

Adelaide Desalination Project (ADP) – DBOM

# Quarterly Salinity Monitoring Report

January to March 2019

Rev	Date	Approved AdelaideAqua
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## 1. Volumes of seawater received, and outfall discharged

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

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

Month	Intake (ML)	Outfall (ML)
January	1127	660
February	1920	1102
March	1324	729
<b>Quarterly Total</b>	<b>4371</b>	<b>2491</b>

## 2. Water Quality

### 2.1 Seawater Characteristics Results

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

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

Parameter	Conductivity	Temperature	pH	DO
	µS/cm	C		mg/L
<b>Average</b>	57,400	21.9	7.92	8.09
<b>Minimum</b>	51,900	19.6	5.50	5.50
<b>Maximum</b>	59,700	24.9	8.30	9.00

Source: Online analyser (10 minutes intervals data over 3 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
<b>Average</b>	<2	<1	0.13	0.01	<0.003	<0.001	<0.001
<b>Minimum</b>	<2	<1	<0.06	0.01	<0.003	<0.001	<0.001
<b>Maximum</b>	<2	4	0.19	0.03	0.006	<0.001	0.005

Source: AWQC

The ADP conducts intake chemical shock dosing to control the bio-growth in the intake tunnel. During the intake shock dosing, pH dropped to 5.5 (normal operation range 8.0-8.5) due to the acid dosing and came back to normal sea water pH range after shock dosing.

## 2.2 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>Average</b>	85,070	23.1	7.96	8.37	0.0
<b>Minimum</b>	38,000	15.3	6.16	6.75	0.0
<b>Maximum</b>	107,000	29.8 <sup>[1]</sup>	8.77	9.99 <sup>[2]</sup>	0.0

**Note:**

**1: Temperature value exceeded maximum seawater temperature during reporting period. Probe re-calibrated monthly**

**2: DO value exceeded maximum seawater saturation value at lowest temperature during reporting period. Probe re-calibrated monthly**

**Source: Online analyser (10 minutes intervals data over 3 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>Average</b>	<2	<1	0.19	0.14	0.005	<0.001	0.005
<b>Minimum</b>	<2	<1	<0.05	0.03	<0.003	<0.001	<0.001
<b>Maximum</b>	<2	2	0.37	0.24	0.006	<0.001	0.009

**Source: AWQC**

During intake shock dosing, discharge stream pH value dropped in correlation to intake pH drop and came back to normal operation range after shock dosing.

High discharge temperature has been noticed. This may be due to summer hot temperature and the instrument line above the ground being heated up.

Low conductivity value has been noticed due to low conductivity permeate flushing during normal plant shutdown. The value came back to normal operation range after plant shutdown finished.

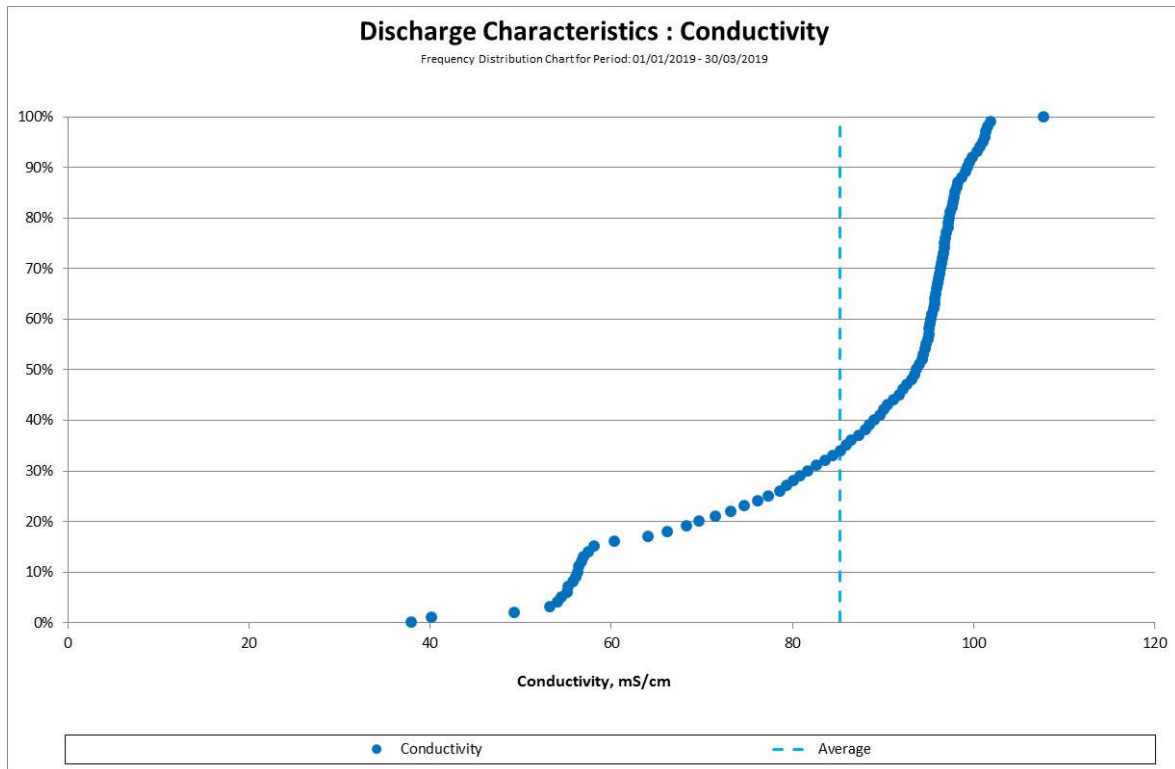


Figure 1 - Discharge Characteristic: Conductivity - Frequency Distribution

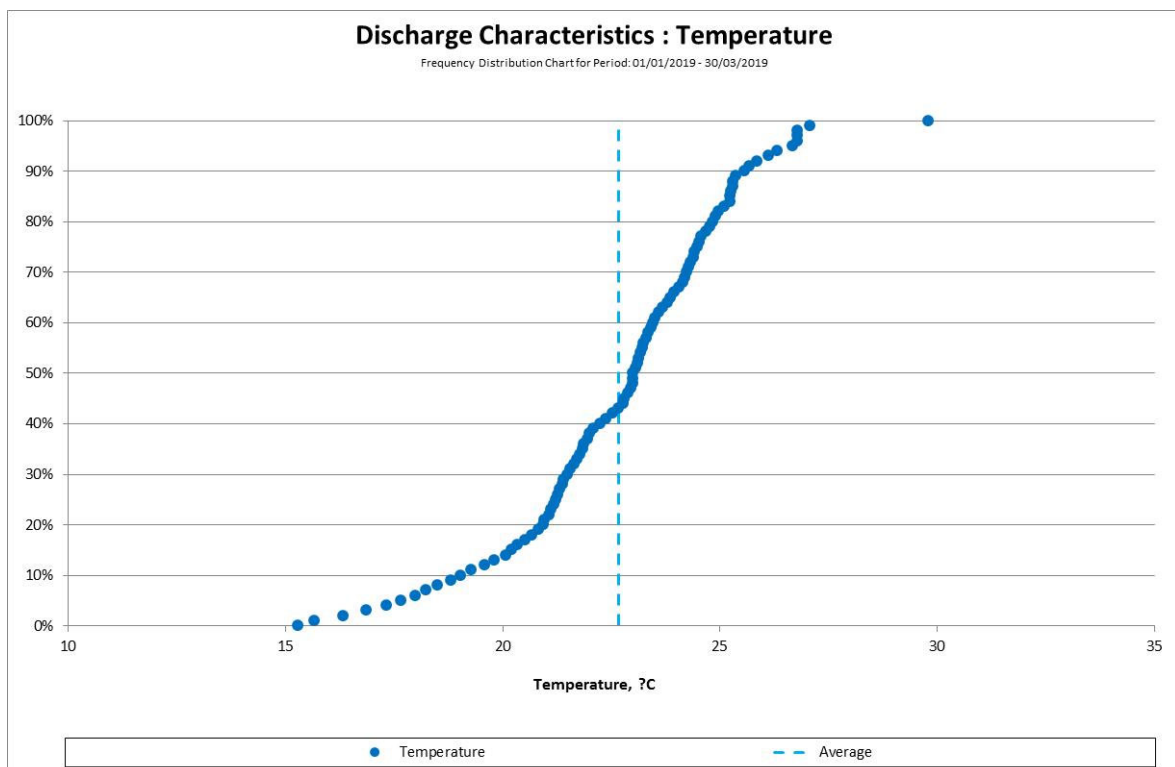
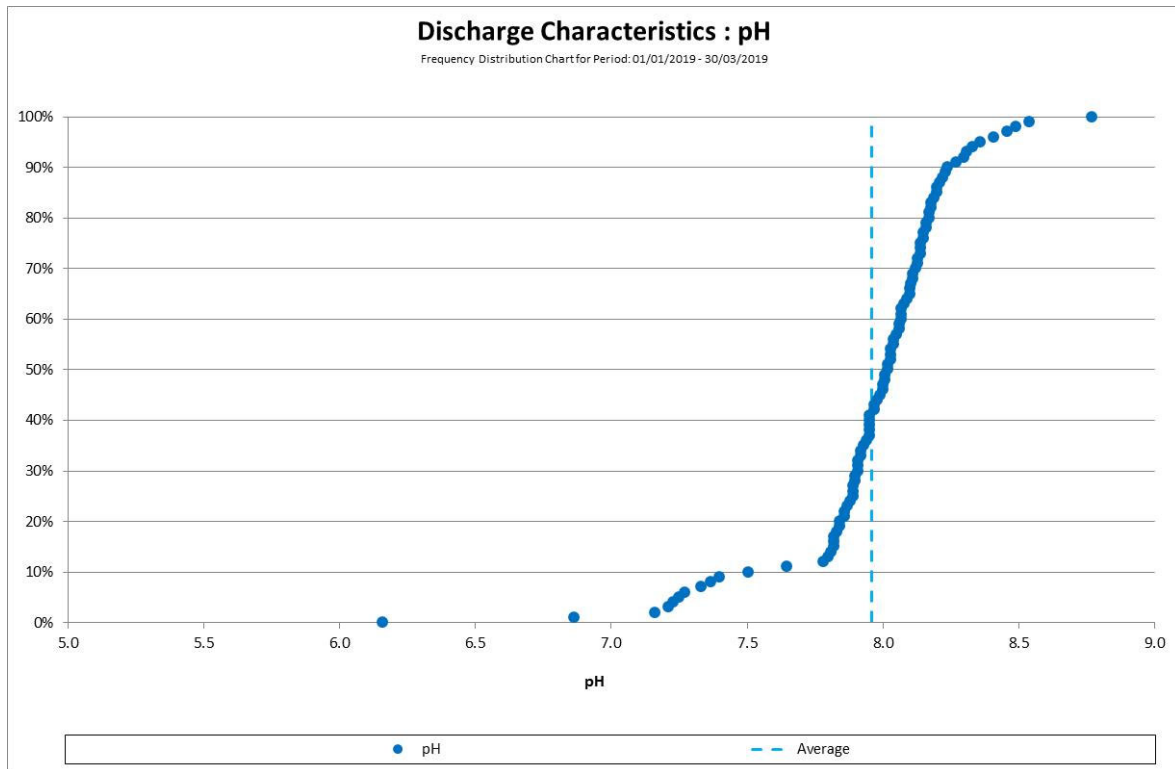
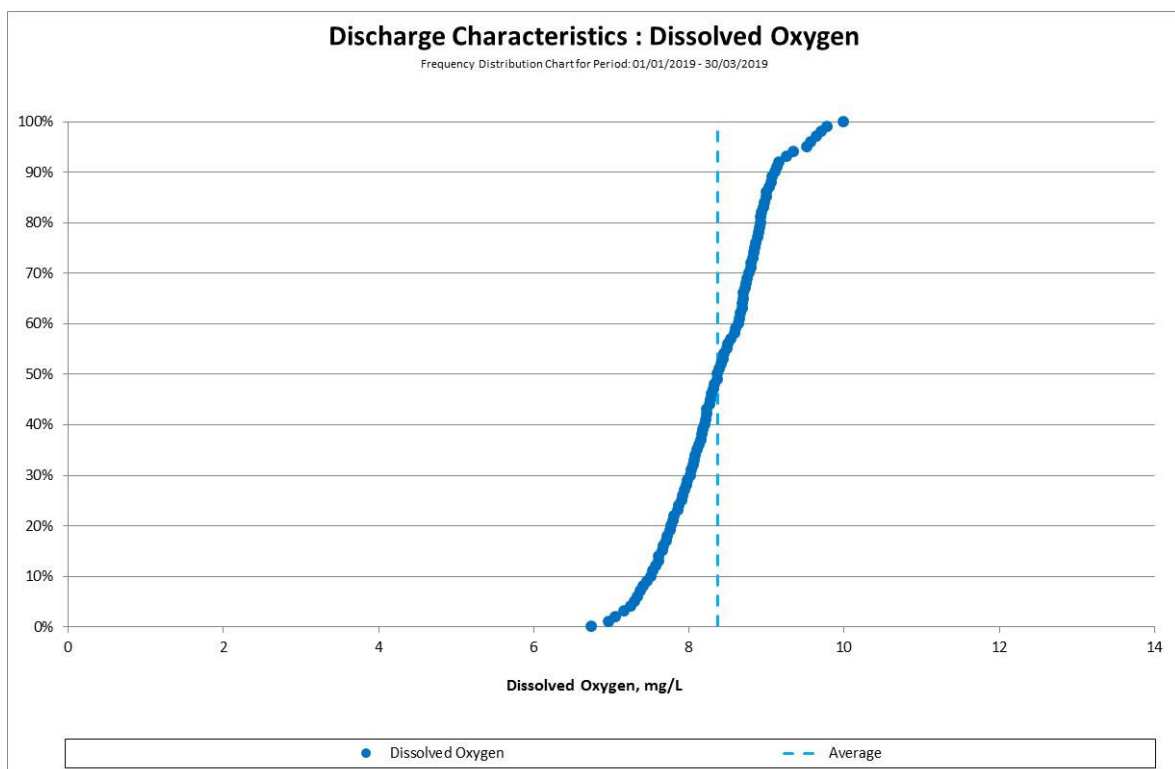


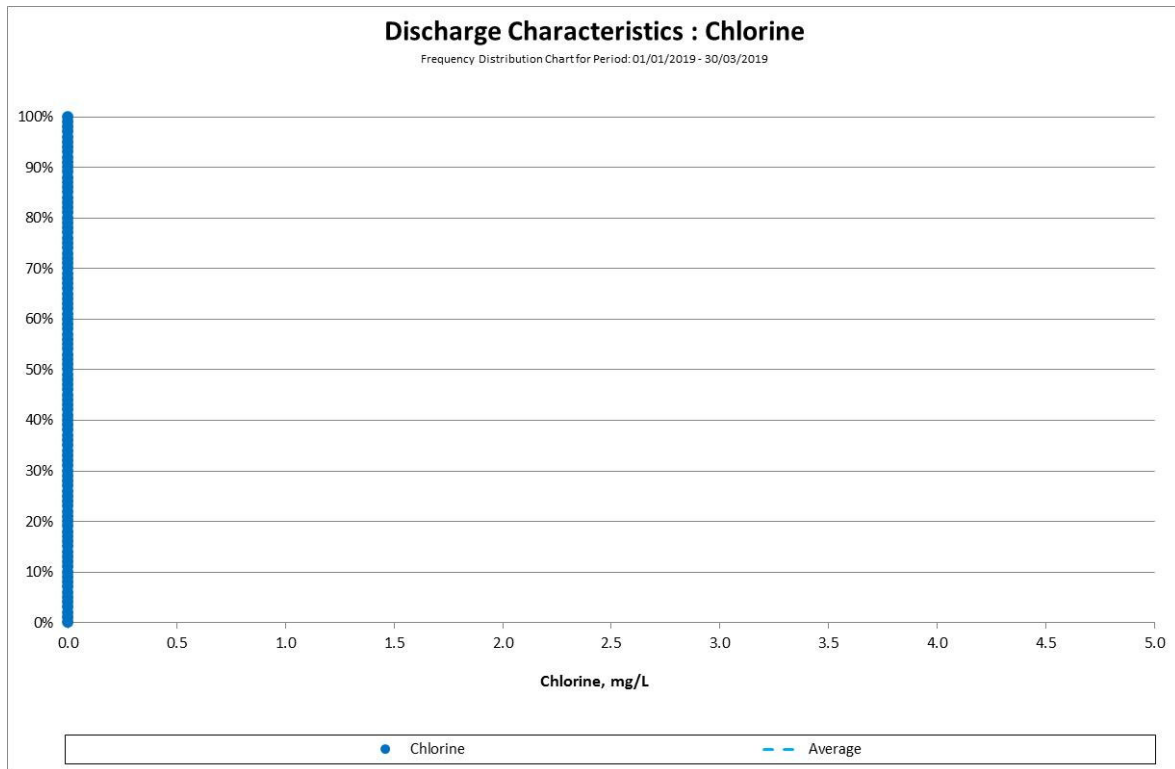
Figure 2 - Discharge Characteristics: Temperature - Frequency Distribution



**Figure 3 - Discharge Characteristics: pH - Frequency Distribution**



**Figure 4 - Discharge Characteristics: DO - Frequency Distribution**



**Figure 5 - Discharge Characteristics: Chlorine - Frequency Distribution**

### 3. Salinity Monitoring Results

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

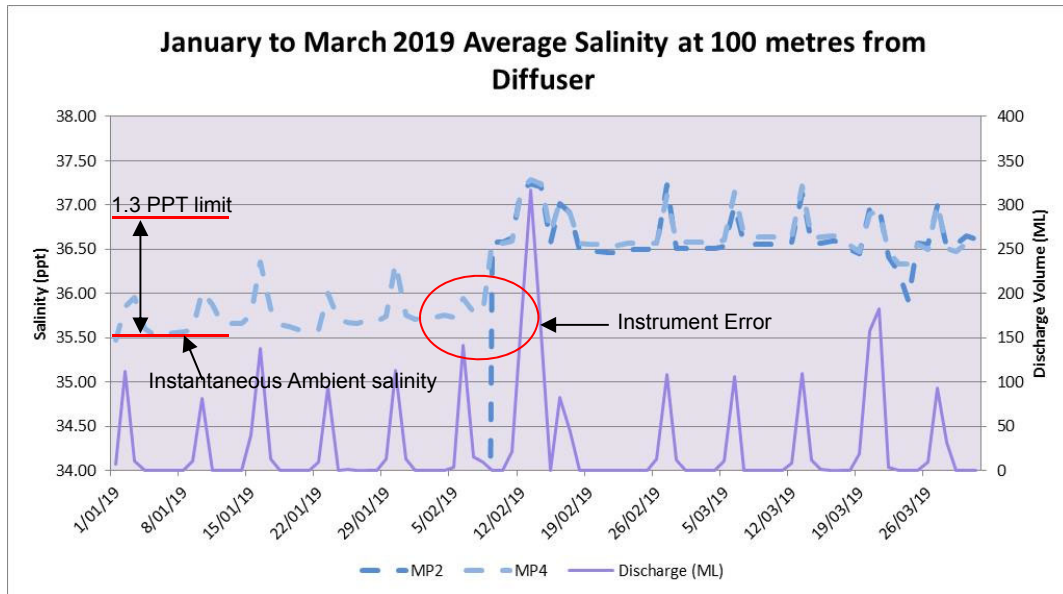
Table 4 below shows the summary of salinity readings at the edge of the mixing zone (100m from the discharge point) for this reporting period.

**Table 4 – Average Salinity Discharge Summary**

	Average Salinity Discharge (ppt)		
	January	February	March
<b>Average</b>	35.7	36.6	36.6
<b>Minimum</b>	35.5	35.7	35.9
<b>Maximum</b>	36.7	37.3	37.2

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. MP2 instrument stopped logging which was related to the battery run out. The reading came back after February instrument changeover. Both MP2 and MP4 value saw a big jump on 12/02/2019 due to the plant full capacity test.

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

### 3.2 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
<b>Average</b>	1.1	1.2	1.1
<b>Minimum</b>	1.0	1.0	1.0
<b>Maximum</b>	1.9	1.9	1.9

Over the quarter, the highest salinity discharge ratio recorded was 1.9 on 27/02/2019. 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.