

Barossa Infrastructure Limited Annual Recycled Water Quality Monitoring Report 2021-2022

Date of submission to the Department for Health and Wellbeing: 01/09/2022

Premises details			
Name of premises:	Barossa Infrastructure Limited		
Type of premises:	Other Water utility supplying to vineyards		
Premise address: 285 GOMERSAL ROAD, GOMERSAL, SOUTH AUSTRALIA, 5352			
Owner details: BAROSSA INFRASTRUCTURE LTD ABN: 80084108958 ACN: 084108958 Australian Public Company 5352 SA			
Primary contact person: Simon Schutz General Manager Barossa Infrastructure Limited 0403743199 simon@BIL.net.au		Secondary contact person: Neville Skipworth Operations Manager Barossa Infrastructure Limited 85632300 Neville@bil.net.au	
Water quality monitoring and system performance			
On-site wastewater system details			
Method of treated wastewater disposal or re-use:	Irrigation via surface drippers		
The treated wastewater is irrigated to:	Vineyard		
Average total daily flow into the system (L):		Total annual volume of wastewater generated by the premises (kL):	289,000 of treated recycled water supplied by Council to BIL
The on-site wastewater system is operated and maintained by: Third-party contractor Barossa Council Michael Clark Co-ordinator Community Wastewater Management Systems 8563 8479 mclark@barossa.sa.gov.au			
System servicing (if applicable)			

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Is the system serviced on a regular basis?	Yes			
Servicing frequency	Weekly			
<p>The on-site wastewater system is serviced by: Third party contractor</p> <p>Infrastructure Maintenance Services Steve Dewar Director stevedewar@imssa.net.au 0418845738</p>				
<p align="center">Department for Health and Wellbeing approved recycled water quality monitoring conditions</p>				
Sampling frequency	BOD ₅	Suspended Solids	<i>E.coli</i>	Chlorine
Monthly	Total BOD less than 20 mg/L	Less than 30 mg/L	Less than 100 cfu/100 mL	Total chlorine not less than 1 mg/L
<p align="center">Water quality sampling results</p>				
Sample Date	Total BOD (mg/L)	Suspended Solids (mg/L)	<i>E.coli</i> (org/100mL)	Total Chlorine (mg/L)
20/07/2021	19	13	0	0
17/08/2021	4	10	0	0
14/09/2021	6	14	0	0
10/10/2021	3	9	0	0
23/11/2021	6	10	0	0
22/12/2021	6	14	0	0
18/01/2022	6	11	0	0
15/02/2022	6	7	0.3	0
16/03/2022	6	8	0	0
12/04/2022	7	12	0	0

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10/05/2022	15	18	0	0
14/06/2022	9	12	0	0
Has the required sampling frequency been achieved?		Yes		
Have any results exceeded the required parameters specified in the approval conditions?		Yes Chlorine less than 1mg/L		
Were there any system upgrades or alterations undertaken this reporting period?		No		
Are there any upgrades or alterations planned for the next 12 months?		No		
Wastewater and recycled water incidents				
Have there been any un-contained overflows or spills of wastewater or recycled water in the reporting period?			Yes	
Incident details: On 29/7/2021 water was discharged onto paddocks as part of pipeline valve maintenance. At one location, east of Heinrich Rd, approximately 298kL of water entered a local water course. At this time, BIL was being supplied by SA Water's filtered and chloraminated Swan Reach water source and the CWMS supply to BIL was turned off.				

Minister for Health
C/- Wastewater Management Section
SA Health
By: Web portal

16 August 2022

Barossa Infrastructure Ltd Recycled Water Irrigation Scheme
2021/22 Annual Audit – Supplementary Information

Barossa Infrastructure Ltd (BIL) supplies water to viticulturalists in the Barossa Valley for supplementary irrigation.

BIL's primary water source is SA Water's Warren Reservoir, which is supplemented with River Murray water via SA Water's Mannum-Adelaide pipeline. In this way raw water is delivered to BIL's infrastructure near Williamstown. At SA Water's discretion, SA Water can also choose to supply BIL chloraminated water via the Swan Reach-Stockwell pipeline, connecting to BIL at the same Williamstown location. Refer to Figure 1.

BIL also receives treated CWMS water from Barossa Council, which is blended with River Murray water and supplied to a limited number of customers from BIL's Gomersal Rd pipeline. Refer to Figure 1. In 2021/22, CWMS water represented 3.0% of BIL's total water supply across the whole scheme, and 16% of the Gomersal Rd pipeline supply.

The blended water supply to the Gomersal Rd pipeline is the subject of this annual audit.

BIL utilised SA Health's web portal to enter and upload the minimum required information. In some instances, the web portal's format does not accommodate BIL's situation. This supplement provides additional context and information.

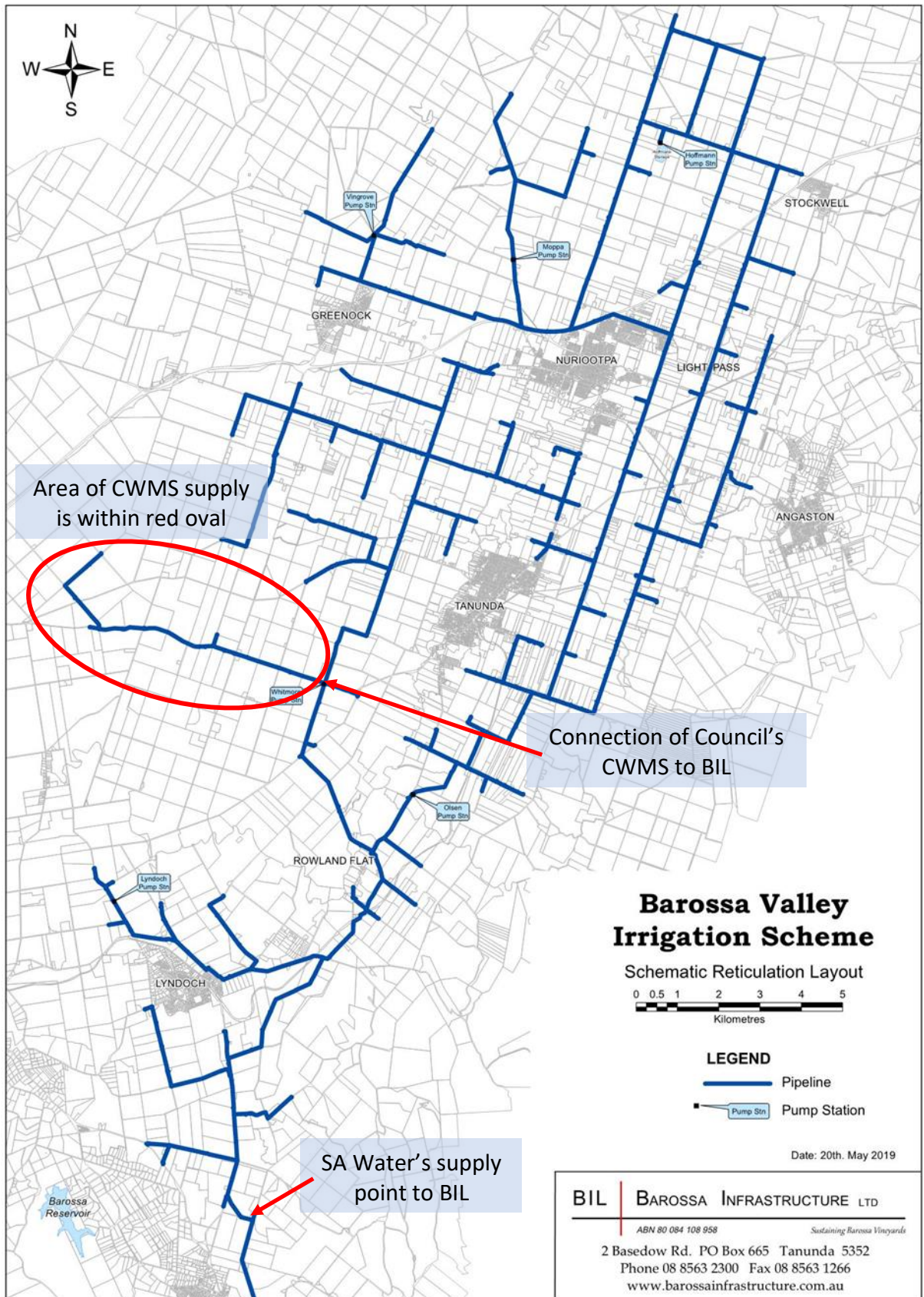


Figure 1. BIL's Pipeline Network, showing location of source waters and area of CWMS supply

Responsibility

Barossa Council are responsible for the treatment of the CWMS water and for supplying it to BIL's pipeline under pressure at the corner of Gomersal Rd and Fromm Rd.

BIL supplies the blended CWMS/River Murray water to only those customers within the red oval in Figure 1.

BIL's infrastructure is operated and maintained by Infrastructure Maintenance Services. Other specialist contractors are used as and when required.

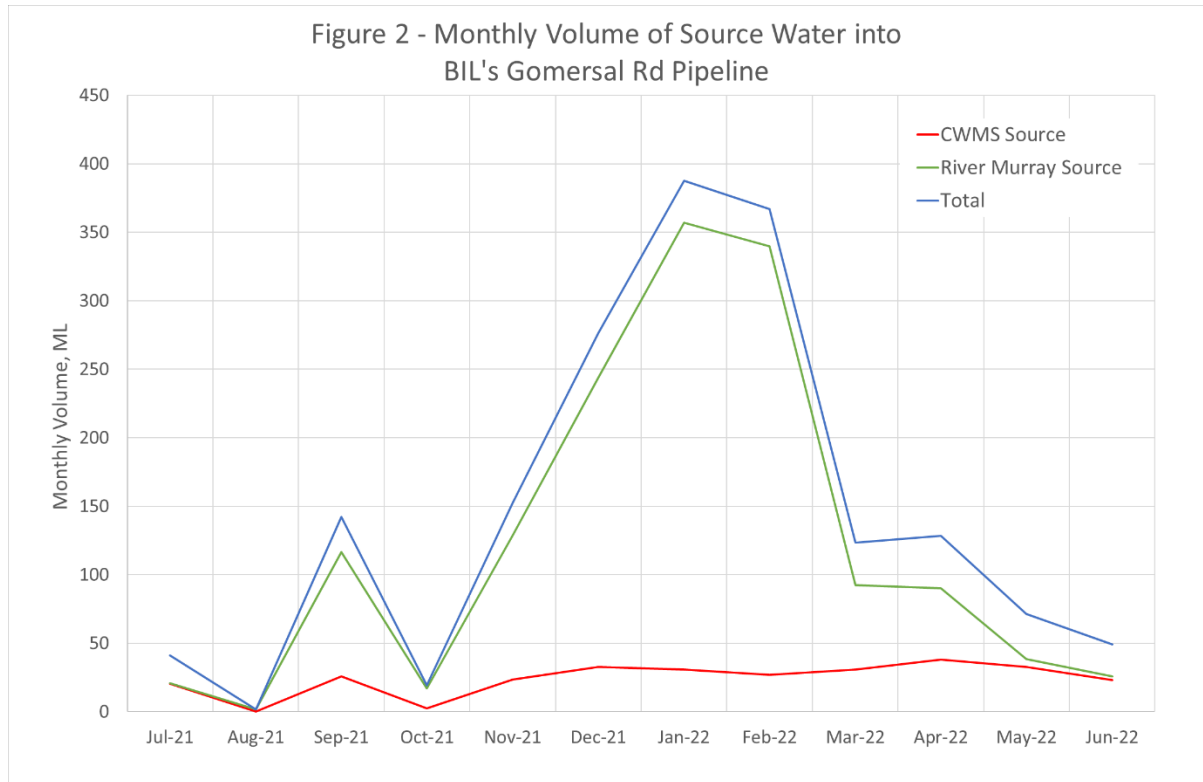
Water Volume

Council's flow meter measures CWMS volumes into BIL's Gomersal Rd pipeline at the interface of Council and BIL's infrastructure.

BIL has a separate flow meter upstream of the CWMS meter that measures River Murray volumes into BIL's Gomersal Rd pipeline.

These two volumes are combined to get the total volume into BIL's Gomersal Rd pipeline. Refer to Table 1 and Figure 2 for this data in tabulated and graphical formats.

Table 1 - Monthly Volume of Source Water into BIL's Gomersal Rd Pipeline					
	CWMS Source		River Murray Source		Total
	(ML)	(%)	(ML)	(%)	(ML)
Jul-21	20.5	50%	20.8	50%	41.3
Aug-21	0	0%	1.6	100%	1.6
Sep-21	25.7	18%	116.4	82%	142.1
Oct-21	2.6	13%	16.8	87%	19.4
Nov-21	23.7	16%	128.8	84%	152.5
Dec-21	32.6	12%	243.7	88%	276.3
Jan-22	30.8	8%	356.9	92%	387.7
Feb-22	27.1	7%	339.7	93%	366.8
Mar-22	30.8	25%	92.6	75%	123.4
Apr-22	38.2	30%	90.3	70%	128.5
May-22	32.9	46%	38.4	54%	71.3
Jun-22	23.2	47%	25.9	53%	49.1
TOTAL VOLUME	288.1	16%	1471.99	84%	1760.1



Water Quality

Monthly and annual samples of the CWMS supply to BIL are taken by Council just upstream of the interface point. These samples are of only CWMS water. The analysis results are provided to BIL and are included in Table 2.

BIL takes an additional sample annually at the same location and tests for some additional parameters. Refer Attachment 1.

Table 2 and Attachment 1 data are from undiluted CWMS water.

Table 3 calculates approximate monthly weighted blended values for the parameters listed in SA Health’s Approval Number WWI-11052. It should be noted that since BIL samples the River Murray supply quarterly, parameters for the in between months are estimates based on the analysis results before or after that month. Further, in 2021/22 sampling of these parameters from the River Murray supply only began part way through the year, so data is sparse. Therefore, the calculated monthly weighted blended values are estimates only.

Table 2 - Sampling Analysis Results

**From Council's Monthly Suite of Testing.
Sampled at the interface point, sampling only undiluted CWMS water.**

Date	Ammonia as N	BOD	Ca	COD	Conductivity	E. coli	Grease & Oil	Mg	N+N as N	Nitrate as N	Nitrite as N	pH	Phos. Total	Sodium	Sodium AR	Suspended S	Temp for pH	TKN as N	Total DS	Free Chlorine	Total Chlorine
	mg/L	mg/L	mg/L	mg/L	uScm	MPN/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	Units	mg/L	mg/L	mg/L	mg/L	Deg C	mg/L	mg/L	mg/L	mg/L
16/06/2021	7.47	8	20.8	111	878	0	<1	8.29	12.47	7.69	4.78	7.1	12.4	102	4.78	22	20.6	18.4	487	-	-
20/07/2021	15.5	34	18.9	118	801	0	1	7.74	5.87	5.14	0.73	7.2	8.61	84.3	4.13	17	20	23.1	444	0	0
17/08/2021	0.67	4	13.9	22	367	0	<1	6.16	0.21	0.08	0.13	7.3	0.826	42.9	2.41	3	21	2.71	203	0.5	0
14/09/2021	16	14	27.4	142	1210	0	3	16.9	5.23	3.75	1.48	7.1	8.67	144	5.33	34	20.5	23	672	0	0
10/10/2021	BIL Discharge Shut Down																				
23/11/2021	21.2	15	32.3	87	1200	0	<1	16.9	0.33	0.03	0.3	7.2	10.5	128	4.54	12	22.6	25.1	666	0.5	0
22/12/2021	10.9	20	33.5	137	1170	0	4	16.1	2.37	0.54	1.83	7.2	10.9	131	4.66	40	22.4	39	650	0	0
18/01/2022	21.9	26	32.4	110	1070	0	1	12.4	<0.06	<0.06	<0.06	7.3	11.2	113	4.28	26	21.3	30	594	0.5	0
15/02/2022	20.9	37	31	100	998	4	5	11.4	<0.06	<0.06	<0.06	7.4	11.8	103	4.02	28	22.7	27.3	554	0	0
16/03/2022	10.8	12	32.3	89	874	0	2	10.7	0.22	0.01	0.21	7.3	9.27	98.5	3.84	16	22.6	16.9	484	0.5	0
12/04/2022	17.2	13	29.5	133	988	0	2	10.8	1.46	1.03	0.43	7.4	8.82	107	4.28	29	22.1	26.8	548	0	0
10/05/2022	24.8	24	28.6	119	980	0	2	9.98	4.96	4.78	0.18	7.3	8.74	95.3	3.91	28	21.1	36.8	544	0	0
14/06/2022	22.5	10	25.8	88	902	0	<1	8.91	5.58	3.58	2	7.3	7.57	86.9	3.76	16	21.4	29.2	500	0	0

**From Council's Annual Suite of Testing.
Sampled at the interface point, sampling only undiluted CWMS water.**

Date	E.coli	Aluminium - Total	Arsenic - Total	Beryllium - Total	Boron - Soluble	Cadmium - Total	Calcium	Chromium - Total	Cobalt - Total	Copper - Total	Iron - Total	Lead - Total	Lithium - Total	Magnesium	Manganese - Total	Mercury - Total	Molybdenum - Total	Nickel - Total	Selenium - Total	TKN as N	SS
	MPN/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
21/07/2020	0	0.112	0.0007	<0.0003	0.081	<0.0001	18.9	0.0006	0.0003	0.0121	0.14	0.0006	0.0063	7.74	0.0285	0.00009	0.0004	0.0017	0.0008	23.1	17

Date	SAR - Calculation	Sodium	Uranium - Total	Vanadium - Total	Zinc - Total	Ammonia as N	Flouride	N + N as N	Nitrite as Nitrogen	Nitrate as N	Grease and Oil	BOD	COD	Conductivity	TDS (by EC)	pH	Temp at pH measurement	Phosphorus - Total
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	pH units	degC	mg/L
21/07/2020	4.13	84.3	<0.0001	0.0002	0.0673	15.5	0.69	5.87	0.73	5.14	1	34	118	801	444	7.2	20	8.61

Table 3 - Calculation of Weighted Average Blended Parameters

Month	Volume		BOD			Suspended Solids			E. coli			Total Chlorine			
	CWMS	River Murray	Criteria ≤20mg/L			Criteria ≤30mg/L			Criteria 100/100mL			Criteria >1mg/L			
			CWMS	River Murray	Weighted Average	CWMS	River Murray	Weighted Average	CWMS	River Murray	Weighted Average	CWMS	River Murray	Weighted Average	
			%	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	cfu/100mL	cfu/100mL	cfu/100mL	mg/L
Jul-21	50%	50%	34	4	19	17	10	13	0	0	0	0	0	0	0
Aug-21	0%	100%	4	4	4	3	10	10	0	0	0	0	0	0	0
Sep-21	18%	82%	14	4	6	34	10	14	0	0	0	0	0	0	0
Oct-21	13%	87%		4	3		10	9		0	0		0	0	0
Nov-21	16%	84%	15	4	6	12	10	10	0	0	0	0	0	0	0
Dec-21	12%	88%	20	4	6	40	10	14	0	0	0	0	0	0	0
Jan-22	8%	92%	26	4	6	26	10	11	0	0	0	0	0	0	0
Feb-22	7%	93%	37	4	6	28	5	7	4	0	0.3	0	0	0	0
Mar-22	25%	75%	12	4	6	16	5	8	0	0	0	0	0	0	0
Apr-22	30%	70%	13	4	7	29	5	12	0	0	0	0	0	0	0
May-22	46%	54%	24	8	15	28	9	18	0	0	0	0	0	0	0
Jun-22	47%	53%	10	8	9	16	9	12	0	0	0	0	0	0	0

Note: Grey coloured values are estimates based on the sample results before or after it, and therefore the weighted average is approximate only
 Note: Criteria are from SA Health Approval Number WWI-11052

Attachment 1 – BIL’s CWMS Only Water Quality Sampling Results



Barossa Infrastructure Ltd
ATTN: Simon Schutz
PO Box 665
TANUNDA
SA 5352 AUSTRALIA

09/08/2021

Dear Simon

Please find attached the Final Analytical Report for

Customer Service Request: 122622-2021-CSR-1
Account: 122622
Project: AWQC-160509 Barossa Infrastructure Ltd - Routine 21/22

This report has also been sent to: Neville Skipworth

AWQC Sample Receipt hours are Monday and Tuesday 8:30am to 8pm and Wednesday, Thursday and Friday 8:30am to 4:30pm.

Yours sincerely,

Jason Cutler
Customer Service Officer
Jason.Cutler@sawater.com.au





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Analytical Results

Sampling Point	921120-Barossa Infrastructure CWMS Supply cnr Gomersal and Fromm Rd Tanunda
Sampled Date	26/07/2021 9:54:46AM
Sample Received Date	26/07/2021 9:54:46AM
Sample Analysis Completed	5/08/2021 11:42:58AM
Sample ID	*2021-005-8324
Status	Endorsed
Collection Type	AWQC Collected

Bacteriology	LOR	Result	Test Start Date
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<i>Sample temperature at time of receipt NA</i>			
E.coli & Thermotolerant Coliforms T0081-01 WMZ-500(ADEL)			26/07/2021
E.coli		0 cfu/100mL	
Thermotolerant Coliforms		10000 cfu/100mL	

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
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<i>Sample temperature at time of receipt NA</i>			
Arsenic - Total TIC-006 W09-023(ADEL)			27/07/2021
Arsenic - Total	0.0003	0.0006 mg/L	
Boron - Soluble TIC-006 W09-023(ADEL)			27/07/2021
Boron - Soluble	0.020	0.073 mg/L	
Cadmium - Total TIC-006 W09-023(ADEL)			27/07/2021
Cadmium - Total	0.0001	<0.0001 mg/L	
Calcium TIC-004 W09-023(ADEL)			27/07/2021
Calcium	0.1	19.9 mg/L	
Chromium - Total TIC-006 W09-023(ADEL)			27/07/2021
Chromium - Total	0.0001	0.0009 mg/L	
Iron - Total TIC-006 W09-023(ADEL)			27/07/2021
Iron - Total	0.0005	0.1677 mg/L	
Lead - Total TIC-006 W09-023(ADEL)			27/07/2021
Lead - Total	0.0001	0.0007 mg/L	
Magnesium TIC-004 W09-023(ADEL)			27/07/2021
Magnesium	0.05	8.03 mg/L	
Manganese - Total TIC-006 W09-023(ADEL)			27/07/2021
Manganese - Total	0.0001	0.0376 mg/L	
Potassium TIC-004 W09-023(ADEL)			27/07/2021
Potassium	0.05	28.4 mg/L	
Sodium Adsorption Ratio TMZ-M06 W09-023(ADEL)			26/07/2021





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Sample Analysis Completed	5/08/2021 11:42:58AM
Sample ID	*2021-005-8324
Status	Endorsed
Collection Type	AWQC Collected

Sodium Adsorption Ratio TMZ-M06 W09-023(ADEL)		26/07/2021
Sodium Adsorption Ratio - Calculation	4.76	
Sodium TIC-004 W09-023(ADEL)		27/07/2021
Sodium	0.1	99.5 mg/L
Sulphur TIC-004 W09-023(ADEL)		27/07/2021
Sulphate	1.5	44.4 mg/L
Sulphur	0.5	14.8 mg/L
Total Hardness as CaCO3 TMZ-M06 W09-023(ADEL)		26/07/2021
Total Hardness as CaCO3	2.0	83 mg/L
Zinc - Total TIC-006 W09-023(ADEL)		27/07/2021
Zinc - Total	0.0003	0.0620 mg/L

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt NA</i>			
Chloride T0104-02 W09-023(ADEL)			27/07/2021
Chloride	4.0	111 mg/L	
Nitrate + Nitrite as N T0161-01 W09-023(ADEL)			04/08/2021
Nitrate + Nitrite as N	0.003	11.0 mg/L	
Nitrogen - Total TMZ-M06 W09-023(ADEL)			26/07/2021
Nitrogen - Total		31.80 mg/L	
Phosphorus - Total T0109-01 W09-023(ADEL)			03/08/2021
Phosphorus - Total	0.005	11.1 mg/L	
TKN as N T0112-01 W09-023(ADEL)			03/08/2021
TKN as Nitrogen	0.05	20.8 mg/L	

Inorganic Chemistry - Physical	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt NA</i>			
Conductivity & Total Dissolved Solids T0016-01 W09-023(ADEL)			27/07/2021
Conductivity	2	910 µS/cm	



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Sample ID	*2021-005-8324	
Status	Endorsed	
Collection Type	AWQC Collected	

Conductivity & Total Dissolved Solids T0016-01 W09-023(ADEL)			27/07/2021
Total Dissolved Solids (by EC)	1	505 mg/L	
pH T0010-01 W09-023(ADEL)			27/07/2021
pH		7.2 pH units	
Temperature at which pH is measured		22.3 °C	
Turbidity T0018-01 W09-023(ADEL)			26/07/2021
Turbidity	0.1	20 NTU	

Sampling	LOR	Result	Test Start Date
Sample temperature at time of receipt NA			
Chlorine T0012-01 W09-023(ADEL)			26/07/2021
Chlorine - Free	0.1	<0.1 mg/L	
Chlorine - Total	0.1	<0.1 mg/L	
Monochloramine	0.1	<0.1 mg/L	



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AWQC Signatories

Mira Banasiak - Supervisor Bacteriology and Molecular Testing Services

Dzung Bui - Supervisor Metals and Physical

Ivana Cech - Technical Officer Chemistry

Vickie Dalglish - Senior Technical Officer Bacteriology & Molecular Testing

Thuy Diep - Technical Officer Chemistry

David Evans - Technical Officer Chemistry

Andrew Ford - Senior Technical Officer Chemistry

Aji John - Technical Officer Chemistry

Chami Karunatilaka - Technical Officer Chemistry

Brendan Walsh - Senior Field Officer



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Incidents

Sample ID	S.Point	Description	Sampled Date	Analysis (where Applicable)	Incident Description
2021-005-8323	84513	Barossa Infrastructure Ltd - Fromms Square Williamstown	16/07/2021	pH	Test not processed within holding time
2021-005-8323	84513	Barossa Infrastructure Ltd - Fromms Square Williamstown	16/07/2021	Turbidity	Test not processed within holding time
2021-005-8324	921120	Barossa Infrastructure CWMS Supply cnr Gomersal and Fromm Rd Tanunda	26/07/2021	pH	Test not processed within holding time

Analytical Method

Analytical Method Code	Description	Reference Method
W-052	Preparation of Samples for Metal Analysis	AP3030AD
TMZ-M06	Derived Results and Data Checks	
T0104-02	Chloride - Discrete Analyser	AP4500CLE
T0018-01	Turbidity - Nephelometric Measurement	APAWWA-WEF
TMZ-M06	Derived Results and Data Checks	AP4500NORGA
T0109-01	Phosphorus - total by discrete analyser	AP4500PF
T0081-01	E. coli - Membrane filtration	USEPA1604_1H
T0012-01	Chlorine by classical and portable meter (field test)	AP4500CLF
T0112-01	Nitrogen- Total Kjeldahl by discrete analyser	AP4500NORGA
TMZ-M06	Derived Results and Data Checks	APHA2340B
T0016-01	Determination of Conductivity - Corrected to 25C	AP2510B
TIC-006	Elemental Analysis By ICP- MS	EPA200.8
T0161-01	Nitrate + Nitrate (NOx) - Automated Flow Colorimetry	AP4500NO3I
T0010-01	Determination of pH	AP4500HB
TIC-004	Determination of Metals - ICP Spectrometry by ICP2	AP3120

Sampling Method

Sampling Method Code	Description
W09-023	Sampling Method for Chemical Analyses
WMZ-500	Sampling Method for Microbiological Analyses

When samples are taken by customers, samples are analysed as received.



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Laboratory Information

Laboratory	NATA accreditation ID
Inorganic Chemistry - Physical Sampling	1115
Inorganic Chemistry - Nutrients	1115
Bacteriology	1115
Inorganic Chemistry - Metals	1115



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- Notes
1. The last figure of the result value is a significant figure.
 2. # determination of the component is not covered by NATA Accreditation.
 3. ^ indicates result is out of specification according to the reference guideline. Refer to report footer.
 4. * indicates an incident has been recorded against the sample. Refer to report footer.
 5. & Indicates the results have changed since the last issued report.
 6. Where a result is required to meet compliance limits the associated measurement uncertainty must be considered. Measurement uncertainty is available at <https://www.awqc.com.au/our-services/Water-quality-testing-and-analysis/measurement-uncertainty>
 7. Uncertainty of Measurement is reported with a coverage factor of 2 providing approximately 95% confidence interval
 8. The Limit of Reporting (LOR) is the lowest concentration of analyte which is reported at the AWQC and is based on the LOQ rounded up to a more readily used value. The Limit of Quantitation (LOQ) is the lowest concentration of analyte for which quantitative results may be obtained within a specified degree of confidence.
 9. Where collection type is AWQC Collect, NATA has confirmed that due to a robust system in place for maintaining the temperature integrity for samples collected by AWQC's Field Laboratory Services, the recording of temperature when samples arrive at the AWQC is out of scope.
 10. If pH has been tested then the pH will be outside of its holding time unless measured in the field.
 11. (ADEL) indicates analysed in Adelaide, (MELB) indicates analysed in Melbourne.