

GREENCAP
Bladin Point
Groundwater Sampling Record

Client: Trility	JOB NO: 4p4(6) Personal informa	Sampled by: 24-6-2020
Project: Groundwater bore installation and sampling	Date: 24-6-2020	
Location: Agnes Water, Qld		

STP 1	WELL DETAILS			SAMPLING EQUIPMENT		
	Well depth:	15.36	(m)	Sampling device:	Peristaltic (low flow)	GEO#
	Well diameter:	50mm		Water meter		YSI# PRO+
	Casing type:	PVC		Turbidity Meter		TM#
	Initial water level:	2.225		Interphase probe:		IP#

Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
1033	2	2	2335	23.6	3.22	3894		6.67	13.8	
1037	2	4	2368	23.6	2.82	3872		6.67	7.5	
1041	2	6	2394	23.7	2.38	3774		6.67	4.4	
1045	2	8	2414	23.7	2.11	3860		6.67	2.8	
1049	2	10	2431	23.7	1.59	3861		6.67	1.1	
1053	2	12	2448	23.7	1.32	3864		6.67	0	
1057	2	14	2462	23.7	1.22	3866		6.67	-0.1	
1101	2	16	2473	23.7	1.07	3855		6.67	0.2	
1105	2	18	2484	23.7	0.96	3878		6.67	0.4	
1109	2	20	2492	23.7	0.93	3863		6.67	0.5	
1113	2	22	2450	23.7	0.85	3898		6.67	1.0	

Sample taken

Stabilisation Criteria (3 readings within ranges)	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mV	N/A
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Field observations: eg. Nearby activities, weather

CLEAR, FINE, STILL

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes
 Decontamination procedures followed? Yes

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour <div style="font-size: 1.2em; color: blue;">No odour, slightly turbid, clear colour.</div>	Samples Taken				
	Metals Plastic*	Number	Duplicate: QA	Triplicate: QA	Order

MONITORING WELL VOLUMES:-			
Diameter of well casing:	<div style="border: 1px solid black; width: 50px; height: 15px;"></div>	mm	
Diameter of hole drilled:	<div style="border: 1px solid black; width: 50px; height: 15px;"></div>	mm	
(1) Volume of casing only	0.000000	m3 (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000	m3 (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000	m3 (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1)	0.000000	m3 (kL)	0.00 L per metre
(assuming 30% porosity in sand/gravel pack)			

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	h4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	24-6-2020

STP 2	WELL DETAILS		SAMPLING EQUIPMENT		GEO#
	Well depth:	13.14 (m)	Sampling device:	Peristaltic (low flow)	YSI#
	Well diameter:	50mm	Water meter		TM#
	Casing type:	PVC	Turbidity Meter		IP#
	Initial water level:	41.73 (m)	Interphase probe:		

Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature (°C)	DO %sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
0834	2	2	4510	23.5	0.79	12102		6.52	91.2	
0838	2	4	4600	23.6	0.99	12067		6.52	69.6	
0843	2	6	4620	23.6	0.89	12089		6.51	71.2	
0847	2	8	4628	23.6	0.74	12063		6.51	78.8	
0851	2	10	4635	23.6	0.66	12033		6.51	79.9	
0855	2	12	4640	23.6	0.63	12025		6.50	79.6	
0859	2	14	4645	23.6	0.56	12032		6.50	79.1	
0903	2	16	4648	23.7	0.56	12031		6.50	77.6	
0908	2	18	4650	23.8	0.53	11931		6.50	77.6	
0912	2	18	4650	23.7	0.50	12020		6.50	79.0	
0916	2	20	4653	23.8	0.49	12009		6.50	80.0	

Samples taken

Stabilisation Criteria (2 readings within ranges)	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A
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Field observations: eg. Nearby activities, weather

CLEAR, FINE, STILL

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes
Decontamination procedures followed? Yes

Observations during sampling:- eg. Odours, sheens, turbidity, water colour	Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Clear, slightly turbid, no odour	Metals Plastic+				
	Plastic unpreserved Inorganics (1L)				
	Preserved Inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved Inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved Inorganics (250mL)				

MONITORING WELL VOLUMES:-		
Diameter of well casing:	<div style="border: 1px solid black; width: 50px; height: 10px;"></div> mm	
Diameter of hole drilled:	<div style="border: 1px solid black; width: 50px; height: 10px;"></div> mm	
(1) Volume of casing only	0.000000 m3 (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000 m3 (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000 m3 (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1) (assuming 30% porosity in sand/gravel pack)	0.000000 m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

**GREENCAP
Bladin Point
Groundwater Sampling Record**

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld

Job No: [Redacted]
Sampled by: [Redacted]
Date: 24-6-2020

Time		Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
0945	2	2	0.690	19.6	2.65	851		5.52	185.6		
0949	2	4	0.694	19.6	2.98	827		5.52	147.1		
0953	2	6	0.693	19.6	2.79	816		5.53	147.7		
0957	2	8	0.695	19.6	2.62	804		5.54	147.8		
1000	2	10	0.695	19.6	2.55	797		5.55	148.2		
1004	2	12	0.695	19.6	2.55	790		5.55	148.5		
1008	2	14	0.695	19.5	2.46	781		5.56	148.1		
Samples taken											
Stabilisation Criteria (3 readings within ranges)											
N/A			Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A	

FINE, CLEAR, STILL.

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour <i>No odours, Turbid</i>	Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes Decontamination procedures followed? Yes				
	Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
	Metals Plastic*				
	Plastic unpreserved Inorganics (1L)				
	Preserved inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved Inorganics (250mL)				
	(* DESIGNATES SAMPLES FILTERED IN FIELD)				

MONITORING WELL VOLUMES:-			
Diameter of well casing:	<div style="border: 1px solid black; width: 100px; height: 20px;"></div>	mm	
Diameter of hole drilled:	<div style="border: 1px solid black; width: 100px; height: 20px;"></div>	mm	
(1) Volume of casing only	0.000000	m ³ (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000	m ³ (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000	m ³ (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1)	0.000000	m ³ (kL)	0.00 L per metre
(assuming 30% porosity in sand/gravel pack)			

Field Technician #1

Field Technician #2

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1040

Pumped dry after 1 liter & did not recover.

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

Diameter of well casing:

Field Technician #2

Field Technician #2

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Stabilisation Criteria (3 readings within range)	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A
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WELL DAY

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour	Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
	Metals Plastic*				
	Plastic unpreserved Inorganics (1L)				
	Preserved Inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved Inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved Inorganics (250mL)				
	(* DESIGNATES SAMPLES FILTERED IN FIELD)				

MONITORING WELL VOLUMES:-			
Diameter of well casing:	<input type="text"/>	mm	
Diameter of hole drilled:	<input type="text"/>	mm	
(1) Volume of casing only	0.000000 m3 (kL)		0.00 L per metre
(2) Volume of drill-hole	0.000000 m3 (kL)		0.00 L per metre
(3) Volume of annulus around casing	0.000000 m3 (kL)		0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1)	0.000000 m3 (kL)		0.00 L per metre
(assuming 30% porosity in sand/gravel pack)			

Field Technician #2

Field Technician #1

JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix B-1: June 2020 Quarterly Results Summary Table

Appendix B: Results Summary Table June 2020									
Field					Incubator				
Dissolved Oxygen (DO)	Electrical Conductivity (EC)	pH	Oxidation Reduction Potential (ORP)	Temperature	Ammonia as N	Chloride	Kjeldahl Nitrogen Total	Nitrate (as N)	Salinity
mg/L	µS/cm	pH_Units	mV	°C	mg/L	mg/L	mg/L	mg/L	mg/L
					0.01	1	0.1	0.01	0
20% change from background	20% change from background	No change from background			20% change from background	20% change from background		20% change from background	
0.85	3,844	6.67		23.7	0.03	1,020	0.1	<0.01	<0.01
0.49	12,069	6.5		26.3	0.03	3,850	0.3	<0.01	<0.01
0.85	3,844	6.67		23.7	0.04	1020	0.1	<0.01	<0.01
0.18	343.1	4.1		24.5	0.12	77	1.1	0.3	<0.01
0.32	238.2	4.3		23.8	0.15	52	1	<0.01	<0.01
0.34	202	5.07		26.3	0.47	47	1.2	<0.01	<0.01
0.18	343.1	4.1		24.5	0.13	78	1.1	<0.01	<0.01

Appendix B: Results Summary Table June 2020																		
Metals																		
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			10	10	1	1	50	0.1	0.1	1	1	1	1	1	1	50	50	1
Trigger Criteria			55	55	13	13	No change from background	0.2	0.2	1	1	1.4	1.4	1.4	1.4			3.4
Sample ID	Sampled Date	Lab_Report Number																
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,660	1,780	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0
STP1 Duplicate	24/06/2020	EB2016812	<10	<10	1	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,630	1,760	<1.0
DESAL1	22/06/2020	EB2016548	620	610	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	170	170	<1.0
DESAL2	22/06/2020	EB2016548	620	590	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	0.001	2.0	760	740	<1.0
DESAL3	22/06/2020	EB2016548	840	1,000	2	0.0	<50	<0.1	<0.1	3.0	3.0	<1.0	<1.0	<1.0	<1.0	3,000	3,000	<1.0
DESAL 1 Duplicate	22/06/2020	EB2016548	0.61	1	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	160	170	<1.0

			Appendix B: Results Summary Table June 2020															
			Metals													Microbiological		
			Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
LOR			1	1	0.1	0.1	1	1	0.01	0.01	10	10	1	1	5	5	1	1
Trigger Criteria			1900	1900	0.06	0.06	11	11	0.05	0.05	5	5			8	8	No change from background	No change from background
Sample ID	Sampled Date	Lab_Report Number																
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	6.0	<1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<1.0	<1.0	17.0	<5.0	<1	<1
STP1 Duplicate	24/06/2020	EB2016812	1,280	1,380	<0.1	<0.1	<1.0	<1.0	<0.01	<0.1	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL1	22/06/2020	EB2016548	13.0	14.0	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	7.0	<1	<1
DESAL2	22/06/2020	EB2016548	12.0	26.0	<0.1	<0.1	<1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	9.0	<1	<1
DESAL3	22/06/2020	EB2016548	23	26	<0.1	<0.1	2.0	2.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL 1 Duplicate	22/06/2020	EB2016548	13	13	<0.1	<0.1	1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1

JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix B-2: IWTP Annual Results Summary Table

Appendix B: Results Summary Table July 2019 to June 2020													
Field													
Inorganics													
Sulphate as S	Total Phosphorus as P	Oxides of Nitrogen	Nitrogen (Total)	Nitrite (as N)	Nitrate (as N)	Kjeldahl Nitrogen Total	Chloride	Ammonia as N	Temperature	Oxidation Reduction Potential (ORP)	pH	Electrical Conductivity (EC)	Dissolved Oxygen (DO)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C	mV	pH Units	µS/cm	mg/L
1 ^l (DO) mg/L	Electrical Conductivity (EC) µS/cm	Electrical Conductivity (EC) µS/cm	pH	pH Units	Ion Reduction Potential (ORP)	Temperature (°C)	Ammonia as N (mg/l) Chloride (mg/l) Kjeldahl Nitrogen Total (mg/l) Nitrate (as N) (mg/l) Nitrite (as N) (mg/l) Nitrogen (Total) (mg/l) Oxides of Nitrogen (mg/l) Total Phosphorus as P (mg/l) Sulphate as S (mg/l)	Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) (µS/cm)	pH	Oxidation Reduction Potential (ORP)	Temperature (°C)	Ammonia as N (mg/l) Chloride (mg/l) Kjeldahl Nitrogen Total (mg/l) Nitrate (as N) (mg/l) Nitrite (as N) (mg/l) Nitrogen (Total) (mg/l) Oxides of Nitrogen (mg/l) Total Phosphorus as P (mg/l) Sulphate as S (mg/l)
mg/L	µS/cm	µS/cm	pH	pH Units	mV	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
DESA.1	16/09/2019	EB1924392	0.13	239	3.92	306	32.4	0.15	56	0.7	0.11	0.02	2
DESA.1	16/12/2019	EB1933892	0.88	278	3.89	248	25.2	0.14	72	0.8	0.02	0.02	<1.0
DESA.1	15/04/2020	EB2010399	0.32	298.7	3.99	172.4	26.3	0.1	74	1.2	0.76	0.05	<5.0
DESA.1	24/06/2020	EB2016548	0.18	343.1	4.1	24.5	0.12	0.3	77	1.1	0.3	0.01	<5
DESA.2	16/09/2019	EB1924392	0.15	212	3.6	334	23	0.1	48	0.7	0.55	0.01	1
DESA.2	16/12/2019	EB1933892	0.98	194	3.71	292	23.9	0.08	46	1.3	0.07	0.03	<1.0
DESA.2	15/04/2020	EB2010399	0.31	313.6	3.92	180.6	24.8	0.1	81	1.3	0.03	0.1	2
DESA.2	22/06/2020	EB2016548	0.32	238.2	4.3	23.8	25	0.15	52	1	<0.05	0.14	<5
DESA.3	16/09/2019	EB1924392	0.15	222	4.74	-171.8	26.6	0.39	56	1.5	<0.01	0.06	<1.0
DESA.3	15/04/2020	EB2010399	1.51	208	4.72	-155	26.6	0.38	54	1.6	<0.01	0.09	<1.0
DESA.3	24/06/2020	EB2016548	0.44	219	4.82	-177.7	27.6	0.5	60	1.6	<0.01	0.21	<1.0
DESA.3			0.34	202	5.07		26.3	0.47	47	1.2	<0.05	0.07	<5

Appendix B: Results Summary Table July 2019 to June 2020																			
Metals																			
Sample ID	Sampled Date	Lab Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
DESAL 1	16/09/2019	EB1924392	420	420	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	290	250	<1.0	<1.0
DESAL 1	16/12/2019	EB1933892	560	470	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	240	200	<1.0	<1.0
DESAL 1	15/04/2020	EB2010399	590	480	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	180	160	<1.0	<1.0
DESAL 1	24/06/2020	EB2016546	620	610	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	170	170	<1.0	<1.0
DESAL 2	16/09/2019	EB1924392	350	370	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	350	330	<1.0	<1.0
DESAL 2	16/12/2019	EB1933892	510	450	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	460	390	<1.0	<1.0
DESAL 2	15/04/2020	EB2010399	1350	560	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	670	570	1	<1.0
DESAL 2	22/06/2020	EB2016546	620	590	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	2	<1.0	760	740	<1.0	<1.0
DESAL 3	16/09/2019	EB1924392	1030	800	1	1	<50	<0.1	<0.1	4	<1.0	<1.0	<1.0	2	<1.0	4300	4280	<1.0	<1.0
DESAL 3	16/12/2019	EB1933892	870	1040	2	2	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	<1.0	4290	3860	<1.0	1
DESAL 3	15/04/2020	EB2010399	920	730	1	1	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	<1.0	3990	3710	<1.0	<1.0
DESAL 3	24/06/2020	EB2016546	840	1000	0.002	0.002	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	<1.0	3000	3000	<1.0	<1.0

Appendix B: Results Summary Table July 2019 to June 2020																		
Metals															Microbiological			
Sample ID	Sampled Date	Lab. Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
			µg/L (Average µg/L Manganese Filtered)	µg/L (Manganese Filtered)	µg/L (Mercury Filtered)	µg/L (Mercury Filtered)	µg/L (Nickel Filtered)	µg/L (Nickel Filtered)	µg/L (Silver Filtered)	µg/L (Silver Filtered)	µg/L (Selenium Filtered)	µg/L (Selenium Filtered)	µg/L (Tin Filtered)	µg/L (Tin Filtered)	µg/L (Zinc Filtered)	µg/L (Zinc Filtered)	cfu/100 ml (E. Coli (cfu/100 ml))	cfu/100 ml (Enterococci (cfu/100 ml))
DESA.1	16/09/2019	EB1924392	7	7	<0.1	<0.1	<0.1	<1.0	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESA.1	16/12/2019	EB1933892	7	6	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESA.1	15/04/2020	EB2010399	8	8	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	6	<5.0	<1	<1
DESA.1	24/06/2020	EB2016546	13	14	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	7	<1	<1
DESA.2	16/09/2019	EB1924392	5	0.014	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESA.2	16/12/2019	EB1933892	7	6	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESA.2	15/04/2020	EB2010399	30	28	<0.1	<0.1	2	1	0.04	<0.01	<10	<10	<1.0	<1.0	<5.0	7	<1	<1
DESA.2	22/06/2020	EB2016546	12	26	<0.1	<0.1	<1.0	1	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	9	<1	<1
DESA.3	16/09/2019	EB1924392	33	36	<0.1	<0.1	4	3	<0.01	<0.01	<10	<10	<1.0	<1.0	6	<5.0	<2	<2
DESA.3	16/12/2019	EB1933892	33	30	<0.1	<0.1	3	3	<0.01	<0.01	<10	<10	<1.0	<1.0	7	<5.0	<1	<1
DESA.3	15/04/2020	EB2010399	28	29	<0.1	<0.1	3	3	0.02	<0.01	<10	<10	<1.0	<1.0	8	8	<1	<1
DESA.3	24/06/2020	EB2016546	23	26	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1

Published for DESA 2009
Public Release Log

JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix B-3: WwTP Annual Results Summary Table

Appendix B: Results Summary Table July 2019 to June 2020															

Appendix B: Results Summary Table July 2019 to June 2020																			
Metals																			
Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)			
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
Aluminium (µg/L)	Aluminium (Filtered) (µg/L)	Arsenic (µg/L)	Arsenic (Filtered) (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Cadmium (Filtered) (µg/L)	Chromium (III+VI) (µg/L)	Chromium (III+VI) (Filtered) (µg/L)	Cobalt (µg/L)	Cobalt (Filtered) (µg/L)	Copper (µg/L)	Copper (Filtered) (µg/L)	Iron (µg/L)	Iron (Filtered) (µg/L)	Lead (µg/L)	Lead (Filtered) (µg/L)			
Sample ID	Sampled Date	Lab Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
STP1	17/09/2019	EB1924565	>10	<10	1.0	1.0	80	<0.1	<0.1	<1.0	<1.0	>1.0	>1.0	<1.0	<1.0	1,680	1,670	<1.0	<1.0
STP1	17/12/2019	EB1934065	10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	>1.0	>1.0	<1.0	<1.0	1,830	1,610	<1.0	<1.0
STP1	15/04/2020	EB2010933	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	>1.0	>1.0	<1.0	<1.0	1,820	1,570	<1.0	<1.0
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	>1.0	>1.0	<1.0	<1.0	1,660	1,780	<1.0	<1.0
STP2	17/09/2019	EB1924565	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	17/12/2019	EB1934065	10	<10	1.0	1.0	60	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	15/04/2020	EB2010933	<10	<10	1.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	2.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0	<1.0

			Appendix B: Results Summary Table July 2019 to June 2020															
			Metals														Microbiological	
			Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. coli	Enterococci
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	cfu/100 ml	cfu/100 ml
			Manganese (µg/L)	Manganese (Filtered) (µg/L)	Mercury (µg/L)	Mercury (Filtered) (µg/L)	Nickel (µg/L)	Nickel (Filtered) (µg/L)	Silver (µg/L)	Silver (Filtered) (µg/L)	Selenium (µg/L)	Selenium (Filtered) (µg/L)	Tin (µg/L)	Tin (Filtered) (µg/L)	Zinc (µg/L)	Zinc (Filtered) (µg/L)	E. Coli (cfu/100 ml)	Enterococci (cfu/100 ml)
Sample ID	Sampled Date	Lab Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
STP1	17/09/2019	EB1924565	1,340	1,310	<0.1	<0.1	<1.0	<1.0	>0.01	>0.01	<10	<10	<1.0	<1.0	>5.0	>5.0	>1	<1
STP1	17/12/2019	EB1934065	1,350	1,260	<0.1	<0.1	<1.0	<1.0	>0.01	>0.01	<10	<10	<1.0	<1.0	>5.0	>5.0	>1	<1
STP1	15/04/2020	EB2010933	1,390	1,240	<0.1	<0.1	<1.0	<1.0	>0.01	>0.01	<10	<10	<1.0	<1.0	>5.0	5.0	>1	<1
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	>0.01	>0.01	<10	<10	<10	<1.0	>5.0	6.0	>1	<1
STP2	17/09/2019	EB1924565	111	126	<0.1	<0.1	3.0	2.0	0.03	0.03	<10	<10	<1.0	<1.0	>5.0	>5.0	>1	<1
STP2	17/12/2019	EB1934065	109	105	<0.1	<0.1	2.0	2.0	0.03	0.02	<10	<10	<1.0	<1.0	>5.0	>5.0	>1	<1
STP2	15/04/2020	EB2010933	113	111	<0.1	<0.1	3.0	3.0	0.02	0.01	<10	<10	<1.0	<1.0	>5.0	5.0	>1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<10	<1.0	17	>5.0	>1	<1

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Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix C: Laboratory Results. COC and QA/QC Documentation

CERTIFICATE OF ANALYSIS

Work Order : **EB1924392**
Client : **TRILITY Pty Ltd**
Contact : (6) Personal info
Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
Telephone : 07 4974 7975
Project : Groundwater Monitoring
Order number : 4500054738
C-O-C number : ---
Sampler : (6) Personal info
Site : ---
Quote number : BN/222/16
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222
Date Samples Received : 17-Sep-2019 09:05
Date Analysis Commenced : 17-Sep-2019
Issue Date : 23-Sep-2019 17:18



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

p4(6) Personal informa

□□□□□□

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- Microbiological Comment: Membrane filtration result is reported <2 CFU/100mL where 50mL sample was filtered because the sample was turbid, insufficient for filtration at higher volume and there were no target organisms confirmed.
- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) for some samples. However, the difference is within experimental variation of the methods.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Sep-2019 09:15	16-Sep-2019 10:00	16-Sep-2019 10:40	16-Sep-2019 09:15	----
				EB1924392-001	EB1924392-002	EB1924392-003	EB1924392-004	-----
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	1	<1	2	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	56	48	56	58	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.42	0.37	0.80	0.42	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.007	0.006	0.036	0.007	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	0.25	0.33	4.28	0.27	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.42	0.35	1.03	0.53	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.004	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.004	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.006	0.009	----
Manganese	7439-96-5	0.001	mg/L	0.007	0.005	0.033	0.006	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	0.05	0.05	<0.05	<0.05	----
Iron	7439-89-6	0.05	mg/L	0.29	0.35	4.30	0.30	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Sep-2019 09:15	16-Sep-2019 10:00	16-Sep-2019 10:40	16-Sep-2019 09:15	----
				EB1924392-001	EB1924392-002	EB1924392-003	EB1924392-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.10	0.39	0.14	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.11	0.55	<0.01	0.10	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.11	0.55	<0.01	0.10	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.7	1.5	0.8	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	1.2	1.5	0.9	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.01	0.06	0.01	----
EN67: Field Tests								
Ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	239	212	222	239	----
Ø Dissolved Oxygen	----	0.1	mg/L	0.13	0.15	0.15	0.13	----
Ø pH	----	0.01	pH Unit	----	3.60	4.74	3.92	----
Ø Redox Potential	----	0.1	mV	306	334	-171.8	306	----
Ø Temperature	----	0.1	°C	23.4	23.0	25.0	23.4	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<2	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<2	<1	----



QUALITY CONTROL REPORT

Work Order : **EB1924392**

Page : 1 of 7

Client : **TRILITY Pt Ltd**

Laboratory : Environmental Division Brisbane

Contact : **(6) Personal info**

Contact : Customer Services EB

Address : LOT 40 SPRINGS ROAD
AGNES WATER QLD 4677

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : 07 4974 7975

Telephone : +61-7-3243 7222

Project : Groundwater Monitoring

Date Samples Received : 17-Sep-2019

Order number : 4500054738

Date Analysis Commenced : 17-Sep-2019

C-O-C number : ---

Issue Date : 23-Sep-2019

Sampler : **(6) Personal info**

Site : ---

Quote number : BN/222/16

No. of samples received : 4

No. of samples analysed : 4



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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(6) Personal info

Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

Brisbane Administration, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2590468)									
EB1924215-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2750	2800	1.77	0% - 20%
EB1924392-004	DESAL 1 Duplicate	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	<1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2590470)									
EB1924215-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19700	19800	0.341	0% - 20%
EB1924392-004	DESAL 1 Duplicate	ED045G: Chloride	16887-00-6	1	mg/L	58	58	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2588924)									
EB1924238-010	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.012	0.012	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.025	<0.025	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.71	0.68	4.37	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.05	0.05	0.00	No Limit
EB1924238-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.010	0.011	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.005	<0.005	0.00	No Limit



Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2588924) - continued									
EB1924238-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.025	<0.025	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	1.61	1.61	0.00	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit		
EG020T: Total Metals by ICP-MS (QC Lot: 2588950)									
EB1924238-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.010	0.011	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.026	<0.026	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	2.07	2.06	0.632	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	2.14	2.13	0.00	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.34	0.18	60.6	No Limit
EB1924238-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.013	0.013	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.026	<0.026	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.86	0.84	1.35	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	2.50	2.50	0.00	0% - 20%
EG020A-T: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.00	No Limit		
EG035F: Dissolved Mercury by FIMS (QC Lot: 2588927)									
EB1924392-001	DESAL 1	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924238-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2588954)									
EB1924238-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924247-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2588935)									
EB1924392-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2588957)									
EB1924392-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2589379)									
EB1924227-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	<0.01	0.00	No Limit
EB1924417-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2590469)									
EB1924215-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1924392-004	DESAL 1 Duplicate	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2589380)									
EB1924227-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB1924417-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.06	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2592251)									
EB1900219-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	5.8	6.1	4.11	0% - 20%
EB1924392-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.8	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2592250)									
EB1900219-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.93	0.95	1.84	0% - 20%
EB1924392-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2590468)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	85.0	118
				<1	100 mg/L	100	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2590470)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	90.0	115
				<1	1000 mg/L	104	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.4	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	111	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	109	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	109	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.1	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	110	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	107	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	95.7	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.6	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2588950)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	96.4	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.1	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.6	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	92.0	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.4	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.6	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.4	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.7	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	95.0	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	# 0.002	0.1 mg/L	99.5	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.4	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	96.8	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.3	82.0	118

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 2588927)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2588954)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2588935)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	94.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2588957)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	103	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2589379)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2590469)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2589380)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.1	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2592251)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	87.4	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2592250)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	88.2	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2590468)							
EB1924215-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2590470)							
EB1924215-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924)							
22-265	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	99.2	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.5	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	86.7	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	83.7	70.0	130

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924) - continued							
EB1924238-002	Anonymous	EG020A-F: Lead	7439-92-1	1 mg/L	93.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	93.5	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.4	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	85.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2588950)							
EB1924238-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.6	70.0	130
		EG020A-T: Cadmium	7440-43-9	1.25 mg/L	101	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	92.1	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	90.4	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	88.9	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	95.5	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	93.9	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	87.1	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	90.9	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2588927)							
EB1924238-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	87.0	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2588954)							
EB1924238-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	85.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2589379)							
EB1924234-001	Anonymous	EK055G: Ammonia as N	7664-41-7	20 mg/L	93.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2590469)							
EB1924215-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	96.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2589380)							
EB1924234-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2592251)							
EB1900219-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	90.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2592250)							
EB1900219-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	85.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1924392	Page	: 1 of 8
Client	: TRILITY Pt Ltd	Laboratory	: Environmental Division Brisbane
Contact	: Personal in	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Sep-2019
Site	: ---	Issue Date	: 23-Sep-2019
Sampler	: Personal in	No. of samples received	: 4
Order number	: 4500054738	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Method Blank value outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Method Blank (MB) Values							
EG020T: Total Metals by ICP-MS	QC-MRG3-25889490	----	Tin	7440-31-5	0.002 mg/L	0.001 mg/L	Blank result exceeds permitted value
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB1924215--003	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED045G: Chloride by Discrete Analyser	EB1924215--003	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)		16-Sep-2019	----	----	----	18-Sep-2019	14-Oct-2019	✓
DESAL 1,	DESAL 2,							
DESAL 3,	DESAL 1 Duplicate							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)		16-Sep-2019	----	----	----	18-Sep-2019	14-Oct-2019	✓
DESAL 1,	DESAL 2,							
DESAL 3,	DESAL 1 Duplicate							
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)		16-Sep-2019	----	----	----	19-Sep-2019	14-Mar-2020	✓
DESAL 1,	DESAL 2,							
DESAL 3,	DESAL 1 Duplicate							
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)		16-Sep-2019	18-Sep-2019	14-Mar-2020	✓	18-Sep-2019	14-Mar-2020	✓
DESAL 1,	DESAL 2,							
DESAL 3,	DESAL 1 Duplicate							



Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	19-Sep-2019	14-Oct-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	18-Sep-2019	14-Oct-2019	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	18-Sep-2019	14-Mar-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	18-Sep-2019	14-Mar-2020	✓	18-Sep-2019	14-Mar-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	18-Sep-2019	14-Oct-2019	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	18-Sep-2019	18-Sep-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	18-Sep-2019	14-Oct-2019	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	19-Sep-2019	14-Oct-2019	✓	19-Sep-2019	14-Oct-2019	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	19-Sep-2019	14-Oct-2019	✓	19-Sep-2019	14-Oct-2019	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Sep-2019	----	----	----	17-Sep-2019	17-Sep-2019	✓



Matrix: **WATER**
Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
DESAL 1,	DESAL 2,	16-Sep-2019	----	----	17-Sep-2019	17-Sep-2019	✔
DESAL 3,	DESAL 1 Duplicate						



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

CERTIFICATE OF ANALYSIS

Work Order : **EB1924565**
Client : **TRILITY Pty Ltd**
Contact : **Personal in**
Address : **LOT 40 SPRINGS ROAD**
AGNES WATER QLD 4677
Telephone : **07 4974 7975**
Project : **GROUNDWATER MONITORING**
Order number : **45000 54738**
C-O-C number : **---**
Sampler : **Personal in**
Site : **---**
Quote number : **BN/222/16**
No. of samples received : **3**
No. of samples analysed : **3**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 18-Sep-2019 08:40
Date Analysis Commenced : 18-Sep-2019
Issue Date : 24-Sep-2019 13:39



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

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This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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4(6) Personal infor

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Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) for some samples. However, the difference is within experimental variation of the methods.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.

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Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				17-Sep-2019 10:50	17-Sep-2019 10:10	17-Sep-2019 10:50	---	---
				EB1924565-001	EB1924565-002	EB1924565-010	-----	-----
				Result	Result	Result	---	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	375	95	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1030	3940	1030	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.002	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.31	0.126	1.33	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Iron	7439-89-6	0.05	mg/L	1.67	<0.05	1.66	---	---
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	<0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.34	0.111	1.28	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Boron	7440-42-8	0.05	mg/L	0.08	0.10	0.06	---	---
Iron	7439-89-6	0.05	mg/L	1.68	<0.05	1.70	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				17-Sep-2019 10:50	17-Sep-2019 10:10	17-Sep-2019 10:50	---	---
				EB1924565-001	EB1924565-002	EB1924565-010	-----	-----
				Result	Result	Result	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.03	<0.01	---	---
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.03	<0.01	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.04	0.06	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	<0.1	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	<0.1	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	0.02	---	---
EN67: Field Tests								
Ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	3848	12364	3848	---	---
Ø Dissolved Oxygen	----	0.1	mg/L	0.25	0.83	0.25	---	---
Ø pH	----	0.01	pH Unit	6.68	6.50	6.68	---	---
Ø Redox Potential	----	0.1	mV	10.7	12.1	10.7	---	---
Ø Temperature	----	0.1	°C	23.5	23.3	23.5	---	---
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	---	---
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	---	---



QUALITY CONTROL REPORT

Work Order : **EB1924565**

Page : 1 of 9

Client : **TRILITY Pt Ltd**

Laboratory : Environmental Division Brisbane

Contact : **(6) Personal in**

Contact : Customer Services EB

Address : LOT 40 SPRINGS ROAD
AGNES WATER QLD 4677

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : 07 4974 7975

Telephone : +61-7-3243 7222

Project : GROUNDWATER MONITORING

Date Samples Received : 18-Sep-2019

Order number : 45000 54738

Date Analysis Commenced : 18-Sep-2019

C-O-C number : ---

Issue Date : 24-Sep-2019

Sampler : **(6) Personal in**

Site : ---

Quote number : BN/222/16

No. of samples received : 3

No. of samples analysed : 3



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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(6) Personal infor

Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

Brisbane Administration, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2591587)									
EB1924565-001	STP1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	95	0.00	0% - 20%
EB1924575-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2591588)									
EB1924565-001	STP1	ED045G: Chloride	16887-00-6	1	mg/L	1030	1030	0.457	0% - 20%
EB1924575-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	34	34	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2592075)									
EB1924565-001	STP1	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.31	1.33	1.51	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.67	1.67	0.00	0% - 20%
EB1924573-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.009	0.009	0.00	No Limit



Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2592075) - continued									
EB1924573-006	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.220	0.217	1.23	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.011	0.010	0.00	0% - 50%
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.374	0.381	1.76	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.03	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.36	0.38	4.24	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2592122)									
EB1924370-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.015	0.016	0.00	0% - 50%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.047	0.049	4.63	0% - 20%
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.016	0.017	0.00	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.011	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.011	0.011	0.00	0% - 50%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	3.76	3.88	2.95	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.028	0.029	0.00	0% - 20%
		EG020A-T: Tin	7440-31-5	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.042	0.047	10.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	18.7	19.7	4.94	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	1.19	1.25	4.94	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	99.6	102	2.57	0% - 20%
EB1924558-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0019	0.0018	0.00	0% - 50%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.140	0.140	0.00	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.006	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.058	0.058	0.00	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.94	0.94	0.00	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.47	0.48	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2592126)									
EB1924565-002 22-265	STP2	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 2592126) - continued									
EB1924565-002	STP2	EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.111	0.109	1.28	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.10	0.10	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB1924573-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0003	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.028	0.028	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.034	0.034	0.00	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	6.14	6.30	2.59	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.603	0.621	2.87	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.40	0.46	13.0	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.22	0.23	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.87	0.94	7.91	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2592074)									
EB1924565-010	STP1 Duplicate	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924558-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2592127)									
EB1924558-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924565-010	STP1 Duplicate	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2591999)									
EB1924565-001	STP1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2592009)									
EB1924565-001	STP1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2591301)									
EB1918165-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.11	9.58	0% - 50%
EB1924504-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	4.64	4.56	1.85	0% - 20%

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2591586)									
EB1924565-001	STP1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1924575-008	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2591300)									
EB1918165-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	15.2	16.0	5.44	0% - 20%
EB1924504-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.94	1.94	0.00	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2593968)									
EB1924435-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.00	No Limit
EB1924573-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	<0.5	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2593967)									
EB1924435-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB1924573-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.33	0.31	6.77	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2591587)									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	85.0	118	
				<1	100 mg/L	98.5	85.0	118	
ED045G: Chloride by Discrete Analyser (QCLot: 2591588)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.4	90.0	115	
				<1	1000 mg/L	103	90.0	115	
EG020F: Dissolved Metals by ICP-MS (QCLot: 2592075)									
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.3	79.0	118	
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	107	88.0	116	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	88.0	108	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	87.0	113	
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	104	86.0	112	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	110	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	89.0	120	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	108	89.0	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.8	83.0	112	
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	87.0	113	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	82.0	114	
EG020T: Total Metals by ICP-MS (QCLot: 2592122)									
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.7	80.0	114	
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	112	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.7	88.0	111	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.4	89.0	115	
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.2	89.0	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.0	88.0	116	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.6	89.0	112	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.4	88.0	116	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.0	79.0	111	
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	105	86.0	116	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.9	84.0	114	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	96.9	82.0	128	
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118	

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2592126)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	106	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.2	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.7	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.8	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.2	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.2	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.6	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	107	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.8	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	111	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.9	82.0	118
EG035F: Dissolved Mercury by FIMS (QCLot: 2592074)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	112	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2592127)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2591999)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	99.5	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2592009)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2591301)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	103	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2591586)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2591300)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.7	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2593968)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	90.7	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2593967)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	89.9	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2591587)							
EB1924565-002	STP2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2591588)							
EB1924565-002	STP2	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2592075)							
EB1924565-002	STP2	EG020A-F: Arsenic	7440-38-2	1 mg/L	104	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	97.4	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	97.9	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	93.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	95.7	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	93.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	94.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2592122)							
EB1924370-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	105	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	104	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	106	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	106	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	96.8	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	103	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2592126)							
EB1924565-010	STP1 Duplicate	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.7	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.5	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.0	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	98.8	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	90.3	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	108	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	89.9	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	93.4	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2592074)							
EB1924558-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	96.3	70.0	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2592127)							
EB1924558-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	89.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2591301)							
EB1919652-001	Anonymous	EK055G: Ammonia as N	7664-41-7	40 mg/L	102	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2591586)							
EB1924565-002	STP2	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2591300)							
EB1919652-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	2 mg/L	112	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2593968)							
EB1924435-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2593967)							
EB1924435-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	98.2	70.0	130

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QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1924565	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	:) Personal inf	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Sep-2019
Site	:	Issue Date	: 24-Sep-2019
Sampler	: 6) Personal inf	No. of samples received	: 3
Order number	: 45000 54738	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB1924565--002	STP2	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
ED045G: Chloride by Discrete Analyser	EB1924565--002	STP2	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
STP1,	STP2,	17-Sep-2019	----	----	----	18-Sep-2019	15-Oct-2019	✓
STP1 Duplicate								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
STP1,	STP2,	17-Sep-2019	----	----	----	18-Sep-2019	15-Oct-2019	✓
STP1 Duplicate								
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
STP1,	STP2,	17-Sep-2019	----	----	----	19-Sep-2019	15-Mar-2020	✓
STP1 Duplicate								
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
STP1,	STP2,	17-Sep-2019	19-Sep-2019	15-Mar-2020	✓	19-Sep-2019	15-Mar-2020	✓
STP1 Duplicate								
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)								
STP1,	STP2,	17-Sep-2019	----	----	----	20-Sep-2019	15-Oct-2019	✓
STP1 Duplicate								



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	20-Sep-2019	15-Oct-2019	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	20-Sep-2019	15-Mar-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) STP1, STP1 Duplicate	STP2, 17-Sep-2019	20-Sep-2019	15-Mar-2020	✓	20-Sep-2019	15-Mar-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	18-Sep-2019	15-Oct-2019	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	18-Sep-2019	19-Sep-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	18-Sep-2019	15-Oct-2019	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) STP1, STP1 Duplicate	STP2, 17-Sep-2019	20-Sep-2019	15-Oct-2019	✓	20-Sep-2019	15-Oct-2019	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) STP1, STP1 Duplicate	STP2, 17-Sep-2019	20-Sep-2019	15-Oct-2019	✓	20-Sep-2019	15-Oct-2019	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	18-Sep-2019	18-Sep-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) STP1, STP1 Duplicate	STP2, 17-Sep-2019	----	----	----	18-Sep-2019	18-Sep-2019	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	30	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
22-265		File D		Page 58 of 306			



Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



CHAIN OF CUSTODY

ALS Laboratory: please tick →

MAGELADE 21 Burnie Road Portlanka SA 5095
Ph: 08 8350 0600 E: adrian.oe@alsglobal.com

BRISBANE 2 Blyn Street Stahard QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 48 Callamondah Drive Clifton QLD 4680
Ph: 07 4876 7944 E: ALSEnviro.gladstone@alsglobal.com

MACKAY 18 Harbour Road Mackay QLD 4740
Ph: 07 4944 0172 E: mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9800 E: samples.melbourne@alsglobal.com

MUDGEE 1/29 Sydney Road Mudgee NSW 2630
Ph: 02 6372 5735 E: mudgee.mai@alsglobal.com

NEWCASTLE 5 Rose Court Road Warabrook NSW 2304
Ph: 02 4368 9433 E: samples.newcastle@alsglobal.com

NOWRA 413 Geary Place North Nowra NSW 2541
Ph: 02 4423 2063 E: nowra@alsglobal.com

PERTH 18 Hod Way Malaga WA 6060
Ph: 08 9269 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2167
Ph: 02 9784 6565 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bontle QLD 4815
Ph: 07 4796 0600 E: townsville.environment@alsglobal.com

WOLLONGONG 99 Kerry Street Wollongong NSW 2500
Ph: 02 4229 3125 E: wollongong@alsglobal.com

CLIENT: TRILITY	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A	
OFFICE: AGNES WATER	PROJECT NO.: 45000 54738		ALS QUOTE NO.: BN/222/16		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
PROJECT: GROUNDWATER MONITORING	ORDER NUMBER: PURCHASE ORDER NO. 45000 54738		COUNTRY OF ORIGIN:		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: GLEN ZIPF	CONTACT PH: (07) 4974 7975		COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7		Other comment:	
SAMPLER: 4p4(6) Personal informa	SAMPLER MOBILE: 4p4(6) Personal inform		RELINQUISHED BY:		RECEIVED BY: (6) Personal info	
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):		DATE/TIME: 17-9-19 12:00		DATE/TIME: 18/9 8:40	
Email Reports to: ereson@TRILITY.com.au; agneswatergroup@trility.com.au	Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au		DATE/TIME:		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please email results also to: czipf@trility.com.au; dmccconnell@trility.com.au; rrupp@trility.com.au; mhills@trility.com.au

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract fee) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle req)					
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	pH Field	0.0 Field	Temp Field	Cond Field	ORP Field
1	STP1	17-9-19 10.50	W		5	X	6.68	0.25	23.5	3848	10.7
2	STP2	10.10	W		5	X	6.50	0.83	23.3	12364	121
3	97-01										
4	97-2										
5	97-3										
6	97-4										
7	97-5										
8	007										
9	008										
10	STP1 Duplicate	10.50	W		5	X	6.68	0.25	23.5	3848	10.7
TOTAL					15						

Environmental Division
Brisbane
Work Order Reference
EB1924565



Telephone : - 61-7-3243 7222

Well Day
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Well Day

MICRO LAB

CERTIFICATE OF ANALYSIS

Work Order : **EB1933892**
Client : **TRILITY Pt Ltd**
Contact : **Personal in**
Address : **LOT 40 SPRINGS ROAD**
AGNES WATER QLD 4677
Telephone : **07 4974 7975**
Project : **Groundwater Monitoring**
Order number : **4500056728**
C-O-C number : **---**
Sampler : **Personal in**
Site : **---**
Quote number : **BN/222/16**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 17-Dec-2019 09:55
Date Analysis Commenced : 17-Dec-2019
Issue Date : 30-Dec-2019 16:00



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

4p4(6) Personal informat

□□□□□□

Microbiologist
 Senior Inorganic Chemist
 Assistant Laboratory Manager
 Senior Chemist

□□□□□□ □□□□

Brisbane Microbiological, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Sampling, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for sample DESAL 3 (EB1933892-003). However, the difference is within experimental variation of the methods.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.

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Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	----
				EB1933892-001	EB1933892-002	EB1933892-003	EB1933892-004	-----
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	71	46	54	72	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.47	0.45	1.04	0.48	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.006	0.006	0.030	0.006	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	0.20	0.39	3.86	0.21	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.56	0.51	0.87	0.62	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.007	0.008	----
Manganese	7439-96-5	0.001	mg/L	0.007	0.007	0.033	0.008	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
Iron	7439-89-6	0.05	mg/L	0.24	0.46	4.29	0.27	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	----
				EB1933892-001	EB1933892-002	EB1933892-003	EB1933892-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.08	0.38	0.14	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.07	<0.01	0.02	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.07	<0.01	0.02	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	1.2	1.6	1.0	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	1.3	1.6	1.0	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.10	0.09	0.02	----
EN67: Field Tests								
pH	----	0.01	pH Unit	3.89	3.71	4.72	3.89	----
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	278	194	208	278	----
Dissolved Oxygen	----	0.01	% saturation	0.88	0.98	1.51	0.88	----
Temperature	----	0.1	°C	25.2	23.9	26.6	25.2	----
Redox Potential	----	0.1	mV	248	292	<0.1	248	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

QUALITY CONTROL REPORT

Work Order : **EB1933892**

Page : 1 of 7

Client : **TRILITY Pt Ltd**

Laboratory : Environmental Division Brisbane

Contact : **(6) Personal info**

Contact : Customer Services EB

Address : LOT 40 SPRINGS ROAD
AGNES WATER QLD 4677

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : 07 4974 7975

Telephone : +61-7-3243 7222

Project : Groundwater Monitoring

Date Samples Received : 17-Dec-2019

Order number : 4500056728

Date Analysis Commenced : 17-Dec-2019

C-O-C number : ---

Issue Date : 30-Dec-2019

Sampler : **(6) Personal info**

Site : ---

Quote number : BN/222/16

No. of samples received : 4

No. of samples analysed : 4



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

□ □ □ □ □ □ □ □

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□ □ □ □ □ □ □ □

(6) Personal info

□ □ □ □ □ □ □ □

Microbiologist
Senior Inorganic Chemist
Assistant Laboratory Manager
Senior Chemist

□ □ □ □ □ □ □ □ □ □ □ □

Brisbane Microbiological, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Sampling, Stafford, QLD
Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2771161)									
EB1933809-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
EB1933914-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	3	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2771159)									
EB1933809-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2390	2360	1.08	0% - 20%
EB1933914-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	42	42	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2772369)									
EB1933866-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.005	0.006	17.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1933898-007	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2772369) - continued									
EB1933898-007	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.254	0.260	2.32	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	3.37	3.42	1.50	0% - 20%		
EG020T: Total Metals by ICP-MS (QC Lot: 2772375)									
EB1933866-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.014	0.014	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.012	0.010	15.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.10	0.12	0.00	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.54	0.57	5.67	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.16	0.17	0.00	No Limit
EB1933898-007	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.287	0.277	3.35	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.38	0.38	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	3.62	3.46	4.33	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2772372)									
EB1933866-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1933898-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2772374)									
EB1933866-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1933898-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2787095)									
EB1933892-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2772275)									
EB1933892-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2771465)									
EB1933665-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.04	24.2	No Limit
EB1933843-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.16	8.27	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2771160)									
EB1933809-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1933914-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2771466)									
EB1933665-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.02	4.07	1.13	0% - 20%
EB1933843-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	6.18	6.30	2.04	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2780179)									
EB1933892-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.8	0.00	No Limit
ET1903895-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.4	2.4	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2780178)									
EB1933892-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit
ET1903895-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.44	0.43	0.00	No Limit

Published on DESI Disclosure Log
 RTI Act 2009



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2771161)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.1	85.0	118
				<1	100 mg/L	100	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2771159)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	100	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	112	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	101	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	105	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2772375)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.0	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	108	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	104	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.0	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	111	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.9	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	107	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	111	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.9	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	114	82.0	118

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File D

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG035F: Dissolved Mercury by FIMS (QCLot: 2772372)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2772374)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	100	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2787095)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	84.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2772275)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	92.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2771465)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	114	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2771160)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2771466)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2780179)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	90.1	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2780178)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.5	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number			Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2771161)							
EB1933914-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	96.7	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2771159)							
EB1933914-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	114	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369)							
22-265	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	93.4	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.0	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.9	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	96.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	98.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	90.2	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	90.6	70.0	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369) - continued							
EB1933866-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	95.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	103	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2772375)							
EB1933866-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	103	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	103	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	102	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	100	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2772372)							
EB1933866-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	96.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2772374)							
EB1933866-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	99.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2771465)							
EB1933666-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	96.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2771160)							
EB1933914-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.8	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2771466)							
EB1933666-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2780179)							
EB1933892-002	DESAL 2	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	110	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2780178)							
EB1933892-002	DESAL 2	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1933892	Page	: 1 of 7
Client	: [REDACTED] td	Laboratory	: Environmental Division Brisbane
Contact	: [REDACTED] Personal in	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Dec-2019
Site	: ----	Issue Date	: 30-Dec-2019
Sampler	: [REDACTED] Personal in	No. of samples received	: 4
Order number	: 4500056728	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	18-Dec-2019	13-Jan-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	18-Dec-2019	13-Jan-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	19-Dec-2019	13-Jun-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	20-Dec-2019	13-Jun-2020	✓	20-Dec-2019	13-Jun-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	19-Dec-2019	13-Jan-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	20-Dec-2019	13-Jan-2020	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	16-Dec-2019	----	----	----	27-Dec-2019	13-Jun-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) DESAL 1, DESAL 3, 22-265 DESAL 2, DESAL 1 Duplicate	16-Dec-2019	27-Dec-2019	13-Jun-2020	✓	27-Dec-2019	13-Jun-2020	✓

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Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	17-Dec-2019	13-Jan-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	18-Dec-2019	18-Dec-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	17-Dec-2019	13-Jan-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	23-Dec-2019	13-Jan-2020	✓	23-Dec-2019	13-Jan-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	23-Dec-2019	13-Jan-2020	✓	23-Dec-2019	13-Jan-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	18-Dec-2019	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	17-Dec-2019	17-Dec-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 Duplicate 16-Dec-2019	----	----	----	17-Dec-2019	17-Dec-2019	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
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Matrix: **WATER**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

CERTIFICATE OF ANALYSIS

Work Order : **EB1934065**
Client : **TRILITY Pty Ltd**
Contact : **Personal in**
Address : **LOT 40 SPRINGS ROAD**
AGNES WATER QLD 4677
Telephone : **07 4974 7975**
Project : **GROUNDWATER MONITORING**
Order number : **4500056928**
C-O-C number : **---**
Sampler : **Personal in**
Site : **---**
Quote number : **BN/222/16**
No. of samples received : **3**
No. of samples analysed : **3**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 18-Dec-2019 10:50
Date Analysis Commenced : 18-Dec-2019
Issue Date : 06-Jan-2020 14:15



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

4(6) Personal infor

□□□□□□

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Inorganics, Stafford, QLD
 Brisbane Sampling, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.

Published on DESI Disclosure Log
RTI Act 2009



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				17-Dec-2019 10:30	17-Dec-2019 09:45	17-Dec-2019 10:30	---	---
				EB1934065-001	EB1934065-002	EB1934065-003	-----	-----
				Result	Result	Result	---	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	381	96	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1020	4020	1010	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.26	0.105	1.28	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Iron	7439-89-6	0.05	mg/L	1.61	<0.05	1.65	---	---
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.01	0.03	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.35	0.109	1.31	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	0.06	<0.05	---	---
Iron	7439-89-6	0.05	mg/L	1.83	<0.05	1.82	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				17-Dec-2019 10:30	17-Dec-2019 09:45	17-Dec-2019 10:30	---	---
				EB1934065-001	EB1934065-002	EB1934065-003	-----	-----
				Result	Result	Result	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.02	<0.01	---	---
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.03	<0.01	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.01	0.03	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.1	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.1	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	0.01	---	---
EN67: Field Tests								
pH	----	0.01	pH Unit	6.54	6.35	6.54	---	---
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	3650	11700	3650	---	---
Dissolved Oxygen	----	0.01	% saturation	2.64	3.24	2.64	---	---
Temperature	----	0.1	°C	24.0	23.5	24.0	---	---
Redox Potential	----	0.1	mV	2.1	111	2.1	---	---
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	---	---
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	---	---



QUALITY CONTROL REPORT

Work Order	: EB1934065	Page	: 1 of 7
Client	: TRILITY Pt Ltd	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Dec-2019
Order number	: 4500056928	Date Analysis Commenced	: 18-Dec-2019
C-O-C number	: ---	Issue Date	: 06-Jan-2020
Sampler	: 6) Personal info		
Site	: ---		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

□□□□ □□ □□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□ □□

6) Personal info

□□□□□□

Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

□□□□ □□□□ □□□□ □□□□

Brisbane Inorganics, Stafford, QLD
Brisbane Sampling, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2773614)									
EB1934074-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	82	1.47	0% - 20%
EB1934011-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	78	80	2.47	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 2773615)									
EB1934074-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	82	82	0.00	0% - 20%
EB1934011-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	619	623	0.581	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2775286)									
EB1934028-018	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.047	0.046	0.00	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.012	0.011	0.00	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.010	0.010	0.00	0% - 50%
		EG020A-F: Tin	7440-31-5	0.001	mg/L	0.003	0.004	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.048	0.047	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.16	0.15	0.00	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB1934075-007	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2775286) - continued									
EB1934075-007	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2775290)									
EB1933803-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<1 µg/L	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	4 µg/L	0.004	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<1 µg/L	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	1170 µg/L	1.17	0.00	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	6 µg/L	0.006	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	1.67	1.65	0.797	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	2130 µg/L	2.09	1.76	0% - 20%
		EB1933803-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	<0.0001
EG020A-T: Arsenic	7440-38-2			0.001	mg/L	<1 µg/L	<0.001	0.00	No Limit
EG020A-T: Chromium	7440-47-3			0.001	mg/L	0.002	0.002	0.00	No Limit
EG020A-T: Cobalt	7440-48-4			0.001	mg/L	<0.001	<0.001	0.00	No Limit
EG020A-T: Copper	7440-50-8			0.001	mg/L	9 µg/L	0.010	0.00	No Limit
EG020A-T: Lead	7439-92-1			0.001	mg/L	3 µg/L	0.003	0.00	No Limit
EG020A-T: Manganese	7439-96-5			0.001	mg/L	27 µg/L	0.028	0.00	0% - 20%
EG020A-T: Nickel	7440-02-0			0.001	mg/L	0.003	0.003	0.00	No Limit
EG020A-T: Tin	7440-31-5			0.001	mg/L	<0.001	<0.001	0.00	No Limit
EG020A-T: Zinc	7440-66-6			0.005	mg/L	12 µg/L	0.014	16.2	No Limit
EG020A-T: Aluminium	7429-90-5			0.01	mg/L	40 µg/L	0.06	29.4	No Limit
EG020A-T: Selenium	7782-49-2			0.01	mg/L	<0.01	<0.01	0.00	No Limit
EG020A-T: Boron	7440-42-8			0.05	mg/L	0.29	0.30	0.00	No Limit
EG020A-T: Iron	7439-89-6	0.05	mg/L	130 µg/L	0.17	29.3	No Limit		
EG035F: Dissolved Mercury by FIMS (QC Lot: 2775287)									
EB1934028-018	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1934075-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Page 88 of 206



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2775293)									
EB1933803-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.5 µg/L	<0.0005	0.00	No Limit
EB1933803-011	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.1 µg/L	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2775411)									
EB1934065-001	STP1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2775143)									
EB1934065-001	STP1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2776021)									
EB1934011-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.40	0.40	0.00	0% - 20%
EB1934075-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.03	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2773613)									
EB1933761-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1934011-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2776022)									
EB1934011-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.05	0.00	No Limit
EB1934075-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2783909)									
EB1933876-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	3.1	13.8	No Limit
EB1934011-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	42.8	44.8	4.64	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2783908)									
EB1933876-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	5.01	5.16	2.97	0% - 20%
EB1934011-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.37	3.49	3.37	0% - 20%

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2773614)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.7	85.0	118
				<1	100 mg/L	102	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2773615)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.3	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	97.0	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.4	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.2	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.6	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.7	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.3	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	102	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.9	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.4	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2775290)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.9	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.1	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	108	82.0	118

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 2775287)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2775293)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2775411)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	84.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2775143)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	99.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2776021)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	105	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2773613)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.8	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2776022)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.4	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2783909)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	88.2	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2783908)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	95.4	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2773614)							
EB1934011-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	93.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2773615)							
EB1934011-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	75.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286)							
22-265	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	96.1	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	96.1	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	95.6	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	100	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	95.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.6	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	99.1	70.0	130

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Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286) - continued							
EB1934047-003	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	97.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	99.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2775290)							
EB1933803-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.9	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	96.2	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	90.0	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.4	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	98.2	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	89.8	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	89.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2775287)							
EB1934065-001	STP1	EG035F: Mercury	7439-97-6	0.01 mg/L	96.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2775293)							
EB1933803-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	94.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2776021)							
EB1934011-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2773613)							
EB1934011-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2776022)							
EB1934011-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	94.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2783909)							
EB1933878-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	84.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2783908)							
EB1933878-001	Anonymous	EK067G: Total Phosphorus as P	----	5 mg/L	98.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1934065	Page	: 1 of 7
Client	: TRILITY Pt. Ltd	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal info	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Dec-2019
Site	: (6) Personal info	Issue Date	: 06-Jan-2020
Sampler	: (6) Personal info	No. of samples received	: 3
Order number	: 4500056928	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK055G: Ammonia as N by Discrete Analyser	EB1934011--002	Anonymous	Ammonia as N	7664-41-7	Not Determined	---	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	14-Jan-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	14-Jan-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	23-Dec-2019	14-Jun-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T) STP1, STP1 Duplicate	STP2, 17-Dec-2019	21-Dec-2019	14-Jun-2020	✓	21-Dec-2019	14-Jun-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	24-Dec-2019	14-Jan-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	23-Dec-2019	14-Jan-2020	✓

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Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	30-Dec-2019	14-Jun-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) STP1, STP1 Duplicate	STP2, 17-Dec-2019	21-Dec-2019	14-Jun-2020	✓	21-Dec-2019	14-Jun-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	19-Dec-2019	14-Jan-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	19-Dec-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	19-Dec-2019	14-Jan-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	27-Dec-2019	14-Jan-2020	✓	27-Dec-2019	14-Jan-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) STP1, STP1 Duplicate	STP2, 17-Dec-2019	27-Dec-2019	14-Jan-2020	✓	27-Dec-2019	14-Jan-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	18-Dec-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) STP1, STP1 Duplicate	STP2, 17-Dec-2019	----	----	----	18-Dec-2019	18-Dec-2019	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Published on DESI Discourse Log
 RFL Act 2009



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADAMSTON 21 Burns Road Phoenix SA 5095
Ph: 08 8350 0800 E: adelaide@alsglobal.com

LIBRISBANE 2 Blyn Street Stafford QLD 4053
Ph: 07 3243 1222 E: samples.brisbane@alsglobal.com

GLADSTONE 48 Callendah Drive Clinton QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com

MACRAE 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com

IMELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

DMUDGE 1/29 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5 Rose Corn Road Warbrook NSW 2304
Ph: 02 4939 9433 E: samples.newcastle@alsglobal.com

UNSWICK 4/13 Geary Place North Nawa NSW 2541
Ph: 02 4923 2083 E: nawa@alsglobal.com

PERTH 10 Hot Way Malaga WA 6090
Ph: 08 9200 7655 E: samples.perth@alsglobal.com

SYDNEY 27-288 Woodbank Road Smithfield NSW 2161
Ph: 02 9339 6000 E: smithfield@alsglobal.com

WORKORDER No: EB1934065

CLIENT: TRILITY

OFFICE: AGNES WATER

PROJECT: GROUNDWATER MONITORING

ORDER NUMBER: PROJECT NO.:

PROJECT MANAGER: PURCHASE ORDER NO.: 45000 56928

SAMPLER: (6) Personal info

COC Emailed to ALS (YES / NO)

Email Reports to: persons@trility.com.au; agneswatergroup@trility.com.au

Email Invoice to (will default to PM if no other addresses are listed): accounts payable@trility.com.au

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please email results also to: czipf@trility.com.au; dmccomnet@trility.com.au; mup@trility.com.au; mhills@trility.com.au

TURNAROUND REQUIREMENTS:

(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.: BN/22/16

COUNTRY OF ORIGIN:

CONTACT PH: (07) 4974 7975

SAMPLER MOBILE: p4(6) Personal info

EDD FORMAT (or default):

☐ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

RELINQUISHED BY: (6) Personal info

DATE/TIME: 17-12-19 12:00

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

RECEIVED BY:

DATE/TIME: 18-12-19 10:50

Environmental Division
Brisbane

Work Order Reference

EB1934065



Telephone: + 61-7-3243 7222

ALS USE ONLY

SAMPLE DETAILS
MATRIX: Solid(S) Water(W)

CONTAINER INFORMATION

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)

Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

Additional Information

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

LAB ID

SAMPLE ID

DATE / TIME

MATRIX

TYPE & PRESERVATIVE
(refer to codes below)

TOTAL BOTTLES

TABLE 1

pH Field

O.O Field

Temp Field

Cond Field

ORP Field

17-12-19

10:30

9:45

W

W

W

W

W

W

W

W

W

W

well Dry
well Dry
well Dry
well Dry
well Dry
well Dry
well Dry
well Dry
well Dry

5

5

5

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x

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x

x

6.54

6.35

6.54

6.54

6.54

6.54

6.54

6.54

6.54

6.54

6.54

6.54

6.54

6.54

2.64

3.24

2.64

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2.64

2.64

2.64

2.64

24.0

23.5

24.0

24.0

24.0

24.0

24.0

24.0

24.0

24.0

24.0

24.0

24.0

24.0

3648

11708

3648

3648

3648

3648

3648

3648

3648

3648

3648

3648

3648

3648

2.1

111

2.1

2.1

2.1

2.1

2.1

2.1

2.1

2.1

2.1

2.1

2.1

2.1

TOTAL

15

File D

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N/A

File D

22-265

Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved; Vial HCl Preserved; VB = Vial Sodium Bisulphate Preserved; VS = Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; S = Unpreserved Bag; LI = Lugol's Iodine Preserved

CERTIFICATE OF ANALYSIS

Work Order : EB2010399
Client : TRILITY Pt Ltd
Contact : [Redacted]
Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
Telephone : +61 08 84086500
Project : Groundwater Monitoring
Order number : 4500059581
C-O-C number : ---
Sampler : [Redacted]
Site : ---
Quote number : BN/222/16
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222
Date Samples Received : 16-Apr-2020 09:00
Date Analysis Commenced : 16-Apr-2020
Issue Date : 23-Apr-2020 15:18



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

[Redacted Signature]

□□□□□□

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EK067G (Total Phosphorus as P): Sample EB2010399_001 (DESAL 1) was diluted due to matrix interference. LOR adjusted accordingly.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for samples DESAL 2 (EB2010399-002) and DESAL 3 (EB2010399-003). However, the difference is within experimental variation of the methods.
- ED041G (Sulfate as SO₄): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	-----
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	2	<1	<5	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	72	81	60	74	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.48	0.56	0.73	0.51	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.007	0.008	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.008	0.028	0.029	0.008	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	0.14	0.57	3.71	0.16	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.59	1.35	0.92	0.60	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.003	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	0.006	0.006	----
Manganese	7439-96-5	0.001	mg/L	0.008	0.030	0.028	0.008	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
Iron	7439-89-6	0.05	mg/L	0.18	0.67	3.99	0.18	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.04	0.02	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.10	0.50	0.13	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.76	0.03	<0.01	0.73	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.03	<0.01	0.73	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	1.3	1.6	1.2	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	2.0	1.3	1.6	1.9	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.05	0.10	0.21	0.07	----
EN67: Field Tests								
Ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	298.7	313.6	219.0	298.7	----
Ø Dissolved Oxygen	----	0.1	mg/L	0.32	0.31	0.44	0.32	----
Ø pH	----	0.01	pH Unit	3.99	3.92	4.82	3.99	----
Ø Temperature	----	0.1	°C	26.3	24.8	27.6	26.3	----
Ø Reactive Phosphorus as P	14265-44-2	0.01	mg/L	172.4	180.6	-177.7	172.4	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----



QUALITY CONTROL REPORT

Work Order : EB2010399

Page : 1 of 7

Client : TRILITY Pt Ltd

Laboratory : Environmental Division Brisbane

Contact : (b) (6) Personal information

Contact : Customer Services EB

Address : LOT 40 SPRINGS ROAD
AGNES WATER QLD 4677

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61 08 84086500

Telephone : +61-7-3243 7222

Project : Groundwater Monitoring

Date Samples Received : 16-Apr-2020

Order number : 4500059581

Date Analysis Commenced : 16-Apr-2020

C-O-C number : ---

Issue Date : 23-Apr-2020

Sampler : (b) (6) Personal information

Site : ---

Quote number : BN/222/16

No. of samples received : 4

No. of samples analysed : 4



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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(b) (6) Personal information

Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

Brisbane Administration, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2973523)									
EB2010268-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	658000 µg/L	656	0.270	0% - 20%
EB2010399-001	DESAL 1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2973525)									
EB2010399-001	DESAL 1	ED045G: Chloride	16887-00-6	1	mg/L	72	73	0.00	0% - 20%
EB2010545-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2420	2440	0.643	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357)									
EB2008355-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.006	0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.03	1.01	2.16	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.018	0.019	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.10	0.10	0.00	No Limit
EB2010262-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357) - continued									
EB2010262-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.115	0.114	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2972363)									
EB2010188-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.10	<0.10	0.00	No Limit
EB2010262-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.050	0.050	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	31.5	31.5	0.0606	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	3.70	3.71	0.478	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2972358)									
EB2010378-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2008355-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2972368)									
EB2008355-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2010085-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2972289)									
EB2010399-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2972282)									
EB2010399-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2977961)									
EB2010399-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.09	0.00	No Limit
EB2010482-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.06	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2973522)									
EB2010268-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
EB2010399-001	DESAL 1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2977962)									
EB2010399-001	DESAL 1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.72	4.65	0% - 20%
EB2010482-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2976603)									
EB2010376-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	2.3	15.9	No Limit
EB2010394-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	31.1	30.5	2.03	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2976602)									
EB2010376-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.35	1.31	2.78	0% - 20%
EB2010394-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.51	3.26	7.45	0% - 20%



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	85.0	118	
				<1	100 mg/L	104	85.0	118	
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	90.0	115	
				<1	1000 mg/L	102	90.0	115	
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)									
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	79.0	118	
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	116	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	88.0	108	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	87.0	113	
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	86.0	112	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	114	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	110	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	89.0	120	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.5	89.0	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	83.0	112	
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	99.3	86.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.3	87.0	113	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	114	
EG020T: Total Metals by ICP-MS (QCLot: 2972363)									
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.9	80.0	114	
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	112	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	88.0	111	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.3	89.0	115	
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.2	89.0	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.2	88.0	116	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.7	89.0	112	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.9	88.0	114	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.0	88.0	116	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.9	79.0	111	
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	108	86.0	116	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.1	84.0	114	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	91.7	82.0	128	
EG020A-T: Iodine	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.0	82.0	118	

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	118	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2972289)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	90.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2972282)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	106	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.0	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	88.5	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.4	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)							
EB2010268-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1000 mg/L	92.5	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)							
EB2010399-002	DESAL 2	ED045G: Chloride	16887-00-6	400 mg/L	107	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)							
22-265	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	97.3	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	92.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.1	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.4	70.0	130

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Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357) - continued							
EB2008355-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	93.1	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2972363)							
EB2010188-006	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	96.7	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.6	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	105	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	108	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	107	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.4	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.7	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)							
EB2008355-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)							
EB2008355-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	82.1	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)							
EB2010399-002	DESAL 2	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	87.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)							
EB2010268-002	Anonymous	EK057G: Nitrite as N	14797-65-0	4 mg/L	96.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)							
EB2010399-002	DESAL 2	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	89.6	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)							
EB2010393-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	86.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)							
EB2010393-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2010399	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	: 4p4(6) Personal informati	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 16-Apr-2020
Site		Issue Date	: 23-Apr-2020
Sampler	: 4p4(6) Personal informati	No. of samples received	: 4
Order number	: 4500059581	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	13-May-2020	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	13-May-2020	✓
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG020A-F) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	12-Oct-2020	✓	21-Apr-2020	12-Oct-2020	✓
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	13-May-2020	✓
Clear Plastic Bottle - Natural (EG035F) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	13-May-2020	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG094-AgF) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG094T: Total metals in Fresh water by ORC-ICPMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	20-Apr-2020	12-Oct-2020	✓	20-Apr-2020	12-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	17-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	13-May-2020	✓	21-Apr-2020	13-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	13-May-2020	✓	21-Apr-2020	13-May-2020	✓
MW006: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	16-Apr-2020	16-Apr-2020	✓
MW023: Enterococci by Membrane Filtration								
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)								
DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	16-Apr-2020	16-Apr-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
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Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

QADELAIDE 21 Burnside Road Parkfield SA 5042
Ph: 08 8359 089C E: daniel@alsglobal.com.au daniel@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGE 129 Sydney Road Mudgee NSW 2850
E: mudgee@alsglobal.com

NEWCASTLE 8 Rose Gum Road Warbrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@aisglobal.com

NOWRA 41/3 Geary Place North Nowra NSW 2541
Ph: 02 4423 2063 E: nowra@aisglobal.com

PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@aisglobal.com

QSYDNEY 277-289 Woodpark Road Smithfield NSW 2154
 Ph: 02 8784 8556 E: samples_sydney@aisglobal.com
QTOWNSVILLE 14-15 Desma Court Bohla QLD 4818
 Ph: 07 4796 0600 E: townsville_environmentals@aisglobal.com
QWOLLONGONG 99 Kenny Street Wollongong NSW 2500
 Ph: 02 4225 3125 E: wollongong@aisglobal.com

CLIENT: TRILITY		TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: AGNES WATER		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Intact? Yes No	
PROJECT: GROUNDWATER MONITORING		PROJECT NO.: BN/222/16		Free ice / frozen ice bricks present upon receipt? Yes No	
ORDER NUMBER:		PURCHASE ORDER NO.: 4500059581		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: I(6) Personal info		CONTACT PH: DL: +617 49757976 M(6) Personal info		Other comment:	
SAMPLER: (6) Personal info		SAMPLER MOBILE: (6) Personal info		RELINQUISHED BY:	
COC Emailed to ALS? (YES) / NO		EDD FORMAT (or default):		RECEIVED BY: (6) Personal info	
Email Reports to: Personal i awatergroup@trility.com.au		DATE/TIME: 15/04/2020 1400		DATE/TIME: 16/4/2020 9:00	
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au				DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic;
V = VOA via HCl Preserved; VS = VOA via Sodium Bisulfate Preserved; VS = VOA via Sulfuric Preserved; AV = Airfreight Unpreserved via SG = Sulfuric Preserved Plastic; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric
Z = Zinc Acetate Preserved Bottle; SE = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag; LI = Lungs Inside Preserved Bottles; SCTL = Sterile Sodium Thiosulfate Preserved Bottles.

**Environmental Division
Brisbane**

Work Order Reference

Work Order Number
EB2010399



Telephone : + 61-7-3243 7222

MICROBLAE

CERTIFICATE OF ANALYSIS

Work Order : **EB2010933**
Client : **TRILITY Pt Ltd**
Contact : **(6) Personal info**
Address : **LOT 40 SPRINGS ROAD**
AGNES WATER QLD 4677
Telephone : **---**
Project : **Groundwater Monitoring**
Order number : **4500059581**
C-O-C number : **---**
Sampler : **p4(6) Personal inform**
Site : **---**
Quote number : **BN/222/16**
No. of samples received : **3**
No. of samples analysed : **3**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 22-Apr-2020 08:10
Date Analysis Commenced : 22-Apr-2020
Issue Date : 28-Apr-2020 10:40



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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□□□□□□

□□□□□□ □□□□

(6) Personal info

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

Brisbane Inorganics, Stafford, QLD
 Brisbane Sampling, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	---	---
				EB2010933-001	EB2010933-002	EB2010933-003	-----	-----
				Result	Result	Result	---	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	369	95	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1020	3850	1020	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	0.005	0.005	0.006	---	---
Manganese	7439-96-5	0.001	mg/L	1.24	0.111	1.26	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Iron	7439-89-6	0.05	mg/L	1.57	<0.05	1.60	---	---
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.39	0.113	1.39	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	---	---
Iron	7439-89-6	0.05	mg/L	1.82	<0.05	1.82	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	---	---
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	---	---
				EB2010933-001	EB2010933-002	EB2010933-003	-----	-----
				Result	Result	Result	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.01	<0.01	---	---
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.02	<0.01	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.25	0.18	0.06	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.1	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.1	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.04	0.03	---	---
EN67: Field Tests								
pH	----	0.01	pH Unit	6.71	6.53	6.71	---	---
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	3730	11700	3730	---	---
Dissolved Oxygen	----	0.01	mg/L	0.72	1.13	0.72	---	---
Temperature	----	0.1	°C	24.1	24.0	24.1	---	---
Redox Potential	----	0.1	mV	<0.1	85.5	<0.1	---	---
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	---	---
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	---	---



QUALITY CONTROL REPORT

Work Order	: EB2010933	Page	: 1 of 7
Client	:	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Order number	: 4500059581	Date Analysis Commenced	: 22-Apr-2020
C-O-C number	: ----	Issue Date	: 28-Apr-2020
Sampler	: p4(6) Personal info		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- | Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- | Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- | Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
-------------	----------	------------------------

(6) Personal info



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER

Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Client sample ID	Method : Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EB2010587-002	Anonymous	ED041G: Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	34	34	0.00	0% - 20%
EB2010590-010	Anonymous	ED041G: Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
EB2010587-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	454	452	0.284	0% - 20%
EB2010590-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.00	No Limit
EB2010930-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.257	0.264	2.43	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.012	0.011	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.20	0.20	0.00	No Limit
EB2010430-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2010933	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	: b4(6) Personal inform	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Site	: ---	Issue Date	: 28-Apr-2020
Sampler	: b4(6) Personal informa	No. of samples received	: 3
Order number	: 4500059581	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EB2010587--003	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
STP1,	STP2,	21-Apr-2020	----	----	----	22-Apr-2020	19-May-2020	✓
STP1 Duplicate								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
STP1,	STP2,	21-Apr-2020	----	----	----	22-Apr-2020	19-May-2020	✓
STP1 Duplicate								
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	18-Oct-2020	✓
STP1 Duplicate								
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
STP1,	STP2,	21-Apr-2020	23-Apr-2020	18-Oct-2020	✓	23-Apr-2020	18-Oct-2020	✓
STP1 Duplicate								
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
STP1 Duplicate								
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
STP1 Duplicate								

22-265

File D

Page 127 of 306



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	18-Oct-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) STP1, STP1 Duplicate	STP2, 21-Apr-2020	23-Apr-2020	18-Oct-2020	✓	23-Apr-2020	18-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	23-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	24-Apr-2020	19-May-2020	✓	24-Apr-2020	19-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	24-Apr-2020	19-May-2020	✓	24-Apr-2020	19-May-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	24-Apr-2020	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	22-Apr-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	22-Apr-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
22-265				File D			

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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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 R/L Act 2009



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Adelaide SA 5005
Ph: 08 8359 0893 E: adelaide@alsglobal.comMACKAY 78 Harbour Road Mackay QLD 4790
Ph: 07 4944 0177 E: mackay@alsglobal.comBON SBANE 2 Byth Street Stafford QLD 4003
Ph: 07 3243 7224 E: samples.brsbane@alsglobal.comMELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 5600 E: samples.melbourne@alsglobal.comGLADSTONE 48 Callamondah Drive Clinton QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.comMUDGEE 126 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6705 E: mudgee@mail@alsglobal.comNEWCASTLE 5 Rose Gum Road Warburton NSW 2344
Ph: 02 4965 9435 E: samples.newcastle@alsglobal.comLINDRUM 4413 Quarry Place North Lismore NSW 2541
Ph: 02 4427 2093 E: lindrum@alsglobal.comPERTH 11 Hod Way Malaga WA 6093
Ph: 02 6200 7655 E: samples.perth@alsglobal.comSYDNEY 217-285 Woodcock Road Smithfield NSW 2194
Ph: 02 9784 8385 E: samples.sydney@alsglobal.comTOWNSVILLE 14-16 Desma Court Boleke QLD 4818
Ph: 07 4759 3000 E: townsville@alsglobal.comWOLLONGONG 99 Kenny Street Wollongong NSW 2520
Ph: 02 4229 3125 E: wollongong@alsglobal.com

CLIENT: TRILITY	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	FOR LABORATORY USE ONLY (Circle)	
OFFICE: AGNES WATER	☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A	
PROJECT: GROUNDWATER MONITORING	PROJECT NO.:	Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER:	PURCHASE ORDER NO.: 4500055581	Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: 4(6) Personal inform	CONTACT PH: DL: +61 7 49757975 M: 5) Personal in	Other comment:	
SAMPLER: 1) Personal in	SAMPLER MOBILE: 6) Personal in	RECEIVED BY: 6) Personal in	
COG Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY:	
Email Reports to: Personal i@trility.com.au; awatergroup@trility.com.au	DATE/TIME: 21-4-20 1400	DATE/TIME: 22/4/2020	
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Consignment Note: MYTF134526

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	pH Field	DO Field	Temp field	EC Field	ORP Field	<div>Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please add field results to COA</div> <div>Environmental Division Brisbane Work Order Reference EB2010933</div> <div></div> <div>Telephone : + 61-7-3243.7222</div>	
1	STP1	21/04/2020 1015	W		5	X	6.71	0.72	24.1	3729	-16.7		
2	STP2	21/04/2020 1120	W		5	X	6.53	1.13	24.0	11732	85.5		
	97-01		W										
	97-2		W										
	97-3		W										
	97-4		W										
	97-5		W										
	007		W										
	008		W										
3	STP1 Duplicate	21/04/2020 1020	W		5	X	6.71	0.72	24.1	3729	-16.7		
TOTAL					15								

Telephone: + 61-7-3243.7222

Environmental Division
Brisbane
Work Order Reference
EB2010933

MICRO LAB

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugol's Iodine Preserved Bottles; STT = Styrene Sodium Thiosulfate Preserved Bottles.

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CERTIFICATE OF ANALYSIS

Work Order : **EB2016548**
Client : **TRILITY Pty Ltd**
Contact : **(6) Personal infor**
Address : **LOT 40 SPRINGS ROAD**
AGNES WATER QLD 4677
Telephone : **---**
Project : **GROUNDWATER MONITORING**
Order number : **4500061046**
C-O-C number : **---**
Sampler : **h4p4(6) Personal informati**
Site : **---**
Quote number : **BN/222/16**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 23-Jun-2020 10:50
Date Analysis Commenced : 23-Jun-2020
Issue Date : 29-Jun-2020 10:24



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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□□□□□□ □□□□

h4p4(6) Personal informati

Microbiologist
 Senior Inorganic Chemist
 Senior Inorganic Chemist

Brisbane Microbiological, Stafford, QLD
 Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- ED041G (Sulfate as SO₄ 2-) / EK057G (Nitrite as N): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				22-Jun-2020 10:40	22-Jun-2020 12:10	22-Jun-2020 13:00	22-Jun-2020 10:45	----
				EB2016548-001	EB2016548-002	EB2016548-003	EB2016548-004	-----
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	<5	<5	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	77	52	47	78	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.61	0.59	0.78	0.60	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	0.002	<0.001	0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.002	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.007	0.009	0.005	0.005	----
Manganese	7439-96-5	0.001	mg/L	0.014	0.014	0.026	0.013	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	0.17	0.74	3.46	0.17	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.62	0.63	0.84	0.61	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.013	0.012	0.023	0.013	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
Iron	7439-89-6	0.05	mg/L	0.17	0.76	3.36	0.16	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				22-Jun-2020 10:40	22-Jun-2020 12:10	22-Jun-2020 13:00	22-Jun-2020 10:45	----
				EB2016548-001	EB2016548-002	EB2016548-003	EB2016548-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.15	0.47	0.13	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.05	<0.05	<0.05	<0.05	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.30	<0.05	<0.05	0.31	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.30	<0.01	<0.01	0.31	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	1.0	1.2	1.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.4	1.0	1.2	1.4	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.14	0.07	0.01	----
EN67: Field Tests								
Ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	343.1	238.2	202.0	343.1	----
Ø Dissolved Oxygen	----	0.1	mg/L	0.18	0.32	0.34	0.18	----
Ø pH	----	0.01	pH Unit	4.10	4.30	5.07	4.10	----
Ø Temperature	----	0.1	°C	24.5	23.8	26.3	24.5	----
Ø Reactive Phosphorus as P	14265-44-2	0.01	mg/L	149.6	30.0	-117.0	149.6	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

QUALITY CONTROL REPORT

Work Order : **EB2016548**

Page : 1 of 7

Client :
 Contact : (6) Personal information
 Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
 Telephone : ---
 Project : GROUNDWATER MONITORING
 Order number : 4500061046
 C-O-C number : ---
 Sampler : p4(6) Personal information
 Site : ---
 Quote number : BN/222/16
 No. of samples received : 4
 No. of samples analysed : 4

Laboratory : Environmental Division Brisbane
 Contact : Customer Services EB
 Address : 2 Byth Street Stafford QLD Australia 4053
 Telephone : +61-7-3243 7222
 Date Samples Received : 23-Jun-2020
 Date Analysis Commenced : 23-Jun-2020
 Issue Date : 29-Jun-2020



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□ □□

h4p4(6) Personal information

□□□□□□

Microbiologist
 Senior Inorganic Chemist
 Senior Inorganic Chemist

□□□□ □□□□ □□□□ □□□□

Brisbane Microbiological, Stafford, QLD
 Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3097754)									
EB2016492-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	40	40	0.00	0% - 20%
EB2016510-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 3097755)									
EB2016492-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	550	552	0.459	0% - 20%
EB2016510-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	10	10	0.00	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3097528)									
EB2016555-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.014	0.014	0.00	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	<0.01	127	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB2016512-017	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3097528) - continued									
EB2016512-017	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.108	0.108	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit		
EG020T: Total Metals by ICP-MS (QC Lot: 3097518)									
EB2016512-013	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.015	0.016	0.00	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.018	0.020	9.22	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.60	0.56	7.69	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.69	0.66	4.67	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.92	2.00	4.34	0% - 20%
EB2016565-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	7 µg/L	0.007	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	49 µg/L	0.050	2.48	0% - 20%
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	44 µg/L	0.044	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	67 µg/L	0.068	1.74	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	40 µg/L	0.041	0.00	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	772 µg/L	0.753	2.48	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	51 µg/L	0.051	0.00	0% - 20%
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	137 µg/L	0.132	3.61	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	40400 µg/L	42.3	4.76	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	50 µg/L	0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	38800 µg/L	39.1	0.983	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 3097527)									
EB2016512-017	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3097531)									

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File D

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3097531) - continued									
EB2016512-013	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016548-004	DESAL 1 Duplicate	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3097537)									
EB2016548-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3097539)									
EB2016548-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3102325)									
EB2016623-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016534-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3097753)									
EB2016492-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016510-008	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3102324)									
EB2016623-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.16	0.16	0.00	0% - 50%
EB2016534-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3101497)									
EB2016444-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.5	0.00	No Limit
EB2016548-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	1.3	16.6	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3101498)									
EB2016444-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.04	0.00	No Limit
EB2016548-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.03	86.1	No Limit

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 RTI Act 2009



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3097754)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	106	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 3097755)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.6	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	111	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	105	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	112	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	110	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	105	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	108	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 3097518)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.5	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.0	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.8	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.4	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.9	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	107	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	128
EG020A-T: Iridium-265	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 3097527)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.3	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3097531)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.6	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3097537)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	95.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3097539)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	98.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3102325)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	103	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3097753)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3102324)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	89.9	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3101497)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	94.0	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3101498)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.4	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3097754)							
EB2016509-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3097755)							
EB2016509-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	99.0	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528)							
EB2016512-018	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	110	70.0	130
22-265	Anonymous	EG020A-F: Cadmium	7440-43-9	0.25 mg/L	101	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	100	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	106	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	99.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	96.6	70.0	130

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528) - continued							
EB2016512-018	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	98.3	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	103	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	106	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3097518)							
EB2016512-014	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	104	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	101	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	106	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	111	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	106	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	102	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3097527)							
EB2016512-018	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	85.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3097531)							
EB2016512-014	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	86.3	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3102325)							
EB2016548-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	90.1	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3097753)							
EB2016509-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3102324)							
EB2016548-001	DESAL 1	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	79.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3101497)							
EB2016444-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	92.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3101498)							
EB2016444-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	102	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2016548	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal infor	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Jun-2020
Site	: ---	Issue Date	: 29-Jun-2020
Sampler	: p4(6) Personal informa	No. of samples received	: 4
Order number		No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2016509--001	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
DESAL 1,	DESAL 2,	22-Jun-2020	----	----	----	24-Jun-2020	20-Jul-2020	✓
DESAL 3,	DESAL 1 Duplicate							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
DESAL 1,	DESAL 2,	22-Jun-2020	----	----	----	24-Jun-2020	20-Jul-2020	✓
DESAL 3,	DESAL 1 Duplicate							
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
DESAL 1,	DESAL 2,	22-Jun-2020	----	----	----	25-Jun-2020	19-Dec-2020	✓
DESAL 3,	DESAL 1 Duplicate							
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
DESAL 1,	DESAL 2,	22-Jun-2020	24-Jun-2020	19-Dec-2020	✓	24-Jun-2020	19-Dec-2020	✓
DESAL 3,	DESAL 1 Duplicate							
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)								
DESAL 1,	DESAL 2,	22-Jun-2020	----	----	----	25-Jun-2020	20-Jul-2020	✓
DESAL 3,	DESAL 1 Duplicate							
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)								
DESAL 1,	DESAL 2,	22-Jun-2020	----	----	----	24-Jun-2020	20-Jul-2020	✓
DESAL 3, 22-265	DESAL 1 Duplicate	File D					Page 146 of 306	



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	24-Jun-2020	19-Dec-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	24-Jun-2020	19-Dec-2020	✓	24-Jun-2020	19-Dec-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	26-Jun-2020	20-Jul-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	24-Jun-2020	24-Jun-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	26-Jun-2020	20-Jul-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	26-Jun-2020	20-Jul-2020	✓	26-Jun-2020	20-Jul-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	26-Jun-2020	20-Jul-2020	✓	26-Jun-2020	20-Jul-2020	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	23-Jun-2020	23-Jun-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) DESAL 1, DESAL 3, DESAL 2, DESAL 1 Duplicate	22-Jun-2020	----	----	----	23-Jun-2020	23-Jun-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
ORC-ICPMS22-265							

File D

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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



ALS Laboratory: please tick →

LADELAIDE 21 Burmea Road, Mackay QLD 4740
Ph: 08 8254 0800 E: info@ladelaide.com.au ladelaide.com.au

BRISBANE 2 Byth Street Oxford QLD 4053 MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 07 3743 7227 F: samples.brisbane@ataglobal.com Ph: 03 8549 5650 E: samples.melbourne@ataglobal.com

UGLADSTONE 48 Callendean Drive Clinton QLD 4680 **BUDDIEE 128 Sydney Road Mudgee NSW 2855**
Ph: 07 4978 7944 E: ALService.gladstone@alsglobal.com **Ph: 02 6572 6765 E: buddiee@alsglobal.com**

LINEWCASTLE 5 Rose Court Road Warabrook NSW 2064
75 02 1980 8423 15

Ph: 02-4223 0003 E: nboers@celglobal.com
 41HOWRA 4115 Geary Place North Vancouver BC V5L 2S1
 Ph: 02-4223 0003 E: nboers@celglobal.com

1200011-10 Hed Way Massage, WVA 0050
 PH: 018 8330 1255 E: hedway@hedwaymassage.com

USDA/EV 77-08/Woodpark Road Cambridge MA 02142

Ph: 07 4756 0680 Fax: 07 4756 0681

JAVO, LONGCHENG 89 Kency Creek Molongong NSW 2600
Ph. 02 4355 3476 E. info@javo.com.au

CLIENT: TRILITY		TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: AGNES WATER		PROJECT NO.: BN/222/H6		COC SEQUENCE NUMBER (Circle)		Custody Seal Intact? Yes No	
PROJECT: GROUNDWATER MONITORING		ALS QUOTE NO.: BN/222/H6		COC: 1 2 3 4 5 6 7		Free ice / frozen ice bricks present upon receipt? Yes No	
ORDER NUMBER: PURCHASE ORDER NO.: 4500061046		COUNTRY OF ORIGIN:		OF: 1 2 3 4 5 6 7		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: (6) Personal info		CONTACT PH: DL: +61 7 49757975 M: (6) Personal info		RECEIVED BY: (6) Personal info		RECEIVED BY:	
SAMPLER: (6) Personal info		SAMPLER MOBILE: (6) Personal info		RELINQUISHED BY: (6) Personal info		RELINQUISHED BY:	
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):		DATE/TIME: 23/06/2020 14:00		DATE/TIME: 23/6/2020 10:50	
Email Reports to: (6) Personal info@trility.com.au; awatergroup@trility.com.au		Email Invoice to (with default to PM if no other addresses are listed): accountspayable@trility.com.au					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	Temp Field	DO Field	EC Field $\mu\text{S}/\text{cm}$	pH Field	ORP Field		
1	DESAL 1	22/06/2020 1040	W		5	X	24.5	0.18	343.1	4.10	149.6		
2	DESAL 2	22/06/2020 1210	W		5	X	23.8	0.32	238.2	4.30	30.0		
3	DESAL 3	22/06/2020 1300	W		5	X	26.3	0.34	202.0	5.07	117.0		
4	DESAL 1 Duplicate	22/06/2020 1045	W		5	X	24.5	0.18	343.1	4.10	149.6		
TOTAL					20								

Comments on likely contaminant levels, dilutions or samples requiring specific QC analysis etc.
Please add field results to COA

Environmental Division
Brisbane
Work Order Reference
EB2016548



Telephone + 61-7-3243 7222

MICRO LAB

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulfate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation bottle; SP = Sulfuric Preserved Speciation Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

RESULTS

Seite 7 von 11

Accepted Date: 27 October 2017

Environmental Division
Brisbane
Work Order Reference
EB2016548



Telephone • + 61-7-3243 7222

MICRO LAB

CERTIFICATE OF ANALYSIS

Work Order : **EB2016812**
Client : **TRILITY Pty Ltd**
Contact : 4(6) Personal info
Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
Telephone : ---
Project : GROUNDWATER MONITORING
Order number : 4500061046
C-O-C number : ---
Sampler : 4(6) Personal info
Site : ---
Quote number : BN/222/16
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 25-Jun-2020 08:40
Date Analysis Commenced : 25-Jun-2020
Issue Date : 02-Jul-2020 14:27



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

(6) Personal info

□□□□□□

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EK061G (Total Kjeldahl Nitrogen as N): Sample EB2016812_002 (STP2) was diluted due to matrix interference. LOR adjusted accordingly.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) for some samples. However, the difference is within experimental variation of the methods.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	97-01	STP1 Duplicate	----
				24-Jun-2020 11:15	24-Jun-2020 09:20	24-Jun-2020 10:10	24-Jun-2020 11:20	----
				EB2016812-001	EB2016812-002	EB2016812-003	EB2016812-004	-----
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	92	369	16	92	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1020	3850	231	1020	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.08	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	0.004	0.004	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	1.38	0.116	0.006	1.38	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	1.78	0.05	<0.05	1.76	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.16	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	<0.001	0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	0.002	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	0.012	0.003	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.017	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	1.26	0.121	0.012	1.28	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.18	<0.05	----
Iron	7439-89-6	0.05	mg/L	1.66	0.06	0.08	1.63	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	97-01	STP1 Duplicate	----
				24-Jun-2020 11:15	24-Jun-2020 09:20	24-Jun-2020 10:10	24-Jun-2020 11:20	----
				EB2016812-001	EB2016812-002	EB2016812-003	EB2016812-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.02	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.02	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.03	0.04	0.04	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	0.15	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.15	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	<0.5	0.3	0.1	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.1	<0.5	0.4	0.1	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.07	0.02	0.01	----
EN67: Field Tests								
∅ Electrical Conductivity (Non Compensated)	----	1	µS/cm	3844	12069	781	3844	----
∅ Dissolved Oxygen	----	0.1	mg/L	0.85	0.49	2.46	0.85	----
∅ pH	----	0.01	pH Unit	6.67	6.50	5.56	6.67	----
∅ Temperature	----	0.1	°C	23.7	23.8	19.5	23.7	----
∅ Reactive Phosphorus as P	14265-44-2	0.01	mg/L	1.0	80.0	148.1	1.0	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	~65	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	21	<1	----

QUALITY CONTROL REPORT

Work Order	: EB2016812	Page	: 1 of 7
Client	: TRILITY Pt Ltd	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal inform	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ---	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 25-Jun-2020
Order number	: 4500061046	Date Analysis Commenced	: 25-Jun-2020
C-O-C number	: ---	Issue Date	: 02-Jul-2020
Sampler	: 4(6) Personal inform		
Site	: ---		
Quote number	: BN/222/16		
No. of samples received	: 4		
No. of samples analysed	: 4		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

□ □ □ □ □ □ □ □

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□ □ □ □ □ □ □ □

4(6) Personal inform

□ □ □ □ □ □ □ □

Senior Inorganic Chemist
Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

□ □ □ □ □ □ □ □ □ □ □ □

Brisbane Administration, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3102812)									
EB2016756-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	57	56	0.00	0% - 20%
EB2016813-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	78	78	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3102813)									
EB2016756-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	142	141	0.770	0% - 20%
EB2016813-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1400	1390	0.250	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3102731)									
EB2016807-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB2016805-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.036	0.036	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3102731) - continued									
EB2016805-004	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.81	0.88	9.02	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.08	0.09	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 3102676)									
EB2016736-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.048	0.048	0.00	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.075	0.077	2.22	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.10	0.10	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.09	0.09	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.20	0.19	0.00	No Limit
EB2016807-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.132	0.134	1.35	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.43	0.37	14.2	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.05	0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.56	0.54	3.82	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 3102729)									
EB2016793-030	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016807-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3102674)									
EB2016736-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016807-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 3102645)									
EB2016812-001	STP1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3102651)									
EB2016812-001	STP1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 3109117)									
EB2016703-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016807-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3102814)									
EB2016756-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.00	No Limit
EB2016813-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3109116)									
EB2016703-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB2016807-003	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3108936)									
EB2016796-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	41.5	43.1	3.83	0% - 20%
EB2016812-002	STP2	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	<0.5	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3108935)									
EB2016796-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	6.07	6.20	2.03	0% - 20%
EB2016812-002	STP2	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	<0.05	31.9	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3102812)									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	85.0	118	
				<1	100 mg/L	95.7	85.0	118	
ED045G: Chloride by Discrete Analyser (QCLot: 3102813)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.8	90.0	115	
				<1	1000 mg/L	103	90.0	115	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731)									
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	96.1	79.0	118	
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	116	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	88.0	108	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.4	87.0	113	
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.5	86.0	112	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.6	88.0	114	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	110	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.2	89.0	120	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.1	89.0	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112	
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.7	87.0	113	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.5	82.0	114	
EG020T: Total Metals by ICP-MS (QCLot: 3102676)									
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.0	80.0	114	
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	88.0	112	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	111	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	115	
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	107	89.0	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	107	88.0	116	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	89.0	112	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	116	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.0	79.0	111	
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	104	86.0	116	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.0	84.0	114	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	128	
EG020A-T: Iridium-265	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	118	



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG035F: Dissolved Mercury by FIMS (QCLot: 3102729)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	105	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3102674)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3102645)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	98.5	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3102651)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	104	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3109117)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3102814)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3109116)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.9	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3108936)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	86.5	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3108935)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	91.7	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3102812)							
EB2016812-001	STP1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3102813)							
EB2016812-001	STP1	ED045G: Chloride	16887-00-6	400 mg/L	77.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731)							
EB2016805-003	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	98.2	70.0	130
22-265	File D	EG020A-F: Cadmium	7440-43-9	0.25 mg/L	102	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	98.6	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	103	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	98.0	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	108	70.0	130

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Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731) - continued							
EB2016805-003	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	99.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3102676)							
EB2016736-002	Anonymous	EG020A-T: Arsenic	7440-38-2	5 mg/L	104	70.0	130
		EG020A-T: Cadmium	7440-43-9	1.25 mg/L	102	70.0	130
		EG020A-T: Chromium	7440-47-3	5 mg/L	85.7	70.0	130
		EG020A-T: Cobalt	7440-48-4	5 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	5 mg/L	98.8	70.0	130
		EG020A-T: Lead	7439-92-1	5 mg/L	94.2	70.0	130
		EG020A-T: Manganese	7439-96-5	5 mg/L	79.4	70.0	130
		EG020A-T: Nickel	7440-02-0	5 mg/L	101	70.0	130
		EG020A-T: Zinc	7440-66-6	5 mg/L	97.9	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3102729)							
EB2016807-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	95.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3102674)							
EB2016736-002	Anonymous	EG035T: Mercury	7439-97-6	0.05 mg/L	73.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3109117)							
EB2016703-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	98.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3102814)							
EB2016812-001	STP1	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3109116)							
EB2016703-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	94.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3108936)							
EB2016796-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	100	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3108935)							
EB2016796-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	106	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2016812	Page	: 1 of 7
Client	: TRILITY Pt. Ltd	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal inform	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 25-Jun-2020
Site	: ---	Issue Date	: 02-Jul-2020
Sampler	: 4(6) Personal inform	No. of samples received	: 4
Order number	: 4500061046	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2016812--001	STP1	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
STP1, 97-01,	STP2, STP1 Duplicate	24-Jun-2020	----	----	----	26-Jun-2020	22-Jul-2020	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
STP1, 97-01,	STP2, STP1 Duplicate	24-Jun-2020	----	----	----	26-Jun-2020	22-Jul-2020	✓
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
STP1, 97-01,	STP2, STP1 Duplicate	24-Jun-2020	----	----	----	29-Jun-2020	21-Dec-2020	✓
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
STP1, 97-01,	STP2, STP1 Duplicate	24-Jun-2020	27-Jun-2020	21-Dec-2020	✓	27-Jun-2020	21-Dec-2020	✓
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)								
STP1, 97-01,	STP2, STP1 Duplicate	24-Jun-2020	----	----	----	30-Jun-2020	22-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)								
STP1, 97-01, 22-265	STP2, STP1 Duplicate	24-Jun-2020	----	----	----	29-Jun-2020	22-Jul-2020	✓



Matrix: **WATER** Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	29-Jun-2020	21-Dec-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	27-Jun-2020	21-Dec-2020	✓	27-Jun-2020	21-Dec-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	30-Jun-2020	22-Jul-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	26-Jun-2020	26-Jun-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	30-Jun-2020	22-Jul-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	30-Jun-2020	22-Jul-2020	✓	30-Jun-2020	22-Jul-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	30-Jun-2020	22-Jul-2020	✓	30-Jun-2020	22-Jul-2020	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	25-Jun-2020	25-Jun-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) STP1, STP2, 97-01, STP1 Duplicate	24-Jun-2020	----	----	----	25-Jun-2020	25-Jun-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
ORC-ICPMS22-265							

File D

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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Published on DESI Discourse Log
 R11 Act 2009



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

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Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix D: Groundwater Contours

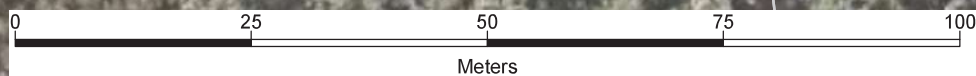
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Lot Boundary
Groundwater Bore
Greencap (May 2016)

Groundwater Level Contours (mAHD)
Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, July 2019

Figure
D-1

Trillity Pty Ltd

Date: 15/10/2019

Author: **ersona**
Map Scale: 1:800

GREENCAP

Revision: R1

Coordinate System: GDA 1984 MGA Zone 58

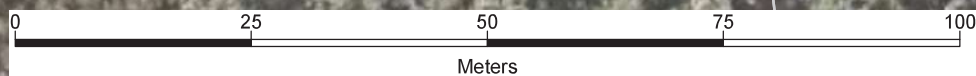
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7321000

7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, August 2019

Figure
D-2

Date: 15/10/2019

Revision: R1

Trillity Pty Ltd

Author: **persona**
Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

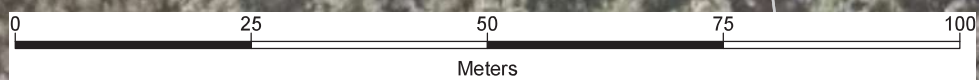
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7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, September 2019

Figure D-3

Date: 15/10/2019

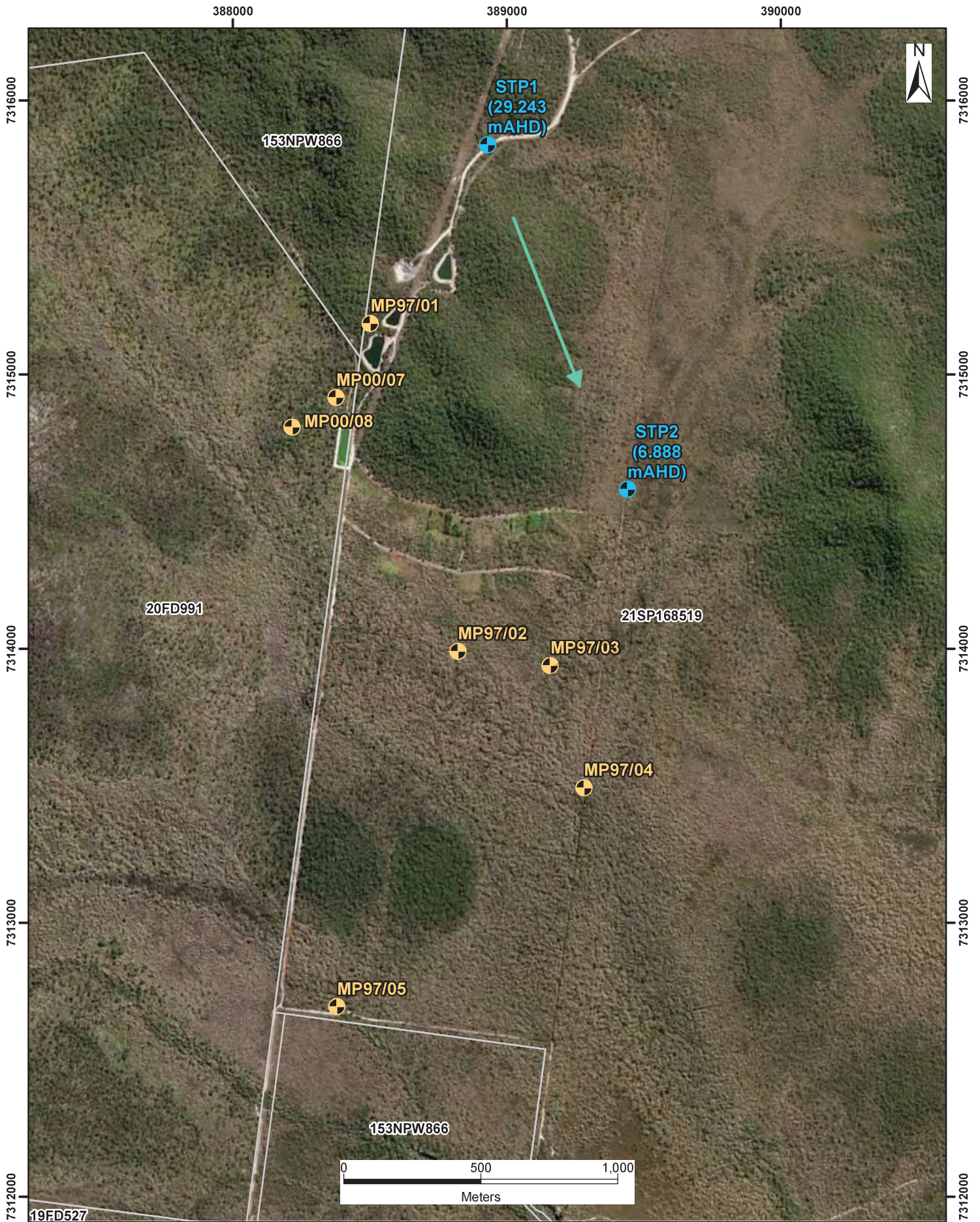
Revision: R1

Trillity Pty Ltd

Author: **Personal**
Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

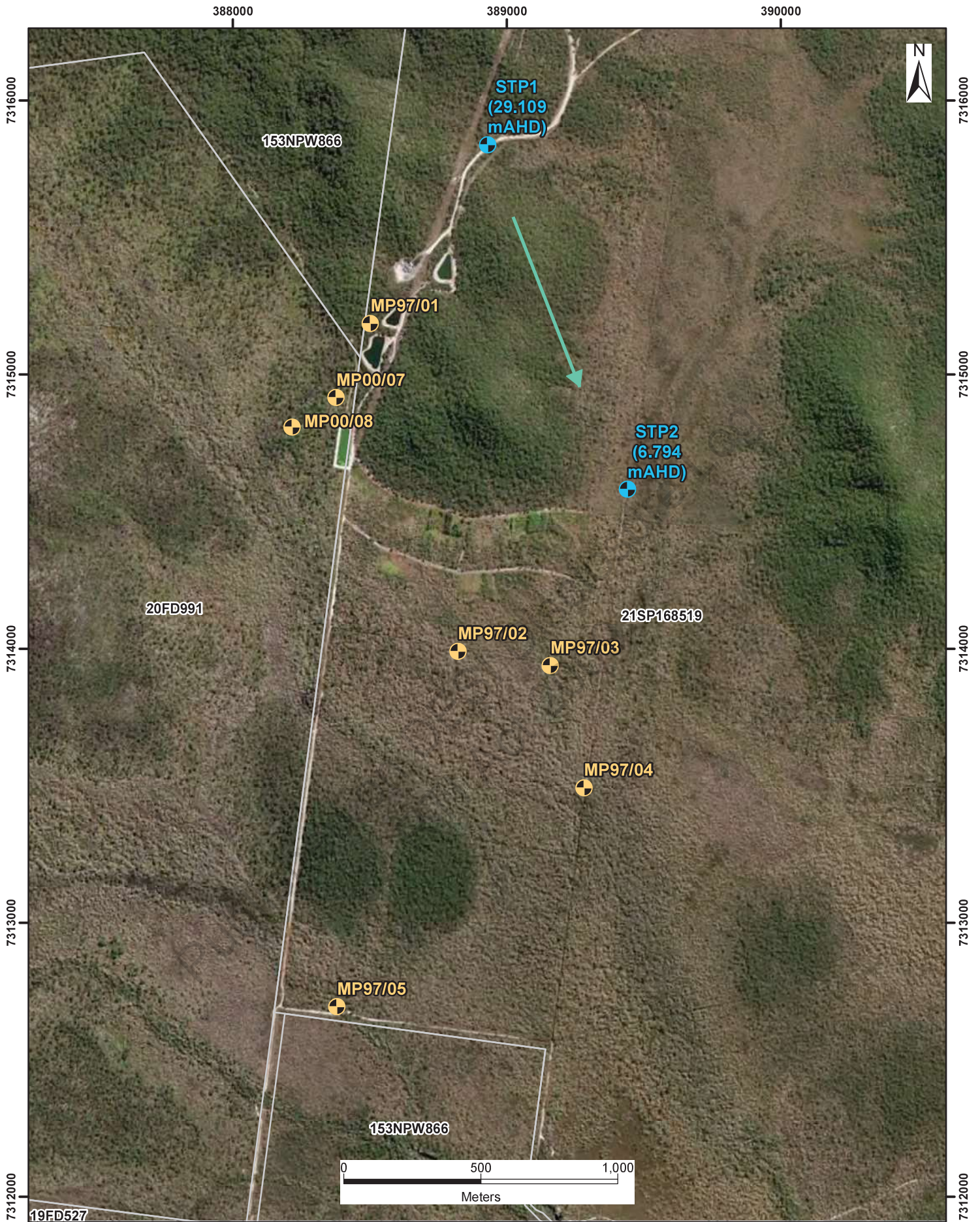


Lot Boundary
Groundwater Bore

Inferred Groundwater Flow Direction

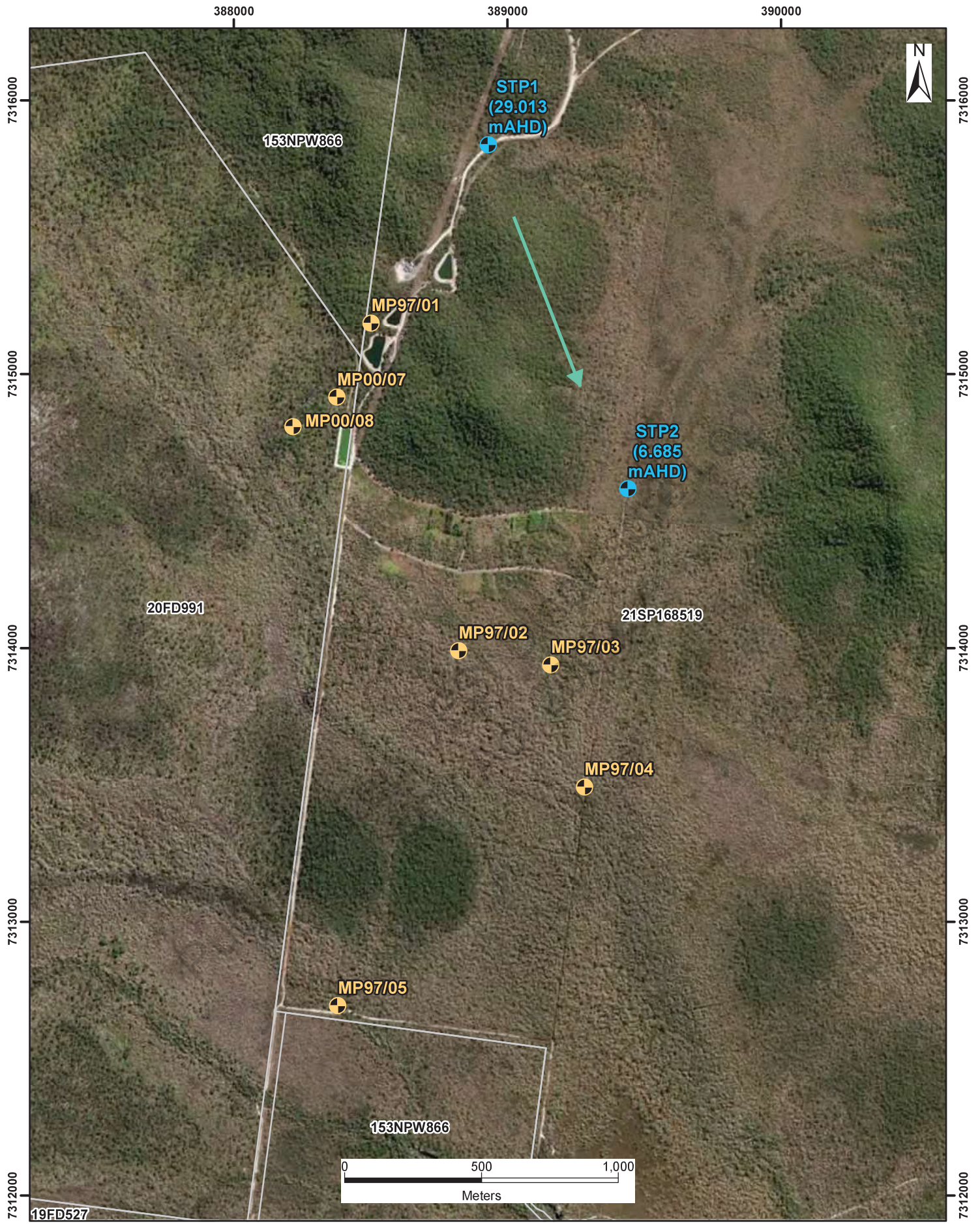
Sampled
Dry

WwTP Inferred Groundwater Flow Direction, July 2019		
Figure D-4	Trility Pty Ltd	
Date: 14/10/2019	Author: ersona Map Scale: 1:18,000	GREENCAP
Revision: R1	Coordinate System: GDA 1984 MGA Zone 58	



- Lot Boundary
- ➔ Inferred Groundwater Flow Direction
- Groundwater Bore
- Sampled
- Dry

WwTP Inferred Groundwater Flow Direction, August 2019		
Figure D-5	Trility Pty Ltd	
Date: 14/10/2019	Author:  Map Scale: 1:18,000	
Revision: E1	Coordinate System: GDA 1984 MGA Zone 58	



Lot Boundary
Groundwater Bore

Inferred Groundwater Flow Direction

Sampled
Dry

WwTP Inferred Groundwater Flow Direction, September 2019		
Figure D-6	Trillity Pty Ltd	
Date: 14/10/2019	Author: Personal	GREENCAP
Revision: R1	Map Scale: 1:18,000 Coordinate System: GDA 1984 MGA Zone 58	

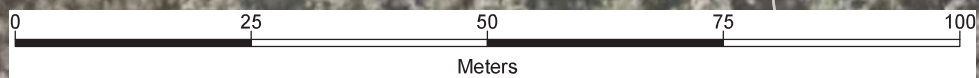
390000

7321000

7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, October 2019

Figure
D-7

Date: 15/01/2020

Revision: R1

Trillity Pty Ltd

Author: **Personal**
Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

390000

7321000

7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, November 2019

Figure D-8

Date: 15/01/2020

Revision: R1

Trillity Pty Ltd

Author: Personal
Map Scale: 1:800
Coordinate System: GDA 1984 MGA Zone 56

GREENCAP

390000

7321000

7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, December 2019

Figure D-9

Date: 15/01/2020

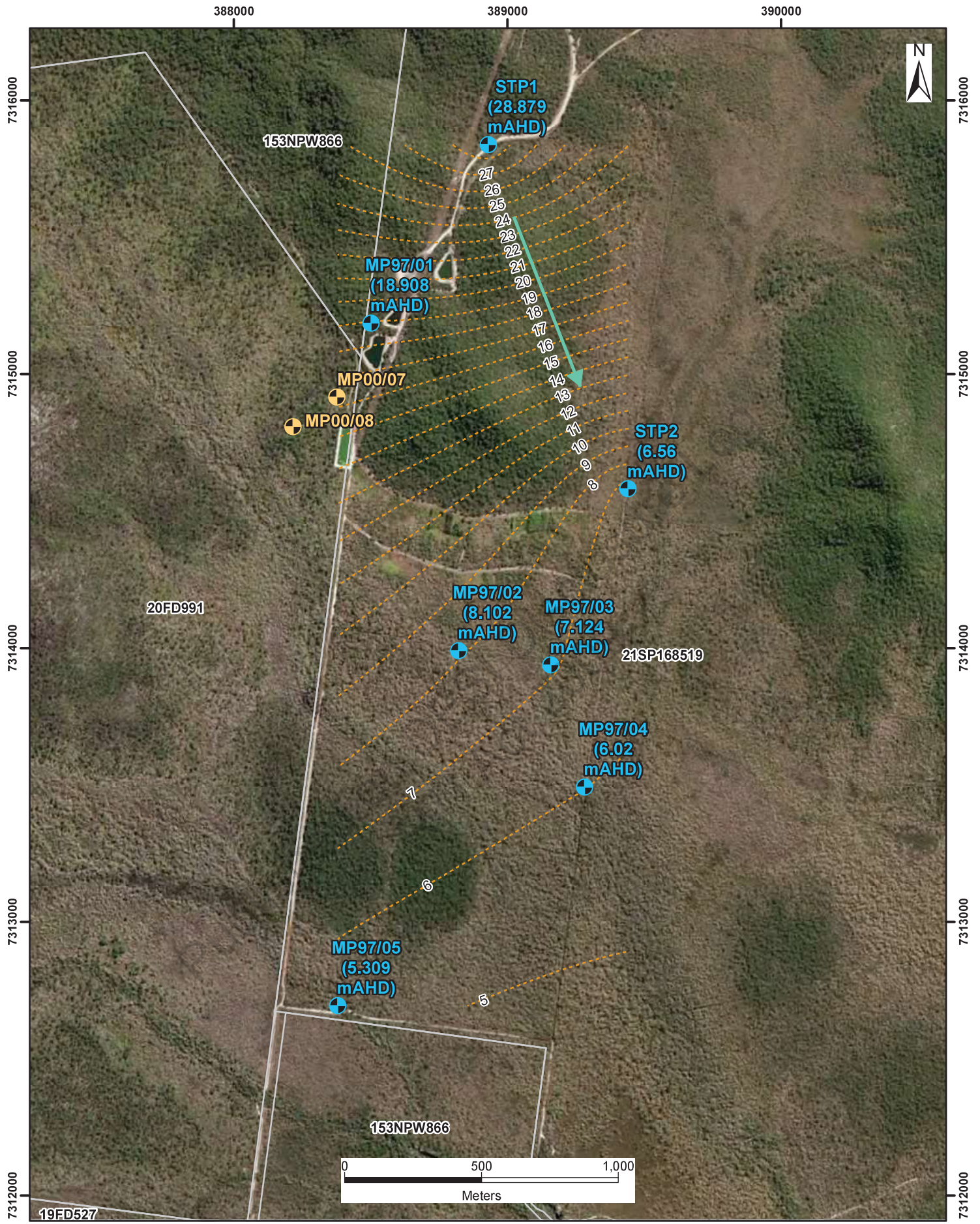
Revision: R1

Trillity Pty Ltd

Autho: **Personal i**
Map Scale: 1:800

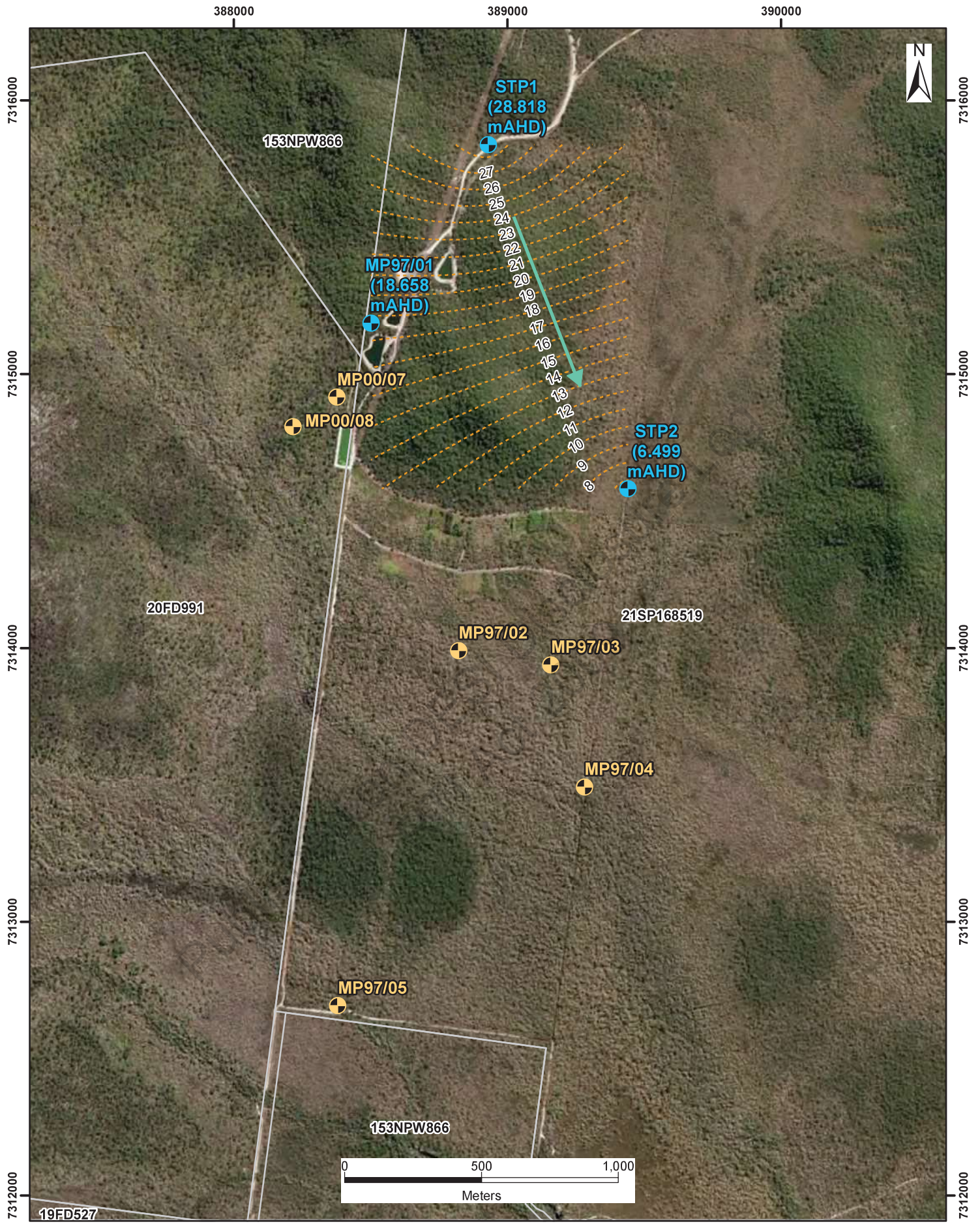
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GRENCAP



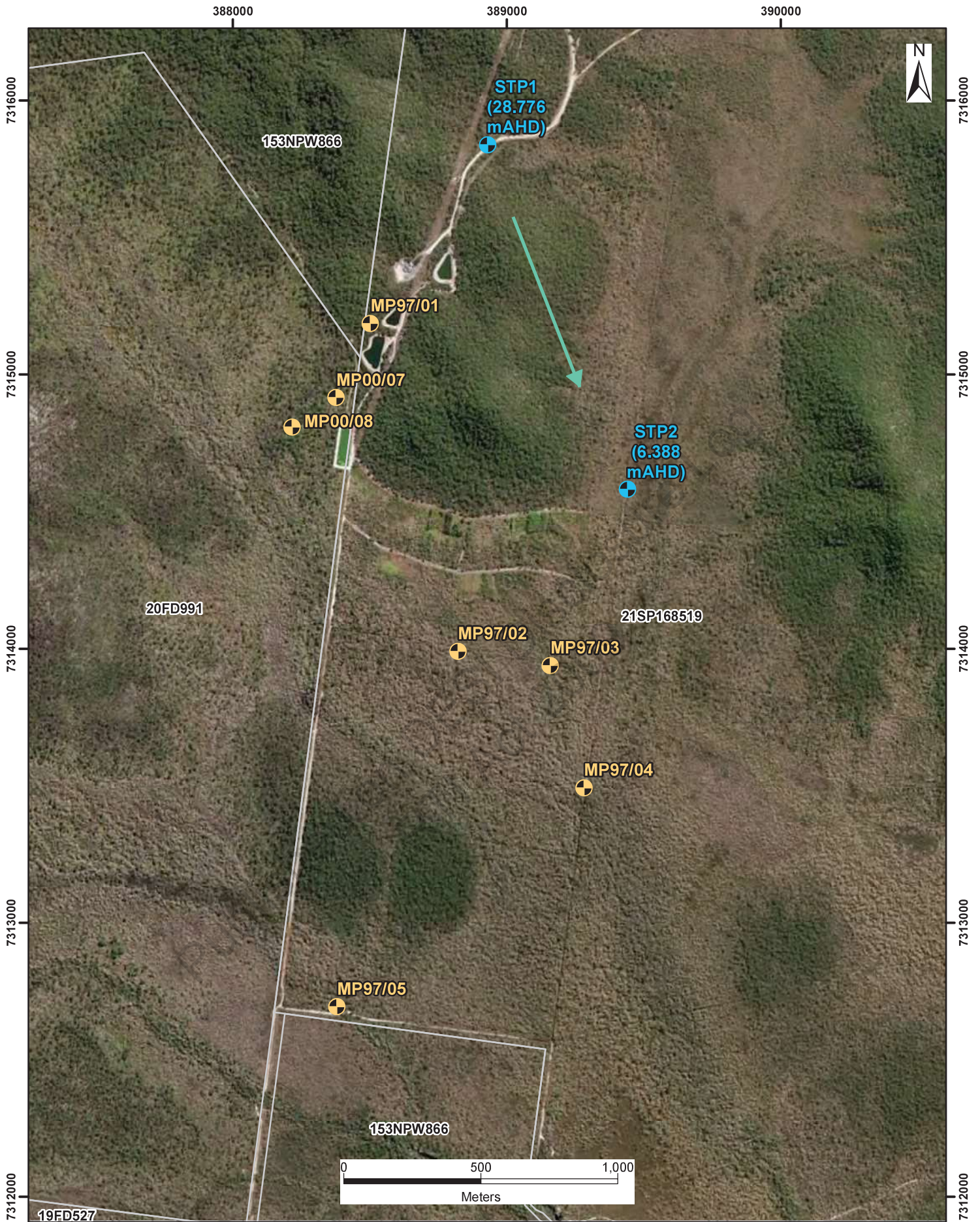
- Lot Boundary
- Groundwater Bore
- Sampled
- Dry
- Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, October 2019		
Figure D-10	Trillity Pty Ltd	
Date: 16/01/2020	Author: <div>Personal</div>	GREENCAP
Revision: R1	Map Scale:	
Coordinate System: GDA 1984 MGA Zone 58		



- Lot Boundary
- ➔ Inferred Groundwater Flow Direction
- Groundwater Bore**
- Sampled
- Dry

WwTP Inferred Groundwater Flow Direction, November 2019		
Figure D-11	Trility Pty Ltd	
	Date: 16/01/2020	Author: Personal Map Scale: 1:18,000
	Revision: R1	Coordinate System: GDA 1984 MGA Zone 58



Lot Boundary
Groundwater Bore

Sampled
Dry

Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, December 2019

Figure D-12

Date: 16/01/2020

Revision: R1

Trillity Pty Ltd

Autho: **Personal**
Map Scale: 1:18,000

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

390000

7321000

7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, January 2020

Figure
D-13

Date: 4/06/2020

Revision: R1

Trillity Pty Ltd

Author: **Persona**
Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

22-265

File D

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Imagery: Greencap GIS Data 1 - Agnes Water\163599-03_Apr_2020_OR\mxd\FIG_6_1_IWTP_GW_Level_01_2020_200604.mxd

Persona

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7321000

7320900

7320900



Lot Boundary
Groundwater Bore
● Grencap (May 2016)

- - - Groundwater Level Contours (mAHd)
→ Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, February 2020

Figure D-14

Trillity Pty Ltd

Date: 4/06/2020

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GRENCAP

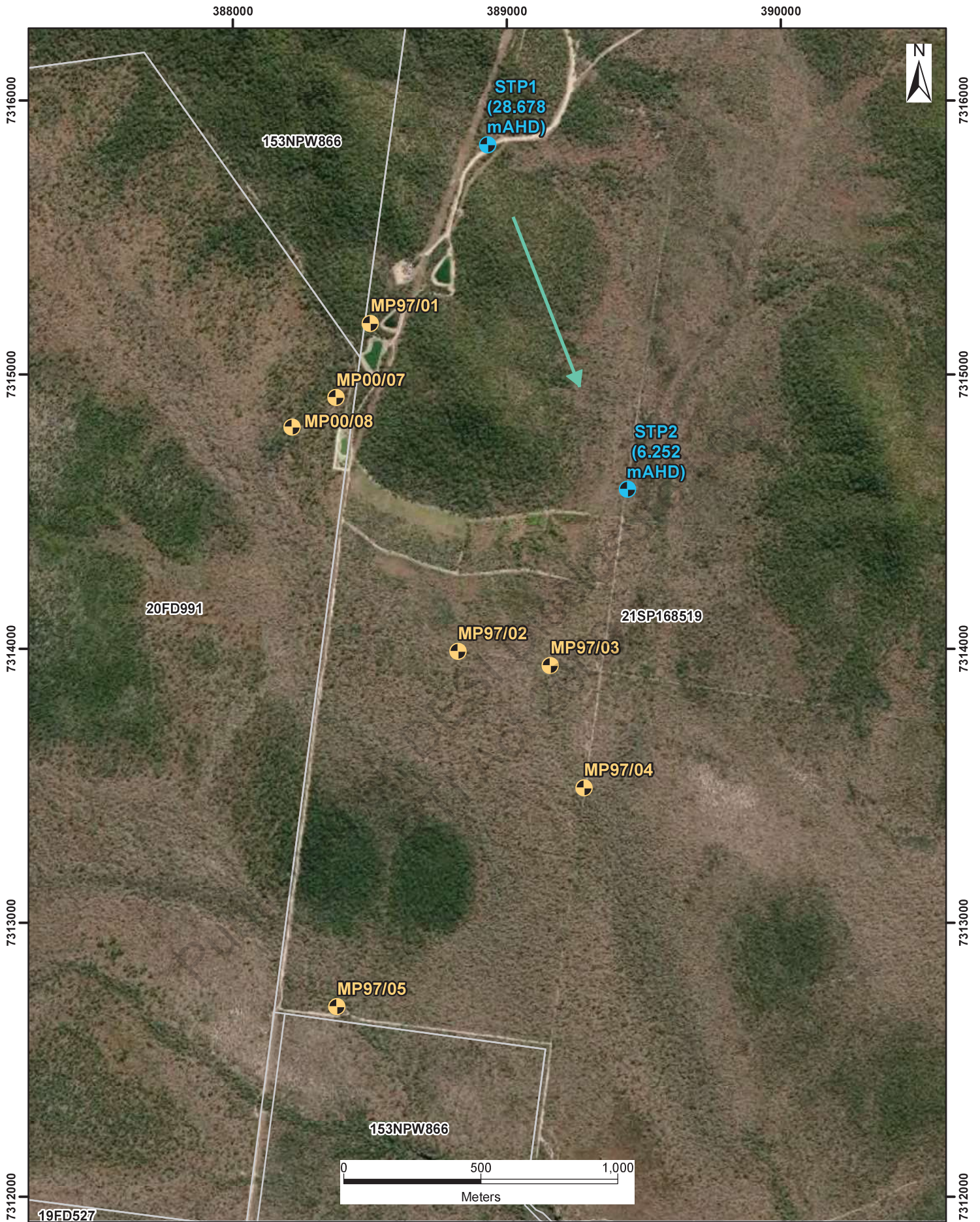
Revision: R1

Coordinate System: GDA 1984 MGA Zone 58

22-265

File D

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- Lot Boundary
- ➔ Inferred Groundwater Flow Direction
- Groundwater Bore**
- Sampled
- Dry

WwTP Inferred Groundwater Flow Direction, January 2020		
Figure D-15	Trillity Pty Ltd	
	Author: ersona	
	Map Scale: 1:18,000	
Date: 4/06/2020	Coordinate System: GDA 1984 MGA Zone 58	
Revision: R1		

JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water

Appendix E: Graphs

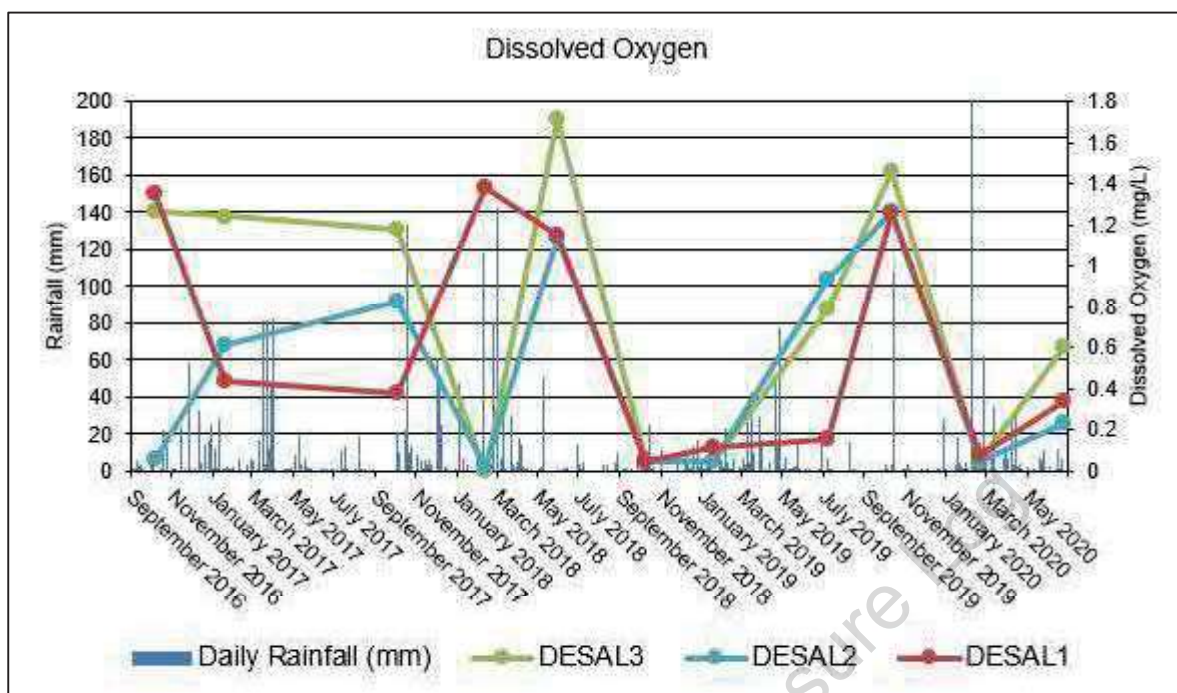


Figure 1 IWTP Dissolved Oxygen, September 2016 – June 2020

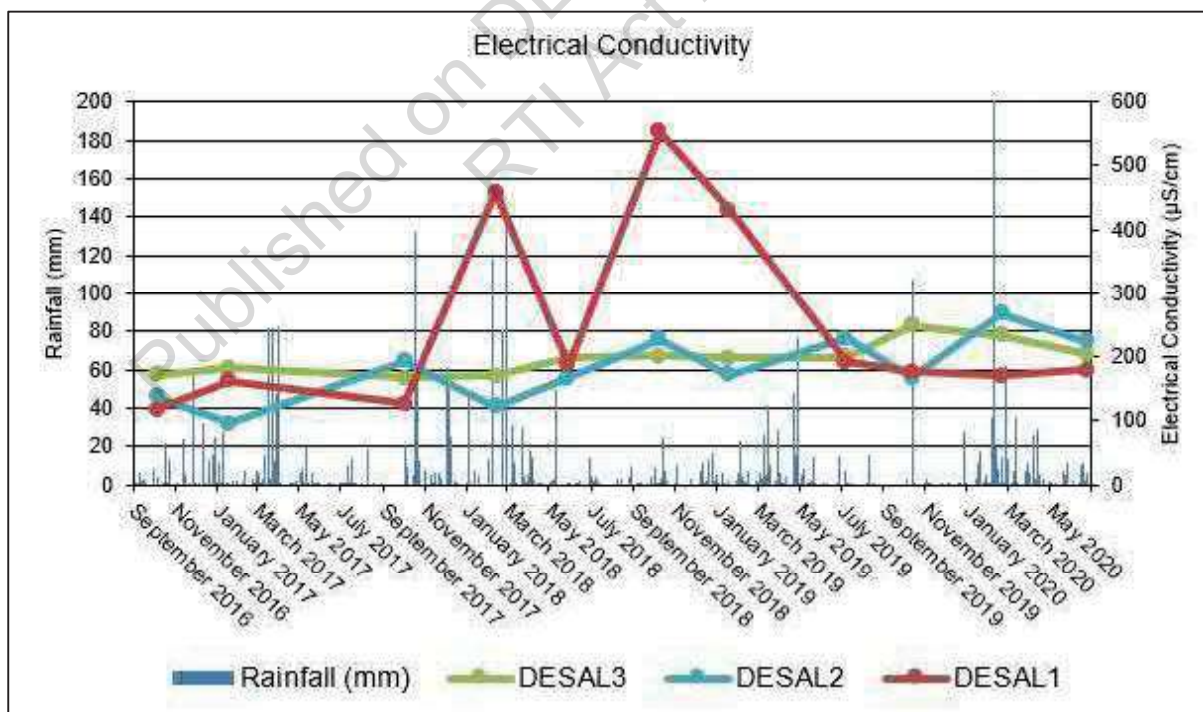


Figure 2 IWTP Electrical Conductivity, September 2016 – June 2020

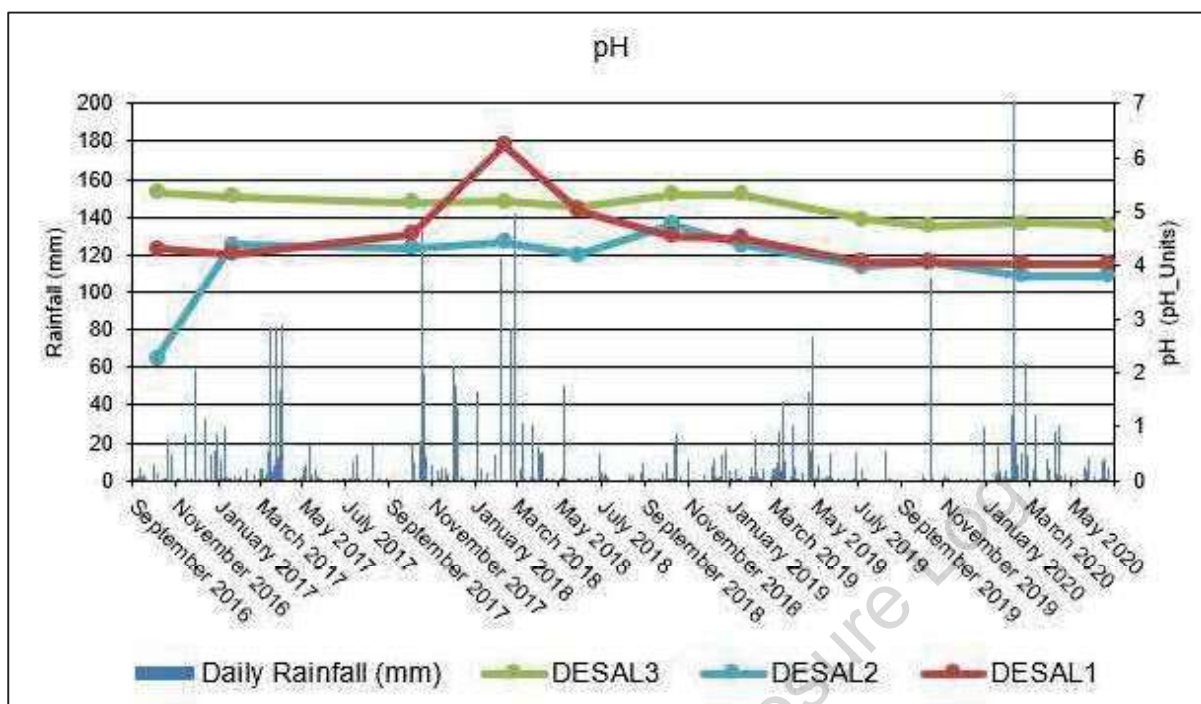


Figure 3 IWTP pH, September 2016 – June 2020

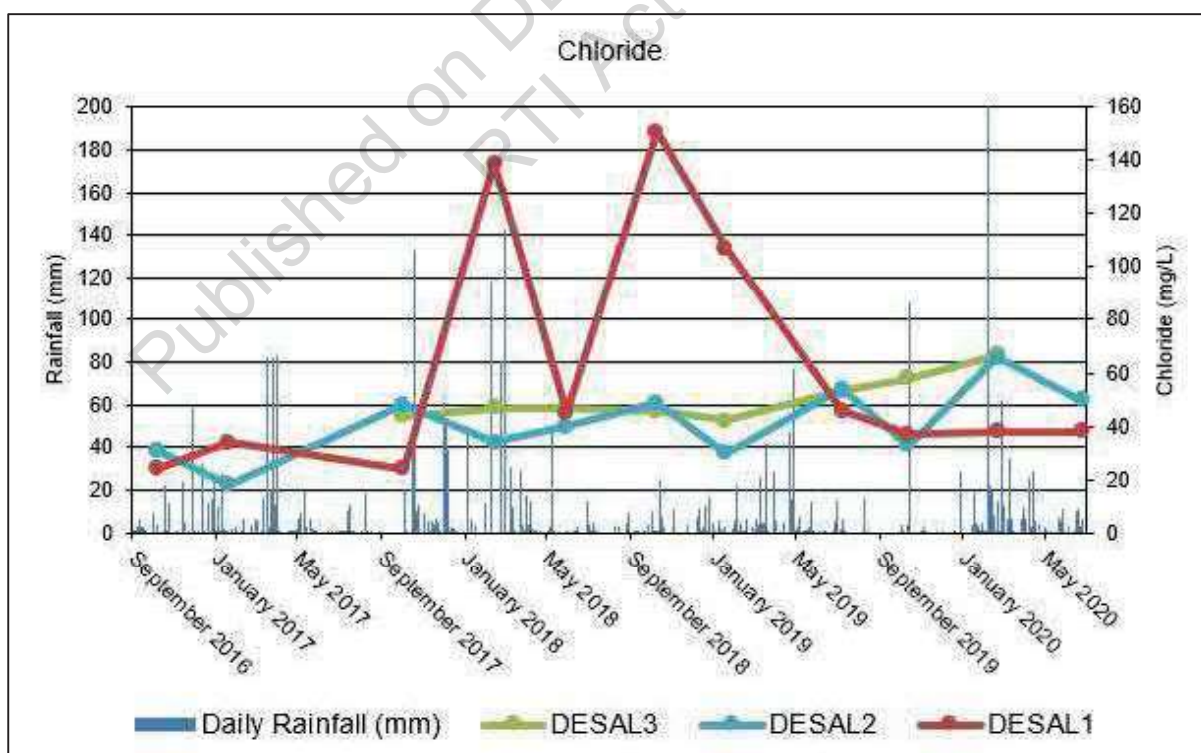


Figure 4 IWTP Chloride, September 2016 – June 2020

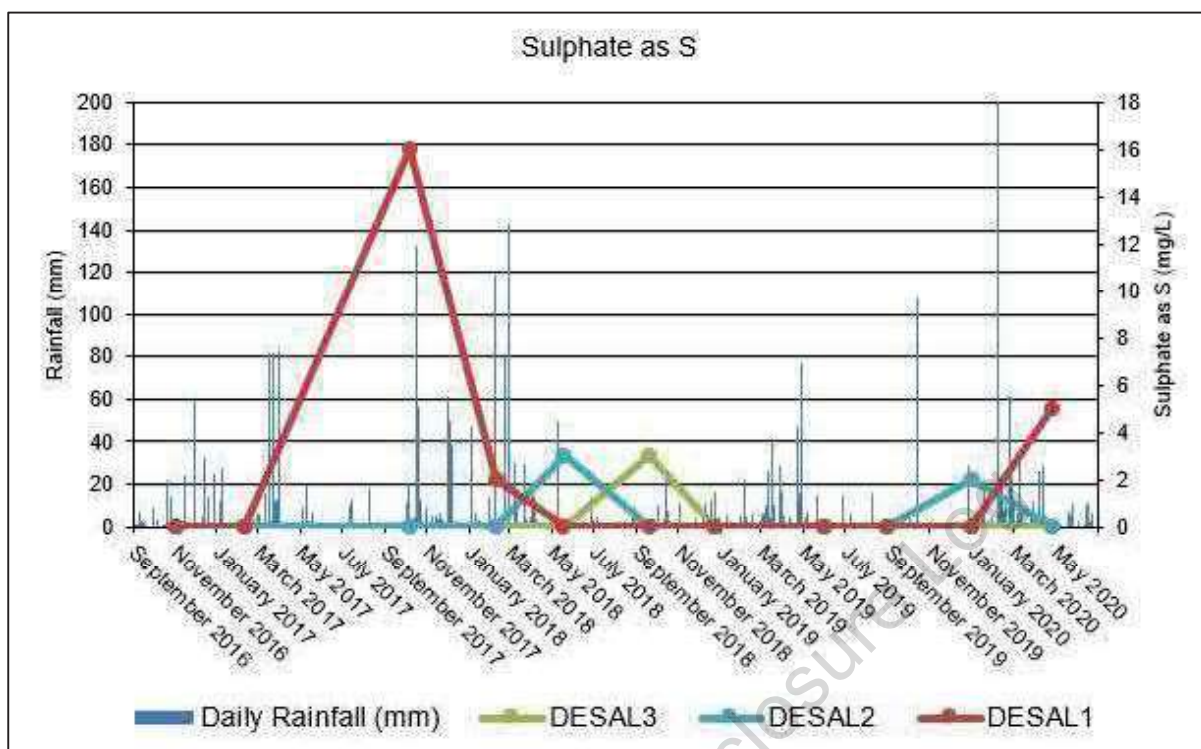


Figure 5 IWTP Sulphate, September 2016 – June 2020

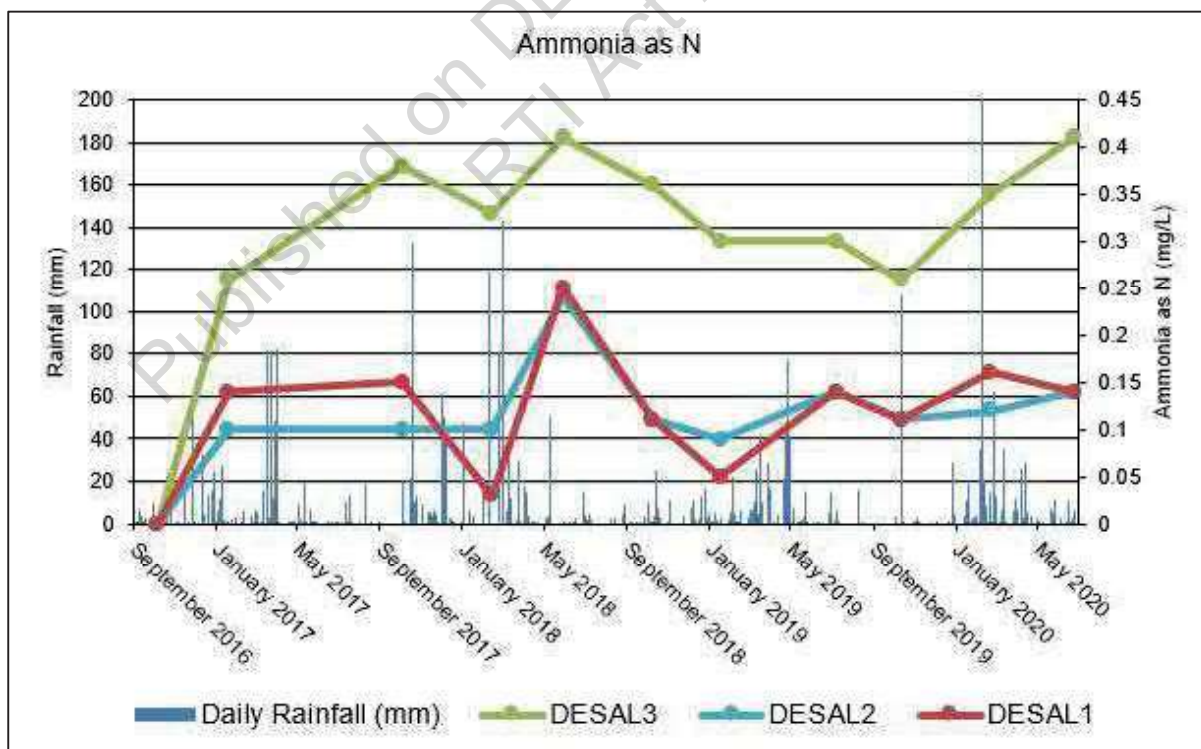


Figure 6 IWTP Ammonia, September 2016 – June 2020

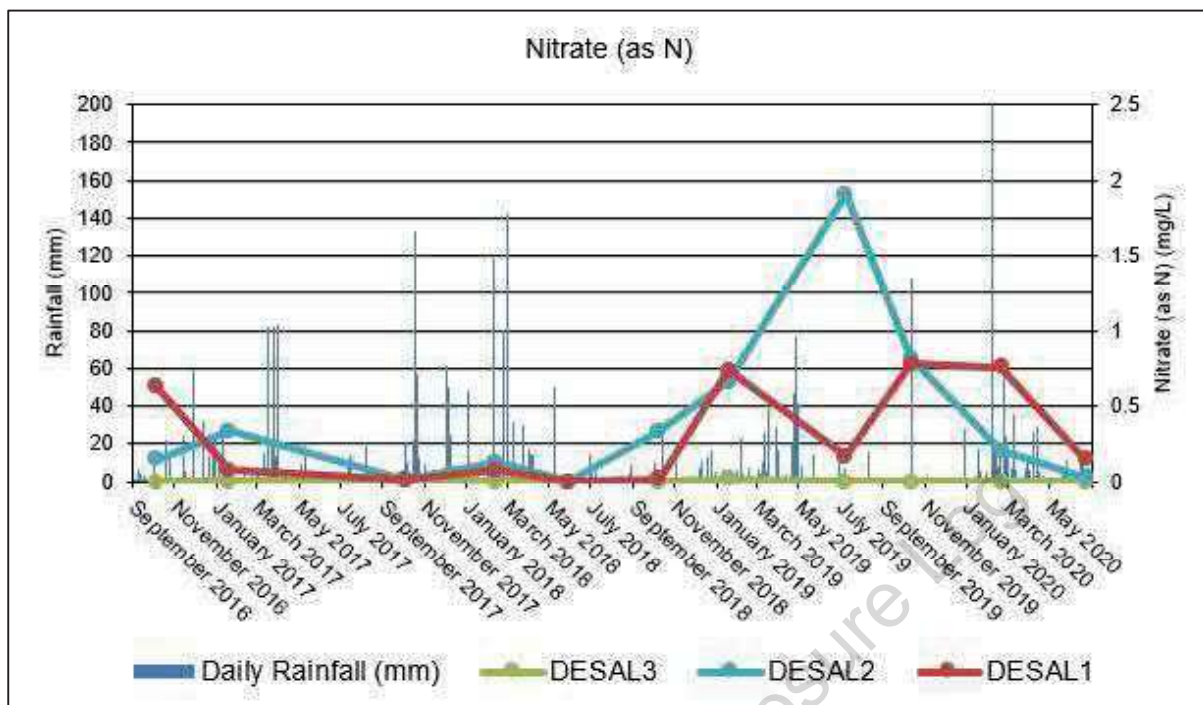


Figure 7 IWTP Nitrate, September 2016 – June 2020

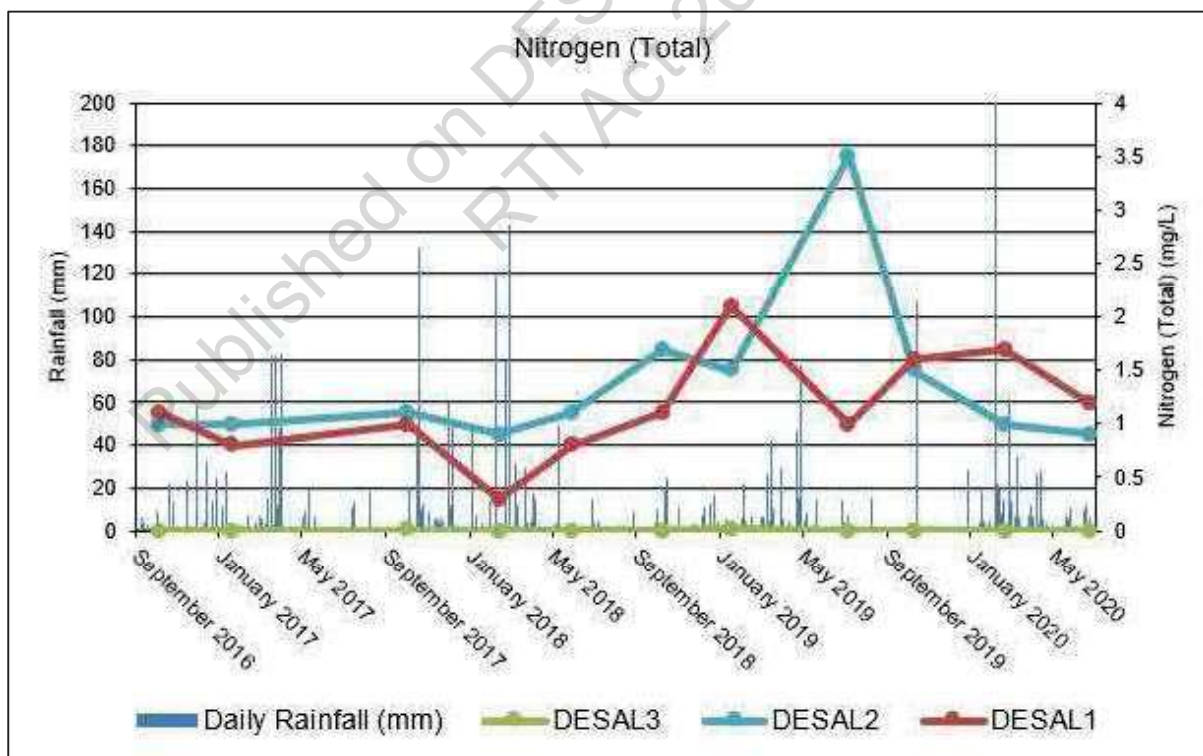


Figure 8 IWTP Total Nitrogen, September 2016 – June 2020

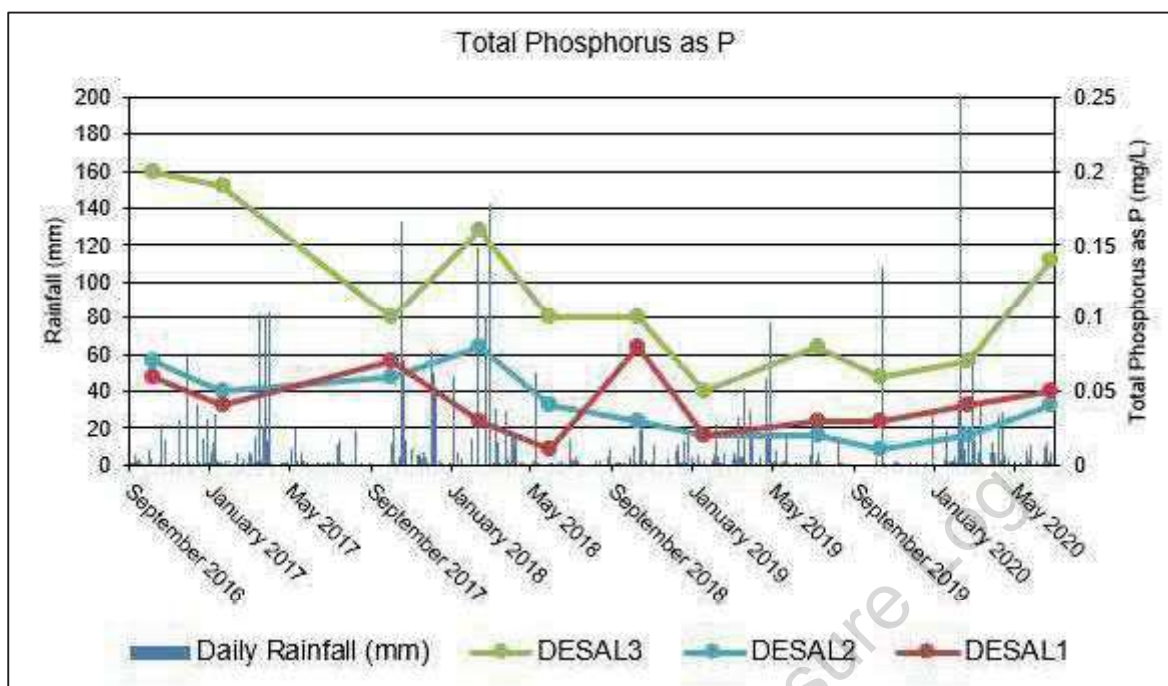


Figure 9 IWTP Total Phosphorus, September 2016 – June 2020

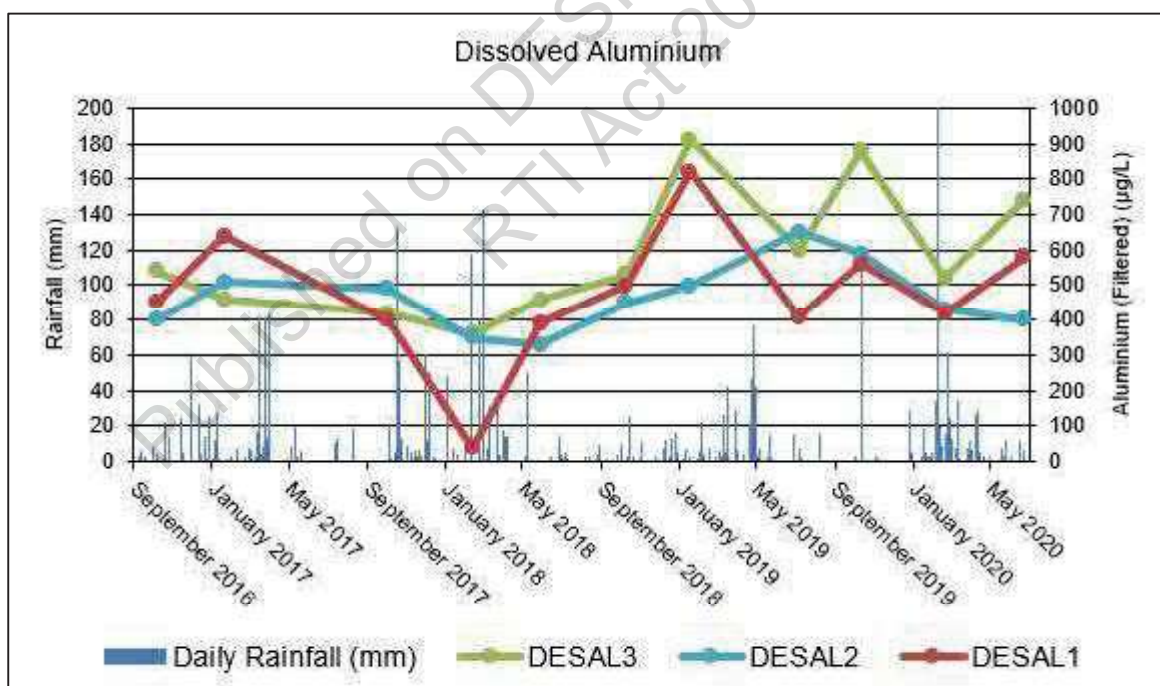


Figure 10 IWTP Dissolved Aluminium, September 2016 – June 2020

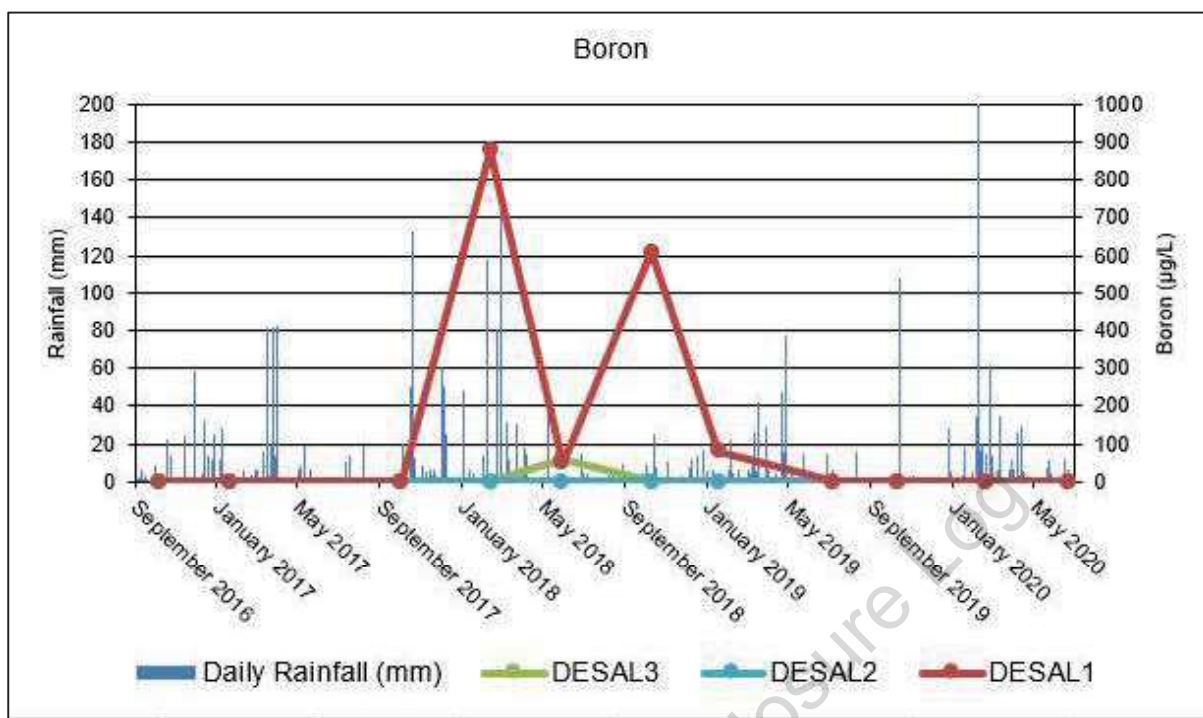


Figure 11 IWTP Total Boron, September 2016 – June 2020

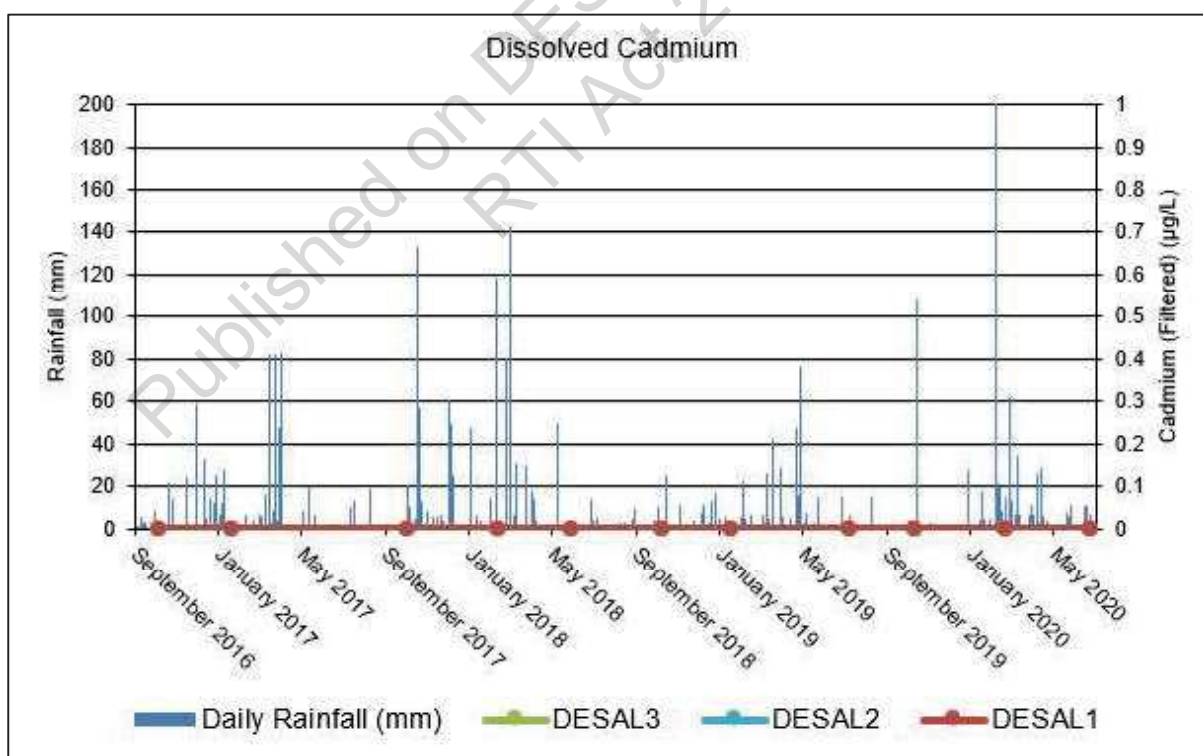


Figure 12 IWTP Dissolved Cadmium, September 2016 – June 2020

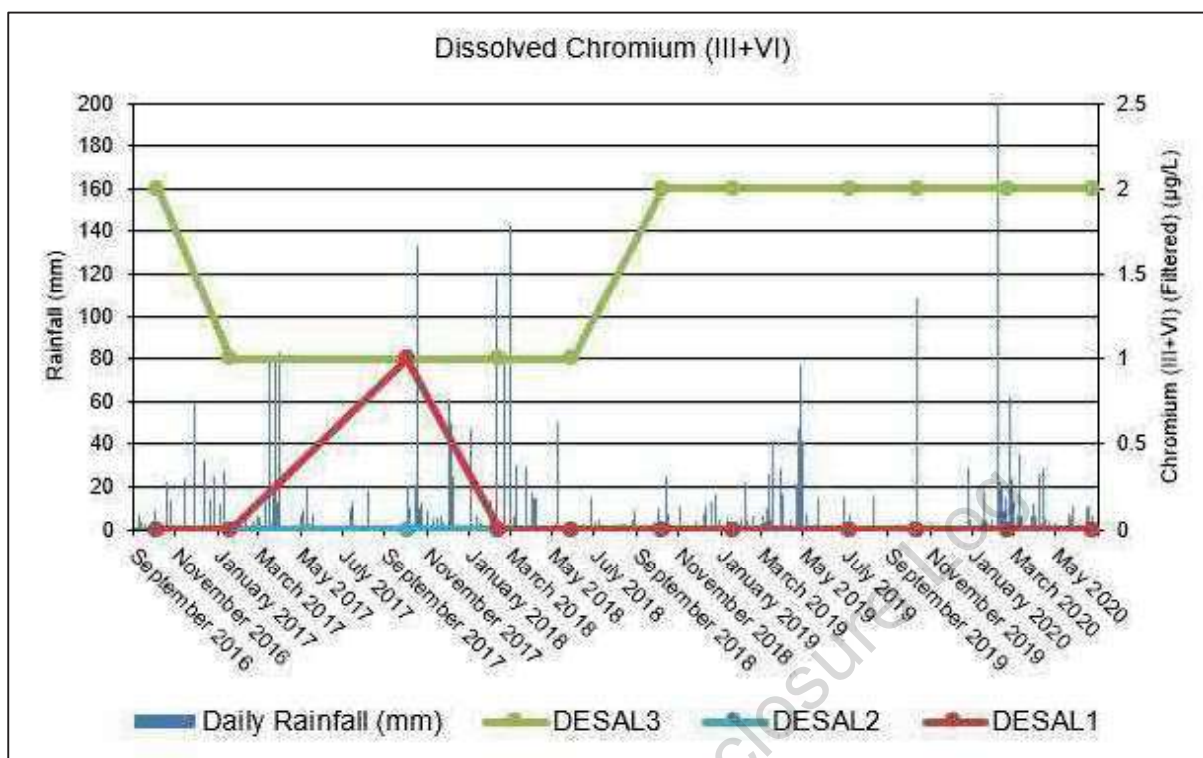


Figure 13 IWTP Dissolved Chromium, September 2016 – June 2019

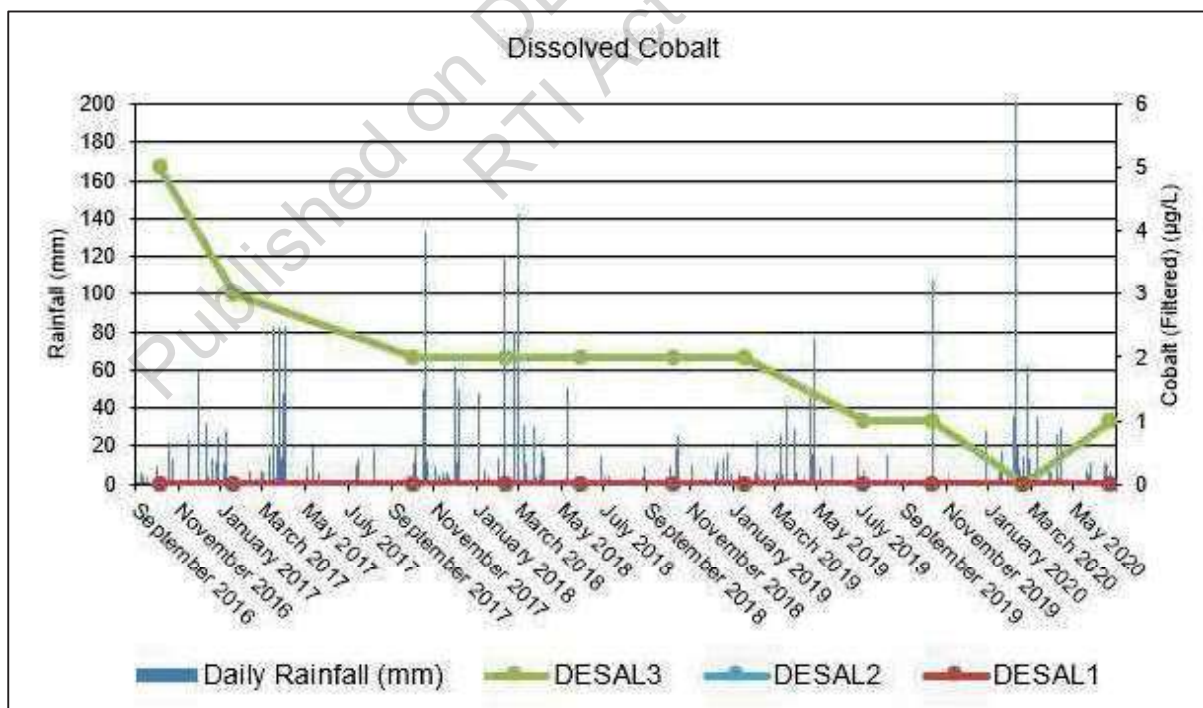


Figure 14 IWTP Dissolved Cobalt, September 2016 – June 2020

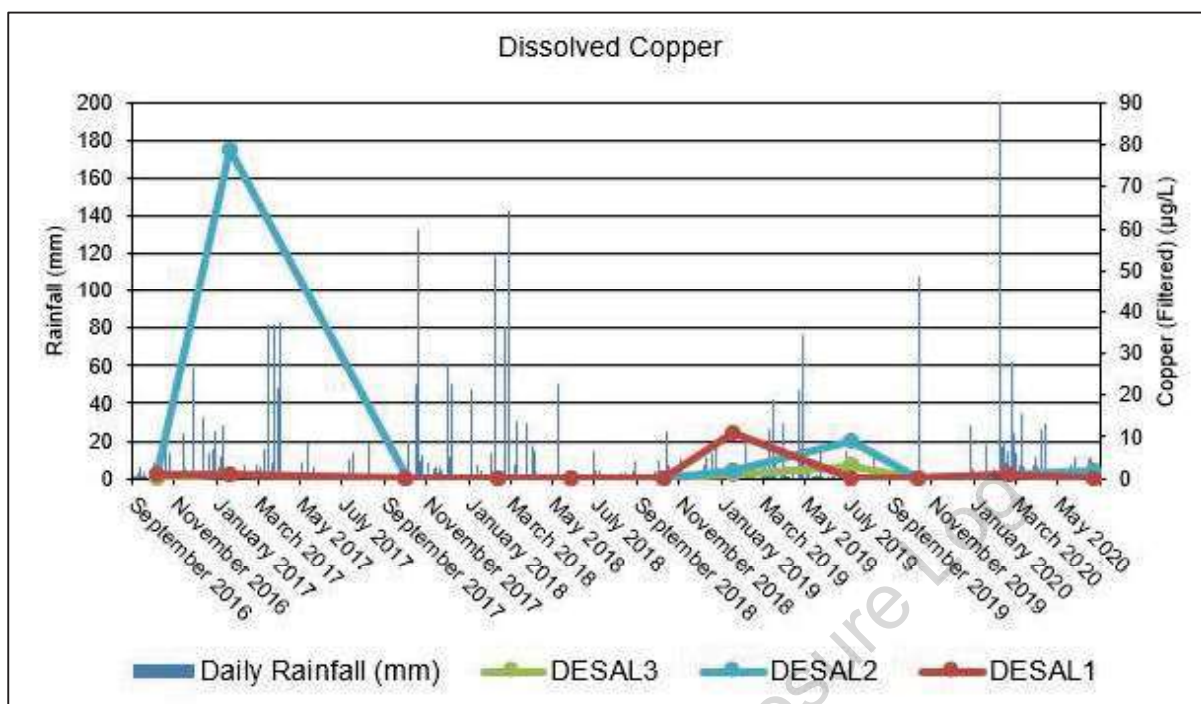


Figure 15 IWTP Dissolved Copper, September 2016 – June 2020

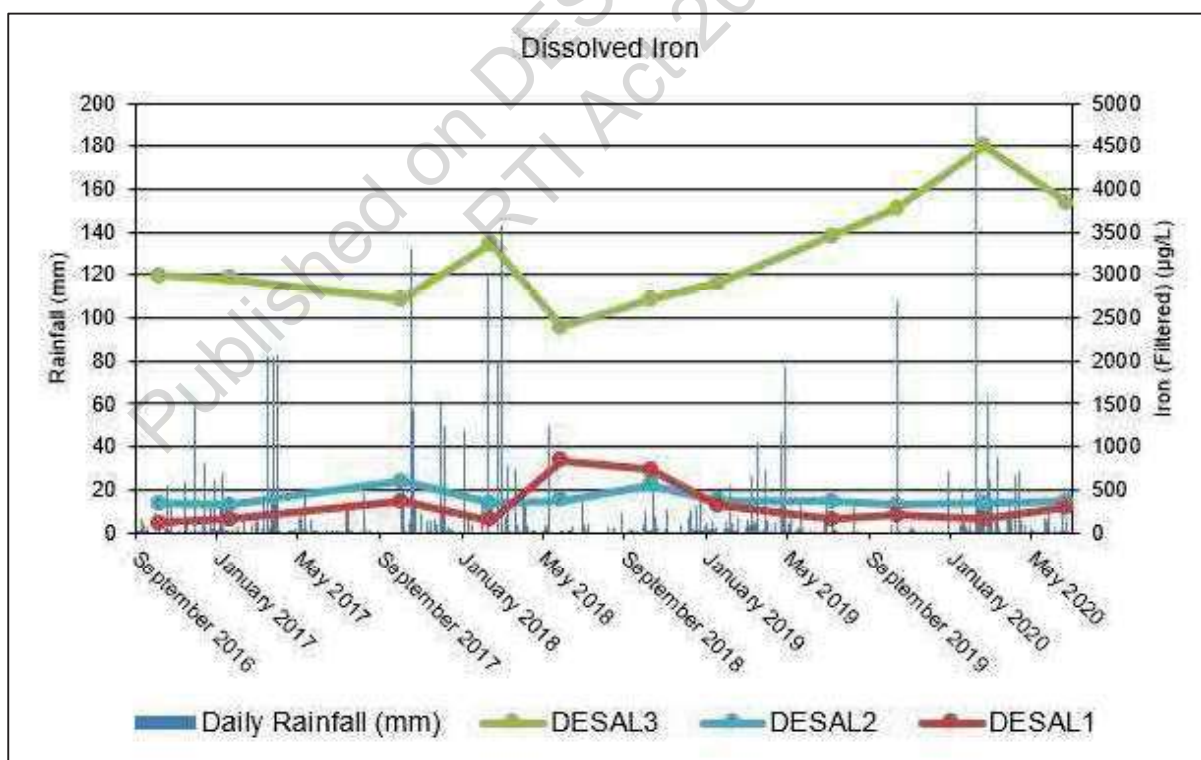


Figure 16 IWTP Dissolved Iron, September 2016 – June 2020

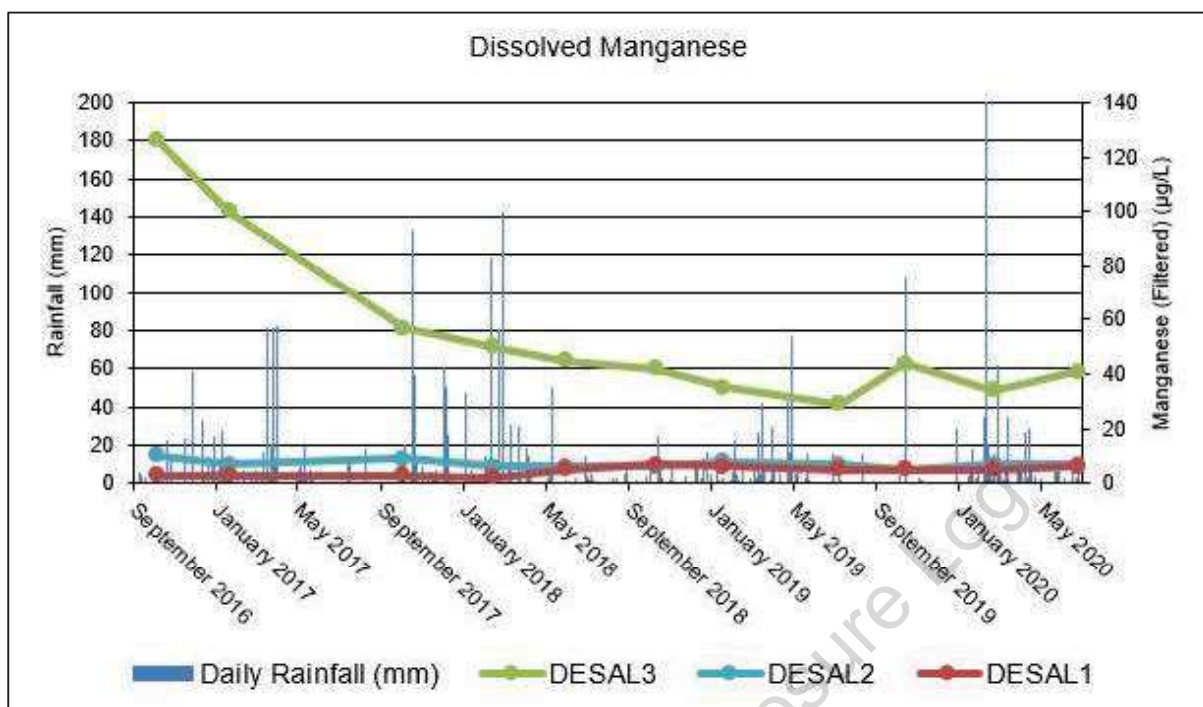


Figure 17 IWTP Dissolved Manganese, September 2016 – June 2020

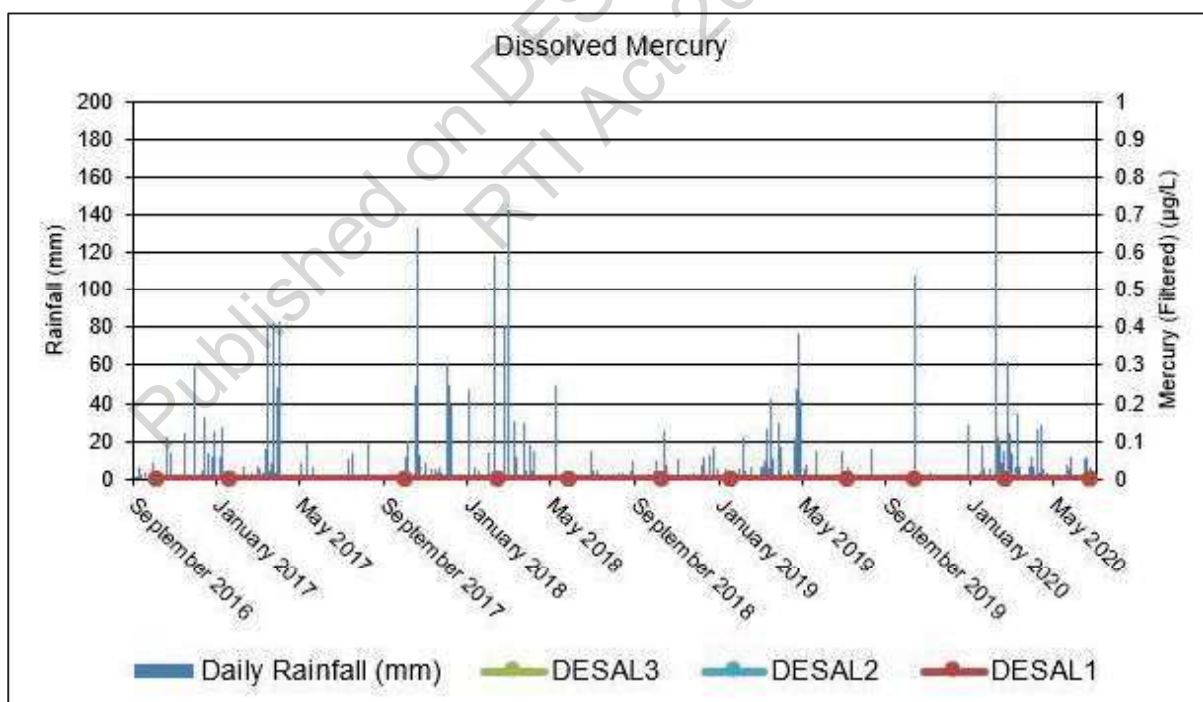


Figure 18 IWTP Dissolved Mercury, September 2016 – June 2020

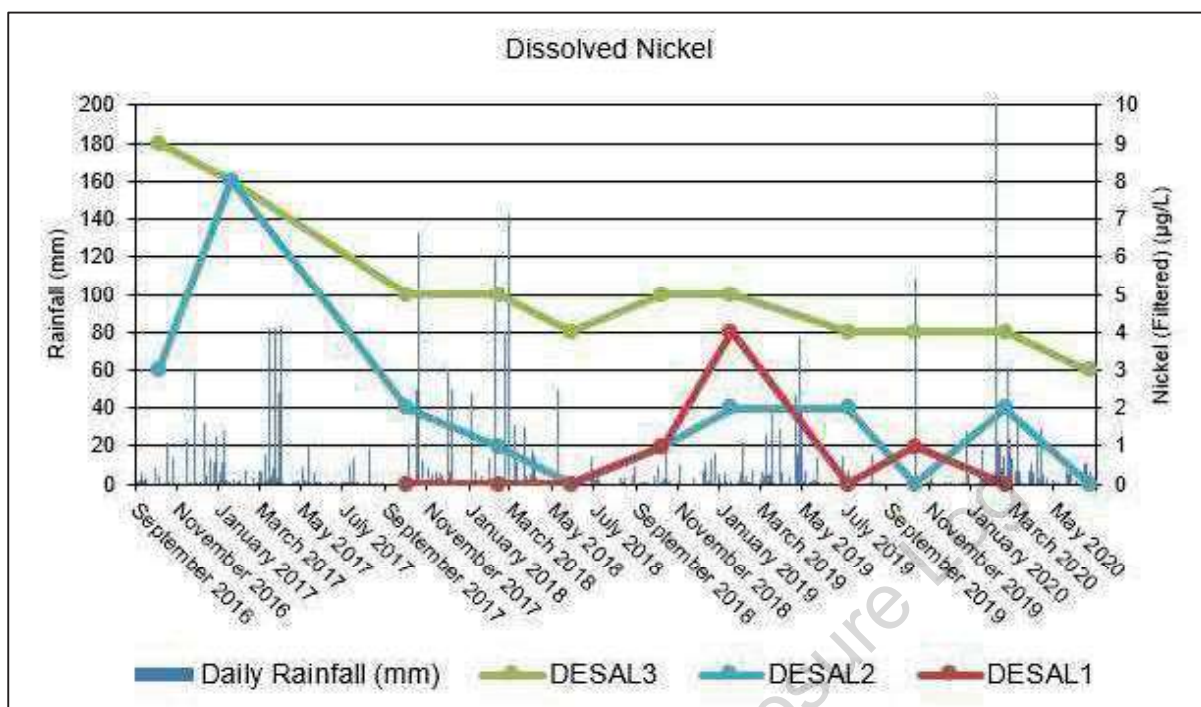


Figure 19 IWTP Dissolved Nickel, September 2016 – June 2020

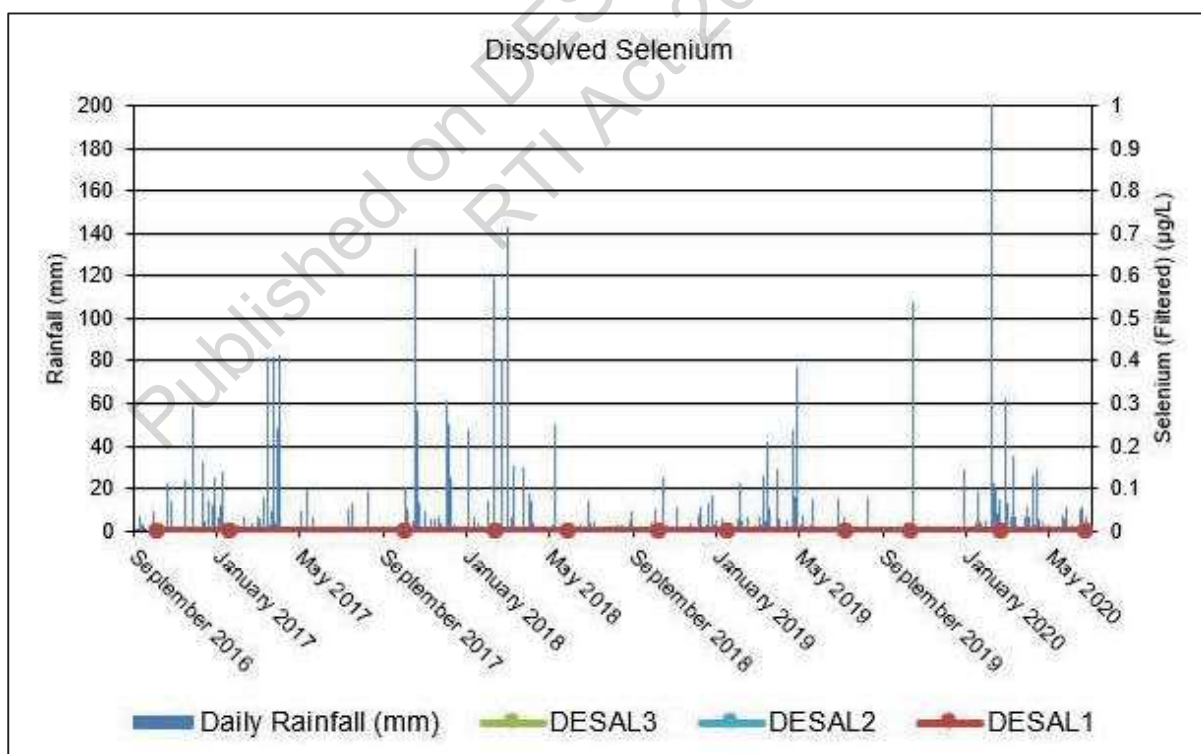


Figure 20 IWTP Dissolved Selenium, September 2016 – June 2020

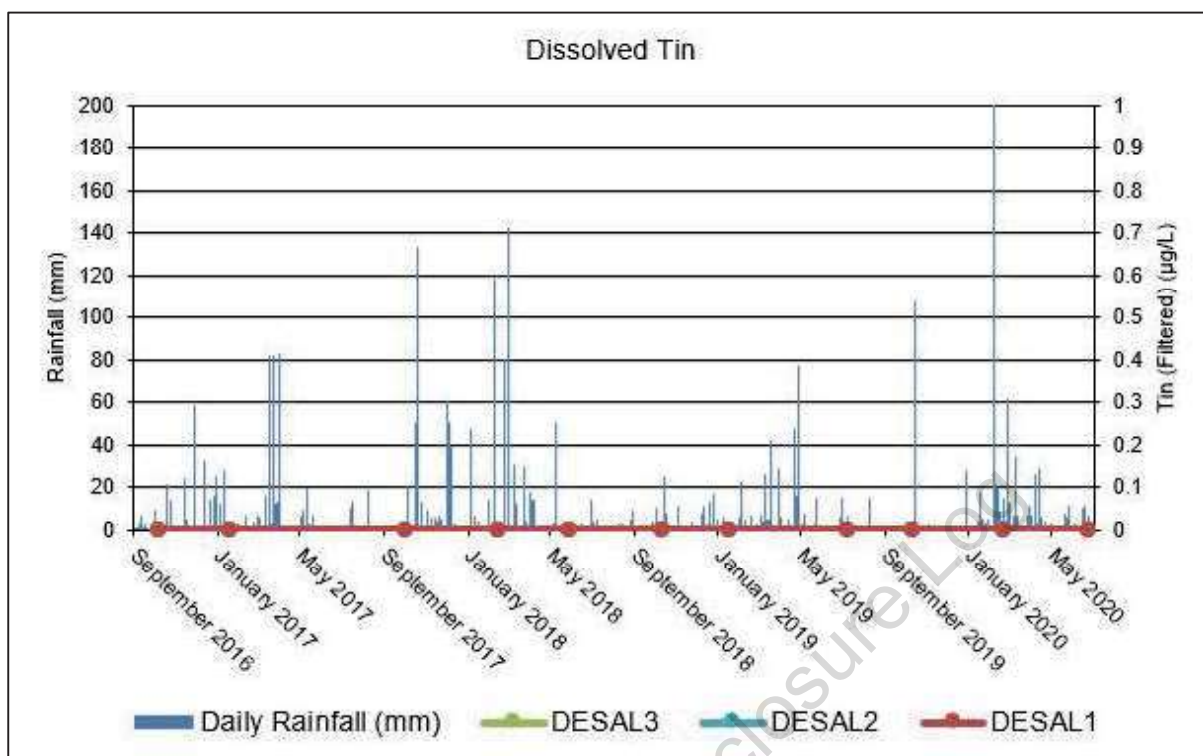


Figure 21 IWTP Dissolved Tin, September 2016 – June 2020

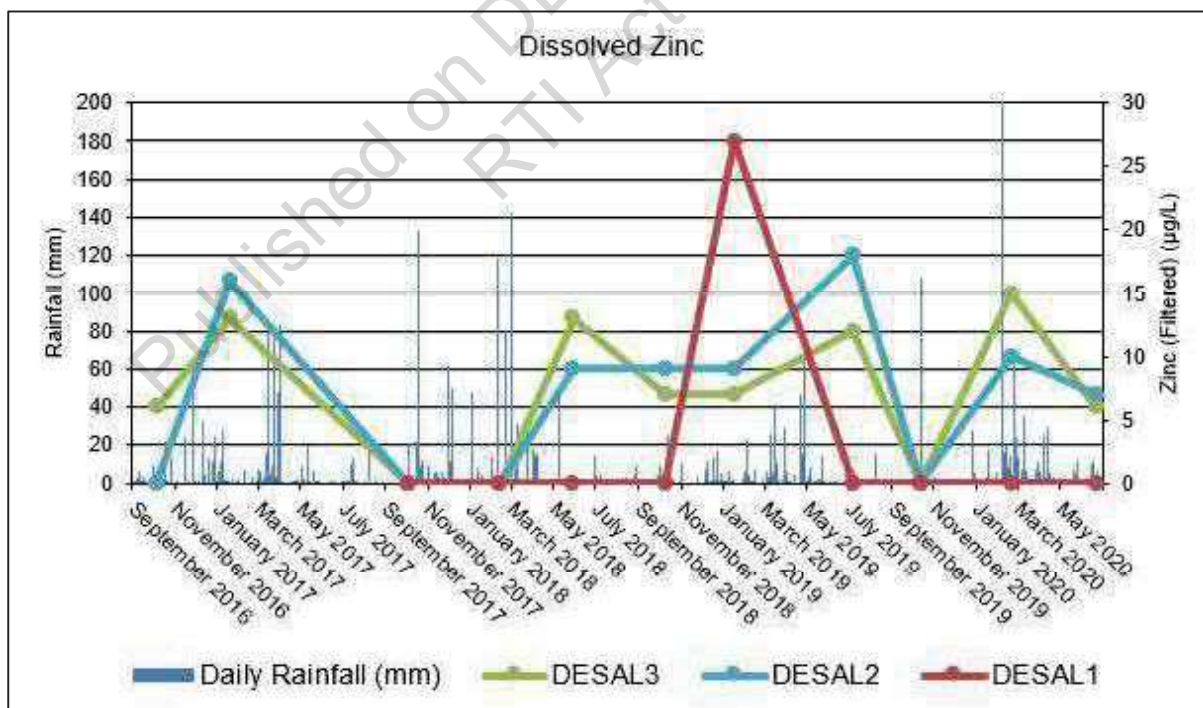


Figure 22 IWTP Dissolved Zinc, September 2016 – June 2020

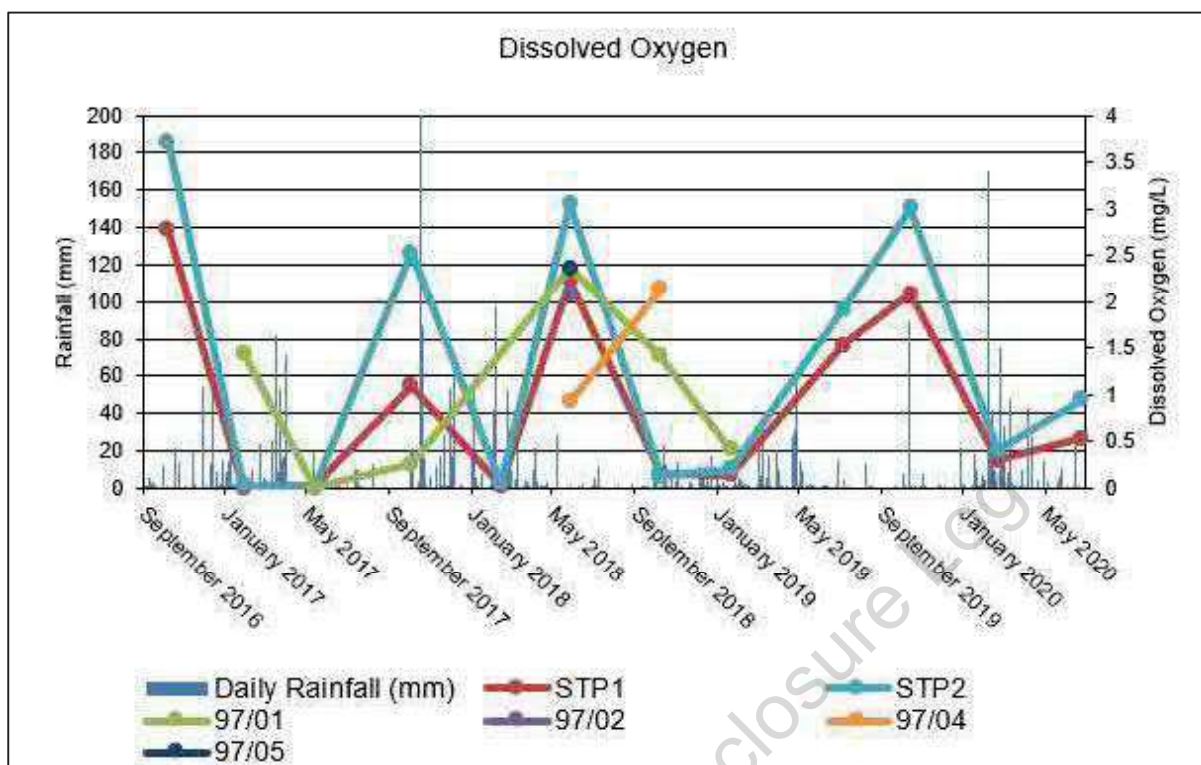


Figure 23 WwTP Dissolved Oxygen, September 2016 – June 2020

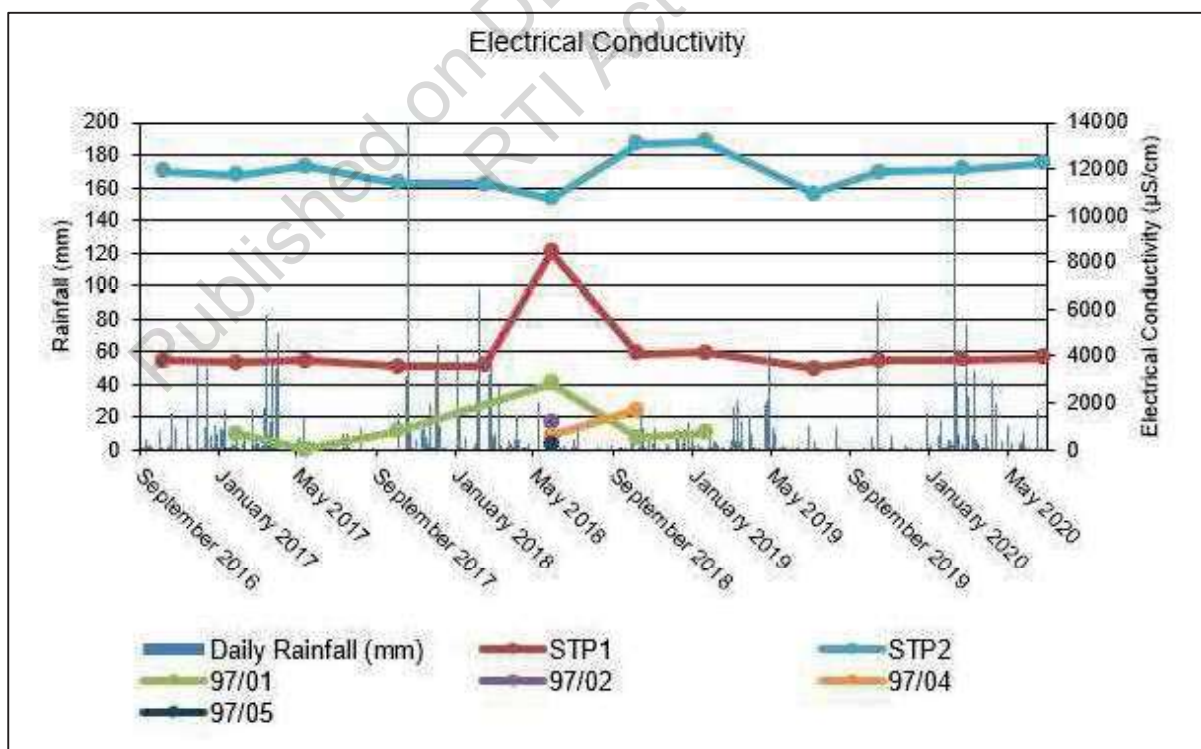


Figure 24 WwTP Electrical Conductivity, September 2016 – June 2020

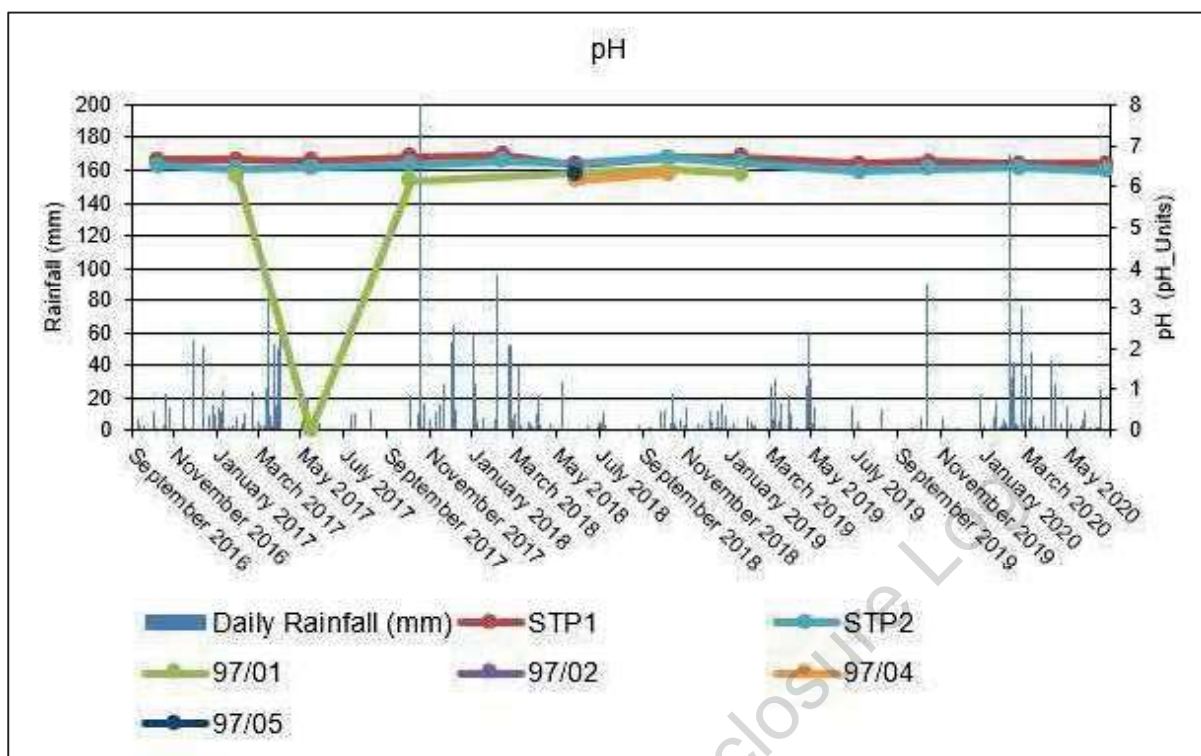


Figure 25 WwTP pH, September 2016 – June 2020

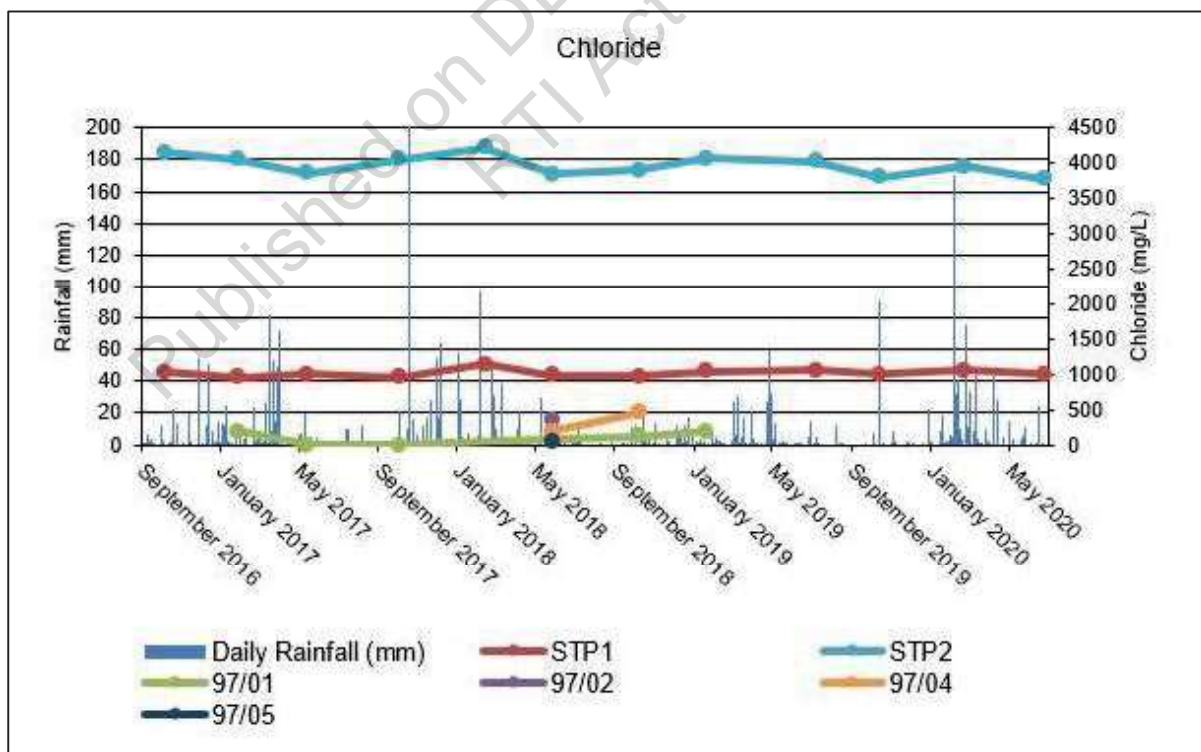


Figure 26 WwTP Chloride, September 2016 – June 2020

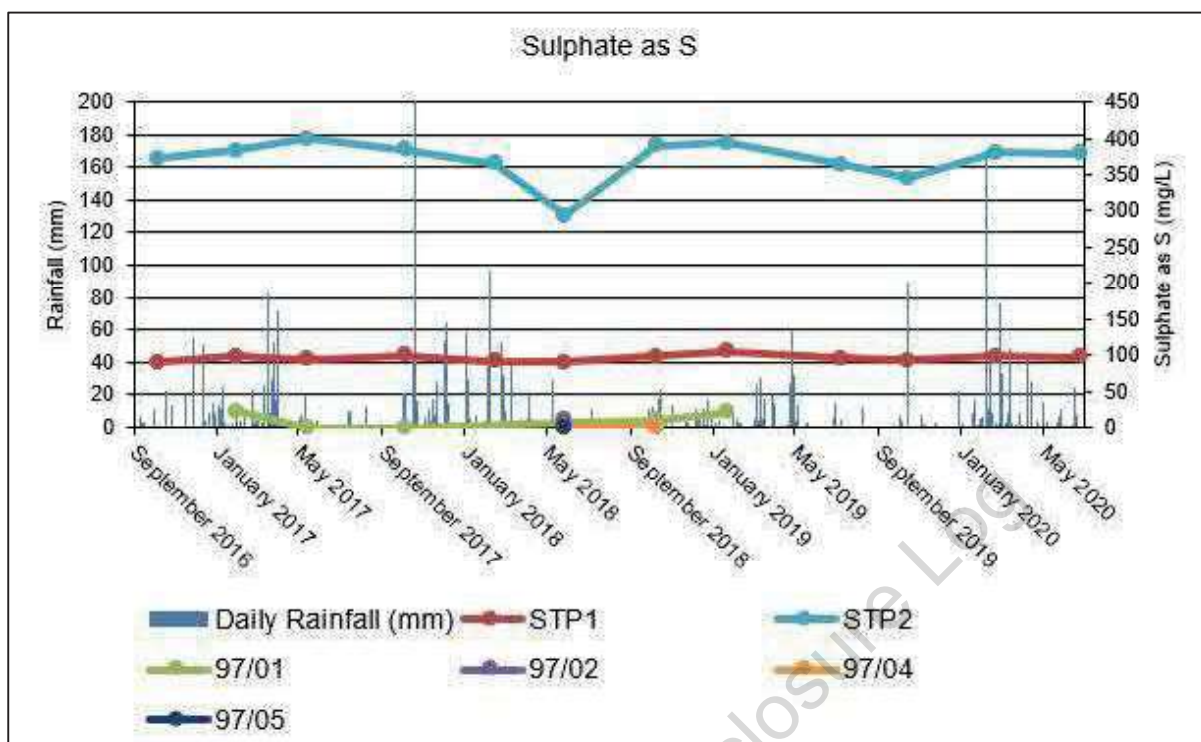


Figure 27 WwTP Sulphate, September 2016 – June 2020

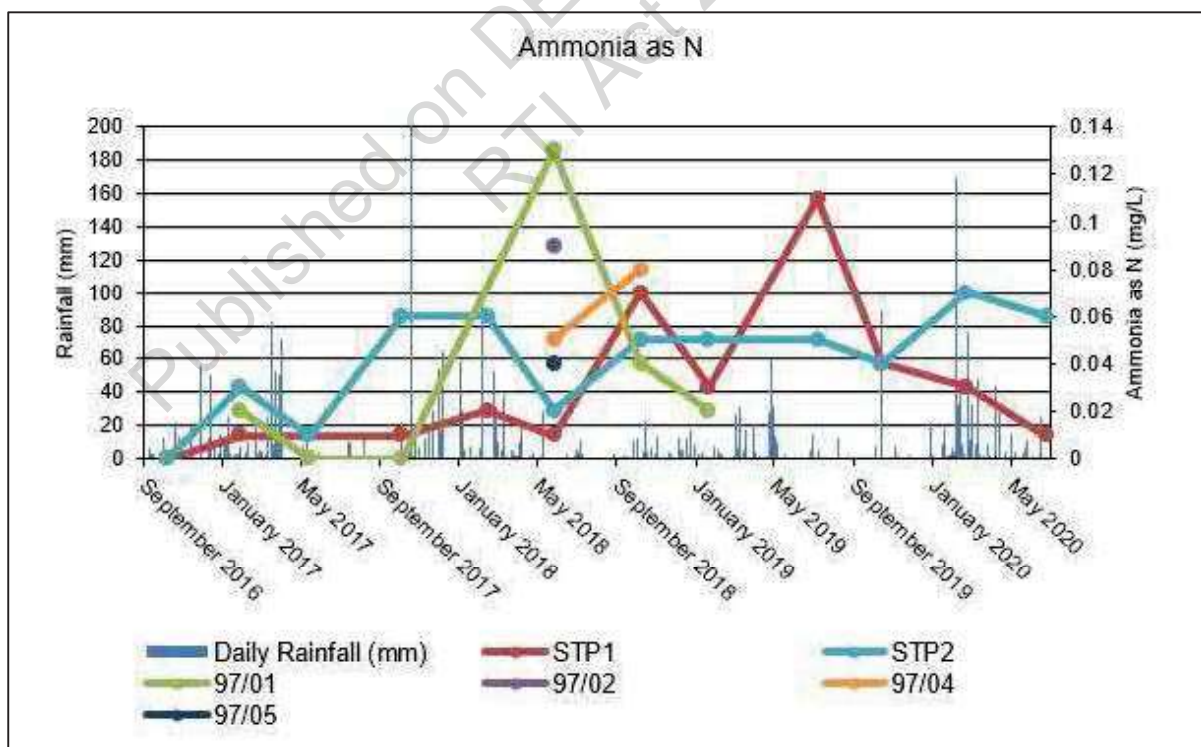


Figure 28 WwTP Ammonia, September 2016 – June 2020

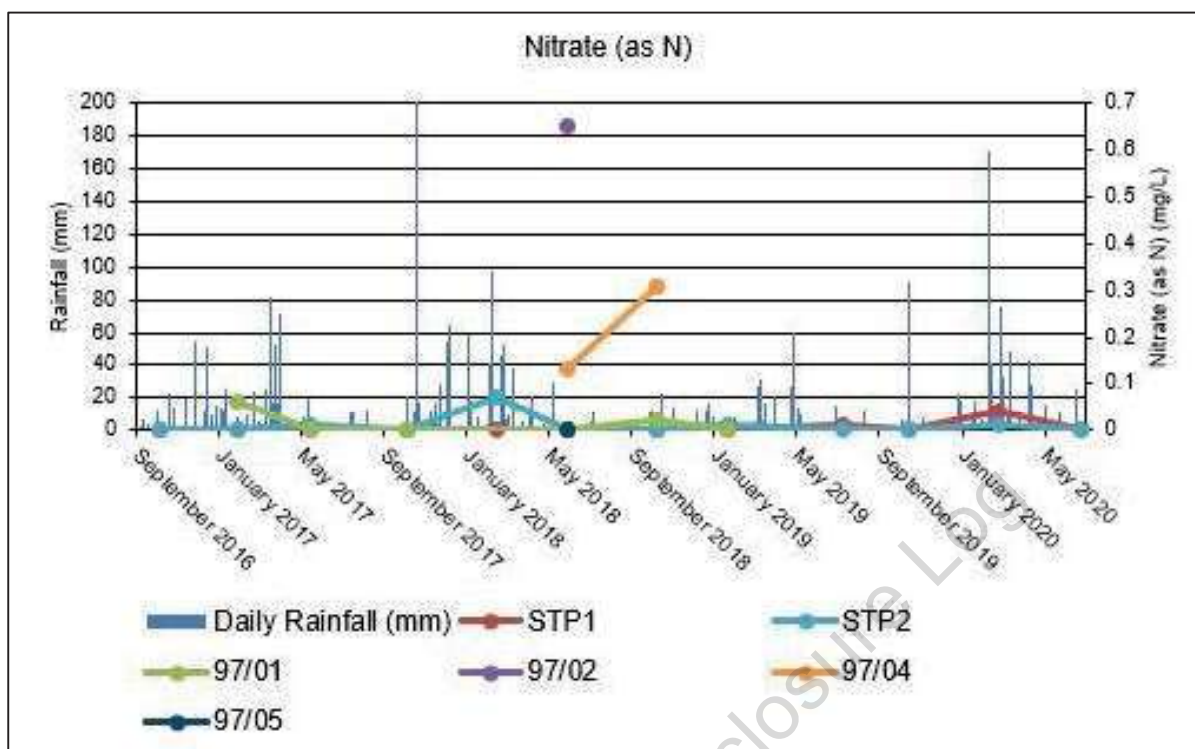


Figure 29 WwTP Nitrate, September 2016 – June 2020

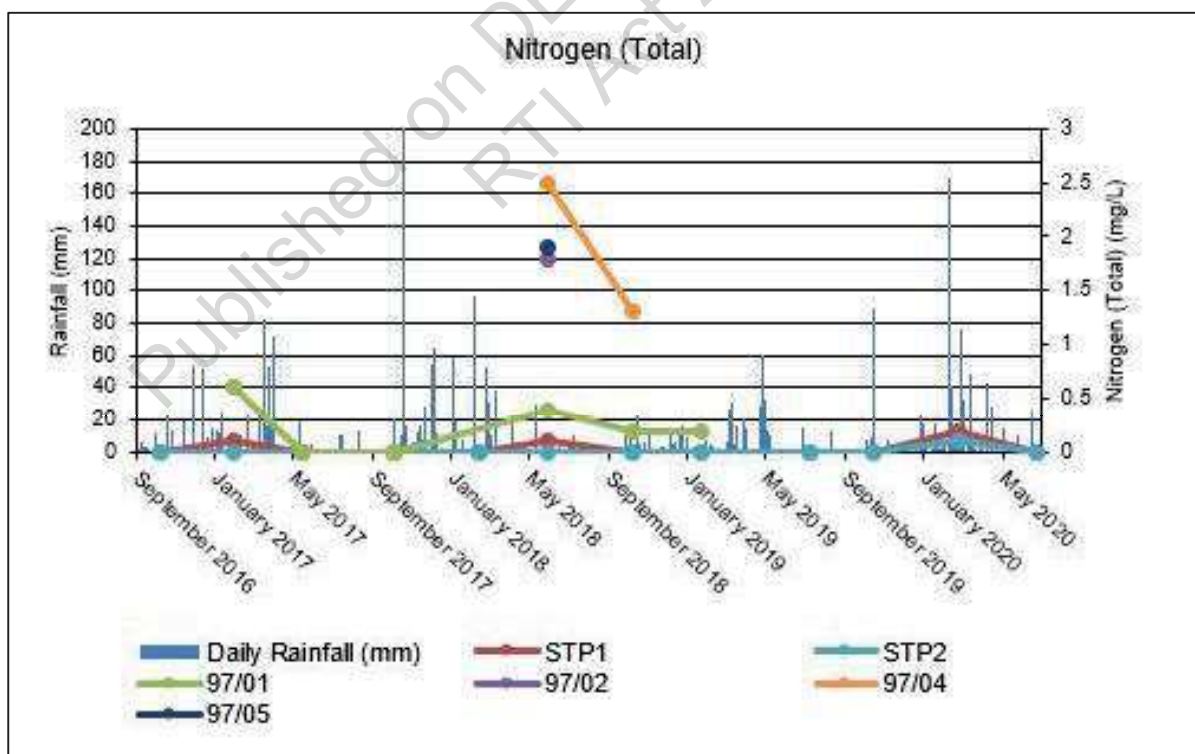


Figure 30 WwTP Total Nitrogen, September 2016 – June 2020

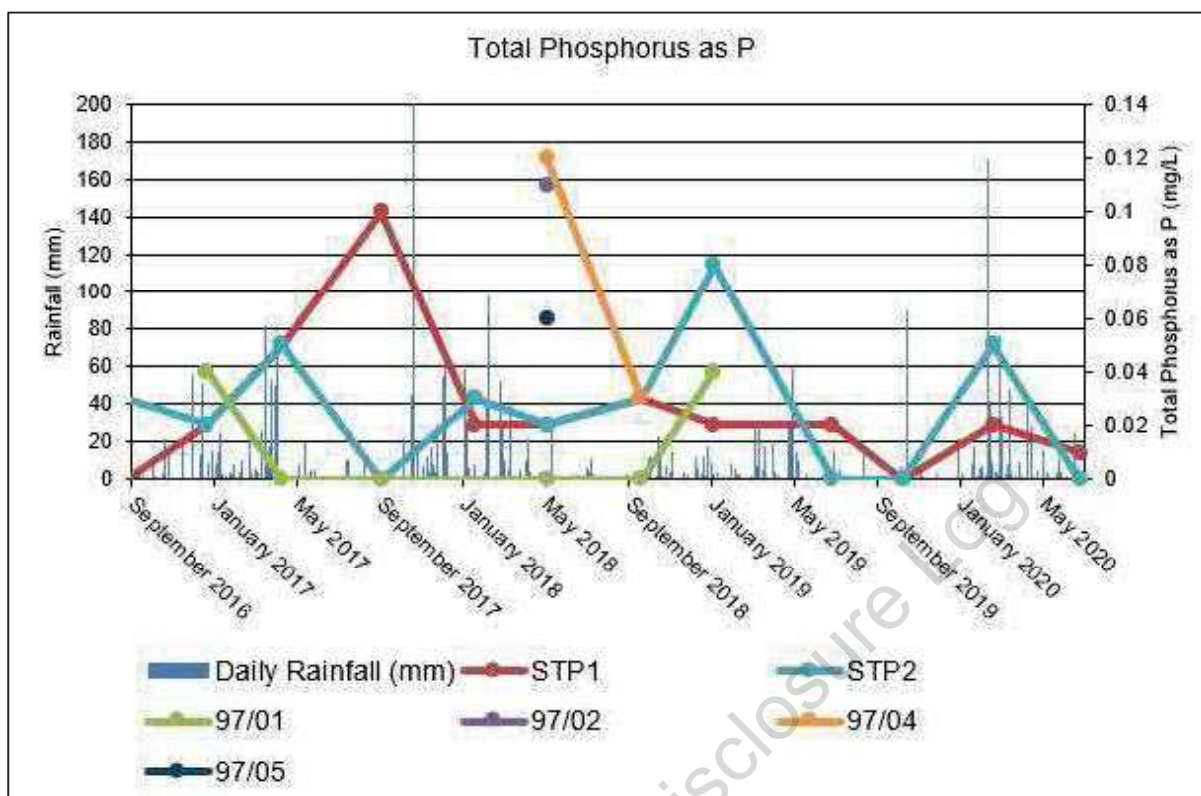


Figure 31 WwTP Total Phosphorus, September 2016 – June 2020

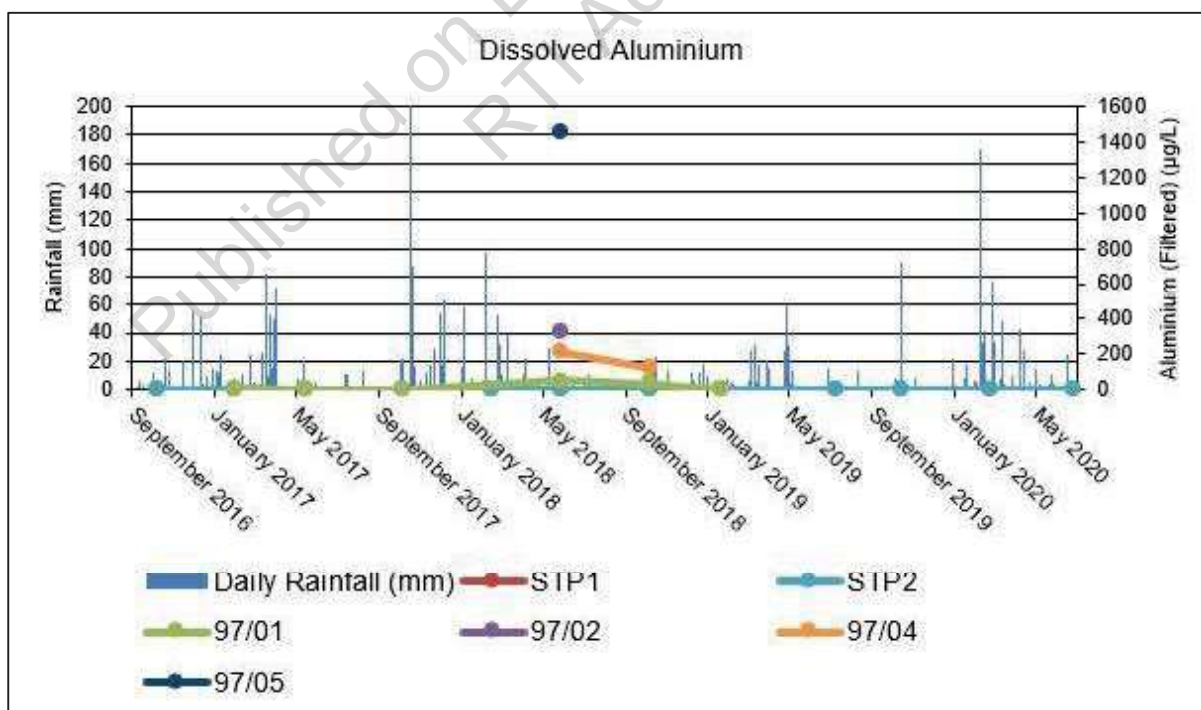


Figure 32 WwTP Dissolved Aluminium, September 2016 – June 2020

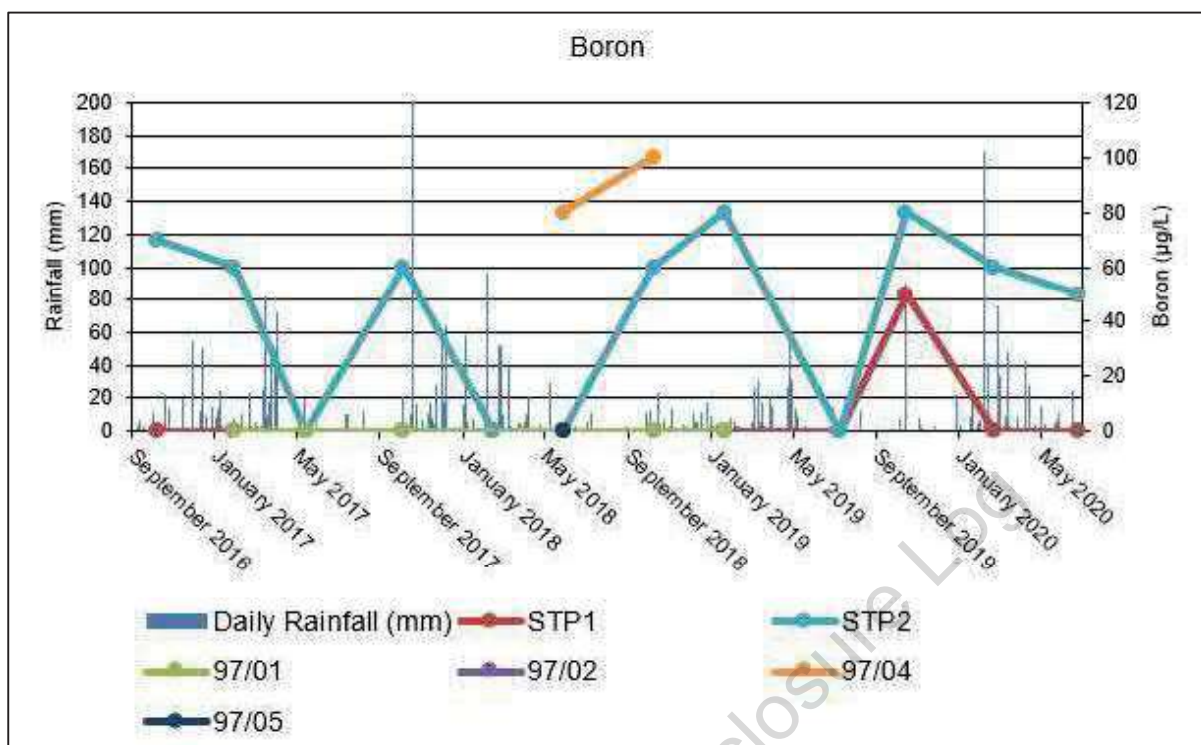


Figure 33 WwTP Total Boron, September 2016 – June 2020

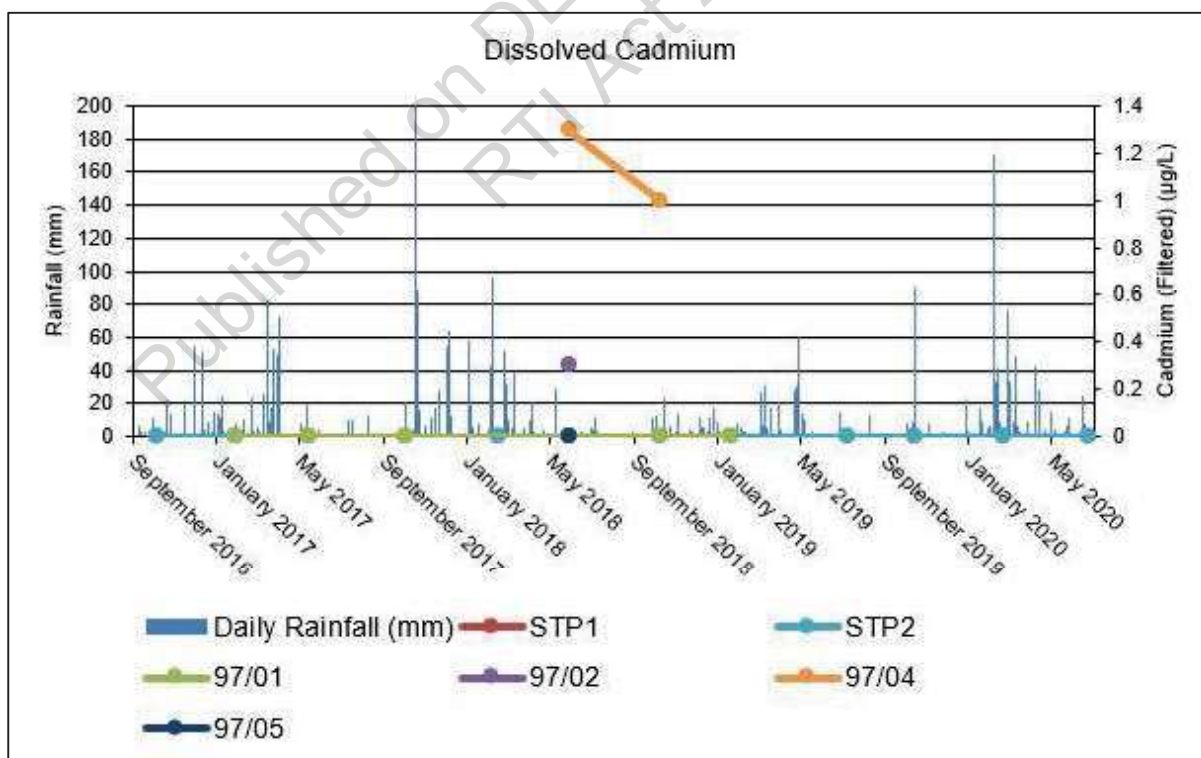


Figure 34 WwTP Dissolved Cadmium, September 2016 – June 2020

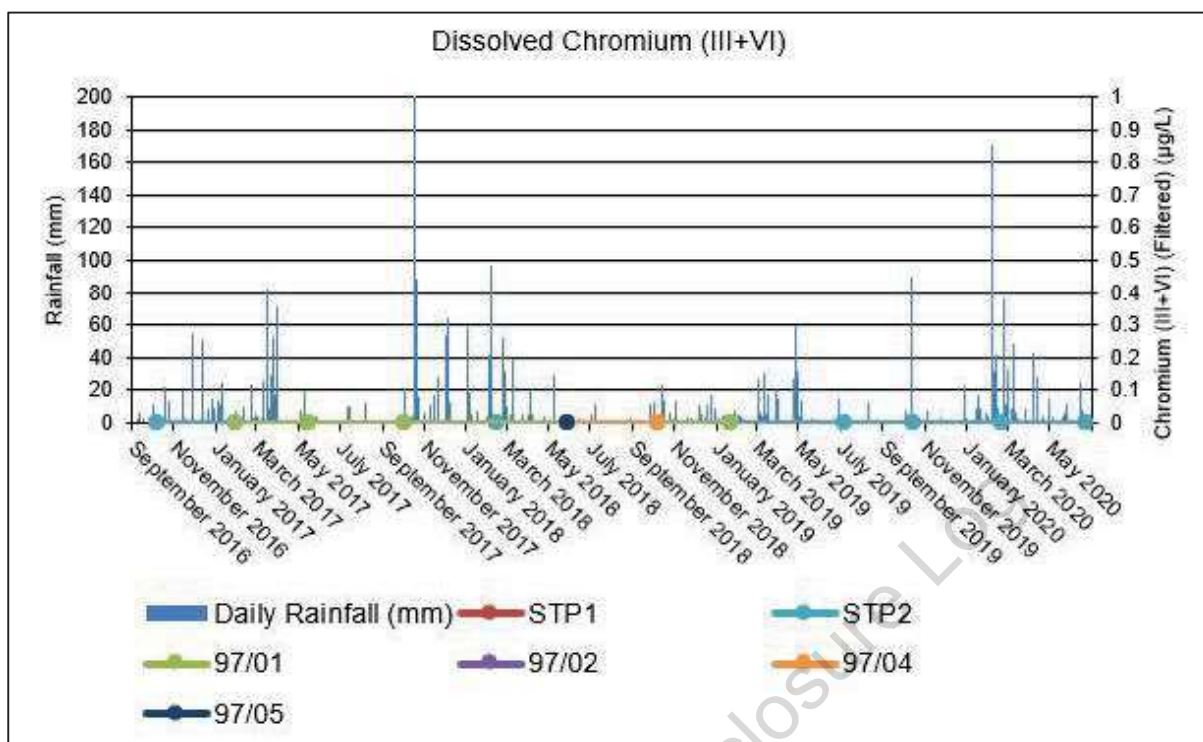


Figure 35 WwTP Dissolved Chromium, September 2016 – June 2020

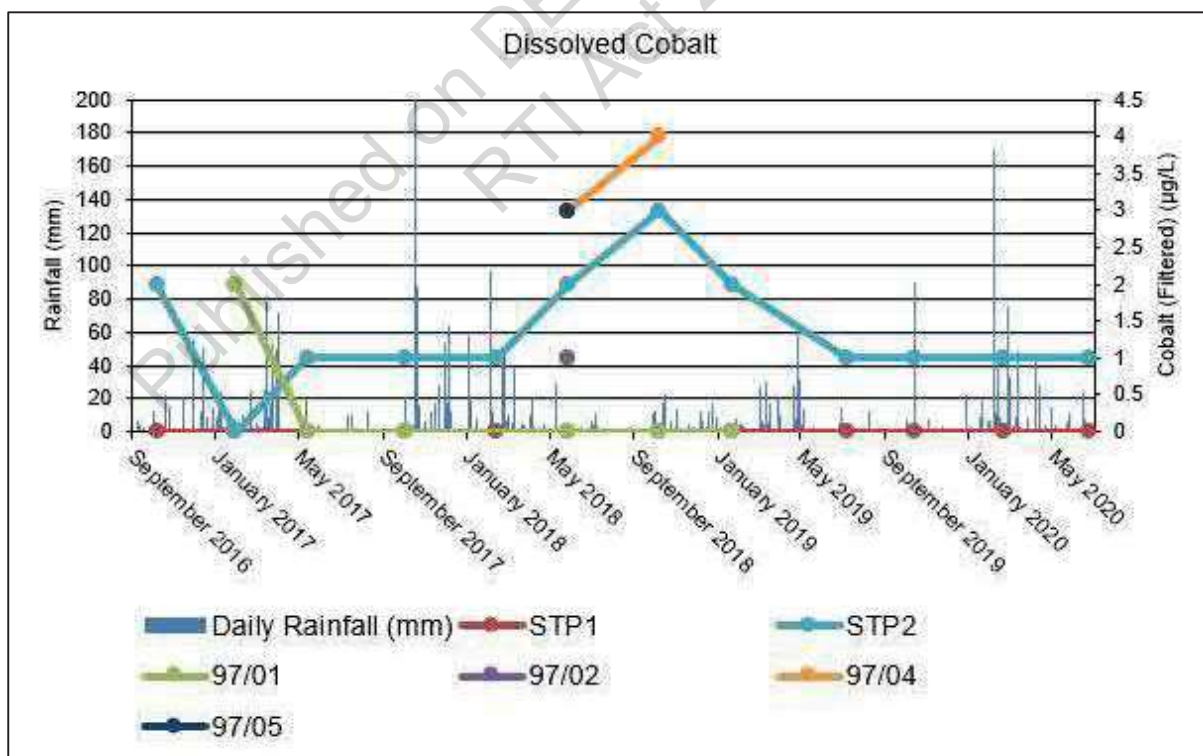


Figure 36 WwTP Dissolved Cobalt, September 2016 – June 2020

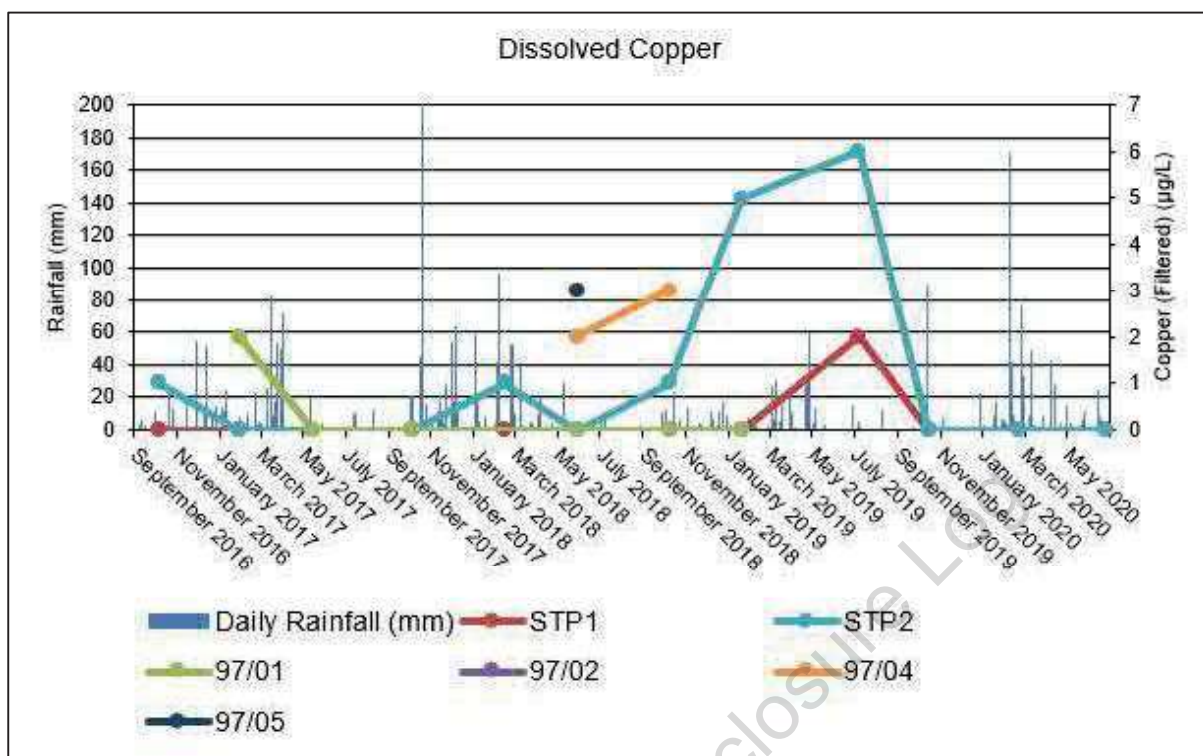


Figure 37 WwTP Dissolved Copper, September 2016 – June 2020

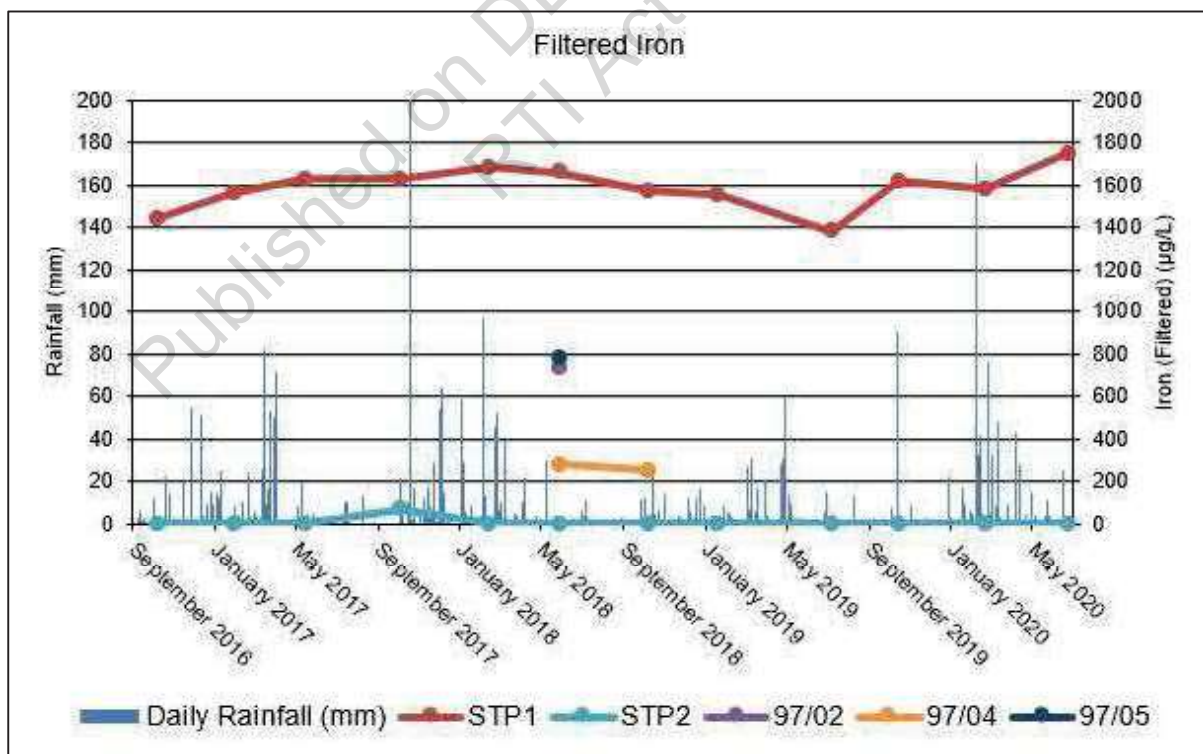


Figure 38 WwTP Filtered Iron, September 2016 – June 2020

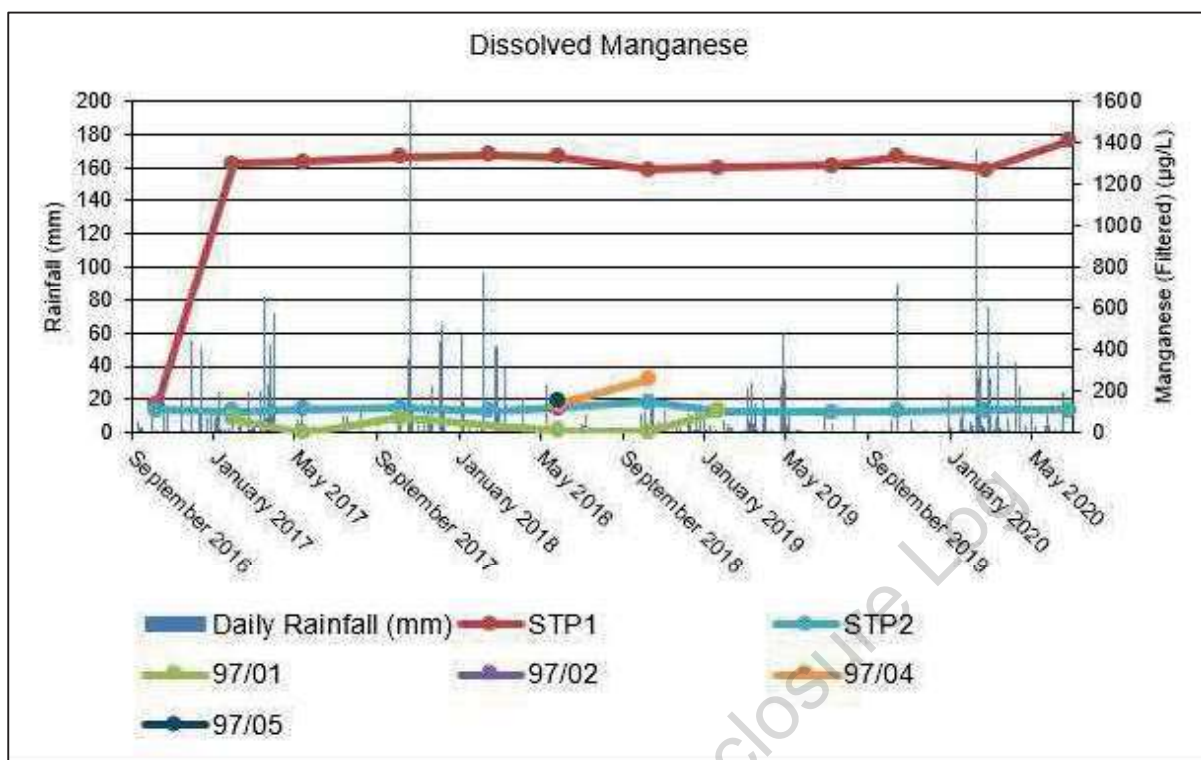


Figure 39 WwTP Dissolved Manganese, September 2016 – June 2020

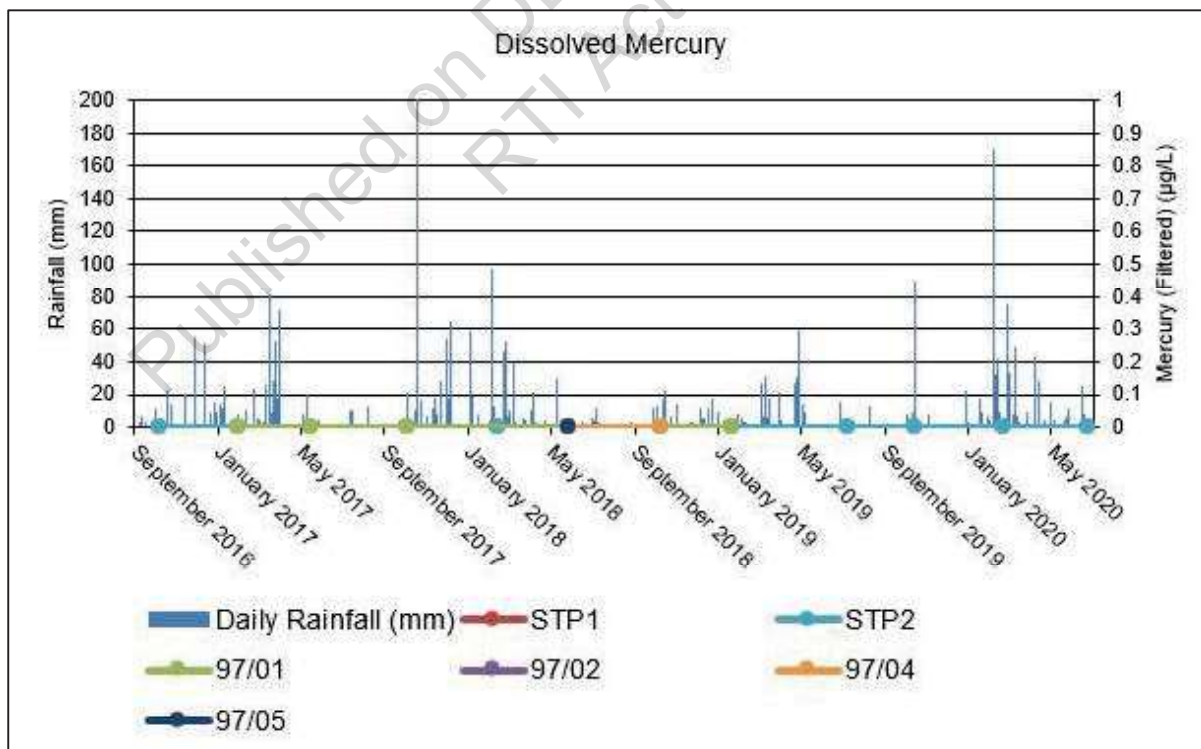


Figure 40 WwTP, Dissolved Mercury, September 2016 – June 2020

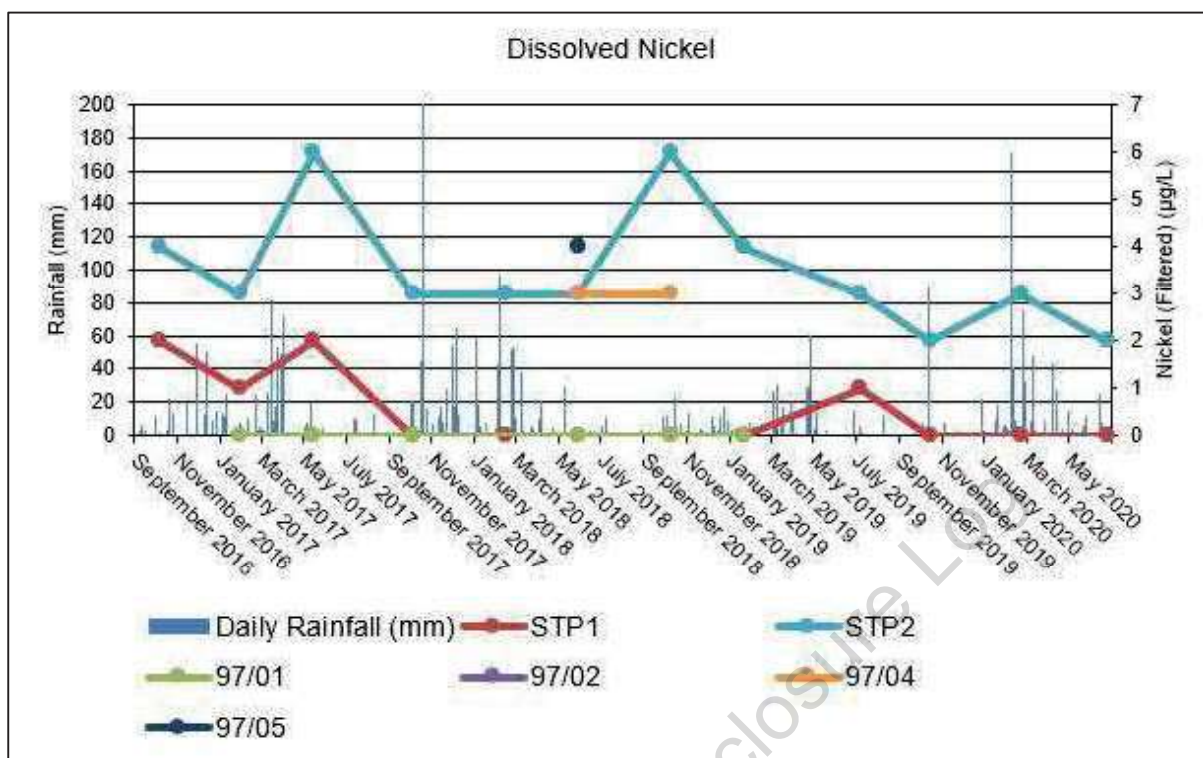


Figure 41 WwTP Dissolved Nickel, September 2016 – June 2020

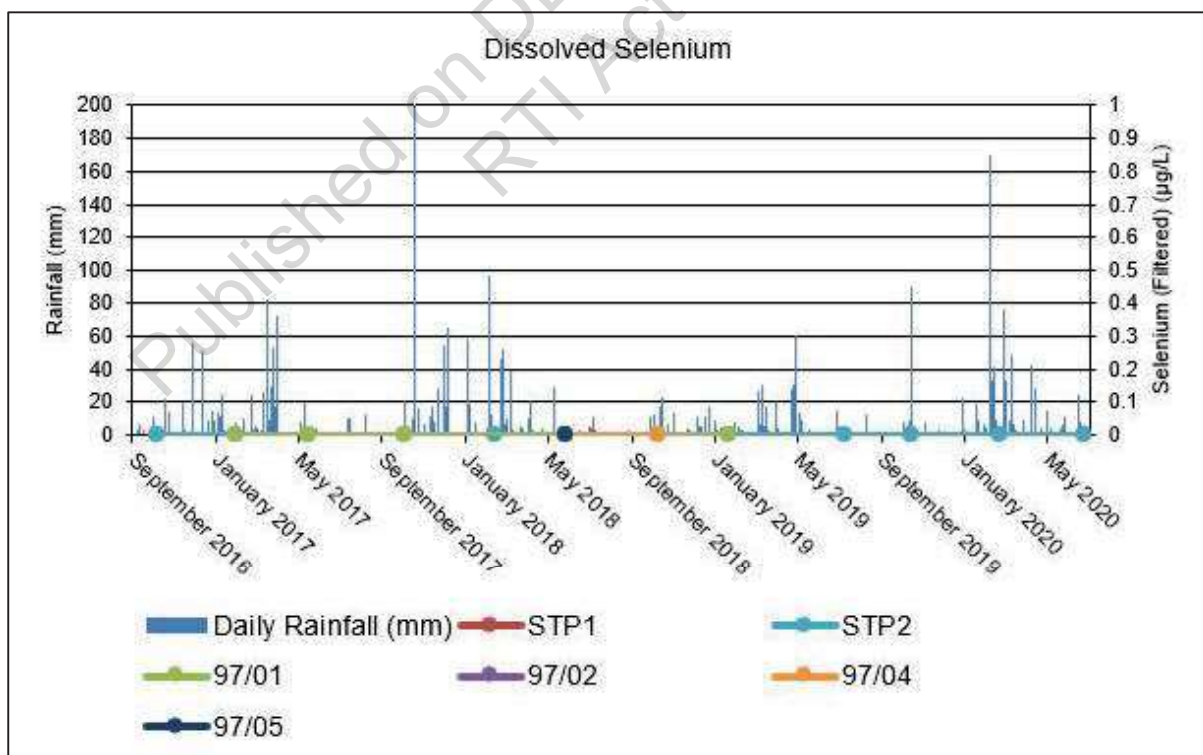


Figure 42 WwTP Dissolved Selenium, September 2016 – June 2020

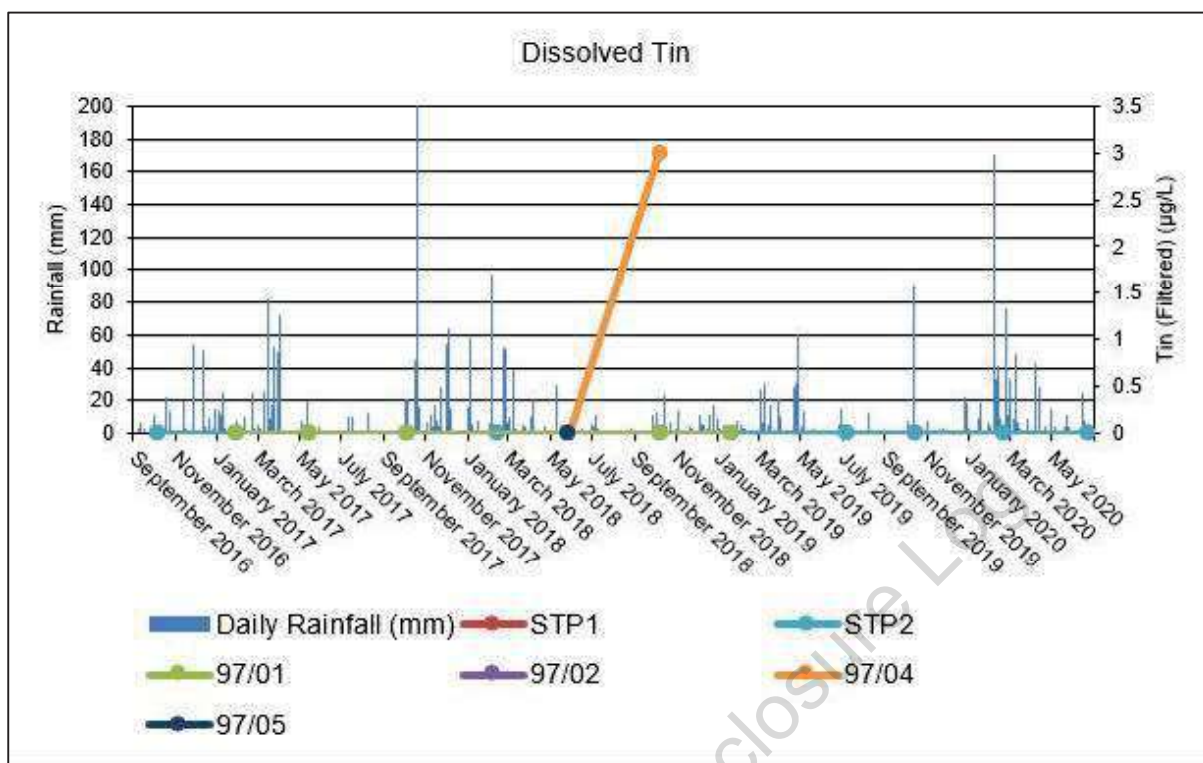


Figure 43 WwTP Dissolved Tin, September 2016 – June 2020

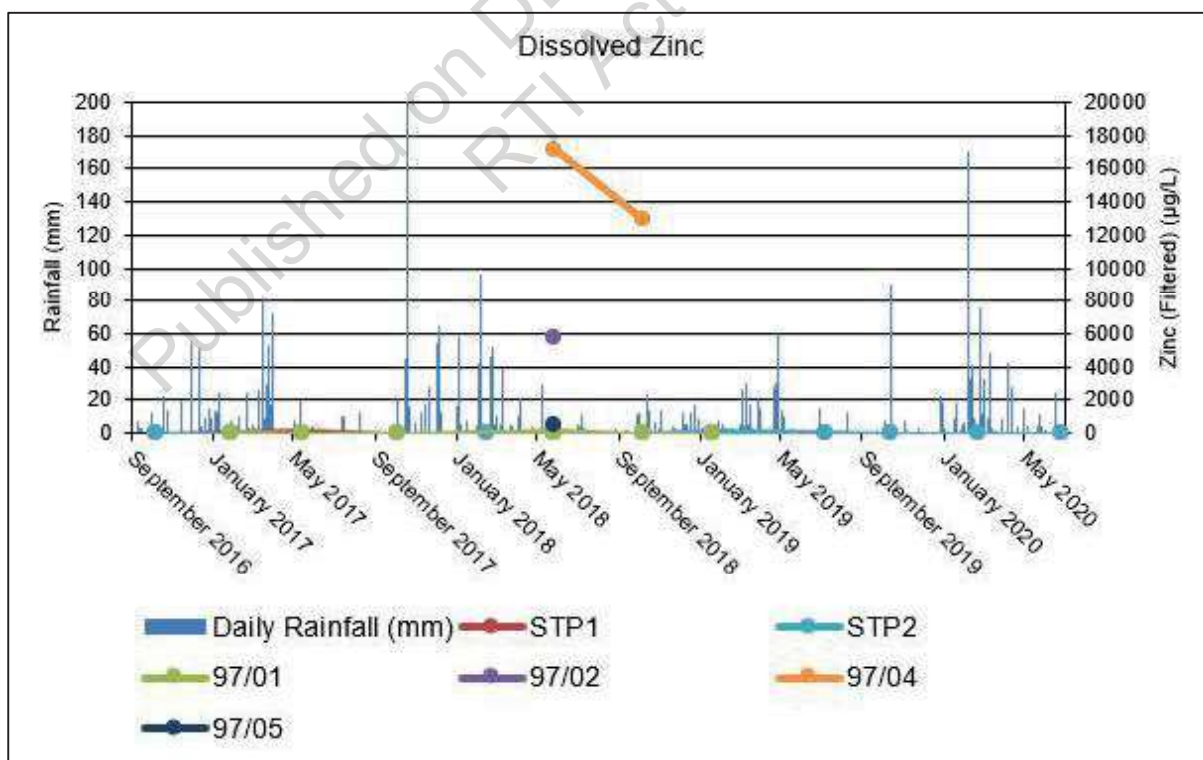


Figure 44 WwTP Dissolved Zinc, September 2016 – June 2020

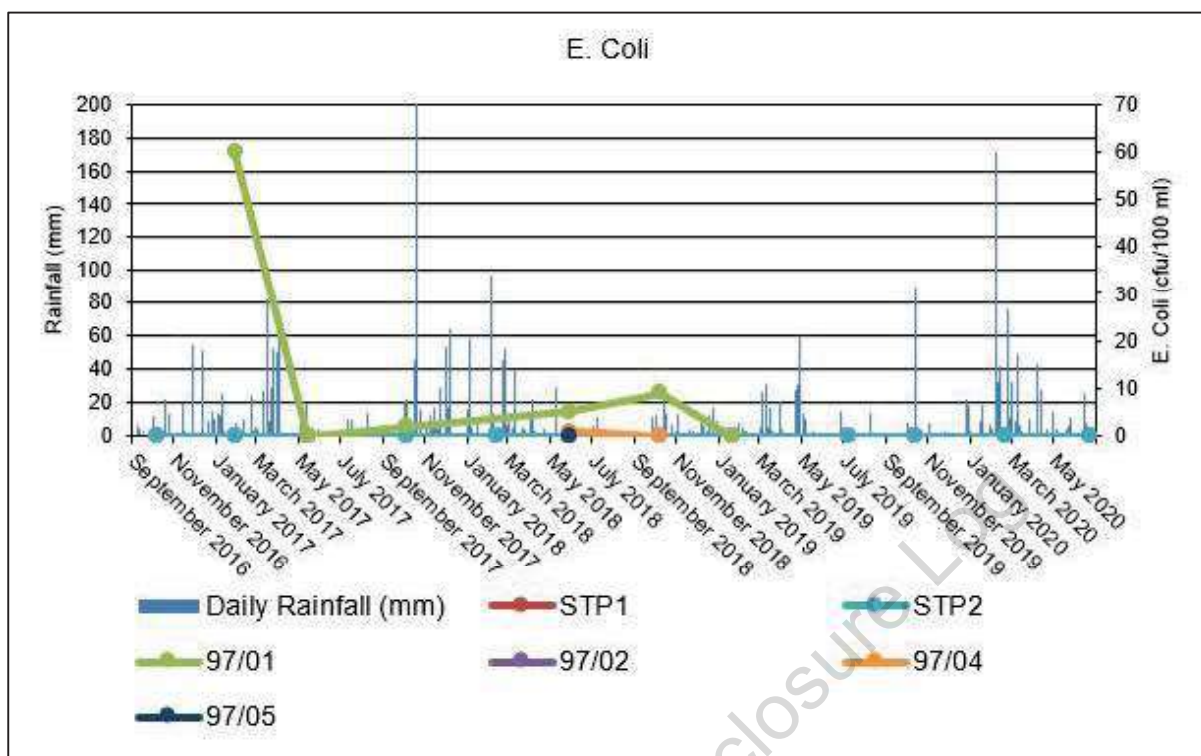


Figure 45 WwTP *E. Coli*, September 2016 – June 2020

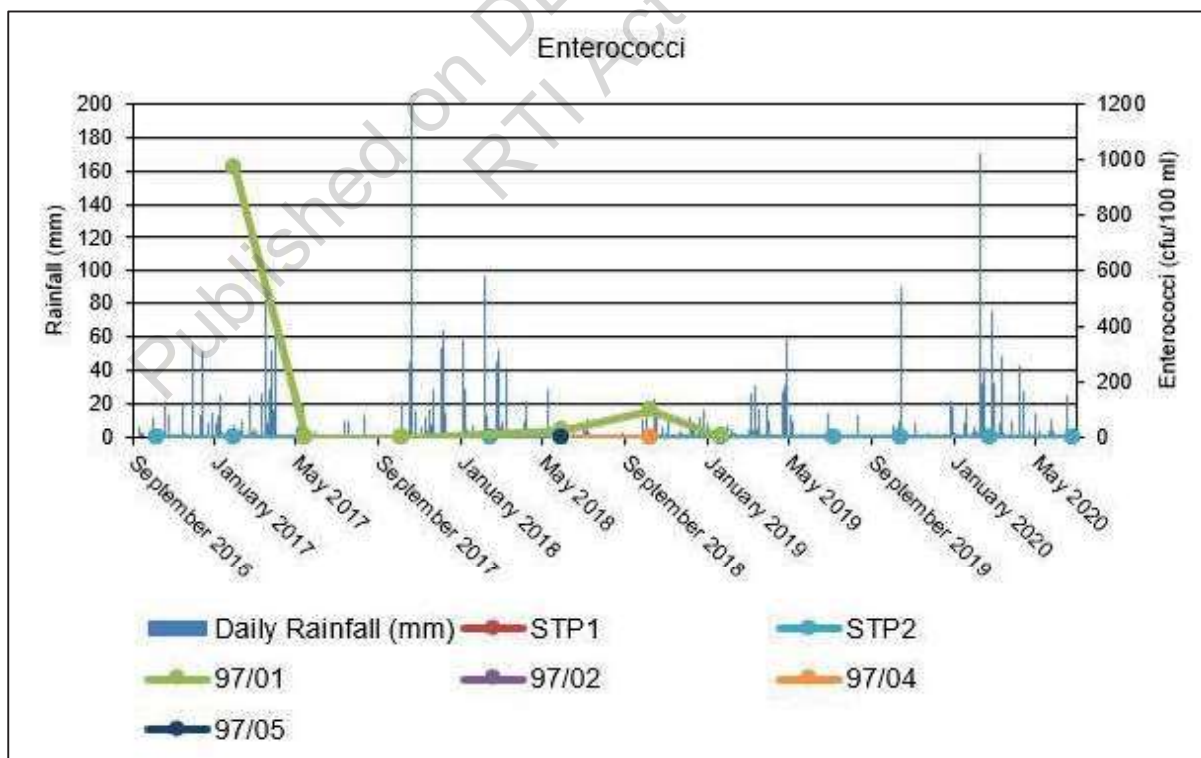


Figure 46 WwTP Enterococci, September 2016 – June 2020

APRIL 2020 QUARTERLY REPORT

June 2020
J163599-03

Trility Pty Ltd

Integrated Water
Treatment Plant and
Wastewater Treatment
Plant, Agnes Water

C114943: JH

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Client Name:	Trility Pty Ltd
Client Number:	C114943
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Definitions and Acronyms

Acronym	Definition
ALS	Australian Laboratory Services
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS/NZS 5667:11	Water Quality Sampling Part 11: Guidance on sampling of groundwaters (1998)
CoC	Chain of Custody
EHP	Department of Environment and Heritage Protection
ERA	Environmentally Relevant Activity
Greencap	Greencap Pty Ltd
IWTP	Integrated Water Treatment Plant
m AHD	metres Australian Height Datum
mg/L	milligrams per litre
ML	Mega Litre
NATA	National Association of Testing Authorities
NEPM	<i>National Environmental Protection (Assessment of Site Contamination) Measure 1999</i> , as amended May 2013
QA/QC	Quality Assurance / Quality Control
RPD	Relative Percent Difference
SWL	Standing Water Level
TOC	Top of Casing
Trility	Trility Pty Ltd
µS/cm	microsiemens per centimetre
µg/L	micrograms per litre
WwTP	Wastewater Treatment Plant

April 2020 QUARTERLY REPORT

Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

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Appendix A: Groundwater Field Sampling Records

Appendix B: Results Summary Table

Appendix C: Laboratory Results. COC and QA/QC Documentation

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1 INTRODUCTION

1.1 Background

In 2015, Greencap Pty Ltd (Greencap) was commissioned by Trility Pty Ltd (Trility) to provide advice regarding the site groundwater conditions and monitoring of groundwater at the Gladstone Regional Council owned and Trility operated Integrated Water Treatment Plant (IWTP) and Wastewater Treatment Plant (WwTP) facilities located in Agnes Water, Queensland (**Table 1-1**).

Table 1-1 Location and ERAs of Facilities

Facility	Environmental Relevant Activity	Location
Integrated Water Treatment Plant (IWTP)	ERA64-(1a) Water Treatment > 0.5 ML but < 5ML water day	Springs Road AGNES WATERS - (Lot 52 Plan SP155903 and Lot 41 Plan SP 206868 (Figure 2-1))
Wastewater Treatment Plant (WwTP)*	ERA63 (1d) Sewage Treatment >4000 to 10,000EP	Streeter Drive AGNES WATERS (Lot 20 Plan FD991 and Lot 21 Plan SP168519) (Figure 2-2)

* It is acknowledged that the treated effluent from the WwTP is irrigated to land as identified in the lot and plan provided above.

These two facilities are administered in accordance with the Department of Environment and Science (DES) Environmental Authority EPPR00959913 (hereafter referred to as the Environmental Authority) issued to Gladstone Regional Council on 1 September 2015.

In accordance with condition WT7-AW of the Environmental Authority, Greencap was engaged to prepare a Preliminary Groundwater Assessment Report for the IWTP in August 2015 and the WwTP in February 2016. The reports presented an overview of the local geological and hydrogeological conditions, and a number of recommendations identified during the assessment were implemented in September 2016. These included Greencap's recommendations:

IWTP

- Prepare and document a groundwater monitoring program, and provide this to EHP for approval, as required by the Environmental Authority EPPR00959913 (the Environmental Authority);
- Install three additional groundwater monitoring wells at the site, in accordance with the Groundwater Monitoring Program; and
- Ongoing groundwater monitoring, in accordance with the Groundwater Monitoring Program.

WwTP

- Undertake collar surveys of the existing groundwater monitoring bores so that groundwater level elevations can be determined with reference to the Australian Height Datum (AHD);
- Install two inferred up hydraulic gradient bores to enable monitoring of background groundwater conditions;
- Prepare a groundwater management system in accordance with the Environmental Authority conditions that meet the requirements of the Environmental Authority in relation to monitoring groundwater for potential contamination; and

- Undertake the required assessment and reporting of groundwater monitoring results.

Trility reviewed these reports and agreed to Greencap's recommendations. These recommendations were implemented, commencing May 2016 and quarterly groundwater monitoring commenced at the IWTP and WwTP in September 2016. Greencap have been compiling groundwater monitoring data collected by Trility into quarterly and annual reports since this work commenced.

1.2 Objectives and Scope of Work

The overarching objective of the groundwater monitoring for IWTP and WwTP is to comply with requirements of the Environmental Authority issued by EHP in relation to the monitoring of groundwater for the Gladstone Regional Council owned and Trility operated IWTP and WwTP facilities.

The objective of this quarterly report is to present and summarise the results from the groundwater sampling events undertaken by Trility at the WwTP and IWTP in accordance with Conditions WT8-AW, WT9-AW, WT10-AW and WT11-AW of the Environmental Authority.

The scope of work implemented during the April 2020 monitoring round included groundwater level sampling from existing groundwater bores at both sites. Groundwater gauging was undertaken on a monthly basis to determine groundwater level, and groundwater sampling occurred in parallel with the April 2020 gauging event.

2 SITE DESCRIPTION

2.1 Integrated Water Treatment Plant

2.1.1 Geology

The IWTP is located at Springs Road, Agnes Water on (Lot 6 on SP150900, Lot 40 Plan SP206868, Lot 52 Plan 155903 and Lot 41 Plan SP206868) and is positioned on the coastal dune system between the Reedy Creek coastal swamp and the Coral Sea (**Figure 2-1**).

The basement rocks in the area are the Lower to Middle Triassic age Agnes Water Volcanics. The shoreline to the east of the IWTP is characterised by rocky outcrops and form coastal headlands to the north and south of the IWTP. These volcanics are widespread to the inland of the site. Overlying the volcanics are Tertiary age Elliot Formation sandstones and alluvial sediments. The Elliot Formation is mapped as outcropping in the elevated areas to the west of the Agnes Water.

The Quaternary Age Coastal Dune deposits are a linear sand deposit located immediately adjacent the Coral Sea. These dune deposits reach heights of 50 m AHD in the vicinity of the IWTP. The Reedy Creek swamp area to the west of the IWTP is mapped as consisting of Quaternary age alluvium.

2.1.2 Operations

The IWTP operations can be summarised as follows:

- The IWTP extracts raw water from the adjoining Pacific Ocean via an intake system sited at Chinaman's Beach, and bore water from the Springs Road bores (**Figure 3-1**);
- Water received at the IWTP is processed via filtration and reverse osmosis systems;
- Water is then chemically dosed to adjust the water properties before distribution to the Gladstone City Council operated potable water network.

The IWTP incorporates the storage and usage of chemicals required to be used during the water treatment process. These chemicals are stored under cover in designated chemical storage locations and managed in accordance with the IWTP Environmental Management Plan provisions.

2.1.3 Potential for Leaks

The potential for impacts on groundwater from IWTP activities are generally restricted to:

- Release of chemicals and materials during transfer to and around the treatment facility;
- Loss of integrity of bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages; and
- Brine disposal pipe leakages.

Any releases of chemicals, raw materials and/or process by products have the potential to impact on the existing shallow sand dune aquifer above the coffee rock layer and potentially move west, the inferred groundwater flow direction.

2.2 Wastewater Treatment Plant and Irrigation Area

2.2.1 Geology

The WwTP is located at Streeter Drive, Agnes Water (Lot 21 on SP168519 and Lot 20 on FD991), and is positioned some 4.5 km inland to the west of the Coral Sea, south-east of a local topographic feature known as Round Hill, within the Deepwater Creek catchment area (**Figure 2-2**).

The WwTP is situated within the Lower to Middle Triassic age Agnes Water Volcanics. These rocks commonly outcrop in the elevated landforms surrounding and to the north of the WwTP. In addition, these rocks form coastal headlands to the east of the WwTP.

These volcanics are a mixture of igneous rock types, thought to have been deposited in a terrestrial environment. Overlying the volcanics in the WwTP area are Quaternary age alluvium and colluvium.

2.2.2 Operations

The operations of the wastewater treatment plant on site can be summarised as follows:

- Sewage from Agnes Water township is pumped to the site via a number of designated pumping stations, at a volume of no more than 10,000 equivalent persons (EPs);
- Sewage undergoes tertiary treatment (to class B standard) on site through aerobic digestion;
- Following tertiary treatment, treated effluent is retained in a series of specially constructed lagoons; and
- Treated effluent is discharged via irrigation to the designated irrigation area.

2.2.3 Potential for Leaks

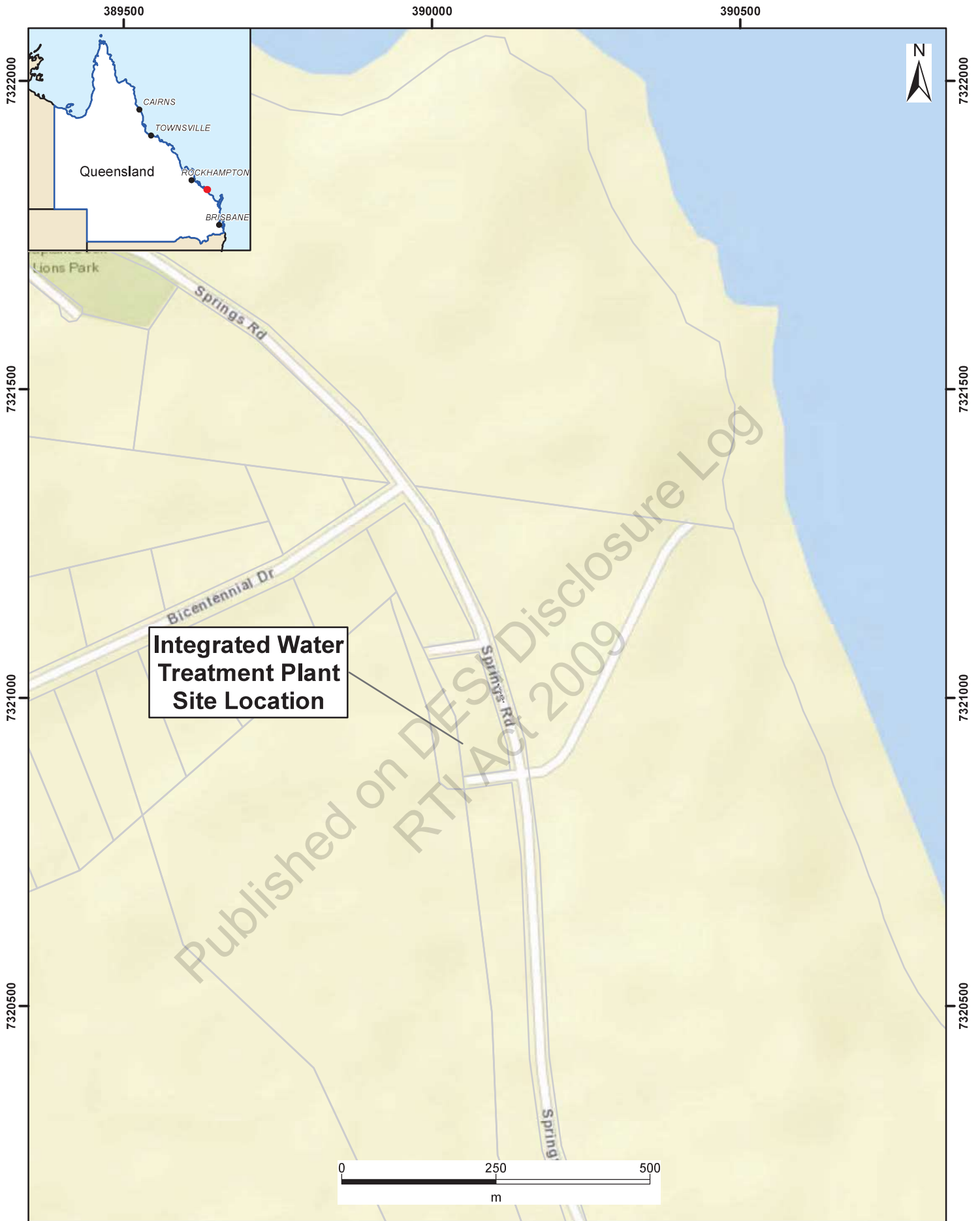
The potential for impacts on groundwater from WwTP activities is generally restricted to:

- Release of chemicals and materials during transfer to and around the treatment facility;
- Loss of integrity from bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages;
- Leaks from the liner of the treated effluent pond; and
- Deep drainage from inappropriate irrigation practices in the irrigation area.

Any leaks of chemicals and/or contaminants arising from the operation have the potential to impact the aquifer in the Agnes Water Volcanics and shallow alluvial material at the WwTP site.

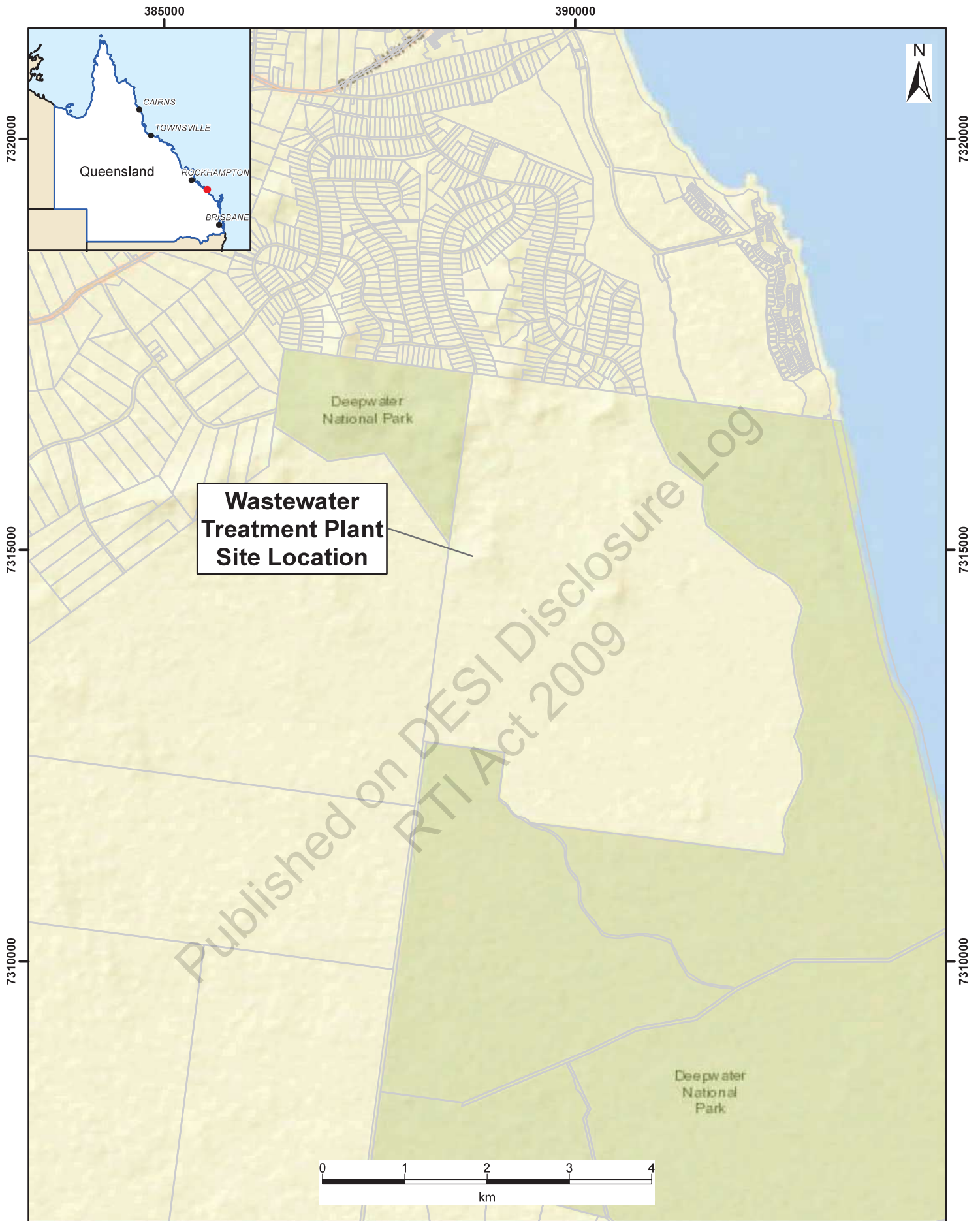
As groundwater flow is inferred as flowing in a southerly direction, impacts from the release of chemicals and/or contaminants on residents drawing water from this aquifer at Agnes Water is unlikely.

Within the irrigation area, both the shallow local alluvial aquifer and the deeper Agnes Water Volcanics may be present. In both areas, groundwater flow direction inferred to be generally in a southern direction, based on groundwater level gauging data and local topography, and hence have the potential to be impacted upon by any chemical and/or contaminant releases.



Lot Boundary

Site Location of Integrated Water Treatment Plant		
Figure 2-1	Trillity Pty Ltd	
	Author: Personal	
	Map Scale: 1:8,000	
	Coordinate System: GDA 1984 MGA Zone 58	
Revision: R1		



Lot Boundary

Site Location of Wastewater Treatment Plant

Figure 2-2

Date: 15/01/2020

Revision: R1

Trillity Pty Ltd

Autho **Personal**

Map Scale: 1:50,000

Coordinate System: GDA 1984 MGA Zone 55

GREENCAP

3 GROUNDWATER BORE MONITORING NETWORK

3.1 Integrated Water Treatment Plant

Greencap attended the IWTP on 23 May 2016 to supervise the installation of three groundwater monitoring bores in accordance with condition WT22-AWDP. A surveyor was engaged to provide the coordinates for each monitoring bore and to determine the relative elevation levels.

Following development of the bores, groundwater level gauging was also conducted by Greencap and documented on 25 May 2016 to identify the level of water within bores. **Table 3-1** below summarises the details of the IWTP groundwater monitoring bores. The locations of the IWTP groundwater bores are shown in **Figure 3-1**.

Table 3-1 Integrated Water Treatment Plant Groundwater Monitoring Bores

Well Name	Easting	Northing	Depth of Well (m)	Relative Level (m)	Depth to Water (m) ¹	Relative Height Data (m AHD)
DESAL1	390050.613	7320897.615	6.5	19.117	2.287	16.830
DESAL2	390045.732	7320949.351	6.0	19.555	2.483	17.072
DESAL3	390005.808	7320906.402	5.0	18.739	3.014	15.725

¹ As measured on 25 May 2016.

3.2 Wastewater Treatment Plant and Irrigation Area

Groundwater monitoring bores were installed at the WwTP prior to 2008 (MP97/01 to MP97/05, MP00/07 and MP00/08) and the management of the facility by Trility. Monitoring of water quality from the supply pipe from the existing bores commenced in September 2008 and has been ongoing on a regular basis.

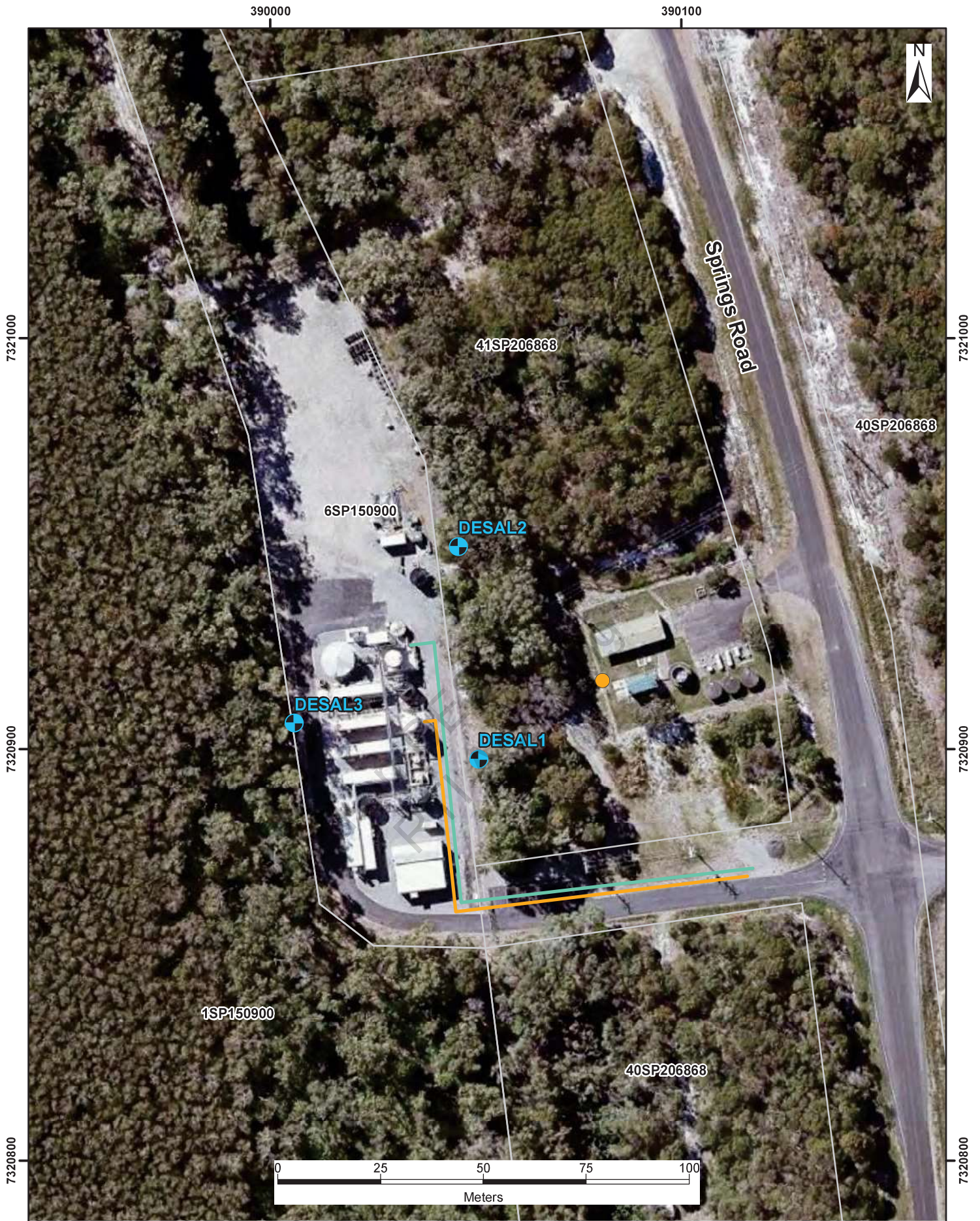
On 25 May 2016 Greencap inspected all the existing bores and identified that they appeared to be in good working condition and suitable for monitoring purposes. At this time Greencap supervised the installation of two additional groundwater monitoring bores at the WwTP, identified as STP1 and STP2, for the purposes of obtaining information on the background groundwater quality in the area. A surveyor was engaged to provide the coordinates for all the existing and newly installed monitoring bores at the WwTP and to determine the levels relative to AHD.

Groundwater level gauging was also conducted by Greencap and documented on 25 May 2016 to identify the level of water within bores. **Table 3-2** below summarises the details of the WwTP groundwater monitoring bores. The locations of the WwTP groundwater bores are shown in **Figure 3-2**.

Table 3-2 Wastewater Treatment Plant Groundwater Monitoring Bores

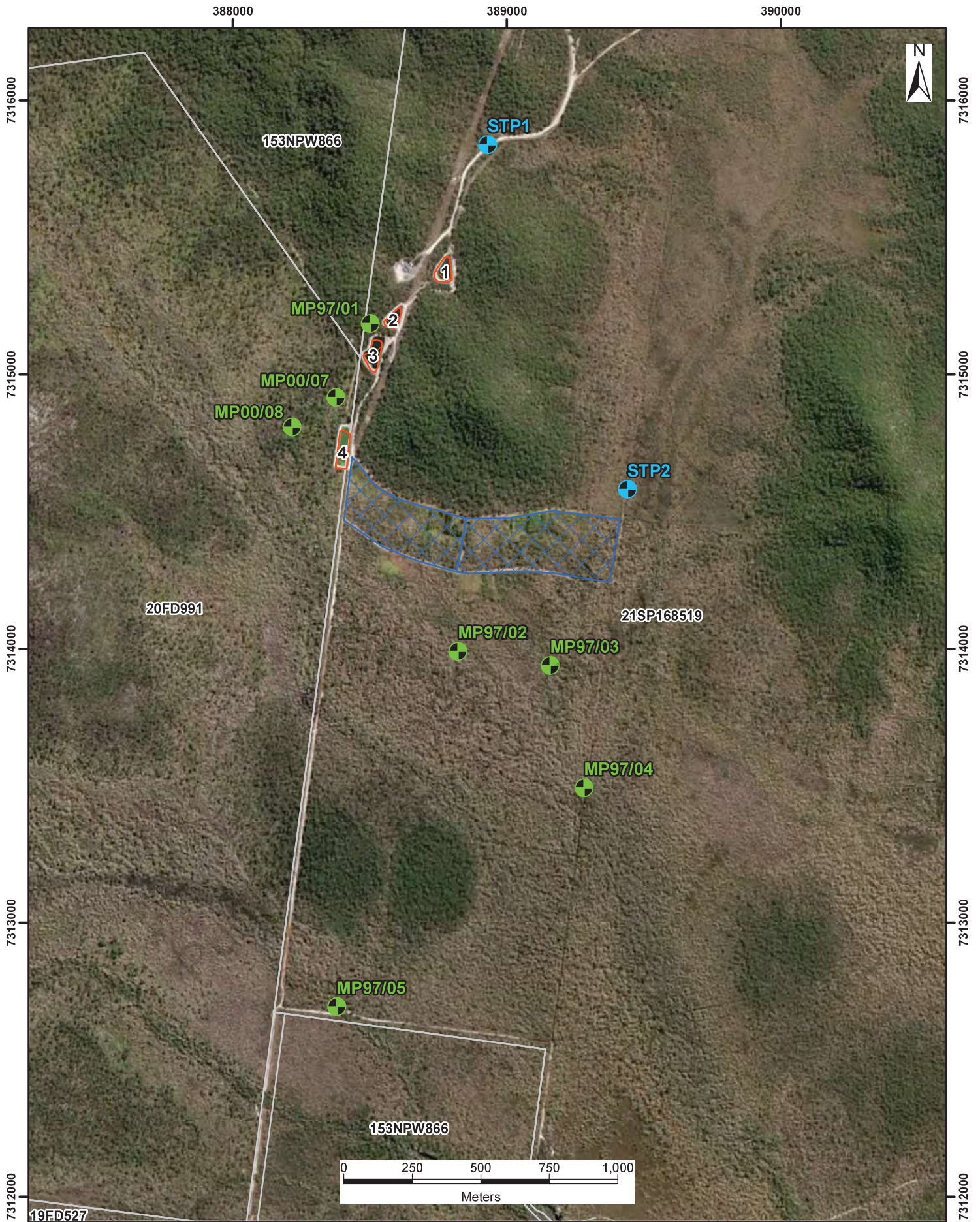
Well Name	Easting	Northing	Depth of Well (m)	Relative Level	Depth to Water (m) ¹	Relative Height Data (m AHD)
STP1	388929.148	7315839.541	15.36	31.081	0.607	30.474
STP2	389440.292	7314580.914	13.14	10.880	2.915	7.965
MP97/01	388501.285	7315186.657	1.10	19.938	0.959	18.979
MP97/02	388820.691	7313990.578	1.70	9.422	1.154	8.268
MP97/03	389158.188	7313938.606	1.69	8.479	1.342	7.137
MP97/04	389280.803	7313491.850	1.57	7.130	1.108	6.022
MP97/05	388379.765	7312693.071	1.02	6.074	0.784	5.290
MP00/07	388376.341	7314916.325	1.80	15.835	DRY	NA
MP00/08	388215.935	7314808.284	1.785	14.120	1.706	12.414

¹ As measured on 25 May 2016.



- Lot Boundary
- Groundwater Bore (Greencap May 2016)
- Indicative Location of Treated Water Flush Point
- Indicative Location of Brine Pipe
- Indicative Location of Seawater Pipe

Location of IWTP Groundwater Bores		
Figure 3-1	Trillity Pty Ltd	
	Date: 9/07/2018	Author: Personal
	Revision: R1	Map Scale: 1:1,200
		Coordinate System: GDA 1984 MGA Zone 58
		GREENCAP



- Lot Boundary
- Lagoon
- Recycled Water Irrigation Area

- Groundwater Bore**
- Greencap (May 2016)
 - Previously Existing

Location of WwTP Groundwater Bores		
Figure 3-2	Trility Pty Ltd	
	Author: Personal	GREENCAP
	Map Scale: 1:18,000	
	Coordinate System: GDA 1984 MGA Zone 58	
Revision: R1		

4 MONITORING PARAMETERS AND TRIGGER VALUES

The Environmental Authority for the WwTP sets out the list of parameters required to be monitored as part of the regular groundwater monitoring program, and the associated trigger values. These are summarised in **Table 4-1**.

Table 4-1 Monitoring Parameters and Trigger Values

Quality Characteristic	Units	Trigger Values
Dissolved Oxygen	mg/L	20% change from background ¹
Total Nitrogen	mg/L as Nitrogen	
Nitrate	mg/L as Nitrogen	
Ammonia	mg/L as Nitrogen	
Total Phosphorous	mg/L	
Chloride	mg/L	
Conductivity	uS/cm	
Sulphate	mg/L	No change from background ²
Boron	mg/L	
pH	pH unit	
Faecal Coliforms	Colony forming units/100ml	
Enterococcus Organisms	Colony forming units/100ml	
Total Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	Within ANZECC Guidelines
Dissolved Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	

¹ Trigger values are defined as an upper limit (20% increase from background) with the exception of dissolved oxygen, which is defined as a lower limit (20% decrease from background).

² Trigger values are defined as an upper limit – an exceedance is any increase from the background value, with the exception of pH which is defined as any change up or down from the background value.

Due to the absence of a background level defined by Environmental Authority and/or suitable baseline groundwater data for the area, the background value for the purposes of the trigger values are currently considered to be the results from the first sampling event conducted for each of the bores included in the Groundwater Monitoring Program.

Trigger values for total and dissolved metals are detailed in the Agnes Water Groundwater Management System and are in accordance with *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council [ANZECC] and the Agriculture and Resource Management Council of Australia and New Zealand [ARMCANZ], 2000a) (ANZECC Guidelines).

The Environmental Authority for the IWTP does not specify any particular requirements for groundwater monitoring parameters and trigger values. On this basis, the groundwater monitoring parameters and trigger values set out in **Table 4-1** above will also apply to the IWTP.

5 SAMPLING METHODOLOGY

Groundwater sampling was undertaken by Trility in accordance with industry standards including AS/NZS 5667.11:1998 *Water Quality Sampling – Guidance on sampling of groundwater* (AS/NZS 5667.11).

Sampling was undertaken using low-flow sampling techniques to obtain samples representative of groundwater within the aquifer. This technique has been recognised by *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as amended May 2013 (NEPM [2013]).

Prior to the sampling, the standing water levels (SWL) were measured from the top of each bore casing (TOC). As indicated by Trility, groundwater bores were purged using a peristaltic pump and sampled via dedicated low-density polyethylene tubing at each location. During purging, groundwater level measurements were recorded to confirm that drawdown within the bores stabilised.

Groundwater quality measurements including pH, temperature, electrical conductivity (EC), salinity, dissolved oxygen (DO), and oxidation reduction potential (ORP), were recorded continually during the purging process using a YSI Professional Plus multi-parameter water quality meter fitted with a flow-through cell. The samples were collected when the field parameters stabilised. The groundwater field sampling records provided by Trility are given in **Appendix A**.

It is understood that decontamination of non-dedicated sampling equipment between each sampled bore was undertaken using a phosphate-free detergent and rinsed with laboratory grade deionised water between sampling locations, in accordance with AS/NZS 5667:11.

Samples used for dissolved analytes were filtered in the field using a 0.45 µm filter and placed in the appropriately preserved sample bottles provided by the testing laboratory as required for individual analyses.

Samples were stored in a chilled portable cooler immediately after collection and were delivered under similar conditions to the analytical laboratories with accompanying chain of custody (COC) documentation.

The laboratory used for the program was Australian Laboratory Services Pty Ltd (ALS), a laboratory accredited by the National Association of Testing Authorities (NATA) with analysis of the samples being conducted under NATA approved methodologies as required under condition G15-AW (b) of the Environmental Authority.

6 RESULTS

Groundwater samples for the January to April 2020 quarter were collected on the 15th and 21st of April 2020. Results for this period are presented below. A summary of the analytical results is provided in **Appendix B** and is discussed in the sections below. Laboratory certificates and chain of custody (COC) documentation provided by Trility are given in **Appendix C**.

6.1 Rainfall

The rainfall recorded at the WwTP was 669.65 mm and 666.7 mm at the IWTP for the period 1 January to 30 April 2020 (**Table 6-1**). This was higher than the rainfall recorded for the same period in 2019 which had 370.8 mm and 469.6 mm of rainfall at the WwTP and IWTP respectively. It was similar to rainfall records for the same period in 2018. 2018 and 2020 have both recorded high February rainfall (>350 mm).

Table 6-1 Rainfall Data, January – April 2020

Month	WwTP	IWTP
January 2020	67.8	54.05
February 2020	422.65	451.95
March 2020	88	83.7
April 2020	91.2	77
Total	669.65	666.7

6.2 Field Observations

Groundwater level gauging was conducted at the WwTP and IWTP bores in January, February and April 2020 (**Table 6-2**). Physical aspects of groundwater quality including colour, and odour noted during sampling are summarised in **Table 6-3**.

The inferred groundwater flow direction for each month for IWTP and WwTP are presented in **Figure 6-1** to **Figure 6-6**.

Field data sheets for the MP bores within the WwTP were not provided. Information provided by Trility indicates that these bores did not recover after initial purging and therefore had insufficient groundwater volumes for sample collection.

Table 6-2 Groundwater Gauging Data, January – April 2020

Monitoring Location	Relative Height Data	Depth to Groundwater from Top of Casing (m bTOC) ¹			Groundwater Elevation (m AHD) ²		
	(m AHD)	January 2020	February 2020	April 2020	January 2020	February 2020	April 2020
WwTP							
STP1	31.081	2.403	2.245	2.248	28.678	28.836	28.833
STP2	10.880	4.628	4.370	4.142	6.252	6.510	6.738
MP97/01	19.938	DRY	FLOODED	0.838	DRY	FLOODED	19.100
MP97/02	9.422	DRY	FLOODED	1.270	DRY	FLOODED	8.152
MP97/03	8.479	DRY	0.270	1.350	DRY	8.209	7.129
MP97/04	7.130	DRY	FLOODED	1.110	DRY	FLOODED	6.020
MP97/05	6.074	DRY	0.325	0.760	DRY	5.749	5.314
MP00/07	15.835	DRY	0.480	DRY	DRY	15.355	DRY
MP00/08	14.120	DRY	0.650	1.440	DRY	13.470	12.680
IWTP							
DESAL1	19.117	2.943	2.104	2.243	16.174	17.013	16.874
DESAL2	19.555	3.244	2.445	2.523	16.311	17.110	17.032
DESAL3	18.739	3.652	2.779	2.960	15.087	15.960	15.779

¹ m bTOC = metres below top of casing

² m AHD = metres Australian Height Datum

Table 6-3 Groundwater Field Description, January - April 2020

Monitoring Location	Colours	Odour	Turbidity
WwTP			
STP1	Clear	No Odour	ND ¹
STP2	Clear	No Odour	ND ¹
MP97/01	ND ¹	ND ¹	ND ¹
MP97/02	ND ¹	ND ¹	ND ¹
MP97/03	ND ¹	ND ¹	ND ¹
MP97/04	ND ¹	ND ¹	ND ¹
MP97/05	ND ¹	ND ¹	ND ¹
MP00/07	DRY	DRY	DRY
MP00/08	ND ¹	ND ¹	ND ¹
IWTP			
DESAL1	Light Tannin Stained	No Odour	ND ¹
DESAL2	Tannin Stained	No Odour	ND ¹
DESAL3	Tannin Stained	High Odour	ND ¹

¹ND = no data

390000

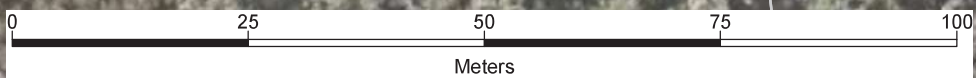
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7321000

7320900

7320900



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, January 2020

Figure 6-1

Date: 4/06/2020

Revision: R1

Trillity Pty Ltd

Auth: Personal

Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

GREENCAP

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Page 233 of 306

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C:\Users\ersona\Documents\GreenCap\GIS Data\1 - Agnes Water\U163599-03_Apr_2020_OR\mxd\FIG_6_1_IWTP_GW_Level_01_2020_200604.mxd

390000

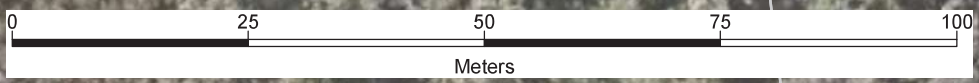
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Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, February 2020

Figure 6-2

Date: 4/06/2020

Revision: R1

Trillity Pty Ltd

Auth: Personal

Map Scale: 1:800

Coordinate System: GDA 1984 MGA Zone 58

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Page 234 of 306

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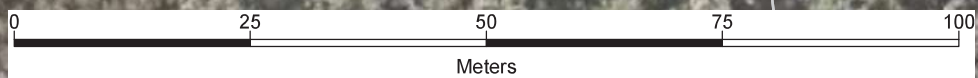
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7320900



- Lot Boundary
- Groundwater Bore
- Greencap (May 2016)

- Groundwater Level Contours (mAHD)
- Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, April 2020

Figure 6-3

Date: 4/06/2020

Revision: R1

Trillity Pty Ltd

Author: persona

Map Sc

Coordinate System: GDA 1984 MGA Zone 58

GRENCAP

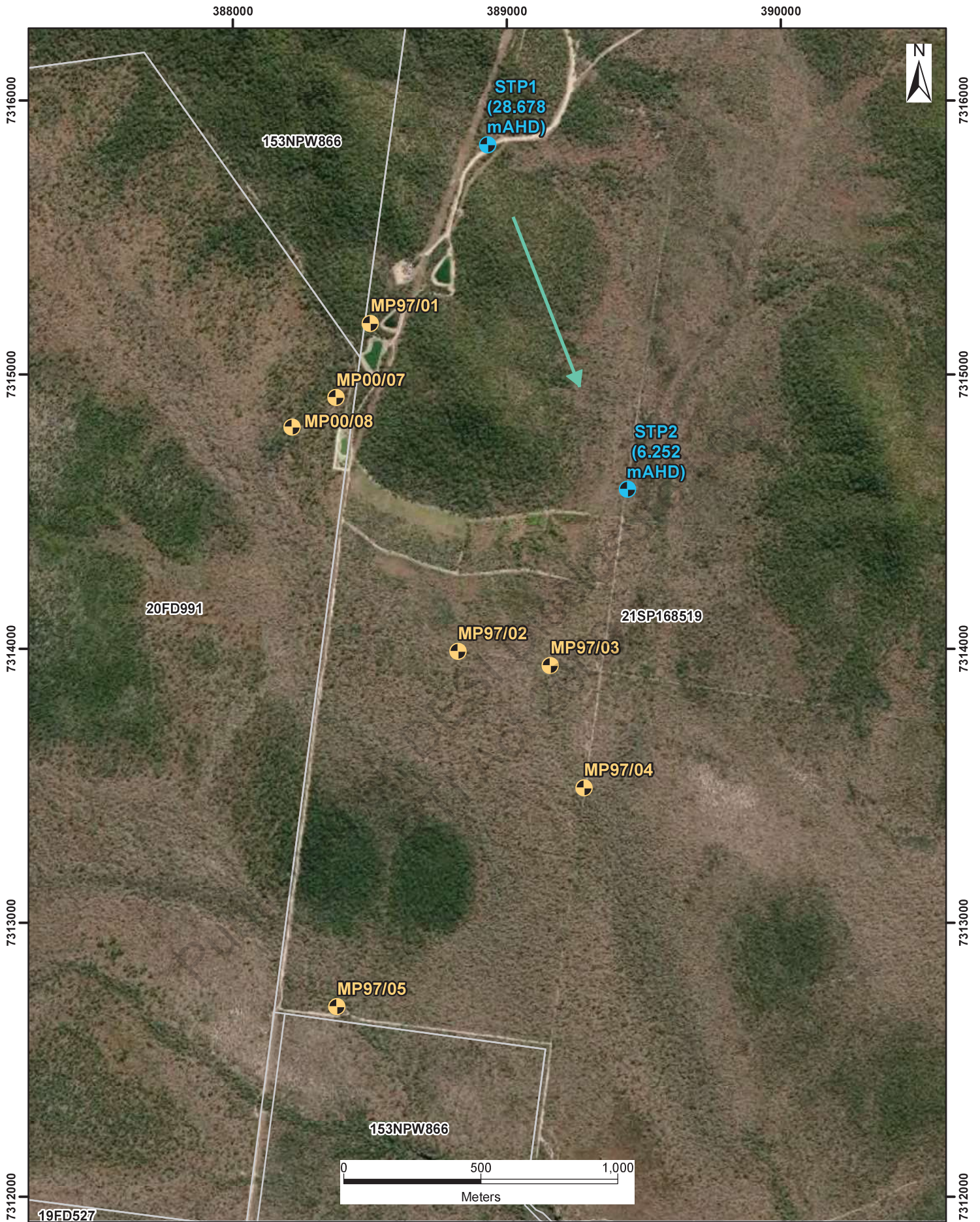
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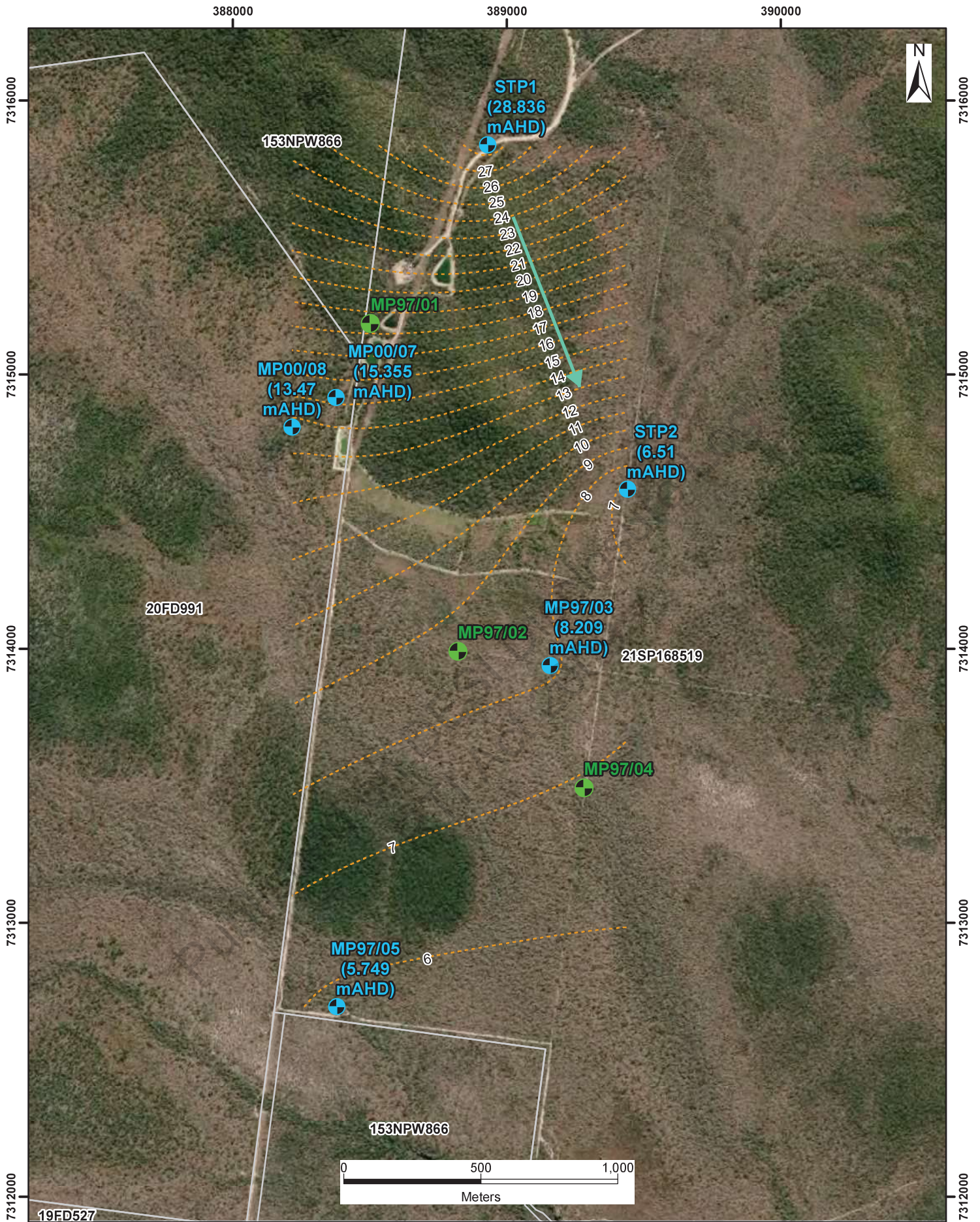
C:\User\persona\Documents\Agnes Water\163599-03_Apr_2020_OR\mxd\FIG_6_3_IWTP_GW_Level_04_2020_200604.mxd



- Lot Boundary
Groundwater Bore
● Sampled
● Dry

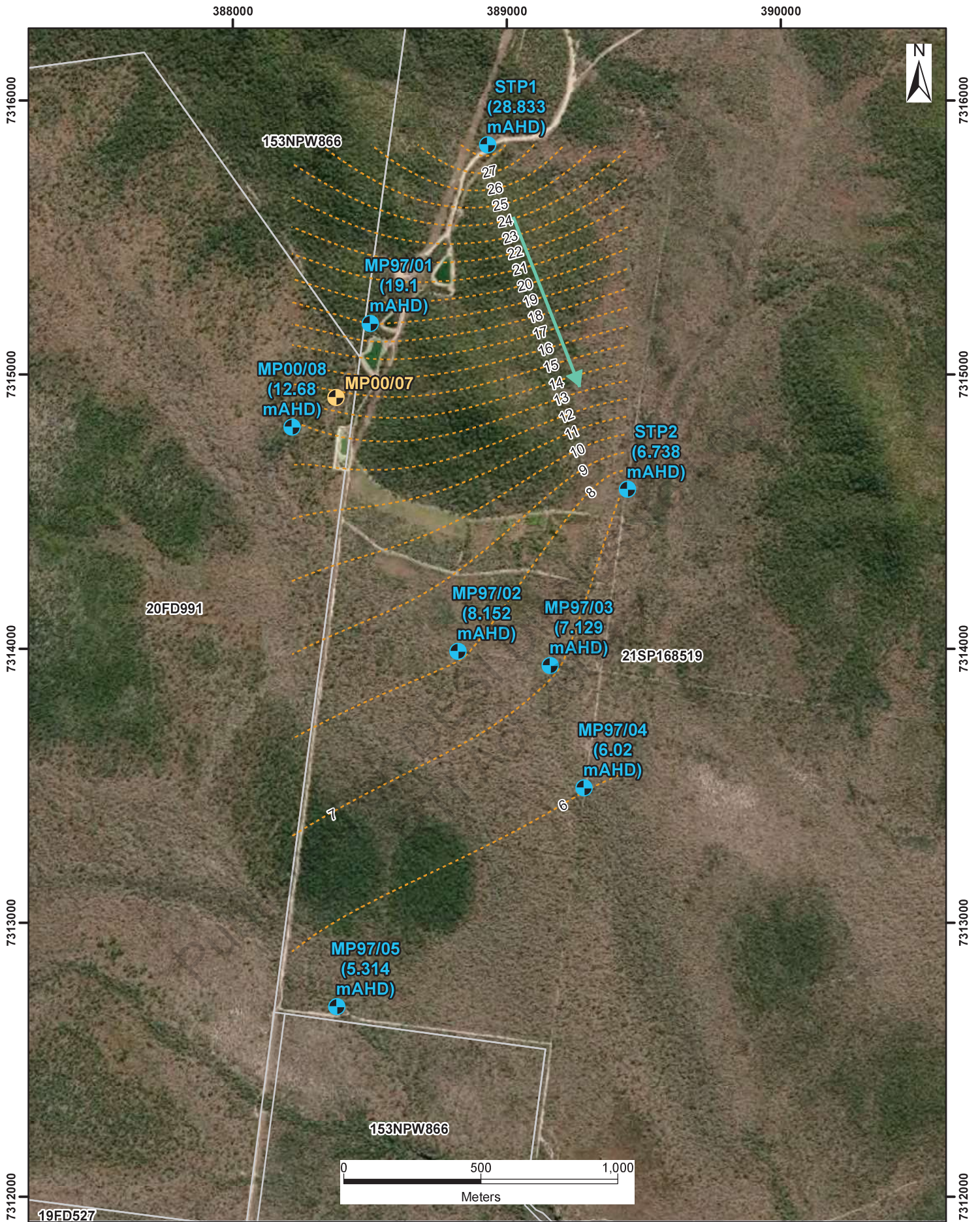
➔ Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, January 2020		
Figure 6-4 <i>Date: 4/06/2020</i> <i>Revision: R1</i>	Trility Pty Ltd	
	Author: Personal	
	Map Scale: 1:18,000	
	Coordinate System: GDA 1984 MGA Zone 58	



- Lot Boundary
- Groundwater Level Contours (mAHd)
- Groundwater Bore**
- Sampled
- Flooded
- ➔ Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, February 2020		
Figure 6-5	Trility Pty Ltd	
	Author: Personal	
	Map Scale: 1:18,000	
Date: 4/06/2020	Coordinate System: GDA 1984 MGA Zone 58	
Revision: R1		



- Lot Boundary
- Groundwater Level Contours (mAHd)
- Groundwater Bore
- Sampled
- Dry
- Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, April 2020		
Figure 6-6	Trility Pty Ltd	
	Date: 4/06/2020	
	Author: Personal	
	Map Scale: 1:18,000	
Revision: R1	Coordinate System: GDA 1984 MGA Zone 58	

6.3 Field Measurements

Physio-chemical water quality parameters were monitored in groundwater bores during purging and prior to sampling. Parameters measured were pH, electrical conductivity (EC), dissolved oxygen (DO), temperature and oxidation reduction potential (ORP). Samples were only collected from STP1, STP2, DESAL1, DESAL2, and DESAL3. Other bores were found to have an insufficient water volume for sample collection. The parameters are summarised in **Table 6-4**. Shaded cells indicate exceedances of the adopted criteria.

Table 6-4 Field Measured Water Quality Parameters, April 2020

Monitoring locations	DO ¹ (mg/L)	EC (µS/cm)	pH ² (pH Units)	ORP ³ (mV)	Temperature ³ (°C)
WwTP					
STP1	0.72	3,729	6.71	-16.7	24.1
STP2	1.13	11,732	6.53	85.5	24
IWTP					
DESAL1	0.32	298.7	3.99	172.4	26.3
DESAL2	0.31	313.6	3.92	180.6	24.8
DESAL3	0.44	219	4.82	-177.7	27.6

¹ The criteria for dissolved oxygen exceedance is a 20% change down from the background value, instead of up

² The criteria for pH exceedance is any change up or down from the background-derived trigger value

³ No associated trigger value

These results indicate that the groundwater within the bores is acidic which is consistent with previous quarterly results. The dissolved oxygen is low, which is expected in groundwater aquifers. The salinity of the IWTP groundwater is indicative of fresh water, whilst the salinity of the WwTP is highly variable and tending towards saline.

6.4 Laboratory Results

Laboratory results for the background bores at the WwTP and the Desal bores within the IWTP were compared against the adopted trigger values (**Table 4-1**). A Summary is provided below. All bores down-gradient of the WwTP were found to have an insufficient water volume following purging and were therefore not sampled during this quarter.

The groundwater quality exceeded adopted trigger values at the background WwTP bores for:

- Ammonia (all sampled bores);
- Total Nitrogen (all sampled bores);
- Total Phosphorus (all sampled bores);
- Sulphate as S (all sampled bores);
- Boron (STP2 only); and
- Dissolved Cobalt (STP2 only).

The groundwater quality exceeded adopted trigger values within the IWTP bores for:

- Ammonia (all bores);
- Chloride (all bores);
- Nitrate (DESAL1 and DESAL2);
- Total Nitrogen (DESAL1 and DESAL2);
- Total Phosphorus (DESAL2);

- Sulphate (DESAL1 and DESAL2);
- Total Chromium (DESAL2 and DESAL3);
- Dissolved Chromium (DESAL3 only); and
- Total Copper (DESAL2 only).

These exceedances are summarised in **Table 6-5**, and **Appendix B** presents a summary of all reported results and exceedances.

Table 6-5 Groundwater Trigger Value Exceedances, April 2020

Parameter	Trigger Value	Bores Exceeding Trigger Value	Exceedance Value	% Lower than Background	% Higher than Background
WwTP					
Ammonia	20% change from background	STP1, STP2	0.18 – 0.25 mg/L	-	1,700 – 2,400%
Total Nitrogen	20% change from background	STP1, STP2	0.3 mg/L	-	200%
Total Phosphorus	20% change from background	STP1, STP2	0.02 – 0.04 mg/L	-	33 -100%
Sulphate as S	No change from background	STP1 ^, STP2 v	95 – 369 mg/L	1.1%	4.4%
Boron	No change from background	STP2	<50 µg/L	29%	-
Dissolved Cobalt	1.4 µg/L	STP2	2.0 µg/L	-	-
IWTP					
Ammonia	20% change from background	DESAL1, DESAL2, DESAL3	0.1 – 0.38 mg/L	-	900 – 3,700%
Chloride	20% change from background	DESAL1, DESAL2, DESAL3	54 – 81 mg/L	-	125 – 208%
Nitrate	20% change from background	DESAL1 ^, DESAL2 v	0.03 – 0.76 mg/L	80%	21%
Total Nitrogen	20% change from background	DESAL1^, DESAL2^	1.3 – 2.0 mg/L	-	30 - 82%
Total Phosphorus	20% change from background	DESAL2^	0.1 mg/L		43%
Sulphate	No change from background	DESAL1^, DESAL2^	2.0 - <5.0 mg/L	-	100 – 400%
Total Chromium	1.0 µg/L	DESAL 2, DESAL3	3.0 µg/L	-	-
Dissolved Chromium	1.0 µg/L	DESAL3	3.0 µg/L	-	-
Total Copper	1.4 µg/L	DESAL2	2.0 µg/L	-	-

7 QUALITY ASSURANCE AND QUALITY CONTROL

7.1 Field QA/QC Data

Only intra-laboratory duplicates were collected during groundwater sampling. Calculated relative percent differences (RPD) between primary and duplicate samples were within the adopted acceptance criteria of 30-50% (Australian Standard AS4482.1-2005 *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds*) relative percent difference (RPD), for samples where results were greater than 10 times the laboratory's limit of reporting.

It should be noted however that in accordance with environmental standards field QA/QC samples should include:

- Field rinsate sample (assesses effectiveness of sampling equipment decontamination procedures);
- Field blank sample (assesses potential for sample contamination during sampling);
- Trip blank sample (assesses for contamination during transportation); and
- Inter-laboratory sample (triplicate – assesses reproducibility of results through a second NATA-accredited laboratory).

Inclusion of these QA samples will assist in identifying potential sources of errors (if any) that may influence the quality of samples during the sampling, sample transportation and equipment decontamination.

Issues have arisen where laboratory results for dissolved metals have returned higher concentrations than the associated total metal. As indicated by the analytical laboratory used this is likely to be a result of the use of different methods for total and filtered chemicals, and measurement uncertainty at such low concentrations.

7.2 Laboratory QA/QC Data

A summary of laboratory quality assurance and quality control (QA/QC) data is presented in **Table 7-1**.

Table 7-1 Laboratory QA/QC data

Report #	Analysis Within Holding Time	Lab. Duplicate RPD %	Lab Matrix Spike Recovery	Lab. Control Sample	Lab Method Blank
EB2010399 (IWTP)	P	P	P	P	P
EB2010933 (WwTP)	P	P	X	P	P
P= Pass X = Fail - = not required * = refer to report text					
Quality Assurance Criteria		Quality Control Criteria			
Holding Times		Accuracy			
Volatile Organic Carbons 14 days soil and water		Matrix spike, control sample: 70-130%, depending on analyte.			
Semi Volatile Organic Carbons 7 days water, 14 days soil		Surrogate recovery: 50-150%, depending on analyte.			
Metals 6 months, Mercury 28 days		Precision			
		Method Blank: Not detected			
		Duplicate: No limit (<10xLOR), 0-50% (10-20xLOR), 0-20% (>20xLOR)			

As shown in **Table 7-1** there were matrix spike issues within the WwTP analyses quality control batch. The laboratory advised that the matrix spikes could not be determined for chloride, on an unrelated sample from another client, due to the background levels being greater than four times the spike level.

This issue was not considered to affect the validity of the data.

8 DISCUSSION

The following sections discuss the results of the April 2020 groundwater sampling event, with reference to previous events.

It is important to note that the exceedances for most parameters, with the exception of metals, reported in quarterly reports and in **Section 6** of this report were based on comparison with the results of the initial groundwater monitoring undertaken in September 2016. The result from this single round have been used to develop a set of trigger levels as discussed in **Section 4**.

Aside from trigger values developed based on the initial groundwater monitoring event, concentrations of metals were also compared against water quality criteria specified by ANZECC Guidelines. Although some exceedances were noted against this criteria, the reported concentrations of metals are likely to be naturally elevated, as there is no consistency in up-gradient vs down-gradient concentrations recorded to indicate impacts from site activities. Also, variations in metal concentrations are evident in some bores in which concentrations periodically decrease to be below the ANZECC criteria. Such variations may be seasonal and need to be further assessed.

The section below summarises the groundwater results and discusses potential causes for the changes in reported concentrations of chemicals of concern and other water quality parameters.

A summary of sampling results is presented in **Appendix B**.

8.1 IWTP

The groundwater hydraulic gradient was consistent with previous monitoring periods, with inferred groundwater flow west-southwest from DESAL1 and DESAL2 towards DESAL3.

Groundwater results for DESAL Bores within the IWTP (DESAL1, DESAL2, and DESAL3) in April 2020 were similar compared with previous results. Some observations were made and discussed below:

- Groundwater salinity (expressed as EC) at IWTP bores returned similar values compared to the previous quarterly results. The EC indicates that the water is fresh and low in salinity;
- Dissolved oxygen levels measured during sampling in all three bores (DESAL1 to DESAL3) were low, and have decreased substantially compared to concentrations from the previous quarter. Low dissolved oxygen is typical for groundwater environments due to the lack of groundwater exposure to atmospheric air;
- The overall pH values in all three bores was again acidic with the most acidic pH values recorded in DESAL2, up-hydraulic gradient of the IWTP. This may be representative of the local groundwater conditions due to the overall general consistency in the pH values over the duration of monitoring, and the most-acidic bore being up-hydraulic gradient of the IWTP;
- Trigger value exceedances were noted for chloride at all three IWTP bores, as well as nitrate, total nitrogen and sulphate at DESAL1, and DESAL2, total phosphorus at DESAL2 and ammonia at DESAL3. It should be noted that the background values (the first sample recorded at each site in September 2016) for ammonia were below the limit of reporting and <0.01 mg/L. The background values established in 2016 may not be representative of the current background conditions, therefore, increases in concentrations classified as an exceedance of background trigger values may not necessarily be a result of onsite activities, particular as DESAL1 and DESAL2 are up-gradient of the IWTP;
- Chromium (total and dissolved) showed exceedances against ANZECC criteria at DESAL3, which is consistent with previous results. Total chromium and total copper also reported exceedance against ANZECC criteria at DESAL2, which is consistent with results from the same period in 2019.
- Microbiological parameters (*E. Coli* and Enterococci) were below the limit of reporting in all three IWTP bores; and

- As discussed above some exceedances noted for the DESAL 3 for pH, EC, DO and some chemicals were attributed to the trigger criteria adopted, which is based on the first monitoring round in September 2016, and may not accurately reflect the background conditions of the aquifer and does not allow for seasonal variation in groundwater quality. It is therefore difficult to conclusively determine if these exceedances are a result of natural variation or the result of an impact from site activities. Dissolved chromium was the only parameter that exceeded the adopted criteria in the inferred down-gradient bore, DESAL3 that did not also exceed the criteria in the two IWTP background bores DESAL1 and DESAL2, and therefore may be evidence of an impact from site activities. The calculation and adoption of IWTP site specific groundwater trigger values would allow a more robust and accurate assessment of the dataset that should also take into account potential seasonal variability.

8.2 WwTP

As all bores located down the inferred hydraulic gradient (97/01, 97/02, 97/03, 97/04, 97/05, 00/07 and 00/08) from the WwTP were not sampled during the April 2020 monitoring event, only results from the background bores STP1 and STP2 are discussed below.

- The exceedances noted in the WwTP bores for pH were attributed to the criteria adopted from the Environmental Authority conditions for the WwTP, which states that any change from the background value constitutes an exceedance. The difference in pH at STP1 and STP2 compared to the background values was approximately <1%, this is not a significant difference;
- Exceedances were noted for sulphate at STP1 and STP2 (<5% change from background), however this was comparable to previous results, and again is not a significant difference;
- Nutrient exceedances in April 2020 were reported for ammonia, total nitrogen and total phosphorus at both STP1 and STP2. Low concentrations of nutrients were detected in the baseline sampling event in September 2016, and therefore slightly elevated but still low concentrations are considered an exceedance of the adopted trigger values;
- STP2 exceeded the 'background' concentration for Boron. STP2 has recorded a decrease in boron (<50 µg/L) compared to the background value (70 µg/L);
- Dissolved cobalt exceeded the ANZECC criteria at STP2. This is consistent with previous results from 2018 and 2017.
- *E. Coli* and Enterococci results were below the limit of reporting in both bores.

As these two bores are upgradient of the irrigation area they are likely to represent natural conditions. There is no data from the downgradient bores to determine if there is any impact from site activities. This will need to be assessed further when data from these downgradient bores becomes available.

9 SUMMARY & CONCLUSIONS

Sampling was undertaken at both IWTP and WwTP bores in April 2020. The groundwater hydraulic gradient and direction at both sites were consistent with historical observations.

IWTP

For the IWTP, all three bores (DESAL1, DESAL2, and DESAL3) were sampled. Exceedances against adopted trigger values were noted for:

- pH (all bores);
- Electrical conductivity (all bores);
- Dissolved oxygen (DESAL1 and DESAL3);
- Ammonia (DESAL3 only);
- Chloride (all bores);
- Nitrate (DESAL1 and DESAL2);
- Total Nitrogen (DESAL1 and DESAL2);
- Total Phosphorus (DESAL2);
- Sulphate (DESAL1 and DESAL2);
- Total Chromium (DESAL2 and DESAL3 only);
- Dissolved Chromium (DESAL3 only); and
- Total Copper (DESAL2 only)

Exceedances of field parameter trigger values occurred in the up-gradient and down-gradient bores at the IWTP, indicating that the exceedances are likely to be related to changes in background groundwater quality rather than as a result of site activities. Exceedances in nutrients at the IWTP further support this, with exceedances occurring in all three bores, or only the up-gradient bores. Calculation of site-specific trigger values will provide a better analysis of potential groundwater quality impacts from the IWTP. Groundwater results for DESAL1, DESAL2 and DESAL3 were generally consistent with results from recent previous quarterly monitoring rounds.

WwTP

For the WwTP, two background bores were sampled for all analytes (STP1 and STP2). All downgradient bores (97/01, 97/02, 97/03, 97/04, 97/05, 00/07 and 00/08) were not sampled. Exceedances against adopted trigger values were noted for:

- pH (all sampled bores);
- Dissolved Oxygen (all sampled bores);
- Ammonia (all sampled bores);
- Total Nitrogen (all sampled bores);
- Total Phosphorus (all sampled bores);
- Sulphate as S (all sampled bores);
- Boron (STP2 only); and
- Dissolved Cobalt (STP2 only).

Any exceedances reported for these background bores are likely to represent variations in the background groundwater quality unrelated to the treatment plant activities, as they are up-hydraulic gradient of treatment plant activities. As mentioned at the beginning of this section, it is recommended that

downgradient bores be installed to a greater depth to enable monitoring of potential impacts from site activities.

In general, the following recommendations were made:

- Field QA/QC samples should be expanded to include inter-laboratory duplicates and blanks to assist in identifying potential sources of errors that may influence the quality of samples; and
- Site specific trigger values should be developed for the IWTP. This process is currently underway.
- Deeper wells should be installed at MP97/01, MP97/02, MP97/03, MP97/04, MP97/05, MP00/07 and MP00/08, as they are all less than 2m deep and have been dry during the majority of sampling events. This would increase the likelihood of obtaining samples from these wells to allow monitoring of potential impacts from site activities associated with the operation of the WwTP

Published on DESI Disclosure Log
RTI Act 2009

APRIL 2020
QUARTERLY REPORT
Trility Pty Ltd

**Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water**

Appendix A: Groundwater Field Sampling Records

DESAL
Groundwater Monitoring Standing Water Level Measurement

****NB**** Measurement to be taken in mm from top of bore casing

Date	Time	Operator	Desal 1	Desal 2	Desal 3
1-9-2016	1300		2210	2440	2985
27-9-2016	10:00		2275	2500	2992
18-10-2016	11:45		2324	2575	2845
18-11-2016	2:50pm		2440	2672	3142
14-12-2016	09:10am		2405	2650	2995
19-1-2017	0745		2461	2698	3072
27-2-2017	0230		2627	2860	3402
8-3-2017	0930		2650	2889	3642
18/4/2017	3:30pm		2051	2278	2953
19/5/2017	11:30am		2135	2572	2960
21-6-2017	9:30		2170	2470	2980
20-7-2017	15:40		2240	2510	2998
27-8-2017	8:10am		2317	2627	3017
27-9-2017	9:10 am		2425	2718	3120
25/10/2017	3pm		1825	2120	2854
22/11/2017	12pm		2630	2344	2892
14-12-17	8:50		1883	2085	2862
21-1-18	1:10pm		2065	2280	2950
27-2-18	8:30 A.M		1532	1788	2745
22-3-18	9:00 P.M		1602	1830	2846
27-4-18	3:30pm		1834	2023	2875
13-5-18	8:15		1912	2123	2896
4-6-18	9:00 a.m		1930	2150	2912
6-7-18	9:10 a.m.		2030	2023	2083
13-8-18	11:10 a.m.		2210	2441	3001
19-9-18	9:00 am		2296	2498	3058
8-10-18	8:42 AM		2350	2578	3072
29-11-18	13:06 pm		2370	2660	3175
18-12-18	9:00 A.M		2765	2692	3016
31-1-19	16:00 pm		2475	2810	3390
28-2-19	10:40 AM		2587	2980	3535
25-3-19	9:00 A.M		2530	2882	3375
16-4-19	8:10 A.M		2547	2889	3401
27-5-19	12:30 p.m		2234	2552	3012
24-6-19	9:00 am		2380	2681	3100
31-7-2019	7:20 A.M		2478	2786	3181
16-8-19	5:30 A.M		2582	2832	3227
16-9-19	8:45 Am		2627	2949	3306
21-10-19	11:20 AM		2547	2851	3090
27-11-19	14:15 P.M.		2760	3065	3082
16-12-19	4:00 AM		2784	3140	2892
29-1-20	15:00 pm		2943	3244	3652
26-2-20	12:30 pm		2104	2445	2779
15-4-20	0830		2243	2523	2960

4p4(6) Personal informat

Client: Trility	Job No: 14p4(6) Personal informati	Date: 15-4-2020
Project: Groundwater bore installation and sampling	Sampled by:	
Location: Agnes Water, Qld	Date:	

WELL DETAILS					SAMPLING EQUIPMENT					
DESAL 1	Well depth:	6.5	(m)	Sampling device:	Peristaltic (low flow)		GEO#	✓		
	Well diameter:	50mm		Water meter:			YSI#	✓ PED +		
	Casing type:	PVC		Turbidity Meter:			TM#			
	Initial water level:	2.243	(m)	Interphase probe:			IP#			
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
11.27	2	2	2.252	26.0	0.12	338.8		3.88	233.1	
11.31	2	4	2.252	26.2	0.11	324.5		3.90	219.3	
11.35	2	6	2.252	26.2	0.15	311.6		3.95	208.4	
11.39	2	8	2.252	26.3	0.22	303.6		3.97	199.4	
11.43	2	10	2.252	26.3	0.27	302.0		3.98	193.1	
11.47	2	12	2.252	26.3	0.29	301.0		3.98	186.7	
11.51	2	14	2.252	26.3	0.30	300.2		3.99	182.1	
11.55	2	16	2.252	26.3	0.31	299.6		3.99	178.9	
11.59	2	18	2.252	26.3	0.32	297.1		4.00	174.9	
12.03	2	20	2.252	26.3	0.32	298.7		3.99	172.4	
SAMPLES TAKEN										
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour COLOUR BUT NOT TURBID.	<table border="1" style="width:100%"> <tr> <td colspan="5">Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes</td> </tr> <tr> <td colspan="5">Decontamination procedures followed? Yes</td> </tr> <tr> <th>Samples Taken</th> <th>Number</th> <th>Duplicate: QA</th> <th>Triplicate: QA</th> <th>Order</th> </tr> <tr><td>Metals Plastic*</td><td></td><td></td><td></td><td></td></tr> <tr><td>Plastic unpreserved inorganics (1L)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Preserved inorganics (250mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Glass vials (40mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Glass amber unpreserved (500mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Plastic nutrients 60mL green/white</td><td></td><td></td><td></td><td></td></tr> <tr><td>Plastic unpreserved inorganics (500mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Plastic nutrients 60mL light green</td><td></td><td></td><td></td><td></td></tr> <tr><td>Glass amber unpreserved (100mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td>Plastic unpreserved inorganics (250mL)</td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="5">(* DESIGNATES SAMPLES FILTERED IN FIELD)</td></tr> </table>	Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes					Decontamination procedures followed? Yes					Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order	Metals Plastic*					Plastic unpreserved inorganics (1L)					Preserved inorganics (250mL)					Glass vials (40mL)					Glass amber unpreserved (500mL)					Plastic nutrients 60mL green/white					Plastic unpreserved inorganics (500mL)					Plastic nutrients 60mL light green					Glass amber unpreserved (100mL)					Plastic unpreserved inorganics (250mL)					(* DESIGNATES SAMPLES FILTERED IN FIELD)				
Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes																																																																							
Decontamination procedures followed? Yes																																																																							
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Plastic unpreserved inorganics (250mL)																																																																							
(* DESIGNATES SAMPLES FILTERED IN FIELD)																																																																							

MONITORING WELL VOLUMES:-			
Diameter of well casing:	<div style="border:1px solid black; width:50px; height:15px;"></div>	mm	
Diameter of hole drilled:	<div style="border:1px solid black; width:50px; height:15px;"></div>	mm	
(1) Volume of casing only	0.000000	m3 (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000	m3 (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000	m3 (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3*(3) + (1)	0.000000	m3 (kL)	0.0 L /m
(assuming 30% porosity in sand/gravel pack)			

Field Technician #1

Field Technician #2

Client: Trility Job No: h4p4(6) Personal information
Project: Groundwater bore installation and sampling Sampled by:
Location: Agnes Water, Qld Date: 15-4-2020

DESAL 2		WELL DETAILS				SAMPLING EQUIPMENT				
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
10-10	2	2	2.530	24.7	0.24	292.2		4.16	135.0	
10-14	2	4	2.530	24.7	0.16	286.0		4.03	163.3	
10-18	2	6	2.532	24.8	0.16	304.0		3.99	186.2	
10-22	2	8	2.532	24.8	0.19	311.0		3.91	190.0	
10-26	2	10	2.532	24.8	0.22	314.2		3.89	191.8	
10-30	2	12	2.532	24.8	0.26	314.0		3.87	189.6	
10-34	2	14	2.532	24.8	0.28	313.3		3.90	186.8	
10-38	2	16	2.532	24.8	0.29	311.7		3.91	186.2	
10-42	2	18	2.532	24.8	0.31	313.6		3.94	183.3	
10-46	2	20	2.532	24.8	0.31	313.6		3.92	180.6	
SAMPLES TAKEN										
Stabilisation Criteria (3 readings within ranges)										
N/A		Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A	

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour	Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
TURBID	Metals Plastic*				
	Plastic unpreserved inorganics (1L)				
	Preserved inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic nutrients unpreserved inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved inorganics (250mL)				

(* DESIGNATES SAMPLES FILTERED IN FIELD)

MONITORING WELL VOLUMES:-

Diameter of well casing: mm

Diameter of hole drilled: mm

(1) Volume of casing only 0.000000 m3 (kL) 0.00 L per metre

(2) Volume of drill-hole 0.000000 m3 (kL) 0.00 L per metre

(3) Volume of annulus around casing 0.000000 m3 (kL) 0.00 L per metre

(4) Total Bore Volume = 0.3*(3) + (1) 0.000000 m3 (kL) 0.0 L/m

(assuming 30% porosity in sand/gravel pack)

Field Technician #1

Field Technician #2

Client: Trillity Project: Groundwater bore installation and sampling Location: Agnes Water, Qld	Job No: Sampled by: Date:
---	---------------------------------

WELL DETAILS					SAMPLING EQUIPMENT					
DESAL 3	Well depth:	5.0	(m)	Sampling device:	Peristaltic (low flow)		GEO#	✓ PRO-4		
	Well diameter:	50mm		Water meter:			YSI#			
	Casing type:	PVC		Turbidity Meter:			TM#			
	Initial water level:	2960	(m)	Interphase probe:			IP#			
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
0830	2	2	3.264	27.6	0.12	198.7		4.86	-109.8	
0834	2	4	3.323	27.7	0.22	199.1		4.83	-139.7	
0838	2	6	3.328	27.6	0.36	200.6		4.81	-155.7	
0842	2	8	3.342	27.7	0.39	204.6		4.83	-159.7	
0846	2	10	3.350	27.7	0.41	205.4		4.82	-167.2	
0850	2	12	3.360	27.7	0.42	207.9		4.82	-171.9	
0854	2	14	3.370	27.6	0.42	209.1		4.82	-173.2	
0858	2	16	3.376	27.6	0.42	211.1		4.82	-175.8	
0902	2	18	3.382	27.6	0.42	211.1		4.83	-177.8	
0906	2	20	3.386	27.7	0.43	212.3		4.82	-177.9	
0910	2	22	3.392	27.6	0.43	218.5		4.82	-177.7	
0914	2	24	3.396	27.6	0.44	219.0		4.82	-177.7	
SAMPLES TAKEN										
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes
Decontamination procedures followed? Yes

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

DIRTY, TANNIN COLOURED,
ODOUROUS

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
Plastic unpreserved inorganics (1L)				
Preserved inorganics (250mL)				
Glass vials (40mL)				
Glass amber unpreserved (500mL)				
Plastic nutrients 60mL green/white				
Plastic unpreserved inorganics (500mL)				
Plastic nutrients 60mL light green				
Glass amber unpreserved (100mL)				
Plastic unpreserved inorganics (250mL)				
(* DESIGNATES SAMPLES FILTERED IN FIELD)				

MONITORING WELL VOLUMES:-

Diameter of well casing:	<div style="border: 1px solid black; width: 50px; height: 15px; display: inline-block;"></div> mm	
Diameter of hole drilled:	<div style="border: 1px solid black; width: 50px; height: 15px; display: inline-block;"></div> mm	
(1) Volume of casing only	0.000000 m3 (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000 m3 (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000 m3 (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3*(3) + (1)	0.000000 m3 (kL)	0.0 L/m
(assuming 30% porosity in sand/gravel pack)		

Field Technician #1

Field Technician #2

STP Groundwater Monitoring Standing Water Level Measurement

NB Measurement to be taken in mm from top of bore casing

Date	Time	Operator	STP 1	STP 2	97-01	97-2	97-3	97-4	97-5	0.007	0.008
8-10-18	8-00	(6) Personal information	1.462	3705	Dry	Dry	Dry	Dry	Dry	Dry	Dry
29-11-18	8-00		1.578	3862	"	"	"	"	"	"	"
20-12-18	8-35		1.743	3935	Dry	Dry	Dry	Dry	Dry	Dry	Dry
26-1-19	7-10		1.795	4050	"	"	"	"	"	"	"
2-3-19	7-30		1.913	4170	"	"	"	"	"	"	"
26-3-19	8-30		1.915	4201	"	"	"	"	"	"	"
16-4-19	10-15am		1.927	4.226	"	"	"	"	"	"	"
27-5-19	2:20pm		1.804	3.842	0.748	1.302	1.355	1.113	0.732	Dry	Dry
25-6-19	8-30am		1.860	3938	1.305	Dry	Dry	Dry	Dry	Dry	Dry
31-7-19	10-58		1.838	3992	Dry	Dry	Dry	Dry	Dry	Dry	Dry
16-8-19	10-07		1.972	4086	Dry	Dry	Dry	Dry	Dry	Dry	Dry
17-9-19	8-30		2.068	4195	Dry	Dry	Dry	Dry	Dry	Dry	Dry
29-10-19	08:50		2.202	4320	1.030	1.320	1.355	1.110	0.765	Dry	Dry
25-11-19	9:00		2.263	4381	1.280	Dry	Dry	Dry	Dry	Dry	Dry
17-12-19	9:30		2.305	4492	Dry	Dry	Dry	Dry	Dry	Dry	Dry
30-12-20	2:03		2.403	4628	Dry	Dry	Dry	Dry	Dry	Dry	Dry
26-02-20	14:20		2.245	4370	FLOODED	FLOODED	0.27	FLOODED	0.325	0.48	0.65
21-04-20	0925		2.248	4142	0.838	1.270	1.350	1.110	0.760	Dry	1.440

GREENCAP
Bladin Point
Groundwater Sampling Record



Client: Trility	Job No: sch4p4(6) Personal information
Project: Groundwater bore installation and sampling	Sampled by:
Location: Agnes Water, Qld	Date: 21-4-2020

STP 1	WELL DETAILS				SAMPLING EQUIPMENT			
	Well depth:	15036	(m)	Sampling device:	Peristaltic (low flow)	GEO#	✓	
	Well diameter:	50mm		Water meter		YSI#	✓ P207	
	Casing type:	PVC		Turbidity Meter		TM#		
	Initial water level:	20248	(m)	Interphase probe:		IP#		

Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
0936	2	2	2.375	24.2	0.39	3801		6.66	2.2	
0940	2	4	2.395	24.2	0.54	3764		6.64	2.8	
0944	2	6	2.428	24.2	0.65	3738		6.70	-6.7	
0948	2	8	2.448	24.1	0.66	3727		6.70	-9.9	
0952	2	10	2.468	24.1	0.68	3680		6.70	-13.2	
0956	2	12	2.484	24.2	0.70	3716		6.71	-15.4	
1000	2	14	2.495	24.1	0.71	3720		6.72	-19.1	
1004	2	16	2.505	24.1	0.72	3716		6.72	-17.4	
1008	2	18	2.512	24.1	0.72	3729		6.71	-16.7	
SAMPLES TAKEN										

Stabilisation Criteria (3 readings within ranges)	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A
---	-----	----------------	-------	-------	------	-------	-------	--------	-----

Field observations: eg. Nearby activities, weather

FINE, NO WIND, SUNNY

Observations during Sampling:- eg. Odours, sheens, turbidity, water colour CLEAR, NO ODOUR	Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes				
	Decontamination procedures followed? Yes				
	Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
	Metals Plastic*				
	Plastic unpreserved Inorganics (1L)				
	Preserved inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved inorganics (500mL)				
Plastic nutrients 60mL light green					
Glass amber unpreserved (100mL)					
Plastic unpreserved Inorganics (250mL)					
(* DESIGNATES SAMPLES FILTERED IN FIELD)					

MONITORING WELL VOLUMES:-

Diameter of well casing: mm

Diameter of hole drilled: mm

(1) Volume of casing only	0.000000 m3 (kL)	0.00 L per metre
(2) Volume of drill-hole	0.000000 m3 (kL)	0.00 L per metre
(3) Volume of annulus around casing	0.000000 m3 (kL)	0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1)	0.000000 m3 (kL)	0.00 L per metre

(assuming 30% porosity in sand/gravel pack)

Field Technician #1 _____ Field Technician #2 _____

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld

Job No: ch4p4(6) Personal informatio
Sampled by:
Date: 21-4-2020

STP 2		WELL DETAILS			SAMPLING EQUIPMENT								
		Well depth:	Well diameter:	Casing type:	Initial water level:	Sampling device:	Water meter:	Turbidity Meter:	Interphase probe:	GEO#	YSI#	TM#	IPH
		13.14 (m)	50mm	PVC	4.142 (m)	Peristaltic (low flow)				✓	✓ PRO +		
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU			
1051	2	2	4.512	24.1	0.62	11903		6.55	92.5				
1055	2	4	4.560	24.0	1.02	11786		6.54	89.7				
1059	2	6	4.565	24.0	1.07	11749		6.54	85.6				
1105	2	8	4.565	24.0	1.09	11656		6.53	86.3				
1109	2	10	4.565	24.0	1.10	11778		6.53	86.3				
1114	2	12	4.565	24.0	1.12	11640		6.53	85.9				
1118	2	14	4.565	24.0	1.13	11732		6.53	85.5				
SAMPLES TAKEN													
Stabilisation Criteria (3 readings within ranges)													
N/A		Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A				
Field observations: eg. Nearby activities, weather													
FINE, NO WIND, SUNNY													
Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes													
Decontamination procedures followed? Yes													
Observations during Sampling:- eg. Odours, sheens, turbidity, water colour													
CLEAR, NO ODOUR													
Samples Taken													
Metals Plastic*													
Plastic unpreserved Inorganics (1L)													
Preserved inorganics (250mL)													
Glass vials (40mL)													
Glass amber unpreserved (500mL)													
Plastic nutrients 60mL green/white													
Plastic unpreserved inorganics (500mL)													
Plastic nutrients 60mL light green													
Glass amber unpreserved (100mL)													
Plastic unpreserved Inorganics (250mL)													
(* DESIGNATES SAMPLES FILTERED IN FIELD)													

MONITORING WELL VOLUMES:-

Diameter of well casing: mm
Diameter of hole drilled: mm
(1) Volume of casing only 0.000000 m3 (kL) 0.00 L per metre
(2) Volume of drill-hole 0.000000 m3 (kL) 0.00 L per metre
(3) Volume of annulus around casing 0.000000 m3 (kL) 0.00 L per metre
(4) Total Bore Volume = 0.3(3) + (1) 0.000000 m3 (kL) 0.00 L per metre
(assuming 30% porosity in sand/gravel pack)

Field Technician #1

Field Technician #2

APRIL 2020
QUARTERLY REPORT
Trility Pty Ltd

**Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water**

Appendix B: Results Summary Table

Appendix B: Results Summary Table April 2020

			Field					Inorganics							
Bore ID	Sampling Date	Lab Report Number	Dissolved Oxygen (DO) ¹	Electrical Conductivity (EC)	pH ²	Oxidation Reduction Potential (ORP)	Temperature	Ammonia as N	Chloride	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total)	Oxides of Nitrogen	Total Phosphorus as P
Units			mg/L	µS/cm	pH_Units	mV	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Trigger Criteria			20% change from background	20% change from background	Any change from background			20% change from background	20% change from background		20% change from background		20% change from background		20% change from background
DESAL1	15/04/2020	EB2010399	0.32	298.7	3.99	172.4	26.3	0.13	74	1.2	0.76	<0.01	2.0	0.76	0.07
DESAL2	15/04/2020	EB2010399	0.31	313.6	3.92	180.6	24.8	0.1	81	1.3	0.03	<0.01	1.3	0.03	0.1
DESAL3	15/04/2020	EB2010399	0.44	219	4.82	-177.7	27.6	0.5	60	1.6	<0.01	<0.01	1.6	<0.01	0.21
STP1	21/04/2020	EB2010933	0.72	3,729	6.71	-16.7	24.1	0.25	1,020	0.3	<0.01	<0.01	0.3	<0.01	0.02
STP2	21/04/2020	EB2010933	1.13	11,732	6.53	85.5	24	0.18	3,850	0.3	<0.01	<0.01	0.3	<0.01	0.04

¹ Dissolved oxygen criteria is a 20% change down from the background value instead of up.

² Criteria for pH is any change up or down from the background-derived trigger value

Appendix B: Results Summary Table April 2020

			Inorganics	Metals								
Bore ID	Sampling Date	Lab Report Number	Sulphate as S	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)
Units			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Trigger Criteria			Any change from background	55 if pH >6.5	55 if pH >6.5	13	13	Any change from background	0.2	0.2	1	1
DESAL1	15/04/2020	EB2010399	<5.0	600	510	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0
DESAL2	15/04/2020	EB2010399	2.0	1350	560	<1.0	<1.0	<50	<0.1	<0.1	3.0	<1.0
DESAL3	15/04/2020	EB2010399	<1.0	920	730	1.0	1.0	<50	<0.1	<0.1	3.0	2.0
STP1	21/04/2020	EB2010933	95	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0
STP2	21/04/2020	EB2010933	369	<10	<10	1.0	2.0	<50	<0.1	<0.1	<1.0	<1.0

Appendix B: Results Summary Table April 2020

			Metals												
Bore ID	Sampling Date	Lab Report Number	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Trigger Criteria			1.4	1.4	1.4	1.4			3.4	3.4	1900	1900	0.06	0.06	11
DESAL1	15/04/2020	EB2010399	<1.0	<1.0	<1.0	<1.0	180	160	<1.0	<1.0	8.0	8.0	<0.1	<0.1	<1.0
DESAL2	15/04/2020	EB2010399	<1.0	<1.0	2.0	<1.0	670	570	1.0	<1.0	30.0	28.0	<0.1	<0.1	2.0
DESAL3	15/04/2020	EB2010399	<1.0	<1.0	<1.0	<1.0	3,990	3,710	<1.0	<1.0	28	29	<0.1	<0.1	3.0
STP1	21/04/2020	EB2010933	<1.0	<1.0	<1.0	<1.0	1,820	1,600	<1.0	<1.0	1,390	1,260	<0.1	<0.1	<1.0
STP2	21/04/2020	EB2010933	1.0	2.0	<1.0	<1.0	<50	<50	<1.0	<1.0	113	111	<0.1	<0.1	3.0

Appendix B: Results Summary Table April 2020

			Metals									Microbiological	
Bore ID	Sampling Date	Lab Report Number	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	cfu/100 ml	cfu/100 m
Trigger Criteria			11	0.05	0.05	5	5			8	8	Any change from background	Any change from background
DESAL1	15/04/2020	EB2010399	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	6.0	<5.0	<1	<1
DESAL2	15/04/2020	EB2010399	1.0	0.04	<0.01	<10	<10	<1.0	<1.0	<5.0	7.0	<1	<1
DESAL3	15/04/2020	EB2010399	3.0	0.02	<0.01	<10	<10	<1.0	<1.0	6.0	8.0	<1	<1
STP1	21/04/2020	EB2010933	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	6.0	<1	<1
STP2	21/04/2020	EB2010933	3.0	0.02	0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1

APRIL 2020
QUARTERLY REPORT
Trility Pty Ltd

**Integrated Water Treatment Plant and Wastewater Treatment
Plant, Agnes Water**

Appendix C: Laboratory Results. COC and QA/QC Documentation



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **EB2010399**
Client :
Contact : h4p4(6) Personal informati
Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
Telephone : +61 08 84086500
Project : Groundwater Monitoring
Order number : 4500059581
C-O-C number : ----
Sampler : h4p4(6) Personal informa
Site : ----
Quote number : BN/222/16
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 16-Apr-2020 09:00
Date Analysis Commenced : 16-Apr-2020
Issue Date : 23-Apr-2020 15:18



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□□□

h4(6) Personal inform

□□□□□□

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

□□□□□□ □□□□

Brisbane Administration, Stafford, QLD
 Brisbane Inorganics, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
Ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EK067G (Total Phosphorus as P): Sample EB2010399_001 (DESAL 1) was diluted due to matrix interference. LOR adjusted accordingly.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for samples DESAL 2 (EB2010399-002) and DESAL 3 (EB2010399-003). However, the difference is within experimental variation of the methods.
- ED041G (Sulfate as SO₄): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	-----
				Result	Result	Result	Result	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	2	<1	<5	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	72	81	60	74	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.48	0.56	0.73	0.51	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.007	0.008	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.008	0.028	0.029	0.008	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	0.14	0.57	3.71	0.16	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.59	1.35	0.92	0.60	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.003	0.003	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	0.006	0.006	----
Manganese	7439-96-5	0.001	mg/L	0.008	0.030	0.028	0.008	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
Iron	7439-89-6	0.05	mg/L	0.18	0.67	3.99	0.18	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	-----
				Result	Result	Result	Result	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.04	0.02	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.10	0.50	0.13	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.76	0.03	<0.01	0.73	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.03	<0.01	0.73	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.2	1.3	1.6	1.2	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	2.0	1.3	1.6	1.9	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.05	0.10	0.21	0.07	----
EN67: Field Tests								
Ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	298.7	313.6	219.0	298.7	----
Ø Dissolved Oxygen	----	0.1	mg/L	0.32	0.31	0.44	0.32	----
Ø pH	----	0.01	pH Unit	3.99	3.92	4.82	3.99	----
Ø Temperature	----	0.1	°C	26.3	24.8	27.6	26.3	----
Ø Reactive Phosphorus as P	14265-44-2	0.01	mg/L	172.4	180.6	-177.7	172.4	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----



QUALITY CONTROL REPORT

Work Order : **EB2010399**

Page : 1 of 7

Client : **TRILITY Pt Ltd**

Laboratory : Environmental Division Brisbane

Contact : **4p4(6) Personal informati**

Contact : Customer Services EB

Address : LOT 40 SPRINGS ROAD
AGNES WATER QLD 4677

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61 08 84086500

Telephone : +61-7-3243 7222

Project : Groundwater Monitoring

Date Samples Received : 16-Apr-2020

Order number : 4500059581

Date Analysis Commenced : 16-Apr-2020

C-O-C number : ----

Issue Date : 23-Apr-2020

Sampler : **4p4(6) Personal informa**

Site : ----

Quote number : BN/222/16

No. of samples received : 4

No. of samples analysed : 4



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

□□□□ □□ □□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

□□□□ □□ □□

4(6) Personal inform

□□□□□□

Senior Inorganic Chemist
Senior Inorganic Chemist
Microbiologist

□□□□ □□□□ □□□□ □

Brisbane Administration, Stafford, QLD
Brisbane Inorganics, Stafford, QLD
Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2973523)									
EB2010268-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	658000 µg/L	656	0.270	0% - 20%
EB2010399-001	DESAL 1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2973525)									
EB2010399-001	DESAL 1	ED045G: Chloride	16887-00-6	1	mg/L	72	73	0.00	0% - 20%
EB2010545-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2420	2440	0.643	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357)									
EB2008355-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.006	0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.03	1.01	2.16	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.018	0.019	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.10	0.10	0.00	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2010262-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357) - continued									
EB2010262-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.115	0.114	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit		
EG020T: Total Metals by ICP-MS (QC Lot: 2972363)									
EB2010188-005	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.10	<0.10	0.00	No Limit
EB2010262-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.050	0.050	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	31.5	31.5	0.0606	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	3.70	3.71	0.478	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2972358)									
EB2010378-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2008355-001265	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2972368)									
EB2008355-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2010085-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2972289)									
EB2010399-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 2972282)									
EB2010399-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2977961)									
EB2010399-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.09	0.00	No Limit
EB2010482-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.06	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2973522)									
EB2010268-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
EB2010399-001	DESAL 1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2977962)									
EB2010399-001	DESAL 1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.72	4.65	0% - 20%
EB2010482-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2976603)									
EB2010376-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	2.3	15.9	No Limit
EB2010394-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	31.1	30.5	2.03	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2976602)									
EB2010376-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.35	1.31	2.78	0% - 20%
EB2010394-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.51	3.26	7.45	0% - 20%

Published on DESI Disclosure Log
 RTI Act 2009



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	85.0	118
				<1	100 mg/L	104	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.5	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	99.3	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.3	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2972363)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.9	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.3	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.2	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.2	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.7	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.9	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.0	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.9	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	108	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.1	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	91.7	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.0	82.0	118



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	118	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2972289)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	90.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2972282)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	106	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.0	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	88.5	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.4	79.2	105

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)							
EB2010268-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1000 mg/L	92.5	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)							
EB2010399-002	DESAL 2	ED045G: Chloride	16887-00-6	400 mg/L	107	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)							
22-265	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	97.3	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	92.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.1	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.4	70.0	130

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Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357) - continued							
EB2008355-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	93.1	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2972363)							
EB2010188-006	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	96.7	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.6	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	105	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	108	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	107	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.4	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.7	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)							
EB2008355-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)							
EB2008355-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	82.1	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)							
EB2010399-002	DESAL 2	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	87.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)							
EB2010268-002	Anonymous	EK057G: Nitrite as N	14797-65-0	4 mg/L	96.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)							
EB2010399-002	DESAL 2	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	89.6	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)							
EB2010393-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	86.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)							
EB2010393-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2010399	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	: ch4p4(6) Personal informatio	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 16-Apr-2020
Site	: ----	Issue Date	: 23-Apr-2020
Sampler	: 4p4(6) Personal informa	No. of samples received	: 4
Order number	: 4500059581	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	13-May-2020	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	13-May-2020	✓
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG020A-F) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	12-Oct-2020	✓	21-Apr-2020	12-Oct-2020	✓
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	13-May-2020	✓
Clear Plastic Bottle - Natural (EG035F) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	13-May-2020	✓
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) DESAL 2,	DESAL 3	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG094-AgF) DESAL 1,	DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	20-Apr-2020	12-Oct-2020	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG094T: Total metals in Fresh water by ORC-ICPMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	20-Apr-2020	12-Oct-2020	✓	20-Apr-2020	12-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	17-Apr-2020	17-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	21-Apr-2020	13-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	13-May-2020	✓	21-Apr-2020	13-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	21-Apr-2020	13-May-2020	✓	21-Apr-2020	13-May-2020	✓
MW006: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	16-Apr-2020	16-Apr-2020	✓
MW023: Enterococci by Membrane Filtration								
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) DESAL 1, DESAL 3,	DESAL 2, DESAL 1 (Duplicate)	15-Apr-2020	----	----	----	16-Apr-2020	16-Apr-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
ORC-ICPMS22-265				File D			
							Page 275 of 306



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests (performed by external sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)



CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burnt Road Puerako SA 5095
Ph: 08 8358 0893 E: adelaide@alsglobal.com
BON SBANE 2 Eyth Street Stafford QLD 4069
Ph: 07 3243 7224 E: samples.brisbane@alsglobal.com
GLADSTONE 48 Callemontah Drive Clinton QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 8000 E: samples.melbourne@alsglobal.com
MUDGEE 126 Sydney Road Mudgee NSW 2850
Ph: 02 6372 8735 E: mudgee@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2204
Ph: 02 4903 9435 E: samples.newcastle@alsglobal.com
LINDRUM 4/113 Geary Place North Lowe NSW 2541
Ph: 02 4427 2093 E: lindrum@alsglobal.com
PERTH 111 Hos Way Malaga WA 6093
Ph: 08 6299 7655 E: samples.perth@alsglobal.com

SYDNEY 217 286 Woodpecker Road Chalfont NSW 2194
Ph: 02 9784 8365 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-16 Desma Court Baffle QLD 4818
Ph: 07 4759 3500 E: townsville.environmentals@alsglobal.com
WOLLONGONG 95 Kenny Street Wollongong NSW 2500
Ph: 02 4229 3135 E: wollongong@alsglobal.com

CLIENT: TRILITY	TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Non Standard or urgent TAT (List due date):	
OFFICE: AGNES WATER	PROJECT NO.: ALS QUOTE NO.: BN/222/16	COC SEQUENCE NUMBER (Circle)	
PROJECT: GROUNDWATER MONITORING	COUNTRY OF ORIGIN:	COC: 1 2 3 4 5 6 7	
ORDER NUMBER: PURCHASE ORDER NO.: 4500059581	CONTACT PH: DL: +61 7 49757975 M: 6 Personal info	OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: 4(6) Personal info	SAMPLER: 6 Personal info	RECEIVED BY: 6 Personal info	
SAMPLER MOBILE: 6 Personal info	COG Emailed to ALS? (YES / NO)	RELINQUISHED BY:	
EDD FORMAT (or default):	DATE/TIME: 21-4-20 1400	DATE/TIME: 23/4/2020	
Email Reports to: Personal info@trility.com.au; awatergroup@trility.com.au	DATE/TIME:	DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au	DATE/TIME:	DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Consignment Note: MYTF134526

ALS USE ONLY		SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	pH Field	DO Field	Temp field	EC Field	ORP Field	Environmental Division Brisbane Work Order Reference EB2010933	
1	STP1	21/04/2020 1015	W		5	X	6.71	0.72	24.1	3729	-16.7		
2	STP2	21/04/2020 1120	W		5	X	6.53	1.13	24.0	11732	85.5	 Telephone: + 61-7-3243.7222	
	97-01		W										
	97-2		W										
	97-3		W										
	97-4		W										
	97-5		W										
	007		W									MICRO LAB	
	008		W										
3	STP1 Duplicate	21/04/2020 1020	W		5	X	6.71	0.72	24.1	3729	-16.7		
TOTAL					15								

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Styrile Sodium Thiosulfate Preserved Bottles.

CERTIFICATE OF ANALYSIS

Work Order : **EB2010933**
Client : **TRILITY Pty Ltd**
Contact : (6) Personal information
Address : LOT 40 SPRINGS ROAD
 AGNES WATER QLD 4677
Telephone : ---
Project : Groundwater Monitoring
Order number : 4500059581
C-O-C number : ---
Sampler : p4(6) Personal information
Site : ---
Quote number : BN/222/16
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 4
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 22-Apr-2020 08:10
Date Analysis Commenced : 22-Apr-2020
Issue Date : 28-Apr-2020 10:40



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

□□□□ □□□□

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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□□□□□□ □□□□

(6) Personal information

Senior Inorganic Chemist
 Senior Inorganic Chemist
 Microbiologist

Brisbane Inorganics, Stafford, QLD
 Brisbane Sampling, Stafford, QLD
 Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

				STP1	STP2	STP1 Duplicate	---	---
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	---	---
				EB2010933-001	EB2010933-002	EB2010933-003	-----	-----
				Result	Result	Result	---	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	369	95	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1020	3850	1020	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	0.005	0.005	0.006	---	---
Manganese	7439-96-5	0.001	mg/L	1.24	0.111	1.26	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Iron	7439-89-6	0.05	mg/L	1.57	<0.05	1.60	---	---
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.001	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.003	<0.001	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	---	---
Manganese	7439-96-5	0.001	mg/L	1.39	0.113	1.39	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	---	---
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	---	---
Iron	7439-89-6	0.05	mg/L	1.82	<0.05	1.82	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	---	---
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	---	---
				EB2010933-001	EB2010933-002	EB2010933-003	-----	-----
				Result	Result	Result	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	---	---
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.01	<0.01	---	---
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	0.02	<0.01	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.25	0.18	0.06	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.1	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.3	0.3	0.1	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.04	0.03	---	---
EN67: Field Tests								
pH	----	0.01	pH Unit	6.71	6.53	6.71	---	---
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	3730	11700	3730	---	---
Dissolved Oxygen	----	0.01	mg/L	0.72	1.13	0.72	---	---
Temperature	----	0.1	°C	24.1	24.0	24.1	---	---
Redox Potential	----	0.1	mV	<0.1	85.5	<0.1	---	---
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	---	---
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	---	---



Environmental

QUALITY CONTROL REPORT

Work Order	: EB2010933	Page	: 1 of 7
Client	: TRILITY Pt. Ltd	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Order number	: 4500059581	Date Analysis Commenced	: 22-Apr-2020
C-O-C number	: ----	Issue Date	: 28-Apr-2020
Sampler	: p4(6) Personal info		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- | Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- | Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- | Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
(6) Personal info	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Sampling, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER

					Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method : Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EB2010587-002	Anonymous	ED041G: Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	34	34	0.00	0% - 20%
EB2010590-010	Anonymous	ED041G: Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
EB2010587-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	454	452	0.284	0% - 20%
EB2010590-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.00	No Limit
EB2010930-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.257	0.264	2.43	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.012	0.011	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.20	0.20	0.00	No Limit
EB2010430-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2010933	Page	: 1 of 7
Client	: TRILITY Pt Ltd	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal infor	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Site	: ----	Issue Date	: 28-Apr-2020
Sampler	: p4(6) Personal inform	No. of samples received	: 3
Order number	: 4500059581	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EB2010587--003	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
STP1,	STP2,	21-Apr-2020	----	----	----	22-Apr-2020	19-May-2020	✓
STP1 Duplicate								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
STP1,	STP2,	21-Apr-2020	----	----	----	22-Apr-2020	19-May-2020	✓
STP1 Duplicate								
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	18-Oct-2020	✓
STP1 Duplicate								
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
STP1,	STP2,	21-Apr-2020	23-Apr-2020	18-Oct-2020	✓	23-Apr-2020	18-Oct-2020	✓
STP1 Duplicate								
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
STP1 Duplicate								
EG035T: Total Recoverable Mercury by FIMS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)								
STP1,	STP2,	21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
STP1 Duplicate								

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Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	18-Oct-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT) STP1, STP1 Duplicate	STP2, 21-Apr-2020	23-Apr-2020	18-Oct-2020	✓	23-Apr-2020	18-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	23-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	23-Apr-2020	19-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	24-Apr-2020	19-May-2020	✓	24-Apr-2020	19-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) STP1, STP1 Duplicate	STP2, 21-Apr-2020	24-Apr-2020	19-May-2020	✓	24-Apr-2020	19-May-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	24-Apr-2020	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	22-Apr-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023) STP1, STP1 Duplicate	STP2, 21-Apr-2020	----	----	----	22-Apr-2020	22-Apr-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

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 R/L Act 2009



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45µm filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

Date : 17/02/2021 7:17:36 AM
From : "Ethics and Integrity (Mailbox)"
To : "CWES_Gladstone"
Subject : RE: Gladstone Regional Council - Agnes Water WWTP - EPPR00959913
Attachment : image004.jpg;image005.png;image007.png;image002.png;
Good Morning,

Council wishes to advise that the Q4 2020 data for the Agnes Water WWTP has been uploaded to the WaTERs database. This upload was delayed due to the change analysis method for *E.coli* and Enterococcus organisms from CFU/100mL to MPN/100mL occurring during this quarter. This required additional liaison with Councils subcontractor with regards to change over dates and potential external lab changes and with the WaTERs database team to update the template so data for both analysis methods could be uploaded.

Kind Regards,

Ashlyn Chalker
Compliance and Internal Audit Officer



PO Box 29 Gladstone Qld 4680
Phone 07 4977 6533 | Mobile: Personal ir
Email Ashlyn.Chalker@gladstone.qld.gov.au | Website: www.gladstone.qld.gov.au

From: CWES_Gladstone <CWES_Gladstone@des.qld.gov.au>
Sent: Friday, 12 February 2021 8:27 AM
To: Ethics and Integrity (Mailbox) <EthicsandIntegrity@gladstone.qld.gov.au>; Info (Mailbox) <info@gladstone.qld.gov.au>
Subject: Gladstone Regional Council - Agnes Water WWTP - EPPR00959913

Good morning,

According to Gladstone Regional Council's (GRC) Environmental Authority (EA) EPPR00959913, condition G21-AW for Agnes Water Waste Water Treatment Plant, all discharges between 1 October 2020-31 December 2020 were due to be reported to the department in a quarterly summary by **1 February 2021**.

A review of our records and submissions made to WaTERS has not found a submission for this period.

GRC is reminded that it is an offence to contravene a condition of an EA.

Please provide a response to the above matter to CWES_Gladstone@des.qld.gov.au before close of business on **Friday, 19 February 2021**.

Regards,



Danielle Major
Compliance Support Officer
Coal & Central Compliance | Gladstone
Department of Environment and Science

Phone (07) 4971 6503 | VoIP 22503 | [Chat with me in Teams](#)
Document Submissions cwes_gladstone@des.qld.gov.au
Level 2 | 20-22 Herbert St | Gladstone QLD 4680
PO Box 5065 | Gladstone QLD 4680

I work remotely on Mondays and Fridays.
I am still contactable on those days by phone/email/Teams.

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If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.

Date : 31/05/2021 1:09:19 PM

From : "Jane Doran"

To : "Clint Swanton" , "Ashlyn Chalker"

Subject : FW: WaTERS - Successful data submission, Return Id 171342 - Agnes Water Sewage Treatment Plant

Attachment : EDOCS-#14942628-v1-Compliance_20210526_Closure_letter_RC1-89517_EPPR00959913_Gladstone_RC_Agnes_Water_WWTP_-_E_coli_exceedence_160421.PDF;ATT00001.png;ATT00002.png;image001.jpg;

Hi Ash & Clint,

FYI. As per attached request from DES (just had to chase Trility up for it). I will forward through the requested monitoring reports this week.



Kind Regards,

Jane Doran

Water Quality & Environmental Monitoring Officer



PO Box 29 Gladstone QLD 4680

Phone 07 4970 0700

Email Jane.Doran@gladstone.qld.gov.au | Website www.gladstone.qld.gov.au

From: psd.help@mail.waters.des.qld.gov.au <psd.help@mail.waters.des.qld.gov.au>

Sent: Monday, 31 May 2021 12:46 PM

To: Jane Doran <Jane.Doran@gladstone.qld.gov.au>

Cc: Water Enquiries (Mailbox) <Water@gladstone.qld.gov.au>; Jane Doran <Jane.Doran@gladstone.qld.gov.au>;

CWES_Gladstone@des.qld.gov.au; psd.help@qld.gov.au

Subject: WaTERS - Successful data submission, Return Id 171342 - Agnes Water Sewage Treatment Plant



Dear Jane Doran,

Electronic data has successfully been submitted to WaTERS for the Agnes Water Sewage Treatment Plant on 31/May/2021.

If you wish to see the return submission details, please log on to WaTERS, and "Search Returns" or "Generate a report" with the return id: 171342.

Please note that unless otherwise stated, this submission does not remove your organisation's duty to notify the administering authority of non-compliances and incidents as prescribed in your approval. (not applicable to Government officers)

Thank you for participating in electronic submission.



Kind regards,

WaTERS Administrator
Water Assessment and Systems
Department of Environment and Science
(07) 3170 5555
psd.help@qld.gov.au

The Water Tracking and Electronic Reporting System (WaTERS) is used for submitting data and notifying the Department of Environment and Science of water releases, limit/triggers exceedances or other notifiable events.

Please do not reply to this email as it has been automatically generated. If you have any difficulties please contact the Database Manager.

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Department of
Environment and Science

Ref 101/0005909|n14940066|RC1-89517

26 May 2021

Gladstone Regional Council
PO Box 29
GLADSTONE QLD 4680

cc Ashlyn Chalker
Compliance and Internal Audit Officer
Ashlyn.Chalker@gladstone.qld.gov.au

Attn: Ms Leisa Dowling

cc Clint Swanton
Manager Water Program Delivery
Clint.Swanton@gladstone.qld.gov.au

cc EthicsandIntegrity@gladstone.qld.gov.au

cc info@gladstonerc.qld.gov.au

Dear Ms Dowling

Incident - Agnes Water Sewage Treatment Plant - EPPR00959913 - 7 April 2021

Thank you for your notification (our reference C-CPLRC-100089517) dated 16 April 2021 in relation to a potential *E. coli* exceedence recorded at the Agnes Water Sewage Treatment Plant (STP) on 7 April 2021.

The Department of Environment and Science (the department) has reviewed the information provided and has determined that no further action will be taken in response to this matter. This outcome was determined as the median limit specified under condition WT6-AW of Environmental Authority (EA) EPPR00959913 was not exceeded, and Gladstone Regional Council (GRC) attributes the *E. coli* sample result of 23,000MPN/100mL to either a sampling or laboratory error.

The department reminds GRC of your requirement under condition G11-AW of the EA to ensure *'all instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this approval must be calibrated, and appropriately operated and maintained in accordance to manufacture specifications.'*

Additionally, it was identified that GRC did not report to the department the discharges from Agnes Water STP between 1 January 2021 and 31 March 2021 by 1 May 2021, as required by condition G21-AW of the EA. The department requests that this data is uploaded to WaTERS by **5:00pm Monday, 7 June 2021**.

The department also requests that you submit the latest reports completed under conditions L2-AW and WT11-AW of the EA by **5:00pm Monday, 14 June 2021** to cwes_gladstone@des.qld.gov.au.

Should you have any queries in relation to this letter, please contact Lindsey File, Senior Environmental Officer on 07 4971 6506 or email cwes_gladstone@des.qld.gov.au.

Yours sincerely,

sch4p4(6) Personal information

David Love
Compliance Delivery Manager
Coal and Central Compliance
Environmental Services & Regulation
Gladstone

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Date : 26/03/2020 1:38:51 PM

From : "Pollution Hotline"

To : "CW ES_Gladstone"

Subject : C-CPLRC-100001974. FW: Gladstone Regional Council Non-Compliance Initial Notification Environmental Authority EPPR00959913 - DES Pollution Hotline - Agnes Water/1770 - 14/03/2020

Attachment : image001.png;image003.png;

Good afternoon Gladstone Team,

Please see below email from **Gladstone Regional Council (EPPR00959913)** in regards to an event of non-compliance, in which 1071kL of recycled water was released (at the Agnes Waters WWTP) due to a minor infrastructure failure on 14/03/2020.

I have assigned the Dynamics case to your group, case number **C-CPLRC-100001974**.

Complexity Assessment output is **MEDIUM**.

Kind regards,



Shannon Henderson
Environmental Officer
Community Response Team | Operational Support
Environmental Services and Regulation
Department of Environment and Science

P 1300 130 372 option 2 E pollutionhotline@des.qld.gov.au
Level 9, 400 George St, Brisbane QLD 4000
GPO Box 2454, Brisbane QLD 4001

From: Jane Doran <Jane.Doran@gladstone.qld.gov.au>

Sent: Thursday, 26 March 2020 11:32 AM

To: Pollution Hotline; Clint Swanton; Anna Scott; Jane Doran; Neels Kloppers; Env Sustainability (Mailbox); Niru Vemuri; Ethics and Integrity (Mailbox); CW ES_Gladstone

Subject: Gladstone Regional Council Non-Compliance Initial Notification Environmental Authority EPPR00959913 - DES Pollution Hotline - Agnes Water/1770 - 14/03/2020

Dear DES Officer,

Gladstone Regional Council would like to notify the following non-compliance details.

WWTP NC ID: WWTP NC TBA

EHP CR number: TBA

Date of Non-compliance: 14/03/2020

Waste Water Treatment Plant: Agnes Water/1770

Licence condition involved: G1-AW

Licence specification: 900kl recycled water / 24 hour period

Non-compliance or breach: >900kL release of recycled water / 24 hour period

Non-compliance data: 1071kL of recycled water was released due to a minor infrastructure failure.

Please notify the below Council Officer with any enquiries regarding this notification.

Jane Doran

PO Box 29 Gladstone Qld 4680

Phone: 07 4970 0700

Jane.Doran@gladstone.qld.gov.au

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Non-Compliance Final Notification Report Environmental Authority EPPR00959913

The purpose of this document is report non-compliance of the requirements set out in the Environmental Authority Permit EPPR00959913. Notification of non-compliance is requested to fulfil an organization's obligations under Section 320 of the Environmental Protection Act 1994, which is an obligation to notify the chief executive of the DEHP of any incident that has and/or threatens to cause material or serious environmental harm. The Gladstone Regional Council is collecting your personal information in accordance with the Environmental Protection Act 1994 to process this Notification Form. The information will only be accessed by authorised council employees. Some of this information may be given to other Government Departments. Your information will not be given to any other person or agency unless you have given us permission or we are required by law.

Notification Report Submitted By:

Gladstone Regional Council	
Address	101 Goondoon Street
Telephone (Work)	49700 700
E-mail address	info@gladstonerc.qld.gov.au

Incident Reference Information

Site:	Agnes Water WWTP
EHP Customer Reference:	CPLRC-100001974
Date/s of Non-Compliance:	14/03/2020

Non-Compliance Information

Licence Condition:	G1-AW
Description of Non-Compliance:	>900kL release of recycled water / 24 hour period
Reason for Non-Compliance:	<p>Operation philosophy for the automated irrigation was changed from quantity to duration due to the requirement to manually control the dosing of Citric Acid to Lagoon 3 for pH correction of the treated effluent prior release.</p> <p>This change coupled with an irrigation valve failing to completely close, thus allowing a small flow to trickle through from Stations 10, 11 & 12 resulted in the limit being exceeded. Please see following Daily Stations Consumption Report for the period.</p>
Actions taken to rectify the Non-Compliance:	The valve has been repaired and the operational philosophy for the automated irrigation control has been returned to quantity (Citric Acid dosing procedure has been altered to align with this change) and irrigation quantities reduced.
Detail extent of environmental harm caused if known:	None identified.

Non-Compliance Final Notification Report Environmental Authority EPPR00959913

Other relevant information:	Please find following: <ul style="list-style-type: none">• Galcon – Daily Station's Consumption Report (09 – 15 March 2020)
Reporter	
Name: Jane Doran	Date: 07/04/2020

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Daily Station's Consumption in m³

From Date

Monday, March 09, 2020

To Date

Sunday, March 15, 2020

Effluent Re use

		Date	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12	Unexpected Flow	Total
2020	Mar	13				360.00	82.00	373.00				9.00	824.0
		14							358.00	353.00	351.00	9.00	1,071.0
		15	291.00	113.00	297.00							7.00	708.0
		Total	291.00	113.00	297.00	360.00	82.00	373.00	358.00	353.00	351.00	25.00	2,603.0
		Grand Total	291.00	113.00	297.00	360.00	82.00	373.00	358.00	353.00	351.00	25.00	2,603.0

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Date : 8/04/2020 8:21:45 PM

From : "Ashlyn Chalker"

To : "Pollution Hotline"

Cc : "CWES_Gladstone" , "Ethics and Integrity (Mailbox)"

Subject : CPLRC-100001974 - Final Notification - Agnes Water WWTP - 14.03.2020

Attachment : CPLRC-100001974 - Agnes Water WWTP - 14.03.2020 - Final Report.pdf;image001.jpg;

Good Evening,

Please find attached final notification for CPLRC-100001974.

Kind Regards,

Ashlyn Chalker

Ethics Integrity and Audit Specialist (Acting)



PO Box 29 Gladstone Qld 4680

Phone 07 4977 6533

Email Ashlyn.Chalker@gladstone.qld.gov.au | Website: www.gladstone.qld.gov.au

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