Prepared by SUEZ Recycling & Recovery Australia

Lucas Heights Resource Recovery Park Project
Response to Submissions and Preferred Project Report

SUEZ Recycling & Recovery

PART 1 - Main Report

June 2016

Contents

Appendices

Glossary

Term	Definition
ANSTO	Australian Nuclear Science and Technology Organisation
ARRT facility	Advanced Resource Recovery Technology facility
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EPA	New South Wales Environment Protection Authority and any successor body
GO facility	The Garden Organics facility at LHRRP, that undertakes composting of waste including green and garden waste, but excluding waste types such as food waste and biosolids
LHRRP	Lucas Heights Resource Recovery Park
OEH	Office of Environment and Heritage
OEMP	Operational Environment Management Plan and all relevant future documents, these will be provided for the landfill, GO, ARRT and post closure and will detail how these projects can be managed to meet the environmental outcomes for the site
RMS	Roads and Maritime Services
SSC	Sutherland Shire Council
SICTA	Sydney International Clay Target Association and any successor body

1. Introduction

1.1. Oveview

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

An Environmental Impact Statement (EIS) was prepared by GHD and SUEZ (formerly known as SITA Australia[2]), to the expectations of Sutherland Shire Council (SSC), to support the 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, SSC is a joint applicant for the proposal. The EIS has been prepared in accordance with the provisions of the EP&A Act and 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.

The EIS was submitted to the New South Wales Department of Planning and Environment (DPE) in October 2016 and concluded the proposal meets SUEZ's objectives of having no significant impacts on the community or environment. In addition, 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.

The EIS was publicly exhibited for six weeks by DPE from 9 November 2015 to 18 December 2015. This was supported by SUEZ's independent exhibition and public communications. After six weeks of public exhibition, SUEZ received nine submissions from the following stakeholders:

- Department of Industry Resources and Energy
- Environment Protection Authority (EPA)
- Office of Environment & Heritage (OEH)
- Department of Primary Industries (DPI)
- Sutherland Shire Council
- Roads & Maritime Serices (RMS)
- Public submission - Donald Page
- Public submission – Grant Beamish
- Public submission – Greg Hoy

The comments were collated by the DPE and provided to SUEZ, accompanied by DPE comments received on 16 January 2016.

This Report addresses all responses received.

1.2. Purpose of this report

The purpose of this report is to respond to submissions from government agencies and the community. Upon

[1] SUEZ Recycling & Recovery Holdings Pty Ltd (SUEZ Holdings) is the holding company for the SUEZ group of companies in Australia. SUEZ Holdings is the parent company of both SUEZ and WSN Environmental Solutions Pty Ltd (WSN). WSN owns the land on which the Lucas Heights Resource Recovery Park (LHRRP) is situated. SUEZ Recycling & Recovery Pty Ltd (SUEZ) holds the environmental protection licence (EPL) and so is the operator of the facilities at LHRRP. For simplicity, the term SUEZ is used to refer to all of these organisations in this document.

[2] In March 2016, SITA Australia Pty Ltd has rebranded to SUEZ Recycling & Recovery Pty Ltd.

consideration of comments received from the Office of Environment and Heritage and Department of Primary Industries, a revised GO facility design is also proposed for the project.

This Report has been provided to satisfy the provisions of:

- Section 89G of the Environmental Planning and Assessment Act 1979
- Clause 85A of the Environmental Planning and Assessment Regulations 2000

The purpose of this report in addition to the above is also to address the requirements of:

- The various government agencies
- The community
- Sutherland Shire Council

1.3. Structure of this report

This Report is structured as follows:

- **Chapter 1 – Introduction.**
- **Chapter 2 – Project overview.**
- **Chapter 3 – Public exhibition and communications.** This chapter describes the communications undertaken by SUEZ before submission of the EIS and during the public exhibition period
- **Chapter 4 – Government agencies submissions overview**. This chapter describes how the government agencies' comments are addressed
- **Chapter 5 – Response to Department of Industry Resources and Energy.**
- **Chapter 6 – Response to Roads & Maritime Services.**
- **Chapter 7 – Response to Environment Protection Authority.**
- **Chapter 8 – Response to Office of Environment and Heritage.**
- **Chapter 9 – Response to Department of Primary Industries.**
- **Chapter 10 – Resposne to Sutherland Shire Council.**
- **Chapter 11 – Response to Department of Planning & Environment.**
- **Chapter 12 – Community submissions.** This chapter summarises the responses received from the community and SUEZ response to comments
- **Chapter 13 – Mitigation measures.** This chapter provides summary of the additional mitigation measures proposed
- **Chapter 14 – References.**

Appendices

- **Appendix A** – Consultation materials
- **Appendix B** – Consolidated submissions from DPE
- **Appendix C** – Response to EPA comments – attachments
- **Appendix D** – Response to OEH comments – attachments
- **Appendix E** – Response to DPE comments – attachments

2. Project overview

2.1. Location

The site of the proposal (referred to as 'the proposal site' for the purpose of this report) 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 SUEZ and 116 ha owned by ANSTO and leased to SUEZ 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.

2.2. 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, SUEZ is committed to better environmental outcomes by the application of best practice prevention, mitigation and rectification measures:

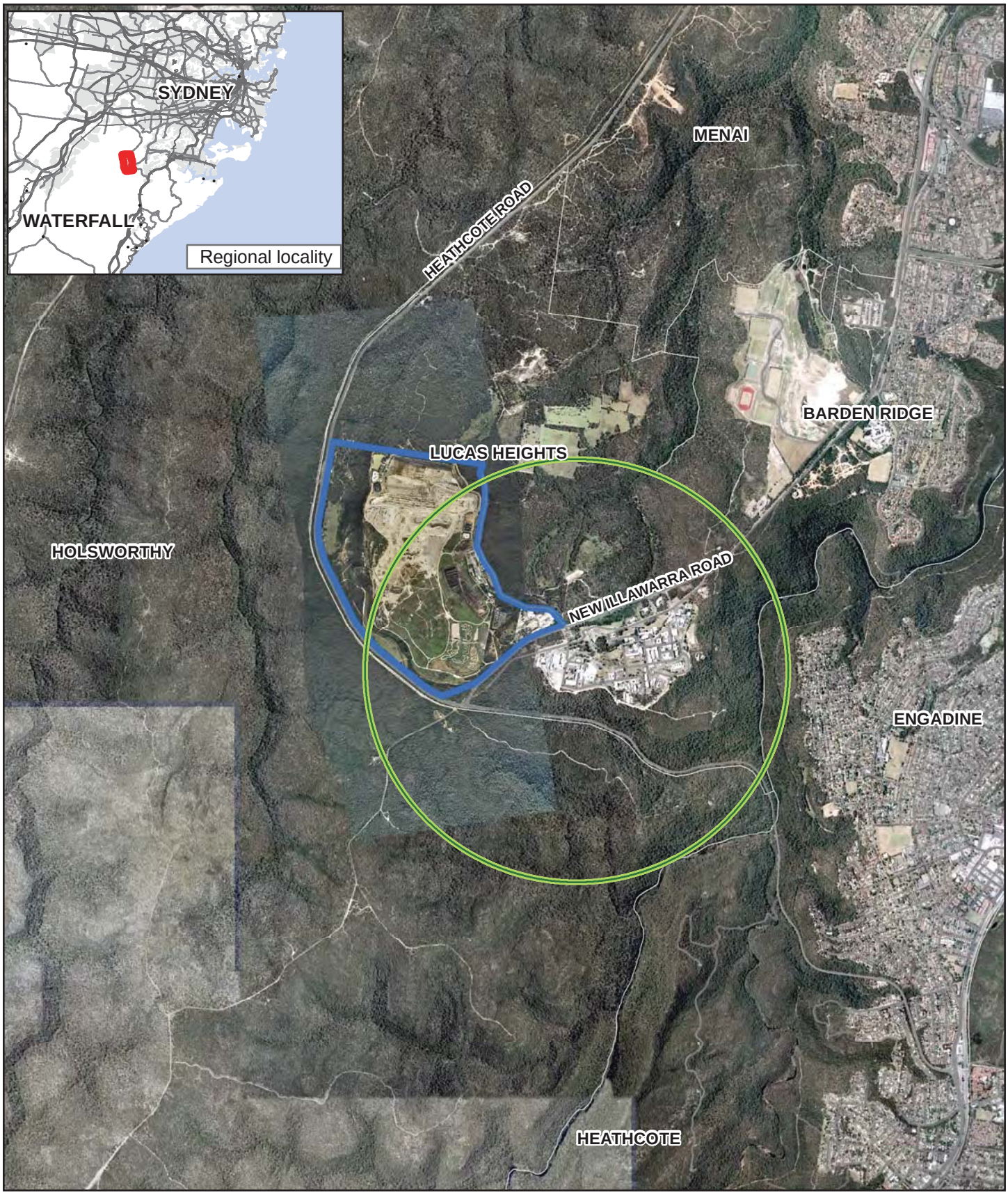
- **Reprofiling of existing landfill areas to provide up to 8.3 million cubic metres of additional landfill airspace capacity.** This is equivalent to approximately 8.3 million tonnes of waste, assuming 1 tonne of waste utilises 1 cubic metre of waste disposal airspace. As the process of reprofiling 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, SUEZ 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 at the end of 2039.

As part of the proposal SUEZ has committed to entering into an agreement with Sutherland Shire Council 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

- 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

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

N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z010_SiteLocation.mxd

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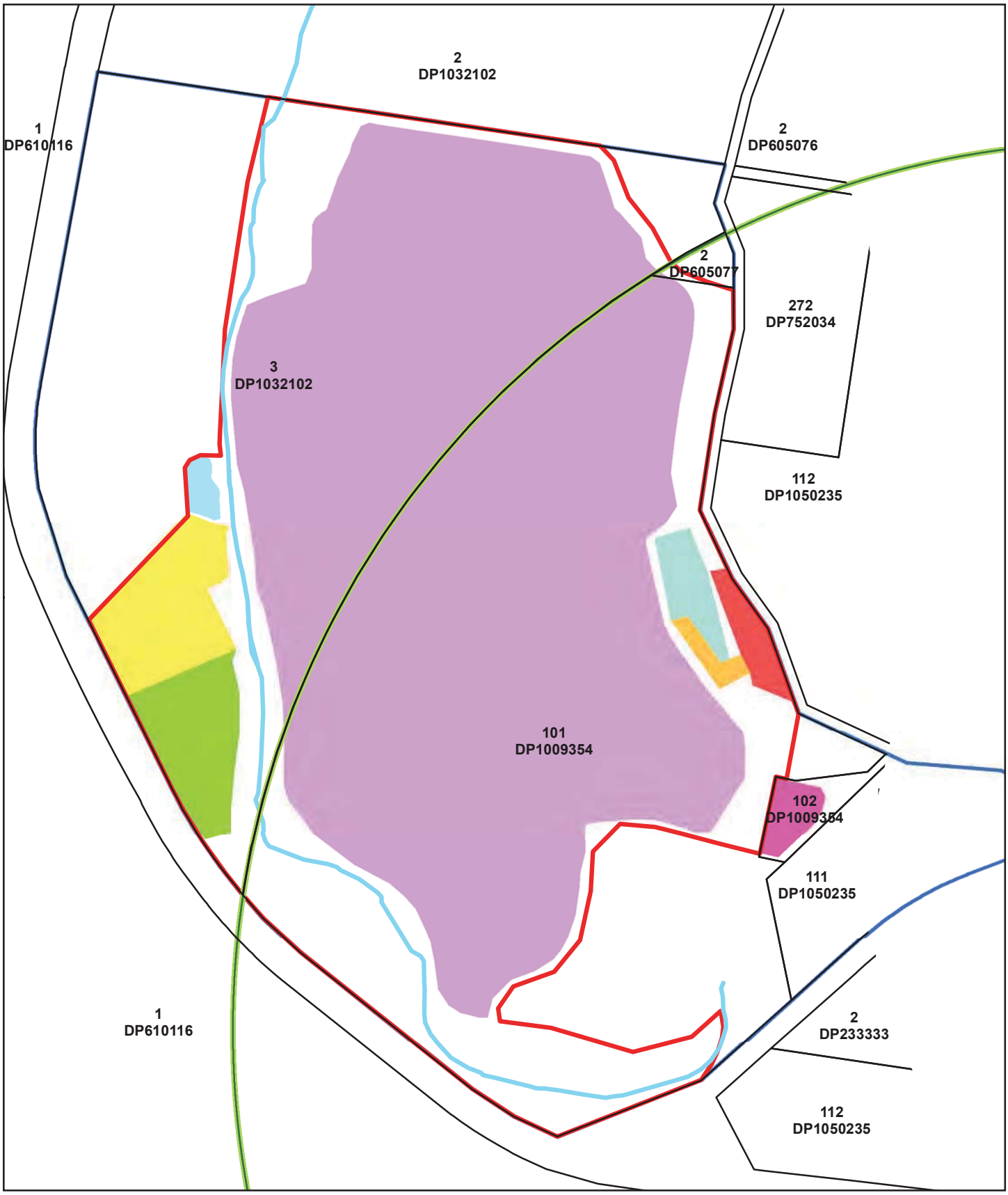
Aerial Imagery: Google, 2014. LHRRP Boundary: GHD, 2014. Roads/Suburbs: NSW LPMA 2012. Location Data: GEOSCIENCE AU 2014. Created by:jrichardson



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

GHD

SITA Australia
Lucas Heights Resource Recovery Park

Job Number	21-23482
Revision	A
Date	25 Jun 2015

The proposal site

Figure E.2

G:\21\23482\GIS\Maps\MXD\21-23482-Z059_TheProposalSite.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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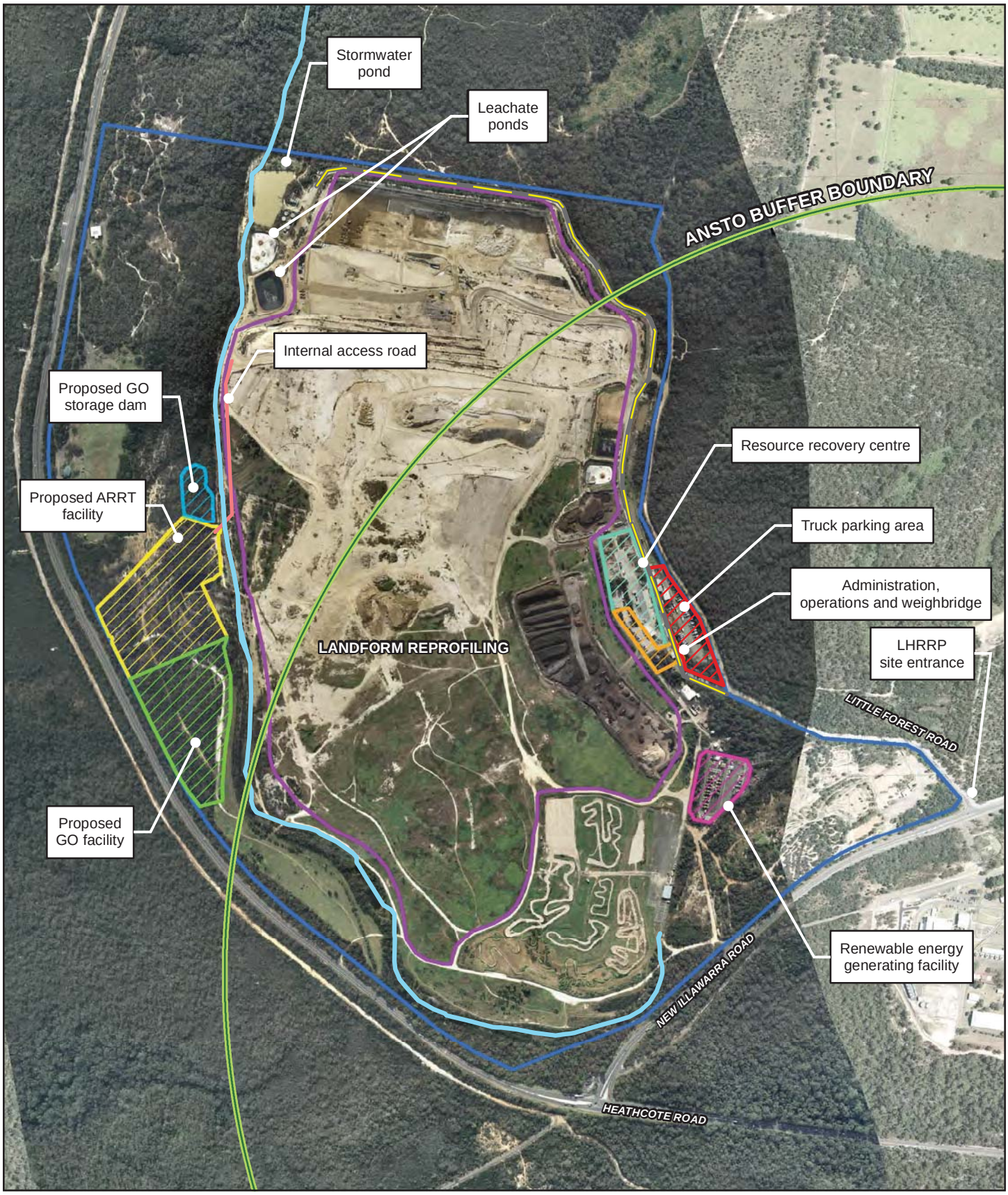
Aerial Imagery: ESRI, 2014. Works: GHD/SITA, 2014. Roads: NSW LPMA, 2012. Created by:afoddy



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 E.3

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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

3. Public exhibition and communications

The EIS was publicly exhibited for six weeks by DPE from 9 November 2015 to 18 December 2015. This was supported by SUEZ's independent exhibition and public communications.

3.1. During prepartion of the EIS

3.1.1. 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 reviewed and endorsed the submission of all relevant key planning documents including the operations environmental management plans (OEMPs), post closure EMP, the EIS document and associated specialist reports.

ANSTO is a federal government agency that operates the nuclear research facility to the southeast 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 also reviewed and endorsed the EIS document and associated specialist reports.

Details regarding consultation with SSC and ANSTO are described in Chapter 3 of the EIS (GHD, 2015).

3.1.2. Additional consultation activities

During preparation of the EIS, SUEZ used a variety of activities and tools to engage with stakeholders and the community during development of the EIS. This included:

- Lucas Heights Community Reference Group (CRG) meetings
- A dedicated proposal website, suez-env.com.au/lucasheights
- Drop-in sessions
- Deliver project information flyer to local neighbourhoods
- A community information centre
- Community information hotline
- One on one meetings with key stakeholders
- Developing and maintaining relationships with local media outlets

3.2. During public exhibition period

In addition to the usual proposal exhibition activity managed by the DPE, additional engagement activities were undertaken in accordance with the Communications Plan developed by SUEZ in consultation with SSC and Lucas Heights CRG to provide additional opportunities for the community to gain further understanding of the proposal, ask questions, discuss issues with SUEZ representatives and receive information.

The objectives of the communications was to:

- Raise awareness of the proposal and its merits
- Inform key stakeholders of EIS lodgement and public exhibition
- Increase awareness of SUEZ's best practice waste and recycling operations
- Discuss and seek feedback from interested community members

Advertising

Multiple advertisements were placed in local newspapers, including:

- Multiple advertisements in the St George and Sutherland Shire Leader
- One advertisement in the monthly publication Shire News

An example of the advertisement is contained in Appendix A.

Bulk mailouts

SUEZ delivered flyers to residents in the neighbouring suburbs during the EIS preparation. Once the EIS was submitted to the DPE, an updated flyer was designed, printed and delivered to all residents in the neighbouring suburbs of Barden Ridge, Engadine, Sandy Point and Menai (over 10,400 residences), to inform the closest residents about the proposal and that the proposal is on public exhibition.

A copy of the delivered bulk mailout is contained Appendix A.

Community information displays

Manned and unmanned static display were provided for interested members of the community to view relevant EIS documentations during three weeks of the display period. This included:

- display of the posters
- display of the proposal video running on a continuous loop
- copies of the brochure
- feedback forms
- information on how to make a submission

Proposal brochures, display posters which included specific findings from the EIS and feedback forms were made available at multiple Sutherland Shire Council locations including Engadine Community Centre (refer Figure 1), SSC administration building (refer Figure 2) and The Ridge Sports Complex.

A copy of the proposal brochure is contained Appendix A.

SUEZ project team members (which includes SUEZ staff and staff from the GHD community engagement team), was available at Menai Marketplace (refer Figure 3) for three weeks during the exhibition period on Tuesdays, Thursdays, Saturdays and selected Sundays to assist and respond to questions about the proposal. SUEZ project team members were also available at the Ridge Sports Complex (Figure 4) for two weeks on Saturdays during the exhibition period.

Over three weeks of face to face engagement with stakeholders at the manned display areas, over 100 discussions were had with locals regarding the proposal. Key topics discussed were logged and documented by team members.

Figure 1 Engadine Community Centre

Figure 2 SSC administration building

Figure 3 Menai Marketplace Setup

Figure 4 Ridge Sports Complex - the Ridge Golf Club House

Digital and social media

SUEZ commissioned targeted Facebook advertising to users in the project area including Bardens Ridge, Menai, Woronora, Heathcote, Yarrawarrah and Engadine to inform the closest residents about the proposal and that the proposal is on public EIS exhibition. The total population reach through Facebook is 19390, with total of 341 connections to the proposal website.

SUEZ also maintained the dedicated proposal website throughout the EIS exhibition period. After the EIS was submitted to the DPE, the website (suez-env.com.au/lucasheights) was updated to provide links to the EIS on the Department website, and to provide details of the exhibition locations. A total of 1128 page views were logged at the website from 9 November 2015 to 18 December 2015 where users could download the project brochure as well as register their interest to be contacted with updates.

SUEZ also maintained the project email address in order to answer questions and direct enquirers to the relevant EIS displays or online materials: lucas.heights@SUEZ.com.au. In addition, the project hotline (1800 810 680) operated throughout the exhibition period in order to answer questions, arrange site tours and direct enquiries to the relevant EIS displays or online materials. The project hotline and email address went to twelve desks at the consultant company engaged to assist with community consultation (GHD). Each of the staff at those desks were stakeholder engagement team members in the Sydney office. Each staff were briefed on the project, and knew to refer enquiries to the consultation team lead if they could not answer them straight away. Each stakeholder engagement team member also had a briefing sheet that described where the project EIS was on exhibition, and how to find out more, such as via the website or at the shopping centre display. In total, six phone calls and one email were received from residents and/or businesses regarding the proposal. Three site tours were also arranged during the time of the proposal exhibition.

Media & other communications

SUEZ also continued to communicate openly with media as requests were received. During the six weeks of public exhibition, SUEZ provided SSC with weekly updates regarding the communications process.

4. Government agencies submissions

SUEZ received seven submissions from government agencies. The following chapters detail the agencies' comments and provide clarifications and/or responses:

- Department of Industry Resources and Energy **(refer Chapter 5)**
- Roads & Maritime Services (RMS) **(refer Chapter 6)**
- Environment Protection Authority (EPA) **(refer Chapter 7)**
- Office of Environment & Heritage (OEH) **(refer Chapter 8)**
- Department of Primary Industries (DPI) **(refer Chapter 9)**
- Sutherland Shire Council **(refer Chapter 10)**
- Department of Planning and Environment **(refer Chapter 11)**

A chapter for each agency has been dedicated to each government agency for ease of reading. The layout of each chapter is as follows:

- Question or statement
- Response and clarifications by SUEZ

4.1. EIS reference list

For ease of reference, the EIS chapters and appendices are summarised below:

VOLUME 1 MAIN REPORT

1. Introduction
2. Statutory framework
3. Stakeholder and community engagement
4. Description of the proposal site and existing facilities
5. Strategic proposal justification
6. Proposal description
7. Identification and prioritisation of issues
8. Waste management
9. Traffic, transport and access
10. Noise
11. Visual
12. Air quality
13. Soils and surface water
14. Groundwater
15. Leachate
16. Contamination
17. Hazards and risk
18. Fire prevention and management
19. Biodiversity
20. Landuse
21. Greenhouse gas
22. Litter, illegal dumping and other issues
23. Voluntary Planning Agreement
24. Environmental management
25. Justification and conclusions
26. References

27. Glossary and abbreviations

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 – GO facility Operational Environmental Management Plan

Appendix U – ARRT facility Operational Environmental Management Plan

Appendix V – LHRRP Post Closure Environmental Managment Plan

Appendix W – Voluntary Planning Agreement

5. Department of Industry Resources and Energy

A response was received from the Department of Industry Resource and Energy – Geological Survey of New South Wales (GSNSW) dated 11 November 2015. The response provided general information as well as stated:

"GSNSW previously provided a response for the request for input into SEARs for the above project on the 12th December 2014 (our reference OUT14/40607). The GSNSW position remains unchanged with no resource issues to raise regarding the above proposal."

A copy of the response is provided in Appendix B. SUEZ appreciates GSNSW's time in considering the project and thanks GSNSW for providing the response.

6. Roads & Maritime Services

A response was received from the RMS dated 16 February 2016. The response stated:

"Roads and Maritime has reviewed the submitted documentation and notes that the proposed development would generate 105 vehicles per hour which is less than the approved 118 vehicles per hour as initially approved in 1999, In this regard, Roads and Maritime raises no objection to the proposal."

A copy of the response is provided in Appendix B. SUEZ appreciates RMS for considering the project and providing the response.

7. Environment Protection Authority

The NSW EPA provided response on 22 December 2015 and requested additional information to the Proposal regarding noise, air quality, surface water and leachate. A copy of the response is provided in Appendix B. A meeting was held with the NSW EPA and GHD to discuss the comments on the 8 February 2016. Responses to NSW EPA comments are documented in sections below.

7.1. Noise assessment (attachment 1)

7.1.1. Topic: Sleep disturbance criteria

Comment No. 1

Sleep disturbance criteria for the proposal have been derived in Table 3.5 of the Noise Assessment, however no assessment of potential sleep disturbance impacts has been carried out. The EPA propose to set night-time LA1, 1minute noise limits conservatively at 45 dBA for all receivers, based on the predicted LAeq noise levels. Alternatively, the proponent should provide an assessment of the potential sleep disturbance impacts of the proposal in the Noise Assessment.

SUEZ Clarification / Response

As shown in Table 5.6 of the Noise Assessment, the predicted noise level at all residential receptors are below 45 dB(A). SUEZ therefore agrees with the EPA's suggested night time LA1, 1 minute noise limits of 45 dB(A) at all residential receptors.

Reference

EIS Volume 2, Appendix E – Noise Assessment, Table 5.6 (p.28)

Table 5.6 Predicted operational noise levels

Receiver	Noise Criteria dB(A)		Existing noise level, $LA_{eq(15min)}$ dB(A)	Predicted noise level, $LA_{eq(15min)}$ dB(A)
	Day	Night		
R1 Engadine	45	37	30	31-32
R2 Barden Ridge	47	38	27	29
R3 Menai	45	37	26	26-27
R4 ANSTO	65	-	42	40-48
R5 ANSTO Motel	65	40	36	36-40
R6 Gandangara	45	37	36	37
R7 Gandangara North	45	37	27	31-34
R8 The Ridge Sports Complex	55	-	34	35

7.1.2. Topic: Noise modelling

Request for additional information No. 1

Table 5.3 of the Noise Assessment assigns a sound power level of 110 dBA for a single 20 tonne Caterpillar excavator, and 107 dBA (3dB lower) for a larger Caterpillar 30 tonne excavator, of which there are two used in the modelling. The proponent must confirm that the sound power levels are assigned correctly in the Noise Assessment.

SUEZ Clarification / Response

The power level of 110 dBA for a single 20 tonne Caterpillar excavator was sourced from Australian Standard AS 2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites" and represents an average measurement.

The power level of 107 dBA for the 30 tonne excavator was added at a later stage in the project and represents a different noise source data set due to a more modern equipment.

In undertaking the noise modelling GHD considered both the Australian and British standards. Neither standard offers specific information such as equipment age, make and model.

In order to confirm that our assumptions are conservative, GHD have reviewed the specifications of two CAT tracked excavators (24 and 30 tonnes), both of which were found to have lower SWLs than that used in the assessment. Refer the following specifications.

- 24 T - 103 dBA (sound power level) (http://s7d2.scene7.com/is/content/Caterpillar/C737602)
- 30 T - 105 dBA (sound power level) (http://s7d2.scene7.com/is/content/Caterpillar/C676055)

Reference

Australian Standard AS 2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"

British Construction standard BS 5528:2009 "Code of practice for noise and vibration control on construction and open sites"

EIS Volume 2, Appendix E – Noise Assessment, Table 5.3 (p.27)

Caterpillar. 2012. 323E SA Hydraulic Excavator. [ONLINE] Available at: http://s7d2.scene7.com/is/content/Caterpillar/C737602

Caterpillar. 2012. 329E Hydraulic Excavator. [ONLINE] Available at: http://s7d2.scene7.com/is/content/Caterpillar/C737602

Table 5.3 Equipment in Landfill Area

Item	Number	Status	Sound Power Level L_{Aeq} dB(A)
Landfill compactor	2	Existing	113
Bulldozer	2	Existing	108
Terex 40-tonne dump truck	3	Existing	106
Caterpillar 30-tonne excavator	2	Existing	107
Caterpillar 20-tonne excavator	1	Existing	110
Terex 40-tonne water cart	1	Existing	107
10-tonne water cart	1	Existing	107
Road Sweeper	1	Existing	104
Caterpillar 140 grader	1	Existing	110
Roller	1	Existing	108

7.2. Air assessment (attachment 2)

The EPA has requested information on the reliability and sensitivity of the odour impact assessment that was completed for the LHRRP EIS. This is to demonstrate the assessment was comprehensive, conservative and can account for any variations due to the nature of modelling and adopted odour emission rates.

A technical memorandum was prepared by GHD and provided in Appendix C to provide further assessment and demonstrate that the odour emission rates applied for the overall odour impact assessment for the Project is a conservative representation of the potential odour emissions from the site.

It is recommended to review this technical memorandum which provides further context for the responses provided below to EPA's comments.

7.2.1. Topic: Air Assessment approach

Attachment 2A – General Comments

Approach to Assessment

The AQAR included an extensive odour sampling regime to quantify spatial emissions across the landfill and identified three large odour sources, which have been focused on for rectification. The predicted odour impacts, and meeting the assessment objectives rely heavily on these odour sources being rectified. The EIS outlines that "through the proposal, estimated odour emissions would be reduced by more than 40% compared to current estimated levels through improved odour management". "These improvements would likely be achieved as early as 2015 with the predicted odour levels dropping considerably at nearby sensitive receptors". ***It is also noted that the AQAR recommends "retesting of rectified localised emission points, the v section, the area south of the excavation stockpile and batter in 2015/16".***

Based on this information there is additional information or data that could be supplied to demonstrate that existing odour emission sources have been rectified.

SUEZ Clarification / Response

In relation to the 40% reduction quoted in the EIS document, the following clarification is offered.

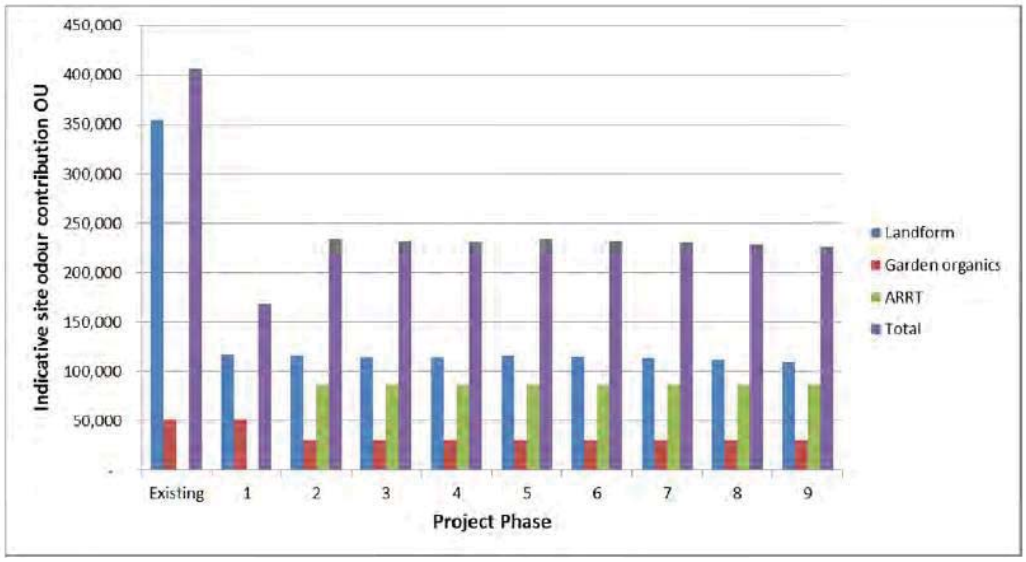
In the AQAR (Appendix G of the EIS), in the executive summary, it states that:

> *"Overall, it is noted that the proposal would result in improvements to odour levels at nearby sensitive receptors overtime, with the improvements realised as early as 2016."*
>
> *"The estimated odour emissions from the upgraded location and process would reduce by over 40% from the current odour levels"*

In the EIS Chapter 25 Justification and Conclusions (p. 25-2), it states that:

> *"In addition, through the proposal, estimated odour emission would be reduced by more than 40% compared to current estimated levels through improved odour management, as described in Chapter 12. These improvements would likely be achieved as early as 2016, with the predicted odour levels dropping considerably at nearby sensitive receptors including over a 50% reduction at ANSTO when compared against existing modelled odour levels (reduction from 10.9 OU to 4.2 OU, as outlined in Section 12.3.3). The 2 OU odour performance criteria would be achieved at the nearest residential receptor."*

Reference is made to the following figure in Section 7.2 of the AQAR (p. 45). The following figure provides a summary of the total relative potential odour emissions emitted during each project phase based on a mass balance.



The following reductions are expected:

- The relocation and upgrade of the GO facility provides an approximate 40% percentage reduction. This calculation is derived from the expected odour emission from the existing GO compared to the proposed GO which is scheduled to commence in 2017. That is, 100 – (31,000 OU / 51,500 OU) x 100 = approximately 40%. This is conservative as when the calculation is undertaken for the proposed GO facility, the reduction due to the breathable membrane covers were not considered. The percentage reduction of odour for the proposed GO facility compared to the existing GO facility is therefore expected to be higher with consideration of the breathable membrane covers and in the order of greater than 50%
- The GO facility reduction is shown in the diagram above as represented by the red bar (Garden organics). The reduction from existing (approximately 50,000 OU) to Phase 2 to Phase 5 (approximately 30,000 OU) is approximately 40%
- Coincidentally, this matches the odour reduction predicted to be achieved when all of the activities are considered cumulatively (landfill, new *uncovered* GO and ARRT). The work predicts a similar odour reduction of approximately 40% compared to the odour emissions in mid-2014 from the landfill and existing GO facility. Again, this value is conservative as the percentage reduction of odour for the proposed GO facility compared to the existing GO facility is expected to be higher with consideration of the breathable membrane covers
- The total reduction is shown in the diagram above as represented by the purple bar (Total). The reduction from existing (approximately 400,000 OU) to Phase 2 to Phase 5 (which is quite similar) is approximately 40%

In summary:

- SUEZ undertook a comprehensive and representative monitoring program during the EIS preparation and identified and rectified large odour sources. This was done by installing additional gas wells and filling over the batter
- The rectification works resulted in an improvement of odour performance across the site, with improvements realised as early as 2016
- Phase 1 of the proposal is not predicted to be the “worst case” of the proposal. The conservatism of the assessment is described in the technical memorandum prepared by GHD and provided in Appendix C (sensitivity analysis) which provides the confidence that the overall odour impact assessment for the proposal is a conservative representation of the potential odour emissions from the site

- Through the proposal, estimated odour emission would be reduced approximately 40% (conservatively) compared to current estimated levels through improved odour management. The improvements are brought about through a combination of relocate and update GO facility, landfill rectification works and improved odour management practices as detailed in the LHRRP OEMP

Rectification works - additional information

The odour concentrations when sampled (June 2014) identified three main problem areas:

- The landfill batter
- "v section" located in the intermediate cover area
- "rectangular area south of the excavation stockpile" located in the intermediate cover area

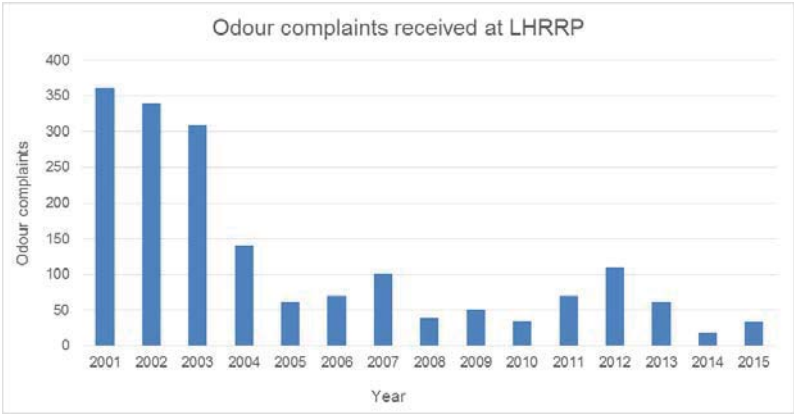
In particular, of the three areas, the landfill batter was identified as a significant potential contributor of odour from the site (refer section 6.4.2 of the air quality assessment). Since the assessment was done, the landfill batter has been landfilled with waste and is no longer exposed.

SUEZ undertakes quarterly landfill gas surface emission monitoring at the LHRRP. Since rectification works occurred in June / July 2014, review of the landfill gas surface emission monitoring data confirms improvement in the "v section" and "rectangular area south of the excavation stockpile". Figure 5 – Figure 8 below are prepared which shows decrease in emissions before (March 2014 plots) and after rectification works (July 2014, October 2014 and December 2014 plots).

Generally, it was observed that:

- Landfill gas surface emissions at the LHRRP are all below 100 ppm during March, July, October and December 2014
- Data shows a step change improvement - landfill gas surface emissions dropped by approximately 10 ppm across the identified problem areas between March 2014 (pre-rectification) to July 2014 (post-rectification)
- The reduced landfill gas surface emissions maintained over the rest of the year as validated by the October 2014 and December 2014 figures
- Number of locations where with surface gas emissions higher than 85 ppm reduced from 7 locations in March to 0 locations in July, and 1 in October, and 0 in December 2014
- Based on the above, it could be demonstrated that rectification works links with sustained reduced landfill gas surface emissions at the LHRRP which correlates with reduced potential odour emissions from the site

In 2015, LHRRP received 33 odour related complaints. This represents an improvement from the years 2011, 2012 and 2013.



** Note the complaint level for 2013 was mistakenly reported in the EIS and should be 61 complaints.*

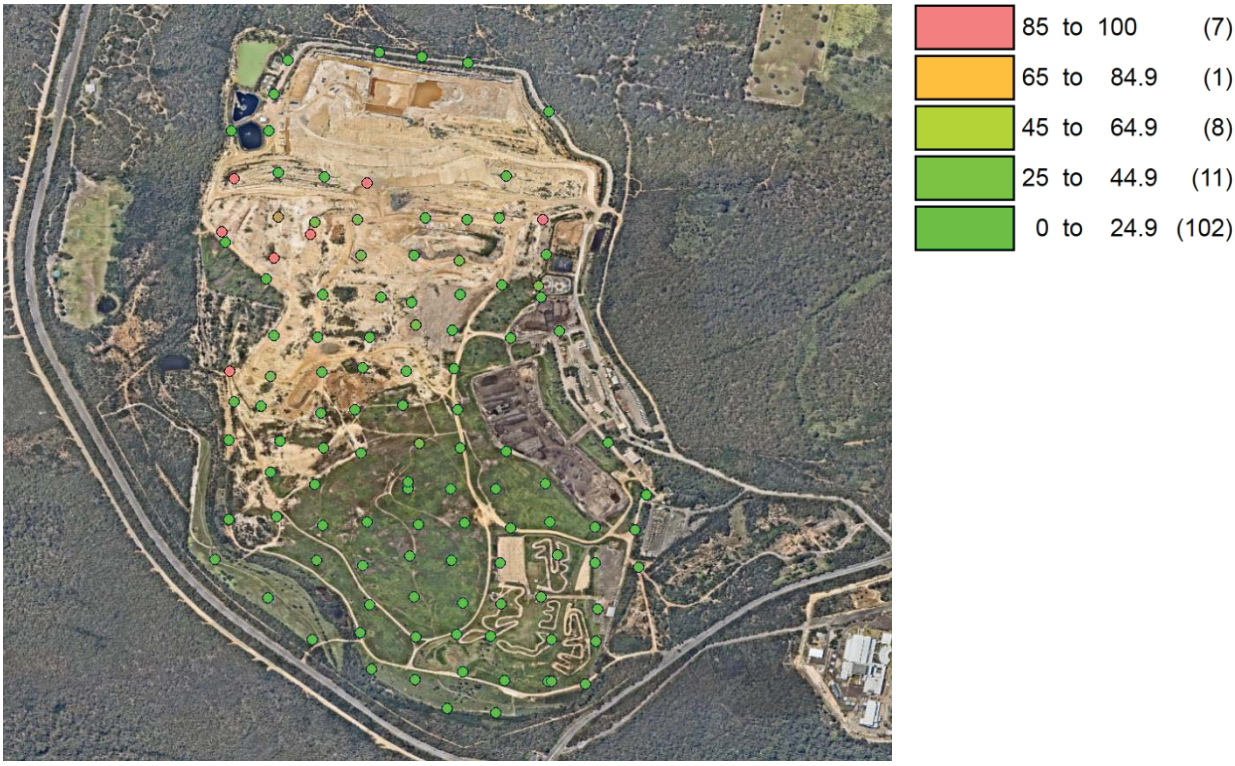


Figure 5 March 2014 surface gas emissions

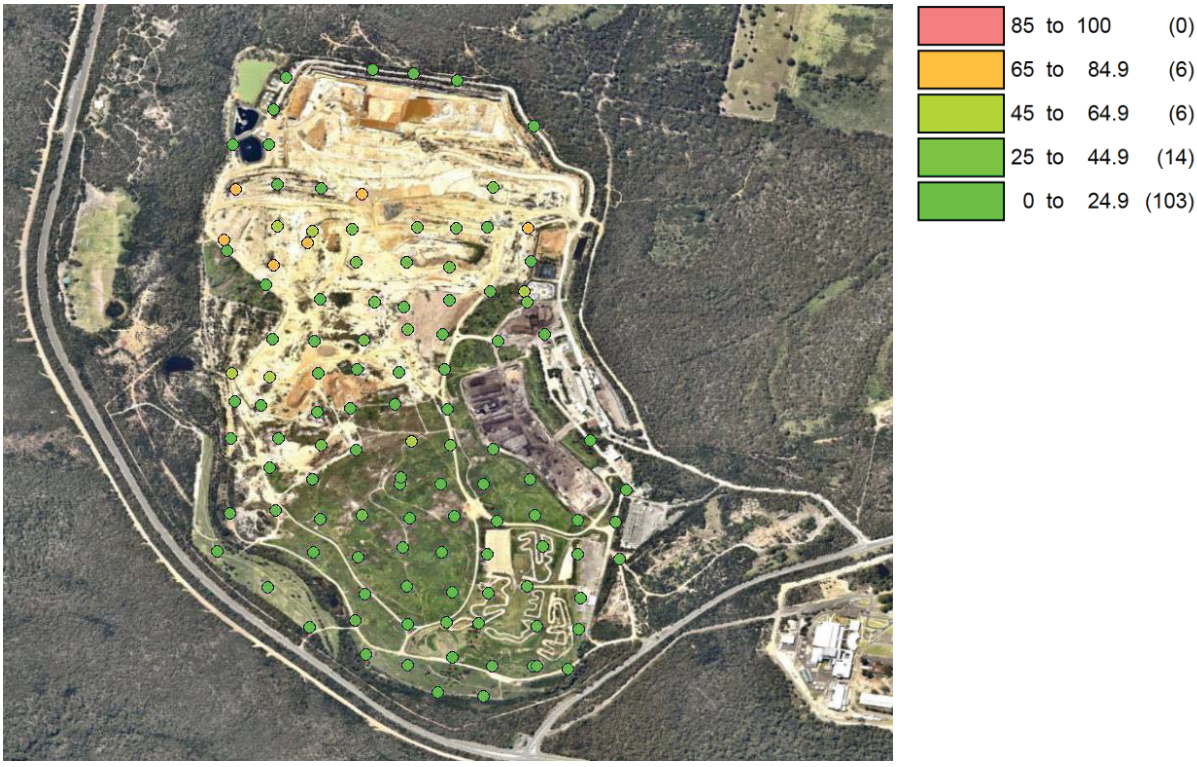


Figure 6 July 2014 surface gas emissions (after rectification)

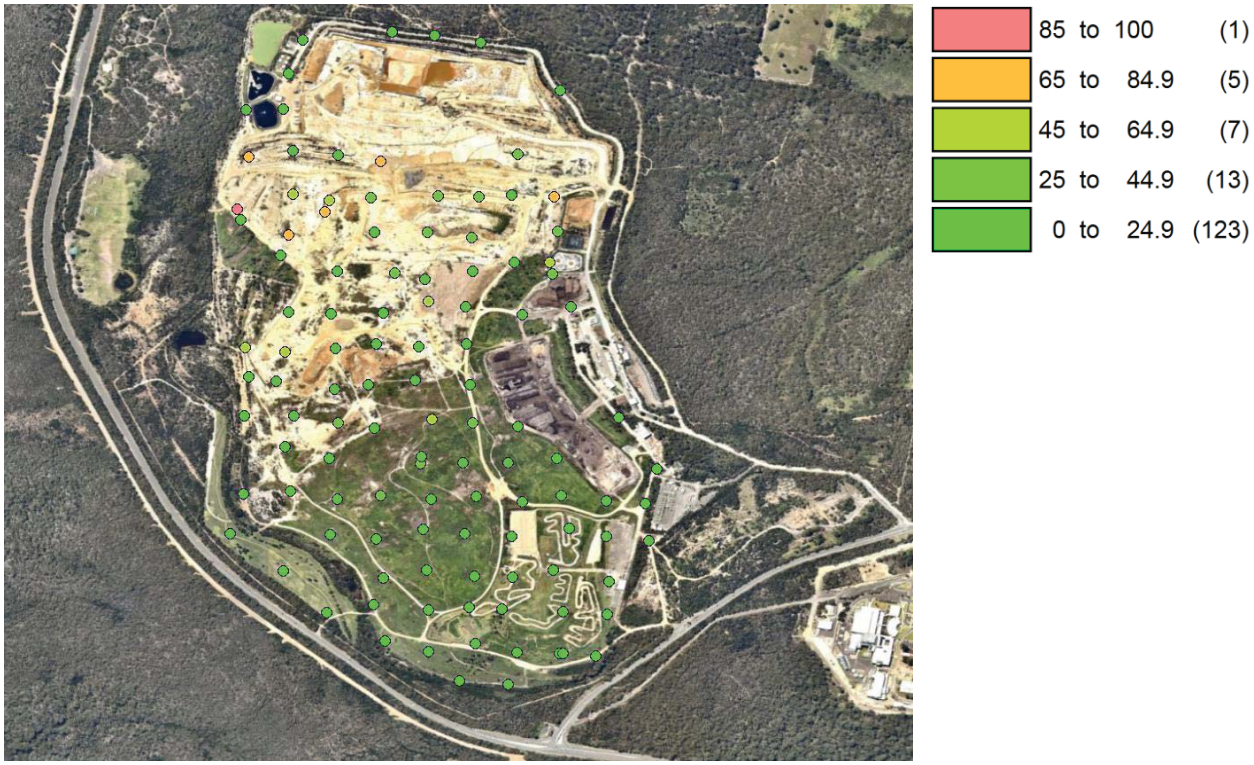


Figure 7 October 2014 surface gas emissions (after rectification)

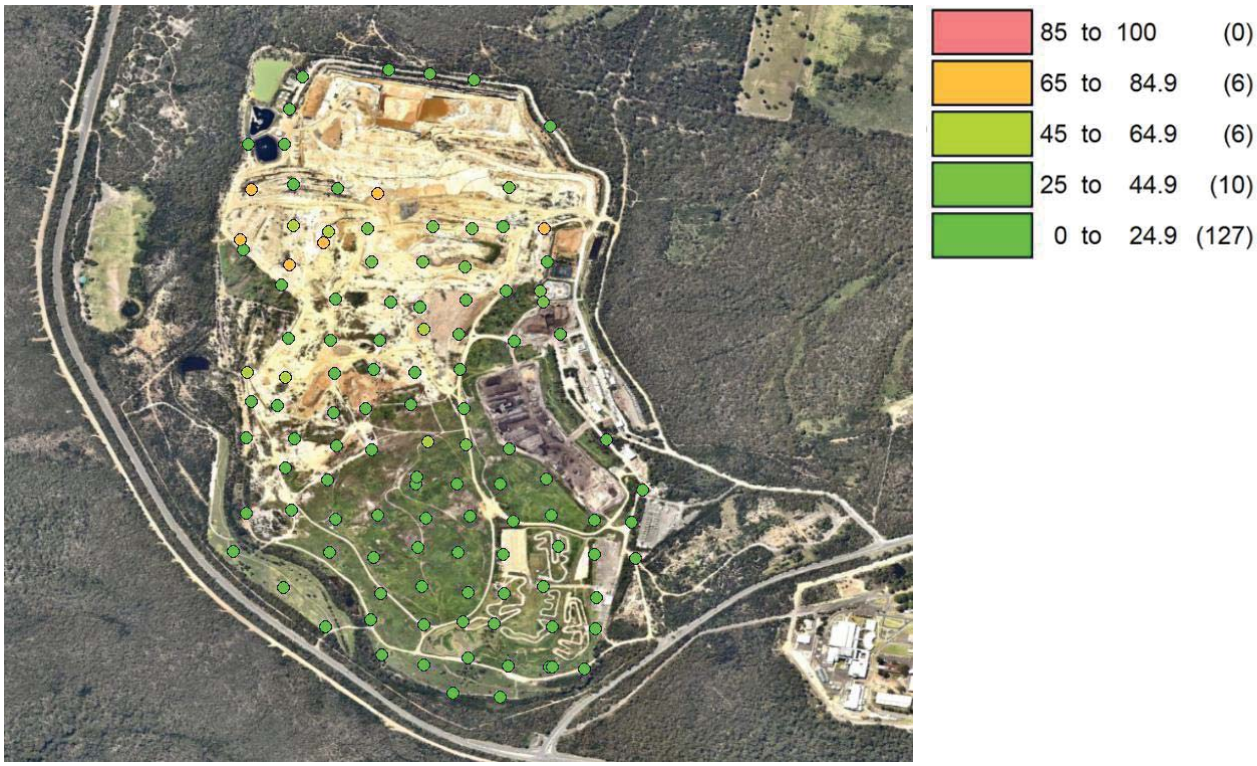


Figure 8 December 2014 surface gas emissions (after rectification)

Reference

EIS Volume 3, Appendix G, Air Quality Assessment - Section 6.4.2 (p. 39) & Section 6.4.5 (p.40)

EIS Volume 3, Appendix G, Air Quality Assessment - Appendix E (p. 67)

7.2.2. Topic: Strip back strategy

Attachment 2B – Request for Additional Information

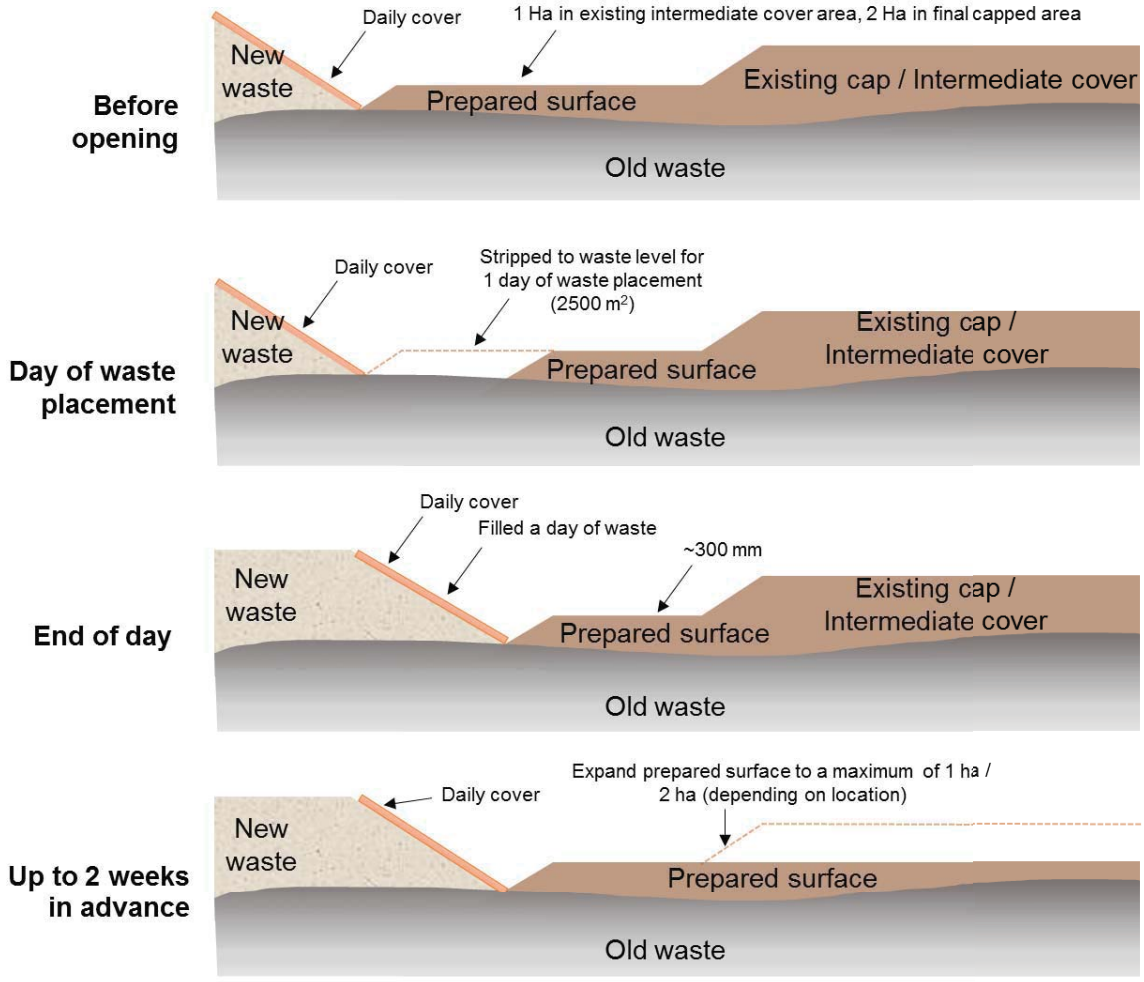
Request for additional information No. 1

a) The EPA requests further detail on why 2,500 m^2 was used to predict odour impacts from the "stripped back areas" in odour modelling scenarios 2, 3 and 4 but up to 2 hectares of stripped back area proposed in the EIS?

b) The EPA requests an additional odour modelling scenario be done using the stripped back areas proposed in this EIS.

SUEZ Clarification / Response

a) The Figure below shows a summary of the proposed strip back mechanism



As stated in Section 12.4.2 of the EIS Volume 1, under heading "Landfill Reprofiling", a maximum area up to 1 ha of the existing intermediate cover (south of the batters) areas, and 2 ha of the existing final capped areas is recommended to be stripped of cover and capping material in advance of landfilling to form the "prepared surface".

These areas would be stripped back to have a minimum of 0.3 m of cover or capping material remaining. An odour emission rate of 1 OUv/m^2/s was used for the first day of each newly stripped area, and a rate of 0.023 OUv/m^2/s for the remaining days of the prepared surface, based on measurements obtained for the intermediate cover areas on site.

Each day before filling with new waste, 2,500 m^2 of the prepared surface would be further excavated, to expose

the underlying waste, as is common practice at this site and others. This is to minimise the risk of perching of leachate and maximise the efficiency of landfill gas extraction. In Table 12.7 of EIS Volume 1 (p.12-7), this area is shown to have an emission rate of either 26 or 40 OUv/m^2/s, depending upon the time of day.

A stated in Section 4.2 of 18 May 2016 memorandum, the odour emission rate for areas of intermediate cover (with gas extraction) could have been assigned a nil odour contribution. It is for this reason that the applied odour emission from intermediate covered surfaces can be considered conservative.

Thus the area shown in table 12.7 for intermediate cover (517,685 m^2) includes the 1 Ha of "prepared surface" which has been stripped back with 0.3 m cover or capping remaining. 2,500 m^2 was used to predict odour impacts from daily "stripped back areas down to old waste" – that line item only refers to daily maximum strip back with the highest emission.

Please also refer to technical memo prepared by GHD contained in Appendix C regarding conservatisms associated with the assessment.

Table 12.7 Odour emissions for 2016 landfill

Source	Surface area (m^2)	SOER OUv/m^2/s	OER	SOER Reference
Active tip face morning	2,500	26	65,000	Ektimo, 2014
Active tip face afternoon	2,500	40	100,000	Ektimo, 2014
Daily cover	2,500	0.03	100	Ektimo, 2014
Daily cover area	10,000	0.03	300	Ektimo, 2014
Leachate pond (quiescent)	3,550	0.26	923	Ektimo, 2014
Leachate pond (aerated) for 2 hours of the day	3,550	1.8	6,390	Ektimo, 2014
Final cap	314,755	0	0	Ektimo, 2014
Intermediate cover	517,685	Intermediate cover without gas extraction – 0.05 Intermediate cover with gas extraction – 0.023	14,195	Ektimo, 2014
Stripped back area	2,500	1	2,500	Ektimo, 2014
total am			82,918	
total pm			117,918	

Follow up question from EPA

EPA notes that the sensitivity analysis and the worst case scenario are the figures used for intermediate cover. In the AQA figures range from 0.023 to 56.7OUv/m^2/s and SITA's response notes values up to 26 or 40OUv/m^2/s. If this is the case how can the adopted figures of 0.023 and 0.05OUv/m^2/s be considered conservative?

Response: The SOERs of 26 and 40 OUv/m^2/s were measured for the odour emissions from the ***active tipping face*** not for intermediate cover. These odour emission rates where measured using the upwind and downwind measurement method and are significantly greater than obtained from the standard IFC method and take into account depositing and movement of waste at the active tipping face and are considered representative.

In the AQAR, In regard to the odour emission rate of 56.7 OUv/m^2/s, this measurement was taken from a localised emission point on the intermediate covered surface. As stated in the AQAR this (and other) localised emission points were not included in the proposal's odour predictions as SUEZ rectified these localised emissions. A series of prevention, mitigation and rectification measures are also detailed in the draft LHRRP OEMP to suitably manage any future localised odour emissions should they occur in the future on intermediate covered areas.

A stated in Section 4.2 of technical memorandum prepared by GHD and provided in Appendix C, the odour emission rate for areas of intermediate cover (with gas extraction) could have been assigned a nil odour contribution. It is for this reason that the applied odour emission from intermediate covered surfaces can be considered conservative.

b) As the strip back areas have been included, further modelling is not required.

Reference

EIS Volume 1, Section 12.4.2 (p.12-18)

EIS Volume 1, Table 12.7 (p.12-7)

7.2.3. Topic: Strip back strategy

Attachment 2B – Request for Additional Information

Request for additional information No. 2

a) The EPA requests that the proponent clarify what depth of intermediate capping will be left after being scraped back.

SUEZ Clarification / Response

As stated in response 7.2.2, a depth of intermediate cover of approximately 300 mm would be retained after being stripped back. Only on the day of placement of waste would an area of 2500m^2 be stripped back to underlying waste as is standard practice at this and other landfills.

As it is unknown the depth of the intermediate capping, during construction activities this depth would be reassessed based on the odour performance of the works and local test pitting.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment - Appendix D and Tables 7-8, 7-9, 7-10 and 7-11 of the AQAR (p. 55, 56, 57, 58)

7.2.4. Topic: Strip back strategy

Attachment 2B – Request for Additional Information

Request for additional information No. 3

a) The EPA requests further information regarding how fugitive landfill gas from "stripped back" areas will be managed without compromising the effectiveness of the entire landfill gas capture system?

SUEZ Clarification / Response

The existing gas collection system will be retained and extended. The gas infrastructure would be retained in the strip back area as much as practicable considering the need for protection of gas wells as well as providing sufficient turning and movement of vehicles and trucks in the offloading area. The system is able to be isolated to manage gas extraction for a range of zones across the landfill. This is considered to be business as usual and is no different to the current waste filling activities.

7.2.5. Topic: Strip back strategy

Attachment 2B – Request for Additional Information

Request for additional information No. 4

a) The EPA requests that a map identifying these areas be provided.

SUEZ Clarification / Response

Both of these locations are in the Appendix E of the AQAR on page 67 of the Ektimo report as shown in Figure 9.

Figure 9 Location of "V Section" and "Rectangular area south of the excavation stockpile"

Reference

EIS Volume 3, Appendix G, Air Quality Assessment - Appendix E (p. 67)

7.2.6. Topic: Strip back strategy

Attachment 2B – Request for Additional Information

Request for additional information No. 5

a) The EPA requests clarification as to how the VPA governs strip back configuration and details.

SUEZ Clarification / Response

Rather than govern the strip back configuration the VPA is a supporting mechanism to reduce the potential for odour complaints.

Odour complaints are a good indicative measure of the site's performance with respect to odour and the approach in the VPA is considered to be the most thorough applied to any landfill in NSW. It establishes additional controls if needed to reduce odour emissions from the site, based on odour complaints.

7.2.7. Topic: Landfill operations

Request for additional information No. 6

a) The EPA requests further details on what activities are proposed to occur between 5pm and 10pm and between 10pm and 6am?

SUEZ Clarification / Response

As described in Table 6.2 of the EIS Volume 1, there will be no waste recieval, construction or landfill operations between 5 pm and 6 am.

Other activities include activities required for efficient operation of site during daylight hours such as security guard patrol, machinery maintenance and/or repairs, site infrastructure maintenance and/or repairs (landfill gas and leachate) and emergency management activities (activities related to site safety, emergency repairs, site infrastructure repairs), These activities are performed as part of current operations. .

Reference

EIS Volume 1. Table 6.2 (p.6-5)

Table 6.2 Proposed site operational hours

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

7.2.8. Topic: GO facility operations and design

Request for additional information No. 7

a) The EPA requests further details on what activities are proposed to occur between 5pm and 10pm and between 10pm and 6am

SUEZ Clarification / Response

As described in Table 6.2 of the EIS Volume 1, there will be no waste recieval, construction or landfill operations between 5 pm and 6 am.

Other activities include activities required for efficient operation of site during daylight hours such as repair works, machinery maintenance and repairs, loading bunkers, final product preparation manufacture (not unloading bunkers) and emergency management activities (activities related to site safety, emergency repairs, site infrastructure repairs), These activities are performed as part of current operations.

The daytime noise generated meets the night time criteria. From an operational perspective, SUEZ will limit work undertaken during night time as far as practicable.

Reference

EIS Volume 1, Table 6.2 (p.6-5)

Table 6.2 Proposed site operational hours

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

7.2.9. Topic: GO facility operations and design

Request for additional information No. 8

a) The EPA requests further information on how the compost stored in the bunkers will be turned

SUEZ Clarification / Response

The turning will be by mechanical turning using loaders or other means (photo below).

7.2.10. Topic: GO facility operations and design

Request for additional information No. 9

The EPA requested that the EIS contain a map of all organic material stored outside, processed or unprocessed including "the type, their respective volumes and locations on site map." This has not been provided.

a) The EPA requests that this information be submitted.

SUEZ Clarification / Response

In response to OEH response to the EIS, adjustments have been made to the GO facility design since the submission of the EIS to DP&E to minimise impacts on the endangered population of Allocasuarina diminuta subsp. mimica. A survey was conducted in the company of a qualified surveyor in March 2016 to accurately map the location of the ramets with respect to the layout of the GO and ARRT facilities, and to refine the layout of these facilities in order to minimise impacts on the endangered population. Due to redesign of the GO facility, no Allocasuarina diminuta subsp. mimica ramets are present with the GO facility footprint.

The redesign of the GO facility has also allowed a reduction in the size of the pond that was located to the north of the ARRT facility. This is now set back further from the nearby Coastal Upland Swamp EEC, further minimising the potential for indirect impacts on this community.

A table showing the changes in area as a result of the redesign is as follows:

GO Component	Area (m^2)		Volume (m^3)
	Original (2015 EIS)	Revised (2016)	
Waste reception/Sorting/ Preparation	2065	2450	12,000
Active composting (bunkers)	40 bunkers	No change	18,000
Maturation	5 x 1000 = 5000 m^2 total		5 x 2,380
Finished compost storage	6 x 1000 + 1 x 700 = 6700 m^2 total		6 x 4,130 + 3,090
Mulch storage	1950		6510
Leachate ponds	4390 on GO platform + 3230 northern storage pond	2185 (southern pond on GO platform)	*2015 EIS* 4.8 ML + 12 ML = 16.8 ML*

GO Component	Area (m^2)		Volume (m^3)
	Original (2015 EIS)	Revised (2016)	
	= 7620 m^2 total	+ 1950 (centre pond adjacent to proposed ARRT facility) + 2480 (northern pond near SICTA) = 6615 m^2 total	*2016 revision* 4.8 ML (southern pond on GO platform) + 3 ML (centre pond adjacent to proposed ARRT facility) + 9 ML (northern pond near SICTA) = 16.8 ML*
Blending area	300	No change	-
Hardstand area (total GO area)	44600 (includes batters and pond)	42,000 (includes batters and pond)	-

** Required volume to be confirmed during detailed design*

The requested information is provided in Figure 10 below.

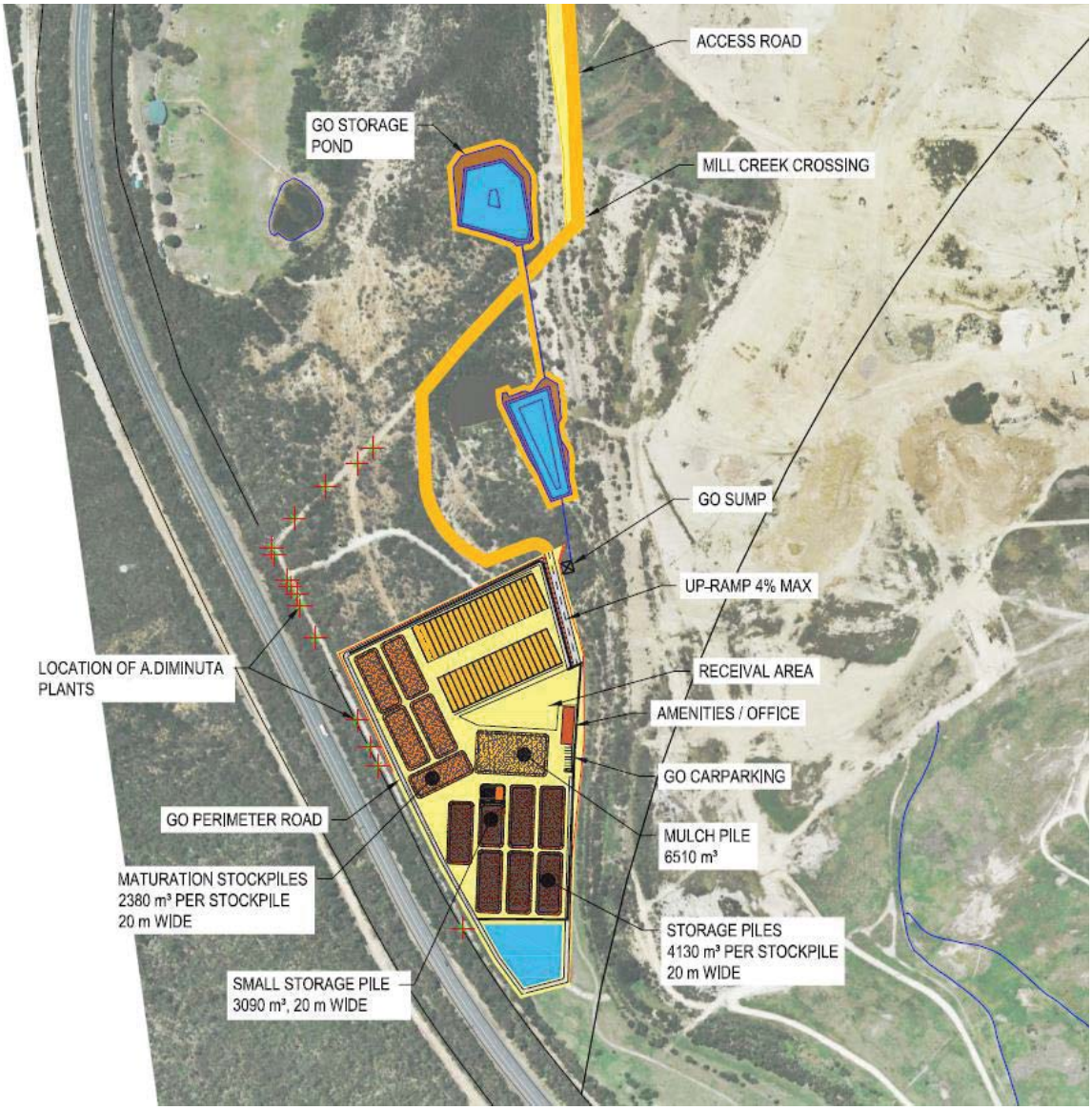


Figure 10 Updated Garden Organics concept layout

7.2.11. Topic: GO facility operations and design

Request for additional information No. 10

a) The EPA requests the proposed width of the windrows located in the maturation area and compost storage area of the GO Facility.

SUEZ Clarification / Response

The requested information is provided in Figure 11 above.

7.2.12. Topic: GO facility operations and design

Request for additional information No. 11

a) The EPA requests details of proposed contingencies should the volume of incoming waste exceed the storage/processing capacity of the Receival Area in the GO Facility?

SUEZ Clarification / Response

As per Section 6.3.7 of the EIS Volume 1, if excess material is received it will be transported offsite to another licenced facility.

Reference

EIS Volume 1, Section 6.3.7 (p.6-28)

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.

7.2.13. Topic: ARRT facility operations and design

Request for additional information No. 12

The EPA notes that there is a conveyor belt that travels between the ARRT Waste Receival and Processing Building to the ARRT Composting Hall.

a) The EPA requests clarification on whether the will be enclosed?

SUEZ Clarification / Response

The conveyor will be enclosed.

7.2.14. Topic: ARRT facility operations and design

Request for additional information No. 13

a) The EPA requests information reading the pre-treatment of air discharged to the bio scrubber, and if there is none proposed, a detailed explanation as to why not.

SUEZ Clarification / Response

As per Section 4 of Appendix C of the AQAR GHD references adopted OERs for several biofilter odour assessments as well as provided a summary of monitoring data from two Bedminister biofilters. The odour emissions from the biofilters were measured by The Odour Unit on 5 separate occasions between April 2009 and April 2011. The measurements resulted in a mean value of 185 OU which demonstrates that they are readily performing more efficiently than those included in the AQAR (250 OU). For further details in this please ask for the report from the Department of Planning and Environment (Bedminister Waste Facility, Raymond Terrace: Peer Review of Odour Modelling – Buffer Assessment, July 2013).

As part of this report, SUEZ engaged specialist from SUEZ France to provide further information on the odour

treatment design. A technical memo was prepared by Dr Robert Kelly to present industry best-practices for odour control at ARRT facilities and associated reference plants to facilitate assessment of the anticipated odour control performance. SUEZ operates numerous large-scale composting facilities throughout the world, including seven ARRT facilities in Australia, representing more than half of all such plants in operation in Australia today. The basis for the data presented in the memo includes SUEZ internal database, contact with SUEZ ARRT operations staff in Europe, and review of the available literature publications for external references.

The technical review confirms that biofilters have been shown to be effective at treating the odours associated with in-vessel composting, including ammonia, and a wide range of volatile organic compounds (including sulfur compounds and amines). A review of representative odour concentration emissions data from similar sites operated by SUEZ and of published literature references demonstrates that a well operated biofilter can achieve outlet odour concentration levels of less than 250 OU/m3. Biofilter performance efficiency, as regards odour concentration removal, was consistently in the 95% range or above for well operated systems.

A copy of the technical memo is contained in Appendix C. The biofilter design is considered to be an issue that will be addressed during the detailed design of the facility. The detailed design will be based on the odour emission performance of the biofilter and air discharge portal to ensure that the constructed works can achieve these outcomes. In addition to the biofilter proposed, as per the technical report provided by Dr Robert Kelly, SUEZ would also commit to including as part of the design and construction provisions for additional odour treatment performance enhancements such as the implementation of advance biofiltration technology or inclusion of an Activated Carbon filter or other proven technology as a polishing treatment stage to be operated only on an “as needed” basis in response to the prevailing environmental conditions

7.2.15. Topic: Odour Impact Assessment Criteria

Attachment 2C – Technical Comments

Odour Impact Assessment Criteria

Section 8.2 of the AQAR provides a discussion around nearest sensitive receptors, including identified future receptors, for the purposes of establishing the odour performance criteria for the assessment. Table 8-3 outlines varying odour criteria (from 2 to 4 OU) for identified receptor groups, however adopts a 2 OU criteria for assessment purposes. The EPA advises that for assessment of sites located in the greater Sydney metro area, a 2 OU criteria is typically adopted.

SUEZ Clarification / Response

Noted. 2 OU was applied as assessment criteria.

7.2.16. Topic: Odour Emission Rate Justification

Odour Emission Rate Justification

Request for additional information No. 1

It is not clear if the adopted SOERs for the daily landfill covers represent potential emissions from the proposed alternative daily cover.

a) The EPA requests clarification on whether SOER are based on odour emission rates from waste covered with alternate daily cover, being Automatic Tarp Machines, or VENM.

SUEZ Clarification / Response

The OERs modelled were based on data that was obtained from VENM daily cover as identified in Section 6.4.5 of the AQAR. The use of alternative cover being automatic tarp machines was approved by the EPA for use at the site on 2 December 2015.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Section 6.4.5 (p.40)

7.2.17. Topic: Odour Emission Rate Justification

Comment

The EPA notes that the proponent has undertaken remediation works to address odour from current "hot spots". Retesting of the remediated "hot spots" identified in the AQAR will be required in 2016, through the environment protection licence, to determine if remediation work has been effective in reducing odours.

SUEZ Clarification / Response

As described in response 7.2.1, SUEZ has undertaken gas monitoring over the area after remediation and gas extraction was implemented. Assessment of the odour emission data indicates the emissions have decreased, as shown in the plots contained response to 7.2.1.

7.2.18. Topic: Odour Emission Rate Justification

(a) Turkey manure

Section 7.5.2 of the AQAR outlines the use of pre-composted turkey manure, and Appendix C outlines an SOER of 867 for chicken manure, which has been adopted in the absence of data for turkey manure. However the modelling inventory doesn't appear to include any SOERs at this level. It is unclear if turkey manure has been adequately considered within the modelling assessment

SUEZ Clarification / Response

Pre-composted turkey manure would have a very low odour potential as it has already been through the composting process. Only small quantities would be stored onsite at any one time with an approximate odour contribution of less than 0.1% of the total odour contribution from the proposed GO facility (based on SOERs from matured compost). Other conservative elements of the assessment more than compensate the odour emission from this material hence this material was omitted from the assessment.

It was an oversight in the AQAR why this was not explained and excluded from the model.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Section 6.5.2 (p.41) & Table 7-11 (p.57)

7.2.19. Topic: Odour Emission Rate Justification

(b) Active composting

The assessment adopts SOERS based on measured data from another facility (the SITA Brooklyn Site). Appendix C outlines that the referenced SOERS were scaled, coupled with a reduction factor associated with the use of the Gore covers. It has not been outlined (including justification) what scaling has been conducted. Additionally no data supporting the 90 % control efficiency for the use of Gore covers has been included.

SUEZ Clarification / Response

Breathable membranes are commonly applied to composting operations throughout the world and are known to reduce odour emission rates. Information available for breathable membranes, for example Gore, has concluded that odour reduction rates of at least 90% are achievable.

Refer to http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf, as referenced in Section 12 of the AQAR.

Please also refer to technical memo prepared by GHD contained in Appendix C regarding conservatisms associated with the assessment.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Section 12 (p.81)

W. L. Gore & Associates. 2008. The GORE® Cover System - A Leading Composting Technology for Organic Waste Treatment. [ONLINE] Available at: http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf.

7.2.20. Topic: Odour Emission Rate Justification

(c) Maturation

Table 7-11 of the Air Assessment outlines an SOER for product maturation of 0.7 OU/m2/s. However Appendix C outlines a range of SOERs up to 6.1 OU/m2/s. It is not clear the justification for adopting the lower SOER for maturation of compost.

SUEZ Clarification / Response

The information reported in Appendix C of the AQAR were unscaled numbers. As described in Section 6.5.2 of the AQAR the data when grease trap was removed has an approximate 8 fold reduction. The data from the trials shows an actual reduction is 7.6. The SOERs presented in Table 7-11 of the AQAR had the reduction factor of 7.6 applied which derives the numbers presented.

0.7 OU/m2/s represents a 7.6 fold reduction of 6.1 OU/m2/s.

Please also refer to technical memo prepared by GHD contained in Appendix C regarding conservatisms associated with the assessment.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Appendix C

EIS Volume 3, Appendix G, Air Quality Assessment – Section 6.5.2 *(p.41)*

7.2.21. Topic: Odour Emission Rate Justification

(d) Finished Compost

Table 7-11 of the Air Assessment adopts an SOER for finished compost of 0.34 OU/m2/s. However Appendix C outlines an SOER of 2.6 for matured product. It is not clear the justification for the lower SOER for finished product.

SUEZ Clarification / Response

The information reported in Appendix C of the AQAR were unscaled numbers. As described in Section 6.5.2 of the AQAR the data when grease trap was removed has an approximate 8 fold reduction. The data from the trials shows an actual reduction is 7.6. The SOERs presented in Table 7-11 of the AQAR had the reduction factor of 7.6 applied which derives the numbers presented.

0.34 OU/m2/s represents a 7.6 fold reduction of 2.6 OU/m2/s.

Please also refer to technical memo prepared by GHD contained in Appendix C regarding conservatisms associated with the assessment.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Appendix C

EIS Volume 3, Appendix G, Air Quality Assessment – Section 6.5.2 *(p.41)*

7.2.22. Topic: Odour Emission Rate Justification

(e) Turning

Table 7-11 of the Air Assessment outlines an SOER of 1.18 for "turning". Presumably this is for turning events

of compost, where spikes in odours can occur. However Appendix C outlines a range of SOERs for turning based on data presented in other assessments, and references SOERs up to 20.5 are referenced.

SUEZ Clarification / Response

The turning stage referenced in the emissions inventory is based on the turning of Maturation product in the 5 – 8 week composting cycle, which is external to the bunkers.

This is the average of the 12 week composting process. The SOER reported of 14.3 OUm/s is then corrected with the 7.6 reduction factor to give 1.88 OUm/s. This source is then modelled as 1.18 OUm/s (for turning) in addition to the existing 0.7 OUm/s maturation area source in the model. The key reason that this was modelled for turning rather than a bunker from the active compost is that the total maturation area modelled as being turned (713m^2) is much larger than the area of one bunker (150m^2) and therefore the total emission is higher. This is considered a conservative approach.

Please also refer to technical memo prepared by GHD contained in Appendix C regarding conservatisms associated with the assessment and explanation regarding how the "averaging" is an average in time rather than discounting the maximum value.

7.2.23. Topic: Odour Emission Rate Justification

Request for additional information No. 2

a) The EPA request a more detailed justification be submitted for the adopted SOER. Where there is uncertainty with the application of a specific SOER, a conservative approach including a sensitivity analysis of the range of referenced values on the predicted impacts should be presented.

SUEZ Clarification / Response

The detailed justification is presented above and as there is appropriate data available for the expected odour emissions no further analysis is recommended to be undertaken.

7.2.24. Topic: Modelling inputs and methodology

Meteorological Data for Assessment

Request for additional information No. 3

a) The EPA recommend that the meteorological data used for assessment purposes:

- *Be demonstrated to adequately represent the longer-term meteorological conditions at the site; and*
- *Adequately represent an appropriate portion of conditions that effect poor dispersion (i.e. calm or low wind speed conditions).*

SUEZ Clarification / Response

The requirement for checking on the meteorological data being used for assessment purposes is so that meteorological data is demonstrated to adequately represent the longer-term meteorological conditions at the site.

In the Approved Methods this relates to using site-representative data when site-specific data are not available.

See discussion as third sentence of Level 2 in section 4.1 Minimum data requirements (p.10).

The project has access to site-specific data. A minimum one-year data selection (2011-12) was made from a five year dataset (2008-09 to 2013-14).

The principal requirement of this dataset selection was completeness of data; to be consistent with the Approved Methods of at least 90% complete. This period of data also coincided with a period of a higher

number of odour complaints received for the site.

The on-site data has had a meteorological examination of the 15 minute averaged data across the available five year period.

A meteorological assessment of the inter-annual variability of the site indicates very little variation from year-to-year.

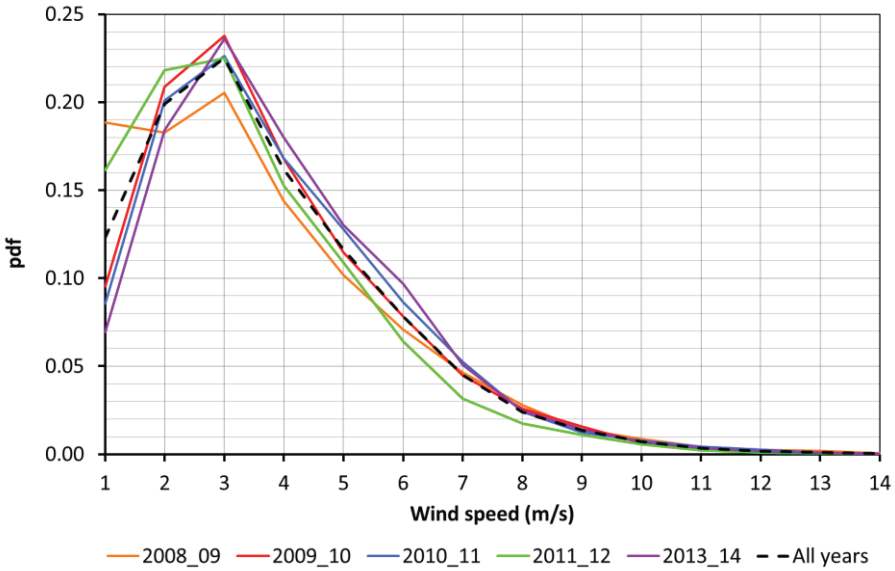
The GHD meteorologist confirms that this is almost universally observed when the Automatic Weather Station (AWS) is established to the correct exposure standards (as this site is confirmed to be).

For the key parameter, in dispersion meteorology of ground based odour sources, of wind speed distribution it is found that the selected year of 2011-12 is 'representative'.

Indeed, the plot below shows that the 2011-12 year is conservative for dispersion meteorology where the largest (but not significant) diversion from the long term mean is for the lowest wind speeds.

Note that for the like-for-like, 2008-09 outlier year in the plot that this is due to that dataset having an instrument QA/QS failure from 9pm 25 January 2009 to noon 24 February 2009.

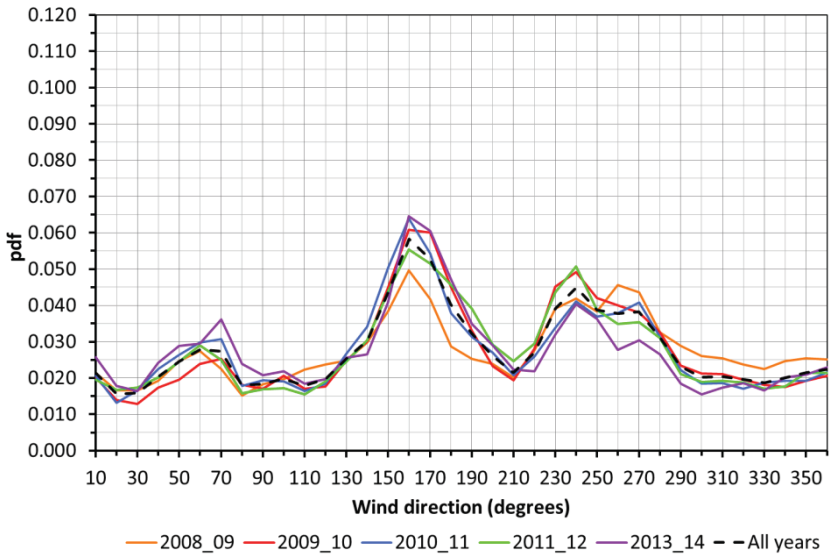
These data have been excluded from the 'All years' analyses.



A similar analysis of year-to-year variability in wind directions, as shown in the plot below, is an even better illustration of the consistency of annual wind datasets for good quality instrumented sites.

The 2011-12 Probability Distribution function (PDF) is within the yearly range for all years and there are no significant deviations from the 'All-years' average.

The obvious peaks of southerly winds (160-170 degrees) associated with drainage flow, winter-time westerlies (230-270 degrees) and summer-time sea breezes (50-70 degrees) can all be explained by physical and meteorological (synoptic) forcing due to the annual climatic cycle imposed on the diurnal cycle.



So in summary, the site-specific data are what can be expected at the site and any given year will supply enough hours in that year where the dispersion model can select the extreme statistics (99 percentile) for the worst-case conditions to be assessed.

The dataset having “No calms” was a technical error when creating the windrose diagrams. GHD had the calms parameter set in the software at a low value for the calmest wind range meaning that 0% is displayed in the charts presented in the AQAR. Calms, when using the 0.5m/s cut-off, for the site are in fact 4.7% of the time. This did not influence the meteorological file used in the modelling as AUSPLUME adjust upward any wind speed less than 0.5 m/s (but uses the prevailing corresponding wind direction).

Reference

“Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW’ (DEC 2005)

7.2.25. Topic: Modelling inputs and methodology

Selection of Dispersion Model

Request for additional information No. 3

a) The EPA requests a detailed justification for the selection of AUSPLUME in the context of site specific sources, terrain and meteorology. Alternatively, if suitable justification cannot be presented, an impact assessment based on modelling that can be suitably justified for the proposal must be presented.

SUEZ Clarification / Response

The proposed sources are ground based emissions that are below the mixing height without the need to consider plume splitting into vertical layers of the atmosphere. The biofilter emissions are the only stack related source but this is near-ground with limited plume rise due to a large emission area and ambient temperatures and with the potential to be wake entrained into the control building envelope.

The source types also minimise, to the point of elimination, any concern with plume strikes on terrain features (given the non-complex nature of the model domain).

The AUSPLUME straight-line Gaussian assumption is also suitable in this situation of near-field impact as the plume travels in a straight line toward the receptor.

If alternative puff-models (CALPUFF) or modified Gaussian models (AERMOD) are used then their light-wind puff-splitting and pancaking treatments ‘spread’ (and therefore dilute) the odour plume more than does AUSPLUME.

The modelling was undertaken using a year of site specific meteorology. This Site specific meteorology takes into account influences from local terrain and all other prevailing variability in the meteorology, the AUSPLUME model satisfies all of the requirements of the Approved Methods (refer Section 6.2 of the Approved Methods). The terrain is not complex as, per the Approved Method guidance, the receivers are lower than the site and also there is not a high frequency of calms. Note that high frequency is not defined in Section 6.2 of the Approved Methods whereas the USEPA are only concerned with the exclusion of clams from Gaussian straight–line modelling when "Stagnation conditions are characterized by calm or very low wind speeds, …(that)… may persist for several hours to several days" (40 CFR Chapter I, Appendix W to Part 51—Guideline On Air Quality Models, section 7.2.8). The nearest residential receptor assessed is approximately 1.5 km away, and AUSPLUME with its steady state assumptions over such a distance (an hour long travel time requires a wind of at least 0.5 m/s) are appropriate for this assessment. Given the lack of terrain effects (non-complex terrain) and minimal short term stagnation events found in the data then AUSPLUME is able to fully treat the time and space variations of meteorology effects on transport and dispersion (especially as these are embedded in the site-specific, on-site data). Other AUSPLUME exclusion situations (Approved Methods Section 6.2) such as buoyant line plumes, coastal fumigation and inversion break-up also do not apply for this assessment.

Reference

"Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW' (DEC 2005)

7.2.26. Topic: Modelling inputs and methodology

Inclusion of Terrain Effects

Request for additional information No. 4

a) The EPA requires an odour assessment be undertaken that adequately considers terrain effects.

SUEZ Clarification / Response

As discussed above, the modelling was undertaken using a year of site specific meteorology. This Site specific meteorology takes into account influences from local terrain and all other prevailing variability in the meteorology.

7.2.27. Topic: Mitigation

Request for additional information No. 5

Mitigation Options and Control Efficiencies

a) The EPA requests documentation that supports the 90% reduction referred to in the EIS so an adequate assessment of its effectiveness can be made.

SUEZ Clarification / Response

As discussed above, breathable membranes are commonly applied to composting operations throughout the world and are known to reduce odour emission rates. Information available for breathable membranes, for example Gore, has concluded that odour reduction rates of at least 90% are achievable.

Refer to http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf, as referenced in Section 12 of the AQAR.

Reference

EIS Volume 3, Appendix G, Air Quality Assessment – Section 12 (p.81)

W. L. Gore & Associates. 2008. The GORE® Cover System - A Leading Composting Technology for Organic Waste Treatment. [ONLINE] Available at: http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf.

7.2.28. Topic: Modelling inputs and methodology

Averaging Period for Assessment Purposes

Request for additional information No. 6

a) The EPA requires that the proponent clarify or revise the modelling to include assessment against 1 hour (peak-to-mean nose response) impacts.

SUEZ Clarification / Response

GHD has used a 1 hour average with peak to mean emission adjustments. This was a misstatement in the report.

7.2.29. Topic: Modelling inputs and methodology

Averaging Period for Assessment Purposes

Dust Impact Assessment

Request for additional information No. 7

a) The EPA requires that the dust impact assessment be revised and must:

- *Include an assessment of all relevant particulate fractions and averaging periods;*
- *Adopt background concentrations representing the averaging period being assessed. The adopted annual average background concentration for assessing 24 hour average impacts is not considered suitable;*
- *Present predicted impacts, as incremental and cumulative (increment plus background) reported as the 100th percentile. As per the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (the Approved Methods) cumulative impacts maybe maximum impact plus maximum background, or a contemporaneous assessment..*

SUEZ Clarification / Response

Dust has not been a significant issue in recent time at the site and in fact no dust complaints have been received by SUEZ since operating the site for almost 5 years.

GHD has undertaken a dust assessment to assess PM10 24 hour, PM10 annual, TSP annual and dust deposition annual as per the NSW Approved Methods impact assessment criteria. The PM10 24 hour dust assessment has been presented cumulatively with the 24 hour dust monitoring data for the corresponding period at EPA's Liverpool monitoring station,

The results below show that predicted dust impacts for all assessed particulate fractions and averaging periods are below the criteria. The one day where the cumulative 24 hour predicted dust impact is above 50 µg/m3 (15/11/2011) the background dust levels were 68.8 µg/m3 and therefore the proposal does not result in any additional days above the criteria.

Dust deposition monitoring around the site also shows that this has not been a significant issue and has not had any (single month) exceedances since October 2013. The annual average dust deposition criterion has not been exceeded at any monitoring location since 2011.

Dust deposition gauge monitoring data for the site is also presented below for reference.

Predicted PM10 24 Hour Dust Concentrations

Liverpool Background PM10	
Date	24 hour µg/m3
15/11/2011	68.8
5/01/2012	40.1
18/05/2012	39.3
12/09/2012	38
29/08/2012	37.2
1/05/2012	35.4
19/05/2012	35.2
10/09/2012	34.9
22/08/2012	34.4
29/11/2011	34

R1 Background and increment	
Date	24 hour µg/m3
15/11/2011	69.0
5/01/2012	40.1
18/05/2012	39.7
12/09/2012	38.7
29/08/2012	38.2
1/05/2012	38.0
19/05/2012	35.6
10/09/2012	35.5
22/08/2012	35.3
14/08/2012	34.6

R2 Background and increment	
Date	24 hour µg/m3
15/11/2011	68.9
5/01/2012	40.2
18/05/2012	39.8
12/09/2012	38.2
29/08/2012	37.2
19/05/2012	36.4
1/05/2012	36.0
10/09/2012	35.5
14/08/2012	34.9
22/08/2012	34.7

R3 Background and increment	
Date	24 hour µg/m3
15/11/2011	68.8
18/05/2012	40.8
5/01/2012	40.4
12/09/2012	38.2
29/08/2012	37.2
1/05/2012	35.7
19/05/2012	35.7
10/09/2012	35.2
14/08/2012	34.7
22/08/2012	34.4

R4 Background and increment	
Date	24 hour µg/m3
15/11/2011	69.0
29/08/2012	42.6
18/05/2012	40.3
5/01/2012	40.1
12/09/2012	39.4
1/05/2012	37.6
22/08/2012	37.6
14/08/2012	36.6
8/04/2012	36.0
10/09/2012	35.9

R5 Background and increment	
Date	24 hour µg/m3
15/11/2011	69.1
5/01/2012	40.1
18/05/2012	40.1
1/05/2012	39.3
12/09/2012	39.1
29/08/2012	38.9
19/05/2012	36.3
22/08/2012	36.0
10/09/2012	35.9
14/08/2012	35.4

R6 Background and increment	
Date	24 hour µg/m3
15/11/2011	69.2
18/05/2012	40.4
5/01/2012	40.3
12/09/2012	38.6
19/05/2012	38.3
1/05/2012	37.4
29/08/2012	37.3
14/08/2012	36.5
10/09/2012	36.3
7/04/2012	36.1

R7 Background and increment	
Date	24 hour µg/m3
15/11/2011	68.8
5/01/2012	41.5
18/05/2012	39.6
12/09/2012	38.9
29/08/2012	37.2
1/05/2012	35.7
19/05/2012	35.6
10/09/2012	35.0
14/08/2012	34.5
22/08/2012	34.4

Predicted deposited dust (site increment)

Deposited Dust	g/m2/month
R1	0.007
R2	0.007
R3	0.006
R4	0.026
R5	0.015
R6	0.020
R7	0.012

Predicted PM10 Dust Concentrations

	Annual µg/m3
R1	0.2580
R2	0.2390
R3	0.2320
R4	0.7630
R5	0.4820
R6	0.5960
R7	0.4290

Predicted TSP Dust Concentrations

	Annual µg/m3
R1	0.5160
R2	0.4780
R3	0.4650
R4	1.5300
R5	0.9630
R6	1.1900
R7	0.8580

7.3. Surface water assessment (attachment 3)

7.3.1 Topic: Sediment dam sizing

Request for additional information No. 1

a) The EPA requests how much freeboard (depth in cms) is required to hold a 5 day 90th percentile rainfall event in Sediment Dam 5?

SUEZ Clarification / Response

Sediment Dam 5 has a total capacity of 32 ML (as surveyed).

The 5-day 90th percentile rainfall depth is 54.6 mm for Sutherland based on Table 6.3a of Managing Urban Stormwater Soils and Construction, Volume 1 (Landcom 2004, 'the Blue Book'). The appropriate volumetric runoff co-efficient based on Table F2 of the Blue Book and the above rainfall depth is 0.74. Applying this to a catchment area of 45 ha (as per Table 4.2 of the Surface Water Assessment Report) the resulting runoff volume is 18.2 ML.

Based on available survey, the 5 day 90th percentile rainfall event (18.2 ML) correlates to approximately 3 metres (300 cm) of storage depth below the top storage level of the dam.

Note: Sediment Dam 5 is designed to manage potential sediment laden stormwater for the 2 day 90th percentile rainfall depth in accordance with the EPA's advice in its Volume 2B of the Blue Book, Soils and Construction, Waste Landfills (2008) - which does not specify a specific management period requirement. This is also developed based on the achievable management period at the site. Sediment Dam 5 was designed with addition storage to allow water to be used for dust suppression at the site, as well as an allowance for sediment build-up in the dam.

Reference

Table 6.3a of Managing Urban Stormwater Soils and Construction, Volume 1 (Landcom 2004)

EIS Volume 4, Appendix H – Surface Water Assessment, Table 4.2 (p.27)

Parameter	Value	Notes
Basin type	Type D	As per *Blue Book Volume 2b (DECC 2008)* Type D should be used where external material could be imported to site.
Design rainfall depth	34.8 mm	90th percentile 2-day depth for Sutherland Shire • 90th percentile selected based on *Blue Book Volume 2b (DECC 2008)* • 2-day management period selected based upon the capacity of the stormwater treatment plant and the size of the settling zone volume required. That is, the capacity of the treatment plant is 2.6 ML/day and would start at the beginning of the rainfall event. The combined rainfall (2-days) and management period (2-days) is 4 days. Over 4 days the stormwater treatment plant can manage a volume of water in excess of the settling zone volume. Therefore, it is expected that the system can re-establish an available capture volume equal to the settling zone volume within a 2-day management period and therefore this was adopted as the management period for the design rainfall event.
Volumetric runoff coefficient	0.64	Based on hydrologic soil type D
Settling zone required volume – per hectare of catchment area	223 m^3/ha	Calculated
Basin catchment area	45 ha	Proposed case for critical phase in proposal (phase 5)
Settling zone required volume	10 ML	Calculated
Sediment accumulation rate in basin	500 m^3/yr	Based on site observations from previous cleanout activities. Majority of sediment captured in upstream sediment traps.
Basin sediment cleanout period	10 years	Conservatively assumed. Likely to be more frequent. To occur when sediment storage zone is 80% full of sediment.
Sediment storage zone required volume	5 ML	Calculated
Required basin volume for erosion and sediment control	15 ML	Calculated The existing main sediment and erosion control basin at the north western corner of the site has a total capacity of 32 ML (as shown by survey).

7.3.2. Topic: Sediment dam sizing

Request for additional information No. 2

a) The EPA requests details of what sized rainfall event could the sediment dam hold if the freeboard level is maintained at the base of the 10ML settling zone in Sediment Dam 5?

SUEZ Clarification / Response

Sediment Dam 5 is designed to manage potential sediment laden stormwater for the 2 day 90th percentile rainfall depth (34.8 mm), based on the achievable management period at the site, and in accordance with the EPA's advice in the Blue Book, as described in Table 4.2 of the Surface Water Assessment Report, noting Volume 2B of the Blue Book does not specify a specific management period requirement. The required volume for the settling zone for the 2-day 90th percentile design rainfall is calculated to be 10 ML.

With a total capacity of 32 ML, the sediment dam can hold 22 ML beneath the 10ML settling zone. This correlates to the runoff generated by 66 mm of rain (for a catchment area of 45 ha and runoff co-efficient of 0.74). This volume of runoff is greater than the 5-day 90th percentile rainfall depth (54.6 mm) and less than 5-day 95th percentile rainfall depth (85.1 mm) according to the Blue Book.

The Environmental Protection Licence for the site (EPL 5065) includes licence conditions relating to discharge of total suspended solids (TSS). Generally, the requirement of the licence is that the discharged water from site should not have a concentration of TSS greater than 50 mg/L. However, it is also stated that for discharges from the sediment basin that a discharge of higher concentrations of TSS is not in breach of the licence if the following conditions are met:

1. The overflow is caused by a rainfall event; and

2. The licensee has taken all practical measures to avoid or minimise water pollution.

For the assessment it has been assumed that "all practical measures" corresponds to implementation of the requirements of Blue Book Volume 1 (Landcom, 2004) and Blue Book Volume 2b (DECC 2008) appropriate for the conditions of the site. These measures are reflected in the LHRRP Operations Environmental Management Plan (OEMP) which would be updated following the proposal's determination to reflect any additional regulatory requirements.

Reference

EIS Volume 4, Appendix H – Surface Water Assessment, Table 4.2 (p.27)

NSW Department of Environment and Climate Change (DECC), 2008, Managing Urban Stormwater, Soils and Construction. Volume 2b, Waste Landfills

Table 6.3a of Managing Urban Stormwater Soils and Construction, Volume 1 (Landcom 2004)

7.3.3. Topic: Sediment dam sizing

Request for additional information No. 3

The EPA seeks clarification on how the Proponent proposes to manage surface water in the GO Facility. The information provided in the EIS is not clear.

- *Section 6.3.4 of the EIS states "All clean water collected from the roof 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."*
- *The Water Balance results for the ARRT/GO facilities indicates that the only surface water being discharged to Mill Creek is from the ARRT Roof and Hardstand.*

a) The EPA requests clarification of which of the above proposed surface water management approaches is

accurate and which approach was used to calculate storage requirements for the two leachate dams?

SUEZ Clarification / Response

Water generated at the GO facility is managed as a separate system to the landfill leachate. The proposed management is as follows:

- Runoff from uncovered waste areas and hardstand areas are considered "garden organics leachate" and would be to be directed to a sump, which would be pumped to the supply dam for reuse or overflows to the storage dam, from which it would be disposed to sewer in accordance with existing EPL and Trade Waste Agreement (TWA) requirements.
- Runoff from roof and breathable membrane areas are considered "clean water" and would be discharged into Mill Creek. This would be considered during the detailed design. Mill Creek does not drain to the LHRRP sediment dam 5 as it operates as a clean water bypass drain, thus improving the effectiveness of the sediment basin.

This is in accordance with the water balance assessment used to calculate the volume of the dams. The addition of a node representing the breathable membrane covered areas discharging to Mill Creek should have been included on the water balance results schematics (Figures 4.2 and 6.3 of the Surface Water Assessment) to provide further clarity. A revised diagram is shown on the next page.

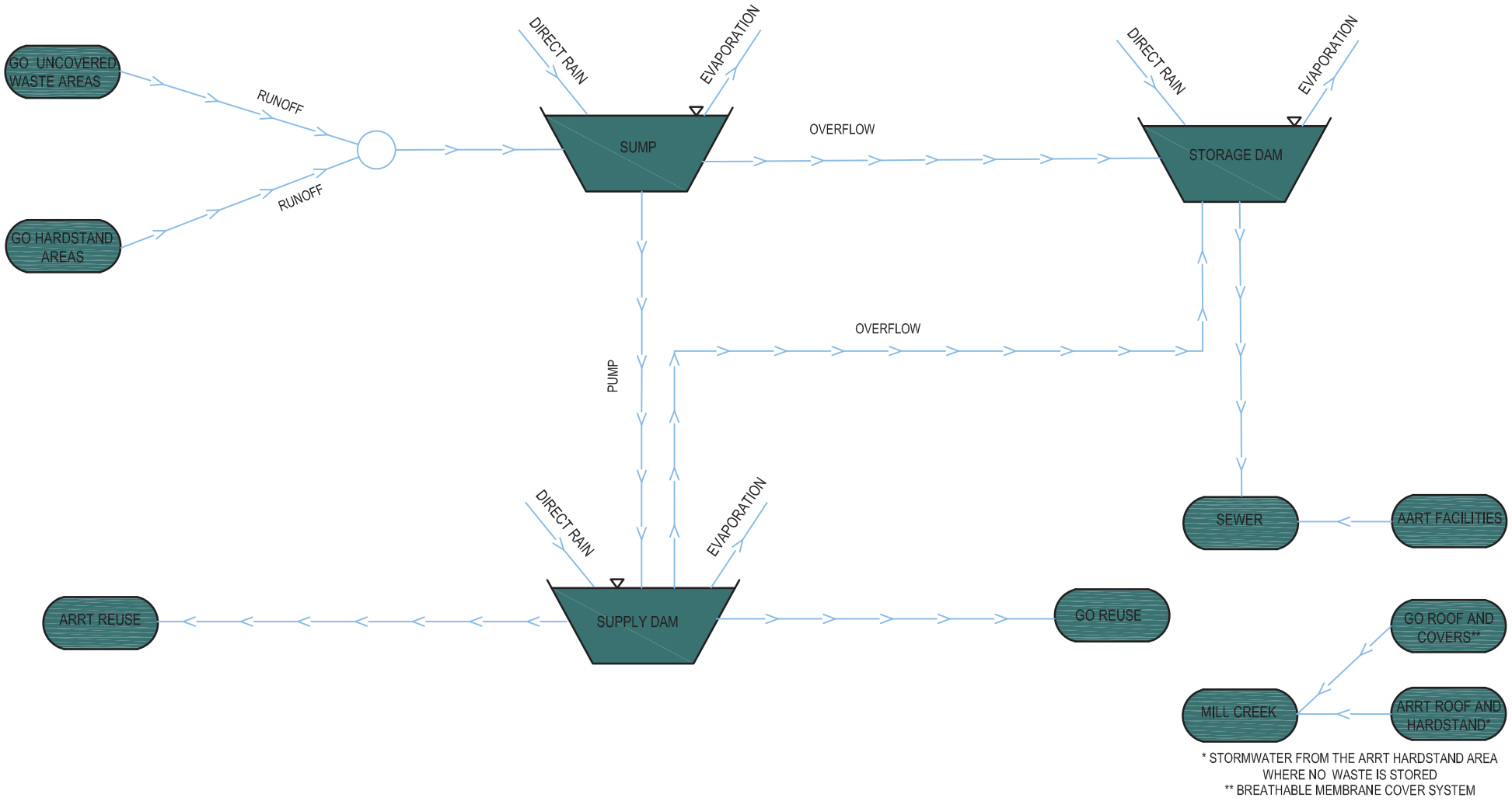
Design and operation of a breathable cover system which could shed uncontaminated stormwater is possible. An example of one design developed by GORE (GORE and associates, 2013) is shown in Figure 11 below and further designs are available (refer reference).

Figure 111 Example design of membrane cover (GORE and associates, 2013)

It is recommended that the EPA consider conditioning this issue to require at the EPL application stage the detailed design which demonstrates that uncontaminated stormwater would be shed from the breathable covers.

Reference

W. L. Gore & Associates. 2008. The GORE® Cover System - A Leading Composting Technology for Organic Waste Treatment. [ONLINE] Available at: http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf.



* STORMWATER FROM THE ARRT HARDSTAND AREA WHERE NO WASTE IS STORED

** BREATHABLE MEMBRANE COVER SYSTEM

SITA AUSTRALIA
LUCAS HEIGHTS RRP

WATER BALANCE SCHEMATIC
ARRT / GO (UPDATED)

Job Number	21-23482
Revision	A
Date	MAR 2016

Figure 1

Level 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

Plot Date: 11 March 2016 - 12:06 PM Plotted by: Rod Towner Cad File No: G:\21\23482\Technical\Surface Water\Water Balance\Lucas Heights Water Cycle SchematicsAARTGO.dwg

7.4. Leachate assessment (attachment 4)

7.4.1. Topic: Leachate modelling

Request for additional information No. 1

a) The EPA asks the proponent to explain why thicker cover resulted in more rainfall infiltration.

The EIS estimates that in a 50% AEP rainfall year the existing final cap (1800mm min. of compacted crushed sandstone) allows significantly more rainwater to infiltrate the cap than intermediate cover (300mm min compacted crushed sandstone) (17% compared to 7% on a platform, 12% compared to 5% on slopes).

SUEZ Clarification / Response

The proposed final cap is as follows (from EIS Volume 7, Appendix R, Figure 2.5):

Figure 2.5 Final cap profile

Below are the modelled comparisons for the two profiles in an average (50% AEP year) for runoff, evapotranspiration and infiltration (as percentage of the modelled year's rainfall):

	Platforms	Batters
Existing final cap	24% runoff 60% evapotranspiration 17% infiltration	30% runoff 59% evapotranspiration 12% infiltration
Intermediate cover	49% runoff 44% evapotranspiration 7% infiltration	52% runoff 44% evapotranspiration 5% infiltration

* Note that runoff + evapotranspiration + infiltration may not equal 100% when considering a single year. While runoff is immediate, there can be a lag in evapotranspiration and infiltration from previous modelled year and into the subsequent year.

There are two primary reasons for the observed model results:

- The existing final cap (and its existing approved profile) has areas not graded with slopes above 5%, limiting runoff and increasing infiltration into the cap

- The thicker layer of soil in the existing final cap allows for greater saturation capacity, resulting in increased infiltration through the cap

The drainage conditions of the existing final cap allow more rainfall infiltration into the cap. SK102 is a depiction of the slopes of the existing final cap (and its existing approved profile) and SK020 is a depiction of the proposed slopes for which the development application is seeking approval to implement.

Increasing the slope of the existing final cap to improve drainage conditions is one of the drivers for this project. This is consistent with the runoff estimates from the HELP modelling undertaken in the leachate assessment.

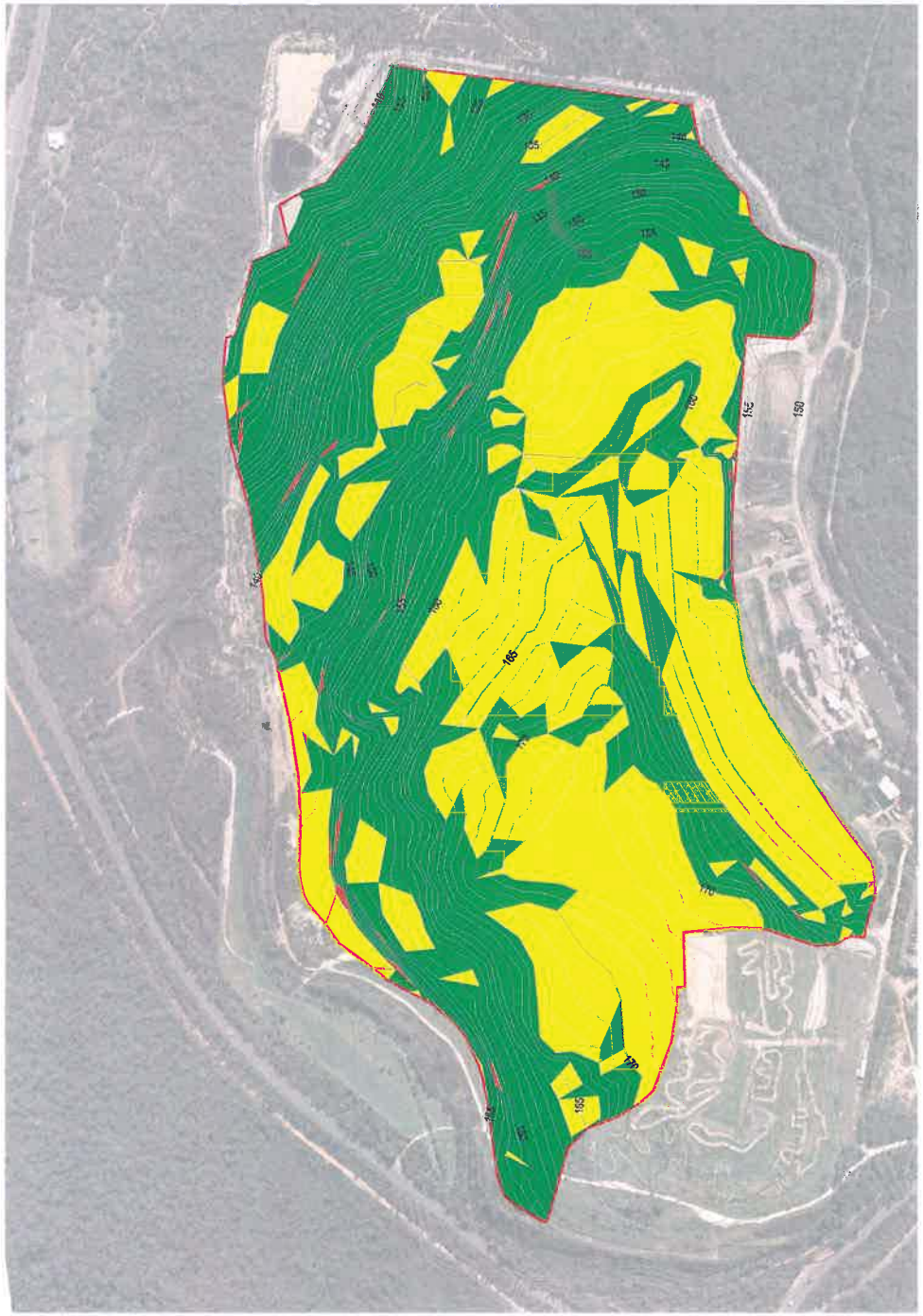
In addition, an increased depth of soil allows for greater saturation capacity. A thicker layer takes longer to become saturated, absorbing a greater volume of water per square metre. This has an associated reduction in the volume of runoff. Any water held within the top of the cap/cover can be removed by evaporation and evapotranspiration (when vegetated). A portion of the water however saturates the soil below the reach of evapotranspiration and this water infiltrates through the cap and into the waste below, resulting in higher leachate generation.

The above is reflected in the HELP modelling and hence the thicker existing final cap resulted in more rainfall infiltration.

Sections 4.10 (p. 39) and 6.2 (p.45) of the leachate assessment provides a recommendation to undertake periodic review of the leachate water balance model in light of ongoing monitoring of leachate extraction volumes to provide calibration of these predicted results.

Reference

EIS Volume 5, Appendix J – Leachate Assessment



LEGEND:

- FINAL LANDFORM CONTOURS FROM NECS 27 APRIL 1999
- AREAS SHALLOWER THAN 5% FALL
- AREAS GRADED BETWEEN 5% & 1(V) IN 3(H)
- AREAS STEEPER THAN 1(V) IN 3(H)
- DA APPROVED BOUNDARY

PRELIMINARY

rev	description	app'd	date
D	REVISED	AD	04.05.15
C	REVISED	AD	02.05.14

SITA Australia
LHRRP

EXISTING DA FINAL LANDFORM SLOPE ANALYSIS

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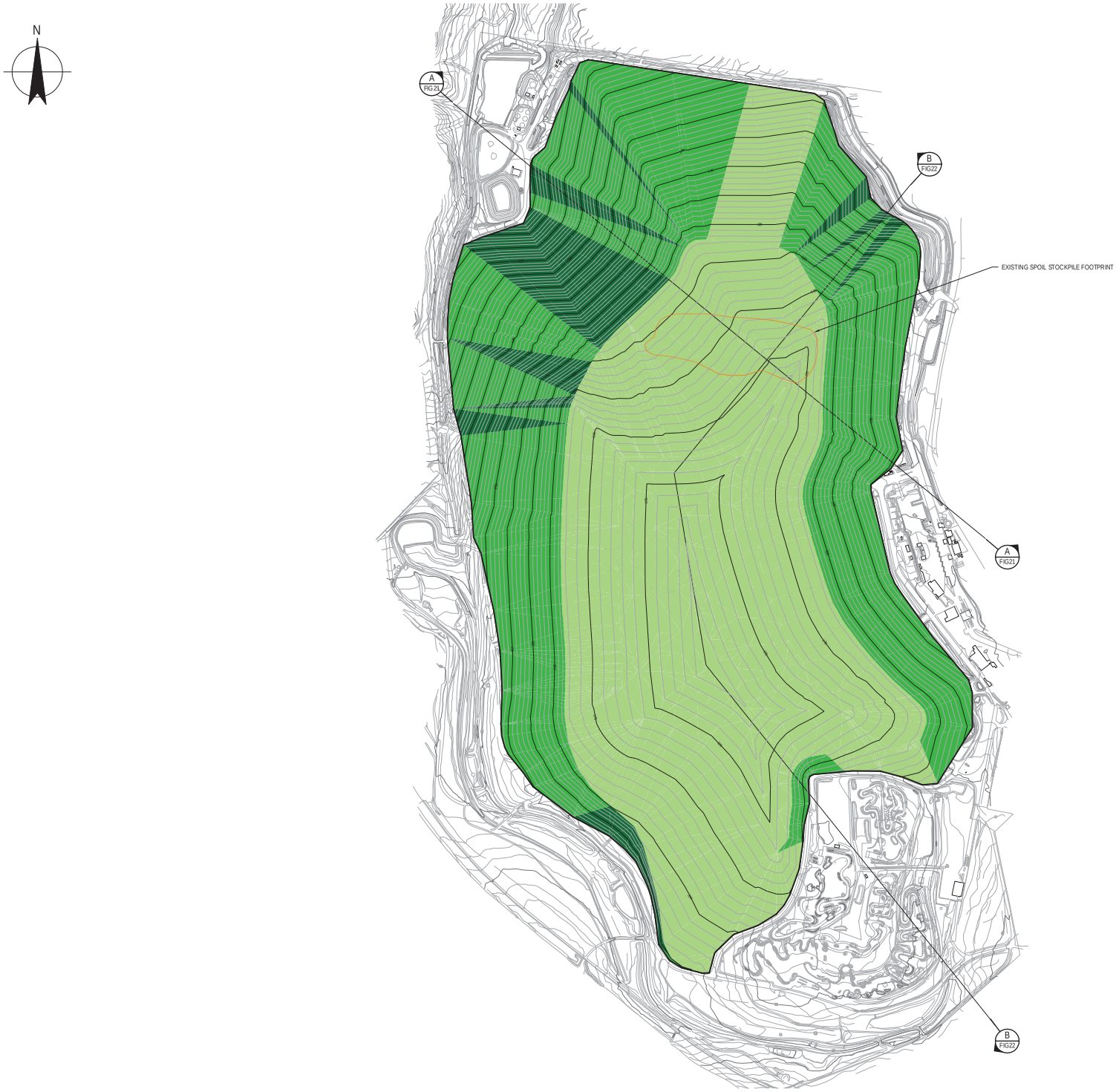
scale | 1:3500 for A1 job no. | 21-20508
date | MAY 2015 rev no. | D

approved (PD) SK102

Plot Date: 4 May 2015 - 4:40 PM Plotted by: Allison Horlyck Cad File No: G:\21\20508\CAD\Drawings\21-20508-SK102.dwg



LEGEND:

PROPOSED LANDFORM CONTOURS - POST SETTLEMENT

SLOPE ANALYSIS:

- 5% - 10%; ; 1(V):20(H) TO 1(V):10(H)
- 10% - 18%; ; 1(V):10(H) TO 1(V):5.6(H)
- 18% - 25%; 1(V):5.6(H) TO 1(V):4(H)

NOTE
THE FINAL LANDFORM HAS BEEN MODELLED TO A CONCEPTUAL LEVEL ONLY.

PRELIMINARY

rev	description	app'd	date
C	REVISED	AD	08.05.15
B	REVISED	AD	01.05.15

SITA Australia
LUCAS HEIGHTS RRP

PROPOSED FINAL LANDFORM SLOPE ANALYSIS

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scale	1:3500 for A1	job no.	21-23482
date	MAY 2015	rev no.	C

approved (PD) .....

SK020

Plot Date: 8 May 2015 - 1:50 PM Plotted by: Alison Horlyck Cad File No: G:\21\23482\CADD\Drawings\21-23482-SK020.dwg

7.4.2. Topic: Leachate modelling

Request for additional information No. 2

a) The EPA asks the proponent to explain why there was little difference between the infiltration rates of the intermediate cap and the proposed final cap.

The EIS estimates that in a 50% AEP rainfall year the infiltration difference between intermediate cover (300mm min compacted crushed sandstone) and the proposed final cap (100mm topsoil, 250mm revegetation layer, 500mm subsoil layer, 600mm compacted clay barrier and 300mm seal bearing layer) is marginal.

That is, the proposed final cap was projected to reduce rainwater infiltration only 1% more than intermediate capping on platforms and 1% less than intermediate capping on slopes.

SUEZ Clarification / Response

Below are the modelled comparisons for the two profiles in an average (50% AEP year) for runoff, evapotranspiration and infiltration (as percentage of the modelled year's rainfall):

	Platforms	Batters
Intermediate cover	49% runoff	52% runoff
	44% evapotranspiration	44% evapotranspiration
	7% infiltration	5% infiltration
Proposed final cap	33% runoff	33% runoff
	62% evapotranspiration	62% evapotranspiration
	6% infiltration	6% infiltration

* Note that runoff + evapotranspiration + infiltration may not equal 100% when considering a single year. While runoff is immediate, there can be a lag in evapotranspiration and infiltration from previous modelled year and into the subsequent year.

There are two primary reasons for the observed model results:

- **The permeability of the existing crushed sandstone material used for intermediate capping gives the intermediate cover good runoff properties**

  Compacted crushed sandstone has relatively low permeability compared to topsoil material. This means that under the same conditions it would be expected that an upper surface of compacted crushed sandstone would encourage more runoff when compared to an upper surface of topsoil. More runoff provides less water for infiltration through the cover layer. This is consistent with the runoff estimates from the HELP modelling undertaken in the leachate assessment.

- **The thicker layer of soil in the proposed final cap allows for greater saturation capacity as its permeability is higher, resulting in increased infiltration through the cap**

  As shown in Figure 2.5 from EIS Volume 7, Appendix R (reproduced below), there is a thicker layer of soil in the proposed final cap. This has higher saturation capacity than compacted crushed sandstone found in the intermediate layer as its permeability is higher. In addition, the increased depth of soil allows for greater saturation capacity. A thicker layer takes longer to become saturated, absorbing a greater volume of water per square metre. This has an associated reduction in the volume of runoff. Any water held within the top of the cap/cover can be removed by evaporation and evapotranspiration. A portion of the water however saturates the soil below the reach of evapotranspiration and this water infiltrates through the cap and into the waste below, resulting in leachate generation.

Figure 2.5 Final cap profile

To compensate for the higher permeability of the topsoil is the low permeability of the compacted clay barrier proposed in the final cap profile.

While there appears to be little advantage in installation of the proposed final cap (compared to intermediate cover) from a leachate generation perspective, it is important to note that a final vegetated cap is important to provide:

- Reduced erosion potential and associated:
  - reduced maintenance requirements
  - reduced sediment controls and maintenance of those controls
- Reduced dust generation potential
- Reduced visual impact
- Water storage required for vegetation growth

Reference

EIS □olume □□Appendi□ □ □ Leachate Assessment

7.4.3. Topic: Trade waste agreement contingencies

Request for additional information No. 3

a) The EPA requests details of proposed contingencies if increases to leachate processing or changes to the trade waste agreement are delayed?

In 50% and 10% AEP rainfall years, the estimated leachate generation for existing operations compared to stage 1 is very similar. Leachate is then expected to reduce as areas are capped. So in effect, SITA is proposing to increase current leachate treatment capacity and trade waste limits to meet both current and projected leachate generation levels.

The EPA notes that the proposal is planned to commence in June 2015.

SUEZ Clarification / Response

SUEZ contingencies to leachate management include:

- 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 SUEZ. 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 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 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 design and construction of Cell 5.2B and Cell 5.3 included both compacted clay and HDPE geomembrane barriers in the base of the cells. This double lined system exceeds the EPA guideline design requirements and provides significantly more environmental protection.

SUEZ believes delays to changes to the processing requests with Sydney Water is not expected to be a problem as SUEZ is well below our allowable limits.

Figure 12 and Figure 13 shows discharge volumes from the LHRRP between April 2014 to October 2015. The current Trade Waste Agreement (TWA) allows a maximum discharge of 1500 kilolitres total discharge with an average daily discharge limit of 800 kilolitres. As shown in figure below, the average discharge in 2014 was just over 600 kL/day and approximately 800 kL/day in 2015. SUEZ is below our allowable limits hence the processing requests with Sydney Water is not expected to be a problem

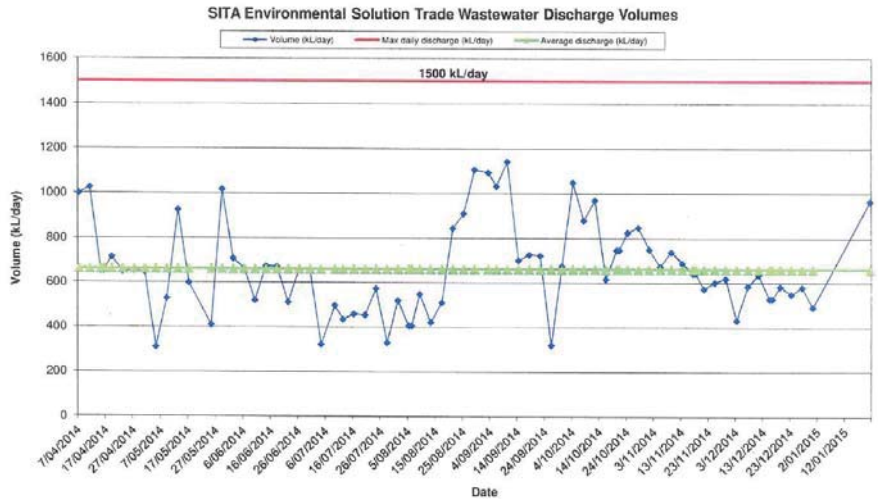

Figure 12 LHRRP tradewaste discharge volumes April 2014 – Jan 2015

Figure 13 LHRRP tradewaste discharge volumes April 2015 – Oct 2015

Reference

EIS □olume □□Appendi□ □ □ Leachate Assessment

7.4.4. Topic: Justification of proposed leachate collection system

Request for additional information No. 4

a) The EPA requests the Proponent justify the proposed leachate collection system on the reprofiled landfill areas. The justification must be detailed and consider alternative leachate barrier options (including a collection layer) on all surfaces on which waste will be placed under this proposal

The EPA notes that the proposal is to place waste without a leachate barrier/liner on top of existing waste cells on the southern end of the Lucas Heights facility.

SUEZ Clarification / Response

When considering leachate management for the reprofiling works, GHD considered the placement of leachate drainage and/or barrier layers between the existing waste and the proposed additional waste in Stages 1 – 3 which are not underlain with a benchmark technique liner and leachate collection system (or better for Stage 5). The following factors were identified as preventing these systems from suitably performing in the long term:

- One of the main drivers for proposing the reprofiling works is that a large portion of the existing landfill surface does not have sufficient grade to provide adequate drainage. Installation of a drainage system on this poorly draining surface would not perform very well.
- Ongoing settlement of the existing waste mass would likely make the existing drainage issues worse, especially as more weight of waste is added above.
- Ongoing settlement of the existing waste mass would likely damage any leachate barrier system
- A leachate barrier or drainage system on the existing waste mass would promote horizontal leachate movements, increasing the risk of leachate contamination of surface water. In areas where there is sufficient existing grade for a leachate barrier and/or drainage system to work effectively, the installation of such a system may introduce stability problems.
- There would need to be in the order of over 100 perforations in any leachate barrier and collection system. These perforations are needed to allow for the efficient extraction of landfill gas from the existing waste. As the waste settles this would compromise the integrity of any barrier/collection system resulting in a low level of their performance

The proposed system has been developed to mitigate the above risks through:

- Removal of the majority of the existing cover and cap material in a staged and controlled manner to encourage leachate to move into the existing leachate collection system.
- Primarily encouraging leachate to move vertically through the waste mass and into the existing leachate collection system. The groundwater assessment (appendix I of the EIS) has concluded that there are no existing impacts to groundwater, an indication that the existing leachate extraction systems and the geology are adequately containing leachate. The submission from DPI, the primary agency responsible for groundwater, has agreed that "…there is no significant concern as to any major alterations in groundwater impacts, flow direction changes or unforeseen impacts resulting from the project's variation of footprints..".
- Any leachate which does move towards the edge of the waste would be intercepted by the proposed perimeter trench system, reducing the risk of leachate potentially entering surface water. This is described in section 5.1.2 of the leachate assessment, reproduced below in "reference" section of this response
- An improved final cap will be installed which will significantly reduce the infiltration rate and associated leachate generation when compared to the existing final cap profile. In effect this system will provide the barrier above the waste to better control leachate generation rather than having to manage it after it is generated.
- Management plans will provide ongoing assessment of leachate levels within the landfill, and

groundwater and surface water monitoring.

Reference

EIS Volume 5, Appendix J – Leachate Assessment, Section 5.1.2 (p.41, reproduced below)

Additional proposed

The existing containment and collection system described above would manage the leachate from existing waste and proposed future landfilling areas. The existing leachate extraction risers and gas wells would require extension with the placement of additional waste.

In areas to be re-profiled, the existing cover and capping system would be stripped back to promote leachate percolation from the new waste into the existing waste and to the existing leachate collection system. In undertaking the stripping works, leachate would be prevented from entering the surface water by the construction of separation bunds.

To intercept any sideways movement of leachate and providing additional extraction points, a dual gas/leachate management trench would be constructed near the perimeter of the re-profiling area. Sections of trench would be constructed as landfilling progresses.

The purpose designed trench would consist of a nominally 1.5 – 2 m deep trench within the existing waste mass backfilled with site-generated crushed sandstone and perforated pipe. The typical arrangement for the trench is illustrated in Figure 5.2. This trench would act as an extraction point for any sideways movement of leachate, should it occur. Extraction risers would be located along the length of the trench, to allow leachate to be extracted and transferred to the existing leachate ring main. Detailed design of the system would be undertaken prior to installation and would include consideration of the predicted leachate flows, settlement and strength requirements. A construction environmental management plan would be required to manage potential impacts to surface water during the installation of the system.

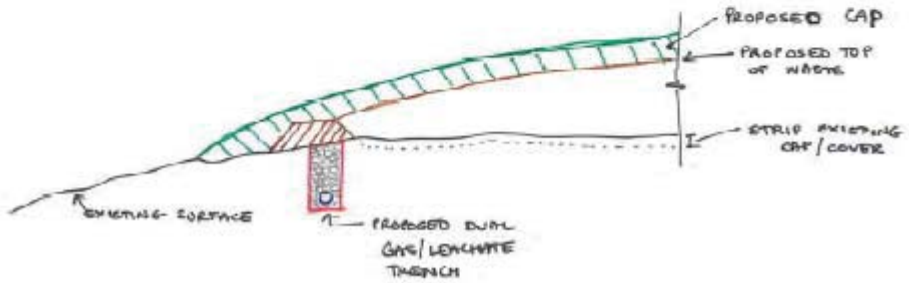

Figure 5.2 Proposed dual gas/leachate trench typical arrangement

7.4.5. Topic: Design

Request for additional information No. 5

a) The EPA requests the Proponent provide the proposed height of Cell 5.2 and Cell 5.3 from the base of the cell to the proposed final landform?

b) What unit weight for waste was used by GHD to calculate the height of 75m?

c) The EPA requires the proponent assess the structural integrity and hydraulic performance of existing leachate collection infrastructure under the additional leachate and waste loads to be imposed by the proposed overtopping of waste and storage of leachate in Cell 5.2 and Cell 5.3.

Calculations by GHD on stages 5.2 and 5.3 (i.e. the north area) indicates that the leachate collection pipework for these cells can withstand a weight/cover height of 75m. The leachate collection pipework and its integrity is essential for the proper management of leachate in a landfill. It is not clear if the unit weight of waste used to calculate the weight/height cover of 75m and the depth of waste in cells 5.2 and Cell 5.3 has been provided in the EIS.

SUEZ Clarification / Response

The response to this question is provided in the attached GHD technical memo in Appendix C

8. Office of Environment and Heritage

The responses to Office of Environment and Heritage comments are provided in the following GHD technical memo

18 May 2016

Carol Ng
SUEZ Recycling & Recovery Australia
PO Box 3500
RHODES NSW 2138

Our ref: 21/23482
Your ref: 215440

Dear Carol

Lucas Heights Resource Recovery Park Environmental Impact Statement Response to OEH comments on the Biodiversity Assessment Report

The Biodiversity Assessment Report has been updated in response to the Office of Environment and Heritage (OEH) comments following submission of the environmental impact statement to the Department of Planning and the Environment (DP&E), and as a result of changes to the project footprint.

1 Overview

SUEZ Recycling & Recovery[1] (SUEZ), currently operates the resource recovery park at Lucas Heights referred to as the Lucas Heights Resource Recovery Park (LHRRP). SUEZ is proposing a number of activities at the LHRRP in Lucas Heights (referred to as 'the proposal').

An Environmental Impact Statement (EIS) was prepared by GHD and SUEZ (formerly known as SITA Australia[2]), to the expectations of Sutherland Shire Council (SSC), to support the 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). In March 2016, SITA Australia Pty Ltd has rebranded to SUEZ Recycling & Recovery Pty Ltd.

The Biodiversity Assessment Report as part of the EIS has been updated in response to the Office of Environment and Heritage (OEH) comments following submission of the environmental impact statement to the Department of Planning and the Environment (DP&E), and as a result of changes to the project footprint. For consistency with the EIS, the updated BAR would maintain the reference to SITA Australia.

[1] SUEZ Recycling & Recovery Holdings Pty Ltd (SUEZ Holdings) is the holding company for the SUEZ group of companies in Australia. SUEZ Holdings is the parent company of both SUEZ and WSN Environmental Solutions Pty Ltd (WSN). WSN owns the land on which the Lucas Heights Resource Recovery Park (LHRRP) is situated. SUEZ Recycling & Recovery Pty Ltd (SUEZ) holds the environmental protection licence (EPL) and so is the operator of the facilities at LHRRP. For simplicity, the term SUEZ is used to refer to all of these organisations in this document.

Adjustments have been made to the GO facility design to minimise impacts on the endangered population of *Allocasuarina diminuta* subsp. *mimica.* A survey was conducted in the company of a qualified surveyor in March 2016 to accurately map the location of the ramets with respect to the layout of the GO and ARRT facilities, and to refine the layout of these facilities in order to minimise impacts on the endangered population. Due to redesign of the GO facility, no *Allocasuarina diminuta* subsp. *mimica* ramets are present with the GO facility footprint. A total of about 67 ramets are within the ARRT facility footprint (66 along the track margin between SITA and SICTA land), and one in regenerating woodland in SICTA land. Many of these appear to be hybrids.The redesign of the GO facility has also allowed a reduction in the size of the pond that was located to the north of the ARRT facility. This is now set back further from the nearby Coastal Upland Swamp EEC, further minimising the potential for indirect impacts on this community.

The proposal will be staged, with the GO facility to be built as soon as possible following project approval, and the AART facility to be constructed upon securing waste supply. A review has been undertaken which concludes that SITA has approval under the previous consent (1999 EIS and associated Consent R97/00029) to clear vegetation on the batters of the existing landfill as it is not yet at final profile. As such, impacts associated with the clearing of regenerated/planted vegetation on the batters of the existing landfill for reprofiling have not been considered in the impact assessment and biobanking credit calculations.

The proponent proposes to purchase and retire ecosystem credits from biobank sites managed by The Hills Shire Council (THSC) to offset the construction of the GO Facility (Stage 1 of the Biodiversity Offset Strategy (BOS)). SITA is investigating several opportunities to secure Eastern Pygmy-possum credits for this facilty.

Stage 2 of the BOS will be to secure and retire the necessary biodiversity credits for the ARRT Facility. The construction of this facility is not immediate and, as such, SITA is seeking approval for the project on the provision that the credits for that facility will be purchased and retired separately to those required for the GO facility, and before any construction of the ARRT facility commences. SITA will consult with Sutherland Shire Council to identify a suitable biobank site and/or engage with the BioBanking open market and provide evidence that the appropriate type and number of credits have been retired, through the provision of a retirement certificate/s, at an appropriate time should the facility be constructed.

2 Responses to comments

A summary of actions arising from the OEH comments is provided in Table 1. The OEH comments are attached to this letter for ease of review.

Table 1 Response to OEH comments

Point	Comment	GHD response
	Comments on additional information	
1	OEH considers that the Biodiversity Assessment report adequately demonstrates that direct and indirect impacts on SSTF are unlikely	Noted
2	*Allocasuarina* ramets	Numbers of ramets corrected following recent surveys and updated in sections 4.3.3 (page 56) and 7.6.3 (pages 93-99).
3	*Allocasuarina* credit calculations	Credit calculations provided using the formula provided by OEH (see section 7.6.4 pages 100-103)
4	*Prostanthera saxicola*	Expert report provided (see Appendix E)
	Additional comments on BAR	
5	Evidence of how PCTs were derived	BAR updated (see sections 3.3.3 (page 18) and 4.2.3 (page 33-38))
6	Landscape figure and associated calculations	BAR updated (see section 7) and Figure 7.1 and credit calculator updated
7	BOS	BOS updated to reflect the spilt of the project to avoid clearing of *Allocasuarina diminuta* subsp. *mimica* for the initial works. SITA is no longer considering using the SICTA site as the biobank site for the GO Facility, rather ecosystem credits will be purchased on the open market (at this stage suitable credits are available at sites managed by The Hills Shire Council and Angas Securities. SITA will commence negotiations in the near future (see section 8). GHD will soon undertake

Point	Comment	GHD response
		targeted surveys for the Eastern Pygmy-possum at a biobank site managed by The Hills Shire Council.
8	Koala	Likelihood table (Appendix B) updated to say unlikely, additional comment added to section 4.3.4 (page 61)
9	Squirrel Glider	Likelihood table updated to say unlikely (Appendix B).
10	Species polygons	New figures to be provided in updated BAR (see Figures 7.2 and 7.3)
11	Plot transect data for Plot 2	Credit calculator updated
12	Update credit summary	BAR updated (see section 7.6.4 pages 100-103)
13	Coastal upland swamp distance, discussion	Distance and discussion of impacts updated (see section 4.3.1 (page 54) and 5.2.1 (page 63).
14	Lot DP	Credit calculator updated
	Other comments	
15	OEMP	OEMP will be updated to include the mitigation measures provided in the BAR.

Sincerely
GHD Pty Ltd

Kirsten Crosby
Senior Ecologist
02 9239 7225

NSW GOVERNMENT | Office of Environment & Heritage

DOC15/443958-12
SSD 6835

Mr Chris Ritchie
Director
Industry Assessments
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

Dear Mr Ritchie

Lucas Heights Resource Recovery Park Project Environmental Impact Statement (SSD 6835)

I refer to your letter dated 3 November 2015 inviting the Office of Environment and Heritage (OEH) to comment on the exhibited environmental impact statement (EIS) for the Lucas Heights Resource Recovery Park Project Environmental Impact Statement (SSD 6835)

OEH provides comments on the project EIS in relation to biodiversity in Attachment 1.

If you have any queries regarding this matter please contact Marnie Stewart, Senior Operations Officer, on 9995 6868.

Yours sincerely

S. Harrison 18/12/15

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Attachment 1: Office of Environment and Heritage comments on the Lucas Heights Resource Recovery Park Project Environmental Impact Statement (SSD 6835)

Biodiversity

OEH has reviewed the *Lucas Heights Resource Recovery Park Project Biodiversity Assessment Report* by GHD (September 2015) against the *Framework for Biodiversity Assessment* (FBA) and the biodiversity SEARs (signed 3 February 2015).

OEH's input into the SEARs included that impacts on the following threatened populations and ecological community would require further consideration and provision of the information specified in s9.2 of the FBA:

Threatened Ecological Communities
Shale Sandstone Transition Forest
Endangered Populations
Allocasuarina diminuta subsp. mimica L.A.S.Johnson population in the Sutherland and Liverpool local government areas
Prostanthera saxicola population in Sutherland and Liverpool local government areas

OEH considers that the Biodiversity Assessment Report (BAR) adequately demonstrates that direct and indirect impacts Shale Sandstone Transition Forest are unlikely.

The BAR reports the presence of the *Allocasuarina diminuta* subsp. *mimica* endangered population within the study area as a number of 'ramets' (the stems of *Allocasuarina diminuta* subsp. *mimica* are described as ramets because it is possible that many of the stems have reproduced apomyctically after damage to the roots and stems of the original plants). However, the BAR inconsistently reports the number of ramets to be directly impacted as 58 and 82. The BAR, and in particular s7.4.3 (impacts requiring further consideration in accordance with s9.2 of the FBA), needs to be updated to accurately report the number of ramets (or individuals if this can be identified) to be impacted. OEH would then need to review this information again against s 9.2.5.2 of the FBA.

Further, as the *Allocasuarina diminuta* subsp. *mimica* endangered population is not currently available within the credit calculator, the BAR does not provide the number of species credits that would be required to offset the impact. Until the calculator is updated, OEH recommends that the BAR include an estimate of the likely number of credits to be required using Equation 6 of the FBA and the Tg value of 0.125.

The BAR states that the *Prostanthera saxicola* population in Sutherland and Liverpool local government areas is "unlikely" to occur within the proposal footprint as no suitable sandstone rock habitat is present and that it was not recorded during the November 2012/January 2015/March 2015 searches. OEH requires further justification as the BAR considers there to be suitable habitat on sandstone outcrops within the wider study area (Appendix B); all but one of the flora species this population is known to associate with (OEH threatened species profile) were recorded within the study area; two rock outcrops are proposed for removal; and, surveys were conducted outside of the optimal detection period for this endangered population (July-October). Specifically, OEH recommends that targeted searches be undertaken during July-October (and/or when a nearby reference sub-population is known to be flowering); or an Expert Report be prepared in accordance with s6.6.2 of the FBA to demonstrate that the endangered population is unlikely to occur and be impacted by the proposed works; or assume that the endangered population is present and assess further in accordance with the FBA.

OEH makes the following additional comments on the BAR:

- The BAR identifies one Plant Community Type (PCT) within the development footprint: 'Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux'. Plot/transect data was compared with Tozer (2010) diagnostic plant species lists to help confirm the identity of the PCT.

However, the BAR does not include evidence of this as required by FBA 5.2.1.8. Raw data has since been provided directly to OEH by the proponent and it is understood that the final BAR will include a summary of the data from this comparison to provide further evidence of how PCTs were derived for the development site in accordance with section 5.2.1.8 of the FBA.

- OEH understands an error has been made on Figure 7.1 of the BAR where 'Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux – regenerating and planted' has not been mapped as native vegetation within the assessment circles and some areas of Exotic Grassland have been mapped as native vegetation. Please update Figure 7.1 to correctly show the areas of native vegetation cover and update the '% native vegetation cover' values within Table 7.1 of the BAR and the credit calculator if required.

- The draft Biodiversity Offset Strategy (BOS) within the BAR is inadequate as it does not address the FBA requirements outlined in Table 22 of Appendix 7. OEH understands that the proponent is considering using the land currently leased by SICTA to establish a biobank site to help offset the proposed works. Initial investigations have determined that the matching vegetation for ecosystem credit requirements is present and that ramets of the *Allocasuarina diminuta* subsp. *mimica* endangered population occur. The following information needs to be considered and included in the draft BOS as a minimum:

    - How many matching ecosystem credits would be generated should a biobanking application be successful? If additional ecosystem credits are required to be purchased, where will these be bought and retired from?

    - How many species credits for the *Allocasuarina diminuta* subsp. *mimica* endangered population would be generated should a Biobanking application be successful? If additional species credits are required, are these available within the endangered population's distribution?

    - BBAM 6.5.1.9 states that species that require species credits cannot be assumed to be present on a biobank site. Therefore, the suggestion within the draft BOS to assume the presence of Eastern Pygmy-possum, Giant Burrowing Frog and Rosenberg's Goanna on the proposed Biobank site is not supported.

    - How many, if any, species credits for *Acacia bynoeana* would be generated should a Biobanking application be successful? If additional species credits are required to be purchased, where will these be bought and retired from?

    - If a biobanking application for the SICTA land is unsuccessful or not pursued, where will all the required credits be bought and retired from?

    - How will the potential impacts of the already accumulated lead shot on flora and fauna be assessed and managed when considering the suitability of the site for biobanking?

    - Will the SICTA lease be terminated to pursue a biobanking application?

    - If multiple parties have an interest in the SICTA lands, have they all expressed an interest in establishing a biobank site?

    - Are there any existing agreements over the SICTA site for managing vegetation for conservation?

    - Section 10.5 of the FBA and s2 of Appendix A of the *NSW Biodiversity Offsets Policy for Major Projects* outline the steps required to be undertaken should a variation to the offset rules and/or supplementary measures be applied for. This includes being able to demonstrate that all reasonable steps have been taken to secure the number and types of credits impacted on at the development site, including: consideration of any feasible sites known to the proponent; checking the biobanking public register and having an

expression of interest for credits on it for at least six months; liaising with an OEH office and relevant local councils to obtain a list of potential sites that meet the requirements for offsetting; considering properties for sale in the required area; and, providing evidence of the unwillingness of a landowner to sell or establish a Biobank site. OEH advises that the proponent may want to consider starting this process to minimise any future delay to applying for an offset rule variation and/or supplementary measure (if required), given that implementing all of the steps would take at least six months.

- The FBA requires that it be determined whether candidate species are likely or unlikely to occur, or use habitat, on a development site (s6.5). Only when it has been determined that a species is unlikely to occur, or unlikely to use habitat, may it be removed from further assessment (s 6.5.1.11). The BAR (Appendix B) states that the Koala (a species credit species) is likely to occur within the study area and that it "may forage in the proposal footprint on occasion when moving between other areas of better quality habitat". The BAR does not include credit calculations for the Koala. OEH understands the habitat within the development footprint is of low value to the Koala, based on the information provided in the BAR. OEH requests however, that either the BAR be updated to exclude the Koala from further consideration in accordance with s6.5.1.11 of the FBA, or that the Koala be considered further and species credits be calculated.

- The BAR also states (in Appendix B) that the Squirrel Glider (a species credit species) may possibly forage within the proposal footprint on occasion, and that limited suitable den habitat is present. Despite this, no credits have been generated for this species and no justification for exclusion has been provided in the BAR. OEH requests that either the BAR be updated to exclude the Squirrel Glider from further consideration in accordance with s6.5.1.11 of the FBA, or that the Squirrel Glider be considered further and species credits be calculated.

- No species polygons, as required by s 6.5.1.17 and Appendix 7 of the FBA, have been included in the BAR.

- Plot/transect data for Plot 2 within the BAR indicates "0" for 'Number of trees with hollows' yet a value of "1" has been entered in the credit calculator. Please confirm which is correct.

- The BAR reports that 459 ecosystem credits are required yet the credit summary report (Appendix A) states that 460 are required.

- The BAR reports the distance between the Coastal Upland Swamp (Needlebush - banksia wet heath) and the proposed GO (garden organics) storage dam sometimes as 40 m and sometimes as 6 m. The BAR should be updated to report the correct distance and consider whether the discussion on indirect impacts to the Coastal Upland Swamp requires updating as a result.

- Lot 2 DP 605077 has not been identified in the 'land title details' section of the credit calculator.

OEH makes the following additional comments on the Operational Environmental Management Plans OEMPs):

- OEH recommends that "Monitoring of revegetation of realigned Mill Creek to ensure planted individuals are thriving" (Table 6.2 of the BAR) is included in the relevant OEMP(s).

- The post-closure mitigation measures in Table 6.3 of the BAR should be included in the post-closure OEMP.

- The 'flora and fauna' sections of the OEMPs should be updated to reflect the recent recording of threatened biota as well as the current TSC Act listings for those species, populations and ecological communities.

(END OF SUBMISSION)

9. Department of Primary Industries

The NSW DPI provided response on 18 December 2015 and commented on aquatic assessment / macroinvertebrate sampling and groundwater assessment, amongst other topics. A copy of the response is provided in Appendix B.

It should be noted when referring to the following comments and responses that the Department of Primary Industries, in their letter dated 18th December 2015, noted that these matters discussed below should not be considered an impediment to determination of the project. As such, they advised that their comments should be addressed subsequently during the detailed design process and by updating the relevant Environmental Management Plans.

9.1. General comments

9.1.1. Topic: Mill Creek

Comment

The project clarifies the riparian widths that are proposed to be established along either side of Mill Creek on the site both during the operation of the project and following site closure.

SUEZ Clarification / Response

As discussed in Section 22.2 of Volume 1 of the EIS the required Vegetated Riparian Zone (VRZ) for Mill Creek will extend 10 metres either side of the channel zone. The extent of the VRZ is indicated on Figure 22.2.

As also discussed in Section 22.2 during site operation there are encroachments within the VRZ which are considered permitted activities under the Guidelines for Riparian Corridors on Waterfront Land (DPI, 2012). It is acknowledged that these encroachments will require to be offset on site.

Following site closure the VRZ width would remain unchanged and would be integrated into the final layout indicated in Appendix E of the surface water assessment.

Reference

EIS Volume 1, Section 22.2 (p.22-4)

EIS Volume 4, Appendix H – Surface Water Assessment, Appendix E – rehabilitation landscape plans

9.1.2. Topic: Mill Creek

Comment

A Mill Creek Stream Rehabilitation and Stabilisation and Vegetation Management Plan should be prepared for the rehabilitation of new section of the realigned creek and for the rehabilitation of Mill Creek and the riparian corridor following site closure.

SUEZ Clarification / Response

Mill Creek Stream Rehabilitation and Stabilization and Vegetation Management Plans were previously prepared and approved by the former Department of Natural Resources in 2006. The proposed works in the riparian zone associated with the GO/ARRT facility represent minor deviations from those works set out in the 2006 plans. During the detailed design phase, these plans will be updated and submitted to DPI – Water for review prior to undertaking site works. Update of the plans will include:

- Detailing the proposed creek diversion
- Defining offset areas and management requirements for riparian zone encroachments
- Defining other areas requiring riparian zone management (eg areas of revegetation) during the construction and operational phase of the proposed project

Defining areas requiring riparian zone management following decommissioning.

Reference

EIS Volume 1, Section 22.2 (p.22-4)

9.1.3. Topic: Storage dam

Comment

Consideration is given to locating the proposed Garden Organics (GO) storage dam to the south of the GO facility on land that is already cleared of native vegetation rather than locating it adjacent to Mill Creek on land that is currently vegetated with native vegetation

SUEZ Clarification / Response

The purpose of the storage dam is to capture and temporarily store water during periods of high rainfall to avoid overflow discharge to downstream waterways. Therefore, the dam needs to be located downhill from its catchment as pumping of water is not feasible to manage the volumes of water associated with these periods of high rainfall. Therefore the alternative suggested location south of the facility is not appropriate.

The impacts of the project on biodiversity values were assessed in the Biodiversity Assessment Report (GHD 2015). This included an assessment of potential impacts of the storage dam.

The proposed site for the GO storage dam is in an area of native vegetation. Native vegetation at this location was identified during the field surveys as Red Bloodwood - Scribbly Gum heathy woodland on sandstone plateaux (ME015). This plant community type is not a threatened ecological community. No threatened flora or fauna species were observed in this location. The construction of the storage dam would remove a very small area of native vegetation at this location.

Needlebush – Banksia wet heath is located about 6 m downslope of the proposed storage dam. This vegetation type occurs in a narrow band which follows a drainage line from the formed access track around the existing infill area to a dam in the SICTA land. This plant community type is commensurate with the endangered ecological community Coastal Upland Swamp listed under the EPBC Act and the TSC Act. An assessment of potential impacts on this community was provided in the Biodiversity Assessment Report. In addition, potential impacts on matters of national environmental significance, including impacts on the Coastal Upland Swamp, were assessed via a referral for the proposal. The proposal was considered unlikely to have a significant impact on this endangered ecological community as there would be no direct impacts, and the proposal would result in minimal edge effects, limited impacts on surface water and is unlikely to impact groundwater in the immediate vicinity.

In consideration of the comments provided by the DPI and OEH, a review was undertaken regarding the location and size of the storage dams. The size of the northern storage dam was reduced by proposing an additional storage dam east of the proposed ARRT facility. The creation of this dam also allowed reduction of the footprint of the southern storage dam. The updated concept dam arrangement is shown in Figure 14 below.

Reference

EIS Volume 8, Appendix M – Biodiversity assessment

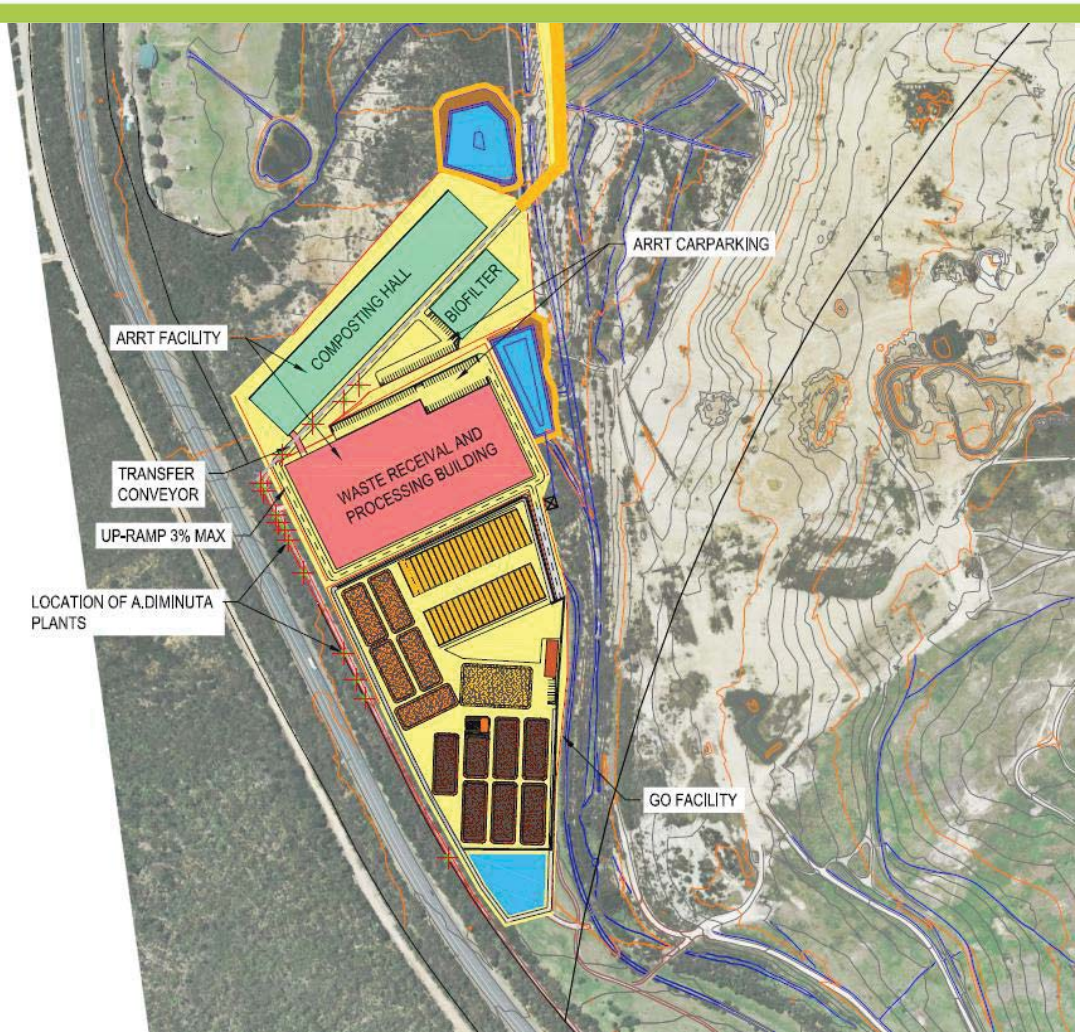

Figure 14 Revised storage dam arrangement for the GO facility

9.1.4. Topic: Storage dam

Comment

The proposed sediment pond/detention pond which is proposed to be located north of the ARRT facility is located elsewhere on the site to avoid potential impacts on the Coastal Upland Swamp.

SUEZ Clarification / Response

In consideration of the comments provided by the DPI and OEH, a review was undertaken regarding the location and size of the storage dams. The size of the northern storage dam was reduced by proposing an additional storage dam east of the proposed ARRT facility. This increases the distance between the Coastal Upland Swamp and the proposed storage dam. The updated concept dam arrangement is shown in Figure 14 above.

Reference

EIS Volume 8, Appendix M – Biodiversity assessment

9.1.5. Topic: Asset protection zone

Comment

A scaled plan is provided which shows the location of the Asset protection zone (APZ) requirements, the

riparian corridor footprint and the proposal.

Where possible, it is recommended the layout is designed so that the APZ is located outside the riparian corridor.

SUEZ Clarification / Response

Refer to attached Figure 15 showing the Asset Protection Zone (APZ) alongside the riparian widths. It can be noted from the figure that the APZ does not extend into the Vegetated Riparian Zone (VRZ).

9.1.6. Topic: Monitoring

Comment

The water quality monitoring parameters target the potential impacts of the landfill leachate. This would assist validate whether the proposed reprofiling has reduced the potential risk of leachate being discharged off site.

SUEZ Clarification / Response

The water quality parameters monitored are targeted to monitoring of leachate as they include ammonia, which is a prime indicator of the presence (or absence) of leachate. Conductivity is also measured which is a trigger for investigation. They also correspond to the parameters stipulated for monitoring in the Environmental Protection Licence (EPL) for the site (EPL No. 5065) which has been considered acceptable by the EPA in the monitoring of surface water quality discharged from the site.

A range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considere live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

Reference

EIS Volume 4, Appendix H – Surface Water Assessment, Section 6.5 (p.47)

9.1.7. Topic: Monitoring

Comment

Additional water quality sampling is undertaken prior to the project commencing.

SUEZ Clarification / Response

More than 20 years of water quality data is available for the site. There would be minimal benefit in undertaking further baseline or ongoing water quality (in addition to what is required by the EPL) or macroinvertebrate assessment (or to include additional reference sites) before the project commenced based on the following:

- As detailed in Section 6.5 of the Surface Water Assessment the proposal is expected to improve water quality downstream
- The macroinvertebrate study undertaken indicated that spatial extent of existing impacts is limited
- As discussed above ammonia, the prime indicator of leachate is included in a regular monitoring plan

which provides a more rapid indication in the un-expected event of worsening impacts

- The EIS does propose that ongoing macroinvertebrate assessment at a frequency of once every 3 years is undertaken

SUEZ will review the macroinvertebrate assessment and if any persistent negative trends are determined, SUEZ will engage with the Department and review the monitoring frequency.

Reference

EIS Volume 4, Appendix H – Surface Water Assessment, Section 6.5 (p.47)

LEGEND

- LHRRP boundary
- Access road
- Asset Protection Zone (APZ)
- SICTA boundary
- Buildings edge
- Creek
- Landfill area
- Top of Bank

VRZ Buffers

- 10 metre
- 5 metre

Paper Size A4

0 25 50 100

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 14 Apr 2016

Submissions Response
Riparian Corridors and Asset Protection Zone

Figure 15

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

N:\AU\Sydney\Projects\21\23482\GIS\Maps\MXD\21-23482-Z057_Riparian.mxd

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

9.1.8. Topic: Monitoring

Comment

Additional baseline aquatic monitoring is undertaken prior to the project commencing over a range of seasons and weather conditions in order to assess change.

SUEZ Clarification / Response

SUEZ will engage independent specialist for the sampling program and determine the most suitable season and weather condition for the assessment. This will be added to the LHRRP OEMP.

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.1.9. Topic: Monitoring

Comment

Additional reference/control sites are added to the macroinvertebrate sampling program.

SUEZ Clarification / Response

SUEZ will engage independent specialist for the sampling program and determine the reference / control sites. This will be added to the LHRRP OEMP.

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.1.10. Topic: Monitoring

Comment

The water quality, macroinvertebrate and aquatic/riparian habitat monitoring continues once the project commences and the monitoring program is undertaken for the duration of the operation of the project to assess any potential impacts on the aquatic ecology downstream of the site.

SUEZ Clarification / Response

SUEZ proposes to undertake ongoing macroinvertebrate assessment at a frequency of once every 3 years is undertaken until post-closure. SUEZ will review the macroinvertebrate assessment and if any persistent negative trends are determined, SUEZ will engage with the Department and review the monitoring frequency. This will be added to the LHRRP OEMP.

9.1.11. Topic: Waterfront land works

Comment

Works on waterfront land should be undertaken in accordance with the Guidelines for Controlled Activities on Waterfront Land (DPI, 2012).

SUEZ Clarification / Response

Before commencement of any works on waterfront land the Guidelines for Controlled Activates on Waterfront Land Will be reviewed and implemented as required, including obtaining any required approvals. SUEZ considered the Department's recommendation and will prepare a Mill Creek Management Plan which documents the requirements.

9.1.12. Topic: Monitoring bores

Comment

Monitoring bore coverage should be improved across the Waste Management Centre domain for the purpose of identifying the potential leachate pathways within the shallow sandstone aquifer.

SUEZ Clarification / Response

The monitoring bores locations for the landfill is determined as part of the EPL and covers both upstream and downstream to monitor any leachate infiltration into groundwater.

The bore location was reviewed by Hydrogeologist at GHD, who undertook an independent review of the bore and commented that the "wells are located in suitable positions to characterise up-gradient (baseline) groundwater quality conditions and the groundwater quality at the down gradient edge of the existing landfill. Under the current proposal the landfill footprint is not expected to expand to any significant extent and therefore this monitoring network is considered to be suitable for ongoing monitoring with the proposed landfill changes"

SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations. This will be added to the LHRRP OEMP.

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.1.13. Topic: Post-closure assessment

Comment

There is an assessment of post-closure potential lead in soil contamination in the NW corner of the site due to the clay-shooting range. Heavy metals associated with the lead shot residue have the potential to be mobilised in the acid soil and groundwater regime. These matters need to be addressed at or before closure.

SUEZ Clarification / Response

Noted. These matters will be addressed prior to construction of the ARRT facility through a site audit statement and prior to closure through review of the post-closure EMP.

The following text will be added to the post-closure EMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted*"

9.1.14. Topic: Post-closure assessment

Comment

Additional monitoring of heavy metal contamination from purpose-built bores installed down gradient of the clay shooting range.

SUEZ Clarification / Response

Noted. The following text will be added to the ARRT OEMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted*"

9.1.15. Topic: Post closure assessment

Comment

Refinement of the management plans to include additional monitoring and revised trigger levels (e.g. lead concentrations down gradient of the clay shooting range) both during operation and post-closure

SUEZ Clarification / Response

Noted. The following text will be added to the ARRT OEMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability*

of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted"

9.1.16. Topic: Post-closure assessment

Comment

Maintenance of the leachate management system, as described in the management plans, to include regular periodic cleaning (i.e. flushing and repair) of the leachate system piping.

SUEZ Clarification / Response

Leachate levels and flow rate is currently monitored using SCADA system to confirm leachate levels are maintained below limits set by the NSW EPA.

The following text will be added to the LHRRP EMP.

"*The leachate management system would be maintained by cleaning (i.e. flushing and repair) of the leachate system piping when required. The Total Suspended Solids (TSS) level would be monitored at the Sequencing Batch Reactor (SBR) outlet against the TSS level specified in the Trade Waste Agreement (TWA). If TSS levels at the outlet exceeds TWA requirements, the leachate system would be flushed to remove biosolids accumulation. This monitoring occurs automatically every four days.*"

9.1.17. Topic: Post-closure assessment

Comment

Clarification of the current number, location and construction of the existing monitoring bores so that additional targeted installations can be designed to improve the likelihood of leachate detection in groundwater if leaks occur (i.e. sentinel monitoring in appropriate locations).

SUEZ Clarification / Response

Noted. After installation, the post-closure EMP would be updated with the location of the bores.

9.2. Aquatic Assessment / Macroinvertebrate sampling (Detailed comments – Attachment A)

9.2.1 Topic: Monitoring

Comment

Water quality monitoring can be improved to ensure adequate monitoring of leachate and stormwater runoff - the water quality parameters don't appear to focus on the potential impacts of the leachate. The monitoring program needs to provide details on:

- *how the leachate/stormwater runoff may affect biota (ie what's in the leachate/stormwater that could affect stream biota).*
- *what the landfill leachate might contain so as to guide the water quality monitoring and clarify whether the water quality monitoring parameters target this.*

The inclusion of parameters that target the potential impacts of the landfill leachate will assist to validate whether reprofiling has reduced the potential risk of leachate being discharged off-site and potential impacts to surface water.

SUEZ Clarification / Response

The water quality parameters monitored are targeted to monitoring of leachate as they include ammonia, which is a prime indicator of the presence (or absence) of leachate. Conductivity is also measured which is a trigger for investigation. They also correspond to the parameters stipulated for monitoring in the Environmental Protection Licence (EPL) for the site (EPL No. 5065) which has been considered acceptable by the EPA in the monitoring of surface water quality discharged from the site.

In addition, a range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.2.2 Topic: Monitoring

Comment

The report refers to the 2013-2014, River Health Monitoring program which has undertaken 5 years of monitoring in the Georges River catchment of water quality, vegetation and macroinvertebrates (page 30) but this monitoring may or may not continue and it is not considered appropriate to rely on another program to monitor this State Significant Development may provide additional information, but it was not designed to test the effects of the landfill.

It is unclear if the project proposes to undertake any additional water quality sampling prior to the project commencing, as only a single round of sampling was undertaken. Additional sampling prior to development should be required.

It is recommended the monitoring is more frequent (for example monthly), and it measures relevant parameters

at appropriate times - focusing on leachate/high nutrients etc. during times when groundwater will be the major source of stream flow.

There also should be some sort of event sampling focusing on stormwater effects, particularly as the report acknowledges that a significant rainfall event which occurred in the 24 hours prior to undertaking the fieldwork may have influenced the results (page 20).

SUEZ Clarification / Response

To gain an understanding of the existing baseline conditions of water quality of the major water receptor, Mill Creek, GHD undertook a detailed aquatic ecosystem survey (refer Appendix C of Appendix H – Surface Water Assessment) in March 2015, which investigated the aquatic ecosystems of Mill Creek. The purpose of the investigation was to examine if any impacts to aquatic macroinvertebrates, a well-known indicator of creek/river health, may be occurring in the habitats downstream of the LHRRP. A combination of physical / chemical and biological monitoring allows for long term, full assessment of impacts to biota.

The River Health Monitoring Program was an independent study which was referenced – the results corresponded with the study undertook by GHD. It was not relied on for the assessment.

The EIS propose that ongoing macroinvertebrate assessment be undertaken at a frequency of once every 3 years is undertaken

SUEZ will review the macroinvertebrate assessment and if any persistent negative trends are determined, SUEZ will engage with the Department and review the monitoring frequency. This will be added to the LHRRP OEMP.

In addition, a range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considere live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

References

EIS Volume 4, Appendix H – Surface Water Assessment, Appendix C Aquatic Ecosystem Survey

9.2.3 Topic: Monitoring

Comment

Appendix T (Garden Organic Operation Environmental Management Plan) notes that any surface water discharged to Mill Creek from a storage dam or pond is to be monitored and tested to confirm that it meets EPL requirements before being discharged (Section 9.1.1, page 9.1). It is noted the parameters listed to monitor the leachate dam differ to the water quality parameters that were measured at the monitoring locations as outlined in Appendix C of Appendix H (see Section 9.1.3 of Appendix T and Section 4.2.2 of Appendix C of Appendix H). It is suggested Sections 9.1.1 and 9.1.3 of Appendix T clarify if the testing will also incorporate the water quality parameters listed in Section 4.2.2 of Appendix C of Appendix H.

SUEZ Clarification / Response

Noted. The following text will be added to the GO facility OEMP.

"The surface water collected from Garden Organics roofs and/or breathable membrane covers discharged to Mill Creek from a storage dam or pond would be monitored for the following parameters:

- *Temperature (°C)*
- *pH*
- *Electrical Conductivity (µS/cm)*
- *Dissolved Oxygen (mg/L and % saturation)*
- *Turbidity (NTU)*
- *Alkalinity (mg/L $CaCO_3$)"*

9.2.4 Topic: Monitoring

Comment

It is also unclear if the project proposes to undertake any additional baseline macroinvertebrate sampling prior to the project commencing. For example, the report notes further sampling in spring and/or an ongoing macroinvertebrate monitoring program would allow for a more comprehensive analysis of macroinvertebrate community composition (Section 6.5.1, page 30) but it recommends further investigation is undertaken of the habitat condition / macroinvertebrate populations every three years commencing soon after reprofiling works commence (Section 8). It is recommended the proponent undertakes additional baseline aquatic monitoring prior to the project commencing over a range of seasons and weather conditions in order to assess change.

SUEZ Clarification / Response

SUEZ proposes to undertake ongoing macroinvertebrate assessment at a frequency of once every 3 years is undertaken until post-closure. SUEZ will review the macroinvertebrate assessment in the event of persistent unsatisfactory water testing results, then frequency would be increased. This will be added to the LHRRP OEMP.

A range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.2.5 Topic: Monitoring

Comment

The report hasn't used control sites but it refers to recent studies in the Georges River catchment which found that urban streams throughout the catchment contain macroinvertebrate communities dominated by pollution tolerant species with little or no pollution sensitive species present. As noted above, it is not considered appropriate to rely on another program to monitor this SSD as the program was not designed to test the effects of the landfill. Ideally some extra reference/control sites should be added to the macroinvertebrate sampling program. A single reference is inadequate (MCUP). In addition, MCUP is probably an intermittent stream and

maybe already affected by stormwater runoff from the site (Fig. 3.1, Appendix A – Staging Drainage Plans). If extra sites are not possible, the monitoring should focus on AUSRIVAS results, which predict the invertebrate assemblage that should occur in the absence of any impact from reference sites

SUEZ Clarification / Response

SUEZ will engage independent specialist for the sampling program and determine the most suitable season and weather condition for the assessment, as well as determine the reference / control sites. This will be added to the LHRRP OEMP.

A range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considere live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.2.6 Topic: Monitoring

Comment

If the project is approved, DPI Water recommends monitoring continues once the project commences and the monitoring program is undertaken for the duration of the operation of the project to assess any potential impacts on the aquatic ecology downstream of the site. It is recommended the proponent repeats the sampling more frequently than every three years and this sampling is undertaken over a range of seasons and weather conditions. It is recommended the macroinvertebrate sampling is undertaken annually or twice per year.

SUEZ Clarification / Response

SUEZ proposes to undertake ongoing macroinvertebrate assessment at a frequency of once every 3 years is undertaken until post-closure. SUEZ will review the macroinvertebrate assessment in the event of persistent unsatisfactory water testing results, then frequency would be increased. This will be added to the LHRRP OEMP.

A range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.3 Groundwater (Detailed comments – Attachment B)

9.3.1 Topic: Monitoring

Comment

There are two areas of particular interest for the project as it develops:

A. GO and ARRT sites: Groundwater monitoring for the relocated and expanded composting facility (GO) and the waste sorting and recovery facility (ARRT) has been proposed to be addressed by the installation of additional monitoring piezometers and development of event trigger plans – Section 24 and especially Table 24.1 which details new monitoring bores.

This is considered to be a satisfactory response.

SUEZ Clarification / Response

Noted.

9.3.2 Topic: Monitoring

Comment

Enlarged landfill overall (LHRRP): Longer term monitoring for the whole, expanded landfill site (LHRRP).

At present 11 clustered monitoring bores are prescribed for sampling and consideration in regard to monitoring the existing groundwater situation and detecting potential leachate effects on the groundwater system. This system should be improved for the proper detection of leachate in groundwater systems to the north of the LHRRP.

SUEZ Clarification / Response

The monitoring bores locations for the landfill is determined as part of the EPL and covers both upstream and downstream to monitor any leachate infiltration into groundwater.

The bore location was reviewed by Hydrogeologist at GHD, who undertook an independent review of the bore and commented that the "wells are located in suitable positions to characterise up-gradient (baseline) groundwater quality conditions and the groundwater quality at the down gradient edge of the existing landfill. Under the current proposal the landfill footprint is not expected to expand to any significant extent and therefore this monitoring network is considered to be suitable for ongoing monitoring with the proposed landfill changes"

SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations. This will be added to the LHRRP OEMP.

In addition, a range of tools are in place to promote an effective monitoring system:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SUEZ provides annual returns to the NSW EPA including montioring reports. The NSW EPA has the power to require improvements to the monitoring regime based on the results obtained
- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.3.3 Topic: Monitoring

Comment

The measurement of SWLs in groundwater monitoring bores needs to be more extensive north (and down-gradient) of the project site. Additional, regular monitoring and reporting from at least bores BH31, MB021, MB022, BH24 should be introduced, and further consideration be given to including additional, existent bores located on Lot 2 DP 1032102. The additionally sampled bores MB044 and MB045, described in the project's "Groundwater Assessment" (Appendix I), should also be included for regular monitoring.

SUEZ Clarification / Response

The monitoring bores locations for the landfill is determined as part of the EPL and covers both upstream and downstream to monitor any leachate infiltration into groundwater.

The bore location was reviewed by Hydrogeologist at GHD, who undertook an independent review of the bore and commented that the "wells are located in suitable positions to characterise up-gradient (baseline) groundwater quality conditions and the groundwater quality at the down gradient edge of the existing landfill. Under the current proposal the landfill footprint is not expected to expand to any significant extent and therefore this monitoring network is considered to be suitable for ongoing monitoring with the proposed landfill changes"

SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations. This will be added to the LHRRP OEMP.

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- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considere live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
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- SUEZ volunteers to continuous improve the site. Over the history of operating the site, SUEZ has commissioned new groundwater monitoring bores over time as the staging of the landfill progresses

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

9.3.4 Topic: Monitoring

Comment

The Proponent has undertaken an extensive analysis of leachate generation (Appendix J) in respect of the proposed increased filling, and placed this properly into the context of present leachate generation and the on-going situation as if the proposed development had not taken place.

The analysis has taken account of existing leachate volumes, considerations of the leachate collection system design and function, typical climate conditions at the site and future proposed designs for the landfill capping. Numerical modelling has then followed and forms the basis of most recommendations regarding the future developments and capacity of the system. The analysis and considerations are satisfactorily developed

The analysis has taken account of existing leachate volumes, considerations of the leachate collection system design and function, typical climate conditions at the site and future proposed designs for the landfill capping. Numerical modelling has then followed and forms the basis of most recommendations regarding the future developments and capacity of the system. The analysis and considerations are satisfactorily developed.

SUEZ Clarification / Response

Noted.

9.3.5 Topic: Monitoring

Comment

The Proponent has addressed the matter of ensuring that the existing leachate management system keeps functioning correctly in Section 5.3 (Appendix J) – "Operational mitigation issues". These proposals could be strengthened by ensuring that, where possible, the leachate collection system be cleaned and flushed from time to time to ensure its continued efficient operation; this is an accepted technique for important sub-soil drainage systems - here the leachate system is equivalent to this

SUEZ Clarification / Response

Leachate levels and flow rate is currently monitored using SCADA system to confirm leachate levels are maintained below limits set by the NSW EPA.

The following text will be added to the LHRRP EMP.

"*The leachate management system would be maintained by cleaning (i.e. flushing and repair) of the leachate system piping when required. The Total Suspended Solids (TSS) level would be monitored at the Sequencing Batch Reactor (SBR) outlet against the TSS level specified in the Trade Waste Agreement (TWA). If TSS levels at the outlet exceeds TWA requirements, the leachate system would be flushed to remove biosolids accumulation. This monitoring occurs automatically every four days.*"

9.3.6 Topic: Monitoring

Comment

With respect to groundwater for this development application and the response for Lucas Heights Resource Recovery Park - Expansion Project (SSD-6835), DPI Water considers this proposal to be adequate and most likely an improvement on the existing site condition. For example, the reprofiling of the landfill cap will significantly (25%) reduce rainfall infiltration rates and therefore also reduce the volumes entering the leachate management system.

SUEZ Clarification / Response

Noted.

9.3.7 Topic: Monitoring

Comment

The EIS illustrates the predictions that as landfilling increases the included watertable rises within the landfill, and down-gradient of the landfill regional water table levels fluctuate in response to the amount of groundwater in the system. Given this historic situation and the site geology there is no significant concern as to any major alterations in groundwater impacts, flow direction changes or unforeseen impacts resulting from the project's variation of footprints, and the repositioning of the GO and ARRT facilities. The Proponent is required to monitor groundwater quality at 11 locations around the greater site as specified in their Environmental Protection Licence (EPL No 5065) (from Appendix I – groundwater assessment).

SUEZ Clarification / Response

Noted. SUEZ is required to monitor groundwater quality at 11 locations around the greater site as specified in their Environmental Protection Licence (EPL No 5065) (from Appendix I – groundwater assessment) and in accordance with the site OEMPs.

9.4 Recommendations (Detailed comments – Attachment C)

9.4.1 Topic: Monitoring

Comment

More comprehensive monitoring bore coverage across the Waste Management Centre domain for the purpose of identifying the potential leachate pathways within the shallow sandstone aquifer.

SUEZ Clarification / Response

SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations. This will be added to the LHRRP OEMP.

9.4.2 Topic: Monitoring

Comment

There is an assessment of post-closure potential lead in soil contamination in the NW corner of the site due to the clay-shooting range. Heavy metals associated with the lead shot residue have the potential to be mobilised in the acid soil and groundwater regime. These matters need to be addressed at or before closure.

SUEZ Clarification / Response

Noted. The following text will be added to the ARRT facility EMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted*"

9.4.3 Topic: Monitoring

Comment

Additional monitoring of heavy metal contamination from purpose-built bores installed down gradient of the clay shooting range.

SUEZ Clarification / Response

Noted. The following text will be added to the ARRT facility EMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted*"

9.4.4 Topic: Monitoring

Comment

Refinement of the management plans to include additional monitoring and revised trigger levels (e.g. lead concentrations down gradient of the clay shooting range) both during operation and post-closure.

SUEZ Clarification / Response

Noted. The following text will be added to the ARRT facility EMP.

"*Prior to construction of the ARRT facility, a site audit statement would be prepared to determine the suitability of the land for construction of the ARRT facility. This may involve assessment of the heavy metal contamination from purpose-built bores, and ongoing monitoring if warranted*"

9.4.5 Topic: Monitoring

Comment

Maintenance of the leachate management system, as described in the management plans, to include regular periodic cleaning (i.e. flushing and repair) of the leachate system piping.

SUEZ Clarification / Response

Leachate levels and flow rate is currently monitored using SCADA system to confirm leachate levels are maintained below limits set by the NSW EPA.

The following text will be added to the LHRRP EMP.

"*The leachate management system would be maintained by cleaning (i.e. flushing and repair) of the leachate system piping when required. The Total Suspended Solids (TSS) level would be monitored at the Sequencing Batch Reactor (SBR) outlet against the TSS level specified in the Trade Waste Agreement (TWA). If TSS levels at the outlet exceeds TWA requirements, the leachate system would be flushed to remove biosolids accumulation. This monitoring occurs automatically every four days.*"

9.4.6 Topic: Monitoring

Comment

Clarification of the current number, location and construction of the existing monitoring bores so that additional targeted installations can be designed to improve the likelihood of leachate detection in groundwater if leaks occur (i.e. sentinel monitoring in appropriate locations).

SUEZ Clarification / Response

SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations. This will be added to the LHRRP OEMP.

The LHRRP OEMP will be updated to include information of existing bores.

SUEZ is open to communications and consultation with the DPI over the lifetime of this project.

10. Sutherland Shire Council

A response was received from SSC dated 30 November 2015. The response described the engagement of SSC within the EIS preparation. The report concluded:

"As Council have had considerable involvement in the development of the EIS it is recommended that Council respond to the Department of Planning and Environment noting that all Council matters have been addressed during the preparation of the EIS and that subject to positive community feedback during the consultation process, Council is supportive of the application."

SUEZ appreciates the contribution SSC has in improving the documentation and support during public consultation.

11. Department of Planning & Environment

The DPE provided comments regarding the EIS and they are addressed below

Comment No.	DPE comments	Response	References
1	Does the application include surrender of the 2010 AWT consent?	Yes SUEZ will surrender the 2010 AWT consent after formal approval of this EIS	N/A
2	Where are the comments from Department of Defence (birdstrike and exhaust plumes posing hazards to aircraft operations) addressed? Can't find reference in Chapter 12 as stated in section 3.5.1	SUEZ received comments from Department of Defence in early stage of the EIS preparation (9 February 2015). A copy is included in Appendix E. Response to Department of Defence comments are in section 11.1 below	N/A
3	Clarify operational hours on weekends, table 6-2 and pg 6-13 conflicting – waste receival hours 8am – 4pm or 8am – 5pm?	The proposed hours of operations are 6 am – 5pm on weekdays and 8am – 5 pm on weekends. The "waste receival" hours ware proposed to be extended by one hour on weekdays and weekends, but "construction & landfilling operations" are only proposed to be extended by one hour on weekdays to 5pm (it is currently already 8am – 5pm for weekends so does not need to be extended). Table 6.2 remains correct.	EIS Volume 1, Section 6.1.3, Table 6.2
4	Provide larger phasing figures (6.5 – 6.10) with clearer labels	Refer Appendix E for phasing sketches with clearer labels	N/A
5	Resource recovery – is the conveyor to transfer waste material to the composting system covered?	Yes – the conveyor will be fully enclosed	N/A
6	More consideration/information required in relation to the need for ANSTO agreement to lease the site for future parkland following closure – this affects over 50% of the land.	This is subject to ANSTO agreeing to release its portion of the site for this purpose. This arrangement is similar to the existing approved arrangement and does not change due to this Proposal.	EIS Volume 1, Section 6.5
7	Is the large sandstone mound currently on the site used for daily cover? When would it be removed/graded into the profile, at which phase?	The stockpile will be used progressively. It is uncertain which phase the stockpile will be exhausted but as part of the Appendix F – Visual Assessment a worst case assessment has been undertaken assuming the stockpile remains in Phase 6 which will occur over a period of 23 months from 2020 – 2021.	EIS Volume 1, Section 4.10 EIS Volume 3, Appendix F – Visual Assessment
8	Provide more detail on the Council resolution referenced regarding a flying area for model aeroplanes in the final parkland design.	Council report number BDS129-15 issued on 11/5/2015, point 4 stated:	EIS Volume 7, Appendix R – Parkland, Future Use

		4. That the EIS and DA identify an area of the site for potential use for model aeroplane flying as part of the project. As per the Council Resolution, an area of the site was identified on the landscape plans.	and Post Closure Management, Section 4.1.1 and Appendix C – landscape plans

11.1 Department of Defence

Defence has concerns regarding possible exacerbation of birdstrike risks and exhaust plumes from expansion of biogas operations posing hazards to aircraft operations conducted within the Holsworthy Training Area.

Birdstrike: Birdstrike is currently not an issue at the Lucas Heights RRP. As the tip face is not expanding, the number of birds is not expected to be different from existing operations.

Exhaust plumes from expansion of biogas operations: Biogas capture and treatment operations is continuously being reviewed and developed at the LHRRP to maintain the infrastructure and provide energy to the grid. SUEZ continously reviews and adapts the landfill gas capture and treatment system through installation of a series of landfill gas and leachate wells. This is considered business as usual and not unique for the expansion project.

12. Community submissions

SUEZ received three submissions from the community:

- Community submission 1 - Donald Page
- Community submission 2 - Grant Beamish
- Community submission 3 – Greg Hoy

12.1 Community submission 1 - Donald Page

Key issues raised in this submission included:

- Environmental cost to local bushland
- Project justification: timeframe of landfilling
- Long term arrangements with Sutherland Shire Council

Response

No significant impact to local bushland: The EIS prepared by GHD (2015) has undertook an assessment of the impact on local environment and concluded there will be no significant impacts on a range of aspects such as air quality, surface water and biodiversity.

A comprehensive biodiversity assessment was undertaken for the proposal and included in Chapter 19 of the EIS and Appendix M of the EIS. The proposal has been purposefully designed to avoid or further reduce impacts on biodiversity values as far as is practicable. Specific mitigation measures are also proposed to minimise impacts on the natural environment and threatened biota.

SUEZ also runs a series of programs to prevent the spread of pest, vermin and noxious weed in the area. Joint programs are organised with SSC, Crown Lands, Department of Defence and ANSTO to control high risk noxious weeds within the LHRRP. SUEZ also has an existing feral animal control program in place since 2008 and would be continued.

Further details of these programs and SUEZ's management strategy is described in the LHRRP OEMP. The OEMP also provides details on other aspects of the bush management including asset protection zone (APZ) for fire management.

Post-closure of the site, the revegetation/landscaping of the final landform would be in accordance with the landscape plans. An extensive planting program would be undertaken using a range of trees and shrubs to create a pleasant setting for passive recreational uses. Thickening of revegetation layer would be required over parts of the reprofiled area to support larger plants.

Timeframe of landfilling: The proposal would extend the timeframe for which the land would be unavailable for recreational purposes until 2037. This is required to ensure that Sydney's waste disposal arrangements are not interrupted.

As described in Chapter 5 of the EIS, 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.

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).

Under the current approval the GO facility was to remain in its current location. As part of the proposal, the GO and ARRT facilities would cease operating in 2037 and be provided to the community as additional parkland.

Compared to the current facility, the LHRRP with the proposal would have improved environmental performance. In particular the LHRRP would be operated in accordance with stringent environmental controls, including best practice, prevention, mitigation and rectification measures for odour, noise, dust and other potential environmental impacts. Additional strategies would also be adopted for litter, leachate, gas, sediment, erosion and surface water management.

Following the cessation of operations, SUEZ would begin the final landscaping works. After landfilling has been completed, the land would then be landscaped in accordance with the landscaping plan. This landscaping plan provides for 149 hectares of rehabilitated parkland for public use. This includes 124 hectares as proposed under the current development and an additional 25 hectares where the current garden organics is located. This parkland is modelled on Sydney's Centennial and Bicentennial Parklands. It will be a regional destination for future generations of the children of the Sutherland Shire Local Government Area and beyond.

The part of the LHRRP that is owned by SUEZ will be transferred to Council at no cost to Council.

Long term arrangements with SSC: The Lucas Heights landfill (Lucas Heights 1 and Lucas Heights 2) has historically serviced the Sutherland Shire and the greater Sydney area. The original 1999 approval had a requirement that 80% of the waste received at the site be sourced from the Southern Sydney Waste Board Region and the other 20% could be sourced from other locations. This restriction was removed via a modification to the consent in 2005. Therefore since the approval in 1999 (and even prior to this approval) the site has been receiving waste from the Sydney region. In recognition of the critical role that the LHRRP plays in managing Sydney's waste, SUEZ has committed to entering into a VPA with SSC in accordance with the requirements of the EP&A Act. Furthermore, SSC and all SUEZ entities will enter into a deed of variation to the existing Deed of Agreement which would set out the contractual enforcement provisions for compliance with their obligations under the VPA. There would be preferential treatment of Council's waste at the LHRRP. SUEZ will reserve 50,000 tonnes per annum capacity out of the total permitted annual landfill volume for the LHRRP of 850,000 tonnes per annum for the exclusive use of SSC up to and including the year 2035.

SUEZ is also committed to providing other material public benefit as described in the VPA, including preferential treatment of waste generated in the Sutherland Shire LGA. Details of the VPA is described in Chapter 23 of the EIS.

SUEZ is dedicated to better environmental outcomes by the application of best practice prevention, mitigation

and rectification measures. A range of tools are in place to promote best practice:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SSC has an important role in ensuring that operations at the LHRRP are conducted in an environmentally responsible manner. SUEZ has committed to entering into an agreement with SSC in the form of a VPA which includes 'environmental undertakings'. The environmental undertakings made by SUEZ to SSC have been developed to demonstrate SUEZ's commitment to protecting the environment and the local community while constructing, operating and during the post closure period for the proposal. The agreed undertakings or commitments relate to the environmental management of the LHRRP, complaints handling and environmental reporting
- SUEZ and Council had entered into a Deed of Agreement in 2000 that sets out the respective responsibilities of SUEZ and Council in relation to activities at the LHRRP, as well as at an old landfill area known as Lucas Heights 1 (now closed) and the area known as the Lucas Heights Conservation Area

SUEZ has committed to entering into a VPA with SSC. The VPA would provide a $100 million financial contribution. SSC would be able to use this package during the operation of the proposal to develop community facilities in the Sutherland Shire. A minimum of 20% of this will be spent within a 7.5 km radius of the proposal

12.2 Community submission 2 - Grant Beamish

Key issues raised in this submission included:

- Project justification: increasing landfill capacity, suitablity of site and the distance from local residents, businesses and infrastructure
- The proposal adds to existing problems associated with the site including odour, water management, visual, pests, and property value

Response

Project justification

There are four key aspects for this Lucas Heights Resource Recovery Park Project, namely:

- Reprofiling of existing landfill areas
- Relocation and expansion of the existing GO facility
- Construction and operation of a fully enclosed ARRT facility
- Community parkland

SUEZ notes this submission agrees with the recycling and resource recovery components of this project. SUEZ is committed to continue to provide smart and reliable resource management solutions. Currently, SUEZ diverts 887,000 tonnes of waste from landfill every year and our landfills are Australia's largest generator of biogas used for the production of renewable energy.

Need to increase landfill capacity and landfill reprofiling: The proposal would extend the timeframe for which the land would be unavailable for recreational purposes until 2037. This is required to ensure that Sydney's waste disposal arrangements are not interrupted.

As described in Chapter 5 of the EIS, 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.

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).

Under the current approval the GO facility was to remain in its current location. As part of the proposal, the GO and ARRT facilities would cease operating in 2037 and be provided to the community as additional parkland.

The final landform is the shape that the landfill will achieve after completion of landfill operations, including reprofiling and capping works. Due to the decomposition of the waste and compression of the waste from the weight above, the landform will settle over time, where it eventually establishes a final shape.

One of the consequences of the increase in landfill capacity and landfill reprofiling is an improvement in the environmental outcomes of the landfill by proving a final shape that allows for improved environmental management at the site. As described in Section 6.2 of the EIS and Appendix R of the EIS, the proposed final landform was developed after a review of the original landform developed in 1999. Through the review, it was established that there were insufficient grades to provide appropriate drainage of stormwater off the landfilled areas. This has a range of undesirable consequences such as allowing water to pond on the landfill surface which results in excess leachate generation. A revised landform was developed in order to meet the NSW EPA's Environmental Guidelines regarding slopes that will better promote water runoff and long term environmental performance of the landfill.

This revised landform will 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. The parkland will also be improved from the master plan developed in 1998, addressing a range of risks including drainage, safety, accessibility of the future parkland. Details of the improvements are documented in Appendix R of the EIS.

Suitability of the site: As described in Section 25.1.6 of the EIS, the LHRRP site is considered to be suitable for the proposal for the following reasons:

- It is located at an existing resource recovery park
- It is central to a number of waste generating areas of Sydney
- It is close to major transport routes
- The footprint of the proposal is predominantly on already disturbed areas of the site
- ANSTO as part land-owner and SSC both endorse the proposal at the site.

Since taking on the operations of the LHRRP, SUEZ through its best practice principles have improved the environmental performance of the site. This is evidenced by improved downstream water qualiuty and reduced odour complaints. SUEZ will continue this program of continuous improvement, prevention and mitigaiton throughout the life of the project.**Distance from local residents, businesses and infrastructure & site suitability:** The LHRRP site is considered to be suitable for the proposal. As described in Section 4.2 of the EIS, the proposal is surrounded by bushland areas that form part of ANSTO's exclusion zone (to the north and south) as well as ANSTO's facility 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)

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 EIS prepared by GHD (2015) has undertook an assessment of the aspects submission, including air quality, surface water management, visual, socio-economic, litter and other issues. The assessments considered the impacts to receivers, including proposed residential receivers (Gandangara development). A summary of the key findings from the assessments of issues identified in this submission is provided below to demonstrate SUEZ has considered the impacts raised and with application of best practice prevention, mitigation and rectification measures, SUEZ is committed to better environmental outcome and the proposal would not have a significant impact on the community.

In addition, a range of tools are in place to promote best practice:

- Operational Environmental Management Plans are in place for the existing landfill and garden organics facility which details monitoring requirements. These OEMPs are considered live documents and updated over the lifetime of the facility with consideration of ongoing operations and contemporary technologies and regulatory requirements. An OEMP has been prepared for the proposed ARRT facility and an EMP has been proposed post-closure of the site
- SSC has an important role in ensuring that operations at the LHRRP are conducted in an environmentally responsible manner. SUEZ has committed to entering into an agreement with SSC in the form of a VPA which includes 'environmental undertakings'. The environmental undertakings made by SUEZ to SSC have been developed to demonstrate SUEZ's commitment to protecting the environment and the local community while constructing, operating and during the post closure period for the proposal. The agreed undertakings or commitments relate to the environmental management of the LHRRP, complaints handling and environmental reporting
- SUEZ and Council had entered into a Deed of Agreement in 2000 that sets out the respective responsibilities of SUEZ and Council in relation to activities at the LHRRP, as well as at an old landfill area known as Lucas Heights 1 (now closed) and the area known as the Lucas Heights Conservation Area

Proposal impacts

The proposal would not have a significant impact on the community. In addition to the proposal detailed below, SUEZ is committed to better environmental outcomes by the application of best practice prevention, mitigation and rectification measures.

Since taking on the operations of the LHRRP, SUEZ Since taking on the operations of the LHRRP, SUEZ through its best practice principles have improved the environmental performance of the site. This is evidenced by improved downstream water qualiuty and reduced odour complaints. SUEZ will continue this program of continuous improvement, prevention and mitigaiton throughout the life of the project.

Air quality: A comprehensive air quality assessment was undertaken for the proposal and included in Chapter 12 of the EIS and Appendix G of the EIS. The air quality assessment concluded that the proposal would result in improvements to odour levels at nearby sensitive receptors overtime, with the improvements realised as early as 2016. This is attributed to the identification and rectification of localised emission points identified during the site specific sampling program undertaken as part of the preparation of this EIS. This improvement is expected to continue over the life of the proposal as an increasing area of landfill is capped and rehabilitated. The assessment concluded that even at the closest proposed residential receptor (Gandangara development), the proposal will meet the 2 odour unit criteria set by the NSW EPA.

Surface water management: A comprehensive surface water assessment was undertaken for the proposal and included in Chapter 13 of the EIS and Appendix H of the EIS. As described above, re-profiling and re-capping of areas would reduce the potential risk of leachate entering the surface water system and reduces environmental risk. The mitigation measures proposed as part of the works will prevent surface water

contamination, minimise sediment generation and transport off site, minimise soil erosion and have no significant impact to downstream flow conditions.

Visual: A comprehensive visual assessment was undertaken for the proposal and included in Chapter 11 of the EIS and Appendix F of the EIS. The 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'. In conclusion, due to interim topography or vegetation which limits visual accessibility of the proposal elements, the magnitude of impacts on each of the identified receptor groups was determined to be moderate or less. Significant distance from receptors also reduces the visibility of the proposal. In addition, as the proposed changes would be incremental over a long time scale rather than occurring rapidly over a short timeframe.

Pest: Three separate operations environmental management plans and a post-closure environmental management plan was developed for the LHRRP. Within each plan, there is a detailed section on how pest, vermin and noxious weeds are controlled and management strategy. Examples of key measures that are included in the OEMPs include a joint noxious weed control program with SSC which provides a cooperative approach to weed control, a feral animal control program (in place since 2008), engaging specialist contractor to control noxious weeds and engage registered pest exterminator to inspected the LHRRP annually and carry out any recommended actions.

Traffic: A comprehensive traffic assessment was undertaken for the proposal and included in Chapter 9 of the EIS and Appendix D of the EIS. The traffic, transport and access assessment concluded that the proposal would have negligible impacts to pedestrians, cyclists and public transport operations. 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.

Socio-economic: An assessment of socio-economic impacts was undertaken and described in Section 22.4 of the EIS and the proposal will provide range of positive benefits for the local community. SUEZ 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.

The submission raises concern over the impact of the proposal on property prices in the area, however, property prices are influenced by a range of factors, including but not limited to supply and demand of property, movements in global and local economy and other social-economic factors and are thus beyond the scope of this assessment.

Currently more than 100 people are currently employed at the LHRRP with 40% living in the Sutherland Shire and neighbouring areas. The full proposal would create opportunities for employment of up to 100 personnel during construction and an additional 62 personnel during operation. 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 SUEZ facilities.

12.3 Community submission 3 – Greg Hoy

- Key issues raised in this submission included:
- Available land for local community groups namely the Cronulla Model Aero Club being, deferred until 2040

Response

This issue is addressed through Sutherland Shire Council report number BDS129-15 issued on 11/5/2015. Point 4 stated:

4. That the EIS and DA identify an area of the site for potential use for model aeroplane flying as part of the project.

As per the Council Resolution, an area of the site was identified on the landscape plans. This concern is also addressed in Appendix R of the EIS, section 4.1.1 (p26) which states:

A model aeroplane flying area will be located in a section on the northern boundary of the site in accordance with a Council resolution on the matter.

13. Mitigation measures

SITA is committed to achieving better environmental outcomes from all its facilities based upon compliance with all relevant legislation and guidelines and through the application of best practice prevention, mitigation and rectification measures. Chapter 24 of the EIS Volume 1 provides an overview of the proposed environmental management and mitigation measures for the proposal which would form part of any approval granted for the project. In addition, the obligations and practices outlined in the facility OEMPs which include additional, broader environmental management objectives would also be employed to reduce the potential for impacts on the community. Rectification measures for foreseeable and contingency events, should they occur, are also provided.

The following are additional mitigation measures that are proposed for this project developed as part of this report.

13.1 Construction

- Provide site audit statement prior to construction of ARRT facility
- In addition to the biofilter proposed, as per the technical report provided by Dr Robert Kelly, SUEZ would also commit to including as part of the design and construction provisions for additional odour treatment performance enhancements such as the implementation of advance biofiltration technology or inclusion of an Activated Carbon filter or other proven technology as a polishing treatment stage to be operated only on an “as needed” basis in response to the prevailing environmental conditions. Once details is known after detailed design, the details would be provided in the ARRT OEMP
- Further counts of Allocasuarina diminuta ssp mimica would be undertaken within the proposed ARRT footprint prior to construction
- Protect any Allocasuarina diminuta ssp mimica along the access track from construction activities associated with the GO facility
- Before commencement of any works on waterfront land the Guidelines for Controlled Activates on Waterfront Land Will be reviewed and implemented as required, including obtaining any required approvals. SUEZ considered OEH’s recommendation and would prepare a Mill Creek Management Plan which documents the requirements.

The above would be included in the relevant Construction Environmental Management Plans which would be provided to SSC for review and comment prior to implementation. In addition, SUEZ acknowledge and commit to including SSC as a joint applicant at all stages of any Development Application, and as such to have an approval role prior to submission, for all future Construction Certificates associated with the 2015 Development Application (as defined in the 2015 Deed of Variation).

13.2 Environmental management plans

The following additions would be made to the relevant OEMPs and EMP as per table below.

Chapter reference	Chapter heading	Reference	Comments	EMP & reference
1	Introduction	N/A	No requirement	N/A
2	Project overview	N/A	No requirement	N/A
3	Public exhibition and communications	N/A	No requirement	N/A
4	Government agencies submissions overview	N/A	No requirement	N/A
5	Response to Department of Industry Resources and Energy	N/A	No requirement	N/A
6	Response to Roads & Maritime Services	Page 16	The following text would be added to the LHRRP OEMP:	LHRRP OEMP Section 8.10

			• SUEZ would monitor traffic movements that enter the facility via the weighbridge. This review would be conducted annually.	
7	Response to Environment Protection Authority	Page 18, section 7.1.1	The following text would be added to the LHRRP OEMP: • Prior to any alternative equipment being installed on site, an internal noise assessment will be conducted to ensure that it is in general accordance within the approved parameters	LHRRP OEMP Section 8.8
7	Response to Environment Protection Authority	Page 30, section 7.2.14	As per the technical report provided by Dr Robert Kelly, SUEZ would commit to including as part of the design provisions for additional odour treatment performance enhancements such as the implementation of advance biofiltration technology or inclusion of an Activated Carbon filter or other proven technology as a polishing treatment stage to be operated only on an "as needed" basis in response to the prevailing environmental conditions. Once details is known after detailed design, the details would be provided in the ARRT OEMP.	ARRT OEMP
7	Response to Environment Protection Authority	Page 41, section 7.3.3	The following text would be added to the GO OEMP: • Runoff from uncovered waste areas and hardstand areas are considered "garden organics leachate" and would be to be directed to a sump, which would be pumped to the supply dam for reuse or overflows to the storage dam, from which it would be disposed to sewer in accordance with existing EPL and Trade Waste Agreement (TWA) requirements. • Runoff from roof and breathable membrane areas are considered "clean water" and would be discharged into Mill Creek. This would be considered during the detailed design. Mill Creek does not drain to the LHRRP sediment dam 5 as it operates as a clean water bypass drain, thus improving the effectiveness of the sediment basin.	GO OEMP Section 8.2
7	Response to Environment Protection Authority	Page 42, section 7.3.3	The following text would be added to the GO OEMP: • Runoff from roof and breathable membrane areas are considered "clean water" and would be discharged into Mill Creek. Only this runoff from the GO facility would be discharged into Mill Creek.	GO OEMP Section 8.2.2
7	EPA	Page 46, section 7.4.1	The following text would be added to the LHRRP OEMP: • Ongoing assessment of leachate generation volumes during re-profiling, periodic updating of landfill water balance model if persistent negative trends are determined. In particular, leachate discharge and treatment volumes would be reviewed annually.	LHRRP OEMP Section 8.3.2
7	Response to Environment Protection Authority	Page 49, section 7.4.2	Included final capping profile in post-closure EMP	Post closure EMP Section 8.5
7	Response to Environment Protection Authority	Page 53, section 7.4.4	The following text would be added to the Landfill OEMP: • Extension of existing leachate extraction risers and gas well (section 8.3.2) • In undertaking the stripping works, prevent leachate from entering the surface water by the construction of separation of bunds (section 8.3.2)	LHRRP OEMP Section 8.3.2 and 8.4.2

			• Detailed design of the system would be undertaken prior to installation and would require consideration of the predicted leachate flows, settlement and strength requirements (section 8.4.2) • A construction environmental management plan would be required to manage potential impacts to surface water during the installation of the system (section 8.4.2)	
8	Response to Office of Environment and Heritage	Page 54	The following text would be added to the LHRRP OEMP: • Update to reflect the recent recording of threatened biota as well as the current TSC Act listings for those species, populations and ecological communities.	LHRRP OEMP Section 2.2.6
8	Response to Office of Environment and Heritage	Page 54	The following text would be added to the LHRRP OEMP: • Monitoring of revegetation of realigned Mill Creek to ensure planted individuals are thriving.	LHRRP OEMP Section 8.9.2
8	Response to Office of Environment and Heritage	Page 54	The following text would be added to the post-closure EMP: The following vegetation management would be undertaken: • Exposed soil should be sown with native seed immediately to prevent colonisation by weeds. • Revegetation should use locally sourced native species. • Use of propagated individuals of Allocasuarina diminuta subsp. mimica from the site should be incorporated into the landscaping plan. • Ongoing management of noxious weeds according to legislative requirements. • Revegetation areas, including planted Allocasuarina diminuta subsp. mimica, should be monitored and managed as per the EMP.	Post-closure EMP Section 8.5
9	Response to Department of Primary Industries	Page 61, section 9.1.6	The following text would be added to the LHRRP OEMP: • SUEZ will continue to review the monitoring bore coverage and adapt the network based on site operations as part of the regulatory annual return process.	LHRRP OEMP Section 8.13.2
9	Response to Department of Primary Industries	Page 62, section 9.1.7 Page 64, section 9.1.8 Page 64, section 9.1.9 Page 64, section 9.1.10	The following text would be added to the LHRRP OEMP: • Further investigation of the habitat condition and macroinvertebrate populations to confirm the preliminary findings stated in the Lucas Heights Resource Recovery Park Project EIS (GHD, 2015). This work be undertaken every three years commencing soon after reprofiling works commence in Area E. SUEZ proposes to undertake ongoing macroinvertebrate assessment at a frequency of once every 3 years is undertaken until post-closure. SUEZ will review the macroinvertebrate assessment and if any persistent negative trends are determined, SUEZ will engage with the Department and review the monitoring frequency. SUEZ will engage independent specialist for the sampling program and determine the most suitable season and weather condition for the assessment.	LHRRP OEMP Section 8.13.2
9	Response to Department of Primary Industries	Page 63, section 9.1.16	The following text would be added to the LHRRP OEMP:	LHRRP OEMP Section 8.3.2

		Page 70, section 9.3.5 Page 72, section 9.4.5	• The leachate management system would be maintained by cleaning (i.e. flushing and repair) of the leachate system piping when required. The Total Suspended Solids (TSS) level would be monitored at the Sequencing Batch Reactor (SBR) outlet against the TSS level specified in the Trade Waste Agreement (TWA). If TSS levels at the outlet exceeds TWA requirements, the leachate system would be flushed to remove biosolids accumulation. This monitoring occurs automatically every four days.	
9	Response to Department of Primary Industries	Page 66, section 9.2.3	The following text would be added to the GO OEMP: • The surface water collected from Garden Organics roofs and/or breathable membrane covers discharged to Mill Creek from a storage dam or pond would be monitored for the following parameters: • Temperature (°C) • pH • Electrical Conductivity (µS/cm) • Dissolved Oxygen (mg/L and % saturation) • Turbidity (NTU) • Alkalinity (mg/L CaCO3)	GO OEMP Section 8.2.2
10	Response to Sutherland Shire Council	N/A	No requirement	
11	Response to Department of Planning & Environment	N/A	No requirement	
12	Community submissions	N/A	No requirement	

14. References

- Australian Standard AS 2436:2010 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”
- British Construction standard BS 5528:2009 “Code of practice for noise and vibration control on construction and open sites”
- Caterpillar. 2012. 323E SA Hydraulic Excavator. [ONLINE] Available at: http://s7d2.scene7.com/is/content/Caterpillar/C737602
- Caterpillar. 2012. 329E Hydraulic Excavator. [ONLINE] Available at: http://s7d2.scene7.com/is/content/Caterpillar/C737602
- GHD (2015) SITA Australia - Lucas Heights Resource Recovery Park Project, Environmental Impact Statement
- Landcom (2004) Managing Urban Stormwater: Soils and Construction Volume 1 (‘Blue Book’)
- NSW Department of Environment and Climate Change (DECC), 2008, Managing Urban Stormwater, Soils and Construction. Volume 2b, Waste Landfills
- W. L. Gore & Associates. 2008. The GORE® Cover System - A Leading Composting Technology for Organic Waste Treatment. [ONLINE] Available at: http://www.astoriaorganics.com.au/download/Gore-Cover-Intro-2013.pdf.

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