

# Victorian Desalination Project



## Commissioning Environmental Sub-Plan

### Attachment I.4 –Commissioning Monitoring Program, Interfacing with the BMMP and OMMP

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Attachment I.4 –Commissioning Monitoring Program, Interfacing with the BMMP and OMMP

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## Attachment I.4 –Commissioning Monitoring Program, Interfacing with the BMMP and OMMP

### Definitions and Acronyms

The following Definitions and Acronyms are used in this document:

AEMP	Area Environmental Management Plan
BMMP	Baseline Marine Monitoring Program
CESP	Commissioning Environmental Sub Plan
CWMS	Construction Work Method Statements
D&C	Design and Construct Phase of the Victorian Desalination Project
OMMP	Operational Marine Monitoring Program
DSE	Department of Sustainability and Environment
EES	Environmental Effects Statement
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
EPA	Victorian Environment Protection Authority
EP Act	Environment Protection Act 1970
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
O&M	Operation and Maintenance Phase of the Victorian Desalination Project
OHS	Occupational Health and Safety
Performance Criteria	The Performance Criteria outline the overarching requirements based on the environmental objective for each Subject Area of Schedule A of Appendix S3 of the Project Scope and Project Requirements
SEPP	State Environment Protection Policy
VDP	Victorian Desalination Project
WAP	Work Area Packages



## Attachment I.4 –Commissioning Monitoring Program, Interfacing with the BMMP and OMMP

### 1 Purpose

The purpose of this document is to provide details of the Baseline Marine Monitoring Program (BMMP), the Operational Marine Monitoring Program (OMMP) and how they interface with the Victorian Desalination Project (VDP) commissioning process.

This document is an attachment (Attachment I.4) to the Commissioning Environmental Sub Plan (CESP), and is relevant, but not limited to, the following attachments:

- Attachment I.1 – Environmental Risk Register
- Attachment I.2 – Commissioning Management Strategies
  - Attachment I.2.1 Seawater Lift Pump Commissioning Management Strategy
  - Attachment I.2.2 Pre-Treatment Commissioning Management Strategy
  - Attachment I.2.3 Reverse Osmosis and Potabilisation Commissioning Management Strategy
  - Attachment I.2.4 Overall Systems Commissioning Management Strategy
- Attachment I.3 – Monitoring, Inspection, Reporting and Auditing Schedule
- Attachment I.5 – Monthly Environmental Checklist

This document should be read in conjunction with the following documents:

- Baseline Marine Monitoring Program (RP-TDV-EN-1-A-000-0000-0-04)
- Operational Marine Monitoring Program (TDV-0-EV-RP-0200)
- Design and Construction EMP (TDV-0-EV-PL-0010)
- Marine D&C AEMP (TDV-0-EV-PL-0013)
- Plant D&C AEMP (TDV-0-EV-PL-0011)
- Utilities D&C AEMP (TDV-0-EV-PL-0012)

### 2 Background to Marine Monitoring Programs

The potential impacts of the intake of seawater and discharge of concentrated seawater and process chemicals as well as induced currents were assessed in the “Victorian Desalination Project. Environmental Effects Statement” (August 2008) and associated technical appendices in accordance with the Ministerial guidelines for assessment of environmental effects under the Environmental Effects Act 1978 and the Minister for Planning Scoping Requirements for the Environmental Effects Statement (EES) (May 2008).

The EES recognised the need for a range of marine ecosystem monitoring tasks to determine the actual extent and level of impact of the discharge, intake and combined effects to:



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- Comply with environmental regulations (SEPP (Waters of Victoria));
- Comply with likely discharge licence conditions;
- Validate the extent of effects predicted in the EES;
- Refine or reduce the extent of the mixing zone for aquatic ecosystems;
- Detect long term changes;
- Ensure protection of marine communities in marine protected areas and nominated high relief reefs;
- Provide information on ecosystem responses which would inform triple-bottom-line assessment of future development options at the Wonthaggi site or elsewhere in Victoria; and
- Provide a basis for evaluation of future potential marine environmental offsets.

In addition, pursuant to the *Environment Protection (Scheduled Premises and Exemptions Regulations) 2007*, water desalination plants having a design capacity to process more than 1 megalitre per day of feed water are defined as a scheduled premises (Type Number K 04) and are subject to the works approval and licensing provisions of the Environment Protection Act 1970.

An operating licence is therefore required from the EPA, for the outlet to discharge the brine into the marine environment. The operating licence is contingent on conditions specified in the PRs, the EPA Works Approval Conditions (WAC) and associated discharge license as well as guidance statements being met in the plant operation.

### **3 Baseline Marine Monitoring Program**

The EES recognised that the monitoring program would require a *“Before component to determine the nature of existing biological communities (a times series) of information on conditions before the return water discharge commences is desirable to establish a baseline for future post-commissioning conditions. This period will also allow for refining monitoring methods.”*

The BMMP has been designed to collect biological baseline information from the marine environment offshore of Williamsons Beach, Wonthaggi, Victoria. This baseline information will inform the longer term impact monitoring of the operation of the marine intake and outlet for the Victorian Desalination Project (VDP).

The marine monitoring described in the BMMP will continue throughout the Commissioning Phase. Programs will have been optimised during the pre-operational period through a rigorous review process. Design of the BMMP has been governed by the Works Approvals Conditions (WAC), Performance Requirements (PRs) and guidance from the former Minister for Environment and Climate Change.

The objective of the BMMP is to:

- Collect sufficient baseline data prior to operation for use in subsequent monitoring to assess the impact of the plant operations on the marine environment



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- Collect sufficient baseline data prior to operation for use in subsequent monitoring to assess the impact of the plant operations on coastal processes.

Once the plant is operational, the baseline monitoring data will be used:

- To detect and manage changes, if any, due to salinity exposure of the reef community in the path of the dispersing plume
- To detect and manage changes, if any, to near shore reef biodiversity due to combined entrainment effects from the intake and outlet
- To detect and manage changes, if any, to Williamsons Beach coastal processes from sand entrainment and from changes in wave climate due to the presence of intake and outlet structures.

### 3.1 Baseline Marine Monitoring Programs – Interface with Commissioning

The BMMP includes a Coastal Processes program and a Marine Ecosystem program which were developed in order to collect baseline data to allow detection of any potential impact upon operation. The BMMP did not define the process or mechanism to analyse impacts; the intent was to develop the strategies during the baseline period, which would be implemented as part of the OMMP once the plant became operational.

The Marine Ecosystem Monitoring Program was informed by the modelling and research undertaken as part of the Works Approval conditions 2.2 – 2.3 and has been designed to allow an impact to be measured outside of a Mixing Zone, to be confirmed at a later date. During commissioning there is a potential for impacts to occur and as the Mixing Zone will not be established until the plant has been fully commissioned there is the requirement to investigate these potential impacts prior to implementation of the OMMP.

The Coastal Processes component does not rely on a Mixing Zone being established, as the program relies on comparison of coastal features before and after operation. However the operation of the marine structures during commissioning (e.g. intake of seawater) may result in changes to coastal processes and therefore impact monitoring is also required.

The impact monitoring during commissioning for both programs will be carried out under the existing BMMP framework, with quarterly reviews of data and analysis informed by the modelling, research and investigations undertaken thus far. Development of triggers and analysis methods has been a key component of the quarterly reporting undertaken to date. Discharge to the marine environment is permitted under Section 30A Commissioning Approvals which will remain in place until the plant obtains the Discharge Licence (which will define the Mixing Zone).

The change from baseline monitoring to impact monitoring is governed by the aspect of the plant being commissioned and the relevant impact pathway being investigated. As the plant is also operating under a Section 30A Commissioning Approval, it is necessary to also perform assessments in order to confirm the validity of modelling work undertaken to date as well as the design of the monitoring programs and their suitability for impact monitoring under a Discharge Licence. These relationships are discussed in further detail in Table 3-1, together with the purpose of each program and its relevance to the commissioning process.

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**Table 3-1 BMMP Components and Interface with Commissioning**

Monitoring Program	Purpose	Interface with Commissioning
Marine Ecosystem Monitoring Program	This program collects baseline data in order to allow the assessment of impacts relating to operation of the intake and outlet on marine flora and fauna.	<p>For inshore components of the BMMP which investigate entrainment, impact monitoring will commence with the commissioning of the seawater lift pump station and intake of seawater.</p> <p>For offshore components, which investigate the impact of brine exposure, impact monitoring will commence with discharge of brine during the reliability test of stream 1.</p> <p>Prior to these events, monitoring data will be considered baseline.</p> <p>The design of these programs will be informed by further investigations carried out during commissioning. During the reliability test of stream 1 a Tracer Test will be performed to validate the hydrodynamic modelling undertaken for Works Approval conditions 2.2 – 2.3 (and subsequent additional monitoring performed following approval). On the basis of the information collected the location of the monitoring sites and their assignment to various analysis classes (e.g. Reference, Test or Impact (Mixing) Zone) will be reviewed and adjusted if necessary.</p> <p>During commissioning a Direct Toxicity Assessment will also be undertaken to confirm the safe dilution factor of 30:1 demonstrated for the Works Approval conditions 2.2 – 2.3. The results of this assessment will be used to confirm the monitoring site analysis classes (as described above).</p>
Coastal Processes Monitoring	This program collects baseline data in order to allow assessment of impacts relating to sand entrainment through the intake and presence of offshore structures that may impact on coastal processes.	Data collection ceases to be 'baseline' immediately prior to intake of seawater. Intake of seawater first occurs during the commissioning of the Marine Tunnels and Sea Water Lift Pump Station. The presence of a Mixing Zone is not required and therefore the impact analysis will not differ from that done as part of the OMMP. Triggers and analysis methods have been developed as part of the BMMP quarterly reports.

## 4 Operational Marine Monitoring Program

The Operational Marine Monitoring Program (OMMP) is required in order to assess the impact of the plant, during the operation and maintenance phase. The OMMP must demonstrate compliance with the Discharge Licence and associated Mixing Zone (to be established during Commissioning) under the Environment Protection Act. Design of the OMMP has thus been governed by the PRs developed for the VDP EES and the WACs and guidance statements provided by the EPA and the Department for Sustainability and Environment (Biodiversity and Ecosystem Services).

The monitoring programs form an integrated monitoring framework, whereby, each program informs another using a “multiple lines of evidence” approach, and include:

- In-Plant Water Quality Monitoring Program

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- Diffuser Performance Monitoring Program
- Ecological Monitoring Program
- Coastal Processes

Investigative monitoring will also take place in response to non-conformances on an as needed basis, as outlined in the OMMP.

Certain aspects of the OMMP have been incorporated into the Section 30A Commissioning Approval Application (TDV-0-EV-PL-0500) and will therefore be implemented during the commission phase. Table 4-1 provides a description of these monitoring programs and the relevance to commissioning activities.

**Table 4-1 OMMP Components Interfacing with Commissioning**

Monitoring Program	Purpose	Interface with Commissioning
In-Plant Water Quality Monitoring Program	Plant monitoring will be undertaken daily for the early detection of potential exceedances at the expected Mixing Zone. Daily monitoring will include flow rate and physicochemical parameters at the plant intake and outlet. Water quality parameters including metals will be sampled at appropriate times during commissioning.	Commences immediately following discharge to the outlet. Discharge first occurs with commencement of the Seawater Lift Pump Commissioning Management Strategy (Attachment I.2.4).
Diffuser Performance Monitoring Program	Verification of diffuser performance (dilution) through measurement of salinity at the expected Mixing Zone boundary.	Commences following discharge of brine and upon completion of the Tracer Testing (Diffuser Validation). Brine is first discharged during the Reliability Test of Stream 1 as part of the Overall Systems Commissioning Management Strategy (Attachment I.2.4), which runs in parallel with the commissioning of Streams 2 and 3 (as set out in Attachment I.2.2 – Pre-treatment Commissioning and Attachment I.2.3 – Reverse Osmosis and Potabilisation Commissioning)

## 5 Summary

In practice, data collection associated with the BMMP continues throughout commissioning and under the OMMP into operations. However the analysis of this data and mechanisms controlling the implementation are adjusted according to the aspect of the plant being commissioned i.e. upon intake of seawater (Coastal Processes component and inshore component of the Marine Ecosystem Monitoring Program) and discharge of brine (offshore component of the Marine Ecosystem Monitoring Program). Upon completion of Commissioning at Reliability Testing and Finalisation (i.e. when all 3 streams have been commissioned and tested) the BMMP becomes obsolete and the OMMP commences.



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Intake of seawater first commences during the Seawater Lift Pump Station Commissioning Strategy (Attachment I.2.1). Brine is first discharged during Overall Systems Commissioning (reliability test of Stream 1), which is the fourth element of the commissioning process, and runs in parallel with the commissioning of Stream 2 and Stream 3 (as set out in Attachment I.2.2 – Pre-treatment Commissioning and Attachment I.2.3 – Reverse Osmosis and Potabilisation Commissioning).