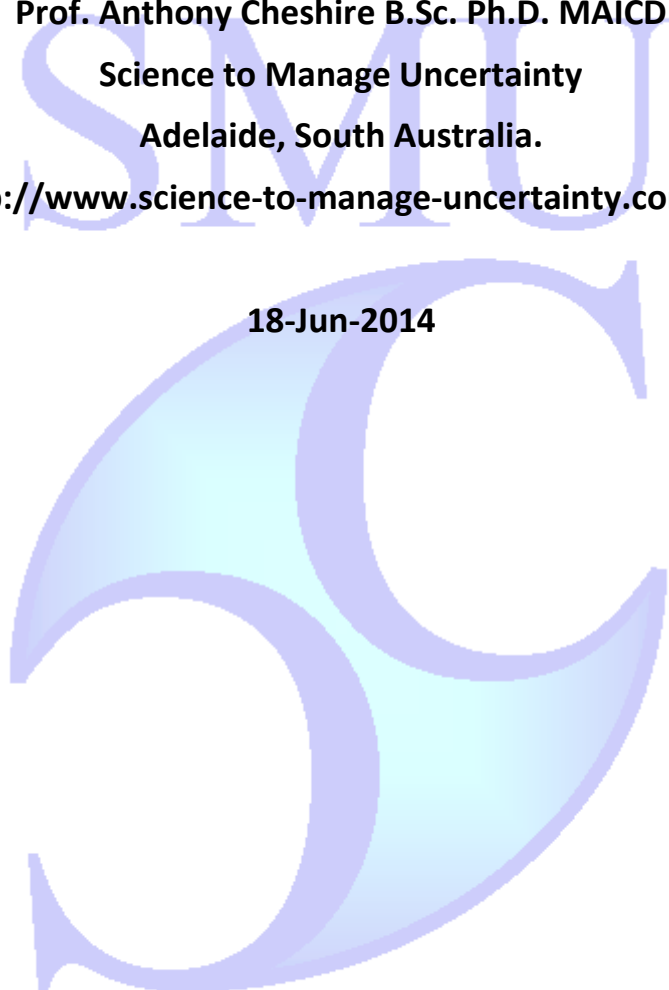


**Review of seawater characteristic - ambient salinity monitoring
licence conditions for the Adelaide Desalination Plant:
June 2014**

**Prepared for
AdelaideAqua Pty Ltd
Report number 7 in the series**

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EXECUTIVE SUMMARY

Purpose

This document represents a report on the extent to which monitoring of ambient seawater character 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 licence issued to AAD&C by the Environment Protection Authority of South Australia (EPA Licence Number 26902) and subsequently under another licence issued to AAPL (EPA Licence Number 39143). These licences 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 licences had specific requirements in relation to “Discharges to Marine Waters” that are the subject of this report.

Section 14 (305-626) of the licence 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 licence 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 seawater characteristic - ambient salinity monitoring encompassed a study of all documentation provided by AdelaideAqua Pty Ltd which comprised a series of 44 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 Licences 26902 and 39143. These being:

EPA Licence 26902: Measure conductivity and temperature of seawater at intake (Ambient MP1) & Pt Stanvac Jetty (Ambient MP2) every 10 minutes.

EPA Licence 39143: Measure conductivity and temperature of seawater at intake (Ambient MP1) & (Ambient MP2) every 10 minutes. Ambient MP2 means the monitoring point located outside the influence of the discharge.

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 Licence 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

The monitoring program is largely consistent with the licence condition as defined under the Marine Monitoring Schedule (Attachment A) to the Licences. The specific requirements for this condition are to make measurements of ambient conductivity and temperature every 10 minutes at each of two recording stations Ambient MP1 and Ambient MP2. Ambient MP1 is intended to monitor the intake within the plant while Ambient MP2 was initially positioned at the Port Stanvac Jetty.

Data from Ambient MP1 has been recorded over the two year period 01-Jan-2012 to 31-Dec-2013. Data were recorded at 10 minute intervals for 89% of this time. The only notable exception being that no data were recorded prior to 1-Jan-2012 and that there were a few months in early 2012 when data recording was somewhat sporadic.

Data from Ambient MP2 has been recorded over the two year period 01-Jan-2012 to 25-Mar-2014. Data were recorded at 10 minute intervals for 82% of this time. There were a few periods where data were not recorded including:

1. Prior to 1-Jan-2012.
2. June and August 2012.

While the monitoring station Ambient MP2 was initially situated at Port Stanvac Jetty, it was moved (around Oct 2012) and re-positioned at site MP5. Note however that the 200 m salinity monitoring stations (MP5 through MP8) were discontinued around April 2012, and it is understood that MP5 was moved to a site closer to the intake (which is around 300 m from the nearest outfall).

LICENCE CONDITION: SEAWATER CHARACTERISTIC - AMBIENT SALINITY MONITORING

In the following the specific requirements pertaining to the licence condition (seawater characteristic - ambient salinity) are summarised along with information about the documents that have been reviewed.

Documents reviewed for this licence condition:

Document Name	Reference
2012_1 EPA_January_Intake seawater characteristics_conditon 8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for January 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_1 EPA_January_Ambient_condition_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for January 2012. AdelaideAqua Pty Ltd.
2012_2 EPA_February_Intake seawater characteristics 8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for February 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_2 EPA_February_Ambient_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for February 2012. AdelaideAqua Pty Ltd.
2012_3 EPA_March_Intake seawater characteristics_conditon 8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for March 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_3 EPA_March_Ambient_condition_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for March 2012. AdelaideAqua Pty Ltd.
2012_4_EPA_APRIL_MM_CONDITON 8 VERIFIED.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for April 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_4_EPA_APRIL_MM_CONDITION_7.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for April 2012. AdelaideAqua Pty Ltd.
2012_5_EPA_MAY_MM_CONDITON 8 VERIFIED.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for May 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_5_EPA_MAY_MM_CONDITION_7.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for May 2012. AdelaideAqua Pty Ltd.
2012_6_EPA_JUNE_MM_CONDITON 8 VERIFIED.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for June 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_7 EPA_JULY_MM_CONDITON 8 intake monitoring pH and DO.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for July 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_7 EPA_JULY_CONDITION_7 ambient seawater characteristics.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for July 2012. AdelaideAqua Pty Ltd.
2012_8 EPA_AUGUST_MM_CONDITON 8 VERIFIED intake monitoring seawater characteristics.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for August 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_9_EPA_SEPTEMBER_CONDITON 8 Inatke monitoring pH and DO.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for September 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_9 EPA_SEPTEMBER_CONDITON 7 Ambient seawater characteristics.XLSX	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for September 2012. AdelaideAqua Pty Ltd.

Document Name	Reference
2012_10_EPA_October_c_8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for October 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_10_EPA_October_c_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for October 2012. AdelaideAqua Pty Ltd.
2012_11_EPA_November_c_8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for November 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_11_EPA_November_c_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for November 2012. AdelaideAqua Pty Ltd.
2012_12_EPA_December_c_8.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP1 for December 2012. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2012_12_EPA_December_c_7.xlsx	AdelaideAqua, (2012). Ambient Salinity Data from AMBIENT MP2 for December 2012. AdelaideAqua Pty Ltd.
2013_01_EPA_January_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for January 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_01_EPA_January_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for January 2013. AdelaideAqua Pty Ltd.
2013_02_EPA_February_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for February 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_02_EPA_February_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for February 2013. AdelaideAqua Pty Ltd.
2013_03_EPA_March_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for March 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_03_EPA_March_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for March 2013. AdelaideAqua Pty Ltd.
2013_04_EPA_April_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for April 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_04_EPA_April_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for April 2013. AdelaideAqua Pty Ltd.
2013_05_EPA_May_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for May 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_05_EPA_May_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for May 2013. AdelaideAqua Pty Ltd.
2013_06_EPA_June_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for June 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_06_EPA_June_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for June 2013. AdelaideAqua Pty Ltd.
2013_07_EPA_July_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for July 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_07_EPA_July_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for July 2013. AdelaideAqua Pty Ltd.

Document Name	Reference
2013_08_EPA_August_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for August 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_08_EPA_August_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for August 2013. AdelaideAqua Pty Ltd.
2013_09_EPA_september_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for September 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_09_EPA_September_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for September 2013. AdelaideAqua Pty Ltd.
2013_10_EPA_October_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for October 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_10_EPA_October_c_7.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP2 for October 2013. AdelaideAqua Pty Ltd.
2013_11_EPA_November_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for November 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.
2013_12_EPA_December_c_8.xlsx	AdelaideAqua, (2013). Ambient Salinity Data from AMBIENT MP1 for December 2013. AdelaideAqua Pty Ltd. Note: These data were provided as Condition 8 data files.

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

EPA Licence 26902: Measure conductivity and temperature of seawater at intake (Ambient MP1) & Pt Stanvac Jetty (Ambient MP2) every 10 minutes.

EPA Licence 39143: Measure conductivity and temperature of seawater at intake (Ambient MP1) & (Ambient MP2) every 10 minutes. Ambient MP2 means the monitoring point located outside the influence of the discharge.

In determining whether or not data records should be considered “valid” a number of criteria were applied. AAPL excluded data based on erroneous readings resulting from the deployment, calibration or as a result of instrument drift caused by bio or mechanical fouling. Criteria for exclusion were:

- Data which display constant downward trend in salinity with more than 0.3 ppt drop in a day.
- Data which display a constant trend with sustained separation from the rest of the buoy salinity data over a 24 hour period of more than 1.5 ppt (taking account of changing weather).

The summary provided in this review (Tables 1 and 2) parsed all data against a value checker to determine whether data were missing and/or whether data values sat within reasonable ranges for the parameters being measured. Account was taken (Ambient MP1 readings) of whether or not the plant was operating and therefore whether a reading was expected.

Overall summary in relation to seawater characteristic - ambient

Monitoring of ambient salinity is intended to provide data on the salinity of intake water over the period of plant construction and operation up to then end of December 2013. In fact (and consistent with other conditions), data has been recorded since January 2012 which is after the early phase testing (including first water runs; Appendix A) but before the major operational testing (SP1 and SP2 full production; Appendix A). No data were obtained for the period prior to 1-Jan-2012; it is notable that “First Water” occurred on 01-Jun-2011 and that operation of the plant was intermittent up until full production was achieved for SP1 (21-Mar-2012) and SP2 (31-May-2012). The data therefore substantively cover the periods during late phase testing and operational start-up.

No attempt has been made to interpret the data other than to report the coverage of conductivity or temperature values (noting that data were provided for review in a series of EXCEL files as detailed above).

Data provided broadly comprise readings from each of the various monitoring stations at 10 minute intervals over the period 1-Jan-2012 to 31-Dec-2013. There are a number of periods during which data were only available for a proportion of the time and these are detailed in Tables 1 and 2 (Ambient MP1 and Ambient MP2 respectively).

In practice the data for this condition have come from a number of data sources:

- 1) Ambient MP1 data has consistently come from a series of 4 conductivity and temperature data loggers situated on input lines SP1 and SP2 respectively. These data loggers SP1 (301-CIT-1501 and 301-CIT-1502) and SP2 (301- CIT-2501 and 301-CIT-2502) only operate when the plant is functioning and therefore there are significant periods where no data has been collected because the plant was not operating. The raw data were provided in the files defined as “Condition 8” data files (and have been referred to in this context in the body of this document).
- 2) Ambient MP2 was initially situated on Port Stanvac Jetty and recorded data from 1-Jan-2012 to 9-Oct-2012. The data as reported were salinity data (i.e. presumed to have been converted from temperature and conductivity measurements but the original data have not been provided).
- 3) Ambient MP2 was relocated on or about 10-Oct-2012 to a location that has otherwise been referred to as MP5 (which originally was one of the 200 m salinity monitoring sites but was later moved to a location closer to the intake). Data have been consistently recorded from this site as measurements of conductivity and temperature (and these have been used to calculate salinity).

Overall data coverage for Ambient MP1 (Table 1) was good¹ comprising 89% of the total period. There were three periods (January, February and April 2012) where there was a material deficiency (<65% data coverage) in the data collected (noting that no data were obtained for either Ambient MP1 or Ambient MP2 prior to Jan 2012).

Data coverage for Ambient MP2 was good (Table 2) comprising 82% of the total period with two notable periods (June and August 2012) where no data were collected.

¹ Qualitative evaluation of the data coverage has been based on the following scale; Excellent $\geq 90\%$, Good $\geq 75\%$, Fair $\geq 60\%$, Materially deficient $< 60\%$. This scale presumes that there is an expectation of missed measurements due to sensor recalibration and maintenance, biofouling or other logistic issues but that coverage should not be heavily impacted by such issues.

Table 1 - Condition 7 Ambient MP1 Conductivity and Temperature (taken from Condition 8 files).

Month and year	File	Record Number	Operating records	% of valid readings		
				Conductivity %	Temperature %	Overall %
2012-01	2012_1 EPA_January_Intake seawater characteristics_conditon 8	4,464	844	0%	100%	50%
2012-02	2012_2 EPA_February_Intake seawater characteristics 8.xlsx	4,167	1,055	16%	100%	58%
2012-03	2012_3 EPA_March_Intake seawater characteristics_conditon 8.xlsx	4,464	1,247	56%	99%	78%
2012-04	2012_4_EPA_APRIL_MM_CONDITON 8 VERIFIED.XLSX	4,420	569	16%	100%	58%
2012-05	2012_5_EPA_MAY_MM_CONDITON 8 VERIFIED.XLSX	4,464	3,524	95%	100%	98%
2012-06	2012_6_EPA_JUNE_MM_CONDITON 8 VERIFIED.XLSX	4,320	4,320	92%	91%	92%
2012-07	2012_7 EPA_JULY_MM_CONDITON 8 intake monitoring pH and DO.XLSX	4,464	4,097	100%	99%	100%
2012-08	2012_8 EPA_AUGUST_MM_CONDITON 8.XLSX	4,321	4,085	100%	99%	100%
2012-09	2012_9_EPA_SEPTEMBER_CONDITON 8 Inatke monitoring pH and DO.XLSX	4,320	3,318	95%	99%	97%
2012-10	2012_10_EPA_October_c_8.xlsx	4,458	3,445	83%	99%	91%
2012-11	2012_11_EPA_November_c_8.xlsx	4,320	2,592	56%	99%	78%
2012-12	2012_12_EPA_December_c_8.xlsx	4,464	3,714	76%	100%	88%
2013-01	2013_01_EPA_January_c_8.xlsx	4,464	4,439	99%	99%	99%
2013-02	2013_02_EPA_February_c_8.xlsx	4,032	4,006	100%	100%	100%
2013-03	2013_03_EPA_March_c_8.xlsx	4,464	4,104	99%	99%	99%
2013-04	2013_04_EPA_April_c_8.xlsx	4,326	2,940	85%	79%	82%
2013-05	2013_05_EPA_May_c_8.xlsx	4,464	4,433	93%	93%	93%
2013-06	2013_06_EPA_June_c_8.xlsx	4,320	2,411	98%	98%	98%
2013-07	2013_07_EPA_July_c_8.xlsx	4,464	4,187	95%	95%	95%
2013-08	2013_08_EPA_August_c_8.xlsx	4,464	3,424	98%	98%	98%
2013-09	2013_09_EPA_september_c_8.xlsx	4,420	3,539	79%	79%	79%
2013-10	2013_10_EPA_October_c_8.xlsx	4,458	4,456	100%	100%	100%
2013-11	2013_11_EPA_November_c_8.xlsx	4,320	4,320	100%	100%	100%
2013-12	2013_12_EPA_December_c_8.xlsx	4,464	4,464	98%	99%	99%
Compliance performance (totals and other statistics)		105,306	79,533	80%	97%	89%

Notes to Table 1:

1. "Record Number" values in red indicate that there were fewer observations than expected given the number of days in the month. In such cases the percentage values only account for the number of operating records (ignoring missing data records). While somewhat conservative, in each case the number of missing data records is not material.
1. "Operating records" represents the number of records taken while either SP1 or SP2 was operating.
2. "Overall %" is the overall measure of compliance in that it defines whether or not there is at least one sensor providing a continuous record of conductivity and temperature for Ambient MP1.
3. All other percentage values represent the proportion of records obtained for each sensor type (while the plant is actually operating) that meet the basic validation rules developed for this licence condition.

Table 2 – Condition 7 Ambient MP2 Conductivity and Temperature from CTD

File	Start Date	End Date	Expected Records	Record Number	Overall %	Valid record (%)		
						Conductivity	Temperature	Salinity
2012_1 EPA_January_Ambient_condition_7	01-Jan-12	31-Jan-12	4,464	2,856	64%	NA	NA	64%
2012_2 EPA_February_Ambient_7	01-Feb-12	29-Feb-12	4,176	4,176	100%	NA	NA	100%
2012_3 EPA_March_Ambient_condition_7	01-Mar-12	31-Mar-12	4,464	3,794	85%	NA	NA	85%
2012_4_EPA_APRIL_MM_CONDITION_7	01-Apr-12	30-Apr-12	4,320	86	2%	NA	NA	2%
2012_5_EPA_MAY_MM_CONDITION_7	01-May-12	31-May-12	4,464	3,660	82%	NA	NA	82%
No data	01-Jun-12	30-Jun-12	4,320	-	0%	NA	NA	0%
2012_7 EPA_JULY_CONDITION_7 ambient seawater characteristics	01-Jul-12	31-Jul-12	4,464	4,285	96%	NA	NA	96%
No data	01-Aug-12	31-Aug-12	4,464	-	0%	NA	NA	0%
2012_9 EPA_SEPTEMBER_CONDITON 7 Ambient seawater characteristics	01-Sep-12	30-Sep-12	4,320	3,369	78%	NA	NA	78%
Copy of 2012_10_EPA_October_c_7.xlsx	01-Oct-12	31-Oct-12	4,464	2,455	55%	NA	NA	55%
Copy of 2012_11_EPA_November_c_7.xlsm	01-Nov-12	30-Nov-12	4,464	3,124	70%	NA	NA	70%
Copy of 2012_12_EPA_December_c_7.xlsm	01-Dec-12	31-Dec-12	4,464	2,856	64%	NA	NA	64%
AMP MP2.xlsx	10-Dec-12	25-Mar-14	67,823	67,702	100%	100%	100%	NA
Compliance performance (totals and other statistics)	01-Jan-12	25-Mar-14	120,671	98,363	82%			

Notes to Table 2:

1. “Expected Records” is always equal to the number of 10 minute intervals (plus 1) in the month as this sensor is at sea and not dependent upon plant operation.
2. “Record Number” is the number of records recorded which in turn provides a measure of “Overall %”.
3. For the period 01-Jan-2012 to 9-Dec-2012 data were recorded as salinity (ppt); from 10-Dec-2012 to 31-Dec-2013 data were recorded as conductivity and temperature (consistent with licence requirement).
4. While the records for salinity do not strictly conform with the licence condition the only way in which salinity could have been calculated using the instrument systems defined in this licence condition would have been for conductivity and temperature to have been measured and the resultant salinity calculated; on this basis the data are taken to be compliant with the licence condition.

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.

Date	Activity
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