

**Review of subtidal reef monitoring licence conditions for the  
Adelaide Desalination Plant:  
June 2014**

**Prepared for  
AdelaideAqua Pty Ltd  
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## EXECUTIVE SUMMARY

### Purpose

This document represents a report on the extent to which monitoring of subtidal ecosystems from selected sites in the vicinity of Port Stanvac meets with the EPA Licence conditions for the construction and operation of the Adelaide Desalination Plant (ADP) over the period February 2009 to 12-Dec-2013. The monitoring reports were associated with the construction (including commissioning) of the desalination plant (by AdelaideAqua D&C Consortium – AAD&C) from February 2009 to 12-Dec-2012 and to the operation of the desalination plant (AdelaideAqua Pty Ltd) from 12-Dec-2012 to 12-Dec-2013.

### Background

AdelaideAqua Pty Ltd is the operator of the Adelaide Desalination Plant at Port Stanvac South Australia. Operation of the ADP requires the discharge of reject water to the marine environment; this activity was originally conducted under a license issued to AAD&C by the Environment Protection Authority of South Australia (EPA License Number 26902) and subsequently under another license issued to AAPL (EPA License Number 39143). These licenses authorised AAD&C and AAPL to undertake a series of activities of environmental significance under Schedule 1 Part A of the Environment Protection Act 1993 (the Act). The licenses had specific requirements in relation to “Discharges to Marine Waters” that are the subject of this report.

Section 14 (305-626) of the license requires that the licensee must ensure that:

1. An independent review of all marine monitoring is conducted by independent specialist(s) as approved in writing by the EPA prior to the review commencing;
2. All marine monitoring from the period commencing with the issue of the license and ending 12 months after project handover of the 100 GL desalination plant is included in the review; and
3. The full results of the review are provided to the EPA not more than 18 months after project handover of the 100 GL desalination plant.

The EPA has also advised that prior to appointment, the independent reviewer must be able to demonstrate to the EPA that:

1. They will use their own professional judgment;
2. They will take appropriate specialised advice when the issue is outside their expertise;
3. Their opinions will be reached independently;
4. In forming opinions, they will not be unduly influenced by the views or actions of others who may have an interest in the outcome of the review; and
5. They must declare any real or apparent conflict of interest.

With the approval of the EPA, Anthony Cheshire (the author of this report) was selected by AdelaideAqua Pty Ltd (AAPL) to undertake this review.

## Approach

This review of subtidal reef monitoring encompassed a study of all documentation provided by AdelaideAqua Pty Ltd which comprised a series of 8 monitoring reports each of which was produced by staff at AAD&C, AAPL or by experts contracted by the parties for that purpose.

Each report has been critically reviewed and key issues that pertain to compliance with the licence conditions have been aggregated into a summary that has been presented in this report.

### *Specific requirements*

To consider the work done against the Scheduled Marine Monitoring Requirements detailed in Attachment A to licenses 26902 and 39143. These being:

Conduct two surveys per year of benthic flora and fauna on the sub-tidal reef at 20 sites, including five reference sites.

### *General requirements*

In addition the EPA require that the Independent Reviewer is to undertake a technical review of all marine monitoring results from the commencement date of the License 26902 (D&C) until 12 December 2013 (12 months after plant handover) in order to assess the environmental impact of the desalination plant. This matter will be addressed in a subsequent report.

## Conclusion

Surveys of subtidal reefs were undertaken to provide baseline data on subtidal reef communities.

The overall design of the subtidal reef monitoring program provides a robust framework for assessing whether or not there has been an environmental impact associated with the construction and early stage operation of the ADP. The specific requirement is for a survey design that covers 20 sites, including 5 reference sites, each surveyed two times per year. The design of the monitoring program that has been implemented comprises 10 sites (2 at each of 5 locations); these sites include 2 putatively impacted sites at Port Stanvac and 8 reference sites across the remaining four locations.

In the first year sampling was undertaken at four different times, sampling in 2010 occurred on 2 occasions, similarly in 2011 and in 2012.

While the scope of the sampling program as implemented differs from the design outlined in the licence condition (10 sites surveyed vs 20 sites as required), the design appears to be robust and has been developed to support detection of an environmental impact should one occur.

## LICENCE CONDITION: SUBTIDAL REEF MONITORING

In the following the specific requirements pertaining to the licence condition (subtidal reef) are summarised along with information about the documents that have been reviewed.

Documents reviewed for this licence condition:

Document Name	Reference
reef_autumn09.pdf	Russell, B. and Connell, S. (Not dated). Reef habitats of Gulf St Vincent. Autumn progress report to AdelaideAqua. School of Earth and Environmental Sciences, The University of Adelaide.
reef_winter09.pdf	Russell, B. and Connell, S. (Not dated). Reef habitats of Gulf St Vincent. Winter progress report to Adelaide Aqua.. School of Earth and Environmental Sciences, The University of Adelaide.
reef_spring09.pdf	Russell, B. and Connell, S. (Not dated). Reef habitats of Gulf St Vincent. School of Earth and Environmental Sciences, The University of Adelaide.
subtidal_final.pdf	Russell, B.D. and Connell, S.D. (2010). Patterns of rocky subtidal assemblages across the Adelaide Metropolitan coast: a baseline in relation to future coastal desalination for Adelaide City. School of Earth and Environmental Sciences, The University of Adelaide.
reef_feb11.pdf	Russell, B. and Connell, S. (2011). Reef habitats of Gulf St Vincent. Data report to Adelaide Aqua January - February 2011. School of Earth and Environmental Sciences, The University of Adelaide.
reef_aprmay11.pdf	Russell, B. and Connell, S. (2011). Reef habitats of Gulf St Vincent. Data report to Adelaide Aqua April - May 2011. School of Earth and Environmental Sciences, The University of Adelaide.
subtidal_final_sum12.pdf	Russell, B.D. and Connell, S.D. (2012). Rocky subtidal assemblages across the Adelaide Metropolitan coast, a baseline in relation to future coastal desalination for Adelaide City: Summer 2012 final report.. School of Earth and Environmental Sciences, The University of Adelaide.
subtidal_final_win12.pdf	Russell, B.D. and Connell, S.D. (2012). Rocky subtidal assemblages across the Adelaide Metropolitan coast, a baseline in relation to future coastal desalination for Adelaide City: Final Winter 2012 report.. School of Earth and Environmental Sciences, The University of Adelaide.

### Specific requirement (see Attachment A – Marine Monitoring Schedule):

Conduct two surveys per year of benthic flora and fauna on the sub-tidal reef at 20 sites, including five reference sites.

### Overall summary in relation to subtidal reef monitoring

Surveys of subtidal reefs were undertaken to provide baseline data on subtidal reef communities and thereby to assess the extent to which the construction and/or operation of the ADP has had an impact on ecological communities in the intertidal region of Port Stanvac.

Specific objectives were to apply standardized survey methods in order to:

- Collect data on reef communities through intensive SCUBA-based surveys using the Reef Health protocols of subtidal reefs at Port Stanvac; and
- Provide AdelaideAqua D&C with detailed reports of the findings of surveys that will form a comprehensive environmental monitoring regime.

The overall design of the subtidal reef monitoring program provides a robust framework for assessing whether or not there has been an environmental impact associated with the construction and early stage operation of the ADP. While the scope of the sampling program as implemented differs from the design outlined in the licence condition (10 sites surveyed vs 20 sites as required), the design appears to be robust and has been developed to support detection of an environmental impact should one occur.

The specific requirement was for a survey design that covers 20 sites, including 5 reference sites, each surveyed two times per year. The design of the monitoring program that has been implemented comprises 10 sites (2 at each of 5 locations); these sites include 2 putatively impacted sites at Port Stanvac and 8 reference sites across the remaining four locations.

In the first year sampling was undertaken at four different times (to cover the seasonal variability) sampling in 2010 occurred on 2 occasions, similarly in 2011 and in 2012. No data was collected in 2013.

A great deal of historical data exists for a number of the reference sites used in this study and it is believed that, over time, this will add strength to any interpretation of changes that may occur. Specifically, the historical data provides a context that would allow an analysis of whether or not any changes that do occur are likely to have resulted from the ADP operation and also whether any changes have impacted negatively on ecological function of the reefs. This information will substantially strengthen any future analysis. Importantly this will also allow one to address the question as to whether or not additional sites should be added to the design or whether the current design is adequate and therefore whether or not the lack of strict conformance with the specific licence conditions is of material importance.

## Appendix A KEY DATES IN PLANT CONSTRUCTION AND OPERATION

The following provides a list of key dates in the construction and operation of the plant. This material provides background to the review and in particular places the analysis and interpretation of each of the monitoring reports into context with the activities that were occurring on-site in the period leading up to the monitoring event.

<b>Date</b>	<b>Activity</b>
01-Feb-2009	Construction activities commenced
16-Nov-2009	Maritime platform arrived on site
08-Jul-2010	Maritime platform completed operations
01-Jun-2011	First discharge and first intake of seawater
14-Oct-2011	First Water – plant production was (30 MLD)
21-Mar-2012	SP1 – Full production from first half the plant (150 MLD)
31-May-2012	SP2 – Full production from second half of the plant (150 MLD)
24-Oct-2012	Performance test – plant running at full production for 7 days (150 MLD)
07-Nov-2012	Performance test – plant running at full production for 7 days (150 MLD)
21-Nov-2012	Reliability test – continuous running at various production rates
12-Dec-2012	Plant handover from commissioning