WEST NOWRA RECYCLING AND WASTE FACILITY

Landfill Environmental Management Plan

Prepared for:

Shoalhaven City Council
36 Bridge Road
Nowra NSW 2541

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PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street
Lane Cove NSW 2066 Australia
(PO Box 176 Lane Cove NSW 1595 Australia)
T: +61 2 9427 8100
E: sydney@slrconsulting.com www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Shoalhaven City Council (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.15781.00000	17 January 2019	Sarah Kill	John Postlethwaite	John Postlethwaite
610.15781.	17 January 2019	Sarah Kill	John Postlethwaite	John Postlethwaite
610.15781	14 December 2018	SKill	JPostlethwaite	JPostlethwaite
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610.15781	13 January 2017	I-hui Waung	Danielle O'Toole	Alan Dyer

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ABBREVIATIONS

EPA	Environment Protection Authority
EPL	Environment Protection Licence
LEMP	Landfill Environmental Management Plan
NSW	New South Wales
POEO	Protection of the Environment Operations
SCC	Shoalhaven City Council
Facility	West Nowra Recycling and Waste Facility

1 Introduction

Shoalhaven City Council (SCC) currently operates and manages the West Nowra Recycling and Waste Facility (Facility) at Flatrock Road, Mundamia (**Figure 1**).

The Facility operates in accordance with a Landfill Environmental Management Plan (LEMP) prepared in 2008 by SCC (Document Reference 7/28/2008) and an Environment-Protection Licence (EPL) Number 5877, issued by the NSW EPA (EPA). Since then, the EPA has approved the extension of solid waste landfilling operations, into Stage 4 land (south east), at the Facility. SCC is applying for a variation of EPL Number 5877 conditions to extend landfilling operations on this land.

This LEMP has been prepared by SLR Consulting Australia Pty Ltd (SLR) in support of the EPL variation application and for the Stage 4 extension. The remainder of the Facility will continue to be managed in accordance with the existing SCC (2008) LEMP.

1.1 Requirement for a LEMP

The *Waste Minimisation and Management Act 1995* and NSW EPA (2016) *Environmental Guidelines: Solid Waste Landfills Second edition,* 2016 (Environmental Guidelines) requires that all landfills requiring an EPL must have an accompanying Landfill Environmental Management Plan and that preparation of a LEMP is required by the EPA when assessing the granting of or variation to an EPL.

1.2 Objectives

This LEMP contains details of site-specific procedures that will allow operations at the Facility to meet the required outcomes, as described in the NSW EPA (2016) Environmental Guidelines, that concern the siting, design and construction, operation, monitoring and rehabilitation procedures for the landfill operation.

The required outcomes in the Environmental Guidelines are based on minimum standards that the EPA currently requires landfill operators to provide for environmental protection. It is, however, recognised by the EPA that there may be alternative techniques that will achieve similar results with respect to meeting the required outcomes.

The objectives of this LEMP are to

- minimise the environmental impact of the landfill;
- control discharges to waters (surface and groundwater);
- control atmospheric emissions;
- promote responsible land management and conservation;
- prevent hazards and loss of amenity;
- ensure SCC fulfils its statutory obligations with respect to operation of the Facility, and
- facilitate compliance of the Facility operations with the Environmental Guidelines.

1.3 Review of LEMP

This LEMP is not a static document. It is a working document that requires regular review and updating to ensure ongoing suitability and effectiveness for environmental management at the Facility.

This LEMP shall be reviewed and updated regularly:

- to remain consistent with waste / landfill regulations / guidelines;
- should improvements to the management measures be required;
  - to take advantage of new technologies, innovations and methodologies that are superior to the management measures presented in the current version of the LEMP, or
  - after changes are made with regards to the operation, landform etc. at the Facility and its surroundings that may affect management measures in the current version of the LEMP.

Changes made to the LEMP, as well as the reasons for the changes made, will be documented as part of the review process.

Copies of the original LEMP, as well as all future versions of the LEMP, shall be retained by SCC and made available at prominent locations such as the weighbridge office, staff amenities etc.

1.4 Literature Review

This LEMP has been prepared based on information from the following documents and materials provided by SCC:

- ALS Environmental (2015) *West Nowra Landfill Surface Gas Emission Monitoring 31st August 2015.*
- ENRS (2015) *Annual Environmental Monitoring Results – 30 October 2014 – 29 October 2015 West Nowra Recycling and Waste Facility.* Report Reference ENRS0047.3.
- GHD (2016) *Shoalhaven City Council West Nowra Resource Recovery Park Environmental Impact Statement Volume 1* (Report 21/22855, dated January 2016).
- Shoalhaven City Council (2015) *2824_273: West Nowra Recycling and Waste Facility EPA Volumetric Survey – Stages 1, 2 & 3 Period Ending December 2015.*
- Shoalhaven City Council (2016) 2824_282: West Nowra Recycling and Waste Facility EPA Volumetric Survey – Stages 1, 2 & 3 Period Ending June 2016.
- Shoalhaven City Council (2015) *Figure A: West Nowra Recycling and Waste Facility Monitoring Wells Location Plan Stages 1, 2 and 3 – 28 August 2015.*
- Shoalhaven City Council (2008) *Landfill Environmental Management Plan West Nowra Recycling and Waste Facility.*
- Shoalhaven City Council (2008) *West Nowra Recycling and Waste Facility Landscape Management Plan December 2008 Review of Landscape Maintenance.*
- Shoalhaven City Council (2015) *Pollution Incident Response Management Plan West Nowra Recycling and Waste Facility.*
- Waste data from SCC for 2015/2016.

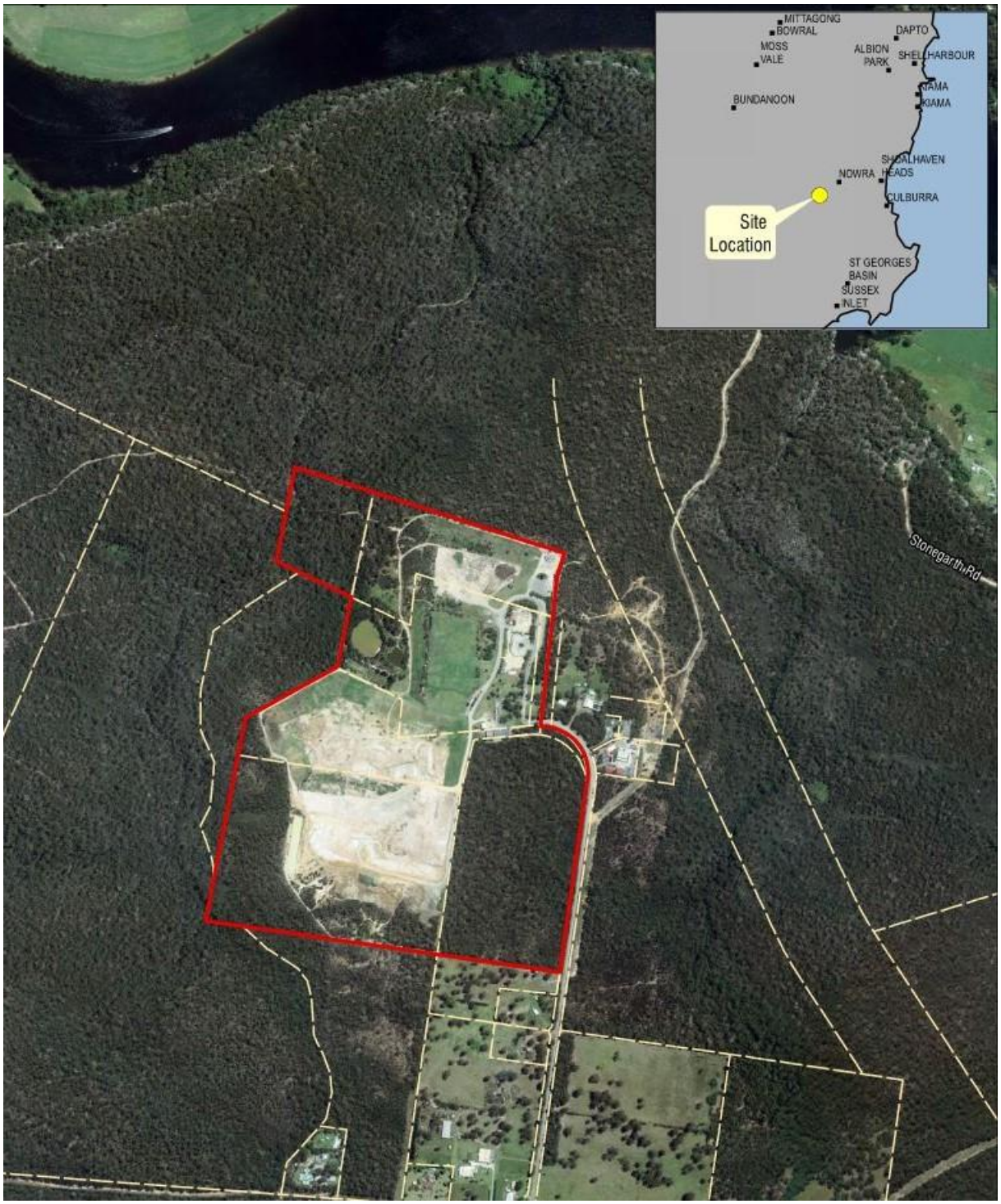

Figure 1 Site Location

2 Site Overview

2.1 Location and Surrounding Land Uses

The Facility is located at the northern end of Flatrock[1] Road, Mundamia (**Figure 1**). The Facility encompasses approximately 65 hectares of land.

The site of the proposed Stage 4 extension (the Site) is predominantly set within undeveloped bushland. Semi-rural properties are located to the south and south-east of the Facility. The main township of Nowra is located approximately 4.5 km to the east of the site.

Shoalhaven River is located approximately 1.5 km north of the site, with two tributary creeks (referred to as "Sandy Creek" in SCC (2008)) within 225 m to the north and east of the site Predominantly the extension area drains towards Cabbage Tree Creek via ephemeral drainage features. Cabbage Tree Creek is located approximately 30-40m to the east of the extension area and flows northward to the Shoalhaven River. Sandy Creek flows along the western boundary of the existing landfill site and drains into Shoalhaven River up gradient of the Cabbage Tree Creek outlet. There are no permanent surface water bodies/courses within the site.

2.2 Land Ownership, Zoning and Description

The Facility is located on parcels of land owned by SCC. SCC is the authority responsible for the operation and management of the Facility.

The principle environmental planning instrument applying to properties in the Shoalhaven Local Government Area is the SCC *Shoalhaven Local Environmental Plan 2014 (SLEP 2014).*

Details of land parcels, zoning and zoned land use applicable to the Facility are summarised in **Table 1**.

Table 1 Property Details

Lot No.	DP No.	Area (ha)	Zone and zoned land use	Address
436	808415	8.29	SP2 Infrastructure - Waste / Resource Management Facilities	Flatrock Road, Mundania, NSW
1	1018193	13.04	SP2 Infrastructure - Waste / Resource Management Facilities	120 Flatrock Road, Mundania, NSW
1	847203	8.96	SP2 Infrastructure - Waste / Resource Management Facilities	Flatrock Road, Mundania, NSW
1	870268	20.33	SP2 Infrastructure - Waste / Resource Management Facilities	Flatrock Road, Mundania, NSW
1	1104402	14.52	SP2 Infrastructure - Waste / Resource Management Facilities	Flatrock Road, Mundania, NSW

Source: Areas: https://maps.six.nsw.gov.au/; Zone and zoned land use: Shoalhaven Local Environmental Plan 2014 Land Zoning Map – Sheet LZN_013B (Map identification number 6950_COM_LZN_013B_020_20140129.

[1] This spelling is as per the street sign. The road is recorded as "Flat Rock Road" in the Environmental Protection Licence for the site.

The Facility commenced operations in 1979, accepting domestic, industrial, commercial liquid, solid wastes and hazardous wastes including asbestos and oil. Landfilling practices originally involved the excavation and filling of a series of trenches. Operations have since progressed to comply with the Environmental Guidelines (as well as the former NSW EPA (1996) *Environmental Guidelines: Solid Waste Landfills*). The Facility no longer accepts liquid wastes and only small quantities of asbestos waste (SCC 2008).

Operationally, the Facility is divided into several stages (**Figure 2**):

- Stage 1: "Old" unlined landfill, stockpile and irrigation areas, and landfill gas extraction comprising the northern portion of the Facility;
- Stage 2: Completed lined landfill areas, now used for stockpiling and landfill gas extraction;
- Stage 3: Active lined landfilling of solid waste and wet weather tipping areas, and future landfill gas extraction area;
- Stage 4: Proposed lined landfilling areas for solid waste, and future landfill gas extraction, and relocated irrigation area to above Stage 2 landfill.

Approved Stage 4 land of the Facility was a State Significant Development (development reference SSD 15_7187) identified by the *State Environmental Planning Policy (State and Regional Development) 2011*.

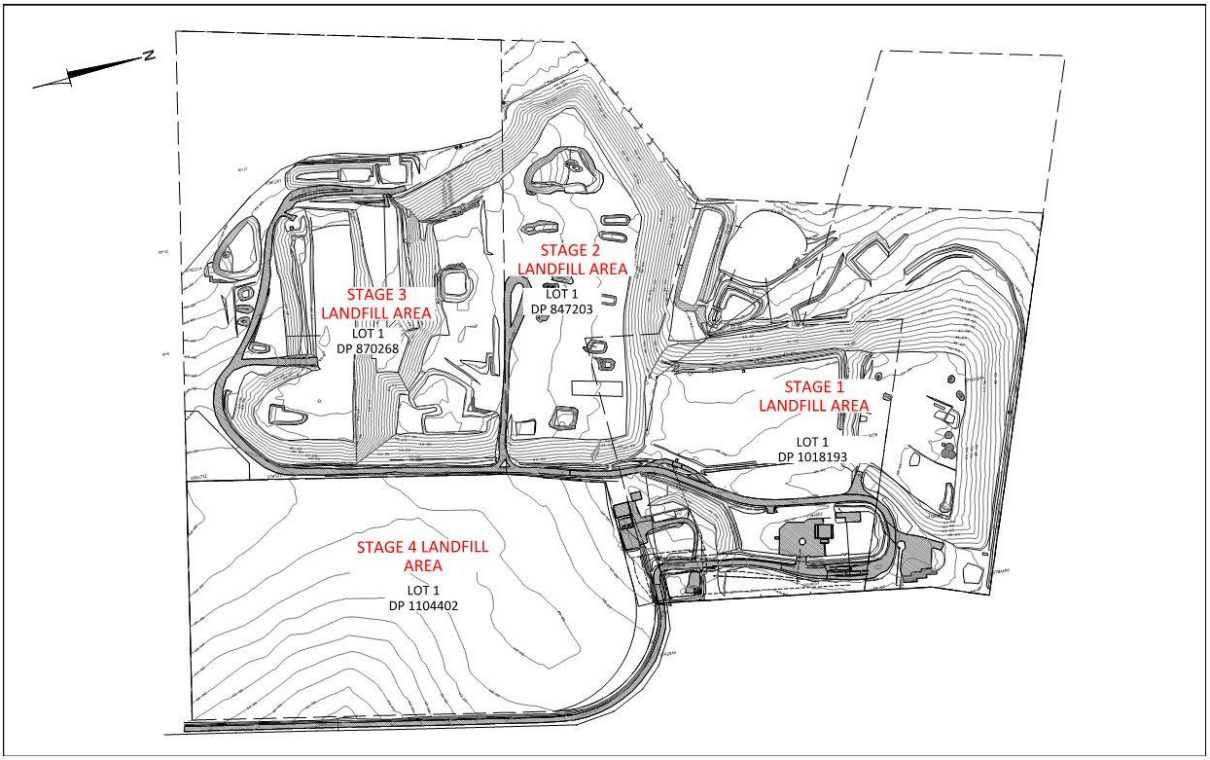

Figure 2 Site Layout

2.3 Indigenous Heritage

In 2014 and 2015 Artefact undertook Aboriginal archaeological surveys for the West Nowra Resource Recovery Park (RRP). An additional archaeological survey was undertaken by Artefact in 2017 for the proposed Stage 4 landfill extension. The survey identified no Aboriginal objects or potential archaeological deposits (PADs) on the proposed Stage 4 landfill site. The proposed Stage 4 landfill site and surrounding area is considered to be

of very low archaeological potential and low archaeological significance due to its distance from freshwater sources, the broad crest landform and prior ground disturbance. Hence on site management of Aboriginal heritage should focus on the procedure for the management of unexpected archaeological finds.

2.4 Physical Environment

2.4.1 Topography

Stages 1, 2 and 3 of the Facility are located on the western side of a ridge line with Stage 4 on the eastern side of the ridge. The Facility is drained by two tributary creeks: Sandy Creek (to the west of the Facility) and Cabbage Tree Creek (to the east of the Facility).

2.4.2 Geology and Soils

The Facility is underlain by Nowra Sandstone and Wandrawandian Siltstone of the Permian aged, Shoalhaven Group. The Nowra Sandstone consists typically of quartz sandstone and the Wandrawandian Siltstone consists typically of siltstone and sandy siltstone.

The soil profile at the Facility comprises typically, from top to bottom (Maunsell 1991, cited in SCC 2008):

- grey loam (approximately 50 mm to 100 mm thick);
- yellow / white silty clay (approximately 200 mm thick);
- yellow clay (approximately 300 mm thick); and
- red / yellow / white clay (> 1600 mm thick).

Sandstone bedrock across the site is likely to be “variably and often deeply weathered” (Forbes Rigby 1996, cited in SCC 2008).

The Stage 4 area comprises silty topsoils underlain by sandy or silty clays, with sandstone bedrock occurring at depths from 2.5 m to 4.5 m below ground surface among the locations investigated by Coffey (2016).

2.4.3 Groundwater and Hydrogeology

The Stage 1 areas are underlain almost everywhere by a deep soil profile, underlain by weathered sandstone, that is highly permeable and can be water bearing if sufficient flow occurs (Forbes Rigby 1996, cited in SCC 2008). The major source of groundwater to the Stage 1 areas is from the east; it is believed that groundwater flows south-west and downslope from the Stage 1 areas towards Sandy Creek (SCC 2008).

A water bearing zone and, in some cases, two zones at different depths, were identified during a groundwater investigation by Forbes Rigby (1996) (cited in SCC 2008). The depth to both water bearing zones were approximately 2 m to 3 m below ground level. The upper water bearing zone is a semi-confined aquifer between bedrock and overlying soils (SCC 2008).

Coffey (2016) interpolated the groundwater table in the Stage 4 area as being between 6.5m to 10.5m below ground level (ground level being before excavation of the landfill cell), but noted that the table may rise after Stage 3 is completed and capped.

Groundwater in Stage 4 flows predominantly east (Coffey 2016).

There are twenty four (24) groundwater monitoring wells located around the Facility to monitor the groundwater flow and provide information on environmental impacts to groundwater. Locations of groundwater monitoring wells are shown in **Figure 3**.

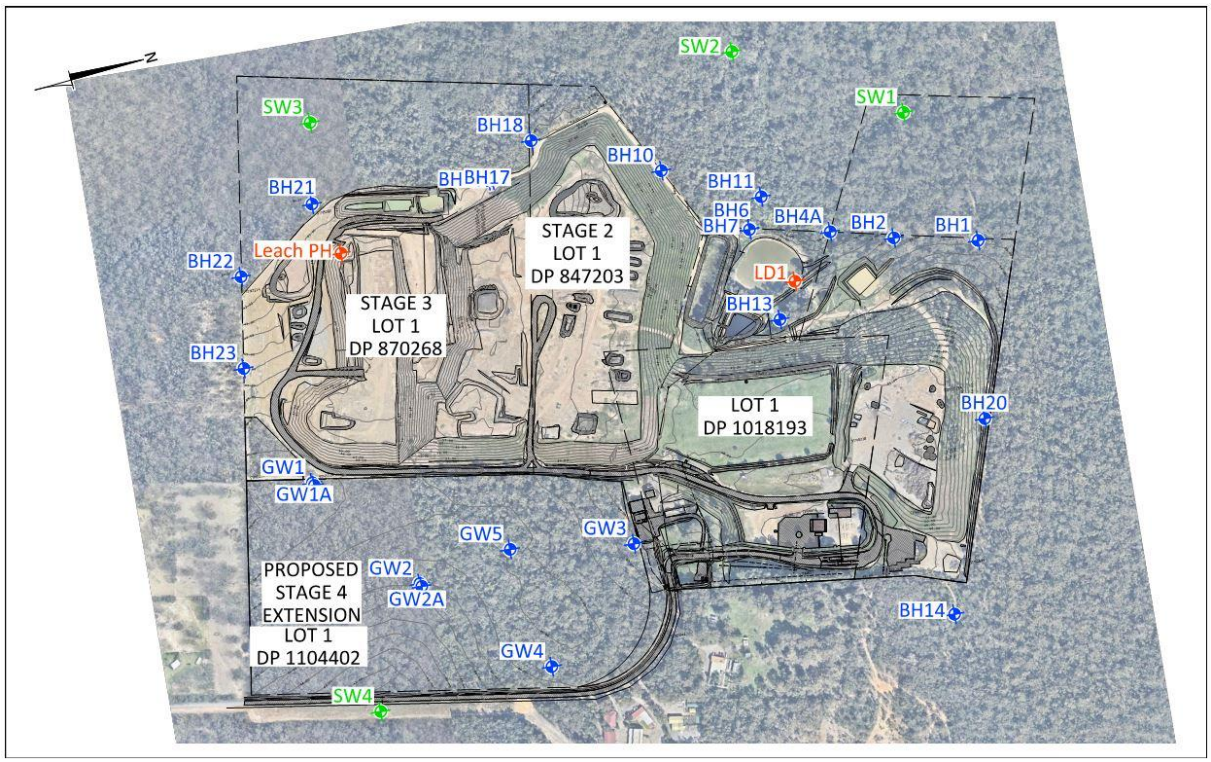

Figure 3 Groundwater and Surface Water Monitoring Locations

2.4.4 Surface Water and Leachate Management

2.4.4.1 Surface Water

There are no permanent surface water courses within the Facility.

An ephemeral drainage line is located at the eastern side of Stage 4, which drains east and into Cabbage Tree Creek.

Heavy vehicles are required to use a wheel wash prior to exiting the Facility, to minimise impact on local amenity and maintain the quality of stormwater runoff.

Surface water from Stages 1 to 3 of the Facility is collected in three sedimentation dams located near the western site boundary. Water accumulated in these dams is primarily used for dust suppression purposes at the Facility and is progressively released into Sandy Creek during favourable weather conditions.

For Stage 4, surface water management controls will include:

- Sediment dams to manage potential sediment-laden runoff from the open and closed landfill cells
- Sediment erosion control measures (coir logs, sediment fences etc.);
- Surface diversion bunds and swale drains around open excavations (unfilled) and active landfill cells.

It is anticipated that, based on surface water flow modelling, additional surface water quality monitoring points will be established in the un-named ephemeral stream or near its confluence with Cabbage Tree Creek. These additional surface water monitoring points will be part of the EPL variation and be incorporated into the environmental monitoring program for the Facility.

2.4.4.2 Leachate

The leachate collection system and leachate dam collect landfill generated leachate, as well as any stormwater that may have come into contact with waste, from Stages 1 to 4 of the Facility. The leachate collected in the leachate dam is then currently disposed of by:

- Spray irrigating over the "irrigation area"/"utilisation area" (EPA Identification No. 26 in EPL Number 5877), immediately north of Stage 2, and/or
- Irrigated at active waste tipping areas.

Due to the increase of leachate from the Stage 4 extension area and the potential for the existing irrigation area to result in the seepage of leachate off-site due to it being located on a closed unlined landfill cell, a new irrigation area has been proposed. The new area will be located within the lined Stage 2 cell, be a minimum of 14,000m^2 in area and will be utilised to receive leachate from Stages 1 – 4.

2.4.5 Flora and Fauna

A vegetation survey conducted at the existing Facility identified three distinct vegetation communities (SCC 2008):

- Woodland / Open Woodland;
- Woodland of Grey Gum, Blue-leaved Stringybark and Blackbutt variety;
- Sedgeland / Heathland vegetation.

The Nowra Tea Tree (*Leptospermum sejunctum*), classified by EPA as a rare plant species, was found in the north-western and south-western corners of the site (SCC 2008). The endangered[2] Nowra Heath-myrtle (*Triplarina nowraensis*) was found in the eastern portion of the Stage 4 area (SCC 2008 and 2017) .

Fauna identified during site surveys (Sinclair Knight Merz 1990, cited in SCC 2008) observed a range of bird species (including the Powerful Owl, Glossy Black Cockatoo and Yellow-bellied glider: SCC 2008), wombats, wallabies, kangaroos and herpetofauna including froglets and toadlets, lizards and goannas. The presence of foxes and feral dogs was also identified.

SCC (2008) described a literature review of State and Commonwealth conservation databases as identifying "the potential for fifty three listed threatened or migratory fauna and flora species".
A Biodiversity Assessment Report (Shoalhaven City Council, 2017) prepared for the Stage 4 landfill extension identified that a conservation area would be maintained around the southern and eastern sides of the landfill extension area. This land contains two plant community types (PCTs):

- Red Bloodwood – Hard-leaved Scribbly Gum – Silvertop Ash heathy open forest on sandstone plateaux of the lower Shoalhaven Valley, Sydney Basin Bioregion (SR594, PCT 1082); and

[2] *Threatened Species Conservation Act 1995 (New South Wales)*: December 2015 list.

- Grey Gum – Blue-leaved Stringybark open forest on gorge slopes, southern Sydney Basin Bioregion and north east South Eastern Highlands Bioregion (SR549, PCT 858).

Further information on the flora and fauna species and associated habitat detected on the site is available in the Biodiversity Assessment Report (Shoalhaven City Council, 2017).

2.4.6 Climate and Meteorology

The nearest Bureau of Meteorology (BOM) automatic weather station (AWS) to the site is the Nowra RAN Air Station AWS (AWS 068072) located approximately 7.5 km from West Nowra.

Details from the BOM on climatic distribution throughout the year are shown in **Table 2**.

Table 2 Climate Data from AWS 068072 from 2000 to 2016

Month	Mean Max daily temperature (°C)	Mean Min daily temperature (°C)	Mean monthly rainfall (mm)
January	27.4	16.4	65.8
February	26.1	16.6	132.6
March	25.1	14.8	100.8
April	22.6	12.3	70.9
May	19.5	9.1	54.4
June	16.9	7.7	102
July	16.5	6.6	60.4
August	18.2	6.8	72.7
September	21	8.7	42.5
October	23.2	10.6	66.7
November	24.7	13.6	72.2
December	25.8	14.7	79.9

Wind direction information given by BOM indicates the prevailing winds at West Nowra are westerlies and north-westerlies.

3 General Operations

3.1 Regulatory Requirements

3.1.1 Environment Protection Licence

Environment Protection Licences (EPLs) are issued under Section 55 of the *Protection of the Environment Operations Act 1997* (POEO Act). Details of EPL Number 5877 for the Facility are shown in **Table 3**.

A copy of EPL Number 5877 is presented in **Appendix A**.

Table 3 Environment Protection Licence EPL 5877 details

Licence Number	**5877**
Anniversary Date	30 October
Review Period	Every 5 years
Licensee	Shoalhaven City Council PO Box 42 Nowra, NSW 2541
Premises	West Nowra Recycling & Waste Facility Flat Rock Road Mundamia, NSW 2540
Scheduled Activity	• Composting; • Waste Disposal (application to land); • Waste Processing (non-thermal treatment); • Waste Storage.
Fee Based Activity (and scale)	• Composting (> 5,000 – 50,000 tonnes of organics received); • Non-thermal treatment of general waste (any annual processing capacity); • Waste disposal by application to land (any capacity); • Waste storage – other types of waste (any other types of waste stored).
Region	Waste & Resources 59 – 61 Goulburn Street Sydney, NSW 2000 T: (02) 9995 5000 F: (02) 9995 5999 PO Box A290 Sydney South, NSW 1232

3.1.2 Regional Environmental Plan

Operations at the Facility are conducted under the *Illawarra-Shoalhaven Regional Plan* (NSW Planning & Environment 2015).

3.2 Site Access

The Facility is currently accessed from the northern end of Flatrock Road (**Figures 1** & **2**).

3.3 Operating Hours

The Facility is open to the public from 8.00 am to 5.00 pm, Monday to Sunday. It is closed on public holidays and Easter Monday.

3.4 Site Security

During operating hours, the Flatrock Road main entrance gate is left open to the public. All other access gates to the Facility are not for public access and are locked at all times unless used by SCC staff for operational purposes.

Outside operating hours, the main entrance and other access gates will be locked and SCC will maintain the security of the site.

The Facility boundary is enclosed by a 2.1 m high security fence.

The gatehouse / weighbridge office will be locked outside operating hours.

Keys to gates and buildings will be kept only by necessary SCC site staff members.

The gates and surrounding fence areas will be inspected daily.

The boundary fence line will be inspected weekly and on an as needs basis.

3.5 Health and Safety Procedures

SCC will take all necessary precautions to ensure the safety of all staff, contractors and visitors at the Facility.

SCC will provide and maintain first aid treatment facilities at the staff amenities facility, weighbridge office and landfill, and will have a trained first aid provider on site during operating hours.

SCC staff shall be familiar with, and able to readily carry out, their required duties in accordance with all relevant Workplace Health and Safety (WHS) regulations and guidelines.

SCC shall ensure all staff and contractors are informed of hazards at the Facility, are aware of their responsibilities with respect to relevant WHS regulations and guidelines and follow all applicable safe work procedures.

3.6 Wet Weather Operation

SCC will ensure that the landfill is able to accept permitted waste under all reasonable weather conditions without compromising the environmental management of the site.

Should SCC consider weather conditions will hinder effective environmental management of the site, no further waste will be accepted at the Facility until weather conditions become more favourable (with respect to environmental management of the site) or alternative environmental management measures are identified and implemented.

3.7 Access Roads

Temporary internal access roads will be maintained to provide effective access to operational areas within the Facility. These roads shall be constructed to a standard sufficient to support traffic of the vehicle(s) and/or mobile plant(s) with the greatest mass per unit area of its footprint.

Access roads should be constructed to be wide enough for safe two-way movement of vehicles and mobile plant (i.e. width allowing for at least two lanes of traffic), wherever possible. A one-way circuit for traffic flow shall be established by SCC for access roads not wide enough to permit safe two-way movement of vehicles and mobile plant.

Access roads shall incorporate a physical barrier adjacent to slopes or embankments to ensure vehicles will not leave the road and deviate down any embankment.

A speed limit of 15 km/hr applies for all vehicles and moving plant within public areas of the Facility.

A speed limit of 40 km/hr applies for service vehicles and moving plant within restricted areas of the Facility.

3.8 Site Facilities

The layout of the Facility (**Figure 2**) includes the following facilities:

- Site support facilities:
    - Site office for administration;
    - Staff amenity building;
    - Plant and equipment shed – for equipment maintenance and storage;
    - Storage sheds for equipment.
- Waste processing areas:
    - Gatehouse / weighbridge office and two weighbridges (entry and exit).
    - Transfer Station
    - Tyres collection;
    - Non-ferrous collection area;
    - Green waste stockpile and processing area;
    - Steel waste stockpiles and processing area;
    - Construction & demolition waste stockpile area;
    - Virgin Excavated Natural Material (VENM) stockpile area;
    - Pavement materials stockpile area;
    - CRT Cell;

  - Recycling sorting and collection area;
  - Buyback area.
- Environmental management infrastructure:
  - Landfill gas management infrastructure (generator & flare);
  - Site water management infrastructure (sediment, leachate collection and first flush capture dams);
  - Irrigation area;
  - Environmental buffer zones for biodiversity conservation;
  - Residential buffer zones to protect amenity for nearby residential land use; and
  - Fire access trails / firebreaks, Asset Protection Zones (APZs).

Some of these facilities are described in more detail in the following paragraphs. Recycling and resource recovery is discussed in further detail in the **Section 3.9**.

3.8.1 Gatehouse / weighbridge office and weighbridges

The gatehouse / weighbridge office and weighbridges are located to the north of the entrance gate from Flatrock Road. The Facility operates two weighbridges: one for the entering vehicles and one for exiting vehicles. Both weighbridges are of concrete construction, are above ground and with approach and exit ramps at either end. Boom gates are installed at both ends of each weighbridge.

The gatehouse / weighbridge office is situated between the two weighbridges.

3.8.2 Landfill Gas Generator and Gas Flare

SCC operates a landfill gas generator and gas flare system on site to extract landfill generated gas and produce electricity. Between August 2013 and August 2014, the system generated approximately 6,403 megawatt hours and the flare destroyed an amount of methane gas equivalent to 26,739 tonnes of carbon dioxide (AGL, 2014[3]).

3.9 Recycling, Resource Recovery and Waste Transfer

3.9.1 Solid Wastes

The Facility operates a Recycling and Recovery Centre, Community Recycling Centre, and Buy-Back Centre located to the west of the entry weighbridge. These Centres accept and receive post-consumer recyclables and sell second-hand recovered goods.

In addition to the Centres, the Facility includes a Waste Transfer Station (WTS) to optimise recovery of re-usable items and recyclable goods from incoming waste streams. Items recovered at the WTS are stored and resold to the public at the Buy-Back Centre.

The Centres and the WTS enable the Facility to receive, recycle and / or on-sell the following waste streams:

[3] AGL (2014) *Re: Shoalhaven Annual Report.* Letter from AGL to Shoalhaven City Council, dated August 2014.

- Construction and demolition waste, including VENM and clean fill;
- Recyclable waste from commercial and industrial facilities;
- Recyclable domestic waste;
- Green waste.

Waste types typically recycled and / or recovered at the Facility include (SCC 2008, SCC 2015):

- Empty drums/containers (i.e. “drum muster”);
- Aluminium and steel cans;
- Batteries;
- Paper and cardboard;
- Electronic waste;
- Gas bottles;
- Glass bottles and jars;
- Mattresses;
- Sump oil;
- Mulch;
- Selected clean metals;
- Pet, pvc, hdpe and “r” plastic bottles;
- Polystyrene;
- Tyres; and
- Silage.

3.9.2 Landfill Gas

Landfill gas generated at the Facility is used to power a 16-cylinder gas engine. The gas engine produces electricity for use in the local electricity grid and is located in a compound north of the staff amenities shed.

Excess landfill gas not used in the gas engine is destroyed with a gas flare, located to the east of the current irrigation area over the old Stage 1 landfill.

3.10 Waste Types and Quantities

3.10.1 Waste Types

In accordance with the requirements of EPL Number 5877, the NSW EPA (2014) *Waste Classification Guidelines* (the *Waste Classification Guidelines)* and SCC policies, the Facility can accept the following types of waste:

- Mixed municipal waste (SCC kerbside collection and small vehicle/public drop off);
- Mixed commercial waste;
- Virgin Excavated Natural Material (VENM);

- Inert, construction and demolition waste (e.g. concrete, brick, tile and glass);
- Separated green and wood wastes;
- Tyres;
- Small household quantities of asbestos;
- Other solid wastes as defined as General Solid Waste in the *Waste Classification Guidelines* and permitted under the EPA guidelines or approved by the NSW EPA.

A summary of the wastes permitted at the Facility is presented in **Table 4**.

Table 4 Permitted Waste Types for the Facility (from EPL Number 5877)

Waste	Description	Activity	Limits
General Solid Waste (putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land). Waste storage. Composting. Waste processing (non-thermal treatment).	No applicable limit.
General Solid Waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land).	No applicable limit.
Asbestos Waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land).	No applicable limit.
Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land).	No applicable limit.
Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time.	-	No applicable limit.

3.10.1.1 Hazardous Waste and Asbestos Waste

3.10.1.1.1 Hazardous Waste

The Facility is not licensed to accept hazardous waste[4].

[4] Hazardous waste is:

- Generally considered to be waste which, through toxicity, carcinogenicity, mutagenicity, teratogenicity, flammability, explosivity, chemical reactivity, corrosivity, infectiousness or other biologically damaging properties, may present danger to the life or health of living organisms when released into the environment (adapted from the definition of "Hazardous Waste" in Appendix B of the superseded EPA (1996) Landfill Guidelines); and/or
- Any waste that is classified as hazardous in accordance with the *Waste Classification Guidelines*

Any hazardous waste substances which are produced by SCC operations are, and shall be managed according to the SCC Procedure for Hazardous Substances Control. This requires SCC personnel to refer to the associated Safety Data Sheet(s) (SDSs) prior to disposing of the substance and ensuring that disposal is in accordance with the specified requirements.

3.10.1.1.2 Asbestos Waste

The Facility is licensed to accept asbestos waste.

SCC has, however, opted to receive only small household quantities of asbestos waste.

3.10.1.2 Liquid Waste

The Facility is not licensed to accept any form of liquid waste.

Liquid Waste is defined in the *Waste Classification Guidelines* as waste that:

- Has an angle of repose of less than 5 degrees above horizontal;
- Becomes free-flowing at or below 60 °c or when it is transported;
- Is generally not capable of being picked up by a spade or shovel, or
- Is classified as liquid waste under an EPA gazettal notice.

3.10.2 Waste Quantities

Table 5 details waste types, quantities, fate and disposal of incoming wastes for the 2015 to 2016 annual period.

Table 5 Summary of Waste Types, Quantities, Fate and Disposal for 2015 / 2016

Waste Type	Quantity (tonnes)	Fate	Disposal
C&D	8,599	Landfilled	On site
	542	Recycled*	Off site
C&I	19,287	Landfilled	On site
	1,079	Recycled	Off site
Green waste	0	Landfilled	On site
	3,331	Recycled	Off site
Domestic Kerbside+	28,020	Landfilled	On site
	0	Recycled	Off site
Drop Off Domestic	8,376	Landfilled	On site
	328	Recycled	Off site
Other Landfill	1,307	Landfilled	On site
Total	**70,869**		

Table notes:

C&D: Construction and Demolition; C&I: Commercial and Industrial.

(*): "Recycled" means all waste not landfilled (including waste processed by transfer station).

(+): "Domestic Kerbside Recycling" tonnage figures not included in above table, as the materials are not recycled at the Facility.

3.11 Waste Control Program

Materials delivered to the Facility are inspected and screened, at the weighbridge, by SCC staff to ensure unacceptable loads of waste are not disposed at the Facility.

To facilitate control of wastes accepted to the Facility, SCC has implemented the following:

- Erection of signage at the entrance to the Facility, that clearly indicates the types of wastes accepted, types of wastes not accepted and the fees / charges board;
- Visual and CCTV inspection and screening of all incoming and outgoing loads of waste at the weighbridge. All vehicles suspected of containing unacceptable waste will be refused permission to deposit waste until the waste is verified as being acceptable. SCC shall require and collect appropriate documentation (e.g. waste classification assessments arranged by SCC Project Managers) for each load of waste accepted;
    - In the event that unacceptable waste is identified in an incoming vehicle, the vehicle will be refused entry, redirected to an appropriate disposal facility and details of the incident recorded as described below. SCC will advise the driver of the vehicle of appropriate disposal facilities, or to contact the EPA for advice on correct disposal of the unacceptable waste (at the waste owner's cost);
- Inspection and screening of waste at active landfilling and stockpiling areas. All waste suspected of being unacceptable will be segregated and checked by SCC as to its acceptability;
    - In the event that unacceptable waste is identified in the landfilling and / or stockpiling areas, SCC will immediately segregate and contain the waste away from the active tipping faces / stockpiles. Details of the waste, such as type, the source and the vehicle and driver identification, will be recorded by SCC. SCC will advise the driver of the vehicle that the waste is not acceptable and must be loaded back onto the vehicle where practical and safe to do so, at the owners cost. The vehicle will then be escorted from the landfill by SCC. SCC may, if deemed necessary and / or appropriate, advise the driver of the vehicle to contact the EPA for advice on the correct disposal of the unacceptable waste (at the waste owner's cost). SCC Rangers must also be contacted and informed of the incident;
- In the event that unacceptable waste is identified during the stockpiling or spreading and compaction of deposited waste, SCC will segregate and contain the waste away from the active waste disposal area. SCC will make all practical efforts to identify the source of the waste, including:
    - inspecting the waste for possible identification labels on containers;
    - identifying the type of waste and consequently the possible sources, and
    - contacting the EPA to determine the proper acceptable disposal options and will clean-up and dispose of the unacceptable waste in accordance with EPA's requirements;
- Incidences involving identification of unacceptable wastes will be recorded in the daily operating log for the Facility and be included in the Annual Return. The record will include (as a minimum):
    - details of the waste (e.g. type, amount);
    - source of the waste (including vehicle and driver identification and generator of waste);
    - recommended disposal facility(ies); and

- dates and result(s) of contact with disposal facility, and if required, NSW EPA[5].

3.12 Waste Recording and Reporting

3.12.1 Waste Recording

All vehicles delivering waste to the Facility will have the time of entry and exit, vehicle registration, waste type and classification, vehicle type and a site destination recorded in the electronic waste tracking system. The gatehouse / weighbridge office will be manned at all times during operating hours to ensure that all vehicles entering and exiting the Facility are recorded.

3.12.2 Volumetric Surveys

SCC will organise for volumetric surveys of the Facility to be undertaken by a qualified surveyor at the following periods / minimum frequencies:

- Landfilling areas: June and December every year;
- Stockpile volumes: June and December every year .

The results of the volumetric survey will be used, in conjunction with the recorded tonnages of accepted waste, to calculate the compaction density that is being achieved and to allow SCC to keep track of the remaining landfill space available at the Facility.

3.12.3 Annual Return and Waste Reporting

A Waste Contributions Monthly Report (WCMR) will be prepared using electronic waste tracking data recorded by the weighbridge at the gatehouse.

SCC will prepare and submit an Annual Return in accordance with Page 4, Page 5 and Condition R1 of EPL Number 5877.

3.13 Quality Assurance

3.13.1 Design and Construction

All design and construction work for the Facility will be undertaken by suitably qualified, competent and experienced personnel and contractors in accordance with relevant Australian construction standards, and industry best practice guidelines.

3.13.2 Operation

Operation of the Facility will be undertaken in accordance with this LEMP and EPL 5877.

All environmental monitoring and / or sampling will be undertaken by suitably qualified and experienced SCC staff and / or environmental consultants.

[5] The EPA may be contacted for advice on appropriate disposal for unacceptable waste and other similar queries.

3.13.3 Quality Assurance Auditing

Internal Quality System audits shall be conducted by the SCC and external audits undertaken as required.

All non-conformances in the Quality System identified by an internal or external audit shall be rectified as soon as possible. Any non-conformances of the Quality System in the construction or operation of the Facility shall be addressed by repairs to the construction and / or changes in the operation.

3.14 Final landform and Life Expectancy of the Facility

3.14.1 Final Landform

The final landform for the Facility is shown on **Figure 4**.

Stages 3 and 4 will be completed as one irregularly-shaped plateau, with a 1 % fall across the top of the Stage 3 portion of the plateau, a 1 % fall across the top of the Stage 4 portion of the plateau and 33.33 % (1V : 3H) gradients for side batter slopes.

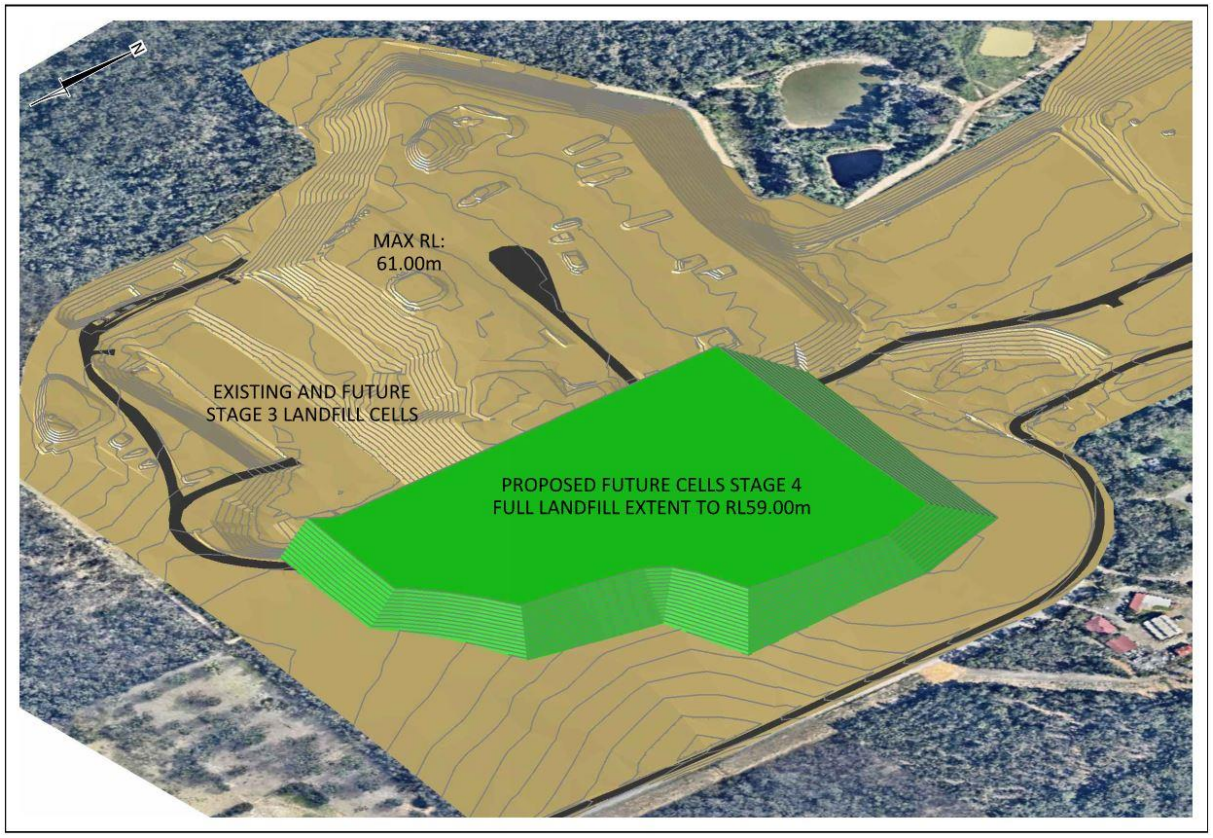

Figure 4 Final Landform

3.14.2 Life Expectancy of the Facility

The combined landfills (remaining area within stage 3 and the proposed Stage 4 Extension) are expected to reach capacity in 2030 (assuming the Resource Recovery Park (RRP) does not proceed) or in 2040 (should the RRP proceed).

This estimate has been made based on the following:

- The remaining life expectancy of the Facility, as of 2016 and based on remaining void space in Stage 3 (not including Stage 4), being approximately ten (10) years.
- Development of an additional 1,385,600 m^3 of void space in Stage 4.
- Daily cover and final capping incorporating approximately 20 % of the total available volume in Stage 4.
- A yearly landfilling rate based on a waste growth multiplier of 1.2 % per year (SCC 2015) and commencing with 65,598 tonnes landfilled between 2015 and 2016.
- A compaction ratio for landfilled waste of 800 kg/m^3 per cubic metre.

3.15 Filling Plans

Stage 4 of the Facility will be filled as multiple landfill cell sub-stages (Error! Reference source not found.). Individual landfill sub-stages within Stage 4 will be filled in a south to north direction.

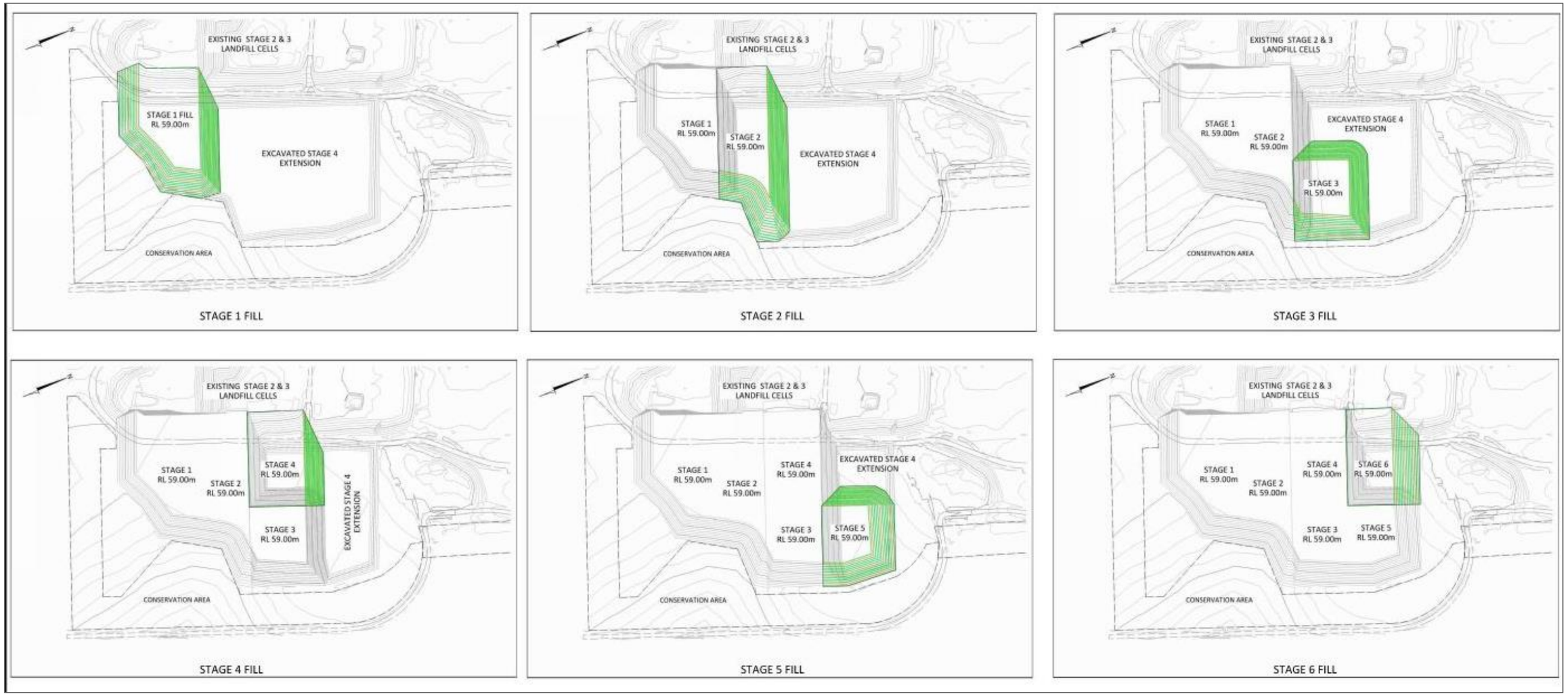

Figure 5 Filling Plans

3.16 External Bund Walls and Inter Landfill Cell Bunds

External bund walls, where required, will be constructed to match the existing final cap profile and the site final contours, and will be rehabilitated as they are being constructed. The bund walls will be constructed from VENM or alternative material(s) approved by the EPA.

Internal bunds (i.e. bunds between individual sub-stages of a landfill cell) will be constructed to manage leachate and surface water during filling of the Stage 4 landfilling area. Internal bunds will be constructed using VENM or alternative material(s) approved by the EPA. Internal bunds in Stage 4 are likely to be temporary and will be removed when appropriate to allow tie-in of sub-stages with existing / completed sub-stages.

3.17 Waste Handling, Disposal and Compaction

Waste will be disposed in a manner that minimises any nuisance or environmental impact.

Waste is to be compacted as much as possible, preferably to a density ranging between 700 kg/m^3 and 1,000 kg/m^3.

Each active waste disposal tipping face will be maintained, as far as practicable, in a dry condition during the life of that landfilling stage. During wet periods, wet weather tipping areas should be utilised in favour of tipping against other tipping faces.

Landfill cells shall be filled as follows:

- For all newly constructed cells, a sacrificial layer of household municipal waste, at least 1 m thick, shall first be placed across the entire floor and internal sidewalls of the cell to protect the cell leachate barrier from damage;
- Waste layers shall be placed in lifts, with each lift having a compacted thickness range of between 2 m and 4 m;
- Large, bulky wastes will be broken up and compacted prior to covering. Such wastes will not be disposed in the final lift layer of a waste cell, as settlement of the fill may result in these waste materials puncturing the overlying final landfill cap layer;
- Compaction of the disposed waste will be carried out primarily using landfilling plant, such as a landfill compactor. Heavy vehicles may also be directed over completed areas to aid in compaction of the waste. Small vehicles are not permitted at the landfilling area;
- At the end of each working day, the active tipping face of the landfill will be covered with a minimum 150 mm thick layer of VENM or an alternative daily or intermediate cover material(s) approved by the EPA (**Section 3.19**).

3.18 Tyres

Tyres (including shredded tyres and tyre pieces) received at the Facility will be stockpiled in a clearly defined area away from the tipping face and managed to prevent any tyres from catching fire and so as not to cause, or to be likely to cause, the spread of disease by vermin.

No more than 50 tonnes of tyres are permitted to be stockpiled at the Facility at any given time.

Excess tyres received or stockpiled at the Facility are to be removed to an approved tyre recycling contractor.

3.19 Waste Covering and Final Capping

3.19.1 Daily Cover

At the end of each working day, all exposed waste surfaces at the active tipping face that have not achieved final landform levels will be covered with a minimum 150 mm thick layer of VENM or an alternative material(s) approved by the EPA.

Placement of the daily cover layer is not restricted to the end of a working day. A daily cover layer can be placed over the waste at any time, and as required, for environmental management reasons (e.g. to mitigate erosion, provide litter control, minimise the likelihood of vermin and minimise odours).

The daily cover layer is to:

- Be comprised of VENM or an alternative material(s) approved by the EPA (refer below);
- Have a minimum thickness of 150 mm (unless where spray-on or geosynthetic covers or alternative materials are approved by the EPA are used), and
- Be graded with a longitudinal slope of at least 1% to promote runoff of surface water.

Alternate daily cover materials which may also be suitable for use at the Facility, subject to EPA approval, include (but are not limited to):

- Excavated natural materials (ENM)[6];
- Inert, waste soils classified as General Solid Waste (non-putrescible) in accordance with the W*aste Classification Guidelines* but excluding materials classified as Special Waste or Hazardous Waste;
- Construction and demolition (C & D) waste fines, such as crushed bricks, concrete, tiles and glass (excluding asbestos, rubber, bitumen, asphalt, paper, cloth, paint, wood, plaster and metal);
- Tarpaulin or similar covers, spray-on covers;
- Geosynthetic covers.

A two-week supply of VENM / ENM / Inert Solid Wastes / C & D materials are to be maintained and stockpiled adjacent to the exposed waste surfaces.

3.19.2 Intermediate Cover

Intermediate covering layers will be applied to any exposed waste surface that:

- Has not achieved final landform level, and
- Will be inactive for a period of more than 90 days.

The intermediate covering layer will:

- Comprise materials as described in **Section 3.19.1**;

[6] As defined by the EPA *The excavated natural material exemption 2014.*

- Have a minimum thickness of 300 mm;
- Be graded to a slope of at least 1% to promote runoff of surface water; and
- Restrict the rainfall infiltration rate into the waste to not more than 20% of the total rainfall.

A two-week supply of VENM / ENM / Inert Solid Wastes / C & D materials are to be maintained and stockpiled adjacent to the exposed waste surfaces.

3.19.3 Final Capping Layer

Completed landfill cells are to be to be capped with a final capping layer within 6 months of the final delivery of waste to the cell.

The final capping layer must achieve the following:

- Reduce rainwater infiltration into the waste (total annual rainwater infiltration to be less than 5% of the annual rainfall), thereby minimising the generation of leachate;
- Stabilise the surface of the landfill cell;
- Reduce sediment and contaminated water runoff (compared to pre-capping levels);
- Minimise the egress of untreated landfill gas;
- Minimise odour emissions, dust, litter, presence of scavengers and vermin and risk of fire; and
- Prepare the site for its future use, including protecting people, fauna and flora on, or near, the site from exposure to pollutants still contained in, or escaping.

Final capping layer designs typically comprise the following key components (in order, from top of final waste layer to top of final capping layer):

- Seal bearing surface;
- Gas drainage layer, if required;
- Sealing layer;
- Infiltration drainage layer;
- A revegetation layer (which promotes water removal and protects the sealing layer from damage).

Given the Facility's landfill areas are expected to receive waste up to approximately between 2030-2040, a detailed design for the final capping layer based on standards, methodologies and technologies current at the time of this LEMP may not represent an optimal final capping layer solution for the Facility at the time of its final closure.

EPL Number 5877 currently requires final caps for landfill cells in the Facility to comprise a seal bearing layer, a 300 mm thick gas drainage layer, a 500 mm thick clay sealing layer, a 300 mm thick infiltration drainage layer and a 100 mm thick revegetation layer. To allow SCC to take advantage of future innovations and technology in landfill cap designs and materials, it is recommended that this general capping design be reviewed, alternative designs (where appropriate) developed, approval from the EPA obtained and this LEMP revised to include the approved detailed design for the final capping layer, no later than 6 months prior to the expected completion date of each substage of Stage 4.

3.20 Staffing

SCC will ensure that the Facility is appropriately staffed by trained, competent and experienced personnel. A minimum of three persons shall be in attendance at the Facility during operational hours. The gatehouse / weighbridge office is to be attended at all times and all operational areas supervised during operational hours.

If SCC trucks are required to access the Facility after hours, at least one Facility staff member will be in attendance at the site during the time the trucks are present.

Prior to commencing work at the Facility, all staff will be trained to ensure:

- The Facility is operated in accordance with the EPL, the LEMP and relevant Regulatory frameworks and Guidelines (e.g. *Protection of the Environment Operations (Waste) Regulation 2014*, EPA (2014) *Waste Classification Guidelines*, EPA (2016) *Environmental Guidelines Solid Waste Llandfills, Second Edition 2016*);
- They are familiar with Council policies and procedures;
- Operators of compaction or earthworks equipment are trained, skilled and competent at undertaking tasks required of them; and
- Staff responsible for inspecting incoming wastes are skilled at identifying unacceptable waste types and will record all waste data accurately and consistently.

3.21 Customer Service Management and Reporting

SCC will provide an appropriate level of customer service to ensure that all queries and comments concerning the Facility received by SCC are addressed. SCC will provide a Customer Service telephone contact number that is notified to the public for the purpose of receiving queries and feedback from customers and the general public.

For every customer query and / or feedback received via the Customer Service telephone line, SCC will record (as a minimum):

- Date and time the correspondence was received;
- Correspondence notification method;
- Any personal details of the correspondent, if provided;
- Nature of the correspondence;
- Subsequent investigations and actions taken by SCC;
- If no action was taken, the reason why no action was taken.

All correspondence received over the course of a reporting year will be reported to the EPA in the annual report to the EPA and on their request.

Customer and public correspondence records will be retained, by SCC, for at least four (4) years from the date of receipt of feedback.

3.22 Environmental Monitoring and Environmental Monitoring Record Keeping

In accordance with EPL Number 5877, environmental monitoring is to be conducted at the Facility for:

- Discharges to air;
- Surface water quality;
- Groundwater quality;
- Leachate.

Environmental monitoring will be carried out by suitably qualified and experienced SCC personnel or environmental consultants.

Environmental monitoring requirements are detailed further from **Section 6** of this LEMP.

Monitoring records / reports will be kept by SCC for at least four (4) years after the monitoring event and will be submitted to the EPA upon request and included in the Annual Return.

4 Site Rehabilitation and Post-Closure Management

4.1 Site Rehabilitation

Future land uses for the Facility being considered by SCC include (but may not be limited to):

- Green waste processing facility;
- Pet cemetery;
- Carbon Farming Initiatives;
- Solar Farming;
- Passive Recreation;
- Recreational Activities; and
- Waste transfer station.

4.2 Landfill Closure Plan

SCC will prepare and submit to the EPA a Landfill Closure Plan (LCP) no later than 12 months before the last load of waste is due to be landfilled at the Facility.

A LCP typically:

- Specifies the steps taken or to be taken in closing and stabilising the landfill, and the time frame for doing so;
- Specifies the detailed design, the materials to be used and the construction quality assurance plan for the final capping;
- Specifies post-closure management and monitoring measures;
- Identifies any proposed future use of the site;
- Is consistent with all applicable conditions of the development consent or other planning approvals that apply to the premises; and
- Provides details to neighbouring residents to contact SCC for queries regarding the Facility closure.

4.3 Post-Closure Management

4.3.1 Environmental Monitoring and Management

After cessation of landfilling operations at the Facility, SCC will conduct regular monitoring and carry out any maintenance actions as required.

SCC will ensure that waste materials for landfilling are not received for disposal at the Facility after cessation of landfilling operations. Waste materials that are intended for use in rehabilitation works will be documented and reported in the same method used during the operation of the landfill.

SCC will continue with Customer Service Management and Reporting during the post-closure period.

SCC will ensure that all stormwater controls and reporting practices at the Facility are maintained at the same level employed when the site was accepting landfill waste, unless agreed otherwise with the EPA.

SCC will continue monitoring and reporting on the environmental performance of the Facility that has been conditioned by the EPA on the varied EPL.

Environmental management and monitoring at the Facility will continue to be undertaken by SCC until it has been demonstrated the waste is stable and non-polluting. Such an end-point is usually demonstrated by SCC submitting a certified statement of completion for approval by EPA, which shows the following criteria as having been met:

- Gas concentration levels in all perimeter gas wells have fallen to less than 1% methane (v/v) and less than 1.5 % carbon dioxide for a period of 24 months;
- Analysis of the leachate composition indicates low levels of contamination posing no hazard to the environment and surface water and groundwater monitoring indicates no water pollution. These matters should be addressed in accordance with published water quality guidelines that are relevant at that time;
- The landfill final capping has been assessed over some years and found to be in good condition and stable, with acceptable stormwater drainage and with no evidence of erosion, cracking, dead vegetation, water ponding, differential settlement or slope instability;
- The level of sediments in stormwater run-off from the final capping shall be less than 50 mg/L;
- The methane gas concentrations at the surface of the final capping shall not exceed 500 ppm at any point;
- The closed landfill no longer poses an adverse amenity risk. It does not generate offensive or excessive odour, dust, noise, litter or debris, present a fire risk, or attract scavengers and vermin;
- All other requirements of the LCP and Surrender Notice have been completed and/or satisfied.

4.3.2 Maintenance and Repairs of Final Landform

SCC will take all required measures to maintain the integrity of the final landforms at the Facility, including (but not limited to):

- Monitoring the condition and efficacy of surface water drains, and undertaking repairs where necessary;
- Filling of any cracks that may occur in the final capping layer;
- Filling of depressions created by settlement of the landfilled waste (to avoid ponding of surface water);
- Replacement of vegetation, where necessary, to maintain the required vegetation cover density;
- Repairing erosion scours.

SCC will continue maintenance and repairs of the final landforms until the landfilled waste been demonstrated to have stabilised (**Section 4.3.1**).

5 Reporting

5.1 Annual Reporting

5.1.1 Annual Return

SCC will prepare an Annual Return for each required reporting period (that being the 12-month period ending 30 October each year), which will be submitted to the EPA no later than sixty (60) days after the end of the reporting period.

A copy of the Annual Return will be retained by SCC for at least four (4) years after the Annual Return is submitted to the EPA.

The Annual Return will include a certified "Statement of Compliance" and a signed Annual Report that contains a summary of environmental monitoring and incidences (if any).

5.1.2 Annual Report

The Annual Report will include the following information in relation to the reporting period:

- Summary of total wastes received, composition and eventual fate (e.g. landfill, recycling market);
- Qualified surveyor's report of the volume of landfill space consumed, remaining landfill void space, and an estimate of the compaction density achieved over the period;
- Estimate of remaining landfill capacity;
- Assessment of any changes detected in the overflow drain water quality, surface water and groundwater monitoring results. Any notable changes in hydraulic gradient and / or variations in contaminant concentrations will be highlighted and potential models for the changes discussed;
- Report on landfill gas management to demonstrate achievement of the appropriate environmental objectives;
- Report on the performance of the leachate collection system;
- Details of any construction and / or rehabilitation works carried out;
- Recommendations on improving the environmental performance of the Facility;
- Summary of environmental incidents that occurred at the Facility; and
- Record of correspondences received by SCC from the public concerning the Facility and their correlation with prevailing weather conditions and / or waste reception circumstances.

5.2 Incident Reporting

Any incident on site that may lead to a breach of EPL conditions will be communicated to the EPA as soon as possible of SCC becoming aware of the incident.

Initial contact will be made via the EPA's Environmental Line service (telephone number: 131 555). Written notice is to be provided to the EPA within seven (7) days of the incident.

Incidents will be recorded in the Operator's Daily Log Book, with sufficient detail to provide the EPA with a written report of the incident, should such a report be requested. Incident reports typically would include (but may not necessarily be restricted to):

- The cause, time and duration of the incident;
- The type, volume and concentration of every pollutant discharged as a result of the incident;
- The name, address and business hours telephone number of employees of SCC or other witnesses;
- Actions taken by the SCC in relation to the incident;
- Details of any measure taken or proposed to be taken to prevent, or mitigate the likelihood for, a recurrence of such an incident; and
- Any additional reporting obligations as required in the Pollution Incident Response Management Plan (PIRMP) (**Section 14**).

6 Water Quality Monitoring

6.1 Groundwater and Leachate Monitoring

6.1.1 Objectives

The primary purpose for undertaking groundwater and leachate monitoring are to:

- Chemically characterise the leachate in order to be able to identify potential leachate seepage/spillage; and
- Assess impact (if any) of leachate from the Facility in local groundwater.

6.1.2 Groundwater Monitoring Wells and Leachate Monitoring Points

The Facility currently has a network of monitoring wells installed around the site to allow monitoring of groundwater quality and several leachate monitoring points (summarised in **Table 6** and shown in **Figure 3**).

Table 6 Groundwater monitoring wells and leachate monitoring points

Monitoring Well ID / Leachate Monitoring Point	Type of Monitoring	Location	EPA Identification Number (EPL Number 5877)
BH1	Groundwater quality	E 275936.454 N 6137766.212	8
BH2	Groundwater quality	E 275914.461 N 6137656.147	9
BH4A	Groundwater quality	E 275892.440 N 6137573.964	11
BH6	Groundwater quality	E 275870.781 N 6137469.007	13
BH7	Groundwater quality	E 275871.835 N 6137468.759	14
BH10	Groundwater quality	E 275775.241 N 6137366.100	17
BH11	Groundwater quality	E 275831.250 N 6137491.270	18
BH13	Groundwater quality	E 275996.400 N 6137488.920	20
BH14	Groundwater quality	E 276421[1] N 6137653[1]	21
BH16	Groundwater quality	E 275750.108 N 6137137.288	29
BH17	Groundwater quality	E 275750.115 N 6137142.420	30

Monitoring Well ID / Leachate Monitoring Point	Type of Monitoring	Location	EPA Identification Number (EPL Number 5877)
BH18	Groundwater quality	E 275706.987 N 6137201.685	31
BH19	Groundwater quality	E 276131.952 N 6137061.323	32
BH20	Groundwater quality	E 276171.380 N 6137736.010	33
BH21	Groundwater quality	E 275741.827 N 6136900.246	34
BH22	Groundwater quality	E 275821.380 N 6136791.130	35
BH23	Groundwater quality	E 275942.256 N 6136774.411	36
GW1	Groundwater quality	E 276107[2] N 6136839[2]	tbc
GW1A	Groundwater quality	E 276111[2] N 6136841[2]	tbc
GW2	Groundwater quality	E 276263[2] N 6136958[2]	tbc
GW2A	Groundwater quality	E 276267[2] N 6136960[2]	tbc
GW3	Groundwater quality	E 276258[2] N 6137248[2]	tbc
GW4	Groundwater quality	E 276401[2] N 6137113[2]	tbc
GW5	Groundwater quality	E 276238[2] N 6137084[2]	tbc
Leachate dam (LD1)	Leachate quality	--	1
Pipeline from LD1 to irrigation area	Leachate volume	--	25
Leachate pump-house	Leachate volume and quality	--	27

Table Notes

1. Coordinate from EPL number 5877.

2. Coordinate from Coffey Geotechnics Pty Ltd (2016) *Geotechnical and Hydrogeological Investigation West Nowra Recycling and Waste Facility.* Report Reference GEOTWOLL03957AA-AB, dated 27 July 2016.

(--). Coordinate information not provided.

6.1.3 Groundwater and Leachate Monitoring Program

Groundwater and leachate monitoring at the Facility will comprise:

- Quarterly and yearly field groundwater quality measurements, sampling and analysis of all groundwater monitoring wells for parameters and analytes as detailed in Item M2 of EPL Number 5877;
- Yearly field leachate quality measurements, sampling and analysis at LD1 (EPA monitoring point 1) and Leachate pump-house (EPA monitoring point 27) for parameters and analytes as detailed in Item M2 of EPL Number 5877;
- Monthly measurements of leachate volume at the Pipeline (EPA monitoring point 25) and Leachate pump-house (EPA monitoring point 27) using a flow meter and continuous logger results, as per Item M6 of EPL Number 5877; and
- Groundwater quality measurements, sampling and analysis of all groundwater wells that will be established downgradient of the newly established irrigation area above the Stage 2 landfill to monitor the effectiveness of the irrigation area.

6.1.4 Performance Indicators and Responsible Party

The groundwater and leachate monitoring parameters and analytes are the key indicators for assessing changes in groundwater conditions and quality, as well as providing indications of actual or potential leachate impacts on the local groundwater.

SCC will be the Responsible Party for implementing the groundwater and leachate monitoring program.

6.1.5 Monitoring Schedule

Groundwater and leachate monitoring will be conducted on a monthly, quarterly and/or yearly basis as described in **Section 6.1.3**.

6.1.6 Reporting

Groundwater parameters and analytical results shall be reviewed quarterly and compared yearly. The yearly comparisons will identify whether there has been any significant (or potentially significant) changes in parameters and analytes.

Additional reports may be required where contamination has been identified and corrective actions are taken (**Section 6.3**).

All monitoring data, results and data evaluation results will be included in the Annual Report within the Annual Return.

6.2 Surface Water Monitoring and Management

6.2.1 Objectives

The primary purpose for undertaking surface water monitoring are to:

- Effectively monitor and report on surface water character; and
- Demonstrate that surface water has not been contaminated by the landfilling operations.

6.2.2 Surface Water Monitoring Locations and Program

Surface water is to be monitored at six locations in and around the Facility as shown in **Table 7**.

Table 7 Surface Water Monitoring Points

Monitoring Point	Type of Monitoring	EPA Identification Number (EPL 5877)
Overflow from sedimentation dam DP3	Surface water quality	3
Immediately downstream of leachate dam LD1	Surface water quality	5
In Sandy Creek, immediately upstream of the Facility	Surface water quality	6
In Sandy Creek, downstream of site	Surface water quality	7
Ephemeral drainage lines	Surface water quality	tbc (shown as SW1 and SW4 on Figure 3 above)

Surface water monitoring at the Facility will comprise:

- Measuring pH and total suspended solids at EPA monitoring point 3 daily during any discharge;
- Quarterly field water quality measurements, sampling and analysis for biochemical oxygen demand, conductivity, dissolved oxygen, nitrogen (ammonia), pH, potassium, total dissolved solids and total organic carbon at EPA monitoring points 5, 6 and 7.
- Water quality measurements, sampling and analysis for biochemical oxygen demand, conductivity, dissolved oxygen, nitrogen (ammonia), pH, potassium, total dissolved solids and total organic carbon at monitoring points SW1 and SW4 after major rainfall events producing flows in the ephemeral drainage lines.

In addition, event-based monitoring is carried out by SCC at monitoring point 2 (First Flush Dam) although this is not a requirement of EPL Number 5877.

6.2.3 Performance Indicators and Responsible Party

The surface water monitoring parameters and analytes are the key indicators for assessing changes in surface water conditions and quality, as well as providing indications of actual or potential leachate impacts on surface water.

SCC will be the Responsible Party for implementing the surface water monitoring program.

6.2.4 Reporting

Surface water parameters and analytical results shall be reviewed quarterly and will identify whether there has been any significant (or potentially significant) changes in parameters and analytes.

Annual report shall be submitted to the EPA.

Additional reports may be required where contamination has been identified and corrective actions are taken (**Section 6.3**).

6.3 Corrective Actions

Should groundwater, surface water or leachate monitoring results indicate contamination of the groundwater and / or surface water may have occurred; the following steps are to be taken:

1. The affected monitoring wells / monitoring locations are to be sampled as soon as possible;
2. If the contamination is confirmed from the sampling carried out, the EPA shall be notified in writing within 24 hours of the receipt of laboratory results;
3. SCC's Pollution Incident Response Management Plan (PIRMP) (refer to **Section 14**) will be carried out.

7 Discharge to Air monitoring

7.1 Objectives

The primary purpose for undertaking air monitoring is to assess:

- If accumulation of landfill gas to dangerous levels is occurring within enclosed structures, within 250 m of landfilling and landfilled areas;
- If any landfill gas emissions are detected above the landfill cover and capping layer areas;
- If there are fugitive emissions from the landfill gas extraction / management system.

7.2 Surface Gas Monitoring Locations

Surface gas monitoring is to be conducted:

- Inside all buildings within 250 m of deposited waste or leachate storage areas;
- In a grid pattern at 25 m spacing across the surface of landfilled areas (areas to have cover and / or caps layers);
- Within depressions or surface fissures (where these are located away from grid sampling points); and
- Of emissions from the landfill gas extraction system.

7.3 Monitoring Schedule

Every six months.

7.4 Performance Indicators and Responsible Party

Concentration of methane gas is the key indicator for potential hazards presented by landfill gas.

SCC is the responsible party for implementing the air monitoring program.

7.4.1 Inside Buildings

The threshold for further investigation and corrective action is detection of methane at concentrations above 1000 ppm or 1% volume/volume.

7.4.2 Surface Gas Emissions

The threshold for further investigations and corrective action is detection of methane at concentrations ≥ 500 ppm or ≥ 0.05% volume/volume.

7.4.3 Landfill Gas Generator and Gas Flare Emissions

The gas flare shall satisfy the following operational requirements, based on Section 5.5 of the Environmental Guidelines:

- Gas residence time: > 0.6 s;

- Combustion temperature: > 760 °C; and
- Destruction efficiency: > 98 %

Emissions from the gas generator are not to exceed the following discharge limits (during dry weather and at standard atmospheric conditions):

- Hydrogen sulphide: 5 mg/m^3;
- Nitrogen dioxide, nitric oxide, or both: 450 mg/m^3;
- Sulfuric acid, sulfur trioxide, or both: 100 mg/m^3; and
- Volatile organic compounds (as n-propane): 40 mg/m^3.

7.5 Reporting

Copies of air monitoring assessments, maintenance / performance logs for the landfill gas generator and gas flare and any landfill gas incidents are to be kept by SCC and included in the Annual Return.

7.6 Corrective Actions

Where thresholds / discharge limits (**Section 7.4**) are exceeded, SCC is to implement the following corrective actions:

7.6.1 Inside Buildings

1. Evacuate and isolate the affected locations and commence monitoring of affected locations;
2. Notify the EPA within 24 hours;
3. Implement the Pollution Incident Response Management Plan (PIRMP) (see **Section 14**).

7.6.2 Surface Gas Emissions

1. Evacuate and isolate the immediate vicinity and conduct additional monitoring to locate the source of the surface gas emission;
2. Set up an exclusion zone around the affected location;
3. Commence monitoring of affected location, as required, and carry out the necessary corrective / remedial works;
4. Continue monitoring of affected locations until methane gas surface levels are below the threshold concentrations.

7.6.3 Landfill Gas Generator and Gas Flare Emissions

Corrective actions involve identifying the issues with the landfill gas generator and / or gas, carrying out the required repairs / modifications and conducting additional air monitoring to ensure the repairs / modifications are adequate .

8 Fire Prevention

8.1 Objectives

With the exception of the gas flare, lighting of fires or incineration of waste is not permissible.

The objective for fire prevention is to ensure the safety of staff, its customers and the surrounding environment.

8.2 Fire Prevention Management

Management measures aimed at fire prevention are described in the Pollution Incident Response Management Plan (PIRMP) (see **Section 14**).

8.3 Performance Indicators and Responsible Party

Fire related incidences reported at the Facility, or included in a written report, will serve as a performance indicator that site operations, with respect to fire prevention and fire control, are unsatisfactory and may require revision.

SCC will be the Responsible Party for implementing fire prevention management at the Facility.

8.4 Reporting

All fire-related incidents will be recorded in detail including the date, time, location, inferred cause of the incident, time the incident was resolved, notification of authorities and whether any additional management measures are warranted to prevent and / or mitigate such incidents from occurring in future. This information will be recorded in the Operator's Daily Log Book.

All fires will be reported to the EPA.

8.5 Corrective Actions

In the event of a fire occurring at the Facility, SCC will take prompt action to extinguish the fire if safe to do so as well as implementing the Pollution Incident Response Management Plan (PIRMP).

9 Odour Management

9.1 Objectives

SCC must not cause or permit the emission of any offensive odour from the Facility.

The objective of odour management is to minimise generation and effect on adjoining land users of odours arising from waste disposal operations.

9.2 Odour Management

Odours will be minimised by:

- Not disposing waste in standing water;
- Disposing wastes in manageable layers to optimise compaction;
- Covering all exposed waste at the end of each working day with daily cover material;
- Minimising disturbance to previously landfilled areas;
- Continuing to conduct green waste operations in areas located an adequate distance from neighbouring residential areas; and/or
- Use of active odour control devices (e.g. misting systems) and/or methods where and/or when necessary.

9.3 Performance Indicators and Responsible Party

Performance indicators for odour control are records of odour complaints received by SCC and recorded in the Customer Relationship Management System.

SCC will be the Responsible party for the Customer Relationship Management System (**Section 3.21**).

9.4 Monitoring Schedule

Site staff shall continuously monitor for odours on site and notify their supervisor or the site manager when noticeably strong (compared to background levels) and persistent odours occur.

9.5 Reporting

A record of complaints regarding odours will be kept in SCC's Customer Relationship Management System and reported to the EPA as required in the Annual Return and Annual Report.

9.6 Corrective Actions

If odours are detected and complaints received, the source of the odour will be identified and remediated until the odour nuisance is rectified.

10 Dust Management

10.1 Objectives

SCC shall ensure that all operations and activities occurring at the Facility are carried out in a manner that will minimise the emission of dust from the premises.

The objective of dust management is to prevent off-site migration of pollutants as airborne dust and / or as part of the sediment load in surface waters.

10.2 Dust Management

Generation of dust is to be minimised by:

- Use of a site water cart, or dust suppressant chemicals or surfactant wetting agents as required;
- Minimising dust-generating work during excessively windy periods;
- Restricting vehicle speeds on site;
- Ensuring internal perimeter and access roads are properly formed, drained, surface treated and maintained;
- Stockpiles be limited in height, wetted down / covered during windy conditions and be turned regularly;
- Immediate burial and / or covering of dusty loads;
- Minimising exposed earthworks / tipping areas;
- Use of daily cover and intermediate cover (**sections 3.19.1** and **3.19.2**);
- Ensuring plant and equipment are fitted with appropriate pollution control devices, and/or
- Implementing any other dust management measures as required.

10.3 Performance Indicators and Responsible Party

Performance indicators are:

- Number of complaints from nearby residents, customers and visitors regarding dust.

The Responsible Party for minimising the impact of dust is SCC.

10.4 Monitoring Schedule

Site staff shall continuously monitor for dust emissions from site and notify their supervisor or the site manager when noticeably large amounts of dust are being generated and/or are migrating off-site.

10.5 Reporting

A record of complaints regarding dust emissions will be kept in SCC's Customer Service Management and Reporting System and reported to the NSW EPA as required in the Annual Return and Annual Report.

Dust emission and control records will be reviewed as per the requirements of the PIRMP.

10.6 Corrective Actions

Should dust become a significant issue for the site, dust generating activities will be reviewed and, where possible, revised to alternative methods that generate less dust. The water cart is to be utilised more frequently for the wetting down of affected areas and to maintain vegetation cover over revegetated areas.

11 Noise Management

11.1 Objectives

SCC is to ensure that all operations and activities occurring at the Facility are carried out in a manner that will minimise noise emissions to the practical extent.

11.2 Noise Management

Noise emissions are to be minimised by:

- Avoiding use of plant, machinery and equipment with tonal movement alarms, where possible;
- Preferably use plant, machinery and equipment with 'broadband' movement alarms;
- Maintaining plant and machinery in good working order, and ensuring required noise reducing guards are installed and maintained;
- Carrying out of noisy / potentially noisy works away from nearby residential areas; and/or
- Adhering to the Facility operating hours.

11.3 Performance Indicators and Responsible Party

Performance indicators for noise are the number of noise complaints received by SCC and the following:

- Noise emanating from the site shall not exceed the limits set out in the EPA (2000) *NSW Industrial Noise Policy* for daytime and night time noise, when measured at any point within one metre of any residential boundary:
    - Daytime is considered as from 7:00 am to 10:00 pm Monday to Saturday, and from 8:00 am to 10:00 pm Sunday and Public Holidays;
    - Night time is considered as from 10:00 pm to 7:00 am Monday to Saturday, and from 10:00 pm to 8:00 am Sunday and Public Holidays;
- Noise emanating from the site shall not exceed the limits set out in the EPA (2000) *NSW Industrial Noise Policy,* when measured at any point within one metre of any boundary of the Facility.

SCC will be the Responsible Party for noise management at the Facility.

11.4 Monitoring Schedule

Monitoring of maximum and background noise as required due to operating conditions.

11.5 Reporting

Noise emission and control records, as well as noise complaints, will be reviewed as per the requirements of the PIRMP.

A record of complaints regarding noise will be kept in SCC's Customer Service Management and Reporting System and reported to the EPA as required in the Annual Return and Annual Report.

11.6 Corrective Actions

Should noise impacts be identified as a nuisance, a number of management strategies may be employed which include (but may not be limited to):

- Noisy machinery be substituted with smaller or quieter alternatives (if possible) or operate shorter working hours;
- Noisy machinery be modified with noise-reducing parts (e.g. silencers);
- Minimising heights that tipped loads fall and, where possible, tipping loads onto soft surfaces; and
- Screening bunds be constructed between working areas and sensitive receptors.

12 Litter Management

12.1 Objectives

The objective of litter control is to prevent the degradation of local amenity.

12.2 Litter Management

Measures to manage litter include (but are not limited to):

- Establishing and maintaining vegetative litter screens around strategic locations within the Facility;
- Upkeep and maintenance of permanent and strategically placed temporary litter fences (including removal of litter caught on the fences) around the perimeter of the Facility and around strategic locations within the site;
- Retrieval of litter from outside the perimeter of the Facility when required;
- Covering of loads entering site and during transit within the Facility;
- Avoiding, if practicable, tipping and/or waste handling during windy conditions;
- Active waste tipping face work area to be maintained to a manageable area to mitigate windblown litter;
- Prompt, efficient placement, continuous compaction and covering of waste when unloading;
- Litter to be collected from surface water storm drains, inlets of pipes and culverts on a regular basis.

12.3 Performance Indicators and Responsible Party

Performance indicators for litter management are the amount of litter retrieved by litter patrols and the number of litter complaints received by SCC.

SCC will be the Responsible Party for litter management at the Facility.

12.4 Monitoring Schedule

Litter fencing, stormwater drains and nearby areas will be monitored regularly and on an as needs basis for the accumulation of litter and litter removed regularly. Damage to litter fencing is to be repaired as soon as possible.

12.5 Reporting

Litter patrols, accumulations of litter and repair/maintenance needs will be included in the daily activities register on the days that inspections are conducted.

Litter management records, as well as litter complaints, will be reviewed as per the requirements of the PIRMP.

A record of complaints regarding litter will be kept in SCC's Customer Relationship Management System and reported to the EPA as required in the Annual Return and Annual Report.

12.6 Corrective Actions

The litter control measures will be continually reviewed by SCC to provide maximum effort towards preventing degradation to the local amenity.

13 Pest, Environmental Weed and Noxious Weed Management

13.1 Objectives

The primary environmental goal is to prevent the degradation of local amenity due to an excess of pests and weeds.

13.2 Pest and Weed Management

Measures to manage pests and weeds include (but are not limited to):

- Compacting and covering waste, keeping exposed areas / volumes of waste to a minimum;
- Preventing unauthorised entry to the Facility;
- Undertaking regular inspections for pests, vermin and noxious weeds and development of a control plan if required;
- Regularly conducting weed-spraying around the site. Care must be taken to ensure that pesticides do not enter stormwater or leachate or pose an airborne pollution hazard or nuisance;
- Use of traps and/or baits to deter and/or control vermin, as well as engaging professional pest and weed control subcontractors, if required;
- Establishing and maintaining fire breaks between the site boundary and surrounding areas;
- Adequately draining the site to prevent ponds of water forming;
- Keeping leachate and stormwater ponds free of mosquito breeding larvae.

13.3 Performance Indicators and Responsible Party

An effective performance indicator is an observable increase or decrease in rodent, pest, noxious weed growth, usage of pesticides/herbicides or bird populations.

SCC will be the Responsible Party for co-ordinating regular checks and to ensure adequate pest control is maintained at the Facility.

13.4 Monitoring Schedule

Regular pest and weed observation checks and control programs will be noted in the site log.

Rodent traps could be set in areas where relatively higher amounts of rodent activity occur or are likely to occur. Traps, if used, should be checked regularly to determine the number of pests found within the Facility.

Areas where weed spraying have been undertaken should be monitored for die back or re-growth.

13.5 Reporting

Records are to be kept on site, detailing the number and types of pests found. Any requirements for further pest control should also be recorded. The records will be reviewed as per the requirements of the PIRMP (only if applicable).

13.6 Corrective Actions

The performance of pest and weed control measures, procedures and plans shall be continually reviewed by SCC and any deficiencies addressed and improvements implemented on an on-going basis.

Should pests and/or weeds become problematic at the Facility, SCC will arrange for a pest and/or weed control plan to be developed.

14 Pollution Incident Response Management Plan

A Pollution Incident Response Management Plan (PIRMP) has been prepared by SCC[7] in accordance with the requirements in the POEO Act for holders of an EPL.

It is understood this LEMP and the PIRMP are to be implemented in parallel by SCC at the Facility.

[7] SCC (2015) *Pollution Incident Response Management Plan West Nowra Recycling and Waste Facility*, dated February 2015.

15 References

Artefact, 2017b, *West Nowra Recycling and Waste Facility Non-Indigenous Heritage Assessment*.

NSW Environment Protection Authority *Environmental Protection Licence* (Number 5877).

NSW Environment Protection Authority (2016) *Environmental Guidelines Solid Waste Landfills Second edition 2016.*

Shoalhaven City Council (2008) *Landfill Environmental Management Plan West Nowra Recycling and Waste Facility.*

Shoalhaven City Council (2017) *Biodiversity Assessment Report: Landfill extension of West Nowra Recycling & Waste Facility.*

Shoalhaven City Council (2015) *Pollution Incident Response Management Plan West Nowra Recycling and Waste Facility,* dated February 2015.

APPENDIX A

Environmental Protection Licence EPL NUMBER 5877

Environment Protection Licence

Licence - 5877

Licence Details	
Number:	5877
Anniversary Date:	30-October

Licensee
SHOALHAVEN CITY COUNCIL
PO BOX 42
NOWRA NSW 2541

Premises
WEST NOWRA RECYCLING & WASTE FACILITY
FLAT ROCK ROAD
MUNDAMIA NSW 2540

Scheduled Activity
Composting
Waste disposal (application to land)
Waste processing (non-thermal treatment)
Waste storage

Fee Based Activity	Scale
Composting	> 5000-50000 T annual capacity to receive organics
Non-thermal treatment of general waste	Any annual processing capacity
Waste disposal by application to land	Any capacity
Waste storage - other types of waste	Any other types of waste stored

Region
Waste & Resource Recovery
59-61 Goulburn Street SYDNEY NSW 2000
Phone: (02) 9995 5000
Fax: (02) 9995 5999
PO Box A290 SYDNEY SOUTH
NSW 1232

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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

SHOALHAVEN CITY COUNCIL
PO BOX 42
NOWRA NSW 2541

subject to the conditions which follow.

Environment Protection Licence

Licence - 5877

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Composting	Composting	> 5000 - 50000 T annual capacity to receive organics
Waste processing (non-thermal treatment)	Non-thermal treatment of general waste	Any annual processing capacity
Waste disposal (application to land)	Waste disposal by application to land	Any capacity
Waste storage	Waste storage - other types of waste	Any other types of waste stored

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
WEST NOWRA RECYCLING & WASTE FACILITY
FLAT ROCK ROAD
MUNDAMIA
NSW 2540
LOT 436 DP 808415, LOT 437 DP 808415, LOT 1 DP 847203, LOT 1 DP 870268, LOT 1 DP 1018193
EXCLUDING THE GAS GENERATOR AND GAS FLARE AS SHOWN ON PLAN REFERENCE NO. 2824_182 DATED 18 AUGUST 2011 (EPA REFERENCE DOC11/38133)

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with

the issuing of this licence.

A3.2 The document titled "Draft Landfill Environment Management Plan (LEMP), West Nowra Recycling & Waste Depot, Flatrock Road, West Nowra; Ref No. 9723127.G; December 1997" submitted to the EPA on 19 December 1997 is not to be taken as part of the documentation in A3.1, other than those parts specifically referenced in this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
24	Gas accumulation monitoring		Inside all buildings within 250 meters of deposited waste as shown on drawing 2824_16 referenced as EPA WOF 9346.

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Leachate Quality Monitoring		Leachate dam LD1 as shown on drawing 2824_16 referenced as EPA WOF9346
2		Overflow drain	Overflow from first flush dam DP2 as shown on drawing 2824_16 referenced as EPA WOF9346
3	Overflow drain	Overflow drain	Overflow from sedimentation dam 1 DP3 as shown on drawing 2824_16 referenced as EPA WOF9346
5	Surface water monitoring		Immediately downstream from the leachate dam at the boundary of the site as shown on drawing 2824_16 referenced as EPA WOF9346
6	Surface water monitoring		Upstream of site in Sandy Creek as shown on drawing 2824_16 referenced as EPA WOF9346.

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7	Surface water monitoring		Downstream of site in Sandy Creek as shown on drawing 2824_16 referenced as EPA WOF9346.
8	Groundwater monitoring		Groundwater monitoring well labelled BH1 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275936 N6137766
9	Groundwater monitoring		Groundwater monitoring well labelled BH2 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01). E275914 N6137656
11	Groundwater monitoring		Groundwater monitoring well labelled BH4A on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275896 N6137573
13	Groundwater monitoring		Groundwater monitoring well labelled BH6 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275871 N6137469
14	Groundwater monitoring		Groundwater monitoring well labelled BH7 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275872 N6137469
17	Groundwater monitoring		Groundwater monitoring well labelled BH10 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275775 N6137366
18	Groundwater monitoring		Groundwater monitoring well labelled BH11 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275830 N6137492
20	Groundwater monitoring		Groundwater monitoring well labelled BH13 on diagram titled "Bore Location Plan" May 17/01/14 (DOC14/6276-07) E275996 N6137489
21	Groundwater monitoring		Groundwater monitoring well labelled BH14 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276421 N6137653
25	Leachate Volume Monitoring		Pipeline from Leachate Dam (LD1) to irrigation area as shown on drawing 2824_16 referenced as EPA WOF 9346
26		Utilisation Area	Irrigation area as shown on drawing 2824_16 referenced as EPA WOF9346

27	Leachate Volume and Quality	leachate pumphouse for Stage 3
29	Groundwater monitoring	Groundwater monitoring well labelled BH16 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 E6137137
30	Groundwater monitoring	Groundwater monitoring well labelled BH17 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275750 N6137142
31	Groundwater monitoring	Groundwater monitoring well labelled BH18 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275707 N6137202
32	Groundwater monitoring	Groundwater monitoring well labelled BH19 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276132 N6137061
33	Groundwater monitoring	Groundwater monitoring well labelled BH20 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E276171 N6137736
34	Groundwater Monitoring	Groundwater monitoring well labelled BH21 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275742 N6136900
35	Groundwater monitoring	Groundwater monitoring well labelled BH22 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275821 N6136791
36	Groundwater monitoring	Groundwater monitoring well labelled BH23 on diagram titled "Bore Location Plan" dated 17/01/14 (DOC14/6276-01) E275942 N6136774

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

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L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

POINT 2

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

POINT 3

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	General solid waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land) Waste storage Composting Waste processing (non-thermal treatment)	NA
NA	General solid waste (putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA
NA	Asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA
NA	Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time	Waste disposal (application to land)	NA
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA

L3.2 The stockpiles of waste or recovered materials must not exceed the following limits at any one time:
a) Processed and unprocessed garden waste and/or wood waste – 5,000 tonnes;
b) Processed and unprocessed building and demolition waste – 10,000 tonnes;
c) Scrap metal – 5,000 tonnes; and
d) Glass – 5,000 tonnes.

L3.3 The licensee must not dispose of any tyres on the premises which;
a) have a diameter of less than 1.2 metres; and
b) are delivered at the premises in a load containing more than 5 whole tyres; and
c) became waste in the Sydney Metropolitan Area.

L3.4 Tyres stockpiled on the premises must:
a) not exceed fifty (50) tonnes of tyres at any one time; and
b) be located in a clearly defined area away from the tipping face; and
c) be managed to control vermin; and
d) be managed to prevent any tyres from catching fire.

L4 Potentially offensive odour

L4.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O4 Emergency response

O4.1 The licensee must have in place and implement procedures to minimise the risk of fire at the premises.

O4.2 The licensee must extinguish fires at the premises as soon as possible.

O5 Processes and management

O5.1 The licensee must take all practicable steps to control entry to the premises.

O5.2 The licensee must ensure that all gates are locked whenever the landfill is unattended.

O6 Waste management

O6.1 Leachate impounded in the surface leachate storage ponds and leachate collected by the subsurface leachate collection system may be irrigated on the following utilisation area(s):
a) Point No. 26 - Irrigation Area; and
b) Irrigation at tip face.

O6.2 The volume of leachate directed to the utilisation area must not exceed the capacity of the area to

assimilate the leachate.

O6.3 The landfill surface must be contoured to ensure that stormwater is managed separately from leachate.

O6.4 Cover material must be Virgin Excavated Natural Material.
a) Daily cover
Cover material must be applied to a minimum depth of 15 centimetres over all exposed landfilled waste prior to ceasing operations at the end of each day.
b) Intermediate cover
Cover material must be applied to a depth of 30 centimetres over surfaces of the landfilled waste at the premises which are to be exposed for more than 90 days.
c) Cover material stockpile
At least two weeks cover material must be available at the premises under all weather conditions. This material may be won on site, or alternatively a cover stockpile must be maintained adjacent to the tip face.

O6.5 The licensee must have in place and implement procedures to identify and prevent the disposal of any waste not permitted by this licence to be disposed of at the premises.

O6.6 Vehicles leaving the premises must not track materials to external surfaces.

O6.7 The licensee must only dispose of waste at the premises in Landfill Cells Stage 3D-2, 3E-1 or the Wet Weather Area unless the EPA amends this licence to expressly permit waste disposal elsewhere at the premises.

Note: For the purposes of this condition, “Wet Weather Area” refers to the area labelled "Wet Weather Tipping Area 1" and "Wet Weather Tipping Area 2" on the drawing “West Nowra Recycling and Waste Facility – Wet Weather Tipping Areas - Site Plan” (Plan Reference: 2824_252) dated 11 December 2014 (EPA Reference DOC14/308730).

O6.8 The licensee must not exhume any landfilled waste unless approved in writing by the EPA.

O6.9 The licensee must obtain approval from the EPA prior to constructing any landfill cells at the premises.

O6.10 The licensee must provide a report to the EPA which details the design, construction, operation and rehabilitation of any new landfill cell. This report must be submitted to the EPA at least six months before the licensee intends to construct the cell, and it must include details on a QA/QC program which can demonstrate that the cell was constructed to meet its design specifications.

O6.11 The licensee must construct landfill cell 3E-2 in accordance with the designs, specifications, methods and construction quality assurance plan contained in "Landfill Cell Stage 3E - Preliminary Design and Construction Specifications - West Nowra Recycling and Waste Facility (Facility) - Proposed Landfill Cell Stage 3E (Sub-section 3E-2)" dated 1 June 2016 and associated drawings. This includes a leachate barrier on the cell floor and walls comprising, from bottom to top:
a) a prepared sub-grade;
b) a geosynthetic clay liner;
c) a geomembrane;
d) a protection geotextile;
e) a leachate collection layer comprising 300 mm of gravel and collection pipework; and
f) a separation geotextile.

O6.12 Following construction of landfill cell 3E-2, the licensee must submit a Construction Quality Assurance Report on the quality assurances that were implemented to ensure that the works comply with the approved designs, specifications and methods.

O6.13 The licensee must not deposit any waste in landfill cell 3E-2 until the EPA has approved the Construction Quality Assurance Report in writing.

O6.14 The licensee must ensure that the landfill cells are capped progressively during operations and specifically at times when the level of waste reaches final heights.

O6.15 The licensee must ensure that the final capping of all landfill cells is in accordance with EPA's "Environmental Guidelines: Solid Waste Landfills, Second Edition") dated 2016.

O6.16 The last licensee must prepare and submit to the EPA within six months prior to the last load of waste being landfilled, a closure plan in accordance with section 76 of the Protection of the Environment Operations Act 1997.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

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POINT 24

Pollutant	Units of measure	Frequency	Sampling Method
Methane	percent by volume	Every 6 months	Special Method 1

M2.3 Water and/ or Land Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample
Bicarbonate	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Yearly	Grab sample
Carbonate	milligrams per litre	Yearly	Grab sample
Chloride	milligrams per litre	Yearly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Chromium (total)	milligrams per litre	Yearly	Grab sample
Cobalt	milligrams per litre	Yearly	Grab sample
Conductivity	microsiemens per centimetre	Yearly	Probe
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Magnesium	milligrams per litre	Yearly	Grab sample
Manganese	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample
Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
pH	pH	Yearly	Probe
Phosphate	milligrams per litre	Yearly	Grab sample
Phosphorus (total)	milligrams per litre	Yearly	Grab sample

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Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Yearly	Grab sample
Sodium	milligrams per litre	Yearly	Grab sample
Sulfate	milligrams per litre	Yearly	Grab sample
Toluene	milligrams per litre	Yearly	Grab sample
Total dissolved solids	milligrams per litre	Yearly	Grab sample
Total organic carbon	milligrams per litre	Yearly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Total suspended solids	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
pH	pH	Daily during any discharge	Grab sample
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample

POINT 5,6,7

Pollutant	Units of measure	Frequency	Sampling Method
Biochemical oxygen demand	milligrams per litre	Quarterly	Grab sample
Conductivity	microsiemens per centimetre	Quarterly	Probe
Dissolved Oxygen	milligrams per litre	Quarterly	Probe
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample

POINT 9,11,14,17,18,20,21,29,30,31,32,33,34,35,36

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample

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Bicarbonate	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Carbonate	milligrams per litre	Yearly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Chromium (total)	milligrams per litre	Yearly	Grab sample
Cobalt	milligrams per litre	Yearly	Grab sample
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Magnesium	milligrams per litre	Yearly	Grab sample
Manganese	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample
Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
pH	pH	Quarterly	Probe
Phosphate	milligrams per litre	Yearly	Grab sample
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Redox potential	millivolts	Yearly	Probe
Sodium	milligrams per litre	Quarterly	Grab sample
Standing Water Level	metres	Quarterly	In situ
Sulfate	milligrams per litre	Quarterly	Grab sample
Toluene	milligrams per litre	Yearly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

POINT 13

Pollutant	Units of measure	Frequency	Sampling Method
2,3,4,5-Tetrachlorophenol	nanograms per litre	Yearly	Grab sample

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2,3,4,6-Tetrachlorophenol	nanograms per litre	Yearly	Grab sample
2,3,4-trichlorophenol	nanograms per litre	Yearly	Grab sample
2,3,5,6-tetrachlorophenol	nanograms per litre	Yearly	Grab sample
2,3,5-trichlorophenol	nanograms per litre	Yearly	Grab sample
2,3,6-trichlorophenol	nanograms per litre	Yearly	Grab sample
2,3-dichlorophenol	nanograms per litre	Yearly	Grab sample
2,4,5-trichlorophenol	nanograms per litre	Yearly	Grab sample
2,4,6-trichlorophenol	nanograms per litre	Yearly	Grab sample
2,4-Dichlorophenol	nanograms per litre	Yearly	Grab sample
2,5-dichlorophenol	nanograms per litre	Yearly	Grab sample
2,6-dichlorophenol	nanograms per litre	Yearly	Grab sample
2-Chlorophenol	nanograms per litre	Yearly	Grab sample
3,4-dichlorophenol	nanograms per litre	Yearly	Grab sample
3,5-dichlorophenol	nanograms per litre	Yearly	Grab sample
3-chlorophenol	nanograms per litre	Yearly	Grab sample
4-Chlorophenol	nanograms per litre	Yearly	Grab sample
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample
Bicarbonate	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Carbonate	milligrams per litre	Yearly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Chromium (total)	milligrams per litre	Yearly	Grab sample
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample
Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
Pentachlorophenol	nanograms per litre	Yearly	Grab sample
pH	pH	Quarterly	Probe
Phosphate	milligrams per litre	Yearly	Grab sample

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Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Redox potential	millivolts	Yearly	Probe
Sodium	milligrams per litre	Quarterly	Grab sample
Standing Water Level	metres	Quarterly	In situ
Sulfate	milligrams per litre	Quarterly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

POINT 27

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample
Bicarbonate	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Yearly	Grab sample
Carbonate	milligrams per litre	Yearly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Chromium (total)	milligrams per litre	Yearly	Grab sample
Cobalt	milligrams per litre	Yearly	Grab sample
Conductivity	microsiemens per centimetre	Yearly	Probe
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Magnesium	milligrams per litre	Yearly	Grab sample
Manganese	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample
Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample

Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
pH	milligrams per litre	Yearly	Probe
Phosphate	milligrams per litre	Yearly	Grab sample
Phosphorus (total)	milligrams per litre	Yearly	Grab sample
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Yearly	Grab sample
Sodium	milligrams per litre	Yearly	Grab sample
Sulfate	milligrams per litre	Yearly	Grab sample
Toluene	milligrams per litre	Yearly	Grab sample
Total dissolved solids	milligrams per litre	Yearly	Grab sample
Total organic carbon	milligrams per litre	Yearly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Total suspended solids	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

M2.4 For the purposes of the above table, Special Method 1 means methane monitoring in accordance with Benchmark Technique Number 18 of the Environmental Guidelines: Solid Waste Landfills (1996).

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:
a) the volume of liquids discharged to water or applied to the area;
b) the mass of solids applied to the area;
c) the mass of pollutants emitted to the air;
at the frequency and using the method and units of measure, specified below.

POINT 25

Frequency	Unit of Measure	Sampling Method
Monthly	cubic metres	Flow meter and continuous logger

POINT 27

Frequency	Unit of Measure	Sampling Method

Monthly	cubic metres	Flow meter and continuous logger

M7 Other monitoring and recording conditions

M7.1 The licensee must monitor the remaining disposal capacity (in cubic metres) of the landfill.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.8 The Annual Return must be accompanied by / or include an Annual Report which must contain an assessment of environmental performance relevant to licence conditions including:

a) tabulated results of all monitoring data required to be collected by this licence;
b) a graphical presentation of data from at least the last three years (if available) in order to show variability and / or trends. Any statistically significant variations or anomalies should be highlighted and explained;
c) an analysis and interpretation of all monitoring data;
d) an analysis of and response to any complaints received;
e) identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and of remedial action taken or proposed to be taken to address these deficiencies; and
f) recommendations on improving the environmental performance of the facility.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R2.3 The licensee must notify the EPA within 24 hours in accordance with condition R2.1 if any landfill gas monitoring required by this licence detects methane concentrations above 1.25% (v/v), and increase the frequency of monitoring to daily, until the EPA determines otherwise.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 The licensee must record the following data in relation to fires occurring at the premises:
a) Time and date when the fire started.
b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire.
c) The time and date that the fire burnt out or was extinguished.
d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc).
e) Prevailing weather conditions at the time of the fire.
f) Observations made in regard to smoke direction and dispersion.
g) The amount of waste that was combusted by the fire.
h) Action taken to extinguish the fire;
i) Action taken to prevent a reoccurrence.

The data must be recorded on each day that the fire is burning.

R4.2 The licensee or its employees or agents must notify the occurrence of all fires on the premises in accordance with conditions R2.1 and R2.2 as soon as practical after becoming aware of the fire.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder describe d at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Ms Debbie Maddison

Environment Protection Authority

(By Delegation)

Date of this edition: 01-December-2000

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End Notes

1	Licence varied by notice 1013108, issued on 04-Jan-2002, which came into effect on 29-Jan-2002.
2	Licence varied by notice 1031238, issued on 05-Dec-2003, which came into effect on 30-Dec-2003.
3	Licence varied by change to DEC Regopm allocation, issued on 03-Mar-2006, which came into effect on 03-Mar-2006.
4	Licence varied by notice 1069250, issued on 02-May-2007, which came into effect on 02-May-2007.
5	Licence varied by notice 1081780, issued on 19-Mar-2008, which came into effect on 19-Mar-2008.
6	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
7	Licence varied by notice 1090155, issued on 15-Dec-2008, which came into effect on 15-Dec-2008.
8	Licence varied by notice 1099238, issued on 03-Apr-2009, which came into effect on 03-Apr-2009.
9	Licence varied by notice 1111694, issued on 17-May-2010, which came into effect on 17-May-2010.
10	Licence varied by notice 1115110, issued on 06-Aug-2010, which came into effect on 06-Aug-2010.
11	Licence varied by notice 1124489, issued on 03-Feb-2011, which came into effect on 03-Feb-2011.
12	Licence varied by notice 1129470, issued on 05-Jul-2011, which came into effect on 05-Jul-2011.
13	Licence varied by notice 1500746 issued on 23-Sep-2011
14	Licence varied by notice 1504597 issued on 01-May-2012
15	Licence varied by notice 1506324 issued on 11-Jan-2013
16	Licence varied by notice 1513038 issued on 22-Mar-2013
17	Licence format updated on 11-Oct-2013
18	Licence varied by notice 1520254 issued on 28-Aug-2015
19	Licence varied by notice 1533849 issued on 29-Sep-2015
20	Licence varied by notice 1535751 issued on 23-Nov-2015
21	Licence varied by notice 1537080 issued on 11-Jan-2016

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22	Licence varied by notice 1544674 issued on 28-Sep-2016

ASIA PACIFIC OFFICES

BRISBANE
Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA
GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN
5 Foelsche Street
Darwin NT 0800
Australia
T: +61 8 8998 0100
F: +61 2 9427 8200

GOLD COAST
Ground Floor, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY
21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE
Suite 2, 2 Domville Avenue
Hawthorn VIC 3122
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE
10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

PERTH
Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

ROCKHAMPTON
rockhampton@slrconsulting.com
M: +61 407 810 417

SYDNEY
2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TAMWORTH
PO Box 11034
Tamworth NSW 2340
Australia
M: +61 408 474 248
F: +61 2 9427 8200

TOWNSVILLE
Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

AUCKLAND
68 Beach Road
Auckland 1010
New Zealand
T: +64 27 441 7849

NELSON
5 Duncan Street
Port Nelson 7010
New Zealand
T: +64 274 898 628

NEW PLYMOUTH
Level 2, 10 Devon Street East
New Plymouth 4310
New Zealand
T: +64 0800 757 695