

Adelaide Desalination Project (ADP) – DBOM

# Yearly Marine Monitoring Report

For 2018

Rev	Date	Approved AdelaideAqua
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## 1. Ambient Marine Ecological Monitoring

### 1.1 Subtidal Reef

As Per the agreed OEMMP, ADP has performed this survey in 2016, and the final report has been presented in January 2017. This condition has been closed until 2019.

### 1.2 Baited Remote Underwater Video

As Per the agreed OEMMP, ADP has performed this survey in 2018, and the final report has been presented in December 2018.

### 1.3 Infauna Survey

As Per the agreed OEMMP, ADP has performed this survey in 2017, and the final report has been presented in December 2017. This condition has been closed until 2020.

## 2. Volumes of seawater received, and outfall discharged

Table 1 below shows the summary of seawater received and outfall discharged volumes for this reporting period.

The plant was in winter shutdown during July and August. The volume shown below during winter shutdown period is only seawater recirculation or shock dosing.

**Table 1 - Intake and Discharge Volume Summary**

Month	Intake (ML)	Outfall (ML)
January	2,270	1,256
February	1,097	636
March	332	110
April	1,151	671
May	1,402	814
June	373	230
July	98	98
August	140	140
September	1,085	670
October	1,533	918
November	1,081	673
December	1,195	699

### 3. Water Quality

#### 3.1 Seawater Characteristics Results

Tables 2A and 2B below show the summary of seawater characteristics for this reporting period.

The plant was in winter shutdown during July and August and Instruments have been preserved therefore results are not available during July and August.

**Table 2A - Seawater Characteristics Summary-Online Analyser**

Parameter	Conductivity	Temperature	pH	DO
	µS/cm	C		mg/L
January	55,300	22.1	8.07	8.67
February	56,560	22.0	8.00	8.10
March	57,400	22.0	8.00	8.40
April	58,000	20.2	7.88	8.30
May	57,530	18.0	7.88	8.43
June	57,377	17.5	7.80	8.45
July	N/A	N/A	N/A	N/A
August	N/A	N/A	N/A	N/A
September	55,460	13.6	7.91	8.10
October	55,270	15.5	8.10	8.20
November	55,440	18.1	7.98	8.23
December	55,550	19.0	7.96	8.18

Source: Online analyser (10 minutes intervals data over 12 month)

**Table 2B - Seawater Characteristics Summary-External lab**

Parameter	Biochemical Oxygen Demand	Suspended solids	Nitrogen (Total)	Phosphorus (Total)	Zinc (Total)	Lead (Total)	Copper (Total)
	mg/L	mg/L	mg/L as N	mg/L as P	mg/L	mg/L	mg/L
January	<2	1.71	0.18	0.02	0.024	<0.001	<0.001
February	<2	3.00	0.21	0.02	0.004	<0.001	<0.001
March	<2	5.00	0.36	0.02	<0.003	<0.001	<0.001
April	<2	1.25	0.58	0.02	0.007	<0.001	<0.001
May	<2	1.20	0.17	0.02	0.006	<0.001	<0.001

Parameter	Biochemical Oxygen Demand	Suspended solids	Nitrogen (Total)	Phosphorus (Total)	Zinc (Total)	Lead (Total)	Copper (Total)
	mg/L	mg/L	mg/L as N	mg/L as P	mg/L	mg/L	mg/L
<b>June</b>	<2	1.00	0.13	0.01	0.003	<0.001	<0.001
<b>July</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>August</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>September</b>	<2	<1	0.09	0.02	0.037	<0.001	<0.001
<b>October</b>	<2	<1	0.19	0.01	<0.003	<0.001	<0.001
<b>November</b>	<2	<1	0.11	0.01	<0.003	<0.001	<0.001
<b>December</b>	<2	<1	0.31	0.01	<0.003	<0.001	<0.001

Source: AWQC

### 3.2 Discharge Characteristics Results

Tables 3A and 3B below show the summary of discharge characteristics for this reporting period.

**Table 3A - Discharge Characteristics Summary-Online Analyser**

Parameter	Conductivity	Temperature	pH	DO	Cl <sub>2</sub>
	µS/cm	C		mg/L	mg/L
<b>January</b>	91,300	23.3	8.19	8.13	0.0
<b>February</b>	89,760	23.8	8.18	8.27	0.0
<b>March</b>	82,030	21.0	7.60	8.77	0.0
<b>April</b>	85,300	20.0	8.25	8.40	0.0
<b>May</b>	81,540	17.0	7.95	8.24	0.0
<b>June</b>	85,440	16.1	7.70	8.76	0.0
<b>July</b>	N/A	N/A	N/A	N/A	N/A
<b>August</b>	N/A	N/A	N/A	N/A	N/A
<b>September</b>	78,460	18.6	7.69	8.82	0.0
<b>October</b>	80,450	17.5	7.67	8.18	0.0
<b>November</b>	85,530	18.6	7.76	8.73	0.0
<b>December</b>	85,900	22.6	7.88	8.04	0.0

Source: Online analyser (10 minutes intervals data over 12 months)

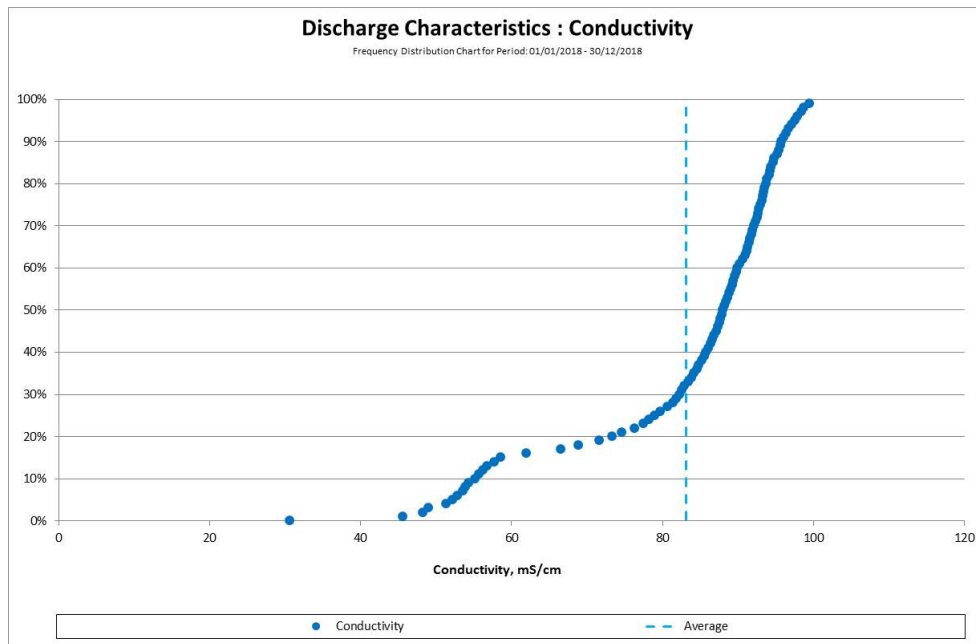
**Table 3B - Discharge Characteristics Summary- External lab**

Parameter	Biochemical Oxygen Demand	Suspended solids	Nitrogen (Total)	Phosphorus (Total)	Zinc (Total)	Lead (Total)	Copper (Total)
	mg/L	mg/L	mg/L as N	mg/L as P	mg/L	mg/L	mg/L
<b>January</b>	<2	5.25	0.29	0.22	0.029	<0.001	0.009
<b>February</b>	<2	2.10	0.25	0.28	0.012	<0.001	0.006
<b>March</b>	<2	3.00	0.34	0.17	0.013	<0.001	0.015
<b>April</b>	<2	1.00	0.57	0.20	0.018	<0.001	0.002
<b>May</b>	<2	<1.00	0.27	0.23	0.010	<0.001	0.011
<b>June</b>	<2	<1.00	0.22	0.11	<0.003	<0.001	0.003
<b>July</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>August</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>September</b>	<2	<1.00	0.12	0.10	0.047	<0.001	0.003
<b>October</b>	<2	2.20	0.29	0.11	0.005	<0.001	0.004
<b>November</b>	<2	<1.00	0.19	0.10	0.005	<0.001	0.007
<b>December</b>	<2	<1.00	0.52	0.11	0.005	<0.001	0.006

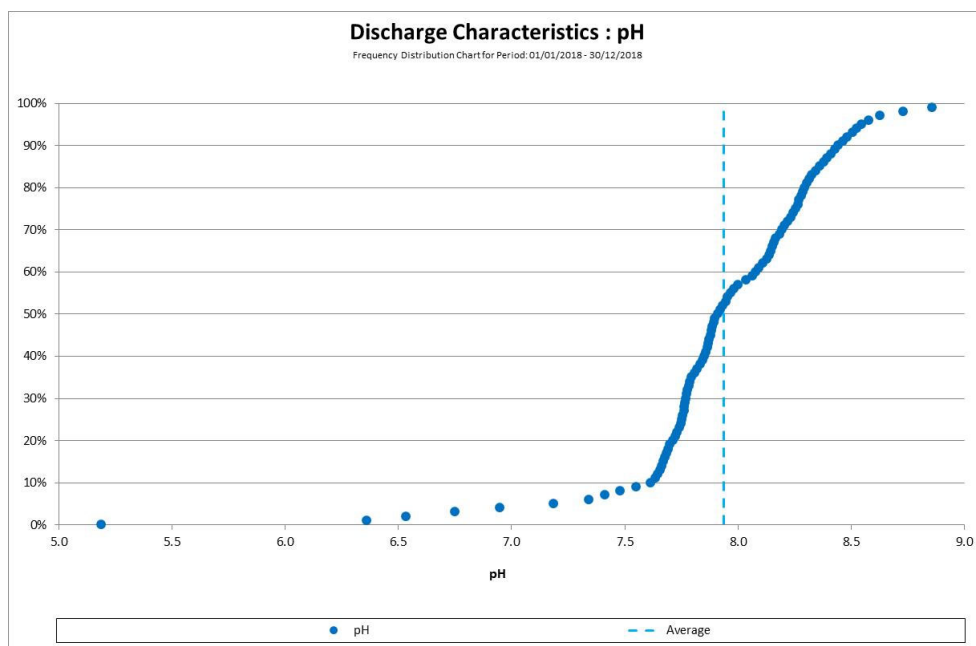
Source: AWQC

The plant was in winter shutdown during July and August and Instruments have been preserved therefore results are not available during July and August.

Discharge stream pH value dropped in correlation to intake pH drop due to intake shock dosing and came back to normal operation range after shock dosing.



**Figure 1 - Discharge Characteristic: Conductivity - Frequency Distribution**



**Figure 2 - Discharge Characteristics: pH - Frequency Distribution**

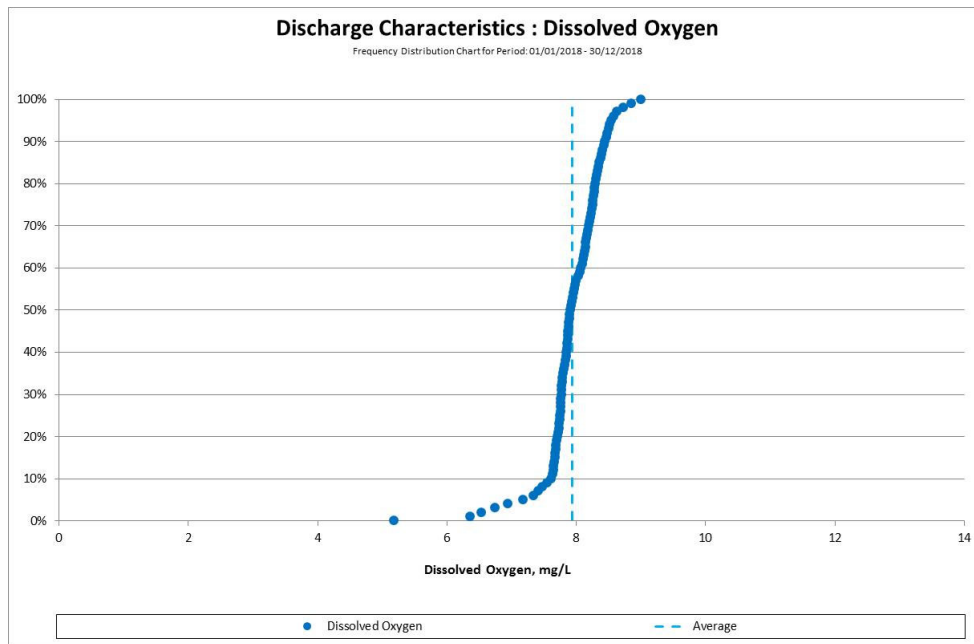


Figure 3 - Discharge Characteristics: DO - Frequency Distribution

## 4. Salinity Monitoring Results

### 4.1 Average Salinity Discharge (U-149) Results

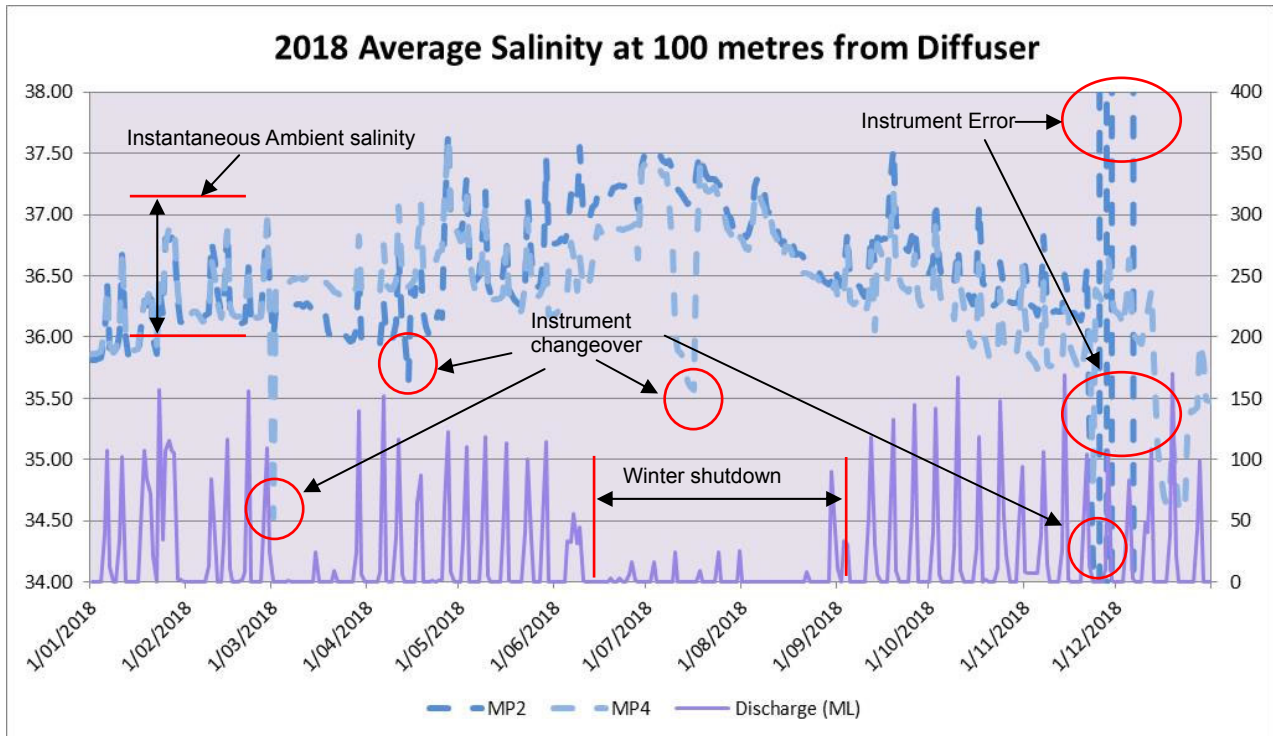
Table 4 below shows the summary of salinity readings at the edge of the mixing zone (100m from the discharge point) for this reporting period.

Table 4 – Average Salinity Discharge Summary

	Average Salinity Discharge (ppt)											
	January	February	March	April	May	June	July	August	September	October	November	December
<b>Average</b>	36.2	36.3	36.3	36.3	36.6	37.1	N/A	N/A	36.7	36.3	36.0	35.5
<b>Minimum</b>	35.8	36.0	35.5	36.0	36.2	36.8	N/A	N/A	36.2	35.8	34.1	34.6
<b>Maximum</b>	37.2	37.2	37.1	38.1	37.9	37.7	N/A	N/A	38.0	37.1	36.8	36.6

Figure 5 below shows instantaneous salinity reading at the edge of the mixing zone (100m from the discharge point) for this reporting period. When plant was running, the maximum difference between ambient and mixing zone edge salinity reached around 1.0ppt which is below the 1.3ppt maximum allowable difference. No exceedances or issues associated with Average Salinity Discharge (U-149) were identified during this reporting period.





Note 1: Ambient Salinity to be worked out from the shape of the peak. Example has been given in the graph.

Note 2: 1.3ppt limit is set for 24-hour rolling average and ADP is using instantaneous value to provide extra safety.

**Figure 4- Average salinity at 100m from diffuser during this reporting period**

## 4.2 Salinity Discharge (U-145, U-146) Results

Table 5 below shows the summary of salinity discharge ratio results for this reporting period.

**Table 5 Salinity discharge ratio summary**

	Salinity Discharge Ratio											
	January	February	March	April	May	June	July	August	September	October	November	December
<b>Average</b>	1.3	1.1	1.0	1.1	1.2	1.1	N/A	N/A	1.1	1.1	1.1	1.1
<b>Minimum</b>	1.0	1.0	1.0	1.0	1.0	1.0	N/A	N/A	1.0	1.0	1.0	1.0
<b>Maximum</b>	1.9	1.9	1.8	1.9	1.9	1.8	N/A	N/A	1.9	1.9	1.9	1.9

Over the quarter, the highest salinity discharge ratio recorded was 1.9 on 09/02/2018. This confirms that the discharge salinity did not exceed the intake salinity by a factor of 2.1. No exceedances, issues associated with Salinity Discharge (U-145, U-146) were identified during this reporting period.