Waste Environmental Management Plan

for Sydney's Desalination Plant

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Section 1. Introduction

1.1. Purpose

The purpose of this Waste Environmental Management Plan (WEMP) is to describe how Veolia Water Australia (Veolia) proposes to ensure resource use (e.g. energy, water and raw materials) is optimised, and that generated wastes are handled, stored, recycled and disposed of in accordance with applicable legislative and contractual requirements during operation of Sydney's Desalination Plant as defined in the Operate and Maintain (O&M) Contract and the Drinking Water Pump Station (Sydney's Desalination Plant).
The objective of this WEMP is to ensure appropriate environmental controls and procedures are implemented during the O&M Contract to avoid or minimise potential adverse impacts associated with resource use (i.e. waste generation, handling and/or disposal). To achieve this objective Veolia will adhere to the specifications of the waste management hierarchy and the NSW Government's Waste Reduction and Purchasing Policy (WRAPP).

1.2. Scope

This WEMP is applicable to all Veolia activities during the Operation and Maintenance phase of Sydney's Desalination Plant, including if the plant is in Care and Maintenance Phase.
In particular, this WEMP has been prepared to address the requirements of the compliance obligations from the Ministers Conditions of Approval (MCoA), Statement of Commitments (SoC), the O&M Contract TS-09, and the applicable legislation.

1.3. References

Table 1 References

Document reference	Operational Environmental Management Documentation	Document Number
TIER 1		
Operational EMS	Integrated Business Management System (IBMS) Manual	MAN-9490
TIER 2		
EMP	Environmental Management Plan	MAN-9490 Section 14
TIER 3		
MWQEMP	Marine Water Quality and Ecosystem Management Plan	MAN-9674
NEMP	Noise Environmental Management Plan	MAN-9675

SWGEMP	Surface Water and Groundwater Environmental Management Plan	MAN-9491
WEMP	Waste Environmental Management Plan	MAN-9676
CAMP	Conservation Area Management Plan	MAN-9918
TIER 4		
CTR	Compliance Tracking Register	
EP	Environmental Procedures	
EMPR	Environmental Monitoring and Reporting Program	

1.4. Definitions

Table 2 Definitions

Abbreviation	Definition
BMS	Veolia's intranet-based document management system - Business Management System (previously known as On-Tap)
DPIE/ DOP	Department of Planning, Industry and Environment (formerly known as the NSW Department of Planning)
EMP	Environmental Management Plan (Section 14 of IBMS)
EMS	Environmental Management System (See IBMS)
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EMSR	Environmental Management System Representative
IBMS	Veolia's Integrated Business Management System
ISO	International Organisation for Standardisation
JSEA	Job Safety Environmental Analysis
MCoA	Minister's Conditions of Approval
NPWS	National Parks and Wildlife Service
O&M	Operate and Maintain

NSW	The State of New South Wales
RO	Reverse Osmosis
Schedule 5	Planning Approval Responsibilities Operate and Maintain Contract
SoC	Statement of Commitments
SSC	Sutherland Shire Council
SWC	Sydney Water Corporation
TS-09	Technical Schedule-09 Environmental Requirements – Operate and Maintain Contract
Veolia	Veolia Water Australia

Section 2. Operational Environmental Management Documentation

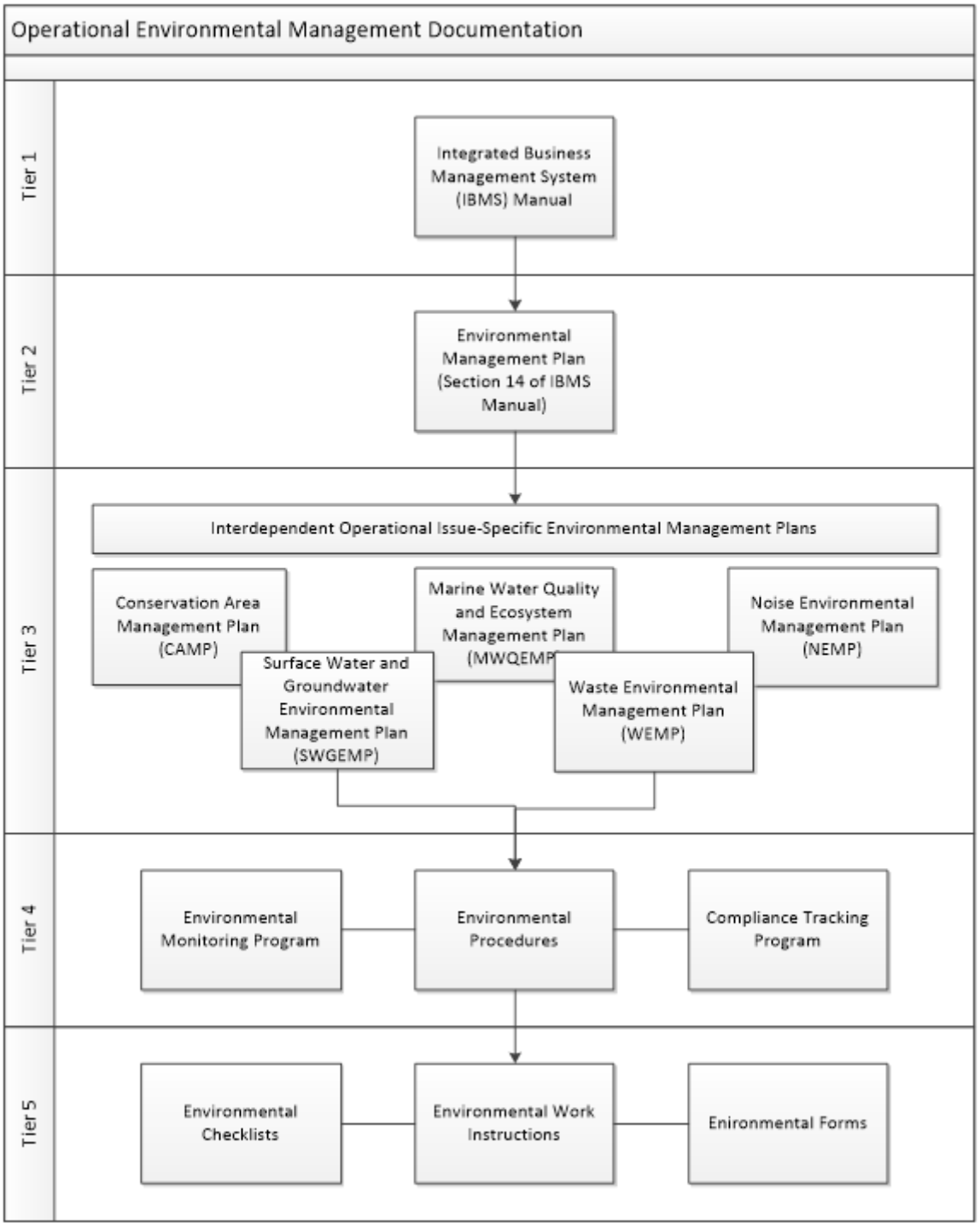

Figure 1 Environmental Documentation Flow Chart

The Environmental Management System (EMS) for the operation and maintenance phase of Sydney's Desalination Plant is described in the Integrated Business Management System (IBMS) Manual MAN-9490 (Tier 1).

Section 14 of the IBMS Manual describes the process and environmental requirements that apply to the environmental aspects applicable to the operation and maintenance of Sydney's Desalination Plant.

This Waste Environmental Management Plan (WEMP) MAN-9676 (Tier 3) is part of the Veolia environmental management suite of documents required for Sydney's Desalination Plant as illustrated above.

The WEMP describes higher-level protocols, procedures and management measures that will be adopted to optimise resource use, manage waste, and mitigate and minimise potential impacts on the community and environment during operation and maintenance activities.

Specific environmental management measures will be incorporated into the relevant procedures and work instructions developed to guide activities on site.

2.1. Document Control

Documents required by the Integrated Business Management System (IBMS) and relevant standards and regulations, are controlled through the Business Management System (BMS), Veolia's intranet-based document control system. Documents required include

- Policies, manuals, standards and plans;
- Procedures;
- Work instructions;
- Forms

A number of documents within the IBMS apply to all locations/employees. These documents are generated by corporate departments and must be complied with.

Location/contract specific documents describe how the corporate requirement, or a specific client requirement is implemented. These documents should complement and not contradict corporate requirements. Unless documented approval is granted by the relevant corporate department a location/contract specific version of a document cannot be developed.

All documents on the BMS are considered uncontrolled copies when printed. The BMS also automatically logs document revision dates and review periods and stores information about document owners and approvers.

Section 3. Background

The Environmental Assessment (EA) of the Concept Plan for Sydney's Desalination Project (SWC, November 2005) identifies waste from the operational phase as an issue of low risk if managed according to the NSW EPA Guidelines for Waste Classification and Disposal.
Further to the EA a Preferred Project Report (PPR) (SWC August, 2006) was prepared with subsequent amendments to the Statement of Commitments (SoC). The PPR outlined the need to classify and manage waste in accordance with the EPA Environmental Guideline: Assessment, Classification and Management of Liquid and non-Liquid Waste (EPA 1999) during all stages of Sydney's Desalination Plant, reflected in amended Statement of Commitment 57, which requires this Waste Environmental Management Plan be prepared.
The PRR outlined the requirements in accordance with the EPA Environmental Guideline: Assessment, Classification and Management of Liquid and non-Liquid Waste (EPA 1999), however this has been superseded by the NSW EPA Waste Classification Guideline: Part 1 Classifying Waste November 2014. This plan will adhere to the requirements outlined in the NSW EPA Waste Classification Guideline: Part 1 Classifying Waste November 2014.
This WEMP has been prepared to satisfy this SoC 57 and the MCoA 4.6(d) requirements.

3.1. Plan Approval Process and Stakeholder Consultation

This WEMP was endorsed by SWC and approved prior to commencement of operation by the Department of Planning (DoP) now known as Department of Industry, Planning and Environment (DPIE).

This Plan had no specific consultation with stakeholders. However, targeted consultation with applicable stakeholders may be undertaken should any specific concerns arise. Stakeholders considered for such consultation includes NSW EPA and Sutherland Shire Council (SSC).

Section 4. Legislative and other Requirements

4.1. Legislation

Veolia has developed this WEMP in accordance with the requirements of the following relevant NSW legislation.

4.1.1. Acts:

Protection of the Environment Operations Act 1997; defines 'Waste' for regulatory purposes and establishes management and licensing requirements along with offence provisions to deliver environmentally appropriate outcomes. This Act also establishes the ability to set various waste management requirements via the regulation.

Waste Avoidance and Resource Recovery Act 2001; promotes waste avoidance and resource recovery by developing waste avoidance and resource recovery strategies and programs such as the extended producer responsibility scheme for industry.

Protection of the Environment Operations (Illegal Waste Disposal) Act 2013

The Protection of the Environment Operations Amendment (Illegal Waste Disposal) Act 2013 amends the POEO Act to more effectively deal with illegal waste disposal and fraud in the waste sector.

4.1.2. Guidelines:

Waste Classification Guidelines; includes Part 1 which outlines a simple step-by-step process for waste generators to follow to classify their waste for disposal. The six waste classes used are:

- Special waste
- Liquid waste
- Hazardous waste
- Restricted solid waste
- General solid waste (Putrescible)
- General solid waste (Non-putrescible)

Resource Recovery Exemptions (Land Application) Guidelines; outline the criteria for a waste or waste-derived material to be applied to land. In addition, it provides guidance to assist with the preparation of a specific exemption application to enable the reuse of waste or waste-derived materials as fill or fertiliser (land applications) or as a fuel or alternative raw material in thermal applications where this is beneficial and does not harm the environment or human health. At the time of this document's review, NSW EPA was in the process of updating Resource Recovery Exemptions in line with 2014 changes to legislation. Resource Recovery Exemptions (Land Application) Guidelines should be consulted annually to check if there have been any changes.

4.1.3. Regulations:

The Protection of the Environment Operations (Waste) Regulation 2014 (the '2014 Waste Regulation') provides for contributions to be paid by occupiers of scheduled waste facilities for each tonne of waste received at the facility or generated in a particular area; exempts certain occupiers or types of waste from these contributions; and allows deductions to be claimed in relation to certain types of waste. It also sets out provisions covering:

- the proximity principle
- record-keeping requirements, measurement of waste and monitoring for waste facilities
- tracking of certain waste

- reporting
- transportation of waste
- transportation and management of asbestos waste
- recycling of consumer packaging
- classification of waste containing immobilised contaminants
- miscellaneous topics.

4.1.4. Strategy

Waste Avoidance and Resource Recovery Strategy 2014-21 (Waste Strategy 2014); provides an essential framework for reducing waste generation and improving the efficient use of resources, including maximising conservation of natural resources and minimising environmental harm from waste management and disposal of solid waste.

4.2. Compliance Obligations

The Minister's Conditions of Approval (MCoA) that this WEMP addresses are indicated in Table 3 Compliance Obligations. This list also contains a cross reference to where the condition is addressed in this Plan or other Veolia Sydney Desalination Plant management documents.
Overall environmental compliance will be managed in accordance with section 16 of the IBMS Manual.
Records of environmental compliance will be submitted monthly in the Veolia Compliance Tracking Program.

Table 3 Compliance Obligations

	No:	Requirement	Doc Ref:
MCoA Plant	4.6 (d)	a Waste Management Plan to outline measures to minimise the production and impact of wastes handled, treated and produced at the project, with a specific focus on lime sludge and backwash solids (where relevant). The Plan shall include a framework for periodic review of alternative waste management measures and options for beneficial reuse of wastes, where appropriate.	This Plan
SoC	57	A Waste Management Plan will be prepared to ensure the proper classification and management of all construction or operational waste material unable to be reused or recycled in accordance with relevant legislation and Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes (EPA, 1999)(superseded by the NSW EPA Waste Classification Guideline: Part 1 Classifying Waste November 2014.), for implementation during construction and operation. Disposal requirements will involve appropriate treatment on site and/or as applicable the use of a licensed waste transporter and disposal at a facility licensed to accept the waste type.	This Plan

	59	Investigations of methods to optimise water conservation will be developed for implementation during operation of the desalination plant and infrastructure.	This Plan Table 7

4.3. Environmental Protection Licence (EPL)

As the operator of the Sydney Desalination Plant, Veolia obtained an EPL for the site - EPL No. 12904. The license requirements currently do not address waste management, however any specific requirements would be built back into the IBMS (Tier 1 document) and implemented accordingly through the business management system.

Section 5. Project Impacts

The types of wastes that are likely to be generated during operation and maintenance of Sydney's Desalination Plant include those listed in Table 4 Potential Waste Sources.

Table 4 Potential Waste Sources

Waste	Source
Desalination Plant Operation	
Marine Debris	Screening from ocean intake
Lime sludge	By-product of lime water preparation
Ferric sludge	Backwash solids
Plant / Equipment Maintenance	
Drums and containers	Maintenance (oil and lubricants etc)
Chemical wastes	Wastes from painting, maintenance, spill cleanup
Waste oil, grease, lubricants, oily rags	Maintenance of plant and equipment
Cables, parts, hoses, pipe	Maintenance of plant and equipment
Surface / Stormwater Controls	
Solids (sediment)	Sediments cleared from drainage channels, drains, pits, sediment fences, basin maintenance
Other collected solids (e.g. rubbish, vegetation)	Wastes cleared from gross pollutant traps, grates, drains etc or collected in general cleanup
Polluted water	Waters from spill cleanup
Administration Office & Other Buildings	
Glass / plastic / cans / paper / cardboard	Administration office
Domestic wastes	Food scraps etc from Administration office
Printer Cartridges	Administration office
Sanitary systems waste	Amenities (Administration office)

Landscape Maintenance	
Green waste, logs, mulched timber	Vegetation from maintenance
Plastic plant pots, fertilisers, containers	Replanting, fertilising, weed and pest control
Consumables	
Valves and Pumps	Valves and pumps used in the process plant
Cartridge Filters	Cartridge filters used prior to the RO elements.
RO Elements	Used for the desalination of seawater
Laboratory Consumables	Used for laboratory analysis

Section 6. Waste Management and Reuse

6.1. Waste Management Strategy

Waste management for Sydney's Desalination Plant uses Waste Hierarchy Principles. This involves the adoption of environmentally sensitive work practices and implementation of environmental safeguards to minimise waste and advance the values of Ecologically Sustainable Development (ESD).

6.2. Waste Minimisation

Waste minimisation will be promoted during all operation and maintenance activities. For example, consideration will always be given to the purchasing of materials in bulk to minimise packaging. Additionally, energy and water consumption will be kept to a minimum through education of personnel, regular inspection of plumbing for leakages and damage; and installation of water saving devices where possible.

6.2.1. Management of Lime Sludge

Lime sludge is a waste product from the potabilisation process. During this process optimisation of the amount of lime powder used during the preparation is prioritised to minimise the amount of sludge being produced. To minimise the production of lime waste, the highest grade (for bulk usage) of lime is used, since purer lime generates less lime solids. Relationships with suppliers and other operating plants are developed to allow the site to remain updated with the latest products and technologies. By remaining informed of potential improvements there is further opportunity to minimise the production of waste and any impacts.
Waste management measures are reviewed for improvement opportunities to minimise waste and its impact including:

- Advancing the lime preparation process including:
  - Optimising the quantity of lime powder and chemicals added
  - Reduce the amount of lime solids waste produced (through optimising operation of the saturators)
- Improving lime waste dewatering process by:
  - optimised centrifuge operation minimising production
  - optimising addition of polymer for dewatering purposes, minimising production and reducing any potential impact

6.2.2. Management of Backwash Solids

Backwash solids are a waste product from the pre-treatment process/facility. In order to minimise the amount of waste water, the pre-treatment production rate is adjusted to match the plant requirement resulting in a minimal production of backwash solids.
These solids are dewatered to reduce the volume of the overall waste (classified as 'general solid waste'). The solids are transported from site to the local licensed waste receiver at Kurnell minimising the impact associated with transportation.
To minimise the quantity of waste, improvements to the dewatering process through optimisation of the centrifuge operation and optimisation of polymer will further reduce the impact of the waste.
Ongoing enhancement of the pre-treatment dosing process occurs to obtain the most efficient pre-treatment with the lowest chemical addition possible. Consequently this efficiency will minimise the amount of chemicals present in the waste stream, reducing the impact of the waste.

Common objectives of advancing the pre-treatment process are optimising the addition of chemicals to reduce any potential chemical impact, optimise the waste water stream capacity to be beneficially treated improving separation of the solid and liquid phases ultimately improving the solid phase dewatering process.

6.2.3. Seawater Screening Waste

The waste from seawater screening is minimised through the design and location of the seawater intake structures at the seabed. Waste collection sources will include materials such as waste from the intake drum screens and waste collected on the intake structure. These materials will be disposed of at an approved off site facility.

The type and quality of initial screenings will be assessed for their potential for beneficial reuse e.g. onsite composting or disposal at a bioreactor facility with cogeneration, eg Earth Power.

6.2.4. Cartridge Filters

Veolia purchases cartridge filters in bulk. To minimise packaging, Veolia requested that the supplier change their packaging from individually boxed and wrapped filters to bulk boxes with approximately 200 filters in the one box.

6.3. Reuse and Recycling Action Plan

Waste separation and segregation will be promoted on site to facilitate reuse and recycling as a priority of the waste management program as follows:

- Waste segregation on site – Waste materials will be separated on site into dedicated bins / areas, for either reuse on site where practicable, or collection by a waste contractor and transport to off site facilities.
- Waste separation off site – Wastes to be deposited into one bin where space is not available for placement of multiple bins, and the waste is to be sorted off site by a waste contractor.

6.3.1. Lime Sludge

This product is contained in 20m^3 self-levelling bins until it is transported off site by a licensed waste transporter for preferential beneficial re-use by utilisation of 'The lime and gypsum residues from drinking water treatment exemption 2006'. Veolia have engaged suppliers who can beneficially reuse this waste stream in soils for agriculture and additionally to neutralise battery acid in a car battery recycling plant.

6.3.2. Cartridge Filters

Cartridge filters are a consumable item +from the desalination process. The cartridges are predominately plastics. Since this is a large and consistent waste stream recycling opportunities have been explored. Once washed and dried out this waste stream is theoretically able to be recycled; however Veolia has so far been unable to identify a contractor who is able to do this. If an opportunity arises, Veolia will consider using a contractor who can beneficially reuse or recycle this waste stream to minimise the impact of the waste.

6.3.3. Waste Oil

A resultant waste stream of plant operation and maintenance is waste oil. Where viable, efforts will be made to reuse the oil on site and where this is not possible the oil will be sent off site for recycling by utilisation of the notice of exemption granted under clause 51 in relation to waste tracking for 'Non-hazardous waste hydrocarbon oil destined for reuse'.

6.4. Environmental Planning & Assessment Regulation

6.4.1. Waste Hierarchy

The Waste Hierarchy describes the approach to waste management to ensure the most efficient use of resources, to reduce environmental harm, and to provide for the continual reduction in waste generation in line with the principles of environmentally sustainable development (ESD).

The following hierarchy for managing waste, from most desirable to least desirable includes:

- avoid unnecessary resource consumption;
- recover resources (including reuse, reprocessing, recycling and energy recovery); and
- dispose (as a last resort)

6.4.2. Waste Handling and Storage

Where waste is required to be handled and stored on site prior to on site reuse or off site recycling/disposal, the following measures apply:

- Liquid wastes are to be stored in appropriate containers in bunded areas until transported off site. Bunded areas will have the capacity to hold 110% of the liquid waste volume for bulk storage or 120% of the volume of the largest container for smaller packaged storage.
- Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the Environmentally Hazardous Chemicals Act 1985, Dangerous Goods (Road and Rail Transport) Act 2008 and the EPA waste disposal guidelines.
- All other recyclable or non-recyclable wastes are to be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations on site and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

6.4.3. Waste Classification

The classification of wastes generated from Sydney's Desalination Plant operation is undertaken in accordance with the NSW EPA Waste Classification Guideline: Part 1 Classifying Waste November 2014.

6.4.4. Disposal

Waste (and spoil) disposal will be in accordance with the appropriate legislation as set out in Section 4. PRO-9736 Waste Handling and Disposal Procedure outlines how waste is disposed of at Sydney's Desalination Plant and how Veolia meets its obligations in disposing of its waste.

6.4.5. Management of Contaminated Material

Waste material that is identified as contaminated will be classified in accordance with the NSW EPA Waste Classification Guideline: Part 1 Classifying Waste November 2014 and disposed of to an approved facility.

Table 5 Proposed Waste Reuse, Recycling and Disposal Arrangements

Key Waste Stream	Segregation Areas / Containers	Reuse / Recycling / Disposal Method	Waste Classification (From EPA Guidelines)
Waste Separation on Site			
Paper / Cardboard	Suitably sized bins (minimise truck movements)	Off site recycling	General solid waste (non-putrescible)
Glass / plastic / cans	Suitably sized bins (minimise truck movements) Kitchen	Off site recycling	General solid waste (non-putrescible)
Glass/plastic/cans/ cartons subject to 10 cent refund	Return and Earn bins Kitchen and Control Room	Of site recycling with earns being donated to charity - currently WIRES	General solid waste (non-putrescible)
Cleared vegetation / green waste	composted in CA or distributed around site as required.	Reuse on site	General solid waste (putrescible)
Compost	Container in kitchen	Compost bin located outside of admin building. Compost used by staff.	General solid waste (putrescible)
Recyclable Metals	Stored near workshop	Recycled where possible.	General solid waste (non-putrescible)
Wood (repairs/maintenance)	Suitably sized bins (minimise truck movements)	Reuse on site where possible / off site recycling	General solid waste (non-putrescible)
Hydrocarbons (oils / grease)	Sealed drums / containers	Off site recycling	Liquid waste
Paints / solvents	Sealed drums / containers	Off site disposal at approved facility	Liquid waste
General Solid Waste	Suitably sized bins (minimise truck movements)	Off site disposal at approved facility	General solid waste (putrescible)

Marine Debris	Suitably sized bins (minimise truck movements)	Reuse on site where possible / off site disposal at approved facility	General solid waste (putrescible)
Lime Sludge	20,000 litre tankers (minimise no. of truck movements)	Beneficial reuse in agriculture/battery industry	General solid waste (non-putrescible)
Backwash Solids	20m^3 bins (minimise no. of truck movements)	Off site disposal at Kurnell for landfill	General solid waste (non-putrescible)
Chemical wastes	Suitably sized bins (minimise truck movements) lined with heavy duty plastic and covered	Off site disposal at approved facility	Hazardous waste
Printer Cartridges	Suitably sized bins	Off site recycling	General solid waste (non-putrescible)
Cartridge Filters	Suitably sized bins	Off site disposal	General solid waste (non-putrescible)
Sanitary wastes	n/a	Off site disposal	Special waste

6.5. Energy Conservation

The operation of the Desalination Plant requires a significant amount of electrical energy to be used, primarily for the operation of the water treatment components of the plant (all power supplied by SDP). The minimisation of energy use was a key part of the design process. Veolia has identified the ongoing need to actively promote energy efficient operations, including the following initiatives:

- Incorporation of Energy Recovery Devices (ERDs) and energy efficient equipment to optimise energy efficiencies, resulting in the reduction of energy demand and therefore a reduction in operating costs.
- A Greenhouse Gas Reduction Plan has been prepared by SWC to ensure that the desalination plant is effectively powered by 100% renewable energy resulting in no net greenhouse emissions.
- Actively explore and investigate energy reduction initiatives to further reduce the amount of electricity used to power the plant and report these in accordance with the Australian Government's Energy Efficiency Opportunities program, as required.

6.6. Water Conservation and Reuse

Veolia has identified the need to promote efficient usage of water during operations. Veolia will promote the responsible use of water and water efficient work practices during all operation and maintenance activities, as

well as investigate ways to conserve water and reuse or recycle wastewater. These methods are actively reviewed and revised where appropriate to take into account new and/or emerging technology or practices. Across site, rainwater tanks have been installed for use in garden maintenance and water saving devices are installed on taps within the administration building to further reduce reliance on mains water. Measures to ensure water conservation and reuse are outlined in Table 6 below.

Table 6 Waste, Water and Energy Management Measures

Management and Mitigation Measures	Responsibility	Timing
General Operation and Maintenance Activities – Waste Avoidance		
Materials will be purchased in bulk where possible to minimise packaging (e.g. process chemicals delivered by tankers).	Operations Manager	At all times
Reduce energy and water consumption through education of personnel, regular inspection of plumbing for leakages and damage; and installation of water saving devices where possible.	Process Engineer / Operations Manager	Ongoing training / Regular Inspection
General Operation and Maintenance Activities – Waste Reuse		
Where practicable, any vegetation cleared will be chipped and mulched and where space allows, mulched material will be stockpiled for reuse during landscape maintenance. Vegetation and leaf material not reused on site to be transferred to landscape suppliers or Greenwaste Centre for composting. Weed material to be disposed of to landfill as required or rafted on site for decomposition..	Process Manager / Supervisors	As required
Any empty fuel, lubricant and chemical containers will be stored for collection by a drum recycler for cleaning and reuse.	Process Manager / Supervisors	At all times
Waste oil, grease and lubricants from maintenance of plant and equipment are to be placed in drums within a bunded area for collection by a Waste Oil Recycler for treatment and reuse where practicable.	Process Manager / Supervisors	At all times
Where possible and cost effective, purchase and/or use of recycled materials or materials and products with recycled content will be considered in place of new materials, especially where they are environmentally preferable to the non-recycled alternative.	Maintenance Supervisor	As required

If after purchasing and using a product on site, excess material exists, it will be determined whether the supplier will allow the unused portion to be returned for a refund / credit.	Maintenance Supervisor	If surplus material exists
Where practicable, surplus materials and waste from works will be reused/recycled (including wood, bricks, concrete, tiles, plasterboard, fittings, etc)	Maintenance Supervisor	As required
General Operation and Maintenance Activities – Waste Recycling		
All potentially recyclable material will be sorted (unless being sorted at the waste facility), collected and taken to an appropriate recycling depot in the area. Locations of recycling facilities are listed in Appendix 3.	Senior Process Manager / Supervisors	At all times
Scrap metal will be collected by a scrap metal contractor for recycling.	Process Manager / Supervisors	As required
Wood packaging, pallets, framework and off-cuts and cardboard resulting from operation and maintenance activities is to be reused on site wherever possible, otherwise to be placed in separate bins and collected for recycling.	Process Manager / Supervisors	Where possible
Chemical wastes will be placed in sealed drums in designated, bunded areas for collection by a waste contractor and off site treatment or management in accordance with the manufacturers' instructions.	Process Manager / Operations Manager	As required
General Operation and Maintenance Activities – Waste Disposal		
Waste disposal is to be in accordance with the Protection of the Environment Operations Act 1997 and the Waste Avoidance and Resource Recovery Act 2001.	EMSR	Ongoing
All materials that cannot be reused or recycled are to be classified for disposal at approved disposal facilities in accordance with the NSW Waste Classification Guideline: Part 1 Classifying Waste November 2014, the Contaminated Land Management Act 1997 and the. Protection of the Environment Operations (Illegal Waste Disposal) Act 2013 Waste materials identified as requiring special management include contaminated sediments and oils. These materials are to be stored and disposed of by a licensed contractor in accordance with EPA requirements.	Operations Manager / EMSR	At all times

Wastes that cannot be reused or recycled are to be disposed of via a licensed waste management contractor. The types of wastes, destination and disposal site are to be provided.	Operations and Maintenance Supervisor	At all times
Appropriate covered receptacles will be provided in suitable locations on the site and a contractor commissioned to regularly remove/empty the bins.	EMSR/ Operations Supervisor	Ongoing
Non-hazardous waste (e.g. putrescible waste, non-recyclable paper/plastics/cardboard/office waste etc) that cannot be reused or recycled is to be placed in skips for disposal to approved landfill.	Operations and Maintenance Supervisor	At all times
Seawater concentrate is to be discharged through the marine outlet discharge point, in accordance with the conditions of the Environmental Protection Licence and any other legislative requirements.	Operations and Maintenance Supervisor	As required
Seawater screening waste is to be disposed of at an approved off site facility.	Operations and Maintenance Supervisor	As required
Lime sludge is transported off site in 20,000 litre tankers by a licensed waste transporter for beneficial reuse.	Operations and Maintenance Supervisor	As required
Wastewater from flushing of pipelines and tanks is to be discharged through the marine outlet discharge point, in accordance with the conditions of the Environmental Protection Licence, and any other legislative requirements.	Operations and Maintenance Supervisor	As required
Any contaminated materials are to be handled, treated, managed and disposed of in accordance with the EPA Waste Classification Guidelines. Wet contaminated sediments are to be stored in bunded areas to ensure leachate runoff does not enter watercourses.	Operations and Maintenance Supervisor	As required
Chemical wastes are to be placed in sealed drums in designated, bunded areas for collection by a waste contractor and off-site treatment or management in accordance with the manufacturers' instructions.	Operations and Maintenance Supervisor	As required

Waste and the Conservation Area		
Veolia personnel and subcontractors working in the Conservation Area will make provision for disposal of all general litter including cigarette butts, food scraps etc.	All	At all times
No waste is to be left on site or in the Conservation Area.	All	At all times
Disturbance of any kind to ground surfaces will be kept to an absolute minimum. Veolia personnel and subcontractors working in the Conservation Area will make provision for appropriate disposal of potential pollutants, garbage or other waste material found on site.	All	At all times
Waste Transportation		
All trucks transporting wastes off site will be appropriately licensed and approved to carry the materials to appropriately licensed waste facilities.	Operations Manager	At all times
Waste truck loads will be covered and tailgates secured prior to trucks leaving the plant site.	Security	At all times
For any transportation of Dangerous Goods, the transporter must be licensed for transport.	Security	At all times
For any transportation of trackable waste the following is required: - obtain a consignment number; - complete waste data forms; - provide copies to the waste transporter regarding the consigned waste; and - keep copies on site.	EMSR	At all times
All waste data to be kept on the local network	Engineers/EMSR	As required
Water Conservation		
Where practicable, reuse of collected water (e.g. rainwater, collected runoff water) is to be maximised on site.	Operations Manager	At all times
Rainwater collected from the roofs of specified buildings and structures on site is to be available for reuse on site (e.g. landscape irrigation).	Operations Manager	At all times
For surface water runoff from the site refer to the Surface Water and Ground Water Environmental Management Plan MAN-9491.	Operations Manager	

Reduce water consumption through education of personnel, regular inspection of plumbing for leakages and damage; and installation of water saving devices where possible.	Process Engineer / Operations Manager	Ongoing training / Regular Inspection
Additional methods to optimise water conservation during operation of the desalination plant are to be investigated on an ongoing and regular basis. Where practicable, new ways of conserving water will be implemented.	Operations Manager	At all times
Energy Conservation		
Ensure equipment / plant maintenance programs and pre-start checks are undertaken to keep plant / equipment operating efficiently.	Process Manager / Supervisors	At all times
Implement energy management awareness program as part of Induction, and where applicable, ongoing operations meetings.	EMSR	Induction
Undertake operational energy reviews to establish energy usage for the operations and identify measures to improve efficiency.	Operations Manager	Monthly during operations. Frequency may be reduced during Care and Maintenance Phase
Training and Awareness		
Implement waste and energy management awareness program as part of Sydney's Desalination Plant Operation Inductions and, where applicable, follow-up with ongoing meetings/toolbox talks. All Sydney Desalination Plant staff and subcontractors will be trained in the requirements of the Waste Environmental Management Plan and the waste hierarchy. Staff and subcontractors will be trained to minimise wastes, recognise which types of materials are recyclable and to be aware of their obligations to use recycling facilities provided on site.	EMSR	Induction
Requirements of the WEMP will be conveyed through Environmental Awareness Training.	EMSR	Initial training and refresher every 3 years.

Clearly signed and categorised waste bins will be provided in convenient locations for segregation of recyclable materials. Where applicable, waste management locations will be identified on work instructions.	Process Manager / Supervisors	Operations
Sydney Desalination Plant personnel will be provided with instruction on location of bins and any special storage or disposal arrangements (e.g. hazardous wastes, chemicals, waste oils / contaminated materials).	Process Manager / Process Engineer / EMSR	Operations
Monitoring, Auditing and Reporting		
Monitoring of waste management and recycling practices is to occur regularly at the plant, including recording the date and time of each waste removal event and the waste removal contractor.	Process Manager, Supervisors	Ongoing
Records of waste disposal and recycling (quantities, destination) will be recorded and reported in the monthly client report.	EMSR	Ongoing
Regular site inspections will be undertaken to assess general waste management and litter on the site.	Process Manager, Supervisors	Daily / Weekly
Monthly reporting to SDP on the amount of waste generated, including the amount recycled and the amount sent to landfill is to occur as part of Sydney's Desalination Plant reporting.	EMSR	Monthly
Operational energy usage will be recorded monthly, and reported to SDP.	Operations Manager	Monthly
Waste review will be conducted annually to assess the effectiveness of the waste management strategy and this Plan. This will also consider alternative waste management measures and options for beneficial reuse of wastes where appropriate	EMSR	Annually

Section 7. Monitoring, Inspection, Auditing and Reporting

7.1. Monitoring, Inspection, Auditing and Reporting Program

A regular reviewing, monitoring and reporting program for waste management will be conducted in accordance with the Environmental Monitoring Program and as follows:

- Waste records will be maintained to track wastes generated and/or subject to disposal from the site.
- The periodic inspections will include assessment of waste management and recycling practices including: status of waste bins (e.g. overflows, adequate containment), segregation of wastes, general waste management practices).
- An annual review will be carried out to assess this Plan. The review will consider alternative waste management measures and options for beneficial reuse of wastes where appropriate, in compliance with condition 4.6d of the Ministers Conditions of Approval.
- Details of operational wastes (backwash solids and lime sludge) and all other waste (office and maintenance) removed from site and quantities sent for beneficial reuse or recycling will be included in monthly reports submitted by the Operations Manager to the SDP on waste contribution from Sydney's Desalination Plant.
- Reviews of the waste management system will be carried out ad-hoc where a potential issue is identified, for example as a result of risk assessments conducted, or weekly site safety and environmental walks.

7.2. Review

A research and development program exists including both pilot trials and trials at the plant scale. The aim of the program is to optimise the functioning of plant process with a review of alternative waste management measures including options for beneficial reuse of wastes.

An awareness of technological improvements in the industry will assist the review of alternate waste management measures to be developed.

Periodic reviews (where possible in line with contract renewals) will occur to assess plant performance by evaluating parameters including: chemical consumption, waste water flows, amount of waste disposal, processes through a review of:

- production of waste over time
- process steps
- performance (pretreatment, WW treatment, WW dewatering, lime preparation, lime sludge dewatering, amount of waste disposed, chemical consumption, etc)

Section 8. Key Waste Management Roles

8.1. Roles and Responsibilities

In summary, the key responsibilities for waste and energy management are detailed in the table below.

Table 7 Roles and Responsibilities

Role	Responsibility
Operations Manager:	Responsible for ensuring that waste and energy management measures are implemented and maintained and, in the event of identified potential or actual breaches, to implement appropriate corrective or preventive actions to fulfil the requirements of this Plan. Responsible for advising applicable members of Sydney's Desalination Plant Team of complaints received pertaining to waste or energy management or misuse and facilitating the resolution of complaints.
Environmental Management Systems Representative (EMSR):	Responsible for ensuring this Plan is implemented by Sydney Desalination Plant personnel. Undertake and assess data from inspections, monitoring and reporting and provide project-wide advice to ensure consistent approach and outcomes are achieved. Responsible for providing necessary training for Sydney Desalination Plant personnel to cover waste minimisation and reuse management issues.
Process Manager:	Responsible for providing assistance to the Environmental Management System Representative to fulfil the requirements of this Plan and for ensuring that appropriate waste and energy management measures are implemented and maintained, and for reviewing performance of these measures.
Operations Supervisor:	Responsible for providing assistance to the Environmental Management System Representative to fulfil the requirements of this Plan and for ensuring that appropriate waste and energy management measures are implemented and maintained.
Maintenance Supervisor:	Responsible for providing assistance to the Environmental Management System Representative to fulfil the requirements of this Plan and for ensuring that appropriate waste and energy management measures are implemented and maintained.
Communications Representative	This role existed for the first three years of operation but now has transferred to the Operations Manager.