



CITY COUNCIL OF BROKEN HILL  
ATTN: Kathy Graham  
240 Blende Street  
Broken Hill  
NSW 2880 AUSTRALIA

08/06/2023

Dear Kathy

Please find attached the Final Analytical Report for

**Customer Service Request:** 120503-2022-CSR-1  
**Account:** 120503  
**Project:** AWQC-182149 City Council of Broken Hill - Bore Program - Routine 22/23

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

Yours sincerely,

Scott Kraft  
Customer Services Officer  
[Scott.Kraft@sawater.com.au](mailto:Scott.Kraft@sawater.com.au)  
+61 8 7424 1250



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## FINAL REPORT: 363709

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## Report Information

Project Name	AWQC-182149
Customer	CITY COUNCIL OF BROKEN HILL
CSR_ID	120503-2022-CSR-1

## Analytical Results

Sampling Point	90144-City Council of Broken Hill - Bore Hole 3
Sampled Date	23/05/2023 6:30:00AM
Sample Received Date	23/05/2023 3:28:34PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0571
Status	Endorsed
Collection Type	Customer Collected

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Cadmium - Total TIC-006(ADEL)</b>			24/05/2023
Cadmium - Total	0.0001	0.0006 mg/L	
<b>Calcium TIC-006(ADEL)</b>			24/05/2023
Calcium	0.05	99.7 mg/L	
<b>Lead - Total TIC-006(ADEL)</b>			24/05/2023
Lead - Total	0.0001	0.0031 mg/L	
<b>Magnesium TIC-006(ADEL)</b>			24/05/2023
Magnesium	0.05	124 mg/L	
<b>Potassium TIC-006(ADEL)</b>			24/05/2023
Potassium	0.05	27.2 mg/L	
<b>Sodium Adsorption Ratio TMZ-M06(ADEL)</b>			23/05/2023
Sodium Adsorption Ratio - Calculation		25.7	
<b>Sodium TIC-006(ADEL)</b>			24/05/2023
Sodium	0.1	1630 mg/L	
<b>Sulphur TIC-006(ADEL)</b>			29/05/2023
Sulphate	0.6	1070 mg/L	
Sulphur	0.2	358 mg/L	
<b>Total Hardness as CaCO3 TMZ-M06(ADEL)</b>			23/05/2023
Total Hardness as CaCO3	2.0	760 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Ammonia as N T0100-01(ADEL)</b>			06/06/2023



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## Analytical Results

Sampling Point	90144-City Council of Broken Hill - Bore Hole 3
Sampled Date	23/05/2023 6:30:00AM
Sample Received Date	23/05/2023 3:28:34PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0571
Status	Endorsed
Collection Type	Customer Collected

<b>Ammonia as N T0100-01(ADEL)</b>			06/06/2023
Ammonia as N	0.005	<0.005 mg/L	
<b>Chloride T0104-02(ADEL)</b>			01/06/2023
Chloride	4.0	1860 mg/L	
<b>Nitrate + Nitrite as N T0161-01(ADEL)</b>			05/06/2023
Nitrate + Nitrite as N	0.003	20.2 mg/L	
<b>Nitrogen - Total TMZ-M06(ADEL)</b>			23/05/2023
Nitrogen - Total		20.96 mg/L	
<b>TKN as N T0112-01(ADEL)</b>			01/06/2023
TKN as Nitrogen	0.05	0.76 mg/L	

Organic Chemistry	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Total Organic Carbon T0158-07(ADEL)</b>			26/05/2023
Total Organic Carbon	0.3	5.5 mg/L	

Inorganic Chemistry - Physical	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Conductivity &amp; Total Dissolved Solids T0016-01(ADEL)</b>			25/05/2023
Conductivity	2	8170 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	4710 mg/L	
<b>pH T0010-01(ADEL)</b>			25/05/2023
pH		7.7 pH units	
Temperature at which pH is measured		21.7 °C	



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## Analytical Results

Sampling Point	90143-City Council of Broken Hill - Bore Hole 2
Sampled Date	23/05/2023 6:50:00AM
Sample Received Date	23/05/2023 3:28:23PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0570
Status	Endorsed
Collection Type	Customer Collected

Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Cadmium - Total TIC-006(ADEL)</b>			24/05/2023
Cadmium - Total	0.0001	0.0002 mg/L	
<b>Calcium TIC-006(ADEL)</b>			24/05/2023
Calcium	0.05	91.3 mg/L	
<b>Lead - Total TIC-006(ADEL)</b>			24/05/2023
Lead - Total	0.0001	0.0063 mg/L	
<b>Magnesium TIC-006(ADEL)</b>			24/05/2023
Magnesium	0.05	91.7 mg/L	
<b>Potassium TIC-006(ADEL)</b>			24/05/2023
Potassium	0.05	20.5 mg/L	
<b>Sodium Adsorption Ratio TMZ-M06(ADEL)</b>			23/05/2023
Sodium Adsorption Ratio - Calculation		22.1	
<b>Sodium TIC-006(ADEL)</b>			24/05/2023
Sodium	0.1	1250 mg/L	
<b>Sulphur TIC-006(ADEL)</b>			29/05/2023
Sulphate	0.6	699 mg/L	
Sulphur	0.2	233 mg/L	
<b>Total Hardness as CaCO3 TMZ-M06(ADEL)</b>			23/05/2023
Total Hardness as CaCO3	2.0	606 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Ammonia as N T0100-01(ADEL)</b>			06/06/2023
Ammonia as N	0.005	<0.005 mg/L	
<b>Chloride T0104-02(ADEL)</b>			01/06/2023
Chloride	4.0	1270 mg/L	
<b>Nitrate + Nitrite as N T0161-01(ADEL)</b>			05/06/2023
Nitrate + Nitrite as N	0.003	8.38 mg/L	



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**Analytical Results**

Sampling Point	90143-City Council of Broken Hill - Bore Hole 2
Sampled Date	23/05/2023 6:50:00AM
Sample Received Date	23/05/2023 3:28:23PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0570
Status	Endorsed
Collection Type	Customer Collected

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<b>Nitrogen - Total TMZ-M06(ADEL)</b>			23/05/2023
Nitrogen - Total		9.70 mg/L	
<b>TKN as N T0112-01(ADEL)</b>			01/06/2023
TKN as Nitrogen	0.05	1.32 mg/L	

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Organic Chemistry	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Total Organic Carbon T0158-07(ADEL)</b>			26/05/2023
Total Organic Carbon	0.3	10.1 mg/L	

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Inorganic Chemistry - Physical	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Conductivity &amp; Total Dissolved Solids T0016-01(ADEL)</b>			25/05/2023
Conductivity	2	6160 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	3510 mg/L	
<b>pH T0010-01(ADEL)</b>			25/05/2023
pH		7.8 pH units	
Temperature at which pH is measured		21.7 °C	



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**Analytical Results**

Sampling Point	90142-City Council of Broken Hill - Bore Hole 1
Sampled Date	23/05/2023 7:10:00AM
Sample Received Date	23/05/2023 3:28:13PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0569
Status	Endorsed
Collection Type	Customer Collected

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Inorganic Chemistry - Metals	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Cadmium - Total TIC-006(ADEL)</b>			24/05/2023
Cadmium - Total	0.0001	0.0007 mg/L	
<b>Calcium TIC-006(ADEL)</b>			24/05/2023
Calcium	0.05	257 mg/L	
<b>Lead - Total TIC-006(ADEL)</b>			25/05/2023
Lead - Total	0.0001	0.0165 mg/L	
<b>Magnesium TIC-006(ADEL)</b>			24/05/2023
Magnesium	0.05	279 mg/L	
<b>Potassium TIC-006(ADEL)</b>			24/05/2023
Potassium	0.05	44.8 mg/L	
<b>Sodium Adsorption Ratio TMZ-M06(ADEL)</b>			23/05/2023
Sodium Adsorption Ratio - Calculation		23.7	
<b>Sodium TIC-006(ADEL)</b>			24/05/2023
Sodium	0.1	2300 mg/L	
<b>Sulphur TIC-006(ADEL)</b>			29/05/2023
Sulphate	0.6	1260 mg/L	
Sulphur	0.2	420 mg/L	
<b>Total Hardness as CaCO3 TMZ-M06(ADEL)</b>			23/05/2023
Total Hardness as CaCO3	2.0	1790 mg/L	

Inorganic Chemistry - Nutrients	LOR	Result	Test Start Date
<i>Sample temperature at time of receipt 13.6°C</i>			
<b>Ammonia as N T0100-01(ADEL)</b>			06/06/2023
Ammonia as N	0.005	0.018 mg/L	
<b>Chloride T0104-02(ADEL)</b>			01/06/2023
Chloride	4.0	2120 mg/L	
<b>Nitrate + Nitrite as N T0161-01(ADEL)</b>			05/06/2023
Nitrate + Nitrite as N	0.003	45.8 mg/L	



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**Analytical Results**

Sampling Point	90142-City Council of Broken Hill - Bore Hole 1
Sampled Date	23/05/2023 7:10:00AM
Sample Received Date	23/05/2023 3:28:13PM
Sample Analysis Completed	7/06/2023 8:43:32AM
Sample ID	*2023-003-0569
Status	Endorsed
Collection Type	Customer Collected

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<b>Nitrogen - Total TMZ-M06(ADEL)</b>			23/05/2023
Nitrogen - Total		48.07 mg/L	
<b>TKN as N T0112-01(ADEL)</b>			01/06/2023
TKN as Nitrogen	0.05	2.27 mg/L	

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Organic Chemistry	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Total Organic Carbon T0158-07(ADEL)</b>			26/05/2023
Total Organic Carbon	0.3	21.1 mg/L	

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Inorganic Chemistry - Physical	LOR	Result	Test Start Date
<b>Sample temperature at time of receipt 13.6°C</b>			
<b>Conductivity &amp; Total Dissolved Solids T0016-01(ADEL)</b>			25/05/2023
Conductivity	2	12500 µS/cm	
Note		Conductivity measurement is corrected to 25°C	
Total Dissolved Solids (by EC)	1	7360 mg/L	
<b>pH T0010-01(ADEL)</b>			25/05/2023
pH		7.2 pH units	
Temperature at which pH is measured		21.8 °C	



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**AWQC Signatories**

Thuy Diep - Technical Officer Chemistry

Andrew Ford - Acting Method Development Specialist

Kerrie Jooste - Manager Chemistry Services

John Martini - Method Development Specialist

Gayle Polley - Supervisor Nutrients and Waste



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### Incidents

Sample ID	S.Point	Description	Sampled Date	Analysis (where Applicable)	Incident Description
2023-003-0569	90142	City Council of Broken Hill - Bore Hole 1	23/05/2023	pH	Test not processed within holding time
2023-003-0570	90143	City Council of Broken Hill - Bore Hole 2	23/05/2023	pH	Test not processed within holding time
2023-003-0571	90144	City Council of Broken Hill - Bore Hole 3	23/05/2023	pH	Test not processed within holding time

### Analytical Method

Analytical Method Code	Description	Reference Method
T0010-01	Determination of pH	AP4500HB
T0016-01	Determination of Conductivity - Corrected to 25C	AP2510B
T0100-01	Ammonia/Ammonium - Automated Flow Colorimetry	AP4500NH3G
T0104-02	Chloride - Discrete Analyser	AP4500CLE
T0112-01	Nitrogen- Total Kjeldahl by discrete analyser	AP4500NORGA
T0158-07	Total and Dissolved Organic Carbon (OI Analytical)	SM5310C
T0161-01	Nitrate + Nitrate (NOx) - Automated Flow Colorimetry	AP4500NO3I
TIC-006	Elemental Analysis By ICP- MS	EPA200.8
TMZ-M06	Derived Results and Data Checks	
TMZ-M06	Derived Results and Data Checks	AP4500NORGA
TMZ-M06	Derived Results and Data Checks	APHA2340B
W-052	Preparation of Samples for Metal Analysis	AP3030AD

### Sampling Method

Sampling Method Code	Description
W09-023	Sampling Method for Chemical Analyses <b>Sampling point and date sampled are provided when collected by customers. Validity of results are based on information and samples supplied by customers. Unless it is reported that sampling has been performed by AWQC, the samples have been analysed as received.</b>

### Laboratory Information

Laboratory	NATA accreditation ID
Inorganic Chemistry - Physical	1115
Inorganic Chemistry - Nutrients	1115
Organic Chemistry	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.
  12. AWQC Melbourne Laboratory are only NATA accredited for sampling of potable waters by inhouse method W 09-023.