

Noise Environmental Management Plan for Sydney's Desalination Plant



Kurnell Site

Sir Joseph Banks Drive, Kurnell NSW 2231

Veolia Water Australia Pty Ltd

Level 4, No 65 Pirrama Road

NSW 2009 Australia

Tel: 02 8572 0300

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Section 1 Introduction

1.1 Purpose

The purpose of this Noise Environmental Management Plan (NEMP) is to describe how Veolia Water Australia (VWA) proposes to monitor, manage and minimise noise impacts on the community and the environment associated with the operation of Sydney's Desalination Plant as defined in the Operate and Maintain Contract and including the Drinking Water Pump Station.

The objective of this Plan is to ensure that noise impacts from the operation of Sydney's Desalination Plant are managed such that community, stakeholder and environmental impacts are minimised, with particular emphasis on "sensitive receivers".

1.2 Scope

This NEMP is applicable to all Veolia activities during the operation and maintenance phase of Sydney's Desalination Plant.

In particular, this NEMP has been prepared to address the requirements of:

- Ministers Conditions of Approval (MCoA) as issued by the NSW DoP (located at Google team Drive: [NSW KDP | Environment | Int > Reference Material > Background](#) 2006-project-approval-desalination-plant.pdf)
- Statement of Commitments (SoC) (Preferred Project Report Chapter 12) (located at Google team Drive: [NSW KDP | Environment | Int > Reference Material > Background](#) 2006-preferred-project-report.pdf)
- O&M Contract TS-09, and
- Applicable legislation (Refer to Section 4.1 of this plan)

Section 2 Operational Environmental Management Documentation

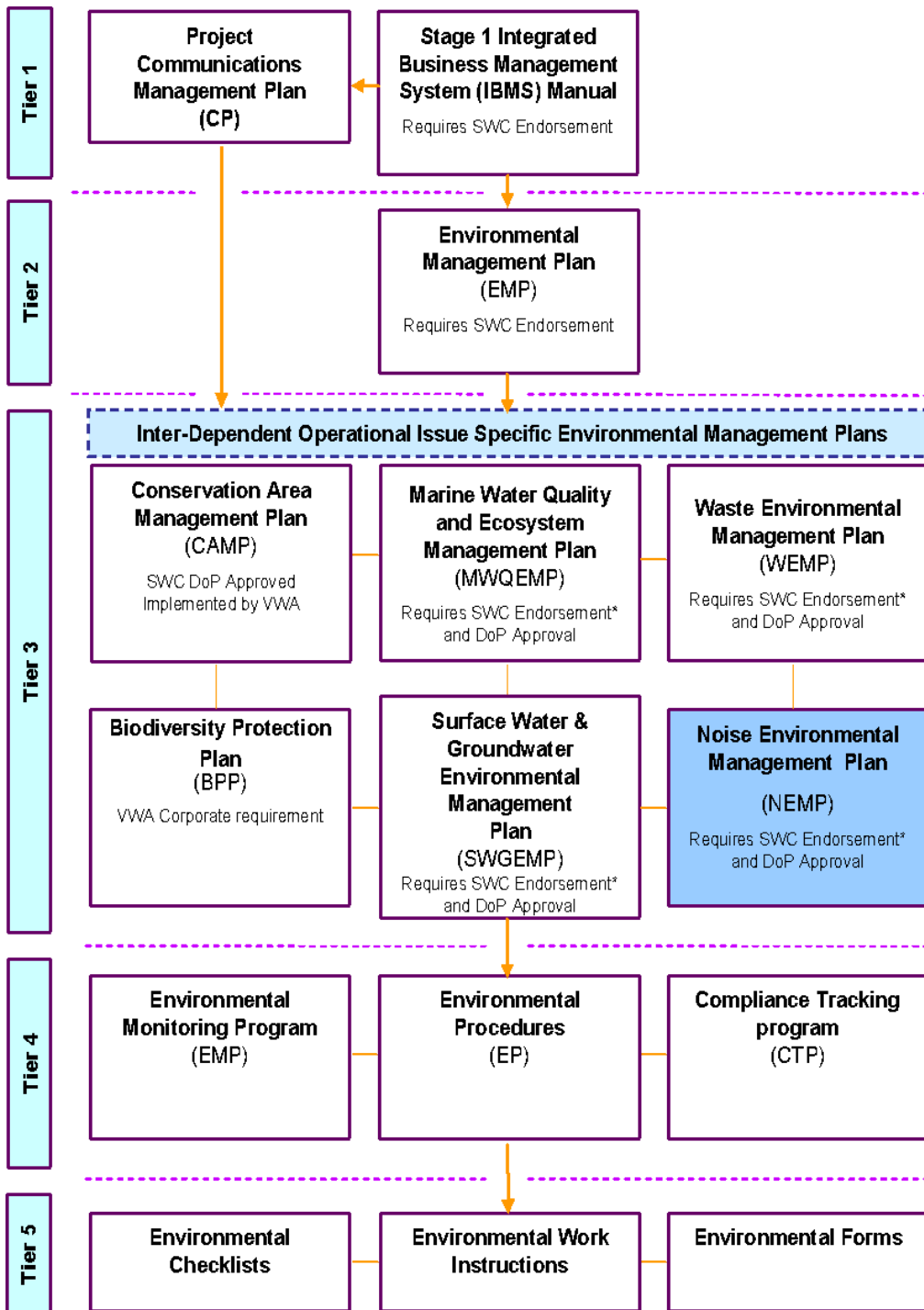


Figure 1 Environmental Documentation Flow Chart

The Environmental Management System (Tier 1) for the operation and maintenance phase of Sydney's Desalination Plant is described in the Integrated Business Management System (IBMS) Manual MAN-9490. The Environmental Management Plan (EMP) MAN-9490 Section 14 of the IBMS Manual (Tier 2) describes the centralised mechanism and environmental requirements that apply during operation and maintenance of Sydney's Desalination Plant.

This Noise Environmental Management Plan (NEMP) MAN-9675 Tier 3 is part of the Veolia environmental management suite of documents required for Sydney's Desalination Plant as illustrated above.

This Plan describes higher-level protocols, procedures and management measures that will be adopted to optimise, manage mitigate and/or minimise potential noise 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

Control of all environmental management documents will be managed in accordance with section 12 of the IBMS Manual.

Section 3 Background

The Environmental Assessment of the Concept Plan for Sydney's Desalination Project (EA) (Sydney Water Corporation, November 2005) along with the Preferred Project Report (PPR) (Sydney Water Corporation, August 2006) highlighted that there was the potential for noise impacts from operation of the desalination plant.

MCoA 2.9 states that the "Proponent shall derive noise limits for the project in accordance with the New South Wales Industrial Noise Policy (EPA, 2000)". BWJV derived operational noise criteria in accordance with the New South Wales Industrial Noise Policy. However, in November 2009, DoP advised that the BWJV derived limits were not accepted and set alternative operational noise limits for the plant. The operational noise limits set by DoP are shown in Section 5.

3.1 Plan Approval Process and Stakeholder Consultation

This NEMP has been endorsed by SWC and approved by the Department of Planning (DoP) prior to commencement of operation. Due to the fact that no specific concerns arose from background noise investigations, there was no requirement to hold specific consultations with other stakeholders.

Section 4 Legislative and other Requirements

4.1 Legislation

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

4.1.1 Acts:

Protection of the Environment Operations Act 1997. (POEO Act) makes the EPA (formerly DECCW) the appropriate regulatory authority and therefore responsible for regulating noise from activities scheduled under the POEO Act and for premises occupied by public authorities. Local councils are largely responsible for the management of noise in relation to non-scheduled activities, with local police also involved in neighbourhood noise matters. NSW Maritime enforces noise controls for marine vessels. Premises conducting scheduled activities are required to hold an Environment Protection Licence through which the EPA (formerly DECCW) can apply appropriate noise control conditions. Councils can control noise through conditions determined by council as part of development consent, issued under the planning legislation, and through Notices or Directions issued under the POEO Act.

4.1.2 Regulations:

POEO (Noise Control) Regulation 2008. Commenced on 1 March 2008 and addresses common noisy activities that occur in residential situations. It limits the time of day that noisy articles (such as lawn mowers, stereos and leaf blowers etc) are permitted to be heard in neighbouring residences. It also has provisions regarding motor vehicles (including noise limits) and addresses noise from marine vessels.

4.1.3 Policy:

NSW Industrial Noise Policy (EPA 2000). The specific policy objectives are to:

- establish noise criteria that protects the community
- use the criteria as the basis for deriving project specific noise levels
- promote uniform methods to measure and estimate noise impacts
- outline a range of mitigation measures to be used to minimise noise impacts
- provide a formal process to guide the determination of feasible and reasonable noise limits
- carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the act.

4.1.4 Criteria:

Environmental criteria for road traffic noise. Reflects Government policy on acceptable road traffic noise levels. The environmental criteria for road traffic noise aim to:

- provide a comprehensive and effective approach to managing road traffic noise
- consider the need to mitigate road traffic noise early in the road development process
- promote a range of strategies that should be applied to reducing traffic noise and prevent over-reliance on engineering noise controls such as noise barriers
- provide criteria that can be used to assess noise impacts for new and redeveloped roads and methodologies that recognise the benefits of all noise mitigation measures.

4.2 Compliance Obligations

Relevant compliance obligations set out in the DoP Minister’s Conditions of Approval (MCoA) and Statement of Commitments (SoC) are listed below with a cross reference to where the condition is addressed in this Plan and/or other project management documents that relate to operational noise management.

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 Register.

Table 1 Compliance Obligations

	No:	Requirement	Doc Ref:
MCoA	2.9	Prior to the commencement of construction of the project, the Proponent shall derive noise limits for the project in accordance with the New South Wales Industrial Noise Policy (EPA, 2000). The Proponent shall submit a copy of this noise assessment to the Director-General and the DEC. The Director-General may, in consultation with the DECCW, approve the noise limits derived for the project in which case, the noise limits shall henceforth apply to the project.	Section 5
	3.1	Within 90 days of the commencement of operation of Sydney’s Desalination Plant project, or as may be agreed by the Director-General, and during a period in which the project is operating under design loads and normal operating conditions, the Proponent shall undertake a program to confirm the noise emission performance of the plant. The program shall include but not necessarily be limited to:	Section 9
		noise monitoring, consistent with the guidelines provided in the New South Wales Industrial Noise Policy (DECCW, 2000), to assess compliance with the noise limits derived and approved under condition 2.9 of this approval;	Section 9
		methodologies for noise monitoring;	Section 9
		location of noise monitoring;	Section 9
		frequency of noise monitoring; and	Section 9
		identification of monitoring sites at which pre- and post-commissioning noise levels can be ascertained.	Section 9
		A report providing the results of the program shall be submitted to the Director-General within 28 days of completion of the testing required under a).	Section 9
	3.2	In the event that the program undertaken to satisfy condition 3.1 of this approval indicates that the operation of the desalination plant, under design loads and normal operating conditions, will lead to greater noise impacts than permitted under condition 2.9 of this approval, the then Proponent shall provide details of	Section 9

		remedial measures to be implemented to reduce noise impacts to levels required by that conditions. Details of the remedial measures and a timetable for implementation shall be submitted to the Director-General for approval within such a period as the Director-General may agree.	
	4.6(a)	A Noise Management Plan to outline monitoring, management procedures and measures to minimise total operational noise emissions from the project. The Plan shall also include, but not necessarily be limited to:	This Plan
		identification of all relevant receivers and the applicable criteria at those receivers commensurate with the noise limits derived/ applied under this approval;	Sections 5 & 6
		identification of activities that will be carried out in relation to the project and the associated noise sources;	Sections 6 & 7
		assessment of project noise impacts at the relevant receivers against the noise limits specified under this approval;	Section 7
		details of all management methods and procedures that will be implemented to control individual and overall noise emissions from the site during the project;	Section 8
		development of reactive and pro-active strategies for dealing promptly with any noise complaints;	Sections 8 & 9
		noise monitoring and reporting procedures;	Section 9
		regular internal audits of compliance of all plant and equipment with acceptable design noise;	Section 8
SoC	33	An assessment of operational noise impact of the desalination plant design will be undertaken and intrusiveness and amenity criteria established in accordance with the NSW Industrial Noise Policy (EPA, 1999). An Operational Noise Management Plan will be prepared and include:	Sections 5 & 7
		Amenity criteria for affected residential areas, Botany Bay National Park and recreation reserves;	Section 5
		Development of sleep disturbance criteria;	Section 5
		Scheduling of heavy vehicle movements associated with the operation of the desalination plant during the daytime (7am to 6pm) where possible; and	Section 8
		Identification of design mitigation measures as needed to reduce operational noise levels including controls on equipment and noise mitigation barriers.	Section 8

Section 5 Operational Noise Criteria

Table 2 shows the operational noise limits set by DoP that supersedes those originally set by BWJV.

Table 2 Site Specific Operational Noise Limits

Location	Noise Limits dB(A)			
	Day	Evening	Night	
	LA _{eq} , 15 minutes	LA _{eq} , 15 minutes	LA _{eq} , 15 minutes	L _{Amax}
Residence on Horning Street, Kurnell	39	39	39	54
Residence on Tasman Street, Kurnell	37	37	37	54
Residence on Torres Street, Kurnell	35	35	35	52
Any residence on Shepherd Street, Kurnell	35	35	35	52

The limits shown in Table 2 apply under all meteorological conditions except for and one of the following:

- a) wind speeds greater than 3 meters per second at 10 metres above ground level; or
- b) stability category G temperature inversion conditions; or
- c) stability category F temperature inversion conditions and wind speeds greater than 2 metres per second at 10 metres above ground level.

Section 6 Project Impacts

Veolia’s operation of Sydney’s Desalination Plant has the potential to result in noise impacts to sensitive receivers from the following elements:

- Heavy vehicle movements associated with the delivery of chemicals and other supplies required for operation of the plant and removal of treatment residuals and waste.
- General operation of Sydney’s Desalination Plant. This relates mostly to noise from pumps, plant and equipment operating 24 hours per day.
- Maintenance activities such as the use of hand tools and mobile plant and equipment such as forklifts, elevated work platforms and mobile cranes.

Note that this plan does not address any additional noise impacts associated with the future expansion of the plant to 500 ML/d. Separate noise management plans for the construction and operations phases of the expanded plant would be submitted in the event of the expansion proceeding.

6.1 Identified Receivers

Land uses on the Kurnell Peninsula surrounding the desalination plant are predominantly industrial and residential, but also include an educational facility/school, Botany Bay National Park and recreational reserves. Identified noise receivers that represent the affected areas, and their distance from Sydney’s Desalination Plant site are described in Table 3 below.

Table 3 Sydney’s Desalination Plant Sensitive Receivers

Receiver	Approximate Distance from the Plant
Residences-Horning Street	<1km (800m-1000m)
Residences –Tasman Street	<1km (800m-1000m)
Residences – Torres Street	<1km (800m-1000m)
Residences-Shepherd Street	<1km (800m-1000m)

Section 7 Operational Noise Assessment

Aecom (formerly Bassett Acoustics) were engaged by BWJV to undertake an assessment of the noise associated with operation of the desalination plant based on a 250 ML/d seawater desalination plant (Operational Noise Assessment, 02-11-2009, 60024755-OpNoise (Rev10) REP). Consideration was also given in this operational noise assessment to the potential future upgrade of the plant to operate at 500ML/day.

Modelling of the 250 ML/day and 500 ML/day plant options was undertaken as these are the two extreme operating scenarios (i.e. the 250 ML/day plant may be upgraded to a 500 ML/day operation). The plant was modelled with and without the drinking water pumping station (DWPS).

The operational noise assessment made specific consideration of the following:

- Sydney's Desalination Plant design layout;
- Tabulated plant and equipment required for the operational desalination plant including a review of where the plant and equipment is located on site.
- Building designs including ventilation and architectural requirements; and
- Identified receivers referenced in Section 6.1 above.

Based on the assumptions and modelling parameters as set out in the previous sections, the predicted operational noise levels (with and without the DWPS) were modelled.

It is important to note that the assumptions were based on operational levels that did not include the use of acoustic covers. Acoustic covers are normally in use for blowers when the plant is operational and as a result the actual noise levels may be less than those modelled.

The results of this assessment indicated that operational noise emissions comply with the operational noise limits, even without acoustic covers in place. Based on the pre-existing background environmental noise levels at the nearby noise sensitive areas, the predicted operational noise emission from the desalination plant was not expected to have an adverse impact on the adjacent residential area of Kurnell.

A further WHS Noise Assessment was carried out in June 2020 by SLR Consultants ([NSW KDP | Safety | Noise Monitoring June 2020](#)). All measurements taken found that the noise levels on the site were within the unspecified limits.

7.1 Sleep Disturbance

The night time noise emissions from the plant are generally associated with relatively constant pumping activities. Therefore no significant peak noise events are expected. The discussion on sleep disturbance contained in the DECCW publication Environmental Criteria for Road Traffic Noise (ECRTN) concludes that maximum internal noise levels below 50-55dBA are unlikely to cause awakening reactions.

Due to the >800m separation between the plant site and the nearest residential sensitive receiver on Horning Street, maximum internal noise events exceeding 50dB(A) would not be expected from the desalination plant operation.

Figure 1 Operational noise measurement and site visit location



Image courtesy of nearmap

Section 8 Noise Management Measures

Whilst the results of the noise assessment indicated that operational noise emissions, up to the maximum capacity of the facility, comply with the operational noise limits outlined in Section 5, a number of noise management measures have been implemented to ensure this performance is maintained.

This section details the noise management measures that have been implemented to assist in the control of noise emissions from operation of Sydney’s Desalination Plant.

8.1 Mitigation

The plant has been designed, constructed, and equipment selected to ensure that noise emissions are minimised.

During the operation of the plant, the scheduling of heavy vehicle movements occurs during the daytime (7am to 6pm) where possible. Daytime deliveries may not always be practical when contractors are required to travel outside of normal working hours due to RTA or NSW Police restrictions (i.e. oversize or dangerous goods) and transport contractor requirements (i.e. long haul delivery schedules); It is built into the business system to request daytime deliveries where practical.

Acoustic covers, where fitted, are in place when equipment is operating wherever possible. It may be necessary to conduct some maintenance activities without the acoustic covers in place. If acoustic covers are to be permanently removed, the Change Management process will be followed and additional noise monitoring conducted as required.

Internal audits of compliance of all plant and equipment with acceptable design noise will be conducted at regular intervals not exceeding three years while the plant is operating. Veolia has assessed that due to the greatly reduced noise from a mothballed plant, audits against design noise will not be conducted during mothball, but will be conducted within the first year of restart.

In addition, all pump-sets having a motor power:

- greater than 110 kW will be equipped with vibration protection equipment, or
- greater than 350kW shall be equipped with on-line vibration monitoring equipment

These measures will ensure equipment operating above normal noise levels is promptly detected and properly maintained (as per the Asset Management Plan section 9.6 of the IBMS Manual) to ensure noise emissions continue to comply with the design noise.

The following table presents a summary of the management of mitigation measures.

Table 3 Mitigation measures

Management of Mitigation Measures	Responsibility	Timing	Status
General Operation and Maintenance Activities			
During the operation of the plant, the scheduling of heavy vehicle movements will occur during the daytime (7am to 6pm) where possible.	Operations Manager	Ongoing	Ongoing
Chemical and other deliveries to the desalination plant site to be during the daytime (7am to 6pm) where possible.	Operations Manager	Ongoing	Ongoing
Complaints regarding noise emissions from the plant will be managed in accordance with the Project Communications Plan (Section 11.8 of the IBMS Manual).	Operations Manager	Ongoing	Ongoing

Changes to plant equipment or design to be assessed for impacts on noise prior to implementation via the Change Management process.	Operations Manager	Ongoing	Ongoing
Asset Management and Maintenance			
All noise generating equipment is to be adequately maintained and replaced as per the Asset Management Plan section 9.6 of the IBMS Manual	Maintenance Supervisor	At all times	Ongoing
Pumps with a motor power greater than 110kW will be equipped with vibration protection equipment.	Operations Manager	At all times	Ongoing
Pumps with a motor power greater than 350kW will be equipped with online vibration monitoring equipment.	Operations Manager	At all times	Ongoing
Acoustic covers for equipment (where fitted) will be left in place whenever possible.	Operations Manager	Where possible	Ongoing
Training and Awareness			
Implement noise 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 NEMP. Staff and subcontractors will be trained to minimise noise generation on site.	EMSR	Induction	Ongoing
Monitoring, Auditing and Reporting			
Internal audits of plant and equipment of acceptable design noise compliance will be conducted.	O & M Supervisor	At least 3 yearly or in response to complaints or identified noise level exceedence	Ongoing
Monitoring at sensitive receiver's	O & M Supervisor	Refer to Section 9 Table 4	Complete

8.2 Complaints

Complaints regarding noise emissions from the plant will be managed in accordance with the Project Communications Plan (Section 11.8 of the IBMS Manual) and will prompt a noise assessment

Section 9 Noise Monitoring

Initial noise monitoring was performed in accordance with MCoA 3.1 of Sydney’s Desalination Plant, within 90 days of commencement of operation of the plant. Noise monitoring was undertaken at the receivers identified in Table 4 (and as per the Noise Monitoring Procedure PRO-9735 to determine if the noise emissions from the operation of the plant comply with the derived noise limits (as outlined in Section 5 above).

Noise monitoring was undertaken consistent with the guidelines provided in the NSW Industrial Noise Policy (EPA, 2005) by a suitably qualified professional acoustic consultant.

A summary of the monitoring program including both the initial and ongoing monitoring requirements are summarised in Table 4, and as also defined in the Environmental Monitoring Program which is located on the Kurnell Google Drive in [NSW KDP | Environment | Reporting](#). This includes the identified sensitive receivers at which noise levels can be confirmed if necessary.

Table 4 Operational Noise Monitoring Locations

Receivers	Type of Monitoring	Initial Monitoring Post Operation of Plant	Ongoing Monitoring
Residences-Horning Street	Attended 1	On two occasions during the period within 90 days of commencement of operation of the desalination plant. (Completed 28/10/10 and 04/11/10)	<ul style="list-style-type: none"> • In the event of complaints being received • As a result of changes to the plant that could affect noise levels.
Residences –Tasman Street	Attended 1	On two occasions during the period within 90 days of commencement of operation of the desalination plant on the same evenings/ nights as for Horning Street. (Completed 28/10/10 and 04/11/10)	
Residences – Torres Street	Attended 1	On two occasions during the period within 90 days of commencement of operation of the desalination plant on the same evenings/ nights as for Horning Street. (Completed 28/10/10 and 04/11/10)	
Residences-Shepherd Street	Attended 1	On two occasions during the period within 90 days of commencement of operation of the desalination plant on the same evenings/ nights as for Horning Street.(Completed 28/10/10 and 04/11/10)	
	Attended At source sound power monitoring of key plant and equipment	Two weeks during the period within 90 days of commencement of operation of the desalination plant and as a result of any non-compliances during the off-site noise monitoring. (Completed 28/10/10 and 04/11/10)	<ul style="list-style-type: none"> • As a result of any non-compliance, • Where there is a significant change to plant operation • As a minimum every 3 years when the plant is operating

NOTES

1. Due to the distance of the desalination plant from receivers, it is considered that attended monitoring will provide the most accurate representation of noise levels (i.e. unattended noise monitoring will be confused with extraneous sources of noise closer to Kurnell Village).
2. No monitoring is proposed at the Caltex Refinery due to the nature of the operations at the oil refinery (i.e. operates 24 hours per day).
3. No monitoring is proposed at Continental Carbon due to the distance from the desalination plant.
4. Boral masonry. No monitoring is proposed as the Boral masonry site is not occupied.

Initial monitoring Post Operation of Plant results of the operational noise monitoring program were provided in a report The Department of Planning within 28 days of completion of the monitoring program.

Results of the monitoring program will be recorded in the Compliance Tracking Register.

If the monitoring outlined above shows that noise levels exceed the operational noise limits, then remedial measures will need to be considered in consultation with the acoustic consultant. A report detailing the proposed remedial measures and the timeframe for their implementation will be submitted to The Department of Planning. This report would also include a program of additional monitoring to confirm that remedial measures implemented result in compliance with the derived noise limits.

As there have been no results exceeding the prescribed limits after initial testing, ongoing monitoring at the receivers is not required unless complaints are received or significant changes that may increase noise levels are made to the plant.

Section 10 Roles and Responsibilities

In summary, the key responsibilities for noise management are detailed in the table below.

Table 5- Roles and Responsibilities

Role	Responsibility
Operations Manager:	Responsible for ensuring that noise management and mitigation measures are implemented and maintained and, in the event of identified potential or actual breaches, to implement appropriate corrective or preventative actions to fulfil the requirements of this Plan, including 90 day post operation monitoring (now complete).
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 noise mitigation and management issues.
Process Engineers:	Responsible for providing assistance to the Environmental Management Systems Representative to fulfil the requirements of this Plan and for ensuring that appropriate noise management measures are implemented and maintained, and for reviewing performance of these measures.
Operations Supervisor/Maintenance Supervisor:	Responsible for providing assistance to the EMSR to fulfil the requirements of this Plan and for ensuring that appropriate noise management measures are implemented and maintained.
Communications Representative	Responsible for advising applicable members of Sydney’s Desalination Plant Team of complaints received pertaining to noise management and facilitating the resolution of complaints. Role exists for first three years of operation. Responsibilities subsequently revert to Operations Manager .

Section 11 Definitions

Abbreviation	Definition
BWJV	Blue Water Joint Venture
DoP	NSW Department of Planning (now DPIE)
DPIE	NSW Department of Planning, Industry and Environment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan (Section 14 of IBMS)
EMS	Environmental Management System (See IBMS)
EPA	Environment Protection Authority (now part of DPIE)
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	Ministers 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
SEPP	State Environmental Planning Policy
SoC	Statement of Commitments
SSC	Sutherland Shire Council
SWC	Sydney Water Corporation
TS-09	Technical Schedule-09 Environmental Requirements – Operate and Maintain Contract
VWA	Veolia Water Australia

Section 12 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
CAMP	Conservation Area Management Plan	SWC
SWGEMP	Surface Water and Groundwater Environmental Management Plan	MAN-9491
WEMP	Waste Environmental Management Plan	MAN-9676
TIER 4		
CTR	Compliance Tracking Register	
EMPR	Environmental Monitoring Program	