) energy sources	Section 5.5
		Selection of the preferred option should be justified in terms of: a) ability to satisfy the objectives of the proposal b) relative environmental and other costs of each alternative c) acceptability of environmental impacts and contribution to identified environmental objectives d) acceptability of any environmental risks or uncertainties e) reliability of proposed environmental impact mitigation measures f) efficient use (including maximising re-use) of land, raw materials, energy and other resources.	Section 5.5
C – the location			
	1 – General		
		Provide an overview of the affected environment to place the proposal in its local and regional environmental context including: a) meteorological data (e.g. rainfall , temperature and evaporation, wind speed and direction) b) topography (landform element, slope type, gradient and length) c) surrounding land uses (potential synergies and conflicts) d) geomorphology (rates of landform change and current erosion and	Chapter 4

Key issues			Reference in the EIS
		deposition processes) e) soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils) f) ecological information (water system habitat, vegetation, fauna) g) availability of services and the accessibility of the site for passenger and freight transport.	
	2 – Air		
		Describe the topography and surrounding land uses. Provide details of the exact locations of dwellings, schools and hospitals. Where appropriate provide a perspective view of the study area such as the terrain file used in dispersion models.	Section 12.2.2
		Describe surrounding buildings that may affect plume dispersion.	Appendix G
		Provide and analyse site representative data on following meteorological parameters: a) temperature and humidity b) rainfall, evaporation and cloud cover c) wind speed and direction d) atmospheric stability class e) mixing height (the height that emissions will be ultimately mixed in the atmosphere) f) katabatic air drainage g) air re-circulation.	Appendix G
	3 – Noise and Vibration		
		Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.	Section 10.2.1
		Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.	Section 10.2, 10.3
	4 - Water		
		Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective.	Section 13.2
	5 – Soil Contamination Issues		
		Provide details of site history- if earthworks are proposed, this needs to be considered with regard to possible soil contamination , for example if the site was previously a landfill site or if irrigation of effluent has occurred.	Section 16.2
D – Identification and prioritisation of issues / scoping of impact assessment			
		Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account: a) relevant NSW government guidelines b) industry guidelines c) EISs for similar projects d) relevant research and reference material e) relevant preliminary studies or reports for the proposal f) consultation with stakeholders.	Sections 7.1, 7.2
		Provide a summary of the outcomes of the process including: a) all issues identified including local, regional and global impacts (e.g. increased/ decreased greenhouse emissions) I	Section 7.3

Key issues			Reference in the EIS
		b) key issues which will require a full analysis (including comprehensive baseline assessment) c) issues not needing full analysis though they may be addressed in the mitigation strategy d) justification for the level of analysis proposed (the capacity of the proposal to give rise to high concentrations of pollution compared with the ambient environment or environmental outcomes is an important factor in setting [the level of assessment).	
E – Environmental issues			
	1 – General		
		The potential impacts identified in the scoping study need to be assessed to determine their significance, particularly in terms of achieving environmental outcomes, and minimising environmental pollution. Identify gaps in information and data relevant to significant impacts of the proposal and any actions proposed to fill those information gaps so as to enable development of appropriate management and mitigation measures. This is in accordance with ESD requirements.	Section 7.2
		Describe baseline conditions	
		Provide a description of existing environmental conditions for any potential impacts.	Sections 10.2, 11.2, 12.2, 13.2, 14.2, 15.2
		Assess impacts	
		For any potential impacts relevant for the assessment of the proposal provide a detailed analysis of the impacts of the proposal on the environment including the cumulative impact of the proposal on the receiving environment especially where there are sensitive receivers.	Sections 9.3, 10.3, 11.3, 12.3, 13.3, 14.3, 15.3, 16.4, 17.2, 18.3, 19.3, 20.2, 21.3, 22
		Describe the methodology used and assumptions made in undertaking this analysis (including any modelling or monitoring undertaken) and indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the predicted impacts. The analysis should also make linkages between different areas of assessment where necessary to enable a full assessment of environmental impacts e.g. assessment of impacts on air quality will often need to draw on the analysis of traffic, health, social, soil and/or ecological systems impacts; etc. The assessment needs to consider impacts at all phases of the project cycle including: exploration (if relevant or significant), construction, routine operation, start-up operations, upset operations and decommissioning if relevant. The level of assessment should be commensurate with the risk to the environment.	Sections 9.1, 10.1, 11.1, 12.1, 13.1, 14.1, 15.1, 16.1, 17.1, 18.1, 19.1, 21.1
		Describe management and mitigation measures	
		Describe any mitigation measures and management options proposed to prevent, control, abate or mitigate identified environmental impacts associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented. Proponents are expected to implement a 'reasonable level of performance' to minimise environmental impacts. The proponent must indicate how the proposal meets reasonable levels of	Sections 8.2, 9.4, 10.4, 11.4, 12.4, 13.4, 14.4, 15.4, 16.5, 17.3, 18.4, 19.4, 20.3, 21.4

Key issues			Reference in the EIS
		performance.	
		Use environmental impacts as key criteria in selecting between alternative sites, designs and technologies, and to avoid options having the highest environmental impacts.	Section 5.5
		Outline any proposed approach (such as an Environmental Management Plan) that will demonstrate how commitments made in the EIS will be implemented. Areas that should be described include: a) operational procedures to manage environmental impacts b) monitoring procedures c) training programs d) community consultation e) complaint mechanisms including site contacts f) strategies to use monitoring information to improve performance g) strategies to achieve acceptable environmental impacts and to respond in event of exceedances.	Chapter 24
	4 – Air		
		Describe baseline conditions	
		Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data.	Section 12.2
		Assess impacts	
		Identify all pollutants of concern and estimate emissions by quantity (and size for particles), source and discharge point.	Section 12.3
		Estimate the resulting ground level concentrations of all pollutants. Where necessary (e.g. potentially significant impacts and complex terrain effects), use an appropriate dispersion model to estimate ambient pollutant concentrations. Discuss choice of model and parameters with the DECCW.	Section 12.3
		Describe the effects and significance of pollutant concentration on the environment, human health, amenity and regional ambient air quality standards or goals.	Section 12.3
		Describe the contribution that the development will make to regional and global pollution, particularly in sensitive locations.	Section 12.3
		For potentially odorous emissions provide the emission rates in terms of odour units (determined by techniques compatible with EPA I DECCW procedures). Use sampling and analysis techniques for individual or complex odours and for point or diffuse sources, as appropriate.	Section 12.3
		Describe management and mitigation measures	
		Outline specifications of pollution control equipment (including manufacturer's performance guarantees where available) and management protocols for both point and fugitive emissions. Where possible, this should include cleaner production processes.	Section 12.4
	5 – Noise and vibration		
		Describe baseline conditions	
		Determine the existing background (LA90) and ambient (LAeq) noise levels in accordance with the NSW Industrial Noise Policy.	Section 10.2
		Determine the existing road traffic noise levels in accordance with the NSW Environmental Criteria for Road Traffic Noise, where road traffic noise impacts may occur.	Section 10.2
		The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including: a) details of equipment used for the measurements b) a brief description of where the equipment was positioned c) a statement justifying the choice of monitoring site, including the	Section 10.2

Key issues			Reference in the EIS
		procedure used to choose the site, having regards to the definition of 'noise sensitive locations(s)' and 'most affected locations(s)' described in Section 3.1.2 of the NSW Industrial Noise Policy d) details of the exact location of the monitoring site and a description of land uses in surrounding areas e) a description of the dominant and background noise sources at the site f) day, evening and night assessment background levels for each day of the monitoring period g) the final Rating Background Level (RBL) value h) graphs of the measured noise levels for each day should be provided i) a record of periods of affected data (due to adverse weather and extraneous noise), methods used to exclude invalid data and a statement indicating the need for any re-monitoring under Step 1 in Section 81.3 of the NSW Industrial Noise Policy j) determination of LAeq noise levels from existing industry.	
		Assess impacts	
		Determine the project specific noise levels for the site. For each identified potentially affected receiver, this should include: a) determination of the intrusive criterion for each identified potentially affected receiver b) selection and justification of the appropriate amenity category for each identified potentially affected receiver c) determination of the amenity criterion for each receiver d) determination of the appropriate sleep disturbance limit.	Section 10.3
		Maximum noise levels during night-time period (10pm-7am) should be assessed to analyse possible effects on sleep. Where LA1(1min) noise levels from the site are less than 15 dB above the background LA90 noise level, sleep, disturbance impacts are unlikely. Where this is not the case, further analysis is required.	Section 10.3
		Determine expected noise level and noise character (e.g. tonality, impulsiveness, vibration, etc.) likely to be generated from noise sources during: a) site establishment b) construction c) operational phases d) transport including traffic noise generated by the proposal e) other services.	Section 10.3
		Determine the noise levels likely to be received at the most sensitive locations (these may vary for different activities at each phase of the development). Potential impacts should be determined for any identified significant adverse meteorological conditions. Predicted noise levels under calm conditions may also aid in quantifying the extent of impact where this is not the most adverse condition.	Section 10.3
		The noise impact assessment report should include: a) a plan showing the assumed location of each noise source for each prediction scenario b) a list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site c) any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc.	Section 10.3

Key issues			Reference in the EIS
		d) methods used to predict noise impacts including identification of any noise models used. Where modelling approaches other than the use of the ENM or SoundPlan computer models are adopted, the approach should be appropriately justified and validated e) an assessment of appropriate weather conditions for the noise predictions including reference to any weather data used to justify the assumed conditions f) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario under any identified significant adverse weather conditions as well as calm conditions where appropriate g) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived h) an assessment of the need to include modification factors as detailed in Section 4 of the NSW Industrial Noise Policy.	
		Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures.	Section 10.3
		The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.	Section 10.3
		Where relevant noise/vibration criteria cannot be met after application of all feasible and cost effective mitigation measures the residual level of noise impact needs to be quantified by identifying: a) locations where the noise level exceeds the criteria and extent of exceedance b) numbers of people (or areas) affected c) times when criteria will be exceeded d) likely impact on activities (speech, sleep, relaxation, listening, etc.) e) change on ambient conditions f) the result of any community consultation or negotiated agreement.	Section 10.3
		For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.	Section 10.3
		Where blasting is intended an assessment in accordance with the Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990) should be undertaken. The following details of the blast design should be included in the noise assessment: a) bench height, burden spacing, spacing burden ratio b) blast hole diameter, inclination and spacing c) type of explosive, maximum instantaneous charge, initiation, blast block size, blast frequency.	Section 10.3
		Describe management and mitigation measures	
		Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise. This will include selecting quiet equipment and construction methods, noise barriers or acoustic screens, location of stockpiles, temporary offices, compounds and vehicle routes, scheduling of activities, etc.	Section 10.4
		For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative	Section 10.4

Key issues			Reference in the EIS
		measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers. Appropriate ameliorative measures may include: a) use of alternative transportation modes, alternative routes , or other methods of avoiding the new road usage b) control of traffic (e.g.: limiting times of access or speed limitations) c) resurfacing of the road using a quiet surface d) use of (additional) noise barriers or bunds e) treatment of the facade to reduce internal noise levels buildings where the night-time criteria is a major concern · f) more stringent limits for noise emission from vehicles (i.e. using specially designed 'quite' trucks and/or trucks to use air bag suspension g) driver education h) appropriate truck routes i) limit usage of exhaust breaks j) use of premium muffles on trucks k) reducing speed limits for trucks I) ongoing community liaison and monitoring of complaints m) phasing in the increased road use.	
	4 – Water		
		Describe baseline conditions	
		Describe existing surface and groundwater quality - an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).	Sections 13.2, 14.2, 15.2
		Provide site drainage details and surface runoff yield.	Section 13.2
		State the ambient Water Quality and River Flow Objectives for the receiving waters.	Section 13.2
		State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 Guidelines for Fresh and Marine Water Quality	Sections 13.2, 14.2, 15.2
		State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries or the NSW Salinity Strategy (DLWC, 2000)	Sections 13.2, 14.2, 15.2
		Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e .g. to assess whether a licensed discharge impacts on water quality objectives}, then prior agreement from the EPA on the approach and study design must be obtained.	Not applicable
		Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives Issues to include in the description of the receiving waters could include: a) lake or estuary flushing characteristics b) specific human uses (e .g. exact location of drinking water offtake) c) sensitive ecosystems or species conservation values d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc. e) an outline of baseline groundwater information, including, but not restricted to, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users	Sections 13.2, 14.2, 15.2

Key issues			Reference in the EIS
		and by the environment f) historic river flow data where available for the catchment.	
		Assess impacts	
		Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.	Sections 13.3, 14.3, 15.3
		Include a rationale, along with relevant calculations, supporting the prediction of the discharges.	Sections 13.3, 14.3, 15.3
		Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).	Sections 13.3, 14.3, 15.3
		Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).	Sections 13.3, 14.3, 15.3
		Identify any potential ·impacts on quality or quantity of groundwater describing their source.	Sections 13.3, 14.3, 15.3
		Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.	Sections 13.3, 14.3, 15.3
		Identify impacts associated with the disturbance of acid sulfate soils and potential acid sulfate soils.	Sections 13.3, 14.3, 15.3
		Containment of spills and leaks shall be in accordance with the technical guidelines section 'Bunding and Spill Management' of the Authorised Officers Manual (EPA, 1995). Containment should be designed for no-discharge.	Sections 13.3, 14.3, 15.3
		The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives. In particular the following questions should be answered: a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.	Sections 13.3, 14.3, 15.3
		Consult with the EPA as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The EPA will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.	Sections 13.3, 14.3, 15.3
		Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.	Sections 13.3, 14.3, 15.3

Key issues			Reference in the EIS
		Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.	Sections 13.3, 14.3, 15.3
		Describe management and mitigation measures	
		Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.	Sections 13.4, 14.4, 15.4
		Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.	Sections 13.4, 14.4, 15.4
		Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.	Sections 13.4, 14.4, 15.4
		Outline pollution control measures relating to storage of materials, possibility of accidental spills (e.g. preparation of contingency plans), appropriate disposal methods, and generation of leachate.	Sections 13.4, 14.4, 15.4
		Describe hydrological impact mitigation measures including: a) site selection (avoiding sites prone to flooding and waterlogging , actively eroding or affected by deposition) b) minimising runoff c) minimising reductions or modifications to flow regimes d) avoiding modifications to groundwater.	Sections 13.4, 14.4, 15.4
		Describe groundwater impact mitigation measures including: a) site selection b) retention of native vegetation and revegetation c) artificial recharge d) providing surface storages with impervious linings e) monitoring program.	Sections 13.4, 14.4, 15.4
		Describe geomorphological impact mitigation measures including: a) site selection b) erosion and sediment controls c) minimising instream works d) treating existing accelerated erosion and deposition e) monitoring program.	Sections 13.4, 14.4, 15.4
	5 – Soils and contamination		
		Describe baseline conditions	
		Provide any details that are needed to describe the existing situation in terms of soil types and properties and soil contamination.	Section 16.2
		Assess impacts	
		Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of: a) disturbing any existing contaminated soil b) contamination of soil by operation of the activity c) subsidence or instability d) soil erosion e) disturbing acid sulfate or potential acid sulfate soils.	Section 16.4
		Describe management and mitigation measures	
		Describe and assess the effectiveness or adequacy of any soil	Section 16.5

Key issues			Reference in the EIS
		management and mitigation measures during construction and operation of the proposal including: a) erosion and sediment control measures b) proposals for site remediation c) proposals for the management of these soils	
	6 – Waste and chemicals		
		Describe baseline conditions	
		Describe any existing waste or chemicals operations related to the proposal.	Chapter 4
		Assess impacts	
		Assess the adequacy of proposed measures to minimise natural resource consumption and minimise impacts from the handling, transporting, storage, processing and reprocessing of waste and/or chemicals.	Section 8.1
		Describe management and mitigation measures	
		Outline measures to minimise the consumption of natural resources.	Section 8.2
		Outline measures to avoid the generation of waste and promote the re-use and recycling and reprocessing of any waste.	
		Outline measures to support any approved regional or industry waste plans.	
	7 – Cumulative impacts		
		Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute.	Section 22.5
		Assess the impact of the proposal against the long term air, noise and water quality objectives for the area or region.	
		Identify infrastructure requirements flowing from the proposal (e.g. water and sewerage services, transport infrastructure upgrades).	
		Assess likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts (e.g. travel demand management strategies).	
F – list of approvals and licences			
		Identify all approvals and licences required under environment protection legislation including details of all scheduled activities, types of ancillary activities and types of discharges (to air, land, water).	Sections 1.4, 4.3
G – Compilation of mitigation measures			
		Outline how the proposal and its environmental protection measures would be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable .of complying·with statutory obligations under EPA licences or approvals (e.g. outline of an environmental management plan).	Chapter 24
		The mitigation strategy should include the environmental management and cleaner production principles which would be followed when planning, designing, establishing and operating the proposal. It should include two sections, one setting out the program for managing the proposal and the other outlining the monitoring program with a feedback loop to the management program.	Chapter 24
H – Justification for the proposal			
		Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.	Section 25.1

Table 3.4 NSW EPA comments on draft EIS

EPA Comment	Reference in the EIS
Garden Organics Facility	
1. Reception/sorting/preparation area	
a. The proposed maximum stockpile heights in the reception / sorting / preparation area.	Section 6.3.7
b. The layout of the reception/sorting/preparation area.	Section 6.3.2
c. Prevention/ mitigation/ rectification strategies to manage instances where the amount of material in the waste reception/sorting/preparation area is at or over capacity limits.	Section 6.3.7
d. Prevention/ mitigation/ rectification strategies to manage instances where the amount of material in the active composting area is at or over capacity limits.	Section 6.3.7
2. Breathable membrane covers	
A contingency plan if the breathable membrane covers fail to prevent offensive offsite odour or stormwater infiltration into the compost, resulting in leachate generation.	Section 6.3.3
Alternate Resource Recovery Treatment Facility	
3. Biofilter	
The depth, description and residence time of the biofilter medium	Section 6.4.1
4. Roller doors	
The number of doors and their use (i.e. for the receival or removal of material).	Section 6.4.1
An assessment of whether negative pressure can be maintained in the Composting Hall and Waste Receival/Processing Building given the projected number of daily truck movements into the Receival Hall.	Section 6.4.1
Landfill Operations	
5. Natural and artificial groundcover	
More details about when and where natural and artificial ground cover would be used to minimise exposed areas.	Section 6.2.7
General	
6. Operational Environment Management Plans	
Updated Operational Environment Management Plans. Currently sections within the Operational Environment Management Plans are marked as "to be updated as part of the 2014 EIS".	Appendix S Appendix T Appendix U Appendix V

Full details on the agency requirements and how they are addressed are also provided in the relevant specialist studies. Refer Volumes 2 to 5 – Appendices.

4. Description of the proposal site and existing facilities

This chapter describes the site location and ownership, the proposal site and surrounds. The chapter also describes the current licences and approvals, existing facilities and operations, and the existing environmental management and monitoring regime.

4.1 Proposal site location and ownership

The site of the proposal (referred to as 'the proposal site' for the purposes of the EIS) is located within the boundary of the existing LHRRP in the suburb of Lucas Heights. It is situated within the Sutherland local government area, approximately 30 km south west of the Sydney city centre. It is currently accessed from Little Forest Road, off New Illawarra Road. Approximately 55% of the LHRRP area is within the 1.6 km ANSTO buffer zone. Refer to Figure 4.1.

Specifically, the proposal would be located on:

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

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

The LHRRP refers to the entire Lucas Heights Resource Recovery Park. The boundary of the LHRRP is shown as the blue line on Figure 4.2. The proposal site refers to the areas where the proposal activities would be located. The boundary of the proposal site is shown as the red line on Figure 4.2.

The LHRRP consists of approximately 205 hectares (ha) in two ownerships. 89 ha is owned by SITA and 116 ha owned by ANSTO and leased to SITA for waste management or other agreed purposes. The ANSTO land comprises the land within the ANSTO buffer zone.

Little Forest Road access is also under a lease agreement. The LHRRP includes a number of facilities which are described in Section 4.3. These include SICTA and PCYC mini bike areas which are both under lease from SITA.

4.2 The LHRRP and surrounds

4.2.1 Existing

The LHRRP has access to several major roads, including New Illawarra Road, Heathcote Road and the M5 further to the north, which provides efficient access to the majority of the Sydney Metropolitan Region.

As shown on Figure 4.3, the following land uses are located in the immediate vicinity of the LHRRP:

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

Land uses in the surrounding area include:

- Holsworthy Military Reserve (to the north, west and south)

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

4.2.2 Potential future surrounding land uses

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

The western boundary of the proposed development is Heathcote Road and the Heathcote Ridge site extends east across Mill Creek to the edge of the existing Menai residential area close to New Illawarra Road. The location of the proposed Heathcote Ridge site is shown on Figure 4.3 as ‘potential future receptors’.

The GALC is seeking to list the Heathcote Ridge site as a State Significant Site and rezone the land to allow for:

- 566 ha of conservation land
- 182.7 ha of residential land, proposed to accommodate approximately 2,400 dwellings
- 51.4 ha of employment land, proposed to provide up to 4,700 jobs
- 17.2 ha of sports fields and other open space
- New roads, bridges and community facilities

Portions of this proposal were approved for development in September 2015. The remaining areas are yet to be approved.

A draft Voluntary Planning Agreement for the Heathcote Ridge project was issued in February 2013.

The GALC and the Australian Government also entered into an agreement to undertake a strategic assessment of the impacts of the proposed development on matters of national environmental significance under the EPBC Act.

A program report for the strategic assessment (GALC 2013) was development which sets out the planning, development and conservation guidelines and principles for urban development, associated infrastructure and conservation zones at the Heathcote Ridge site. In May 2013, the program report was endorsed under the EPBC Act.

In June 2013, the Australian Government granted approval for classes of actions under the endorsed program that allows for development and other related activities identified in the program to proceed without the need for further approval from the Australian Government environment minister.

LEGEND

Lucas Heights Resource Recovery Park boundary

ANSTO buffer boundary

Roads

Paper Size A4

0 250 500 1,000

Metres

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

N

SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 27 Apr 2015

Site location

Figure 4.1

15/133 Castlereagh Street Sydney NSW 2000 Australia **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

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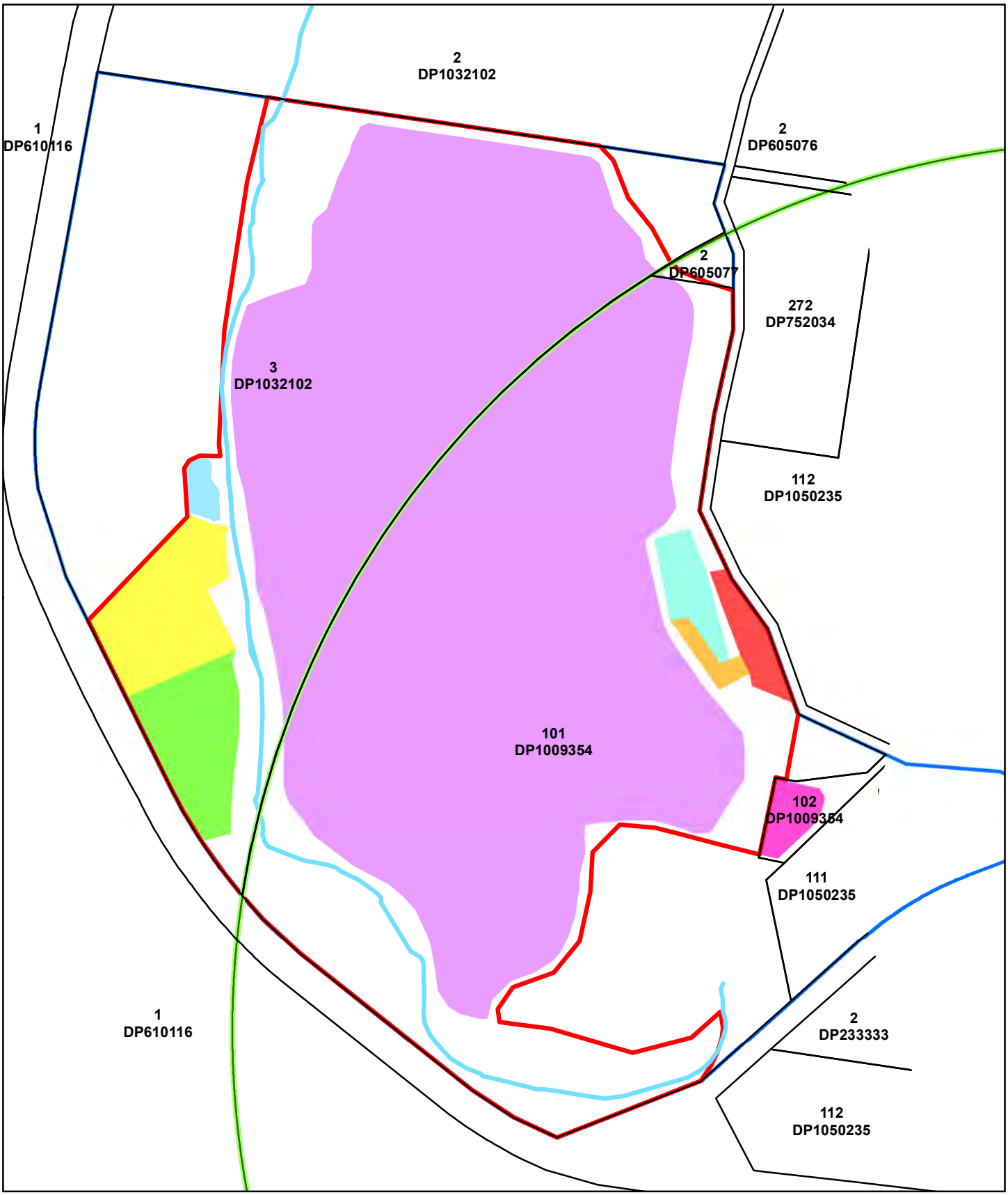
Aerial Imagery: Google, 2014. LHRRP Boundary: GHD, 2014. Roads/Suburbs: NSW LPMA 2012. Location Data: GEOSCIENCE AU 2014. Created by:jrichardson



LEGEND

- ANSTO buffer boundary
- Mill Creek
- Cadastre
- Proposal site boundary
- Lucas Heights Resource Recovery Park boundary
- Truck parking area
- Proposed GO facility
- Proposed ARRT facility
- Resource Recovery Centre
- Administration, operations and weighbridge
- Renewable energy generating facility
- Landform reprofiling boundary

Paper Size A4

0 45 90 180 270 360

Metres

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

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GHD

SITA Australia
Lucas Heights Resource Recovery Park

Job Number	21-23482
Revision	A
Date	25 Jun 2015

The proposal site

Figure 4.2

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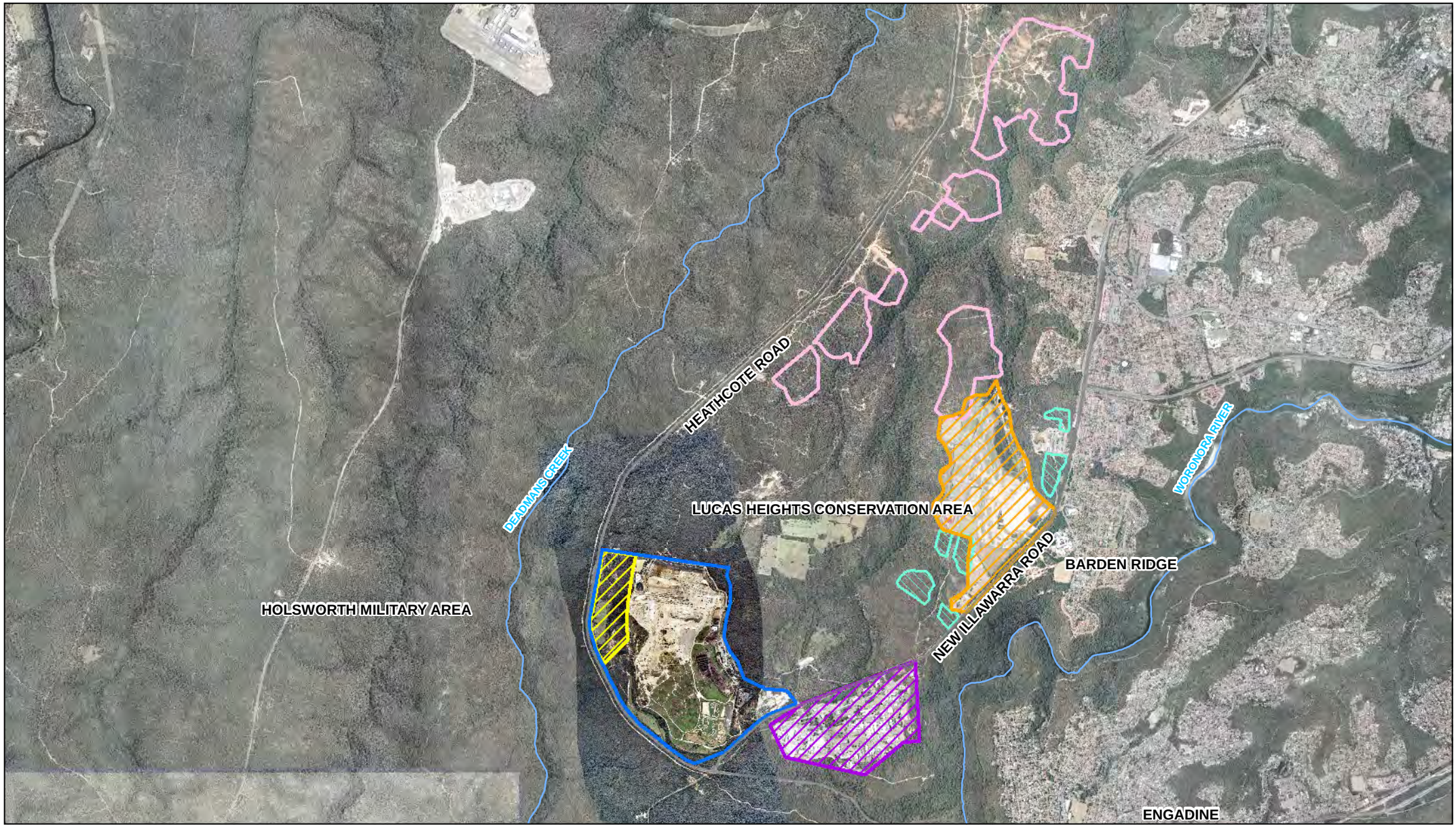
Aerial Imagery: ESRI, 2014. Works: GHD/SITA, 2014. Roads: NSW LPMA, 2012. Created by:afoddy



Paper Size A4

0 250 500 1,000 1,500

Metres

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

N

Legend

- LHRRP boundary
- SICTA boundary
- ANSTO
- Barden Ridge Sports Complex
- Potential future receptors
- Future receptors – Residential

SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision B
Date 14 Aug 2015

Surrounding landuses

Figure 4.3

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

4.3 Existing facilities and approvals

The LHRRP originally opened in 1987, based on a development consent received in 1985 permitting waste disposal operations.

A development application was submitted and approved in 1999 which permitted the expansion of waste disposal operations and also the development of composting and other resource recovery operations at the LHRRP. The final land-use was approved to be parkland over the majority of the LHRRP and also on-going composting and other resource recovery operations located on the eastern side of the LHRRP.

A further development application was submitted and approved in 2010 for an AWT facility, to treat up to 100,000 tonnes per year of municipal solid waste. The project did not proceed and the approved location at the south eastern extent of the LHRRP is considered no longer suitable for this purpose.

Prior to landfill activities commencing in 1987, the LHRRP site was used for logging and laterite gravel extraction.

Current facilities at the LHRRP include:

- Landfill (approved to receive up to 575,000 tonnes per year of Sydney's waste)
- Resource recovery centre and waste collection point
- GO facility for processing garden organics
- Renewable energy production (operated by Energy Developments Ltd)
- Truck parking area
- Community use areas

There are also several ancillary buildings and structures (e.g. weighbridge, machinery workshop, administration offices, stormwater and leachate dams). Leachate is transported to Lucas Heights 1 for treatment.

These are shown on Figure 4.4 and described below.

The LHRRP operates in accordance with the hours of operation detailed in Table 4.1 as stipulated in the current development consent.

Table 4.1 LHRRP operational hours

Activity	Day	Hours
Construction and landfilling operations	Monday - Friday	6 am - 4 pm
	Saturday and Sunday	8 am - 5 pm
Any other activity	Monday - Sunday	Anytime
AWT (never constructed) – see below		

The LHRRP is approved to receive up to 730,000 tonnes of waste per year for disposal, recycling and recovery. Table 4.2 depicts the activities approved and their respective waste receival tonnages.

Table 4.2 Summary of existing waste disposal/processing limits

Activity	Current approval (t/yr)
Landfill disposal	575,000
Resource Recovery Centre and GO facility	55,000
AWT facility	100,000
Maximum waste processed/disposed at the LHRRP	*730,000*

Landfill

The landfill accepts large quantities of general municipal waste (or mixed solid waste/ municipal solid waste) from various council kerbside collections. Local council collection vehicles, waste contractors providing council collection services and commercial waste contractors all deliver material to the LHRRP for disposal. Waste from various waste transfer stations operated by SITA is also disposed of at the LHRRP.

The maximum permissible acceptance rate to the LHRRP in accordance with the existing conditions of consent is currently 630,000 tonnes per year, comprising 575,000 tonnes of waste for disposal and 55,000 tonnes of material for recycling, which covers both garden organics processed on site and materials dropped off by businesses and residents at the resource recovery centre and waste collection point.

As at 1 January 2015, the landfill is estimated to have a further 4.32 million tonnes of capacity remaining.

A key part of SITA's environmental responsibilities is ongoing rehabilitation and long term management of closed landfill areas. Infrastructure located on site to manage the environmental aspects of waste disposal includes leachate collection ponds, stormwater basins, a biogas collection system and electricity generators (refer below).

AWT facility

Arising from the 2010 development application, the LHRRP is approved to receive 100,000 tonnes per year of waste for treatment at the approved AWT facility. This approval was based on a fully enclosed facility with buildings under negative pressure to prevent any untreated odour releases.

The approved hours of operation for the AWT facility are detailed below in Table 4.3.

As mentioned previously, this facility was not constructed and the nominated location is no longer considered to be suitable.

Table 4.3 AWT facility operational hours

AWT (never constructed)	Day	Hours
Construction	Monday - Friday Saturday Sunday & Public holidays	7 am – 6 pm 8 am – 1 pm Nil
Waste receipt, outdoor operations and product dispatch	Monday - Friday Saturday Sunday & Public holidays	6 am – 4 pm 8 am – 4 pm 6 am – 2 pm
Indoor operations	Monday - Friday	5 am – 9 pm
Biological plant, electricity generation plant, and emergency	Monday - Sunday	Anytime

Resource recovery centre and waste collection point

The resource recovery centre and waste collection point is an area for small vehicles to drop off recyclable materials including the following items:

- Recyclables e.g. used plastic containers, paper, cardboard, E-waste
- Ferrous metal e.g. washing machines, stoves, bicycles, scrap steel
- Hazardous items e.g. paint, vehicle batteries, engine oil, LPG gas cylinders
- Mattresses
- Old clothing

- Household rubble e.g. bricks, concrete, roof tiles and terracotta pipes (which are all processed for reuse on site)

Deposited items that cannot be reused or recycled are deposited in the waste disposal area. Up to 10,000 tonnes per year of these materials are currently dropped off each year in accordance with the LHRRP approved receival tonnages.

Garden organics facility

The current GO facility is located on the eastern side of the LHRRP. Here, garden organics collected from the kerbside from various local councils are received and processed. Householders and small businesses are also able to deliver garden organics to the facility. Open windrow composting is used on site to process the material into composts, mulches and other soil conditioning products. The facility also accepts clean untreated timber for recycling into mulches and biofuels.

Up to 50,000 tonnes of garden organics per year are currently approved in the EPL (and 55,000 tonnes permitted in the development approval) to be processed on site to produce composts that meet the quality requirements of Australian Standard AS4454: Composts, soil conditioners and mulches.

The GO facility produces a range of products suitable for mulching and compost applications. Compost products are extensively used in council works at sporting fields, wholesale nurseries and ornamental landscaping and in soil conditions, while mulch products are used as ground covers and rehabilitation media for agricultural, horticultural and restoration projects.

- Incoming garden organics is delivered to the receival, decontamination area and shredding area where gross contaminants are removed.
- The material is then stockpiled and water is added at this stage to maintain moisture levels and begin the composting process.
- The product is then moved by truck to the main composting area. During this phase the compost is turned regularly (every two weeks or monthly) and watered. The temperature of the piles is monitored regularly.
- After approximately four months the material is then formed into windrows for further maturation, turned and watered as required.
- The matured compost is then moved to the blending area where it is mixed with sand, small quantities of composted manure (composted before receival on site) and or bark etc. ready for sale.

The current GO facility process takes between 24 and 30 weeks to complete the process from delivery of garden organics to blending of matured compost.

Renewable energy production

The natural decomposition of organics in the deposited waste results in the production of biogas. Wells are constructed by drilling into the landfilled waste, located at intervals on the surface, and used to extract the biogas from deep within the waste mass. The biogas is collected by a series of header pipes and transported to the south-eastern corner of the waste disposal area. Here it is converted into electricity using large reciprocating engines that are specially designed to run on the landfill gas. The facility is currently operated under contract by EDL. The large-scale generation of renewable electricity from landfill gas in Australia was pioneered at the Lucas Heights site in 1994.

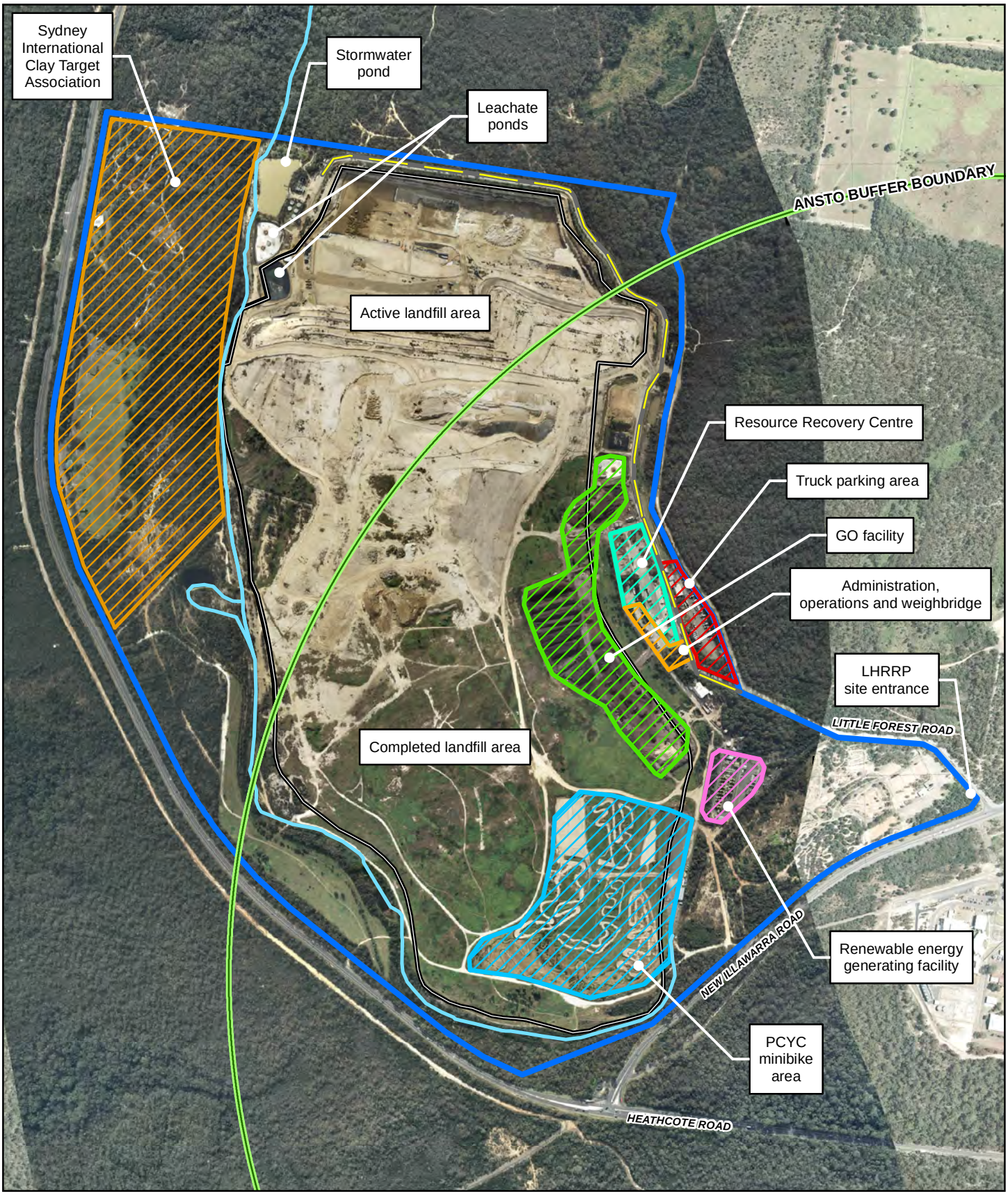
Truck parking area

A truck parking area was approved as part of Modification 6 of the consent in 2010. The truck parking area, with associated administrative office, workshop and utilities, is located near the eastern boundary of the LHRRP. Key components of the truck parking facility include:

- 32 truck parking bays on a hardstand impervious concrete surface
- 40 staff vehicle parking bays
- double bay workshop (with bund and grease trap) dimensions 18 m x 12 m x 7 m, with one bay having a roof height to allow a truck jacking hoist to lift a truck 2 m
- amenities (Administrative office / lunch room and toilets/change room) - two single story demountable buildings approximately 72 m^2 (12 m x 6 m) connected to the existing sewer
- stormwater system
- diesel fuel tank – 12,000 L capacity with bunding.

Community use areas

- In addition to the ongoing rehabilitation of areas where waste disposal activities have been completed, a number of areas of the LHRRP are currently being used by community groups. These include the mini-bike area at the southern extent of the LHRRP (run by the Sutherland branch of the Police Citizens Youth Club) and the Sydney International Clay Target Association (SICTA) which leases land from SITA and operates on an area on the north-western side of the LHRRP adjacent to Heathcote Road.
- A group of local volunteers also operates a plant nursery at the LHRRP. Endemic species are propagated on site and used for both on site rehabilitation and for supplying the local community with plants. During 2013, more than 5,000 plants were donated to various community groups participating in programs such as National Tree Day.



LEGEND

- ANSTO buffer boundary
- Internal access road
- Approved landfill footprint
- Lucas Heights Resource Recovery Park boundary
- Sydney International Clay Target Association
- GO facility
- Resource Recovery Centre
- Administration, operations and weighbridge
- Renewable energy generating facility
- PCYC minibike area
- Truck parking area

Paper Size A4

0 75 150 300

Metres

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

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GHD

SITA Australia
Lucas Heights Resource Recovery Park

Existing key infrastructure and facilities

Job Number	21-23482
Revision	A
Date	28 May 2015

Figure 4.4

15/133 Castlereagh Street Sydney NSW 2000 Australia **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

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

4.3.1 Historic and existing planning approvals

Initially, SSC was the consent authority for the LHRRP. In 1985, SSC granted approval for operation of the LHRRP (Consent No. 5482/85), commonly known as Lucas Heights 2. SSC also approved the upgrading of the entrance in 1996 (DA No 951337).

However, from 1999 onwards, the NSW Minister for Planning has determined all developments requiring approval. The consent granted by the Minister for Planning on 12 November 1999 (development consent DA No 11-01-99 consent ref R97/00029) applies to three contiguous areas being: Lucas Heights 1 (Ridge Sporting Complex), Lucas Heights 2 (the LHRRP) and the conservation area in between these sites. This consent also permitted expansion of the LHRRP's capacity by 8.225 million tonnes and extension of the landfill life to 31 December 2024 (noting the closure date would be earlier if the maximum permitted capacity is reached prior to this). The same consent also permits ongoing resource recovery operations at the LHRRP and capping and landscaping to permit the creation of an adjacent parkland facility for passive recreation for community use. It included long time environmental monitoring requirements in accordance with an EPL.

WSN (the previous operators) and SSC had also entered into a Deed of Agreement in 2000 that set out the respective responsibilities in relation to activities at the LHRRP, as well as at Lucas Heights 1.

Since 1999 there have been a number of modifications to the conditions of consent (e.g. to remove restrictions on the sources of waste), and the LHRRP has been used for disposal of significant quantities of waste from outside the southern Sydney council areas. Those modifications to the consent were granted by the Minister for Planning.

There have been other modifications to the consent in regard to the Ridge Sporting Complex. The following modifications to the consent relate to the LHRRP site.

Modifications to the current consent

- 5 June 2001 – Limits on amounts of waste received per annum and restrictions on access road to be used
- 21 April 2005 – Reduction in number of dams on site, modification of other dams
- 22 Sept 2005 – Removal of restriction to source 80% of waste from SSWPMB region
- 26 July 2010 – Truck parking area modification for up to 32 waste collection trucks, and associated internal access roads, administration office and utilities
- 8 December 2010 – Additional excavation of Stages 5-2 and 5-3 and subsequent stockpiling of soil

Other consents

- Part 3A of the *Rivers and Foreshores Improvement Act 1948*, permit for Mill Creek rehabilitation works
- Approval in 2010 for an AWT facility to process up to 100,000 tonnes of municipal solid waste per year in the south-western area of the LHRRP. The location of this proposed facility is no longer considered suitable.
- Operation of a mini-bike club on a portion of the LHRRP site, operated by the Police Youth Citizens Club (PCYC)
- Operation of landfill gas engines for electricity generation

4.4 Environmental context

4.4.1 Geology

The LHRRP is located on the dissected Hawkesbury sandstone of the Woronora Plateau, which was uplifted during the Triassic Period such that it now dips downwards in a northerly direction and forms part of the Sydney Basin.

The dominant surface geology is made up of Hawkesbury Sandstone, which is approximately 200 m thick in the Lucas Heights region. It is a medium to coarse grained sandstone and consists of a series of lenticular (and therefore laterally discontinuous) beds of quartz sandstones. The thickness of the individual beds varies up to a maximum of around 15 m with beds generally around 1.5 to 3 m thick. The sandstone formation dips in a northerly direction and contains two sets of tectonic joints, which control the drainage for Mill Creek and Bardens Creek.

Although the dominant lithology is Hawkesbury Sandstone, the formation also includes significant minor components of Wianamatta Shale and siltstone. The shales and siltstones generally occur in relatively thin units frequently interbedded with sandstones, but thicker units are present and are estimated to make up approximately 5% of the total thickness. The largest occurrence of shale, several metres thick, is in the Little Forest area, near the LHRRP.

4.4.2 Soils

The LHRRP is part of the Gymea Soil Landscape, with soils up to 1.5 m deep. They are formed from sandstone and shale parent material, and consist of a surface layer of sand and subsurface layers of sandy clay and clay. The soils are highly permeable, with very low general fertility. Outcrops of Hawkesbury sandstone are found within the region. A small amount of sandstone bedrock is exposed within the LHRRP as a result of soil erosion.

4.4.3 Topography, hydrology and drainage

The local region is characterised by gently undulating rises and low hills. The LHRRP slopes gently to the north east, with elevations ranging from 150 to 160 m AHD. To the north west of the LHRRP, two ridges run parallel to Heathcote Road and form a shallow valley in between.

The ridges are higher to the south, forming the upper reaches to three creeks: Mill Creek, Bardens Creek and Lucas Heights 1 Creek (also known as Mill Creek Tributary and Pym's Creek). All three creeks flow in a northerly direction. Bardens Creek and Lucas Heights 1 Creek flow into Mill Creek, which in turn flows into the Georges River near Alfords Point and finally into Botany Bay.

Nearby watercourses include Deadmans Creek (approximately two kilometres west of the LHRRP), and Williams Creek (3.3 km to the west), which are also tributaries of the Georges River. To the south of the LHRRP, on the other side of Melinga Molong Ridge, Fire Creek flows east into the Woronora River.

The topography of the LHRRP has been changed due to past land filling activities. Two ridges dissect the LHRRP forming a valley that gently slopes towards Mill Creek. The slope becomes steeper as approaching Mill Creek.

4.4.4 Climate and meteorology

The local climate is similar to that of the broader Sydney metropolitan region with warm to hot summers and cool to mild winters.

The mean daily maximum temperatures range from 26°C in summer to 16°C in winter, and the mean daily minimum temperatures range from 17°C in summer to 7°C in winter. The Lucas

Heights area experiences significant diurnal and seasonal variations in meteorological conditions.

According to meteorological data collected by ANSTO, the average rainfall in the region is 1,017 mm (Bureau of Meteorology). Average monthly rainfall ranges from between 53 mm and 112 mm, and the driest months are in winter and early spring, with the higher rainfalls experienced between November and March.

For much of the year, winds are of light to moderate strength, increasing in the afternoons. The winds are generally stronger during winter and spring and lighter during summer and autumn. Wind direction is predominantly from the south west and south east, with south easterlies present in summer and autumn and south westerlies present in winter. Winds occur from most directions in spring.

4.4.5 Vegetation and landscape

The LHRRP site is located in the upper catchment of Mill Creek, which flows northwards to the Georges River. Remaining native vegetation comprises Scribbly Gums and Red Bloodwood around the boundaries and within the leased SICTA site. An area of shale / sandstone transition forest is preserved in the north-east corner of the LHRRP.

4.5 Environmental management and monitoring

Management of activities at the LHRRP is currently undertaken in accordance with the LHRRP environmental management plan, which specifies goals and principles, management strategies, management and monitoring activities and frequencies, performance indicators and targets, responsibilities and reporting and review requirements for:

- Surface water management
- Leachate management
- Landfill gas management
- Odour control
- Dust control
- Litter control
- Noise control
- Pest, vermin and noxious weed control
- Emergency preparedness.

Monitoring activities incorporate surface water, leachate, landfill gas, groundwater, dust, noise and other environmental performance indicators in accordance with the LHRRP's EPLs and the LHRRP environmental management plan. The monitoring regime is shown in Table 4.4.

Table 4.4 Current operational monitoring procedures at LHRRP

Aspects	Existing monitoring requirements for LHRRP
Air quality	Subsurface gas monitoring is carried out at six locations on a quarterly basis.
	Surface gas and accumulation monitoring is carried out on a bi-monthly basis based on a 100 m spaced grid format.
	Dust monitoring is taken at six designated locations on a monthly basis.
Surface water	Surface water is monitored on a monthly basis at 6 designated locations. Surface water is externally monitored at 3 locations on a quarterly basis.
	Surface water is monitored and lab sampled within 24 hours following wet weather at 9 designated locations.

Aspects	Existing monitoring requirements for LHRRP
	The surface water stored in the sediment dam 5 is monitored and lab sampled prior to controlled discharge. The licence discharge point is monitored and lab sampled during this discharge. Sediment Dam 5 is externally monitored on a quarterly basis.
Groundwater	Groundwater monitoring is carried out at 8 separate locations on/around site. Sampling is carried out on quarterly and yearly basis with varying parameters.
Odour	Odour is constantly monitored on site during daily inspections. Odour monitoring patrols are also initiated subject to complaints being received.
	Any discharge of leachate to surface water is against licence conditions. Leachate is transferred to Lucas Heights 1 (Closed Landfill) and treated and discharged to Sydney Water Corporation Sewer under Trade Waste Licence 13749.
	The leachate dam is externally monitored on a quarterly basis.
Noise	Noise monitoring is carried out on a quarterly basis at 5 specified sites.
Pest, vermin and Weed Control	Pest, vermin and weed control is carried out in conjunction with SSC and privately on-site as required.

4.6 Environmental performance of existing operations

4.6.1 Surface and subsurface gas

It is estimated that the landfill gas management system currently captures approximately 67% of methane generate by the landfill for combustion and energy generation purposes. This is above the current the average methane capture rate for landfills in New South Wales, which is approximately 37%.

Subsurface gas monitoring is undertaken at six locations on a quarterly basis and surface gas and accumulation monitoring on a bi-monthly basis. Recent historical annual returns submitted to the EPA have indicated exceedances of the EPL monitoring criteria for methane levels at one subsurface monitoring point. SITA has been undertaking action to address this issue since acquiring the site in 2011. The frequency of accumulation gas monitoring in surrounding buildings on site was increased and have shown no build-up of gas. Surface methane levels have indicated exceedances in recent historical annual returns submitted to the EPA. These annual returns incorrectly recorded landfill gas at, or around, faulty gas infrastructure, which has since been repaired. Since SITA's acquisition of the site surface emissions of landfill gas have been significantly reduced, as reflected by the decreased number of odour complaints received in the past two years. This has been assisted by the recent installation of twenty nine additional landfill gas collection wells at the LHRRP.

Both WSN (the previous operator of the LHRRP) and SITA have undertaken a number of required actions to control methane emissions. SITA is also proposing to undertake additional works to control methane emissions at the monitoring point that is triggering reporting levels and at the surface of the capped areas of the LHRRP. These works include:

- Installation of additional dual gas wells, associated pipework and leachate pumps at Cells 5.1, 5.2 and 4.3 to improve landfill gas capture in areas identified for improvement.
- Monthly maintenance works including repair and servicing to site equipment and infrastructure as required to ensure gas field compliance.
- Monitoring of gas field performance, repair, service and maintenance of the gas field and associated equipment and infrastructure.

- Installation of additional gas wells and associated pipework as required from monitoring work.

4.6.2 Dust

Dust monitoring is undertaken monthly at six locations around the boundary of LHRRP. Between February 2011 and February 2013, there were no monthly exceedances of the dust deposition criteria at three of the monitoring locations. However, in this period the 4 g/m^2/month total dust deposition criteria has been exceeded at two points (at the northern and western boundaries) on three occasions, and at one other point on nine occasions.

Elevated dust levels at these three locations are temporary, and most likely due to large scale excavation works being undertaken in close proximity to these dust deposition gauges. The excavation works are scheduled for completion by mid 2017, or sooner, which would likely reduce dust to similar levels to those measured at other gauges and those which occurred before 2011, when major excavation activity commenced in this part of the LHRRP.

4.6.3 Surface water

Mill Creek has been modified in the past to flank the north-western edge of the landfill. As such, the creek does not have a natural appearance over much of its length. Bunding has been used to isolate Mill Creek from surface water run-off from the landfill. All stormwater flowing from the finished areas of the landfill is directed into a surface water management system before being discharged to the Creek at the down gradient (northern) end of the landfill. Leachate generated by the landfill is separately managed and is isolated from the LHRRP surface water system. Leachate is not discharged to Mill Creek, but is pumped to Lucas Heights 1 for treatment and sewer discharge.

The existing surface water system comprises:

- Main sediment and water reuse basin at the north western corner of the LHRRP which has a total capacity of 32 ML
- Western sediment and water reuse basin with 4 ML capacity
- PCYC basin with 2.8 ML capacity
- Stormwater drains and diversion drains
- Sediment traps

In order to gain understanding of the existing baseline conditions of water quality of the major water receptor, Mill Creek, GHD undertook an aquatic ecosystem survey (refer Appendix H). The purpose of the investigation was to examine if any impacts to aquatic macroinvertebrates, a well-known indicator of river health, may be occurring in the habitats downstream of the LHRRP.

For the existing site, surface water run-off has on occasion been influenced by leachate. SITA have been undertaking works to improve site operations to resolve this situation. The aquatic ecosystem survey report included an assessment of the magnitude and extent of any impacts resulting from any landfill leachate seepage entering the surface water system and subsequently being discharged from the LHRRP. It concluded that the water quality and macroinvertebrate communities in Mill Creek are revealing minimal signs of impairment.

The assessment also found that while the LHRRP (including this potential batter seepage) may be causing minor impacts on the aquatic and riparian habitat of Mill Creek close to the LHRRP, the recovery of habitat condition at locations further downstream of the LHRRP suggests that any impacts are spatially limited. It concluded that that the natural condition of the surrounding catchment downstream would minimise impacts to the Georges River receiving environment.

It is noted that River Health Monitoring Program (refer section 13.2.4) monitors three important ecological indicators to provide an assessment of catchment health; water quality, vegetation and macroinvertebrates and that the findings of this program were that Mill Creek was in excellent condition downstream of the LHRRP.

4.6.4 Groundwater

Groundwater is currently sampled on a quarterly basis from 13 monitoring bores (eleven of which correspond with the EPL requirements for groundwater monitoring). The Groundwater Assessment Report (Appendix I) provides an assessment of water quality monitoring data, previous investigations and review of the landfill management systems.

The Groundwater Assessment Report concludes monitoring results suggest that the hydrogeological and landfill management systems currently result in minimal impacts to groundwater and that there is minimal or no migration of leachate via groundwater to down gradient receptors such as Mill Creek.

4.6.5 Leachate

The main storage for leachate generated by the landfill is within a HDPE geomembrane lined dam, located in the north west corner of the LHRRP. The main leachate dam has a storage capacity of 9,000 ML and includes mechanical aerators. Here leachate can be aerated before being transported to a treatment plant located at nearby Lucas Heights 1.

A double lined (900 mm compacted clay and HDPE geomembrane) emergency leachate storage dam was constructed adjacent to the main dam in mid-2014 by SITA. This dam has a design storage capacity of 9.2 ML. The total capacity, including within the freeboard volume, is 10.2 ML.

There are also five 100 kL leachate tanks adjacent to the main leachate dam.

A leachate extraction system is in place and works in tandem with the landfill liners and other leachate collection systems to manage and treat leachate generated by the landfill. The extraction system includes a range of underground pipe systems and over 100 extraction wells that control the collection of landfill leachate within the landfill.

The primary sources of leachate are:

- LHRRP (Lucas Heights 2)
  - Landfilled waste
  - Groundwater collection system
  - Leachate impacted surface water
- Lucas Heights 1 landfilled waste (generates 277 kL/day on average)
- Harrington's quarry (generates an average of 20 kL/day during wet periods and 10 kL/day during dry periods)

Over the past seven years the recorded average leachate collection rate varied from 266 to 426 m^3/day.

The existing leachate treatment system is a sequencing batch reactor (SBR) treatment system that discharges directly to sewer at Lucas Heights 1. This system has a current leachate treatment capacity of 570 kL/day. The current annual average sewer discharge limit is 800 kL/day at a maximum daily discharge of 1,500 kL, in accordance with the Trade Waste Agreement.

4.6.6 Odour

A review of odour complaints at the LHRRP from January 2001 to the end of 2014 indicate that the years 2013 and 2014 had the lowest number of odour complaints in the last 10 years with 28 and 16 complaints respectively. The majority of the odour complaints occurred in autumn and winter during stable weather conditions and were sourced from the surrounding suburbs of Engadine, Menai and Barden Ridge with the complaints location on average 3 to 5 km from the LHRRP. Most complaints described the odour as rotting garbage/ gassy / rotten eggs (which would be attributed to landfill operations) and have been registered to have occurred early morning (6 to 9 am) and evening (6 to 9 pm).

SITA has reacted to the complaints that occurred in 2013, and taken action to modify the operations of the facility. The lower level of complaints in 2014 is attributed to progress made during this period. Chapter 12 describes the improvements that have been made and further proposed to existing operations which would further reduce the potential for odour impacts from the proposal site. This also includes improvements relating to landfill gas described in Section 4.6.1.

4.6.7 Noise and vibration

A preliminary review of noise monitoring data provided by SITA shows that LHRRP operations were not audible for any of the monitoring events at locations off site. Furthermore, SITA provided GHD with a summary of noise complaints at the LHRRP from July 2013 to the end of 2014. One noise complaint was received during this period (in September 2013) and no noise complaints were received throughout 2014. This indicates that noise is not likely to be an issue moving forward.

There are no known vibration complaints made in relation to activities at the LHRRP. Blasting activities associated with current activities would be completed prior to construction of the proposal.

Part B
The proposal

5. Strategic proposal justification

This chapter summarises the strategic framework that influenced development of the proposal, including the waste strategies at the metropolitan, regional, state and national levels. It also describes the need for the proposal and the alternatives that were considered and assessed during the proposal development process.

5.1 Proposal need

5.1.1 Reprofiling and additional landfill airspace

Planning for future waste disposal capacity for Sydney

There are currently two main active putrescible waste landfills in Sydney, the landfill at the LHRRP (expected to close in 2024) and the landfill at the Eastern Creek Resource Recovery Park (ECRRP), which is expected to close in mid-2018. The ECRRP landfill is already receiving approximately 60,000 tonnes per year of additional waste resulting from the closure of the Belrose landfill in late 2014, which has brought forward its closure date from its originally forecast closure date of 2017.

Both landfills play strategically important roles in Sydney's waste disposal network and receive approximately equal tonnages of putrescible waste each year (approximately half a million tonnes each). All other putrescible waste from Sydney (about half a million tonnes per year) is sent by train to the Woodlawn landfill near Goulburn. Putrescible waste includes waste from both municipal and commercial and industrial sources.

The LHRRP landfill has the longest life expectancy of the two landfills in the Sydney region that are currently receiving Sydney waste and it is a critical part of Sydney's waste infrastructure. Should the LHRRP cease to receive waste in 2024 (or possibly sooner), an alternative disposal location would be required for municipal waste generated within the Sydney basin beyond this time.

Unless additional local capacity can be provided, all of Sydney's putrescible waste would need to be transported to Woodlawn for disposal from 2025 onwards. There is no other approved landfill site within the Sydney region. This creates a potentially risky situation, in that there would be no disposal option for all of Sydney's putrescible waste (currently more than 1.5 million tonnes per year) if for some reason, it was not possible to transfer and dispose of waste to this single long distance landfill. This is further discussed later in this chapter.

The proposal provides landfill capacity (a further 8.3 million cubic metres) and hence sufficient time for another major landfill to serve Sydney to be identified, planned, approved and developed. Typically, this process could take more than 10 years, so would have needed to commence before 2014 for a new landfill to be ready to replace LHRRP before the proposed closure date.

This has not occurred, and the proposal would ensure that Sydney's waste disposal arrangements are not interrupted, and that planning for another major landfill or alternative facilities (possibly major energy from waste facilities) can proceed in an orderly way. The extra 12 years of landfilling capacity provided by the proposal would provide additional time, which would make it more likely that suitable facilities are available to manage Sydney's waste by 2037 (when the LHRRP would close under the proposal).

Accommodating delays in provision of new AWT infrastructure

To meet the NSW Government's strategy objectives, and reduce the costs of landfilling, various alternative waste technology facilities have been constructed in NSW over the past few years. However, the rate at which these facilities are being developed and implemented has lagged behind what was envisaged in developing the NSW Waste strategy.

For instance, there have been no new AWT facilities developed in Sydney since 2009, when SITA opened its Kemps Creek facility. The proposed ARRT facility would be the first new facility constructed in NSW since that time. By the time that the facility is completed and operating, more than 7 years would have passed. The overall waste generated within the Sydney Metropolitan Area (SMA) would have increased by approximately 1.2% per annum during this time, according to SKM (2014), in modelling undertaken by SKM to inform the WARR Strategy.

In 2011, a combined total of approximately 5.8 million tonnes of municipal solid waste and commercial and industrial waste was generated in the SMA. By 2017, after 6 years at an annual growth rate of 1.2%, annual waste tonnages would have increased to approximately 6.38 million tonnes per year. This means that an extra 0.58 million tonnes of waste per annum would need to be accommodated somewhere.

Accommodating Sydney population growth

Population increase is an important consideration in relation to future waste disposal capacity. The population of Sydney is expected to increase by approximately 1.9 million people (ABS 2013) from 2015 to the end of 2037 (i.e. over the proposal's operational life). As at 2015 the quantity of waste generated in Sydney is expected to be approximately 12.7 million tonnes, with each person contributing on average approximately 2.65 tonnes per year (DECCW 2011). By 2024, when LHRRP is currently scheduled to close, over 14 million tonnes of waste may possibly be generated in Sydney and require disposal annually. By 2037, almost 18 million tonnes of waste may be generated annually, a 50% increase on current levels.

Over the operational life of the proposal an additional approximate 58 million tonnes of waste is expected to be generated in Sydney, due to the expected population increase. This additional waste will require the introduction of additional waste recovery facilities to reduce the increasing quantity of waste that would otherwise require disposal.

This is illustrated in Figure 5.1 which shows the projected total waste generation in Sydney over the life of the proposal (to 2037) assuming no population increase and the waste generation based on ABS (2013) population projections. This includes all waste streams – municipal, commercial and industrial and construction and demolition. The waste is either recovered, recycled or disposed at landfill.

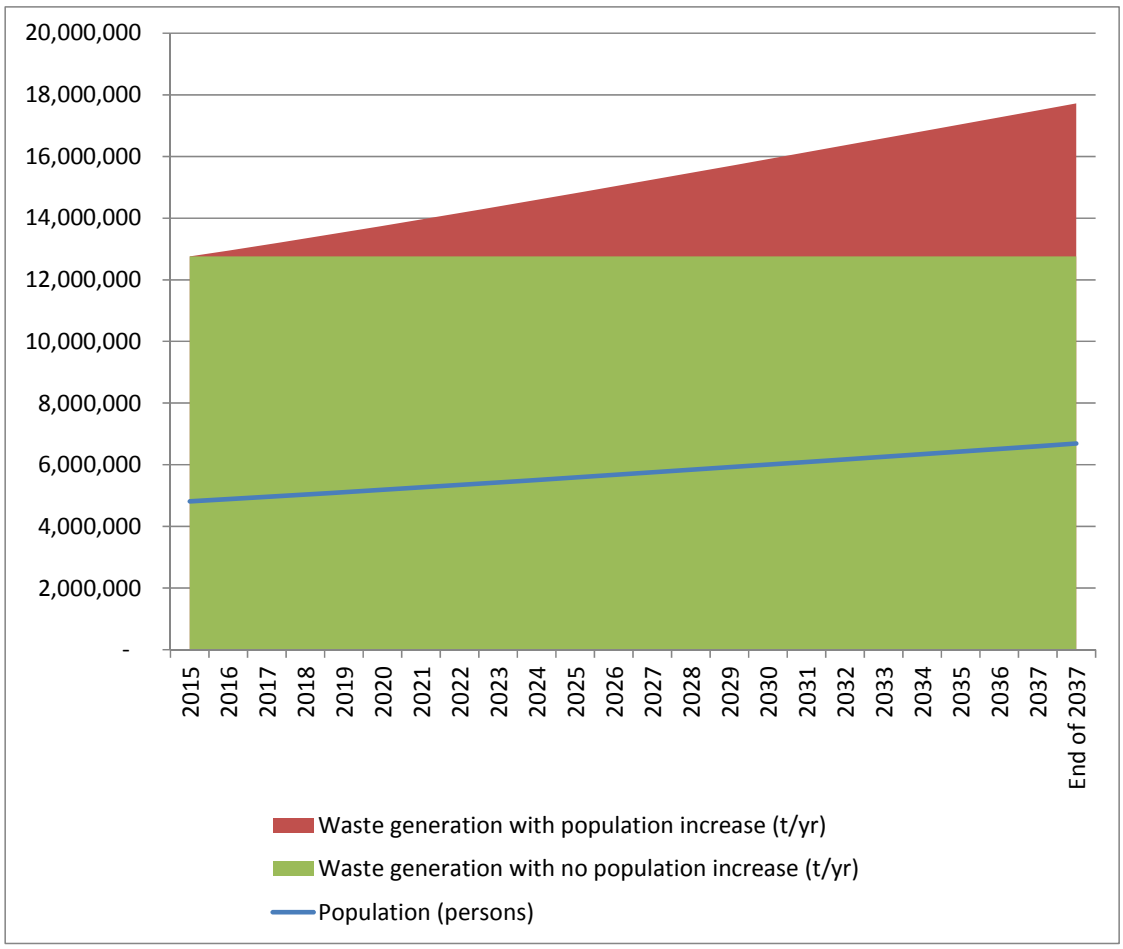


Figure 5.1 Projected waste generation in Sydney with population increase

Providing emergency waste disposal capacity for Sydney after 2024

The proposed closure of the ECRRP after 2018 would mean that Sydney is dependent on two landfills for disposal of putrescible waste from both municipal and commercial and industrial waste streams, at the LHRRP and at Woodlawn. The latter currently requires almost half a million tonnes of waste to be loaded into rail containers at Clyde Rail Yards per year. Woodlawn has approval to accept up to 1.13 million tonnes per year as well as approval for a new rail terminal at Banksmeadow for up to 0.5 million tonnes per year. This waste is loaded throughout the day and transported overnight to Woodlawn. The containers are then transferred from train carriages to trucks at Crisps Creek and the contents of the containers are disposed of at the landfill using a mechanical truck tipping arrangement.

While the Woodlawn long haul disposal arrangement functions effectively, there are a number of possible scenarios under which the transport of waste to Woodlawn (which must occur daily due to limitations on the number of rail cars available and logistics of transport), could be interrupted for more than a few days. These include a critical breakdown of waste container loading equipment at Clyde, rail track issues (such as a derailment of the waste train or another train using the same track, malfunctioning of unloading equipment at Crisps Creek, a major bushfire at Crisps Creek causing damage to the facilities, malfunctioning of the unloading equipment at Woodlawn, or a problem at the landfill, such as a major fire.

This type of situation (however unlikely) would potentially be accommodated at present by directing Woodlawn's waste temporarily to ECRRP and LHRRP. After the closure of ECRRP in 2018, any putrescible waste unable to be transported to Woodlawn would need to be directed to LHRRP. If LHRRP is closed after 2024, however, there would be no location to dispose of this waste in the event of a situation making it impossible to dispose of waste to Woodlawn.

If a situation arose with the rail line, such as a derailment, it would be theoretically be possible to transport waste to Woodlawn using semitrailers or B doubles. However there may not be enough suitable trailers/vehicles available to make this possible, since to replace one train would require a large number of trucks (potentially 50 trucks per day currently, rising to 100 trucks a day once one million tonnes of waste is received at Woodlawn per year).

The proposal would provide the physical and operational capacity for emergency putrescible waste disposal for Sydney from 2025 until 2037 should it be required.

The proposal also provides landfill disposal capacity for waste generated due to population increases, should the NSW government resource recovery targets nominated in the (EPA 2014a) 'Waste Avoidance and Resource Recovery Strategy 2014-21' not be achieved.

Disposal site for ARRT residuals

The proposal provides a solution for disposal of residuals from the proposed ARRT facility, which would likely be operating until 2037. On-site disposal of these residuals is preferable to transporting the residuals to another site.

Environmental improvements

An assessment of the approved final landform for the LHRRP was undertaken which identified that the landform was not sufficiently graded in some sections to provide proper drainage, and that this situation could potentially worsen as the landfill surface settles over time. The proposed reprofiling of the landfill would provide additional capacity and would also improve the environmental performance of the landfill. Increasing the final slope gradients would assist in surface water run-off and decrease the volume of leachate potentially generated from the landfill in the longer term.

Reprofiling the landfill and placing a final cap over areas that only had intermediate cover until now would also assist with more efficient collection of the gas generated by natural decomposition of deposited waste and reduce the potential odour and greenhouse emissions from the proposal site.

5.1.2 Garden organics facility

Sydney is experiencing significant population growth, particularly in the south western region. This is expected to result in an increase in garden organics being generated. There are also substantial seasonal fluctuations in garden organics generation, with significantly higher flows in the summer months.

There are limited processing sites within the Sydney basin, which is putting greater pressure on existing sites to accommodate the current and future demand for garden organics processing. The current GO facility is operating at full capacity and has a limited site area, meaning that it is not ideally suited to operating at this level. The garden organics expansion would increase the processing capacity to 80,000 tonnes per year, and would give SITA greater flexibility to reduce potential odour impacts from the facility and meet growing market demand and waste reduction targets.

The relocation and expansion of the GO facility also provides an opportunity for SITA to invest in additional infrastructure to improve environmental performance. The relocated and expanded GO facility would include partial enclosure, active aeration and covering of the waste during the first four weeks of the active composting process to enable more effective control of odour.

5.1.3 ARRT facility

The ARRT facility is proposed to address a growing need by local government for alternative ways to process waste, extract resources and reduce waste disposal. Establishment of the

200,000 tonne per year ARRT facility is also being facilitated by the waste and environment levy. This is one of a number of resource recovery projects being proposed by SITA both at the LHRRP and across its Sydney network of facilities.

The new fully enclosed ARRT facility would provide an additional option for the management of putrescible waste in Sydney. As well as this, the ARRT facility could potentially divert up to 70% of municipal waste from landfill. SSC, as well as other Sydney councils would be able to have their municipal waste processed by the ARRT facility. There are currently not enough facilities to enable municipal waste from all Councils in Sydney to be processed for resource recovery.

5.2 Consistency with Government policies and objectives

5.2.1 National waste policy

In 2009 the Australian Government released the 'National Waste Policy: Less Waste More Resources' (Environment Protection and Heritage Council, 2009). The National Waste Policy, which was adopted on 5 November 2009, builds on the 1992 National Strategy for Ecologically Sustainable Development and attempts to reduce the environmental impact of waste disposal. The policy sets the direction for waste management in Australia over the next 10 years, aiming to produce less waste for disposal and manage waste as a resource to deliver economic, environmental and social benefits. The policy establishes a comprehensive program for national coordinated action on waste across six key areas, being to:

- Provide a coherent, comprehensive national framework for waste management, resource recovery and waste avoidance over the next decade.
- Enable Australia to meet its international obligations in regards to the management of hazardous wastes and substances and persistent organic pollutants into the future and reduce the risk and legacy for future generations.
- Address market impediments and streamline the regulatory frameworks so that national companies and small businesses can operate effectively and efficiently and manage products and materials responsibly during and at end of life.
- Provide national leadership on waste and resource recovery where it is needed and facilitate collaboration between the states on national issues.
- Contribute to climate change, sustainability, innovation and employment opportunities.
- Be high impact and cost effective by setting clear national directions and through collaborative, carefully targeted action that incrementally builds on the existing efforts of governments over a ten year period.

The overall objectives of the National Waste Policy are that all wastes, including hazardous wastes, are managed in a way that is consistent with Australia's international obligations, to protect human health and the environment. The policy also seeks to ensure that risks associated with waste are understood and managed to minimise intergenerational legacy issues.

The proposal includes reprofiling of the landfill landform to provide additional capacity and improve environmental outcomes. It also includes the expansion of a resource recovery facility (the GO facility) and a new resource recovery facility (the ARRT facility) to reduce waste to landfill and produce a product that can be beneficially used (compost). The proposal is consistent with the aims and objectives of the National Waste Policy as it would:

- Manage waste as a resource.
- Deliver economic, environmental and social benefits.

- Contribute to sustainability, innovation and employment opportunities.
- Protect human health and environment

5.2.2 State waste policy

The NSW strategic policy framework for waste management incorporates policy to drive waste reduction and resource recovery. The framework has been strengthened with legislation to streamline development of waste management infrastructure and a strategy to provide for increasing resource recovery. These include the *Waste Avoidance and Resource Recovery Act 2001* and associated Strategy 2014-21 (EPA 2014a).

'NSW 2021: A plan to make NSW number one' is a 10 year plan for NSW. The plan identifies reducing waste generation and keeping materials circulating within the economy as priorities for NSW. A state-wide waste avoidance and resource recovery strategy is prepared every five years to address this priority. The latest strategy is the 'NSW Waste Avoidance and Resource Recovery Strategy 2014-21', which provides the framework for maximising conservation of natural resources and minimising environmental harm from waste management and disposal of solid waste. The draft strategy proposes long-term directions for waste in NSW and includes targets for:

- Avoiding and reducing waste generation
- Increasing recycling
- Diverting more waste from landfill
- Managing problem wastes better
- Reducing litter
- Combating illegal dumping

Relevant to the proposal are the following targets:

- By 2021-22, increase recycling rates for:
  - Municipal solid waste to 70 percent
  - Commercial and industrial waste to 70 percent
  - Construction and demolition waste to 80 percent
- By 2021-22, increase waste diverted from landfill to 75 percent

The proposed facility would assist the State in achieving the increased recycling rates and landfill diversion targets listed above. The proposal is consistent with the *NSW Waste Avoidance and Resource Recovery Act 2001* and 'Waste Avoidance and Resource Recovery Strategy 2014-21' as it is built around the diversion of kerbside collected waste, commercial waste.

The State Government has a clear aim to increase the number of waste processing facilities and through the 'Waste Less, Recycle More' initiative has provided $465.7 million over five years to achieve this. One of the emphases is on encouraging facilities that will process waste from regional or groups of councils.

5.3 Proposal benefits

The proposal has a number of benefits.

Overarching benefits

The following benefits apply across the three proposal components:

- Improved technologies and operational practices
- Better environmental outcomes by the application of best practice prevention, mitigation and rectification measures
- Stronger environmental controls
- Improved and defined post-closure management (as defined in the VPA)
- Provide critical infrastructure to be available to manage Sydney's projected waste needs into the future as the City's population increases
- Provision of a larger parkland area available for passive recreation by the community
- Job creation, including best endeavours for local employment
- No significant impacts on the community.

Reprofiling

The landform reprofiling would also have a number of benefits including:

- Reducing the generation of leachate by minimising stormwater infiltration, thereby reducing the risk of surface water and groundwater impacts
  - In the 50% AEP average year, the current final cap is estimated to allow 12-17% of rainfall to infiltrate. The proposed final cap is estimated to reduce the infiltration to 6% of rainfall. This would result in a reduction in leachate generation in the order of 50% - 64% for final capped areas.
  - In the 10% AEP wet year, the current final cap is estimated to allow 17 – 22% of rainfall to infiltrate. The proposed final cap is estimated to reduce the infiltration to 5% of rainfall. This would result in a reduction in leachate generation in the order 70% - 77% for final capped areas.
- Providing steeper final landform slopes which provides a long term solution that can cater for waste settlement and still provide enough gradient to facilitate stormwater runoff (and thereby maintain conformance with the EPA's Environmental Guidelines into the future)
- Capturing an increased amount of landfill gas which would be used to generate power (equivalent to the needs of approximately 5,700 homes).
- Improved efficiency of landfill gas collection through an increase in the number of gas collection wells and better sealing through final capping of landfill surfaces
- Providing a final landform suitable for passive recreational activities and 25 ha larger in area than currently approved.
- Providing a wildlife corridor to an existing conservation area north of the LHRRP.

Garden Organics facility

The GO facility would:

- Reduce odour levels at the nearest receivers through application of higher standard technology including:
  - partial enclosure of the active composting phase with breathable membranes
  - aerated concrete 'bunkers'
  - optimised facility layout
- Increasing the offset distance from the facility to nearest sensitive receivers
- Support resource recovery in the Sydney region

- Provide for projected growth and fluctuations in garden organic waste quantities and deliver a stable long term waste management and resource recovery solution for waste from the Sydney region
- Through the provision of a revised layout, allow SITA to increase operational safety and improve the efficiency of organics processing
- Play a key role in the overall optimisation of SITA's garden organics network and result in direct cost savings with benefit to the community

ARRT facility

The new fully enclosed ARRT facility would:

- Be designed and operated with best practice environmental controls including:
  - Fully enclosed buildings under negative air pressure, with self closing roller doors to further reduce the potential for odour
  - Operation of biofilters to capture and treat air prior to release
  - Full enclosure of the all phases of treatment, including maturation – making it one of the first fully enclosed facilities of its kind in Australia
- Support resource recovery in the Sydney region and provide a viable alternative for local government waste processing/management
- Assist in diverting organic waste away from landfill
- Produce a compost product and PEF
- Recover additional resource (metals) from the waste stream that would otherwise have been landfilled.

Parkland

The proposed parkland, although delayed in its availability has the following benefits:

- It would be approximately 25 ha larger in area than the currently approved parkland
- All waste receival, processing and disposal would have ceased and the use of the intended parkland would not be impacted by these activities when it becomes available for use in 2039. Under the current consent, the existing GO facility continues to operate beyond 2024 and is located directly adjacent to the intended parkland.

5.4 Contributes to sustainability

The proposal would result in a number of improved environmental outcomes. In turn these improvements would reduce the potential for environmental pollution and or pollution incidents.

Specifically, the reprofiling works would include the removal of intermediate capping material, landfilling with a relatively thin layer of waste and placement of final capping material over previously landfilled waste with gradients conductive to improved run-off of stormwater and the augmentation of existing gas collection systems. The environmental performance of the proposal site would ultimately be improved by reducing the infiltration of stormwater into the landfill (resulting in reduced landfill leachate being generated as a result of high rainfall events).

The proposed improvements to the GO facility include a more efficient and effective layout and partial enclosure of the process (including covering of the first four weeks of active composting). The revisions would improve the operational safety and efficiency of the facility as well as reduce the potential for adverse odour impacts.

5.5 Alternatives considered and justification of the preferred option

5.5.1 Do nothing

If the proposal does not proceed, Sydney would either require an additional new landfill site to be developed and approved before 2024 (when LHRRP is due to close), or before all airspace is consumed at LHRRP, which may be prior to 2024. Alternatively, all untreated putrescible waste (municipal and commercial) would need to be sent to the Woodlawn facility near Goulburn, This leaves Sydney dependent on one single facility.

There are commercial issues associated with this (no competition) and also risk management issues, since a serious incident at either the Woodlawn facility or at any point along the transport route (for example a train derailment) that resulted in an inability of the facility to receive waste for a certain period e.g. two weeks would potentially cause a situation where waste could not be collected from a large part of Sydney (as it would have nowhere to be disposed of).

Therefore the preferred option provides a ‘safety valve’, in the event that a serious incident relating to Woodlawn occurs, the proposal would also be of benefit to the operators of Woodlawn, should such an incident occur, as it would allow them to continue to receive waste and service their customers through this period.

5.5.2 New landfill facility vs expansion of existing facility

As mentioned above, an alternative to expanding the amount of airspace at LHRRP would be to have a new major landfill facility established to service Sydney. It is quite likely that any new major landfill site would have to be quite remotely located, possibly hundreds of kilometres from Sydney, and potentially accessed by rail rather than trucks. Environmental approvals have been sought in the past to fill mine voids in the Hunter Valley, but with no success. In 2002, the State Government refused to approve a 25 million tonne capacity landfill at the former No.2 mine at Ravensworth, on the basis of a lack of justifiable demand for such a facility.

Siting of new landfills at former mines south of Sydney at Ardlethan and Woodlawn has also been proposed. Veolia managed to get approval for its proposed facility at Woodlawn, which was approved to landfill approximately 0.5 million tonnes per year. Veolia recently applied to increase the amount of waste received at Woodlawn to 1.13 million tonnes per year. This was approved by the State Government.

The likely timeframe for approval of a new major landfill site to replace the LHRRP is also challenging, as the whole process could potentially take many years (based on experience with Woodlawn and Lucas Heights 1). Less than nine years currently remains before the LHRRP is due to close. This is considered to be insufficient time to identify a suitable site, purchase suitable land for the landfill and rail loading facilities, obtain the environmental approvals for both and construct the facilities.

Studies undertaken by GHD and other organisations (in commercial confidence) have identified very few (if any) potentially available sites in close proximity to Sydney with suitable geology, transport links and void or potential void size, so a long distance landfill would likely be required.

In summary, expansion of the existing landfill at LHRRP landfill would provide Sydney with landfill capacity until 2037, by which time it is expected that other long term solutions would be available.

5.5.3 GO facility

To expand its garden organics processing capacity and optimise its garden organics network, an alternative to relocating the proposed GO facility would be for SITA to shift the operations to a site with an existing operating licence to process garden organics.

SITA has organics processing operations on the following sites. In addition, none of these sites have planning approval to process an additional 80,000 tonnes per year of garden organics.

Table 5.1 Summary of SITA garden organics processing sites

Site	Comment
Eastern Creek Resource Recovery Park	SITA is separately proposing to increase the volume of organics processing capacity at the Eastern Creek Resource Recovery Park (from 50,000 to 80,000 tonnes per year)
Camden Organic Resource Recovery Facility	There is insufficient space for expanding the existing operations.
Spring Farm Resource Recovery Park	There is insufficient space for expanding the existing operations.
Lucas Heights Resource Recovery Park	The LHRRP is the only site with sufficient space and or life span to accommodate the required increase. It has an existing operating licence for processing 50,000 tonnes per year of garden organics and planning approval in place to process up to 55,000 tonnes per year.

5.5.4 ARRT facility

The LHRRP site was chosen by SITA for the ARRT facility location in a similar manner as the other landfill sites (such as Jacks Gully, Eastern Creek, Kemps Creek and Raymond Terrace) which already have alternative waste technology facilities located on their sites (refer Table 5.2).

Table 5.2 Summary of SITA ARRT facility processing sites

Site	Details
Jacks Gully (Spring Farm)	Anaerobic digestion facility and electricity plant, 30,000 tonnes per year tunnel composting facility for organics processing, mechanical pre-treatment area where non-organic materials are removed from mixed solid waste. Organic material is sent to Kemps Creek for further processing.
Eastern Creek (UR-3R)	220,000 tonne per year processing facility for mixed solid waste using mechanical pre-treatment and composting.
Kemps Creek	134,000 tonne per year processing facility for mixed solid waste and source separated food and garden organics. Includes mechanical pre-treatment and tunnel composting technology.
Raymond Terrace (Newline Road)	40,000 tonnes per year processing facility for mixed solid waste using drum composting.

Providing a facility at Lucas Heights enables the Southern Sydney areas to be provided with waste processing capacity. There are no other sites controlled by SITA in this part of Sydney and it would be necessary for SITA to acquire another suitable site if the LHRRP was not utilised.

The proposed facility would complement other resource recovery activities on the LHRRP site, and have the added advantage that all residues could be disposed in the adjacent landfill. The LHRRP already operates as a resource recovery park and has good transport connections.

The ARRT facility would combine successful and proven technologies (from SITA's resource recovery operations around the world). The technology which has been selected would enable the segregation of both organic materials and high-calorific materials from the waste stream. This would enable the production of both a compost product and PEF. The ARRT facility would enable all activities to occur indoors in enclosed buildings. This includes waste receival and separation, composting and maturation, blending and preparation of finished product for market. This would minimise potential impacts of the facility on the surrounding community that it would potentially serve.

6. Proposal description

This chapter provides a description of the proposal, including infrastructure components, preliminary layouts, waste tonnages, description of operations/processes and construction activities.

6.1 Overview

6.1.1 Key infrastructure components

The proposal comprises four key elements. These are:

- **Reprofiling of the landfill site**. Reprofiling would be conducted by increasing the slope of the landfill embankments across the existing landfill area as well as 25 ha of additional area (approximately 5% of the size of the total landfill area) currently used by the garden organics facility at the eastern side of the LHRRP. This would provide up to 8.3 million cubic metres of additional landfill capacity (equivalent to approximately 8.3 million tonnes of waste assuming 1 tonne of waste utilises 1 cubic metre of landfill airspace). As the process of reprofiling would include the removal and replacement of capping material over previously landfilled waste and the augmentation of gas and leachate collection systems, the environmental performance of the site would be ultimately improved by reducing the infiltration of stormwater into the landfill (resulting in reduced landfill leachate in the longer term) and increase the overall amount of landfill gas recovered from the site.

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

- **Relocation and expansion of the existing GO facility**. The existing garden organics (GO) facility would be relocated from the eastern side of the site (near Little Forest Road) to the western side of the site adjacent to Heathcote Road. Approval is also being sought to increase the approved capacity of the facility from 55,000 to 80,000 tonnes of garden organics received each year. The new facility would include the partial enclosure, active aeration and covering of the waste during the first four weeks of the active composting process, which coincides with the period of highest potential for odour generation, to enable more effective control of odour. Relocation of the facility would result in increased separation distances from the current nearest occupied land at ANSTO, existing residential areas and a proposed new residential area at West Menai.

- **Construction and operation of a fully enclosed ARRT facility**. The ARRT facility would be located on the western side of the site adjacent to the GO facility and would process and recover valuable resources from up to 200,000 tonnes of general solid waste per year. This would divert up to 140,000 tonnes of waste per year from the landfill. SSC and other councils would be able to have their municipal waste processed by the ARRT facility. Establishment of the ARRT facility would be dependent upon SITA securing a guaranteed, long term waste supply to ensure that the substantial upfront investment is able to be recouped.

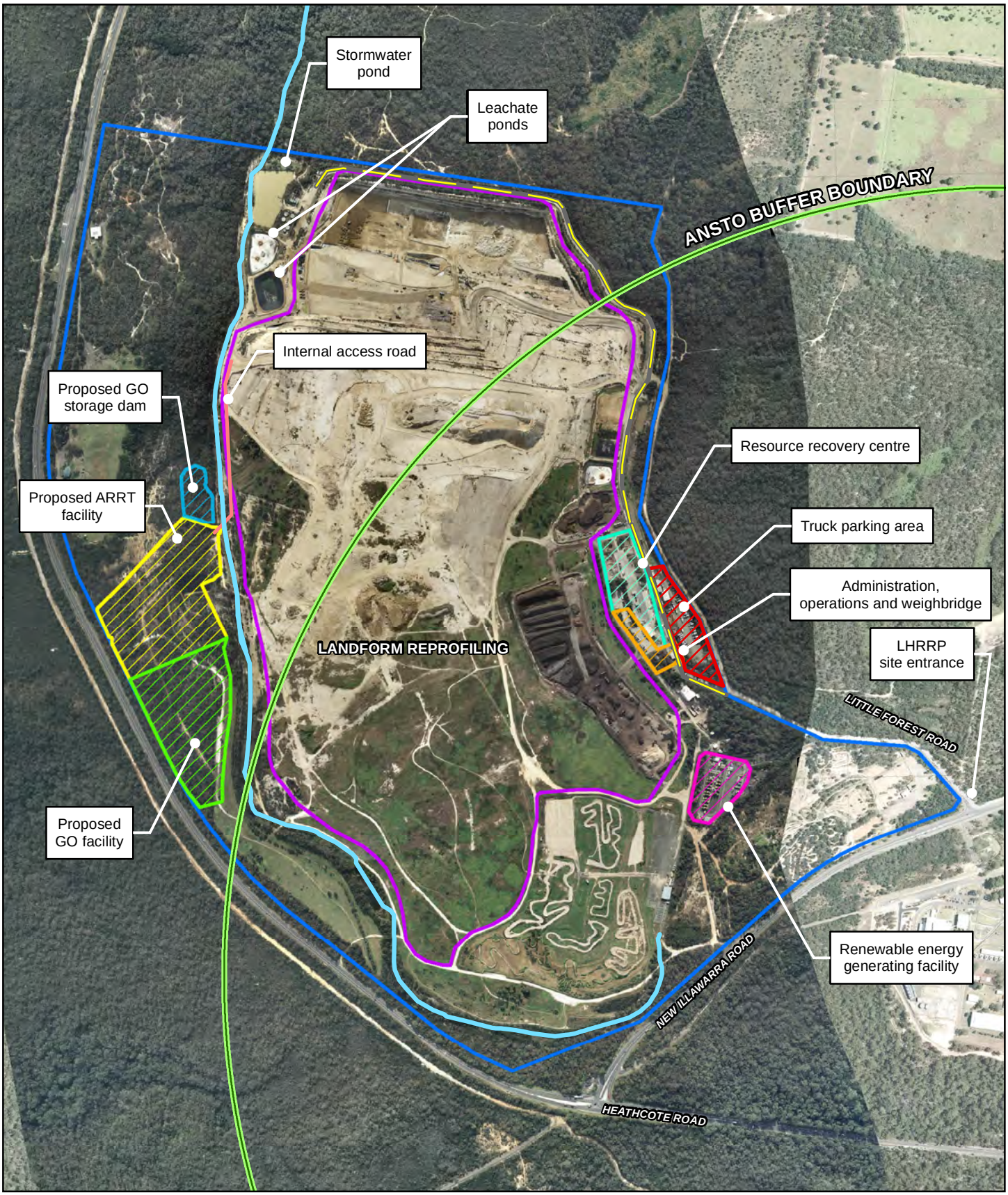
- **Community parkland**. The landfill reprofiling would increase the area available for future passive recreation following site closure from 124 ha (existing approved parkland) to a total of 149 ha, an increase of approximately 25 ha. Landfilling would cease in 2037 after which time the site would be rehabilitated and converted to a community parkland, with capping and landscaping to be completed and the site made available for community use in 2039.

Other existing key LHRRP infrastructure that would remain in place and continue operating includes:

- Resource recovery centre and waste collection point
- Renewable energy production
- Truck parking area
- Community use areas – SICTA area and PCYC mini-bike area
- Ancillary buildings and structures such as weighbridge, machinery workshop, administration offices
- Continued access to the proposal site via Little Forest Road

All waste receival, landfilling and processing activities at LHRRP are proposed to cease by 31 December 2037 (compared to 31 December 2024 under the current approval). Landscaping of the final landform would subsequently commence in 2038, which is expected to take approximately two years, with the site being made available for passive recreational use by 2039.

The locations of these key proposal components are shown on Figure 6.1 along with further details of the each of the key proposal components in Sections 6.2, 6.3 and 6.4. Section 6.5 provides details on the proposed parkland.



LEGEND

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

Paper Size A4

0 100 200 400

Metres

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

N

GHD

SITA Australia
Lucas Heights Resource Recovery Park

Key proposed infrastructure

Job Number 21-23482
Revision A
Date 28 May 2015

Figure 6.1

N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z046_KeyProposedInfrastructure.mxd 15/133 Castlereagh Street Sydney NSW 2000 Australia **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com **W** www.ghd.com

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6.1.2 Waste input and processing rates

As part of the proposal, SITA is seeking to increase the total maximum quantity of waste processed at the LHRRP from 730,000 tonnes to 1,140,000 tonnes per year, an increase of 410,000 tonnes per year. This would enable the reprofiling of the site to be completed in 2037.

This amount includes consideration of residual wastes generated by the GO, ARRT and resource recovery centre (RRC) that are not suitable for composting or resource recovery and would also be landfilled. Residual wastes would include contaminants in the incoming GO waste stream such as: glass, plastic, textiles, etc. which will be landfilled onsite if it meets the classification of general solid waste or removed off site to another facility licensed to receive the specific waste type. Where possible recyclable contaminants would be separated for recycling.

When the ARRT becomes operational, up to approximately 60,000 tonnes per year of unrecoverable waste would be landfilled i.e. used for reprofiling of the site. Garden organics received at the RRC would be transferred to the GO facility for processing and any non-recyclable wastes would be disposed of to the landfill.

As a result of these transfers between various recovery and disposal facilities, the maximum expected waste quantities processed at the LHRRP would exceed the maximum waste inputs received through the weighbridge. A breakdown of the expected waste streams and facilities highlighting the differences between the maximum input and processing rates is provided in Table 6.1.

Table 6.1 Proposed maximum waste inputs and processing rates

Facility/ activity	Current approved (t/yr)	Maximum proposed (t/yr)
Maximum LHRRP wastes processed		
Landfilling and reprofiling activities	575,000	850,000
GO facility	55,000	80,000*
RRC facility		10,000**
ARRT facility / AWT facility	100,000	200,000
Subtotal		**1,140,000**
Less internal transfers:		
ARRT facility residuals to landfill		60,000
GO facility and RRC residuals to landfill		10,000
Maximum LHRRP waste inputs (receipts)	**730,000**	**1,070,000**

* This does not include approximately 37,000 tonnes of imported blending materials for the GO facility
**All waste received is removed from the RRC and either:
- Recycled and removed from site (e.g. paints, batteries etc.);
- Delivered to the GO facility for processing; or
- Disposed to landfill
Note: The quantities of each of the above will be determined by the waste types delivered to the RRC.

The maximum annual waste tonnages likely to be received and processed at the LHRRP are difficult to accurately predict and will vary year to year based on factors such as seasonality, economic conditions, the number of waste processing contracts obtained by SITA and the possible introduction of competing waste recovery facilities. As a result, during some years, the incoming and processed quantities of waste may be less than the estimated maximums in Table 6.1. However, the total volume of waste utilised for reprofiling the site (via landfill disposal) would be limited to 8.3 million cubic metres and would not exceed 850,000 tonnes per year at any time. Throughout the operation of the LHRRP, SITA would divert incoming waste to the ARRT and GO facilities to utilise the maximum waste recovery capacity of these facilities.

6.1.3 Operating hours

The proposed site operational hours are shown in Table 6.2 alongside the current operational hours. The only proposed change to operating hours is for the waste recevial and landfilling activities which are proposed be extended by one hour each day on weekdays to provide time to undertake the daily covering of the waste and other necessary activities. Although aeration of the material within the ARRT and GO facilities would occur continuously to ensure that the material remained aerobic, waste receival activities at the LHRRP would be restricted to the operational hours shown in Table 6.2.

Table 6.2 Proposed site operational hours

Activity	Day	Current hours	Proposed hours
Waste receival	Monday - Friday Saturday and Sunday	6 am – 4 pm 8 am – 4 pm	6 am – 5 pm 8 am – 5 pm
Construction & landfilling operations	Monday - Friday Saturday and Sunday	6 am – 4 pm 8 am – 5 pm	6 am – 5 pm 8 am – 5 pm
Other activities	Monday - Sunday	Anytime	Anytime
GO facility operations	Monday - Sunday	Anytime	Anytime
ARRT facility operations	Monday - Sunday	N/A	Anytime

6.1.4 Regulatory and operational environmental safeguards

There are a number of regulatory and operational safeguards that would ensure that the appropriate measures are put in place during construction, operation and post-closure to reduce potential environmental impacts and ensure ongoing environmental management. These include:

- CEMPs
- Conditions of approval
- Environmental undertakings as part of the VPA
- OEMPs
- EPLs
- Post closure management requirements defined in a post closure EMP

These are discussed briefly below and in detail in Chapter 24.

Construction environmental management plans

Construction environmental management plans would be prepared prior to construction commencing. These would detail the proposed measures to manage construction impacts including procedures, mitigation and management measures.

Conditions of approval

The conditions of approval for the proposal would incorporate proposed measures to manage potential environmental impacts as identified either in the EIS and/or additional measures the Department of Planning and Environment deems necessary in its assessment of the proposal.

Environmental undertakings

SITA has committed to entering into an agreement with SSC in the form of a VPA which includes ‘environmental undertakings’. These would be made by SITA to demonstrate SITA’s

commitment to protecting the environment and the local community while constructing, operating and during the post closure period for the proposal.

Operational environmental management plans

Individual OEMPs have been prepared for the landfill, GO facility and the ARRT facility. The OEMPs describe the current operational activities on site that have, or are likely to have, an impact on the environment, and measures to be undertaken to minimise those impacts. The OEMPs have been developed to reflect the regulatory requirements and provide a basis for NSW EPA to assess the environmental performances of the operations. They also provide guidance for operators on site to undertake activities in an environmentally sound manner.

The OEMPs are provided in Appendix S, Appendix T and Appendix U of this EIS.

Environment protection licences

The operation of the GO facility, ARRT facility and landfill would be subject to and be required to operate in accordance with EPLs issued for each facility/operation. Landfill gas, groundwater and leachate would all be monitored in accordance with the site operating licence to ensure that they comply with the licence conditions. During the post-closure period, the proposal would be managed in accordance with a post closure EPL for the LHRRP.

Post closure environmental management

Following the proposed cessation of operations by the end of 2037, 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 proposal site in accordance with the closure requirements administered by the EPA.

A post closure EMP has also been prepared (Appendix V) which outlines the post closure environmental management for the proposal site.

6.2 Landfill reprofiling

6.2.1 Key design parameters

The NSW EPA (1996) Environmental Guidelines: Solid Waste Landfills, Benchmark Technique no. 28 states the following, 'The final settlement of the seal-bearing surface should leave a gradient of 5% to defined drainage points'.

Currently, it is estimated that approximately 40% of the approved final landform will result in slopes less than 5% following settlement as currently experienced at the site and as demonstrated by landform modelling analysis.

Reprofiling of the landfill would involve increasing the slope of the final landform to meet the EPA (1996) guidelines. A slope of at least 5% would be achieved following settlement of the waste. The maximum waste input to the LHRRP would be capped at 8.3 million cubic metres above the existing approved tonnage of waste and based on predicted tonnage figures and the assumption that one tonne of waste utilises 1 cubic metre of landfill capacity, it is expected that the capacity of the landfill would be reached by 2037.

The constructed grade of the final landform would be a maximum of 1 (vertical) in 4 (horizontal). An increase from existing maximum height of RL172 m is required in order to facilitate the proposed grades. The height of the constructed surface would not exceed RL 184.9 m AHD (includes waste and final cap). The landform is expected to settle to a height of RL 179.9 m (includes waste and cap) which is 7.9 m higher than the currently approved design.

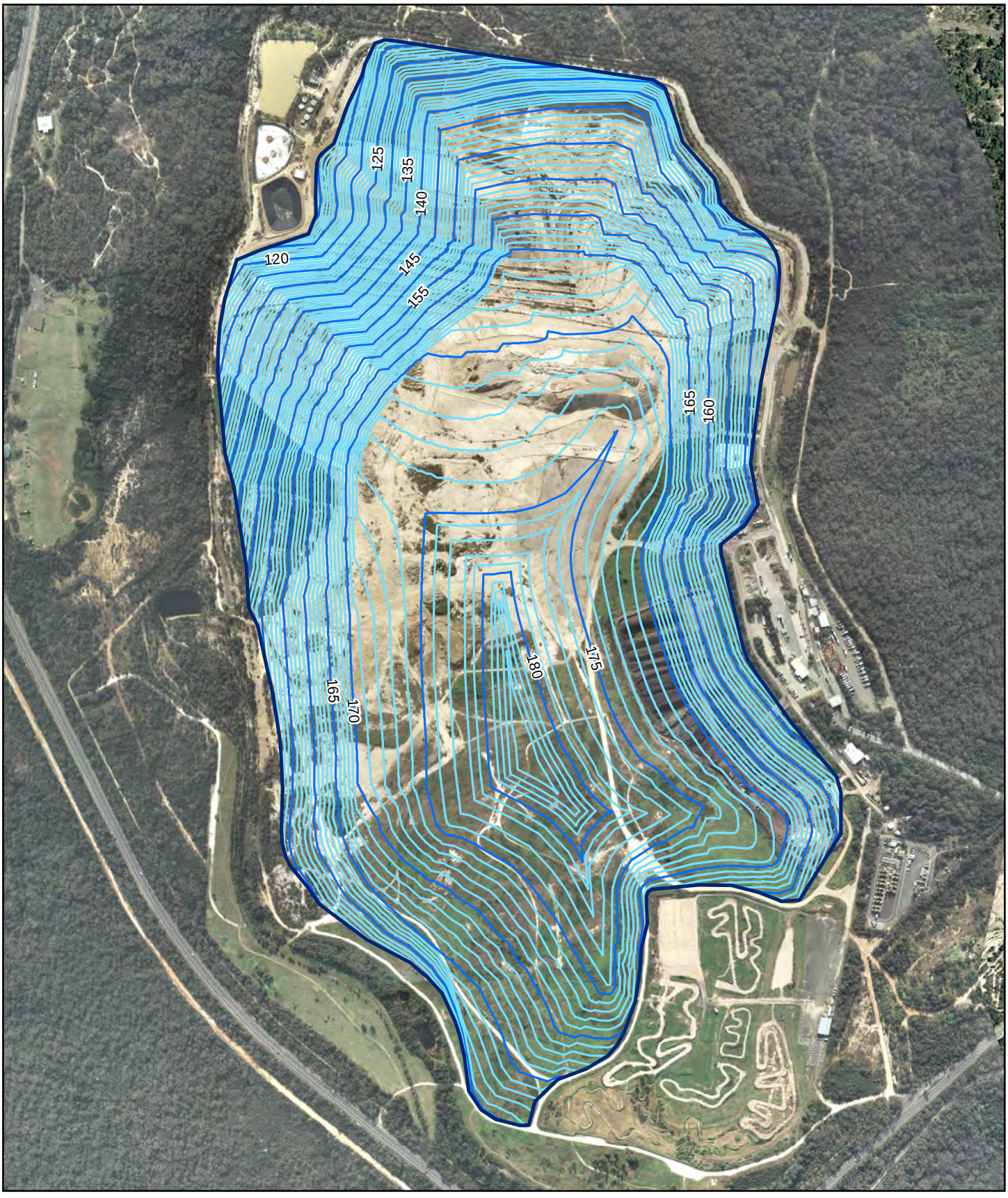
Figure 6.2 shows the proposed baseline final landform and Figure 6.3 shows the proposed post-settlement final landform.

Details of the design for the final landform, settlement analysis, staging plans and mass balance is contained in Appendix C.

6.2.2 Reprofiling area

The reprofiling would take place almost entirely (approximately 95%) over areas of the site that have previously been landfilled. The footprint of the current approved landfill area and the extent of landfill reprofiling proposed are illustrated in Figure 6.4.

The areas where reprofiling works would be conducted that have not previously been landfilled are to the east over the existing GO facility area and toward the site perimeter access road as well as between 14 m and 19 m to the north from the existing landfill edge to allow construction of the current remaining landfill cells.



LEGEND

- Baseline 5m contours
- Baseline 1m contours Proposed
- landfill footprint boundary

Paper Size A4

0 25 50 100 150 200

Metres

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

N

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Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 05 May 2015

Proposed final landform Baseline

Figure 6.2

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N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z021_ProposedFinalLandform_Pre-Settlement.mxd

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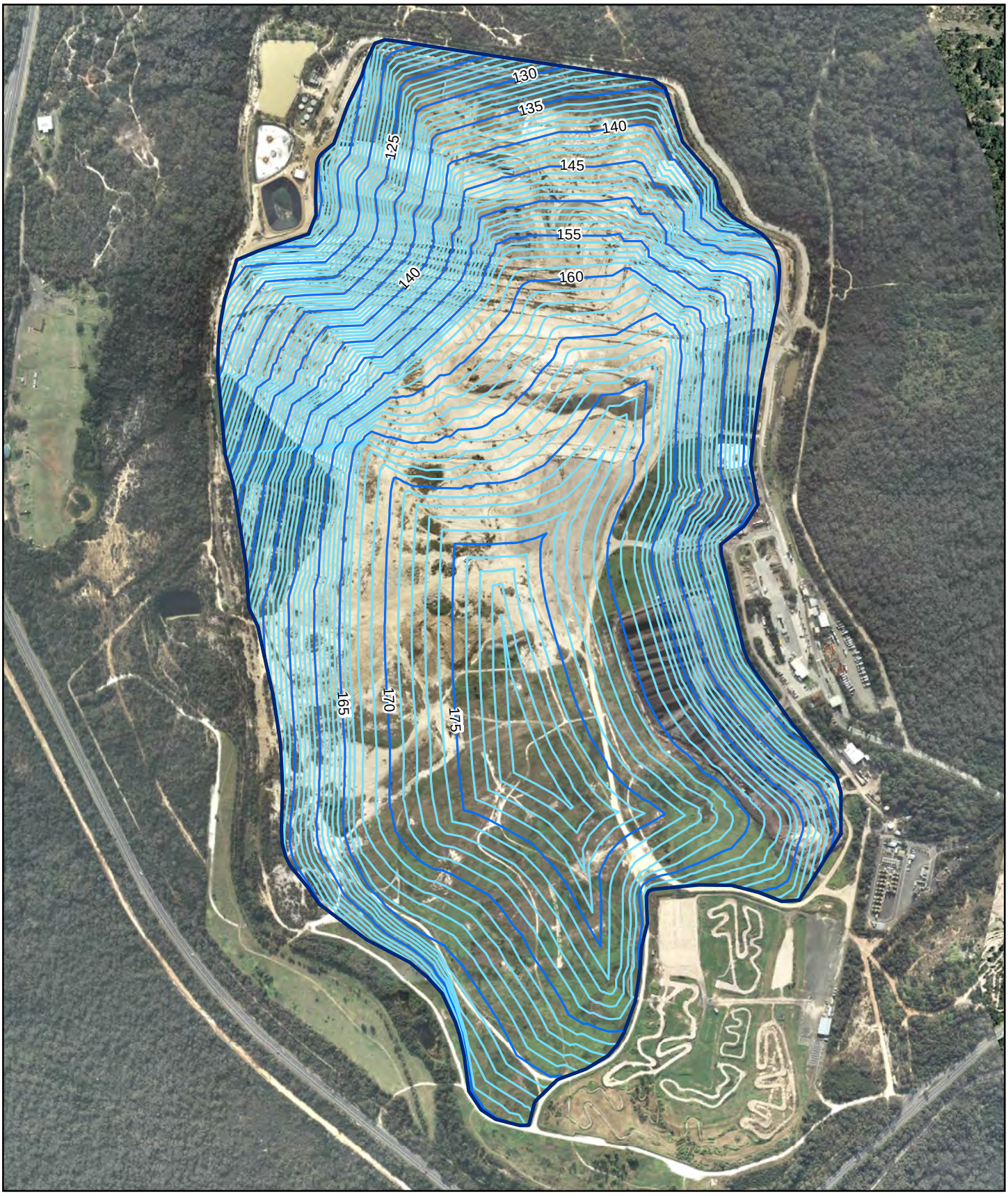

LEGEND

- Post settlement 5m contours
- Post settlement 1m contours
- Proposed landfill footprint boundary

Paper Size A4

0 25 50 100 150 200

Metres

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

N

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Revision A
Date 05 May 2015

Proposed final landform
Post-settlement

Figure 6.3

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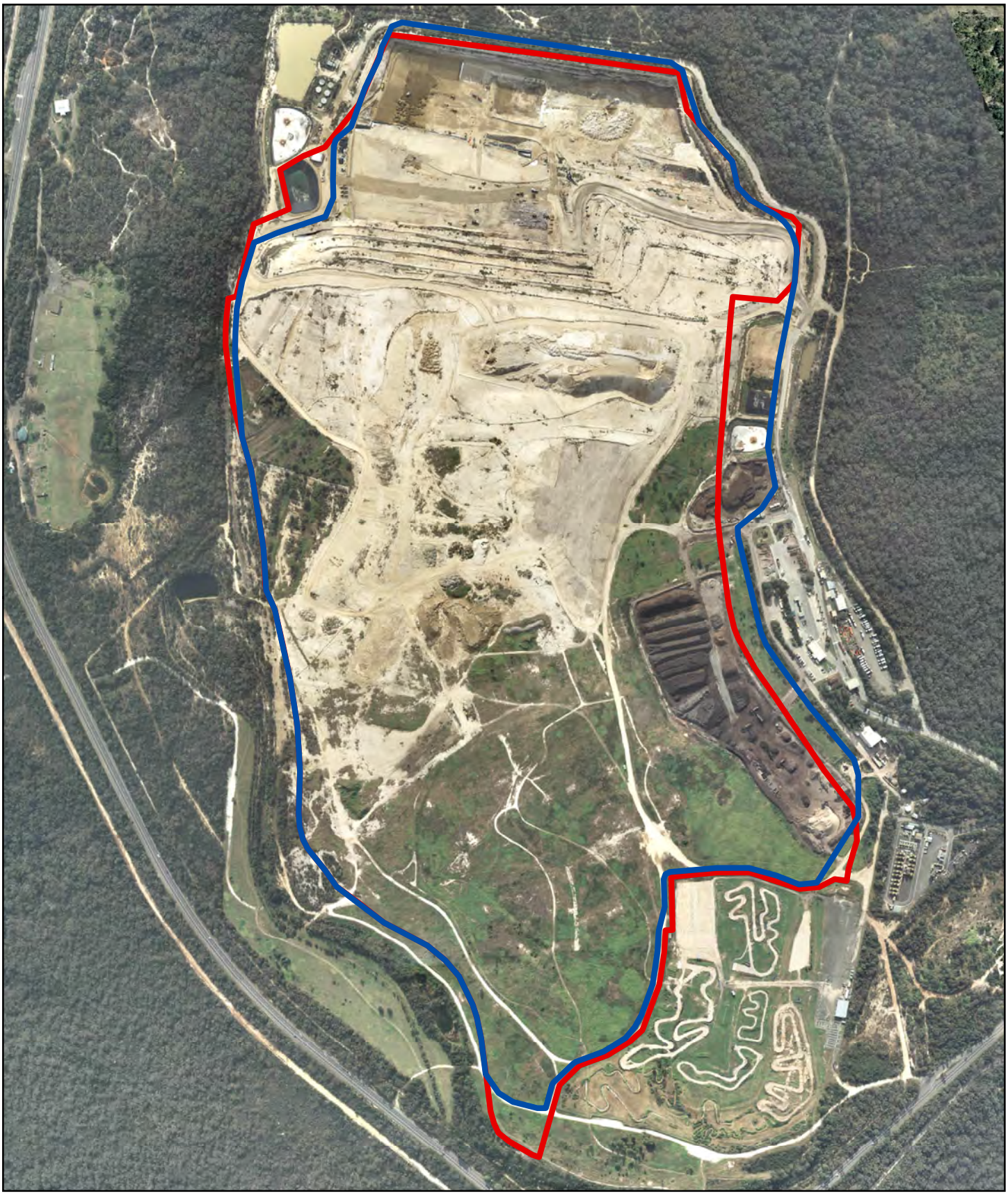

LEGEND

Proposed landfill footprint boundary

Approved landfill footprint

Paper Size A4

0 25 50 100 150 200

Metres

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

N

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Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 28 Apr 2015

Current approved and proposed landfill footprint

Figure 6.4

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6.2.3 Surface water management

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.

However as the water may still come into contact with non-vegetated areas, surface water runoff would be collected by a series of channels and transported to the sediment dam in the northwest corner of the proposal site. There, it would be treated prior to discharge at the licensed discharge point at Mill Creek at the north west corner of the proposal site.

The proposed surface water management system is further described and illustrated in Chapter 13 and detailed in the landfill OEMP (Appendix S).

6.2.4 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 proposal site. The assessment and management of leachate from the basal areas of the site to the south are further described in Chapters 14 and 15.

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 proposal 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. Leachate that meets discharge standards 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 proposed leachate management system is further described and illustrated in Chapter 15 and detailed in the LHRRP OEMP (Appendix S).

6.2.5 Landfill gas management

Landfill gas management at the future landfill would remain largely unchanged from current practices.

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.

The OEMP for the LHRRP (Appendix S) also provides more detail on the proposed landfill gas management measures.

6.2.6 Odour management

Section 6.2.8 outlines the construction process for reprofiling previously landfilled areas which would involve removing the existing landfill cap and cover materials.

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, 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 potentially offensive odours off-site and to assist in limiting odour levels at the nearest receptors to 2 OU.

Justification of the extent of extraction of the cover materials above the previously landfilled waste and the range of odour controls, including the gas extraction system are described in Chapter 12. Chapter 12 and the OEMP for the LHRRP (Appendix S) also provide more detail on the proposed odour management measures.

6.2.7 Operation

Landfilling

Landfilling operations would be undertaken in a manner consistent with current operational practices and as outlined in the existing landfill Operations Environment Management Plan.

Waste would be deposited, spread and compacted in layers. Each layer would generally have a maximum compacted depth of 600 mm and approximately 5 layers would be placed to achieve a compacted lift thickness of 3 m. At the end of each working day, all exposed waste surfaces would be covered with a layer of compacted soil or other suitable material not less than 150 mm in depth. This daily cover layer would 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 impacts such as litter or odour.

Intermediate cover would be installed in areas which would remain inactive for more than 90 days. It would comprise an additional 150 mm of soil material over the daily cover, making a total soil thickness of approximately 300 mm. It is noted that SITA is currently undertaking a trial of alternative daily cover at the proposal site.

Either virgin excavated natural material (soil) or approved alternative daily cover would be used for covering landfilled waste overnight. Intermediate cover would comprise virgin excavated natural material or an approved alternative.

To optimise the use of landfill space and facilitate efficient leachate drainage, daily and intermediate cover material would be removed as far as practicable prior to the placement of waste. This would be stockpiled for reuse as daily cover on the waste.

Plant and equipment

Existing landfill equipment would continue to be used for the proposed reprofiling/landfilling operations. This includes landfill compactors, dozers, excavators, dump trucks, a grader, roller, water carts and road sweeper. Portable litter screens and portable odour control units also form part of the landfill equipment requirements.

Workforce

There are currently 33 landfill staff at the LHRRP. The proposal would require approximately 7 additional staff for landfill operations. Additional staff and work crews would be needed to prepare new areas for landfilling, fill areas with waste and then cap and revegetate them progressively.

Operational hours

It is proposed to extend the hours of operation of the landfill facility on weekdays by one hour to between 6 am and 5 pm. There would be no change to the existing hours of operation on weekends (currently 6 am to 4 pm weekdays, 8 am to 5 pm weekends). The additional proposed hour would provide the ability to complete necessary landfilling and other activities at the end of each weekday. This would have an added benefit of spreading traffic to and from the LHRRP over a longer period throughout the day.

6.2.8 Construction

General construction process

Landfill reprofiling would be undertaken in a staged manner for logistical reasons and to minimise the environmental impacts of the works.

A preliminary staging plan has been developed which indicates the anticipated order in which areas are proposed to be reprofiled and as a basis for the environmental impact assessment to be completed. The preliminary staging plan maintains the existing commitment to complete works on the ANSTO owned portion of the landfill prior to 2025. The staging sequence is designed to reduce the potential for sediment laden water to be produced. The sequence would commence the filling works over the uncapped portions of the site and prioritise achieving final levels over the southern parts of the site. This would enable areas to be progressively completed and capped, minimising the generation of leachate and odour during reprofiling works.

Reprofiling would commence in the central areas of the proposal site which have previously been landfilled but have not been capped. Once these areas are complete, landfilling activities would relocate to the southern areas where capping has already been completed and then over the existing garden organics facility (which by then would have been relocated to the western side of the LHRRP). The landfilling and reprofiling would then continue along the northern boundary of the LHRRP until all areas of the proposal site reach final landform levels. The preliminary staging plans are shown in Figure 6.5 to Figure 6.10.

The following methodology for developing each area for landfilling and reprofiling would be followed:

- Identify existing gas infrastructure within the reprofiling area.
- Install clean water diversions around the area to prevent surface water flowing into the area being disturbed.
- Install erosion and sediment controls to collect and treat any water which runs off the disturbed area.

- Strip grass from areas over the southern parts of the landfill which have been previously capped and vegetated. Remove the topsoil and existing capping materials and stockpile them for future use (Refer Section 12.5.2). Prepare an area equivalent to approximately one day's landfilling activity.
- Remove the seal bearing layer from this prepared area and stockpile material for re-use.
- Shut down the existing gas infrastructure within the prepared area, extend and protect the gas extraction wells with visual markers and protective steel sleeves.
- Identify and protect any existing leachate infrastructure within the prepared area, including the leachate ring main which is buried within the existing cap.
- Install leachate management controls within the prepared area to prevent perched leachate and allow depressurisation of any gas which may build up. The additional measures would include a dual gas/leachate management trench located near the perimeter of the new waste.
- Install or update odour controls.
- Install litter controls (litter fence and portable litter screens).
- Remove daily cover to minimise the risk of perched leachate and stockpile material for site usage.
- Place new waste and follow standard operating procedures for landfilling of waste.

Where required and appropriate, a visible bund would be created and filling with waste would take place behind the bund edge.

EXISTING

PHASE 1

Paper Size A4

N

- Proposed Re-profiling Boundary
- Active Cell
- Intermediate Cover - Platform
- Intermediate Cover - Slopes
- Existing Cap
- Proposed Final Cap - Platform
- Proposed Final Cap - Slopes
- Proposed Post Closure Cap - Platform
- Proposed Post Closure Cap - Slopes
- Indicative Surface Water Diversion Drain
- Indicative Surface Water Collection Drain

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Job Number 21-23482
Revision A
Date 08 Jul 2015

Preliminary reprofiling staging plan - existing and phase 1

Figure 6.5

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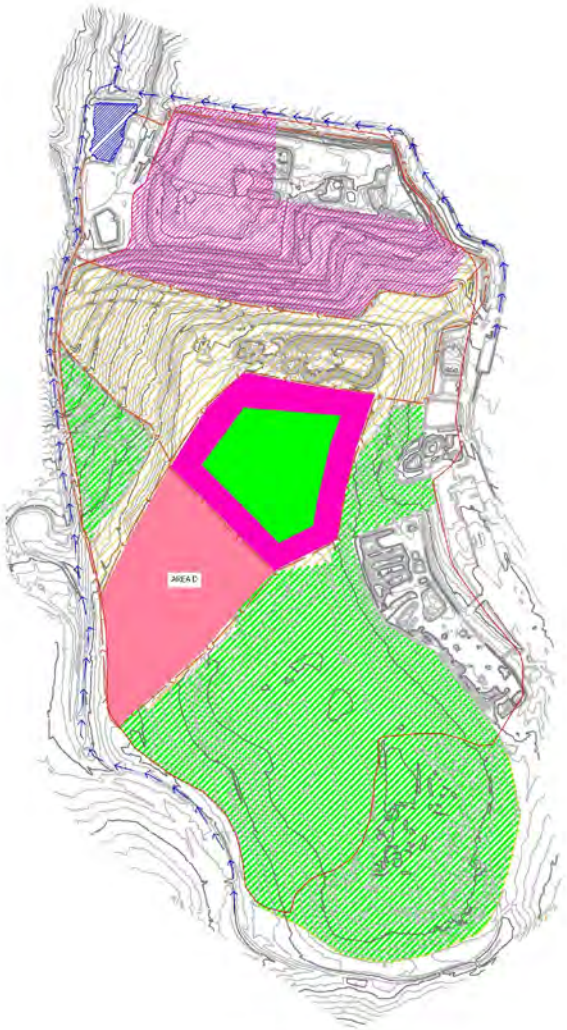
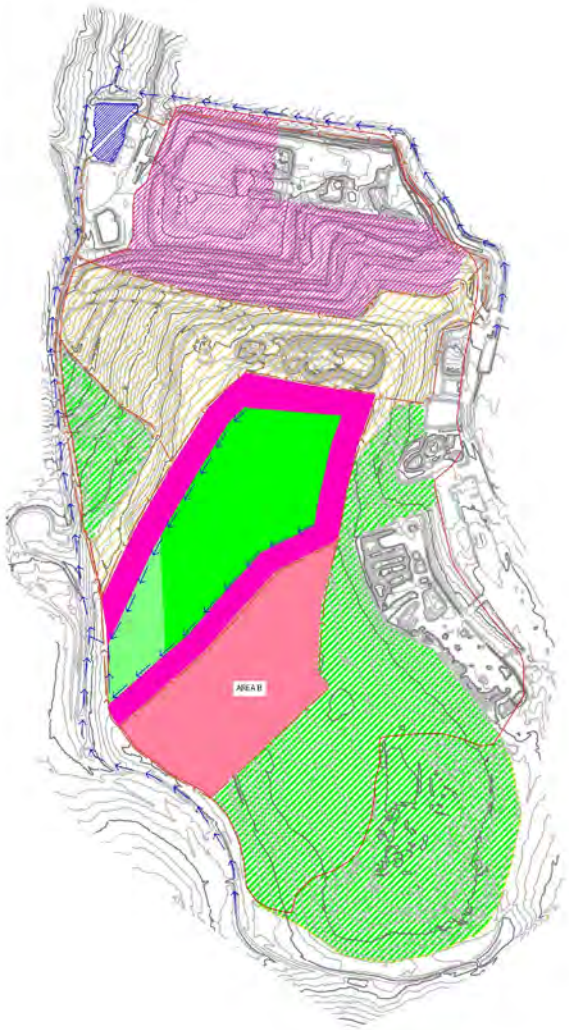


PHASE 2



PHASE 3

Paper Size A4

N

- Proposed Re-profiling Boundary
- Active Cell
- Intermediate Cover - Platform
- Intermediate Cover - Slopes
- Existing Cap
- Proposed Final Cap - Platform
- Proposed Final Cap - Slopes
- Proposed Post Closure Cap - Platform
- Proposed Post Closure Cap - Slopes
- Indicative Surface Water Diversion Drain
- Indicative Surface Water Collection Drain

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Preliminary reprofiling staging plan - phase 2 and 3

Figure 6.6

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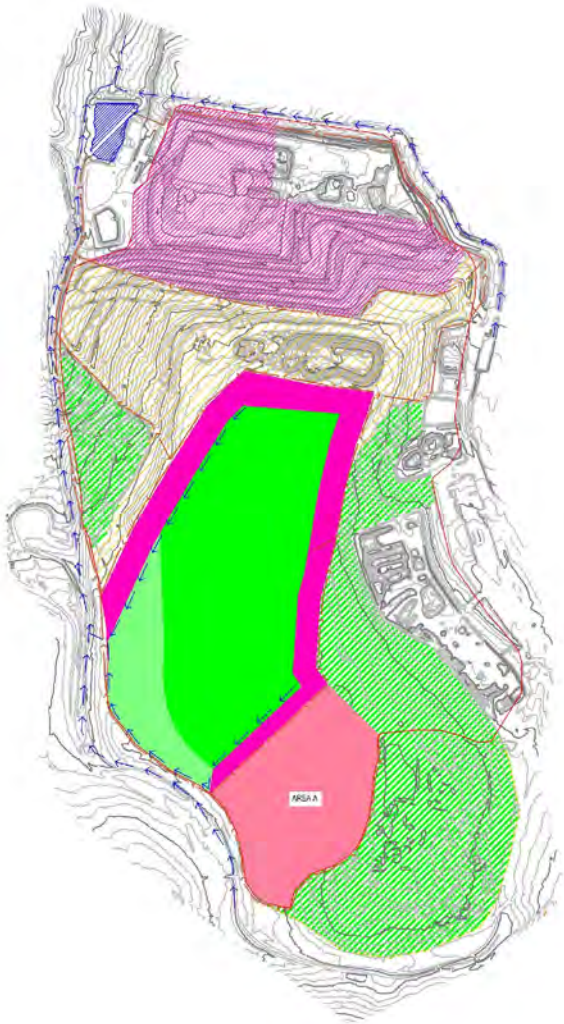

PHASE 4

PHASE 5

Paper Size A4

N

- Proposed Re-profiling Boundary
- Active Cell
- Intermediate Cover - Platform
- Intermediate Cover - Slopes
- Existing Cap
- Proposed Final Cap - Platform
- Proposed Final Cap - Slopes
- Proposed Post Closure Cap - Platform
- Proposed Post Closure Cap - Slopes
- Indicative Surface Water Diversion Drain
- Indicative Surface Water Collection Drain

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Preliminary reprofiling staging plan - phase 4 and 5

Figure 6.7

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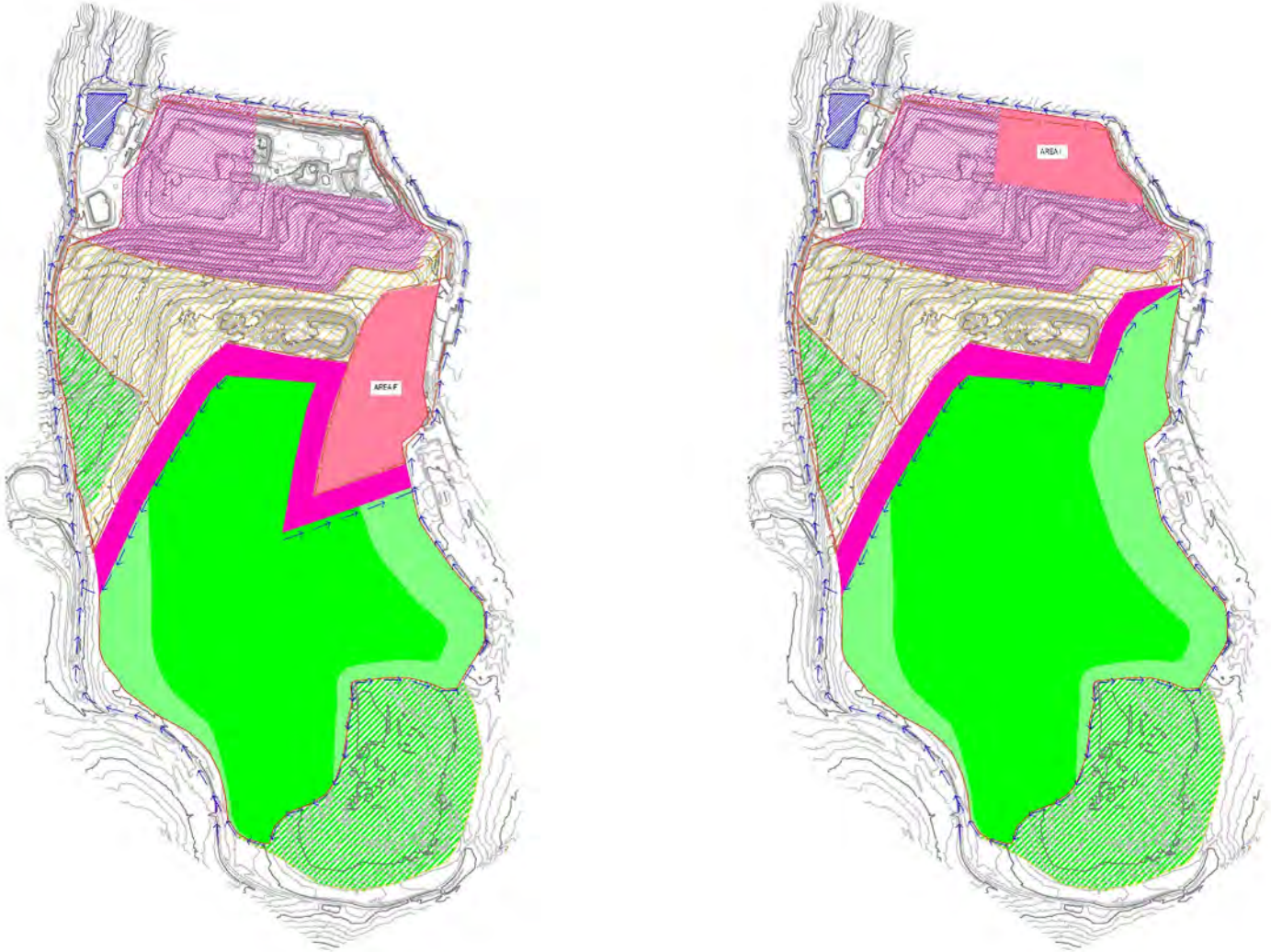

Paper Size A4

N

Proposed Re-profiling Boundary
Active Cell
Intermediate Cover - Platform
Intermediate Cover - Slopes
Existing Cap
Proposed Final Cap - Platform
Proposed Final Cap - Slopes
Proposed Post Closure Cap - Platform
Proposed Post Closure Cap - Slopes
Indicative Surface Water Diversion Drain
Indicative Surface Water Collection Drain

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Preliminary reprofiling staging plan - phase 6 and 7

Figure 6.8

G:\21\23482\GIS\Maps\MXD\Staging\21-23482-Z053-Staging_6_7.mxd

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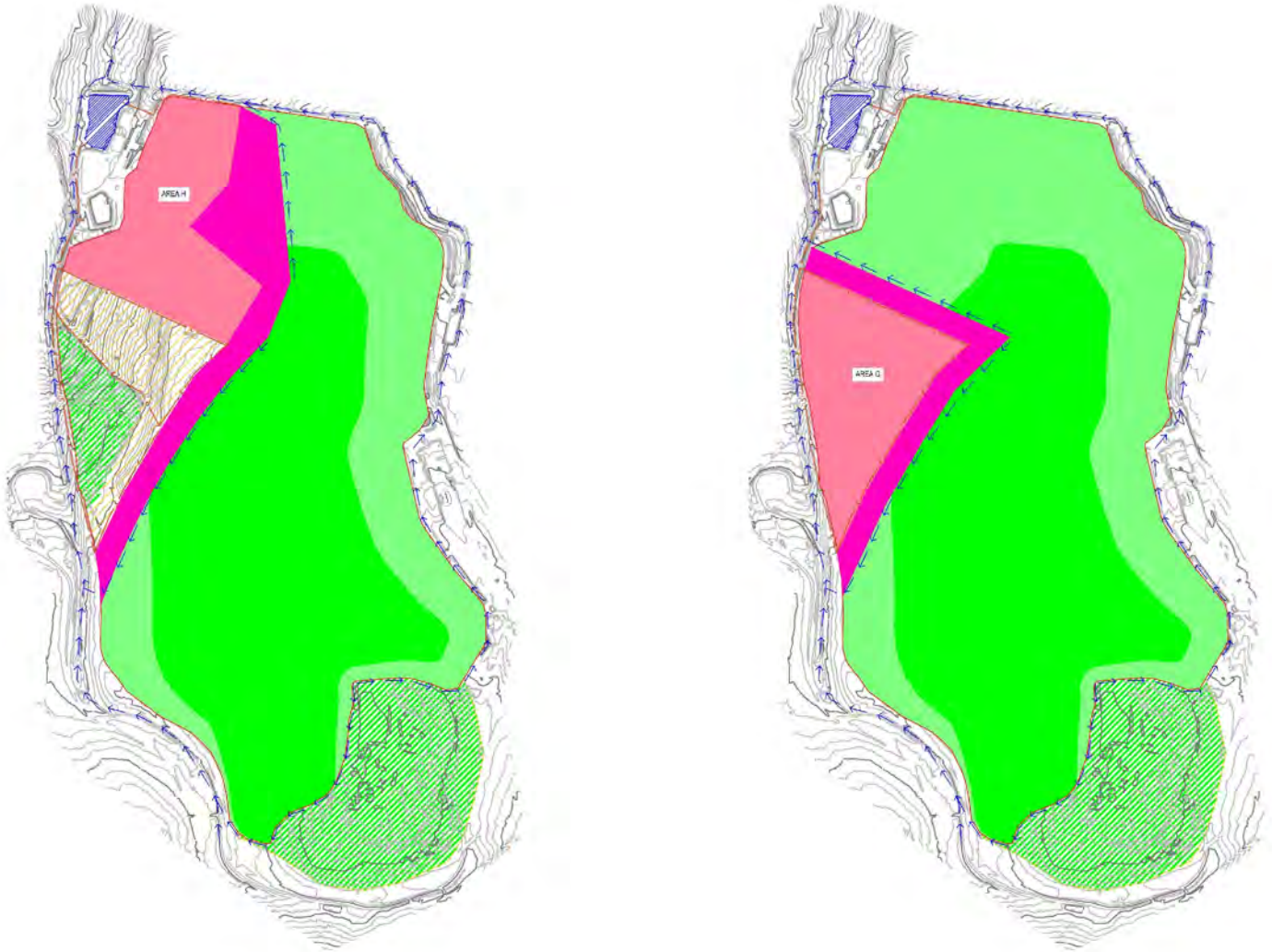

Paper Size A4

N

Proposed Re-profiling Boundary
Active Cell
Intermediate Cover - Platform
Intermediate Cover - Slopes
Existing Cap
Proposed Final Cap - Platform
Proposed Final Cap - Slopes
Proposed Post Closure Cap - Platform
Proposed Post Closure Cap - Slopes
Indicative Surface Water Diversion Drain
Indicative Surface Water Collection Drain

SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 08 Jul 2015

Preliminary reprofiling staging plan - phase 8 and 9

Figure 6.9

G:\21\23482\GIS\Maps\MXD\Staging\21-23482-Z053-Staging_8_9.mxd

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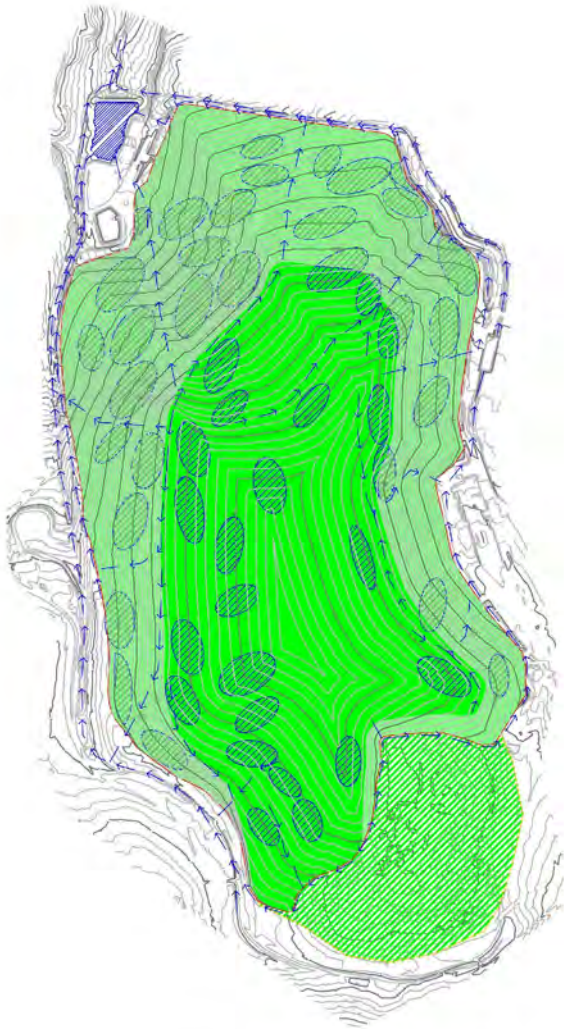
Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:apmiller



FINAL POST-CLOSURE

Paper Size A4

N

- Proposed Re-profiling Boundary
- Active Cell
- Intermediate Cover - Platform
- Intermediate Cover - Slopes
- Existing Cap
- Proposed Final Cap - Platform
- Proposed Final Cap - Slopes
- Proposed Post Closure Cap - Platform
- Proposed Post Closure Cap - Slopes
- Indicative Surface Water Diversion Drain
- Indicative Surface Water Collection Drain

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Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 08 Jul 2015

Preliminary reprofiling staging plan
- final post closure

Figure 6.10

G:\21\23482\GIS\Maps\MXD\Staging\21-23482-Z053-Staging_Final.mxd

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Capping

The new landfill cap would be progressively constructed as soon as practicable after reaching final landform levels. The 1.75 m thick cap would comprise the following layers (from top to bottom):

- 100 mm topsoil to support grass growth
- 250 mm revegetation layer
- 500 mm subsoil layer
- 600 mm low permeability clay barrier or equivalent
- 300 mm seal bearing layer

The likely performance of the landfill cap has been assessed in Chapter 15. The proposed landfill cap, or equivalent, would need to be approved by the EPA as part of the assessment of the EIS and proposal application. The growing medium specification is included as part of the landscape plans.

When landfilling works have ceased, the entire landfilled area would be capped and rehabilitated. This would likely involve thickening of areas of the cap to support trees and shrubs where required.

All capping material would be brought into the site. This material import has been taken into account in the traffic modelling for the EIS.

Rehabilitation works are described further in Section 6.5.

Construction quality assurance

A construction quality assurance (CQA) plan would be prepared as part of the detailed design of the cap to provide a framework to confirm that the works are undertaken in a way that is consistent with the design and meet the environmental protection intent.

The assurance works would include testing of source and installed materials, observation of construction processes by a suitably qualified engineer and surveying to confirm layer thicknesses.

Materials

Material for daily and intermediate cover would consist of crushed sandstone material generated onsite through past and future excavation works and through reuse of recovered existing cap and cover materials, or approved alternatives. The total amount of cover material required for the proposal (i.e. above existing approved amounts) would be approximately 1.25 million m^3 (compacted). However application of more efficient covering practices than typical landfill operations means that the volume would likely be less than this. Potentially odorous material recovered from the ARRT facility would not be used as alternative cover.

Materials for final capping of the waste would be imported to site. Clay and shale material may be imported from SITA's Elizabeth Drive Landfill at Kemps Creek. It is estimated that a total of approximately 1.75 million m^3 (compacted) of clay and soils would be required for the capping and rehabilitation works, subject to the approval of the EPA.

Plant and equipment

Existing landfill (operational) equipment would also be used for constructing reprofiling/ landfilling operations as part of the proposal. This includes landfill compactors, dozers, excavators, dump trucks, a grader, roller, water cart, road sweeper, portable litter screens and odour control units.

Workforce

There are currently 33 landfill staff at the LHRRP. The proposal would require approximately 7 additional staff to prepare new areas for landfilling, fill areas with waste and then cap and revegetate them progressively.

Construction hours

The construction of the reprofiled areas is proposed to be undertaken within the proposed operating hours of the landfill.

6.3 Garden organics facility

6.3.1 Composting process

The GO facility would be relocated to an area on the western side of the LHRRP, adjacent to Heathcote Road on an approximately 3.7 ha parcel of land. Access to the GO facility would be via an internal access road around the perimeter of the landfill.

The proposed composting process to be undertaken at the new facility would be different from the current composting process and based on best practice. To reduce the potential for odour, the new facility would be partially enclosed, would use breathable membranes as part of the active composting phase and include use of aerated concrete 'bunkers' during the active composting phase. Further details of the key infrastructure, emissions controls and operations are provided in Sections 6.3.2 to 6.3.7.

6.3.2 Proposed facilities and infrastructure

Layout

The key components of the GO facility, shown on the preliminary layout in Figure 6.11, would include:

1. Waste receival/sorting/preparation
2. Active composting
3. Maturation
4. Finished compost storage
5. Mulch storage
6. Storage pond
7. Reception
8. Compost blending
9. Hardstand
10. GO sump
11. Amenities office

A reception area would be constructed between the waste receival area and the compost blending area including an amenities office with rooms to store samples and house the electrical panel room. This would also include a car park for 7 vehicles.

LEGEND

- Lucas Heights Resource Recovery Park boundary
- Internal access road
- Creek
- Landfill area

1. Waste reception/sorting/preparation
2. Active composting
3. Maturation
4. Finished compost storage
5. Mulch storage
6. Leachate pond
7. Reception
8. Blending
9. Hardstand
10. GO sump
11. Amenities office

Paper Size A4

0 10 20 40 60 80

Metres

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

N

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SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 03 Jun 2015

GO facility layout

Figure 6.11

G:\21\23482\GIS\Maps\MXD\21-23482-Z014_GOFacility.mxd

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Aerial Imagery: SITA, 2014. GO&ARRT: GHD/SITA Australia, 2014. Roads/Suburb: NSW LPMA, 2012. Created by:apmiller

Engineered pad

The proposed engineered pad would meet the requirements of the Department of Environment and Conservation (NSW) July 2004 publication 'Environmental guidelines: Composting and related organics processing'.

Aerated composting bunkers

During the active composting phase, composting would be undertaken in a series of 34, partially enclosed composting bunkers each 30 m long x 5 m wide. The back walls of the bunkers would be approximately four metres high. It is anticipated the bunkers would be filled with material to approximately three metres in depth.

The bunkers would be equipped with a common ground aeration network.

The ground aeration system would comprise four, high density polypropylene pipes perforated at 10 cm spacing. The pipes would supply air to the composting material and permit process waters (leachate) to be evacuated towards drip pots. Photo 6.1 shows an example of the type of floor that would be used in a composting bunker.

Photo 6.1 Example of aerated composting bunker floor

A watering system would also be installed in the bunkers to recycle process leachate and rainwater run-off back into the composting process. The watering system would consist of a pump and filtration system near the leachate pond as well as a distribution and valve network permitting system regulation.

Bunker covering system

A cover system would be used for the first four weeks of composting to reduce odour and would comprise the following elements:

- A metallic frame resting on the back wall of the bunker

- A mobile winding cart to fold back the cover
- Guide rails
- A motorised hoist installed on the mobile cart to unroll the cover
- Breathable membrane covers

Photo 6.2 and Photo 6.3 show an example of a similar bunker and cover system to that proposed.

Photo 6.2 Example of bunker aeration and cover system infrastructure

Photo 6.3 Example of covered bunker during composting operation

6.3.3 Odour management

The use of breathable membrane covers would assist to control the emission of odour from the composting process. It would also prevent stormwater infiltration into the compost, which would reduce garden organics leachate generation.

Active aeration of the material is also a key odour reduction measure, as it prevents the composting material going anaerobic (the main potential cause of odours).

A series of preventative measures are detailed in the GO facility OEMP (Appendix T) to prevent excess odour from the composting process from occurring in the first place. The GO facility OEMP also has a range of rectification measures. This includes a complaints register which requires SITA to activate and control odour emissions based on odour complaints.

Any complaints about odour from the proposal site would be investigated in a wholistic manner, to examine all practices including aeration, use of covers, stockpiling times for incoming material etc. The appropriate control(s) would be identified and adopted.

Odour is assessed in Chapter 12.

6.3.4 Stormwater and leachate management

The GO facility would generate clean stormwater runoff and leachate. Garden organics leachate would be produced by rainwater run-off in dirty areas and process leachate from the aeration network.

All clean water collected from roofing and breathable membrane covers via a separate collection system. Separation of clean water from garden organics leachate would prevent excessive volumes of contaminated water from being produced. The clean water would be conveyed direct to the natural environment (Mill Creek), or stored for later use on site.

Through appropriate grading and channels, garden organics leachate would be directed to and stored in a leachate pond prior to recycling back into the composting process.

As shown on Figure 6.11, the garden organics leachate pond would be located on the southern portion of the GO facility site and have a capacity of approximately 10,000 m^3. A pump and filtration system would be installed in proximity to the leachate pond, along with a distribution and valve network to enable the leachate to be recycled back into the process.

The covers form an impermeable barrier to stormwater infiltration into the covered compost. In the unlikely event that the covers are ineffective (e.g. via composting getting on their upper surface) housekeeping measures would be able to be taken to adjust the management of the cover process to maintain the effectiveness of covers for excluding stormwater from the compost.

Stormwater management and GO facility leachate are assessed in Chapter 13.

6.3.5 Access and internal roadways

Access to the GO facility would be via an internal access road around the perimeter of the landfill.

All vehicles entering the GO facility would pass over the LHRRP site weighbridge where vehicle weights and details would be recorded. Vehicle details would also be recorded via video surveillance cameras at this point.

6.3.6 Utilities and services

Electricity

Electricity is supplied to the existing resource recovery buildings located to the east of the GO facility. New aboveground power lines would be run alongside the proposed internal access road from the existing resource recovery centre to the proposed GO facility.

The electrical power supply requirements for the GO facility are likely to be relatively low, with the aeration fans being the largest consumer of electricity. Most mobile and fixed processing plant would be run by diesel engines. Electricity would be needed for the office and testing building.

It is expected that the GO facility would have an electricity demand of approximately 600,000 kWh per year.

Communications

The GO facility amenities office would be provided with telephone, computer and data cable access. Standard telephone cabling and two-way radio / mobile telephones would provide the required telecommunication services. Internet access would be provided via ADSL or Wi-Fi.

Water supply

Water supply would be drawn from local reticulated main supplies. Apart from potable water which would be used for showering and drinking purposes, water collected in large rainwater tanks would be used to clean equipment and floors, toilet flushing, and for other industrial purposes. It would also be used for watering any landscaped areas.

The water requirements for process purposes are further detailed in Chapter 13. It is proposed that a significant amount of leachate from the GO area would be stored and utilised for composting purposes. Any shortfall of water required for composting would be supplemented from stormwater or the potable water supply.

Wastewater management

Wastewater from the amenities facilities at the proposal site would be managed separately to leachate arising from composting at the GO facility. Since the reticulated sewerage system does not currently service the GO facility site, an onsite sewage package treatment plant or a storage tank with pump out capability would be provided.

Fire services

Water to be used for firefighting would be drawn from the storage pond, or from landfill water storage basins by fire trucks if required. Fire management and prevention are addressed in Chapter 18.

6.3.7 Operation

Process

The following table outlines the GO facility process. The steps are described in detail in the following section.

Table 6.3 GO facility process

Step	Description	Estimated timeframe
Receival and sorting	Receival of waste and initial removal of contaminants	1 day
Shredding and screening	Size reduction and screening into fine fraction (for composting) and coarse fraction (mulch)	1-3 days
Composting	Composting in aerated bunkers, covered with breathable membrane	4 weeks
Maturation	Maturation in windrows, mechanically turned regularly	8 weeks
Storage and blending	Stable material stored ready for blending and sale	As required

Receival and sorting

After passing over the weighbridge, trucks would deliver organics waste to the waste receival and preparation area. The garden organics would be discharged and stacked up with a loader to a height of approximately four metres before being sorted and shredded.

The receival and sorting area would be large enough to store approximately three days of garden organics supply during peak periods (or one week in normal times). If excess material is received, it would need to be transported off-site to another SITA facility.

Restricting the area for receival would assist in preventing the start of composting before the shredding/screening stage and hence reduce potential for odour generation.

The garden organics would be sorted by spreading the material on the ground and manually removing contaminants.

Shredding and screening

Once the material has been sorted, it would be prepared for composting using a mobile shredder and a screen for size reduction purposes.

The screening step would separate the incoming material into two different fractions: a fine fraction that would be used for the production of compost, and a coarse fraction to be used for the production of mulch or biomass for energy production. The separation of the coarse woody components (which are slower to degrade) would also improve the efficiency of the composting

process. If material being prepared cannot be processed due to insufficient area, it would need to be transported off-site to another SITA facility.

Composting

The prepared material would then undergo a minimum four week composting process in the aerated concrete bunkers. Studies show that the odour potential of compost is highest during the first days of composting. Nevertheless it is proposed that the bunkers would be covered for the full four weeks of composting and only uncovered to turn after two weeks. The composting material would be covered by a breathable membrane during this time (refer Photo 6.3).

The proposed concrete bunkers and covering system would significantly reduce the potential odour generation from the new GO facility compared to current operations (open windrow composting). The aerated bunkers would allow the composting process to be accelerated as well as reduce the stockpile volumes on the GO facility site.

Maturation

The compost material would be moved to the maturation area and matured for a further eight weeks. The maturation piles would be aerated by natural convection of air and by mechanical turning.

It is proposed that in addition to the loading operations for maturation and storage, maturing compost would be turned three times (once every two weeks) during this phase.

Storage and blending

The compost material would be moved to the storage area. At this point the compost would be stable, and therefore no turning would be undertaken. The storage area would include a small area allocated for blending of finished compost to create a variety of compost products for market.

Plant and equipment

Operational plant and equipment currently used at the existing GO facility would be relocated and continue to be used at the new facility. This includes existing loaders, excavator, shredder, trommel, grader and screen. However the expanded facility would require some additional plant and equipment including:

- Loader
- Tipper truck
- Excavator
- Fans (for aeration)

Workforce

The relocation and expansion of the GO facility is expected to provide employment for an additional 5 personnel.

Operational hours

No change to the operational hours of the existing GO facility are proposed for the relocated facility.

Decommissioning

The GO facility would be cease operating at the end of 2037, to coincide with the closure of the landfill. The facility would then be decommissioned.

6.3.8 Construction

Construction activities

It is anticipated that the construction works for the GO facility would be conducted over a 6 month period.

Construction works would be undertaken in accordance with the construction environmental management. and include the following:

Earthworks and civil infrastructure

Construction activities would include site preparation, vegetation clearing, construction of temporary drainage works, bulk earthworks, pavement construction, installation of utility services and other miscellaneous civil construction activities.

Temporary drainage and erosion and sediment control works would be constructed in accordance with a soil and water management plan that would be developed for the proposal, including:

- Clean water diversion drains
- Temporary sedimentation ponds
- Silt fences and other sediment control methods to prevent sediment run-off.

Earthworks would include excavation and fill activities for the roadways, reception area and car park and compost bunkers and storage pads as well as trenching for services.

Works would also include compaction of the barrier layer and spreading/compaction of the final working surface. The proposed engineered pad would meet the requirements of DEC (2004) 'Environmental guidelines: Composting and related organics processing'. The pad material may comprise hardstand material combined with clay or other impermeable layer below. Concrete would be used as a base for the bunker area.

Permanent drainage works would also be constructed, including stormwater infrastructure and a leachate pond.

Building infrastructure and concrete bunkers

Onsite buildings would be constructed (the administration building and testing building) and pre-fabricated concrete bunkers would be installed.

Installation of equipment and services

Equipment including covers and the aeration system would be installed once the buildings and bunkers have been completed.

Commissioning

Commissioning would be undertaken once the concrete bunkers are constructed and mechanical equipment installed (including covers and aerations system).

Workforce

The workforce required for construction of the GO facility is expected to be in the order of 30 workers.

Construction hours

Construction would be undertaken during recommended standard construction hours of Monday to Friday: 7 am to 6 pm, Saturday: 8 am to 1 pm and no work on Sundays or public holidays.

6.4 Advanced Resource Recovery Technology facility

6.4.1 Key facilities and infrastructure

The ARRT facility would be located on the western side of the LHRRP on approximately 8 ha of land, immediately adjacent to the proposed GO facility. Part of the land proposed to be used is currently leased by SITA to SICTA. The land take associated with this new facility is estimated to be approximately 1.2 ha. The facility would comprise a series of buildings, enclosed biofilters and stacks, fire water storage tanks, leachate storage tanks, internal roadways and car parking. The ARRT facility layout is shown in Figure 6.12 and key components described further below.

Waste receival and processing building and composting hall

Incoming waste materials would be delivered to the waste receival and processing building. Compost would be processed within this and the composting hall. Finished and refined compost would be stored within the compost hall ready for market.

All buildings would be enclosed under negative pressure and equipped with fast-acting roller doors to assist with air management and hence reduce dust and odour emissions.

The waste receival and processing building would have an approximate area of 18,500 m^2, including biofilters. The composting hall on the northern side of the facility would have approximate area of 11,500 m^2. An additional separate building of area 2,400 m^2 has been allowed for the composting hall biofilters.

The buildings would be portal-framed structures with concrete floors. The main rafters and columns would be constructed from universal or welded beams. Roof and floor cladding would be constructed using colourbond steel wall sheeting with a colour selected to compliment the surrounding environment.

Biofilters

Biofilters would be connected to buildings to treat internal air emissions prior to discharge to the atmosphere. These biofilters would be enclosed and fitted with irrigation spray systems to maintain a moist environment and ensure adequate treatment of air prior to discharge. Each biofilter would be fitted with a 20 m high column to enhance dispersion. This has been modelled in the odour assessment (refer Chapter 12).

The biofilter design would be based on the standard practice of the biofilter supplier. An enclosed biofilter with portal to raise the height and velocity of treated air emissions is proposed, so standard dimensions and residence times used for regular biofilters would not necessarily apply. A specialist firm would design the biofilter to meet the required emissions standards. This would involve designing the system to have some excess capacity, at all times, and to allow for progressive maintenance.

Roller doors

For the main ARRT facility building, it is currently envisaged that there would be one entrance door for vehicles entering the building to drop off waste, and a second roller door for exiting vehicles. Both would be automatic fast closing doors and have air curtains fitted. There would probably be one or two other doors for operational access purposes. The final number and exact positions of roller doors would be determined during the detailed design.

The composting hall would have at least two roller doors, on the southern face of the building, again fitted with air curtains. These may not be automatic closing doors, as the use of these doors would be less frequent than the doors for entry and existing of vehicles carrying waste to the ARRT facility.

The building ventilation systems for both the composting hall and waste receival / processing buildings would be designed to maintain negative air pressure conditions at all times. The ventilation requirements for achieving negative air pressure in the waste receival building would mean that approximately 0.5 air changes per hour are needed. In the composting hall, a greater number of air changes per hour than this would be needed due to the nature of the activities and the need to provide sufficient air for the composting processes.

The systems in the ARRT facility could achieve up to 4 air changes per hour if the detailed analysis requires.

This has been taken into account in the air quality assessment (Chapter 12) and would ensure that the buildings maintain negative air pressure conditions.

Access and internal roadways

Access to the ARRT facility would be via an internal access road around the perimeter of the landfill.

All vehicles entering the ARRT facility would pass over the LHRRP site weighbridge where vehicle weights and details would be recorded. Vehicle details would also be recorded via video surveillance cameras at this point.

Offices and amenities

Amenities for the ARRT facility staff would be provided in accordance with the requirements of relevant building codes. Amenities would include a washroom, toilet, staff change room and lunch room.

A site office would also be provided. This would contain a laboratory for product quality control for the composting process. The office and amenities would be internal to the main ARRT facility receival and processing building.

The ARRT facility would cater for the vehicles of up to 50 staff members and 20 visitors. The car park has been designed to meet the requirements of AS2890.

LEGEND

- Creek
- Lucas Heights Resource Recovery Park boundary
- Internal access road
- Landfill area

Paper Size A4

0 15 30 60 90 120

Metres

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

N

GHD

SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 03 Jun 2015

ARRT facility layout

Figure 6.12

G:\21\23482\GIS\Maps\MXD\21-23482-Z017_ARRTFacility.mxd

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Aerial Imagery: SITA/GHD. 2014. GO&ARRT: GHD/SITA, 2014. Roads/Suburb: NSW LPMA, 2012. Created by:apmiller

6.4.2 Utilities and services

Electricity

Similar to the proposed arrangements for the GO facility, above ground power lines would be run alongside the proposed new internal access road from the resource recovery centre to the GO/ARRT facility sites.

The peak power supply requirements for both GO and ARRT facilities are likely to be of the order of 1.0 to 1.5 MW. The capacity of the existing supply wires and transformers, and of the district supply infrastructure, would be verified as part of the design process. If necessary, any required upgrades would be implemented.

It is expected that the ARRT facility would have a total electrical demand of approximately 9.5 GWh per year (181,500 kWh per week).

Communications

The ARRT facility buildings would be provided with telephone, computer and data cable access. Standard telephone cabling and two-way radio / mobile telephones would provide the required telecommunication services. Internet access would be provided via ADSL or Wi-Fi.

Water supply

Potable water would be required for a number of activities at the ARRT facility including staff amenities. Water would be supplied to the ARRT facility site by ANSTO.

The water supply requirements for process purposes are discussed further in Section 6.4.3 and would depend on the composting/waste treatment technology adopted. This would be determined at the detailed design stage. However the composting process is expected to be a net user of water. In addition to compost leachate and stormwater being collected and reused from the GO and ARRT facility areas, these sources would be supplemented with potable water as necessary.

Apart from potable water, which would be used for showering and drinking purposes, rainwater would be collected and stored in large tanks which would be used to clean equipment and floors, for toilet flushing, landscaping and for other non-potable purposes.

Fire services

Firefighting requires a high volume and reliable supply of water. Provision for sufficient firefighting storage capacity to satisfy relevant building standards would be made at the detailed design stage.

It is anticipated that firefighting water would be retained in storage tanks in accordance with BCA requirements, to be determined at the detailed design stage. Fire management would be in accordance with the OEMP for the ARRT facility.

Suitable fire fighting apparatus and infrastructure including fire hydrants, fire extinguishers and sprinkler systems would be provided in the buildings as needed and in accordance with relevant building standards.

An asset protection zone (APZ) of 10 m would be maintained between the ARRT facility buildings and existing vegetation.

Fire prevention and management is addressed in Chapter 18.

Stormwater management

Stormwater collected from building roof areas would be collected in rainwater tanks alongside the buildings, and used for general purposes e.g. washing down of equipment, or for addition into the composting processes.

Stormwater management is assessed in Chapter 13.

Process leachate

Process leachate would be produced within the enclosed operational areas of the ARRT facility, primarily from the composting system and the biofilters, but small volumes of leachate may also be generated during the cleaning and biofilters. Process leachate would also be generated within the composting hall.

An estimated 150 kL per day of process leachate is expected to be generated. All process leachate would be directed to and stored in an aerated 500 kL capacity above ground leachate storage tank arrange for reuse in the composting process. The leachate storage tanks would provide capacity for three days of storage. Bunding would be provided around the leachate storage tank array to prevent discharge of leachate from the ARRT facility site in the unlikely event of failure or during maintenance.

Water is required for application to the composting material in order to accelerate the composting process. The objective is to produce material with 35% moisture content for effective quality control. The estimated water demand to maintain this moisture content is 240 kL per day on the five days per week that turning would operate. Therefore the overall weekly demand for process leachate from the operation of the ARRT facility composting would exceed the volume of process leachate anticipated to be collected from the system. As such, the shortfall in water would be supplied from other sources including stormwater ponds on other parts of the LHRRP site, or potable water.

In the event that excess process leachate is produced, it would be transferred to a licensed processing facility for treatment and disposal.

Wastewater management

As the reticulated sewerage system does not currently service the site, wastewater from the amenities facilities would be managed through an onsite sewage package treatment plant or a storage tank with pump out capability. The wastewater/sewage (partly treated or untreated) would be tankered to an external wastewater treatment plant for disposal.

6.4.3 Operation

The ARRT facility process would comprise a combination of mechanical separation, manual sorting and biological composting technologies. The main steps in the process would include:

a. Receival

b. Resource recovery

c. Composting and maturation

d. Refining

Receival

Waste would be transported to the ARRT facility predominantly by trucks with enclosed ‘walking floor’ trailers. It would be the responsibility of the waste transportation contractors to transport waste appropriately and in accordance with licence and legislative requirements. Loads of

waste that are not licensed to be accepted at the ARRT facility would not be accepted at the weighbridge.

Collection vehicles would be directed to the ARRT facility receival and processing building after exiting the weighbridge. Vehicles would unload waste inside the building. Mixed waste and source separated organic waste loads would be handled separately via an internal conveyor system to the next process stage.

Resource recovery

Resource recovery would be undertaken in two separate processing lines within the ARRT facility waste receival and processing building. One processing line would be used for the mixed waste feedstock and the other for source-separated organics. Material would be passed through a series of mechanical separation equipment. Examples of the equipment include:

- Trommel screens to separate waste streams by size
- Manual sorting stations to recover recyclable items and remove hazardous materials such as car batteries
- Magnetic separators to recover ferrous metals
- Eddie current separators to recover aluminium and other non-ferrous metals
- Shredding equipment to size reduce and prepare material for composting
- Mixing equipment to prepare material for composting

This pre-treatment process would remove recyclables and contaminants from the waste stream before the material is composted. Recovered recyclables removed during the pre-treatment process would be stored initially in bunkers and then baled for transportation off site.

Process residuals such as any separated paper and plastics would also be baled for use as PEF.

Waste material that has been pre-processed would be transferred via conveyor to the composting system. Mixed waste and source separated organics streams would continue to be kept separate and processed separately.

Composting and maturation

Following resource recovery, waste would be directed to the composting hall. Composting would be carried out by a fully automated and mechanised process, consisting of a travelling crane transporting rotating screw augers to continuously turn material and progressively move it through the composting hall.

Inside the composting hall, the material would be moved across a series of composting reactors at a rate of approximately one metre per day. Waste material would be composted for a minimum of four weeks before undergoing refinement.

A deluge type irrigation system would be mounted on the screw augers to control the moisture content of the composting material. Sumps installed within the floor aeration systems would collect any free water and condensate, and direct it to leachate storage tanks for reuse in the system. At the beginning of the composting process, leachate from the leachate storage tanks would be used for moisture control whereas cleaner water sourced from the stormwater ponds or stormwater leachate pond would be used towards the end of the process for compost quality reasons.

Air supply for the composting hall would be via ducting and fans extracting air from the resource recovery building. This would increase the negative pressure in these buildings and help prevent fugitive emissions from this segment of the facility.

The composting system would draw air through the compost via a network of pipes in a porous bed to aerate the compost, prevent anaerobic conditions developing, and to control temperature. Multiple aeration piping systems and fans would be used to allow independent control of different floor segments, and therefore differential control of the compost as it is moved across the reactor. This would also provide a level of redundancy and ensure that aeration of the compost and overall building airflow would not be affected by possible fan breakdowns.

Air extracted from the reactors would be directed to enclosed biofilters for treatment prior to discharge through stacks. The biofilters would have an automated irrigation system for media moisture control and the biofilter floor system would be designed for rapid media change, thereby minimising the down time of individual biofilters.

Odour impacts are assessed in Chapter 12.

Refining

Specialised compost refining equipment would be used to prepare the matured mixed waste compost for final use/sale. This would include removal of oversized materials and remaining contaminants.

The matured and refined compost would be stored within the composting hall to await off-site transport.

Residual process material from the refining stage would be disposed of at the adjacent landfill.

Plant and equipment

The following equipment would be required for operation of the ARRT facility:

- 2 x forklifts
- 1 x truck and dog trailer
- 2 x wheel loaders

Operational workforce

The ARRT facility would require approximately 50 additional full time equivalent staff.

Decommissioning

The ARRT facility would cease operating at the end of 2037, to coincide with the closure of the landfill. The facility would then be decommissioned, and the area it occupies would be landscaped.

6.4.4 Construction

Construction activities

Construction activities would take place over a period of approximately 18 months. All construction activities would be carried out in accordance with the construction environmental management plan, and include the following:

Earthworks and civil infrastructure

Construction activities would include site preparation, vegetation clearing, construction of temporary drainage works, bulk earthworks, pavement construction, installation of utility services and other miscellaneous civil construction activities.

Temporary drainage and erosion and sediment control works would be constructed in accordance with a soil and water management plan that would be developed for the proposal, including:

- Clean water diversion drains
- Temporary sedimentation ponds
- Silt fences and other sediment control methods to prevent sediment run-off.

Earthworks would include excavation and fill activities for the roadways, car park and building pads as well as trenching for services corridors.

Permanent drainage works would also be constructed, including stormwater infrastructure and leachate collection devices/trenches to accommodate the leachate conveyance system connecting to the leachate storage tanks.

Mill Creek realignment

A section of Mill Creek is proposed to be realigned as part of the proposal to allow construction of the ARRT facility. The creek has been progressively relocated over many years in concert with development of the LHRRP and was originally located to the east of its current position.

The section of creek is approximately 300 m long and the works would involve removal of an online dam (Mill Pond) to the west of the main creek. As part of the realignment, a bridge would be constructed across the creek to allow access to the GO and ARRT facilities.

A previous permit for the Mill Creek realignment was approved in 2006 by the former Department of Natural Resources based on a concept plan for works in the riparian zone. The permit noted that the remediation actions planned for Mill Creek would not be finalised until final decommissioning of the LHRRP site. The planned works have been implemented at the northern end of the LHRRP in accordance with the permit but some changes to the alignment of the identified (southern) section would now be required to enable the ARRT facility to be constructed. Hence these works are now included in the proposal and have been included in the surface water assessment (Chapter 13).

The 2006 permit and associated concept design envisaged that a low flow bypass would be constructed along this section of Mill Creek, but that Mill Pond would still be retained. The proposed realignment of Mill Creek involves constructing a straighter section of Mill Creek than the bypass, and filling in Mill Pond. It is envisaged that this current alignment and Mill Pond would be reinstated once the ARRT facility is decommissioned in 2037.

Except for the creek crossing and realignment works, disturbance from the proposal would be limited to areas outside of the 5 m riparian buffer of the creek.

The proposed realignment is shown on Figure 6.13.

Legend

- Existing alignment
- Realignment of Mill Creek for this proposal
- 20m buffer
- 40m buffer

Paper Size A4

0 50 100 200 300 400

Metres

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

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GHD

SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 05 Jun 2015

Realignment of Mill Creek

Figure 6.12

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

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Data source: Google Earth: Imagery- May 2014, NSW Department of Lands: contours - Jan 2012. Created by:apmiller

Building infrastructure

Construction of the buildings is expected to take approximately 20 to 30 weeks. Concrete would be delivered to site pre-mixed and items formed and constructed on site. Structural steelwork would be fabricated off-site and erected on-site using cranes and other such equipment. Cladding would be delivered in sheets to be fitted to the building framing on site.

Installation of mechanical equipment and large plant and services

Mechanical equipment would be constructed off-site and delivered for installation and commissioning. It is expected that the equipment would be required on-site prior to completion of building infrastructure to allow equipment to be positioned inside the buildings. Therefore, the erection of portal frames for building would be coordinated with installation of large plant and the biofilters.

Internal fit-out

The fit-out of the ARRT facility would include installation of internal building services including electrical services, hydraulic services and ventilation systems. It would also include fit-out of the office/amenities.

Commissioning

Commissioning would be undertaken once the buildings are complete and mechanical equipment installed. Commissioning would be undertaken in two stages – mechanical/electrical (dry) commissioning and process (wet) commissioning.

Workforce

The workforce required for construction of the ARRT facility would fluctuate throughout the construction period depending on construction activities, but would peak at approximately 100 workers during installation and fit-out.

Construction hours

Construction would be undertaken during recommended standard construction hours of Monday to Friday 7 am to 6 pm, Saturday 8 am to 1 pm and no work on Sundays or public holidays.

6.5 Site closure

6.5.1 Overview

Consistent with existing approvals, it is intended that a future parkland for recreational use would be made available at the LHRRP following completion of waste disposal and processing operations in 2037 and rehabilitation and landscaping activities in 2038 and 2039. Details of the rehabilitation and landscaping of the site are included in Appendix R.

The proposed parkland would be approximately 149 ha in area (25 ha larger than the existing approved parkland), which is approximately half the size of Sydney's Centennial[4].

6.5.2 Early works and maintenance

As part of the proposal, in accordance with the interim landscape plan, SITA would implement substantial woodland and understory planting with the aim of screening the landfill, garden organics and ARRT facilities from adjacent areas and roads including along Heathcote Road and around the boundary of the existing PCYC area where this is feasible in light of operational

[4] subject to ANSTO agreeing to release its portion of the site for this purpose

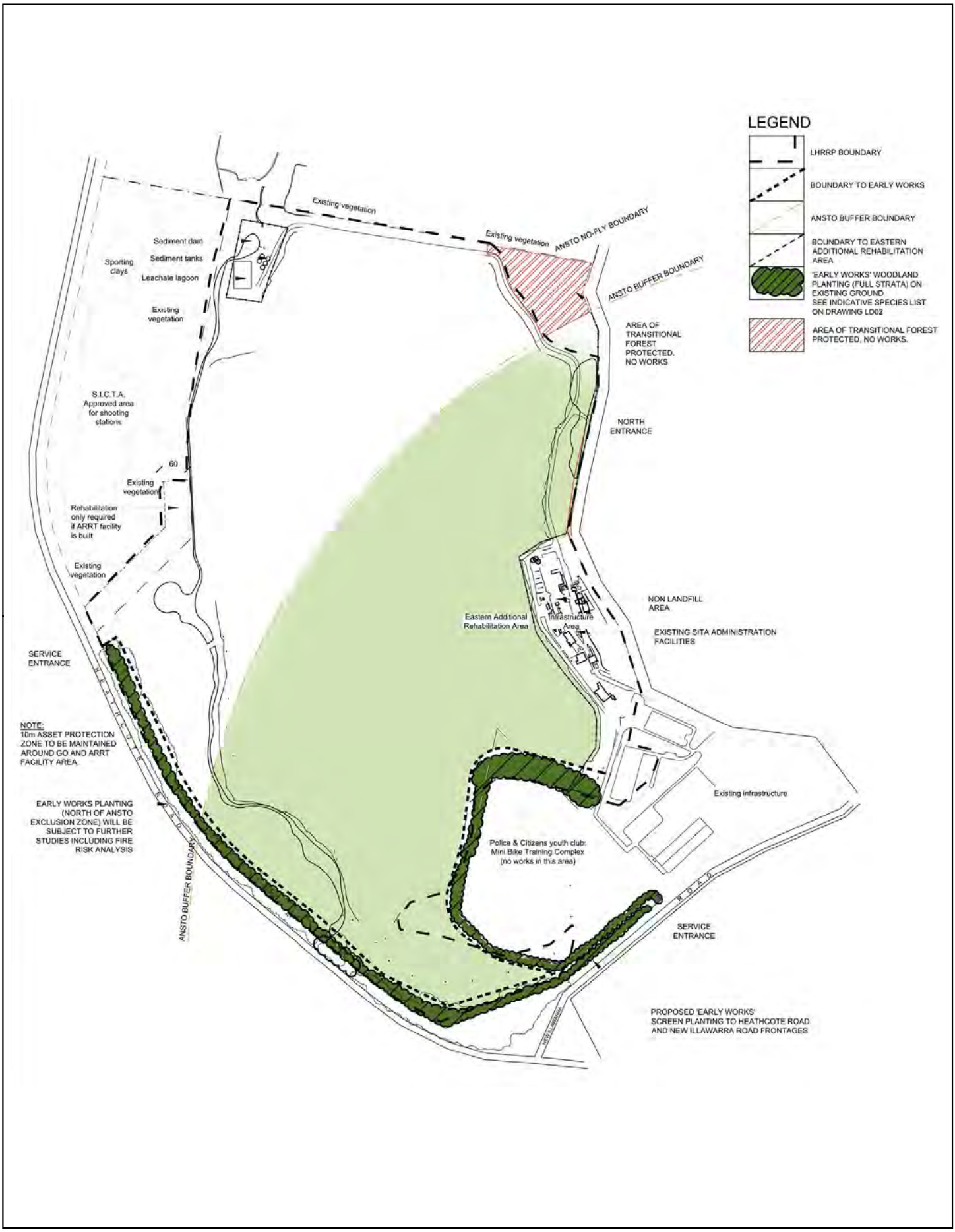
needs and bushfire safety requirements. The interim landscaping plan is provided in Figure 6.14.

Once filled, the ANSTO owned portion of the landfill would be capped and grassed as per initial discussions on a new agreement for use of the land. In the period between capping and grassing until 2037, SITA would be responsible for maintaining a neat appearance of the ANSTO owned area. Landscaping of the LHRRP would commence in 2037 and would be completed by 2039.

6.5.3 Landscape masterplan

The final proposed contours of the proposal site would enable an elevated passive recreational parkland to be created for the community. An extensive planting program would be undertaken using a range of trees and shrubs to create a pleasant setting for passive recreational uses. In addition, pedestrian, cycle pathways and water features, combined with lawn areas and amenities buildings are proposed.

The preliminary masterplan is shown in Figure 6.15 and an artist's impression is provided in Figure 6.16. Further details of the proposed landscape plan are provided in Appendix C.



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SITA Australia

Lucas Heights Resource Recovery Park

Interim landscape plan

Job Number	23482
Revision	B
Date	31 Aug 2015

Figure 6.14

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SITA Australia
Lucas Heights Resource Recovery Park

Job Number 21-23482
Revision A
Date 24 June 2015

Proposed parkland master plan **Figure 6.15**

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

Figure 6.16 Artist's impression of future parkland area

6.5.4 Responsibilities

Following closure of the landfill, GO facility and ARRT facility and creation of the parkland, SSC would be responsible for maintaining the parkland. However SITA would continue to have responsibility for the environmental performance of the disposed waste for a minimum 30 year period after site closure in accordance with the closure requirements administered by the NSW EPA. This includes monitoring, management of landfill gas and leachate.

SITA's post closure responsibilities are set out in the VPA and details are provided in the post-closure EMP. The responsibilities also include (from 1 January 2040):

- Landscaping (2 years)
- Stormwater infrastructure (5 years)
- Roads and cycle paths (5 years)
- Facilities (composting toilets) (15 years)
- Landfill cap (minimum 30 years)

Further details are provided in the VPA (Appendix W) and the post-closure EMP for the proposal site (Appendix V).

6.6 Future use

The proposed parkland would comprise extensive area of open space, which would provide primarily for passive recreational uses. The area would comprise open grassed picnic areas, viewing areas, bridges, ponds, a vehicle access route through the proposal site and a pedestrian and cyclist route. Details of the parkland design and uses for the site following the cessation of waste related activities Appendix R.

6.6.1 Viewing points

The landform reprofiling would create a new broad ridgeline with maximum height of RL184.9 mAHD with lateral valleys that drain towards Mill Creek. The high point would be close to the central north-south axis of the proposal site, slightly towards the eastern side.

The proposal site's highest point (The Peak) and ridgeline would provide prominent views to the Sydney City and North Shore skyline.

6.6.2 Water bodies

The present course of Mill Creek includes a chain of ponds which have been shaped to suit available runoff recharge capacity and to meet functional and aesthetic needs, with water levels controlled by adjustable spillways. As part of the construction of the ARRT facility a part of the creek would be realigned (refer Section 6.4.4). During creation of the parkland, Mill Creek would be retained with the addition of Mill Pond and Duck Pond (discussed below).

Mill Pond

As part of creation of the parkland, Mill Pond would be reinstated and shaped to create a visual landscape feature and amenity. A weir and spillway structure would be constructed to control the water level.

A bridge (Mill Bridge) would be constructed over a weir and would provide a strong visual element within the parkland. It would be constructed as a piped culvert with stone masonry walls. The bridge would provide access to the picnic area on the western side of the parkland.

Mill Pond would be maintained as a 'clear water' pond with densely grassed margins.

Duck Pond

A new water feature, termed Duck Pond, would be constructed in the south eastern part of the parkland. Duck Pond would be established with macrophyte planting to remove any nutrients and sediment from the water. Runoff from Heathcote Road would enter Mill Creek above this pond and the pond could be used to provide initial treatment for this runoff. Islands would be formed within the pond to serve as fauna protection habitats, especially for waterfowl.

A bridge (Paddock Bridge) would be constructed over the southern part of the pond and would provide a point of focus for the area. Paddock Bridge would be a piped culvert crossing with stone masonry walls.

Wetland

The existing water body next to the proposed North Entrance to the parkland would be retained. The pond would be used as a visual element and wildlife refuge as part of the final open space development.

Leachate lagoon

The existing leachate dam, in the north western corner of the proposal site, would remain in its present location. It would be fenced and public access would be prohibited. A service road would be maintained for access to this area from Little Forest Road.

This portion of the proposal site would be situated on steeply sloping land under an open tree canopy. Development of dense woodland plantings is proposed through the whole of the area westwards from the Woodlands drive. This would provide a screen for the leachate lagoon and ponds and other facilities remaining in the area. It would also create a visual and ecological extension of the Lucas Heights Conservation Area.

6.6.3 General open space areas

The proposal site would contain extensive areas of open space. The parkland would provide primarily for passive recreational uses. The final structure of the parkland would not fully emerge until completion of the final stage in 2037.

Grading and landscaping of all site areas has been developed to provide maximum flexibility to accommodate possible needs of future generations. Large, gently undulating and sloping spaces edged with trees and pathways would be able to cater for a rage of different activities.

Figure 6.17 Artist impression of landscaping

Future uses of the open space areas could include but are not limited to:

- model aeroplane flying areas (in a section on the northern boundary of the proposal site in accordance with a Council resolution on the matter)
- dog training or off-leash dog areas
- running/jogging/walking
- picnicking
- bicycling

The final uses of the each space would be determined by SSC based on community needs at the time. This would be done in 2035 in accordance with the VPA and in consultation with the community and ANSTO as appropriate.

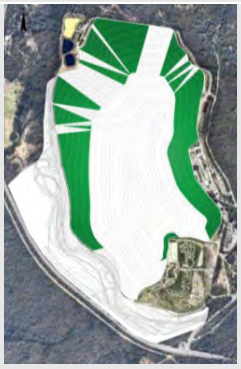
It is noted that some potential future uses may require further assessment at the time.

Figure 6.18 show an artist's impression of potential park land uses.

Figure 6.18 Artist's impression of potential parkland use – example 1

The final landform would provide grades which are appropriate for the proposed passive recreation uses. A discussion of the grades and examples of equivalent slopes in existing parklands is provided in Table 6.4.

Table 6.4 Reprofiling area slope analysis

Grade range	Park area	Portion of park area	Example of equivalent slope
5 – 10%	52.4 hectares	 35%	 Barden Ridge Sporting Complex
10 – 18%	35.6 hectares	 24%	 Bicentennial Park

Grade range	Park area	Portion of park area	Example of equivalent slope
18 – 25%	4.6 hectares	 3%	 Cronulla Park

6.6.4 Access and circulation within the parkland

Three vehicular access points are proposed into the parkland. The main entry point would be the North Entrance, from Little Forest Road. Two other entrances are proposed including to the south (from New Illawarra Road) and to the west (from Heathcote Road). The Heathcote Road entry would be used for emergency/egress only. The New Illawarra Road entry would be primarily used as a service access point.

Two distinct circulation systems are proposed for the parkland. These are:

- Provision for light-duty vehicular (and occasional service vehicles) movement
- Provision for pedestrian, bicycle and other non-motorised movement.

Vehicular traffic

The vehicular tracks would circulate between the three access points. This system would be criss-crossed by many smaller trail links and would involve loop roads and parking areas which would allow movement completely within the park. The major vehicular links would be known as:

- Mill Run, linking New Illawarra Road and Heathcote Road through the parkland
- Woodlands Drive, connecting the western areas of the parkland to the northern parts of the parkland
- A service road, connecting the leachate dam and Little Forest Road

Roads and footpath pavements would be 6 m and 2.5 m wide respectively. Cement stabilised crushed sandstone with two coats of seal finish is proposed.

Future secondary road connections would include Meadow Lane, The Cutting, and The Ridgeway, providing vehicular connections to the highest point of the LHRRP and along the eastern boundary of the parkland.

Pedestrian/cycle traffic

A shared pedestrian and cyclist path would be provided. It would be 2.5 m wide and would be made of compacted, crushed sandstone and would be stabilised with cement and spray seal. This path would link various parkland facilities throughout the proposal site.