

Adelaide Desalination Project (ADP) – DBOM

Quarterly Salinity Monitoring Report

October to December 2018

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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)
October	1533	918
November	1081	673
December	1195	699
Quarterly Total	3809	2290

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
Average	55,450	17.4	7.94	8.21
Minimum	52,900	14.3	6.05	6.90
Maximum	56,950	20.7	8.10	9.40

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
Average	<2	<1	0.19	0.01	<0.003	<0.001	<0.001
Minimum	<2	<1	0.06	0.01	<0.003	<0.001	<0.001
Maximum	<2	2	0.34	0.02	0.025	<0.001	<0.001

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 6.05 (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 ₂
	µS/cm	C		mg/L	mg/L
Average	83,000	19.3	7.77	8.22	0.0
Minimum	41,600	11.5	5.55	5.69	0.0
Maximum	99,950	26.9 ^[1]	8.97	9.99 ^[2]	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
Average	<2	<1	0.31	0.11	0.005	<0.001	0.005
Minimum	<2	<1	0.07	0.07	<0.003	<0.001	<0.001
Maximum	<2	6	0.59	0.14	0.008	<0.001	0.008

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.

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.

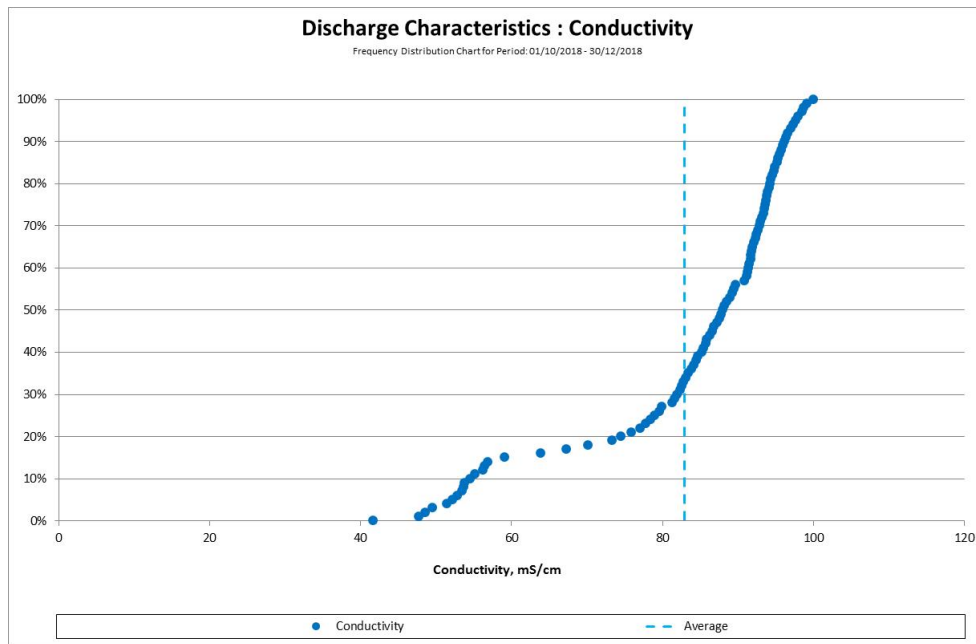


Figure 1 - Discharge Characteristic: Conductivity - Frequency Distribution

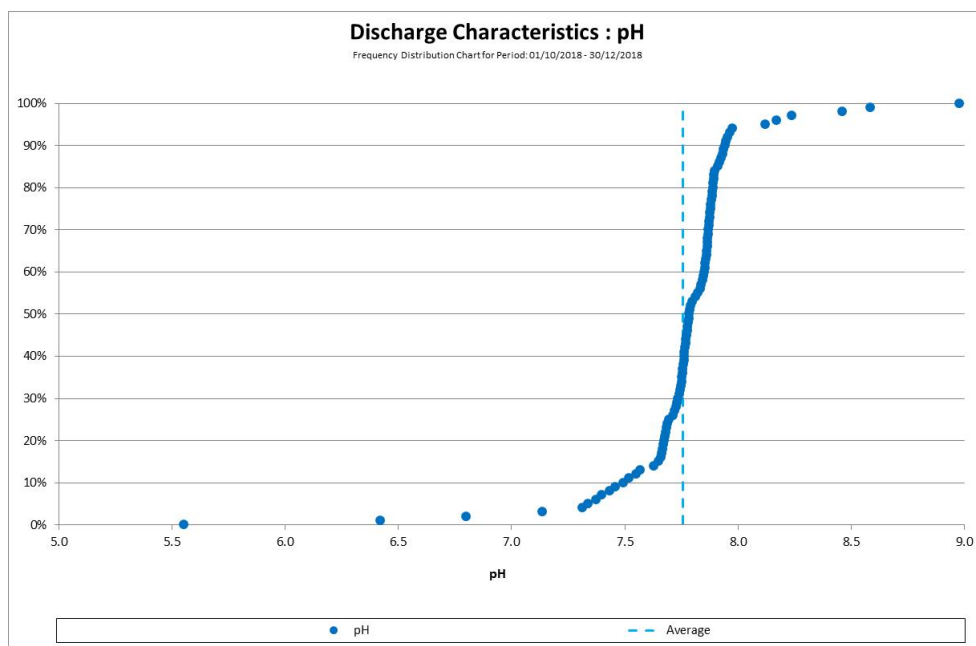


Figure 2 - Discharge Characteristics: pH - Frequency Distribution

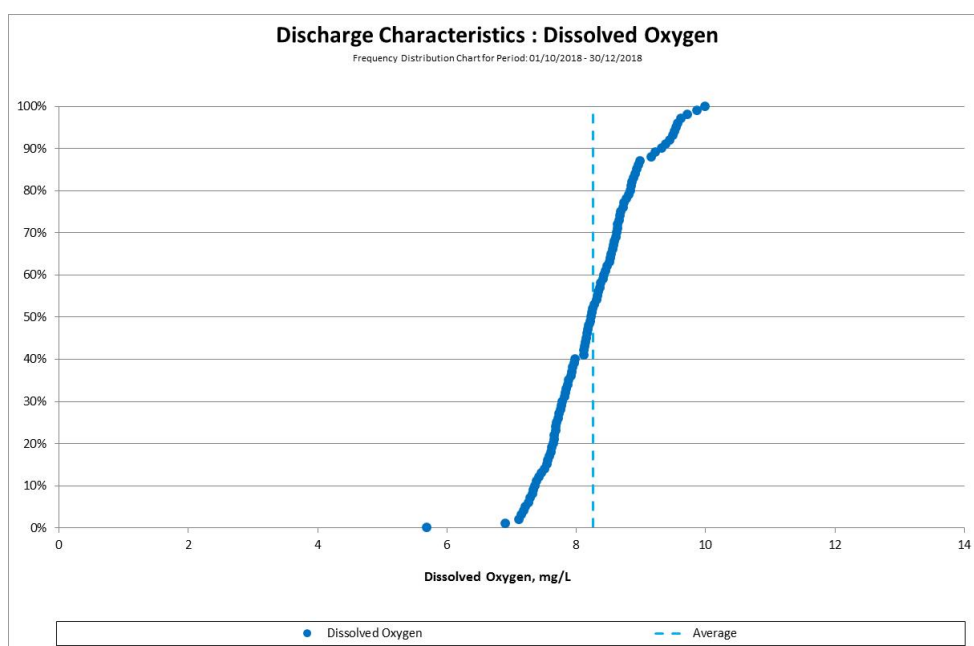


Figure 3 - Discharge Characteristics: DO - Frequency Distribution

3. Salinity Monitoring Results

3.1 Average Salinity Discharge (U-149) Results

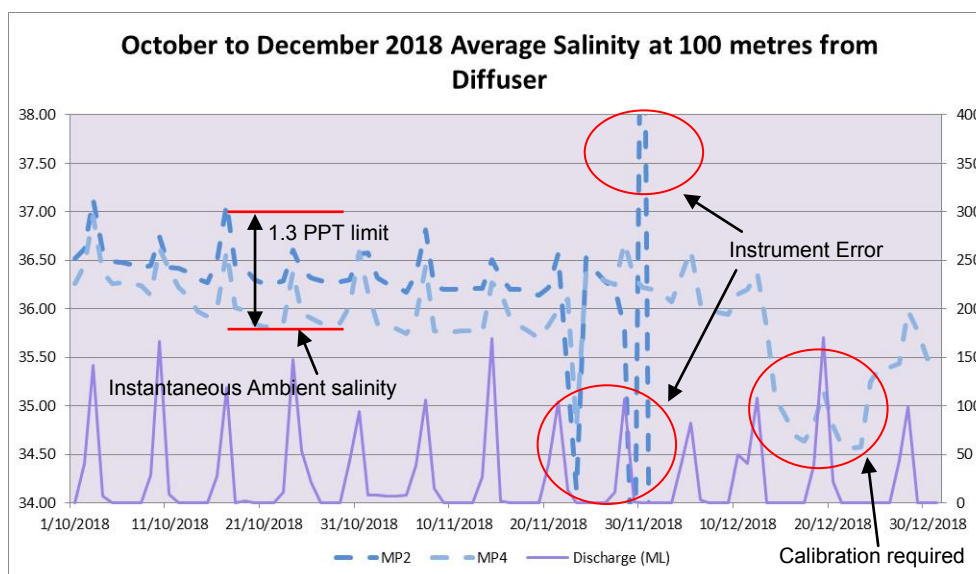
Table 4 below shows the summary of salinity readings at the edge of the mixing zone (100m from the discharge point) for this reporting period.

Table 4 – Average Salinity Discharge Summary

	Average Salinity Discharge (ppt)		
	October	November	December
Average	36.3	36.0	35.5
Minimum	35.8	34.1	34.6
Maximum	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. MP2 instrument started having error at 24/11/2018 and stopped recording data at 30/11/2018. This is related to the battery run out and instrument will be calibrated before next deployment. MP4 value saw a big drop before 20/12/2018. Instrument will be calibrated before next deployment.

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

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		
	October	November	December
Average	1.1	1.1	1.1
Minimum	1.0	1.0	1.0
Maximum	1.9	1.9	1.9

Over the quarter, the highest salinity discharge ratio recorded was 1.9 on 7/11/2018. 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.