

Construction Water Quality Monitoring Report

Event 1C 2024

Project Number: 22-013



Document verification

Project Title: Event 1C 2024

Project Number: 22-013

Project File Name: 22-013 WQM Field and Lab Report Event 1C Final V.1.docx

Revision	Date	Prepared by	Reviewed by	Approved by
Draft	6/05/2024	Martin Wyburn	Nicola Smith	Nicola Smith
Final V.1	15/05/2024	Martin Wyburn	Nicola Smith	Nicola Smith

NGH Pty Ltd is committed to environmentally sustainable practices, including fostering a digital culture and minimising printing. Where printing is unavoidable, NGH prints on 100% recycled paper.



W. www.nghconsulting.com.au

BEGA - ACT & SOUTH EAST NSW

Suite 11, 89-91 Auckland Street
(PO Box 470) Bega NSW 2550
T. (02) 6492 8333

BRISBANE

T3, Level 7, 348 Edward Street
Brisbane QLD 4000
T. (07) 3129 7633

CANBERRA - NSW SE & ACT

Unit 8, 27 Yallourn Street
(PO Box 62) Fyshwick ACT 2609
T. (02) 6280 5053

GOLD COAST

2B 34 Tallebudgera Creek Road
Burleigh Heads QLD 4220
(PO Box 424 West Burleigh QLD 4219)
T. (07) 3129 7633

E. ngh@nghconsulting.com.au

NEWCASTLE - HUNTER & NORTH COAST

Level 1, 31-33 Beaumont Street
Hamilton NSW 2303
T. (02) 4929 2301

SYDNEY REGION

Unit 17, 21 Mary Street
Surry Hills NSW 2010
T. (02) 8202 8333

WAGGA WAGGA - RIVERINA & WESTERN NSW

35 Kincaid Street (PO Box 5464)
Wagga Wagga NSW 2650
T. (02) 6971 9696

WODONGA

Unit 2, 83 Hume Street
(PO Box 506) Wodonga VIC 3690
T. (02) 6067 2533

NSW • ACT • QLD • VIC

W. www.nghconsulting.com.au

ABN 31 124 444 622 ACN 124 444 622

Table of contents

- 1. Introduction..... 3
- 2. Program and methodology 3
- 3. Monitoring event observations and results..... 5
 - 3.1. Event 25..... 5
 - 3.1.1. Results..... 7
 - 3.2. Quality Assurance / Quality Control 26
- 4. Conclusion..... 27
- 5. References 28

Figures

- Figure 2-1 WQM locations 4
- Figure 3-1 Yarrangobilly River (YR2-RS) 6
- Figure 3-2 Wallaces Creek (WC-IS)..... 6
- Figure 3-3 Yorkers Creek (YK-IS (D/S))..... 6
- Figure 3-4 Temperature for Talbingo Reservoir Catchment..... 11
- Figure 3-5 Temperature for Lick-Hole Gully Impact Site 11
- Figure 3-6 Temperature for Yorkers Creek Catchment..... 11
- Figure 3-7 DO (%) for Talbingo Reservoir Catchment 12
- Figure 3-8 DO (%) for Lick-Hole Gully Impact Site..... 12
- Figure 3-9 DO (%) for Yorkers Creek Catchment 12
- Figure 3-10 DO (ppm) for Talbingo Reservoir Catchment 13
- Figure 3-11 DO (ppm) for Lick-Hole Gully Impact Site..... 13
- Figure 3-12 DO (ppm) for Yorkers Creek Catchment..... 13
- Figure 3-13 Specific Conductance ($\mu\text{S}/\text{cm}$) for Talbingo Reservoir Catchment 14
- Figure 3-14 Specific Conductance ($\mu\text{S}/\text{cm}$) for Lick-Hole Gully Impact Site 14
- Figure 3-15 Specific Conductance ($\mu\text{S}/\text{cm}$) for Yorkers Creek Catchment..... 14
- Figure 3-16 Conductivity ($\mu\text{S}/\text{cm}$) for Talbingo Reservoir Catchment..... 15
- Figure 3-17 Conductivity ($\mu\text{S}/\text{cm}$) for Lick-Hole Gully Impact Site 15
- Figure 3-18 Conductivity ($\mu\text{S}/\text{cm}$) for Yorkers Creek Catchment..... 15
- Figure 3-19 Potential of hydrogen (pH) readings for Talbingo Reservoir Catchment 16
- Figure 3-20 Potential of hydrogen (pH) reading for Lick-Hole Gully Impact Site 16
- Figure 3-21 Potential of hydrogen (pH) readings for Yorkers Creek Catchment 16
- Figure 3-22 ORP (mV) for Talbingo Reservoir Catchment..... 17

Figure 3-23 ORP (mV) for Lick-Hole Gully Impact Site 17

Figure 3-24 ORP (mV) for Yorkers Creek Catchment..... 17

Figure 3-25 Turbidity (NTU) for Talbingo Reservoir Catchment..... 18

Figure 3-26 Turbidity (NTU) for Lick-Hole Gully Impact Site 18

Figure 3-27 Turbidity (NTU) for Yorkers Creek Catchment..... 18

Figure 3-28 Ammonia (mg/L) for Talbingo Reservoir Catchment..... 19

Figure 3-29 Ammonia (mg/L) for Lick-Hole Gully Impact Site 19

Figure 3-30 Ammonia (mg/L) for Yorkers Creek Catchment..... 19

Figure 3-31 Nitrogen Oxides (mg/L) for Talbingo Reservoir Catchment..... 20

Figure 3-32 Nitrogen Oxides (mg/L) for Lick-Hole Gully Impact Site 20

Figure 3-33 Nitrogen Oxides (mg/L) for Yorkers Creek Catchment 20

Figure 3-34 Reactive phosphorus (mg/L) for Talbingo Reservoir Catchment..... 21

Figure 3-35 Reactive phosphorus (mg/L) for Lick-Hole Gully Impact Site 21

Figure 3-36 Reactive phosphorus (mg/L) for Yorkers Creek Catchment 21

Figure 3-37 Total Hardness (CaCO3) for Talbingo Reservoir Catchment 22

Figure 3-38 Total Hardness (CaCO3) for Lick-Hole Gully Impact Site..... 22

Figure 3-39 Total Hardness (CaCO3) for Yorkers Creek Catchment 22

Figure 3-40 TKN for Talbingo Reservoir Catchment..... 23

Figure 3-41 TKN for Lick-Hole Gully Impact Site 23

Figure 3-42 TKN for Yorkers Creek Catchment 23

Figure 3-43 Total Dissolved Solids (mg/L) for Talbingo Reservoir Catchment 24

Figure 3-44 Total Dissolved Solids (mg/L) for Lick-Hole Gully Impact Site..... 24

Figure 3-45 Total Dissolved Solids (mg/L) for Yorkers Creek Catchment 24

Figure 3-46 Total Suspended Solids (mg/L) for Talbingo Reservoir Catchment..... 25

Figure 3-47 Total Suspended Solids (mg/L) for Lick-Hole Gully Impact Site 25

Figure 3-48 Total Suspended Solids (mg/L) for Yorkers Creek Catchment..... 25

Appendices

Appendix A Event Data Table A-I

Appendix B Observations and Field Data B-I

Appendix C Laboratory Certificates..... C-I

Appendix D RPD Table D-I

Appendix E Calibration Certificates E-I

1. Introduction

To connect Snowy 2.0 to the National Energy Market (NEM), a new transmission connection is required. NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (known as TransGrid and the Proponent) will construct a substation and overhead transmission lines (the Project) to facilitate the connection of Snowy 2.0 to the existing electrical transmission network. The Project location is approximately 27 kilometres (km) east of Tumbarumba, New South Wales (NSW). UGL has been engaged on behalf of the Proponent to undertake the Project.

The purpose of the construction water quality monitoring is to address the requirements of the Environmental Impact Statement (EIS) (Jacobs 2020) that was prepared by the Proponent under Part 5, Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* to assess the environmental impacts of the proposed Project. Subsequently, an Amendment Report (TransGrid 2021b) was submitted with the Response to Submissions (TransGrid 2021a) to the Department of Planning and Environment (DPE) with updated mitigation measures for the Project.

The objective of the construction surface water quality monitoring is to collect data during the construction phase of works. This data will be compared to the baseline water values obtained during the pre-construction water quality monitoring (NGH 2022a – 2024b), the site-specific trigger values (NGH, 2024c) and the ANZG (2018) guidelines to characterise the existing surface water quality. The data will be compared to the water quality objectives (WQO) for the Project area.

2. Program and methodology

The Construction Water Quality Monitoring Program and Methodology (the Program) (NGH 2022k) has been prepared to detail the WQOs for the Project, the location of the monitoring locations and the methodology for water sampling.

The Project area within Kosciuszko National Park is an area of high conservation value. Therefore, the water quality objectives for physical and chemical stressors includes **no change beyond natural variability** (ANZG 2018).

The location of the sampling points in relation to the Project footprint is provided in Figure 2-1.

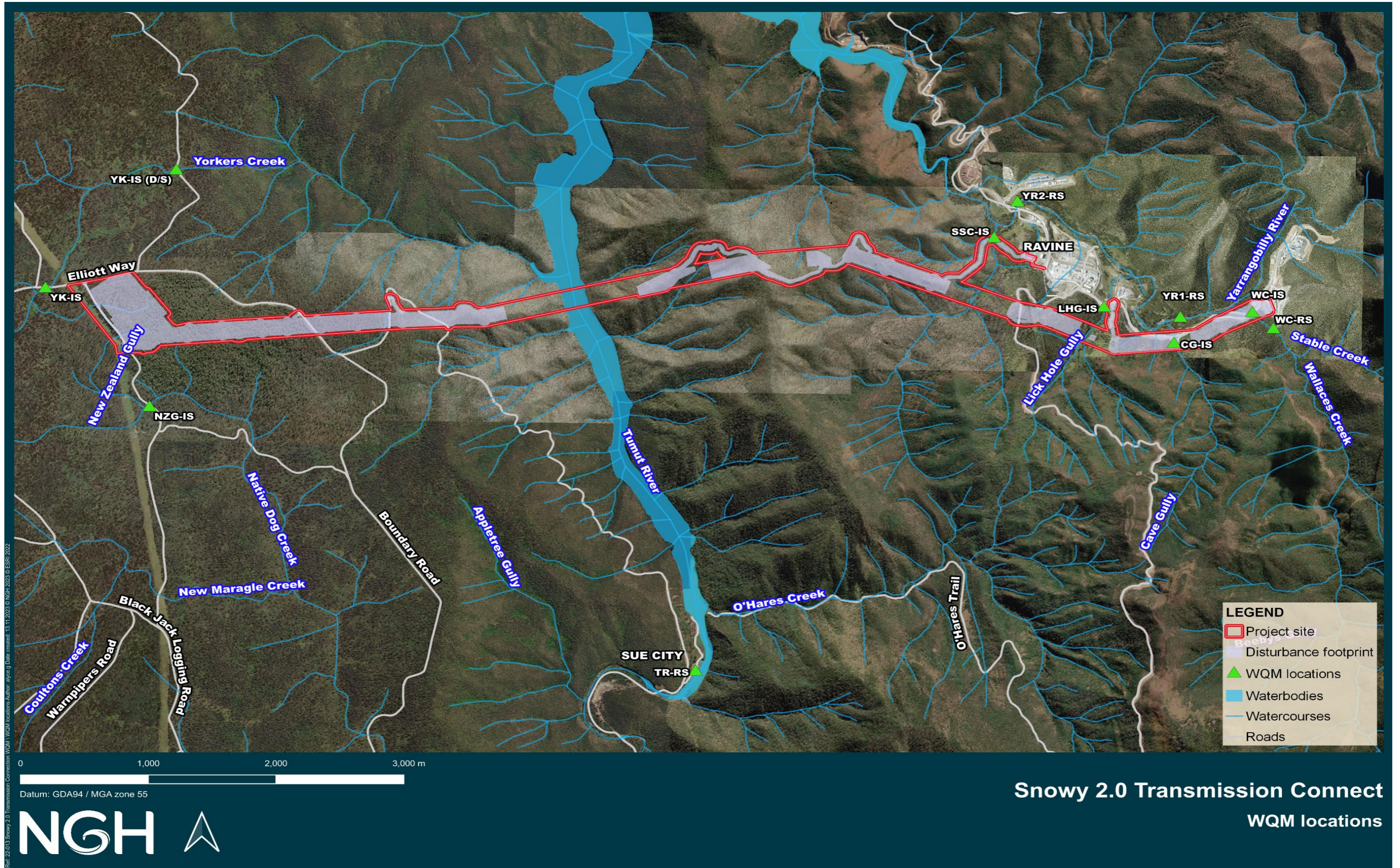


Figure 2-1 WQM locations

3. Monitoring event observations and results

Images for Yarrangobilly River (YR2-RS), Wallaces Creek (WC-IS) and New Zealand Gully (NZG-IS) are provided as Figure 3-1 to Figure 3-3. Water quality results for each site are provided in Appendix A. Results are highlighted where they exceed the default guideline value (refer to the Program (NGH 2022k)). Section 3.1.1 identifies exceedances of the Adopted trigger values for metals, cyanide and nutrients. Physico-chemical results have been provided in Figure 3-4 to Figure 3-48. Field data and observations are provided in Appendix B.

3.1. Event 1C construction monitoring

NGH has conducted monthly pre-construction sampling events since March 2022 (Event 1). Reports for each event were prepared following receipt of the laboratory results (NGH 2022a – 2024b). The results of Event 1 through to Event 24 have been compiled to form Project trigger values for ongoing construction water quality monitoring. These trigger values have been compared in this report to the results for Event 1C construction monitoring.

NGH Environmental Scientist Martin Wyburn conducted monitoring for Event 1C with a UGL representative on 26 March 2024. The weather was sunny. Data from the Tumbarumba weather station (Station ID 072043) indicates that it was calm, with temperatures ranging from a low of 6.0°C to a high of 28.0°C. Between the 22 February 2024 and 26 March 2024, 42.2 millimetres (mm) of rainfall was recorded. Data from the Cabramurra SMHEA automatic weather station (Station ID 072161) indicates that morning winds were from south southwest with speeds of 15 km/hr. During the afternoon, winds were from the west with speeds of 19 km/hr. Temperatures on the day included a low of 9.3°C and a high of 18.6°C. Between the 22 February 2024 and 26 March 2024 66.8 mm of rainfall was recorded.

Clear, low flows were observed at most locations. Both CG-IS and SSC-IS were dry at the time of sampling. A sheen was detected on the surface water at LGH-IS and YK-RS, which is likely attributed to bacteria or other natural source.

No odours were noted. The banks of each channel were well vegetated, with the vegetation matrix weedier in some locations. Evidence of bank erosion from hooved animals was observed at the New Zealand Gully site with a section of the bank collapsed into the stream. Evidence of bank erosion from hooved animals was also noted at the Yorkers Creek impact site and the Yorkers Creek reference site.



Figure 3-1 Yarrangobilly River (YR2-RS)



Figure 3-2 Wallaces Creek (WC-IS)



Figure 3-3 Yorkers Creek (YK-IS (D/S))

3.1.1. Results

A summary of the pre-construction water quality monitoring (WQM), including the site specific triggers values, identified in the Baseline Water Quality Report (NGH, 2024c) are provided in Table 3-1. The data obtained during the pre-construction sampling events have been divided into the Talbingo Reservoir catchment (which includes the Talbingo Reservoir reference site and the Yarrangobilly River and its tributaries) and the Yorkers Creek catchment (which includes the three sampling locations along Yorkers Creek and New Zealand Gully). Results for CG-IS and LHG-IS have been detailed independently due to the high variance observed within some of the pre-construction monitoring results.

Table 3-1 Results summary and adopted site-specific trigger values for pre-construction WQM

Parameter	DGV	Talbingo Reservoir catchment			CG-IS			LHG-IS			Yorkers Creek catchment		
		Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value
DO%	90 – 110%	87.27	111.0	54 – 121 ¹	85.48	116.90	47 – 123	78.78	100.50	47 – 110	85.09	102.10	58 -112
DO (ppm)	-	9.51	19.18	5.3 – 13.7	9.24	12.06	5.8 – 12.6	8.34	11.22	4.6 – 12.0	9.16	12.79	5.8 – 12.6
SPC (µS/cm)	-	88.09	177.0	13.0 – 163.2	479.86	583.00	357.1 – 602.6	496.08	627.0	322.6 – 669.6	34.56	61.30	17.8 – 51.3
EC (µS/cm)	30 – 350	69.56	149.40	3.4 – 135.8	376.03	445.30	287 – 465	383.72	513.0	240.5 – 526.9	25.46	49.80	10.7 – 40.2
pH units	6.5 – 8.0	7.67	8.80	6.8 - 8.6	7.83	8.42	7.0 – 8.6	7.68	8.34	7.0 – 8.3	6.90	8.39	6.0 – 7.8
Redox (mV)	-	104.67	258.30	22.4 – 186.9	117.64	189.20	42.2 – 193.1	36.78	149.91	-61.1 – 134.7	104.08	235.60	24.0 – 184.1
Turbidity (NTU)	2.0 – 25.0	7.18	124.93	0 – 41.4	41.43	785.48	0 – 367.6	24.98	149.91	0 – 101.0	10.15	59.63	0 – 30.3
Aluminium (mg/L)	0.027	0.14	1.73	0.8	0.10	1.06	0.55	0.11	0.41	0.34	0.26	0.87	0.67
Arsenic (mg/L)	0.0008	<0.0003	<0.0003	0.0002	<0.0003	<0.0003	0.0002	<0.0003	<0.0003	0.0002	<0.0003	<0.0003	0.0002
Cadmium (mg/L)	0.0006	0.002	0.0001	0.0006	0.0001	0.002	0.001	0.0001	0.003	0.001	0.0001	0.001	0.0004
Chromium (mg/L)	0.00001	0.0001	0.004	0.0012	0.0003	0.003	0.002	0.00027	0.003	0.002	0.0001	0.01	0.002
Copper (mg/L)	0.001	0.0004	0.004	0.002	0.001	0.01	0.004	0.002	0.01	0.01	0.0005	0.01	0.002
Cyanide (mg/L)	0.004	<0.002	<0.002	0.001	<0.002	<0.002	0.001	<0.002	<0.002	0.001	<0.002	<0.002	0.001
Iron (mg/L)	0.3	0.07	0.77	0.3	0.03	0.52	0.24	0.08	0.28	0.25	0.23	0.74	0.6
Lead (mg/L)	0.001	0.001	0.02	0.005	0.001	0.004	0.003	0.002	0.01	0.01	0.00074	0.01	0.003
Manganese (mg/L)	1.2	0.002	0.02	0.008	0.001	0.01	0.001	0.02	0.09	0.08	0.01	0.04	0.002

¹ Trigger value = mean + (standard deviation x 2). Where a range was required (e.g. for DO%), the mean +/- the standard deviation (x 2) was utilised.

Parameter	DGV	Talbingo Reservoir catchment			CG-IS			LHG-IS			Yorkers Creek catchment		
		Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value	Average	Maximum	Adopted trigger value
Mercury (mg/L)	0.0001	<0.00003	<0.00003	0.0001	<0.00003	<0.00003	0.0001	<0.00003	<0.00003	0.0001	<0.00003	<0.00003	0.0001
Nickel (mg/L)	0.008	0.001	0.004	0.002	0.001	0.01	0.003	0.0016	0.01	0.01	0.0005	0.002	0.001
Total nitrogen (mg/L)	0.25	0.25	7.0	1.82	0.31	2.0	1.46	0.22	2.0	1.08	0.44	9.0	2.94
Nitrogen oxides (mg/L)	0.015	0.05	1.10	0.30	0.04	0.30	0.16	0.04	0.10	0.11	0.05	0.20	0.14
Total Kjeldahl Nitrogen (TKN) (mg/L)	-	0.21	7.0	1.70	0.14	1.0	0.50	0.22	2.0	1.08	0.23	3.0	1.12
Total phosphorous (mg/L)	0.02	0.02	0.50	0.14	0.03	0.35	0.17	0.02	0.07	0.06	0.02	0.17	0.07
Reactive phosphorous (mg/L)	0.015	0.01	0.09	0.06	0.01	0.03	0.02	0.01	0.05	0.04	0.01	0.07	0.04
Silver (mg/L)	0.00002	0.002	0.01	0.00002	0.00001	0.00001	0.00002	0.00001	0.00001	0.00002	0.00001	0.00001	0.00002
Zinc (mg/L)	0.0024	0.002	0.02	0.008	0.01	0.04	0.02	0.004	0.01	0.01	0.002	0.03	0.01
Ammonia (mg/L)	0.013	0.025	0.80	0.23	0.007	0.0007	0.007	0.007	0.0007	0.007	0.06	1.80	0.62
Total hardness (CaCO ₃) (mg/L)	-	34.83	74.00	70.05	0.14	1.0	341.37	282.92	306.0	308.8	7.40	19.0	17.01
Total Dissolved Solids (TDS) (mg/L)	-	47.41	343.0	142.71	258.75	317.0	341.94	288.30	353.0	381.8	21.32	106.0	59.21
Total Suspended Solids (TSS) (mg/L)	0.2	2.43	52.0	16.69	29.06	450.0	215.61	5.30	64.0	31.5	5.13	104.0	30.51

The results indicate that the water quality at the selected sampling locations generally meets the site-specific adopted trigger values (ATV). The only location that recorded a metal, cyanide or nutrient analyte above the ATV was at YK-IS. The result for Iron (0.66 mg/L) was elevated above the ATV but remained below the maximum recorded value for the Yorkers Creek catchment. Refer to Table 3-1.

Water temperatures ranged from 9.6 degrees Celsius at NZG-IS to 16.3 degrees Celsius at YK-RS, refer to Figure 3-4 and Figure 3-6.

Many of the results are recorded as below (<) the limit of detection. To enable calculation of the statistics, the *Limit of Detection Divided by Two (LOD/2) Method* (Cohen and Ryan 1989) has been applied. This data is provided in Appendix A.

The following figures, Figure 3-4 to Figure 3-48 display physico-chemical water quality for monitoring event 25. Where an ATV range is available, these values are shown on the graph and have been included for dissolved oxygen (%), dissolved oxygen (ppm), conductivity, pH and turbidity.

Although the Talbingo Reservoir is the ultimate catchment for both the Yarrangobilly River and tributaries, and Yorkers Creek and tributaries, the data has been divided into the Talbingo Reservoir catchment, which include the Talbingo Reservoir reference site sampling location and the Yarrangobilly River and its tributaries. These are all located in the Kosciuszko National Park. The Yorkers Creek catchment includes the three sampling locations along Yorkers Creek and New Zealand Gully, which are all located in the Bago State Forest. The confluence of Yorkers Creek with Tumut River (Talbingo Reservoir) is downstream of sampling location TR-RS but upstream of the confluence of the Yarrangobilly River and Tumut River.

Temperatures within the Talbingo Reservoir catchment ranged between 10.7°C at both WC-RS and WC-IS to 13.4°C at TR-RS, refer to Figure 3-4. The temperature at LHG-IS was 11.9°C, refer to Figure 3-5. Temperatures within the Yorkers Creek catchment ranged between 9.6°C at NZG-IS to 16.3°C at YK-RS, refer to Figure 3-6.

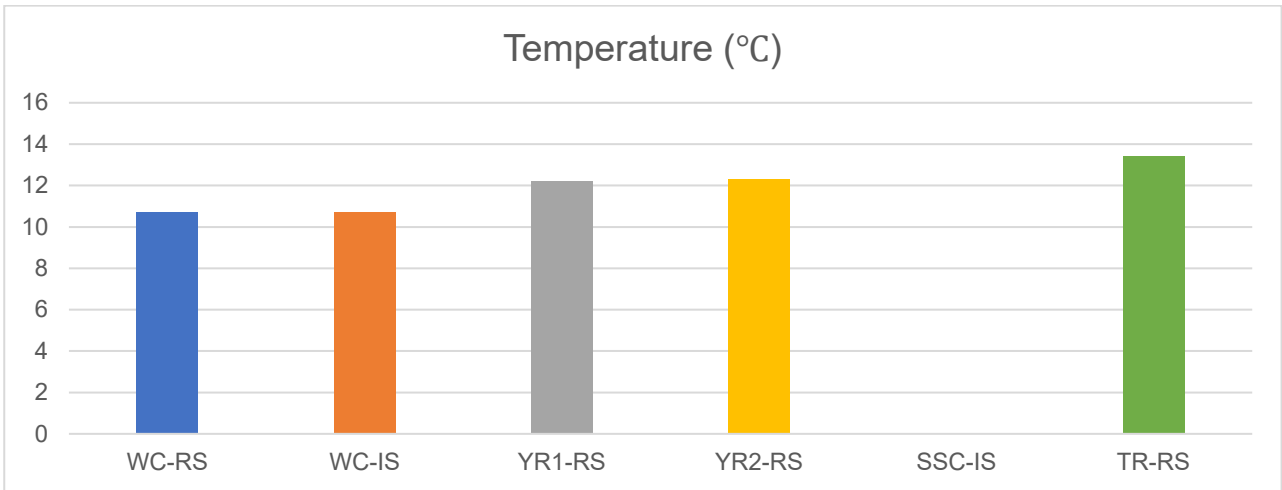


Figure 3-4 Temperature for Talbingo Reservoir Catchment

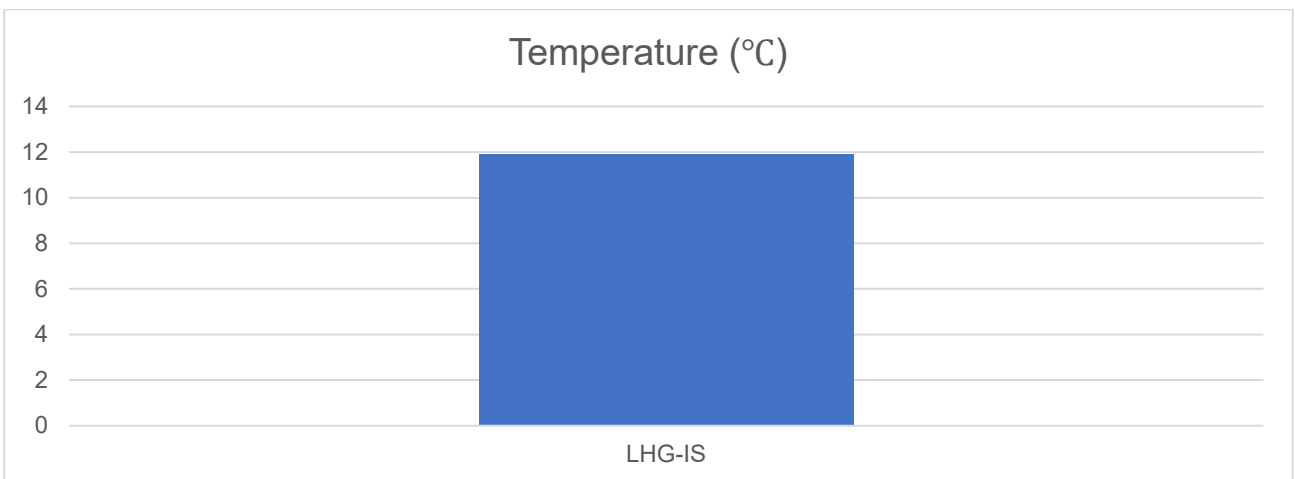


Figure 3-5 Temperature for Lick-Hole Gully Impact Site

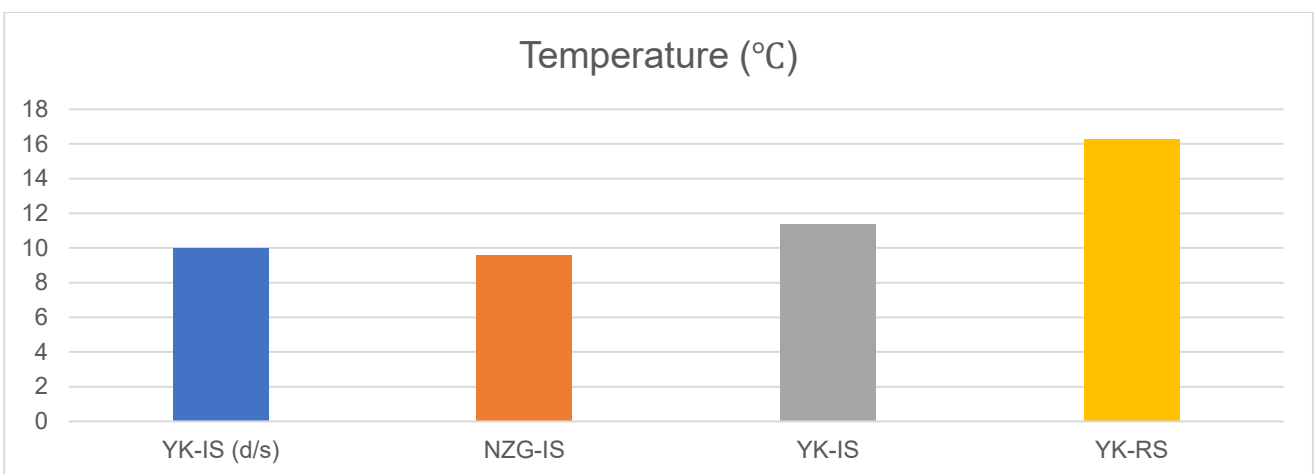


Figure 3-6 Temperature for Yorkers Creek Catchment

All DO (%) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were within the site-specific ATV ranges of 54% - 121%, 47% - 110% and 58% - 112% respectively. Refer to Figure 3-7, Figure 3-8 and Figure 3-9.

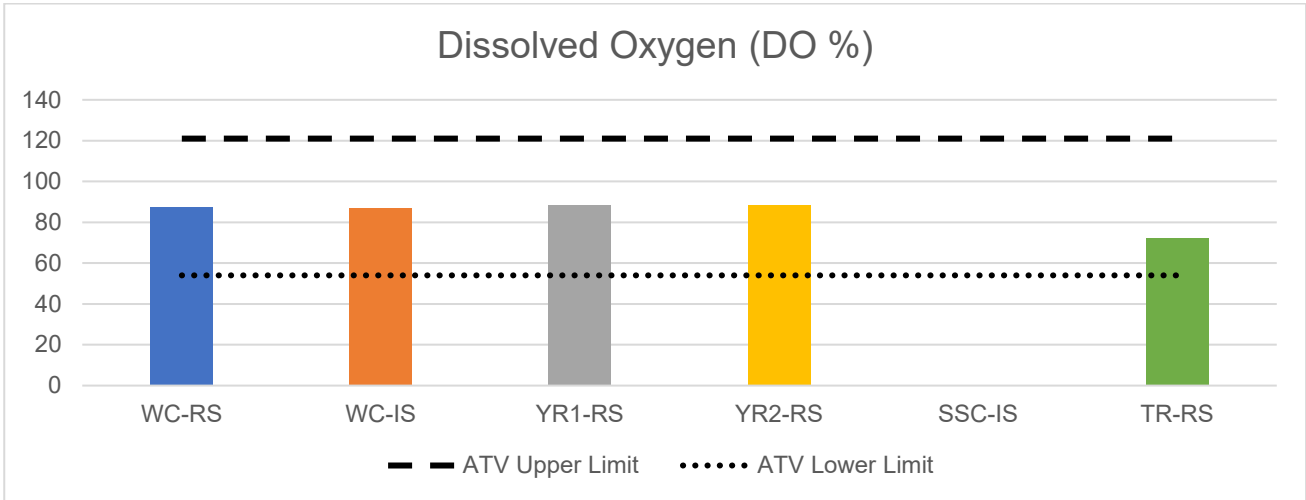


Figure 3-7 DO (%) for Talbingo Reservoir Catchment

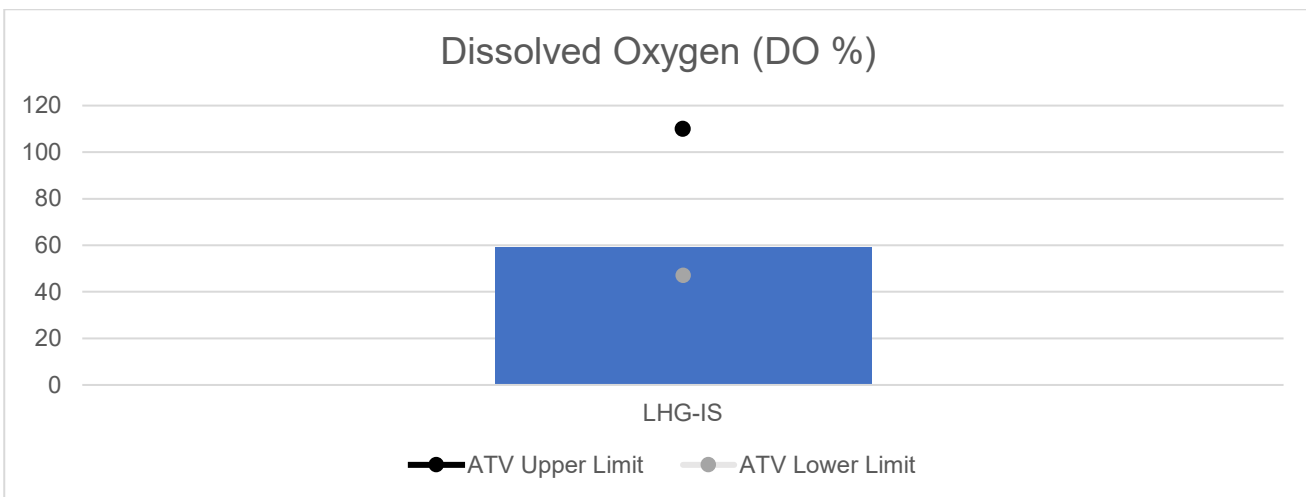


Figure 3-8 DO (%) for Lick-Hole Gully Impact Site

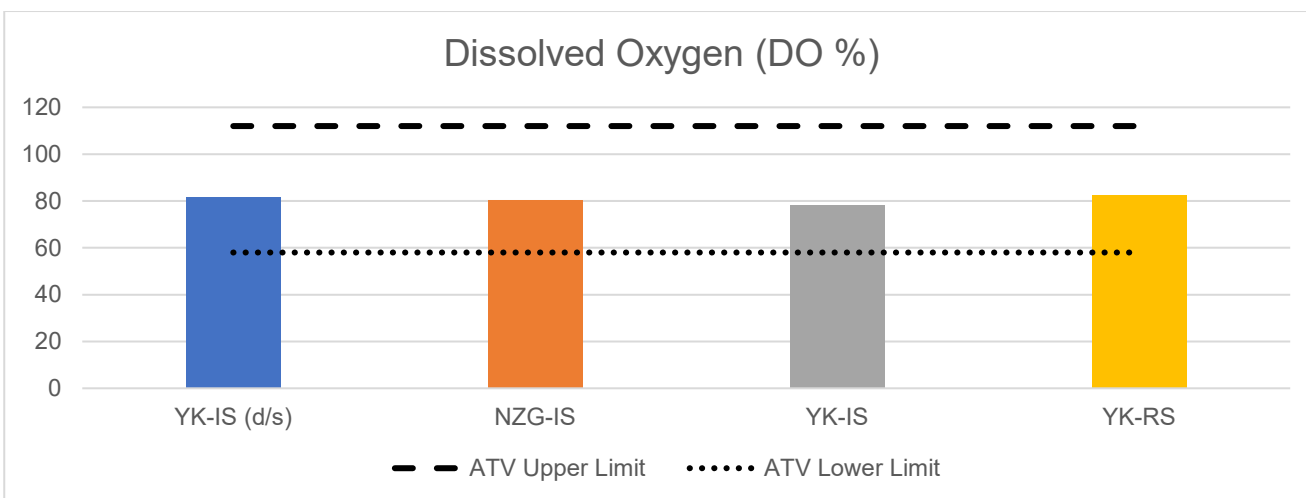


Figure 3-9 DO (%) for Yorkers Creek Catchment

All DO (ppm) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were within the site-specific ATV ranges of 5.3-13.7ppm, 4.6-12.0ppm and 5.8-12.6ppm respectively. Refer to Figure 3-10, Figure 3-11, Figure 3-12.

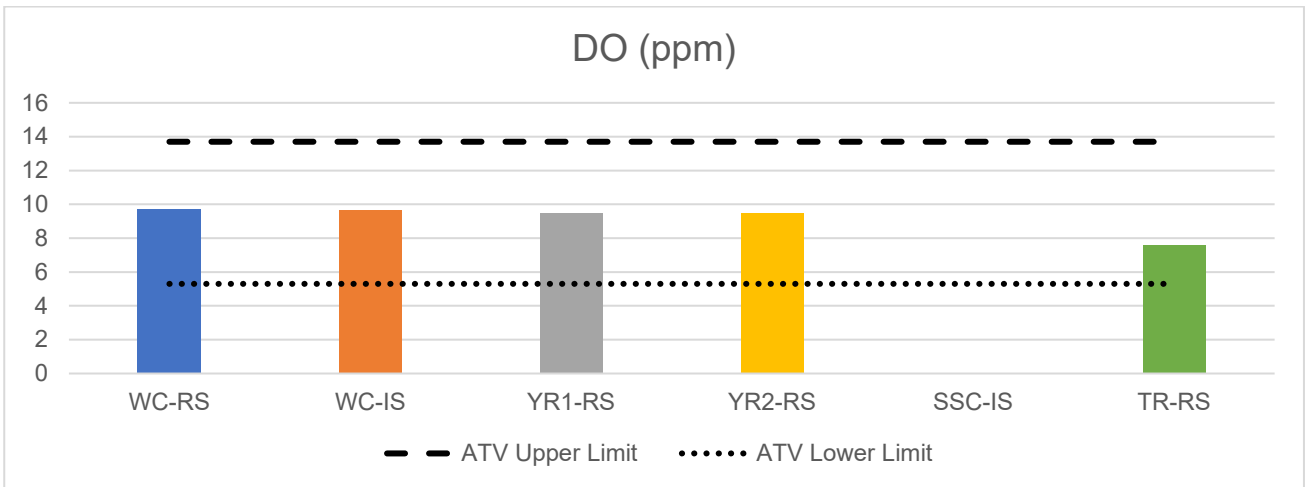


Figure 3-10 DO (ppm) for Talbingo Reservoir Catchment

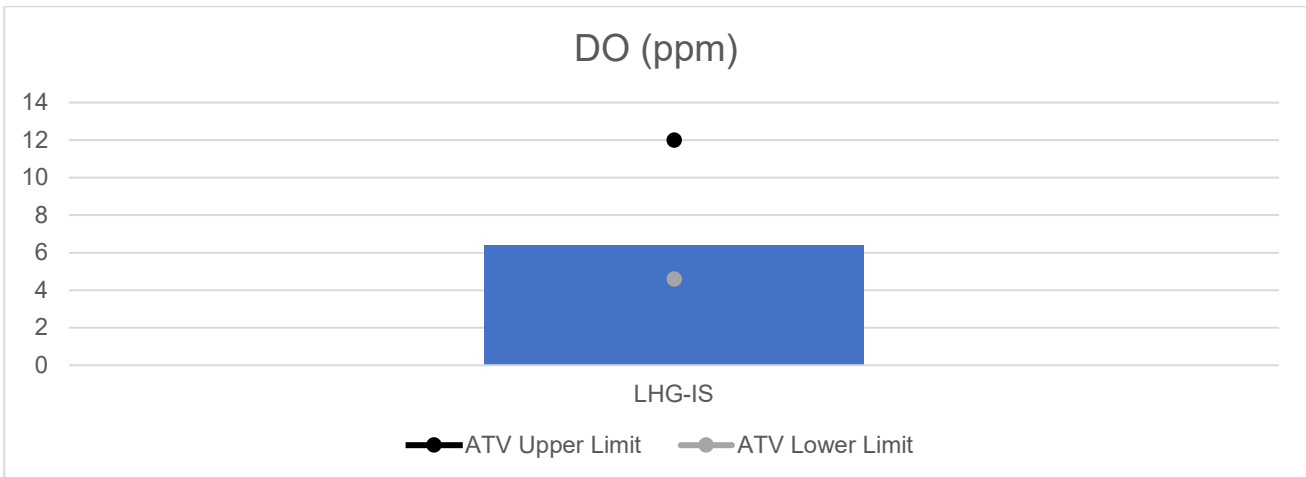


Figure 3-11 DO (ppm) for Lick-Hole Gully Impact Site

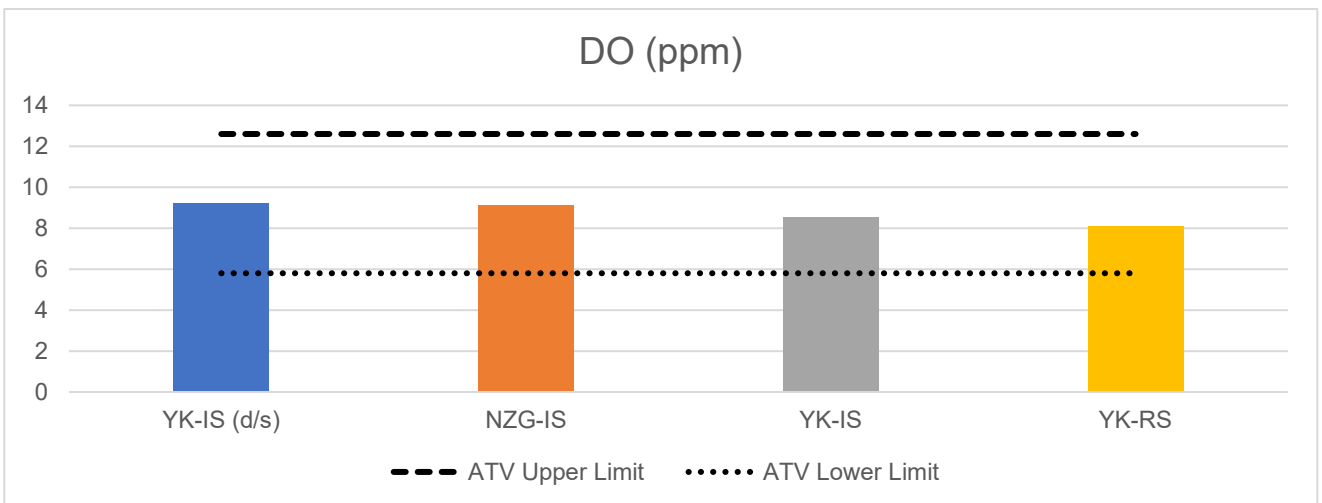


Figure 3-12 DO (ppm) for Yorkers Creek Catchment

Results for specific conductance within the Talbingo Reservoir catchment and LHG-IS were all within the site-specific ATV. TR-RS was notably lower than the other sampling locations (24 $\mu\text{S}/\text{cm}$), refer Figure 3-13 and Figure 3-14. All locations within the Yorkers Creek catchment were within the site-specific ATV, with the exception of NZG-IS, which returned a result of 64.2 $\mu\text{S}/\text{cm}$. Refer to Figure 3-15.

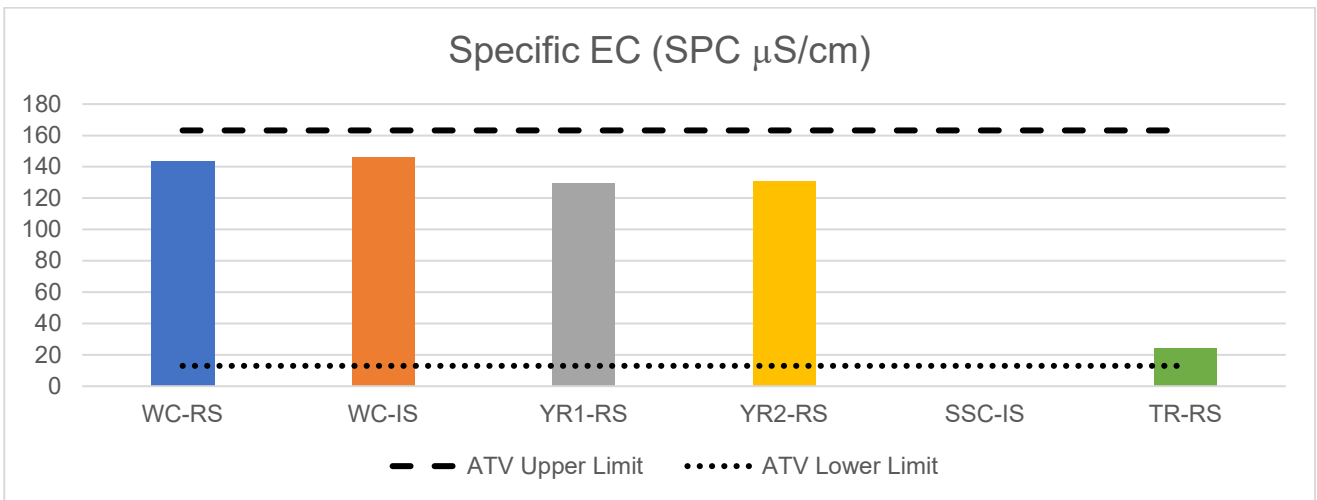


Figure 3-13 Specific Conductance ($\mu\text{S}/\text{cm}$) for Talbingo Reservoir Catchment

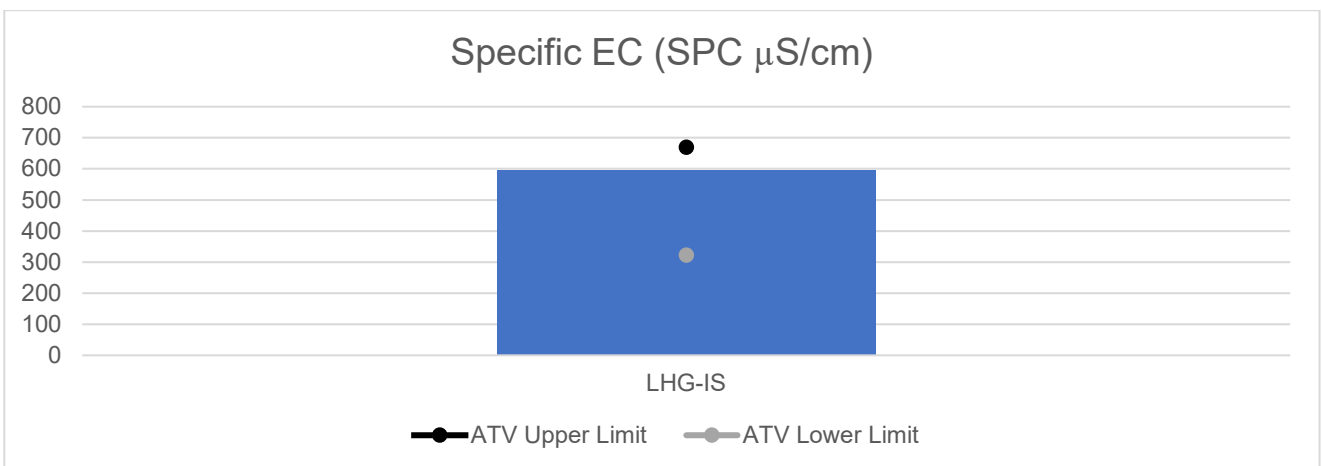


Figure 3-14 Specific Conductance ($\mu\text{S}/\text{cm}$) for Lick-Hole Gully Impact Site

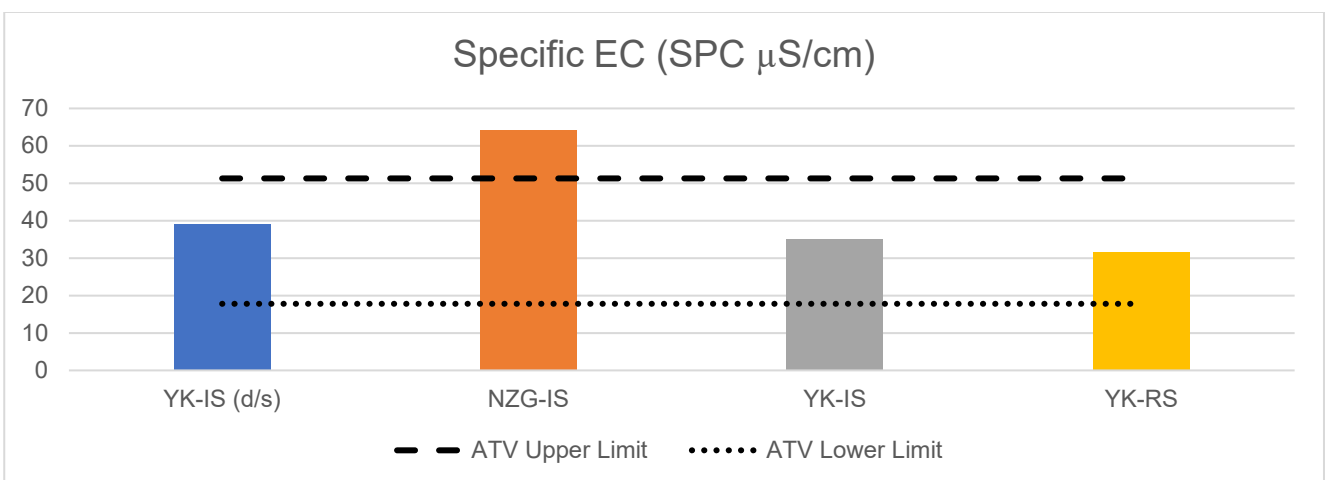


Figure 3-15 Specific Conductance ($\mu\text{S}/\text{cm}$) for Yorkers Creek Catchment

Results for Conductivity within the Talbingo Reservoir catchment and LHG-IS were all within the site-specific ATV. TR-RS was notably lower than the other sampling locations (18.7 $\mu\text{S}/\text{cm}$), refer Figure 3-16 and Figure 3-17. All locations within the Yorkers Creek catchment were within the site-specific ATV, with the exception of NZG-IS, which returned a result of 45.3 $\mu\text{S}/\text{cm}$. Refer to Figure 3-18.

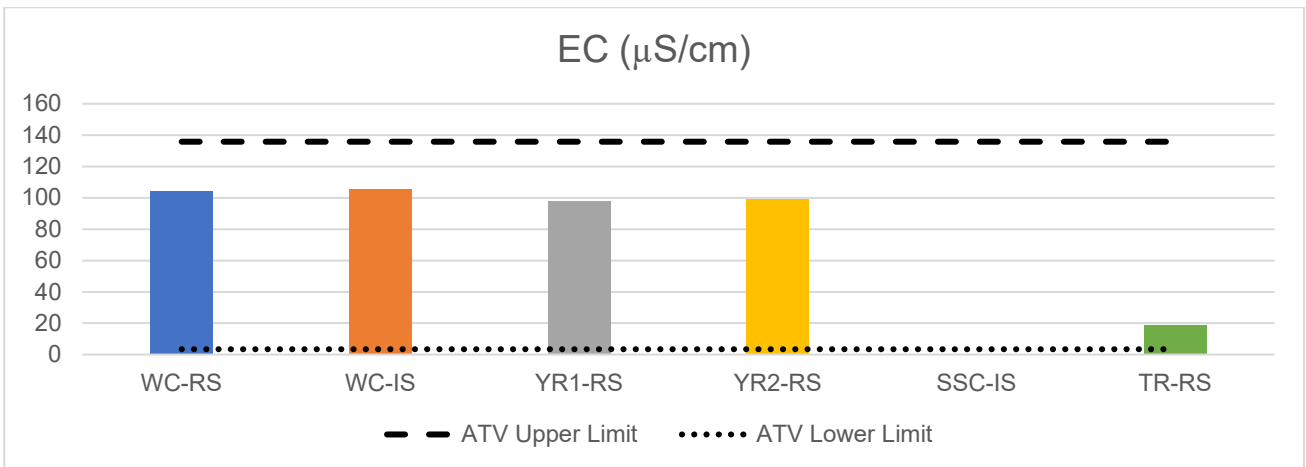


Figure 3-16 Conductivity ($\mu\text{S}/\text{cm}$) for Talbingo Reservoir Catchment

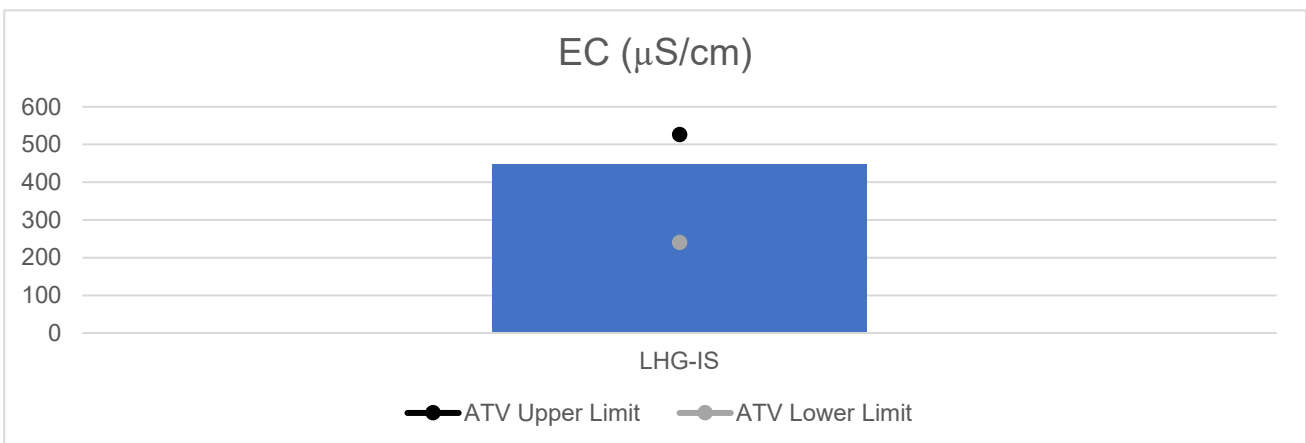


Figure 3-17 Conductivity ($\mu\text{S}/\text{cm}$) for Lick-Hole Gully Impact Site

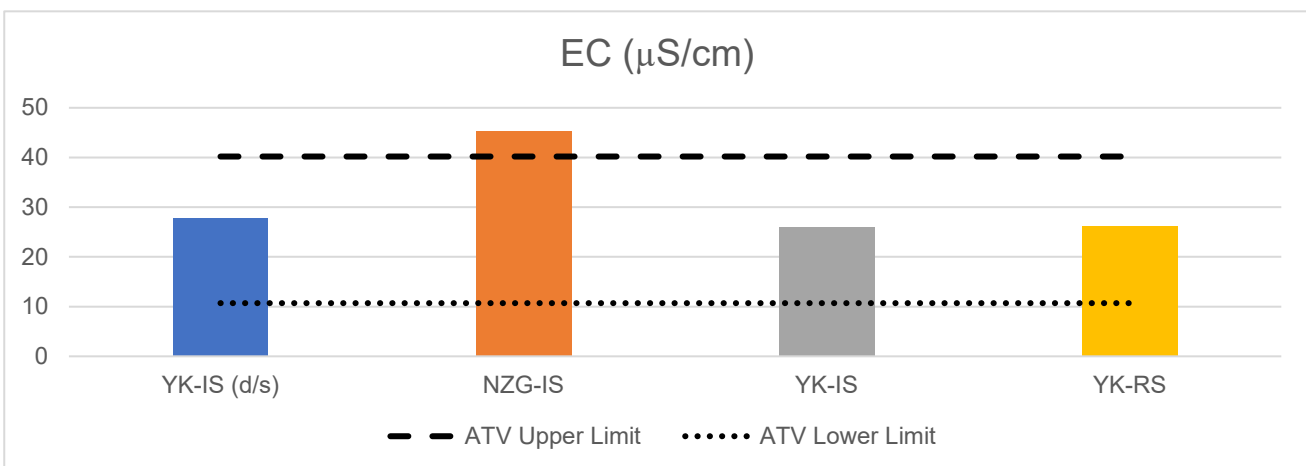


Figure 3-18 Conductivity ($\mu\text{S}/\text{cm}$) for Yorkers Creek Catchment

All pH results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were within the site-specific ATV ranges of 6.8-8.6pH, 7.0-8.3pH and 6.0-7.8pH respectively. Refer to Figure 3-19, Figure 3-20 and Figure 3-21.

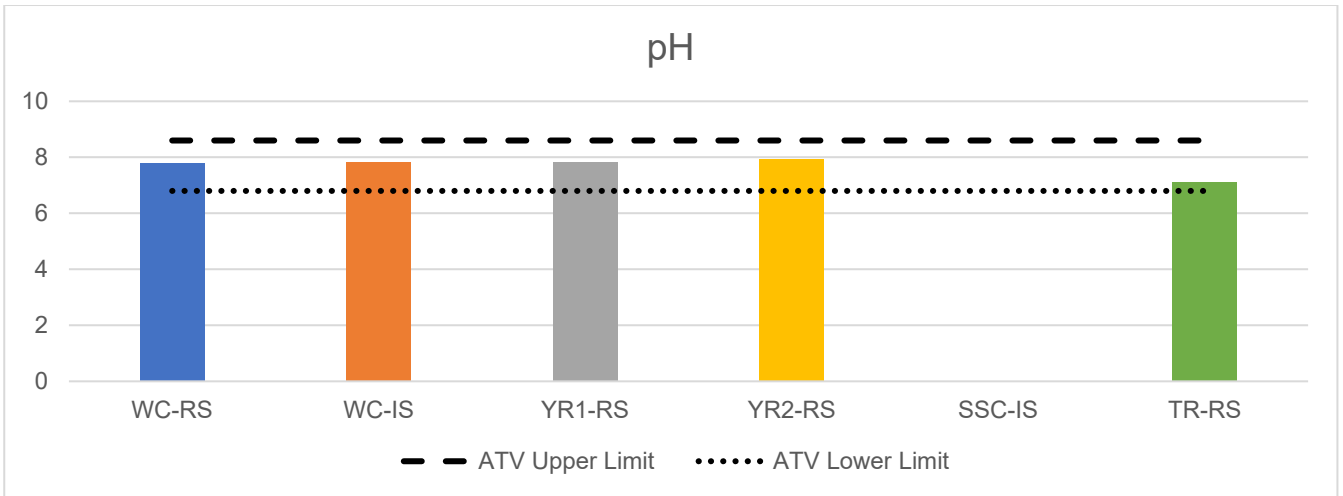


Figure 3-19 Potential of hydrogen (pH) readings for Talbingo Reservoir Catchment

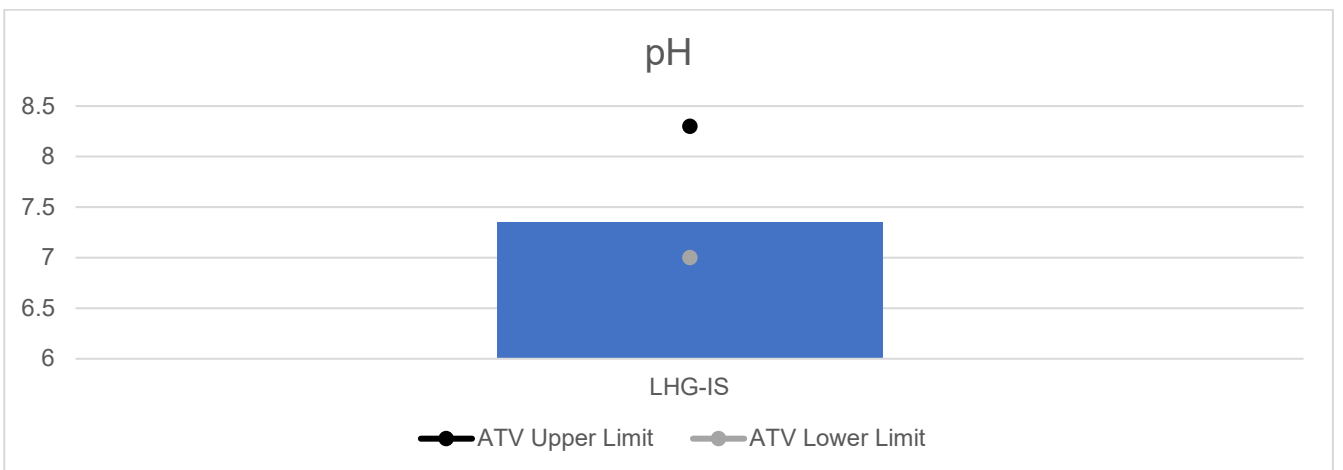


Figure 3-20 Potential of hydrogen (pH) reading for Lick-Hole Gully Impact Site

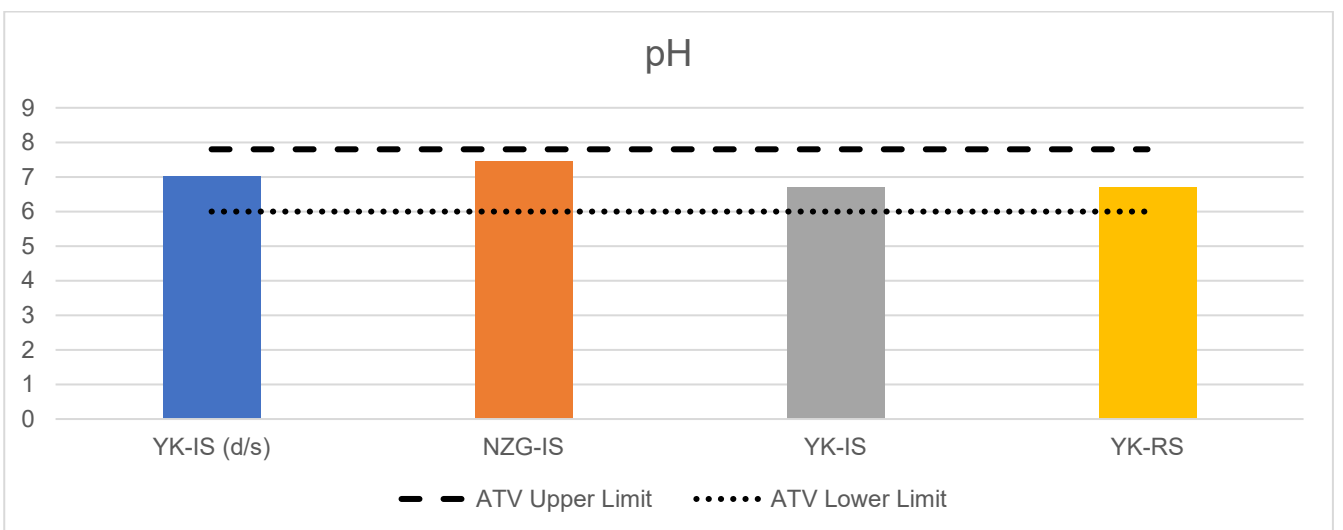


Figure 3-21 Potential of hydrogen (pH) readings for Yorkers Creek Catchment

All oxygen redox potential (ORP) (mV) values for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were within the site-specific ATV ranges of 22.4-186.9mV, -61.1-134.7mV and 24.0-184.1mV respectively. Refer to Figure 3-22, Figure 3-23 and Figure 3-24.

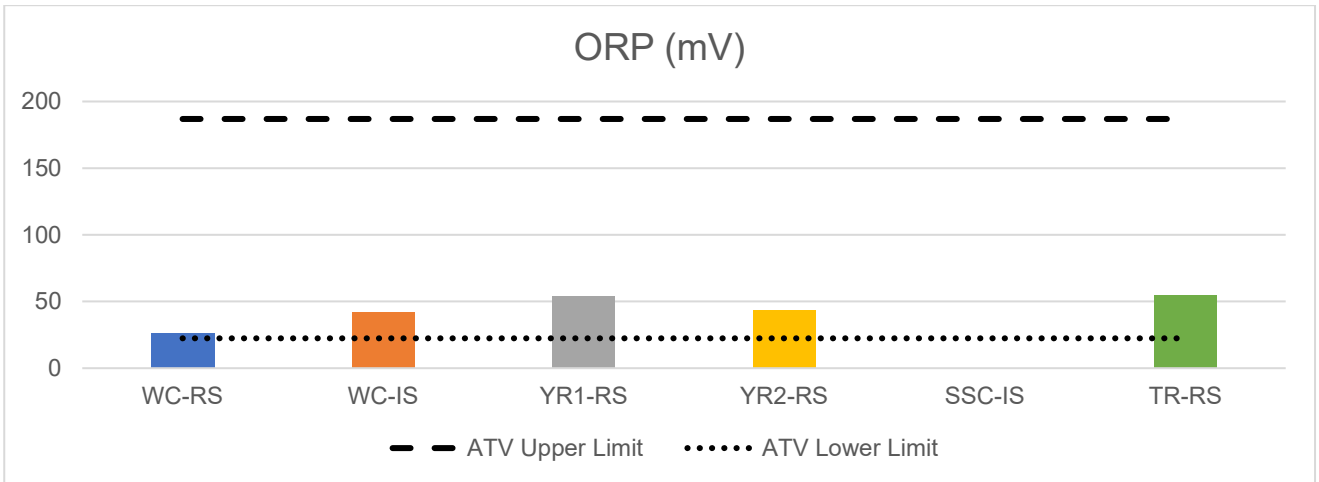


Figure 3-22 ORP (mV) for Talbingo Reservoir Catchment

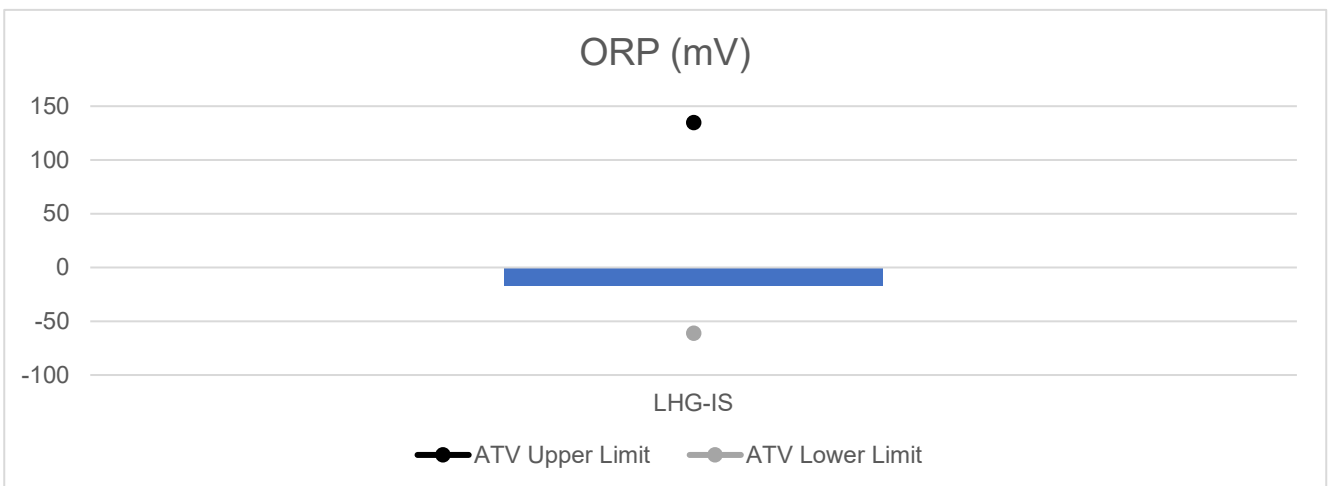


Figure 3-23 ORP (mV) for Lick-Hole Gully Impact Site

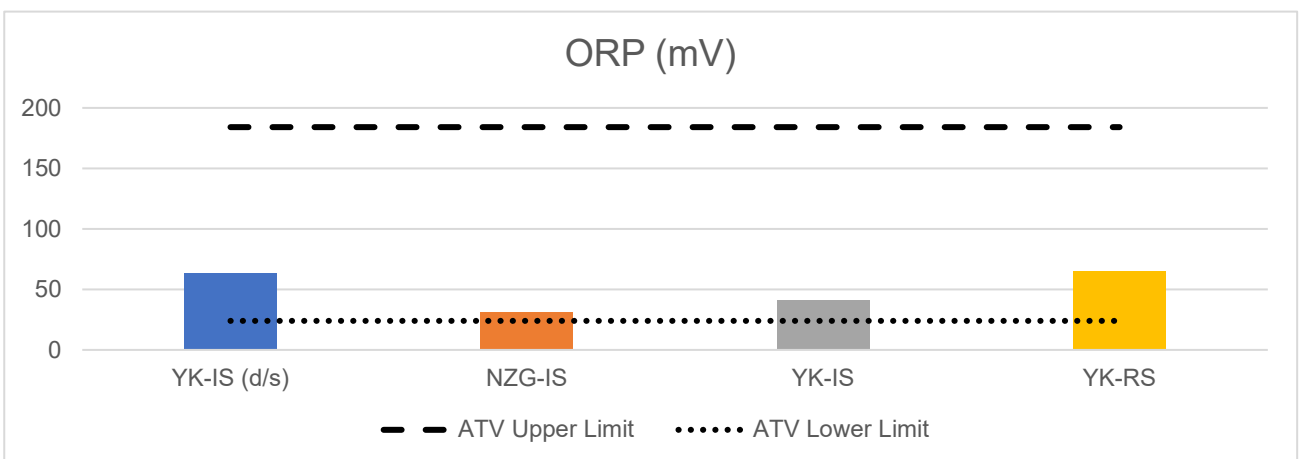


Figure 3-24 ORP (mV) for Yorkers Creek Catchment

Results for Turbidity (NTU) were within the site-specific ATV ranges for both the Talbingo Reservoir and Yorkers Creek catchments, refer to Figure 3-25 and Figure 3-27. Results for LHG-IS were notably above the site-specific ATV range (408.5 NTU). Refer to Figure 3-26.

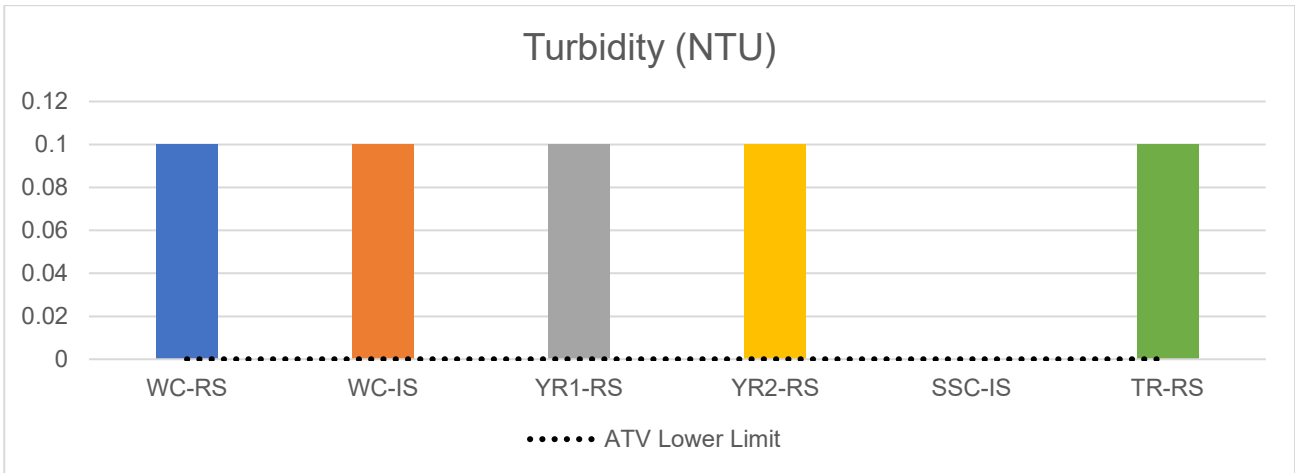


Figure 3-25 Turbidity (NTU) for Talbingo Reservoir Catchment

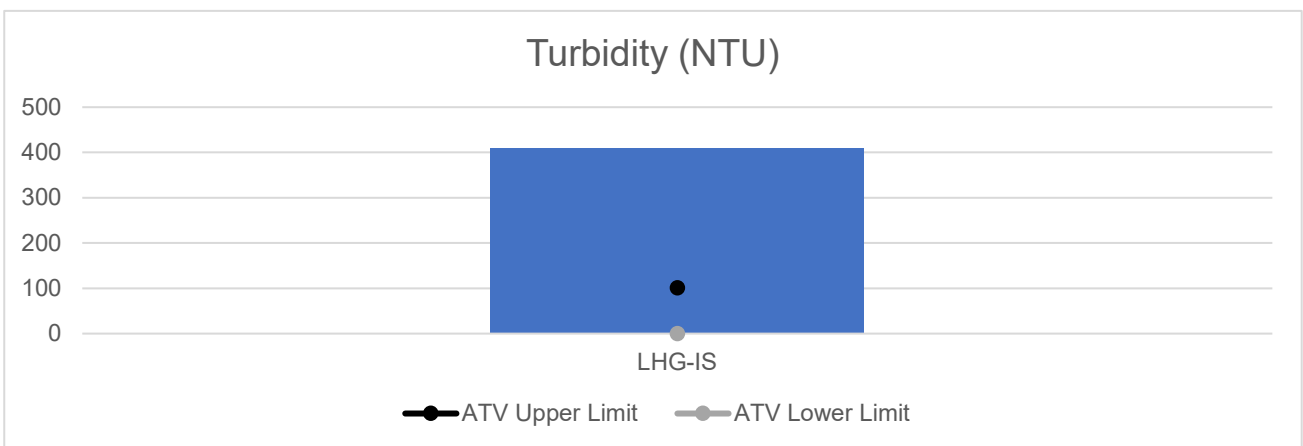


Figure 3-26 Turbidity (NTU) for Lick-Hole Gully Impact Site

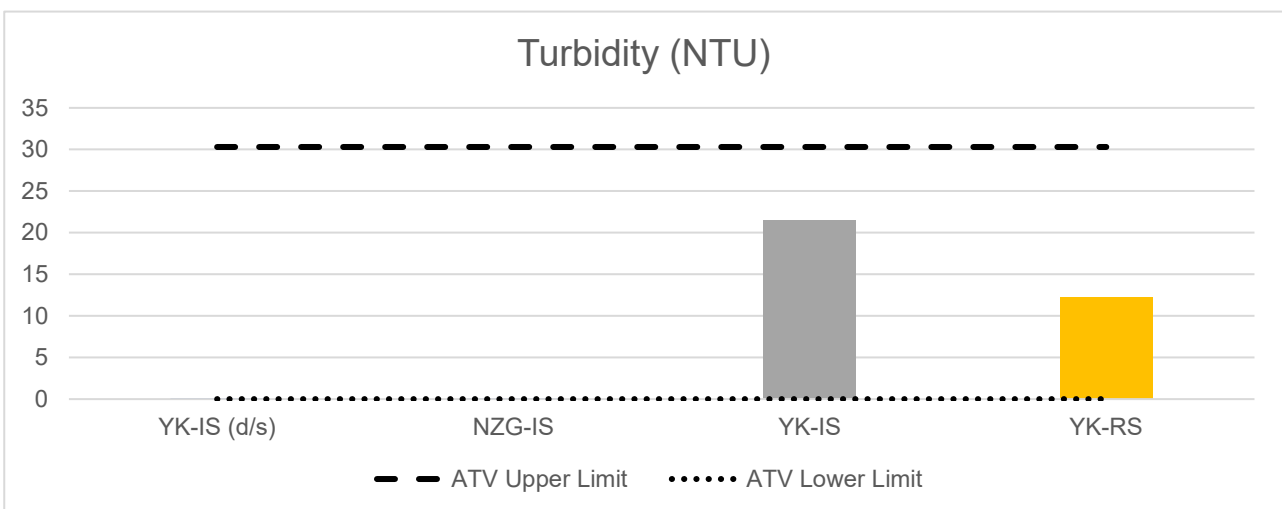


Figure 3-27 Turbidity (NTU) for Yorkers Creek Catchment

All Ammonia (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV of 0.23 mg/L, 0.007 mg/L and 0.62 mg/L respectively. Refer to Figure 3-28, Figure 3-29 and Figure 3-30.

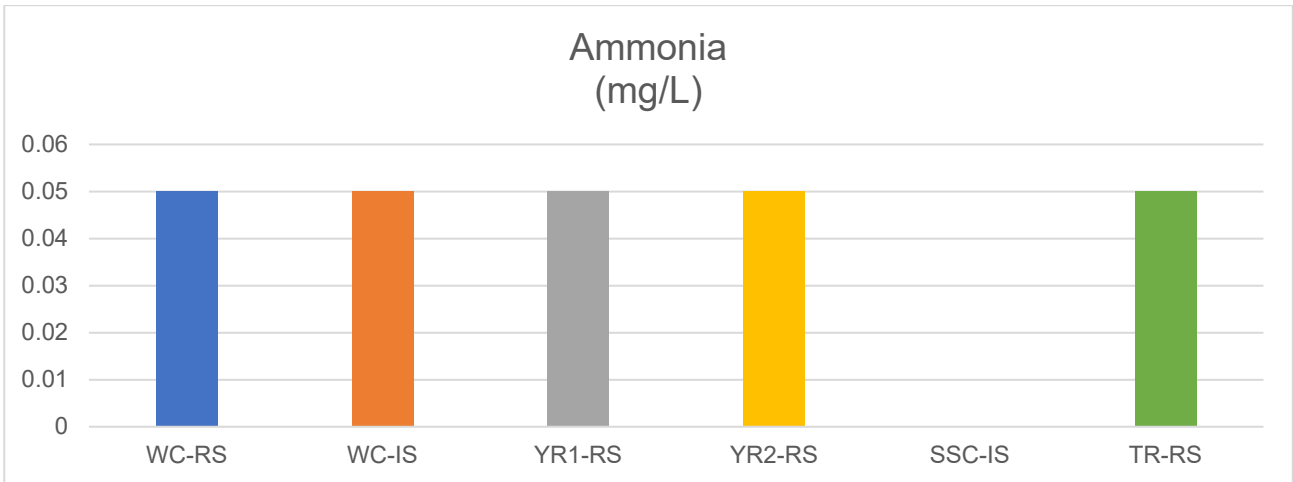


Figure 3-28 Ammonia (mg/L) for Talbingo Reservoir Catchment

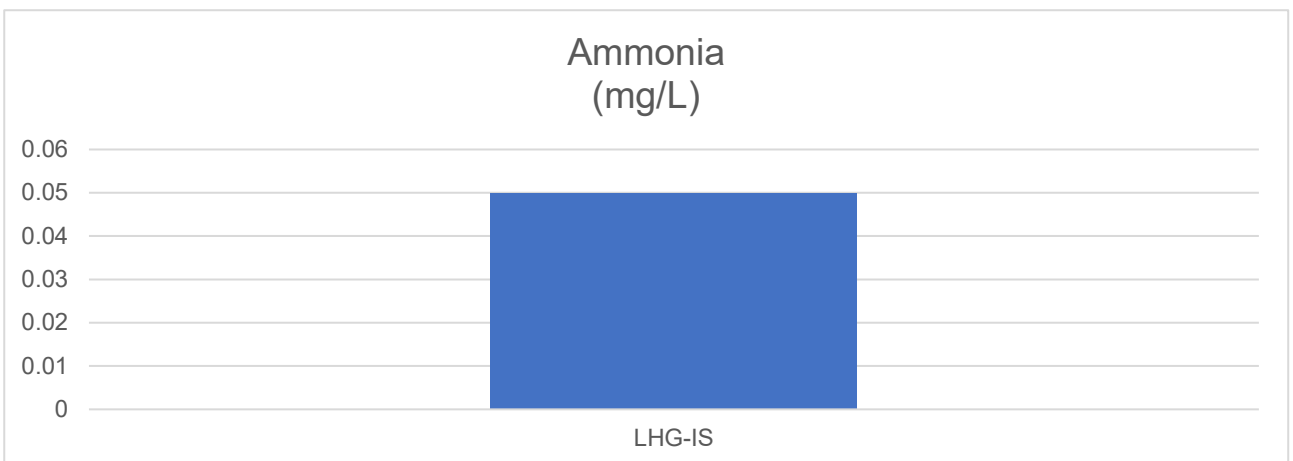


Figure 3-29 Ammonia (mg/L) for Lick-Hole Gully Impact Site

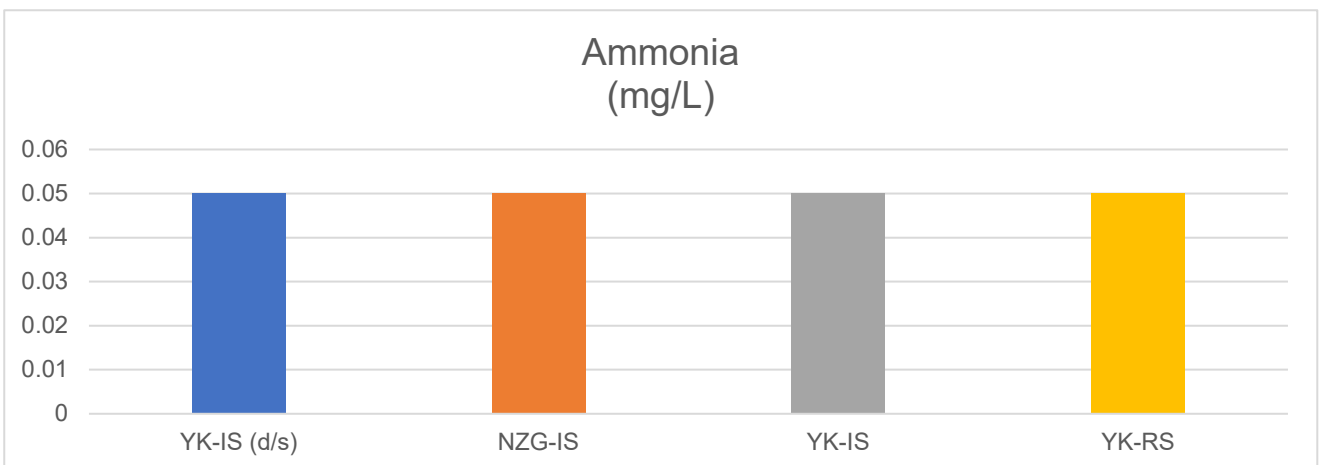


Figure 3-30 Ammonia (mg/L) for Yorkers Creek Catchment

All Nitrogen Oxides (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. Refer to Figure 3-31, Figure 3-32 and Figure 3-33.

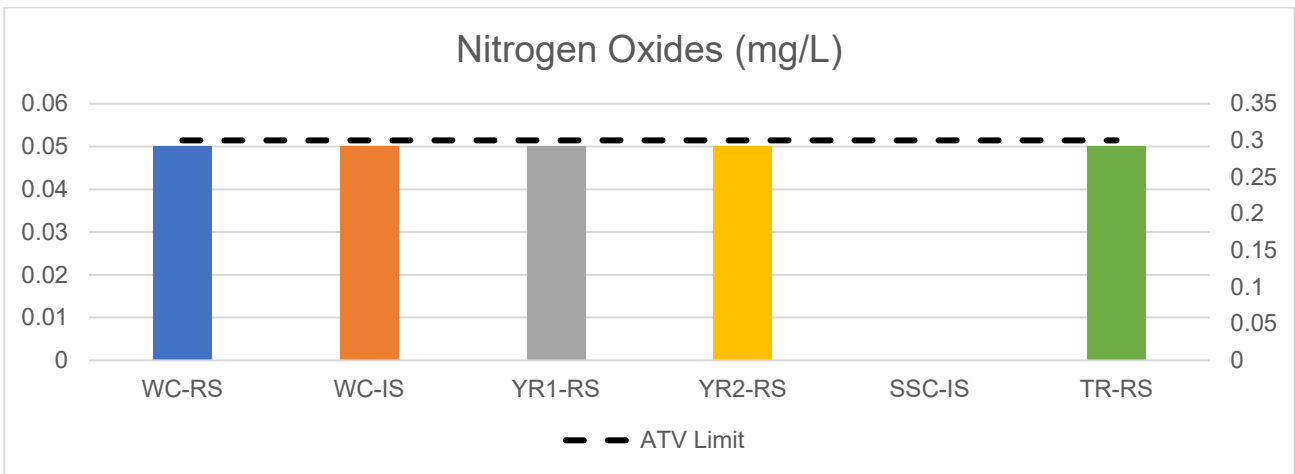


Figure 3-31 Nitrogen Oxides (mg/L) for Talbingo Reservoir Catchment

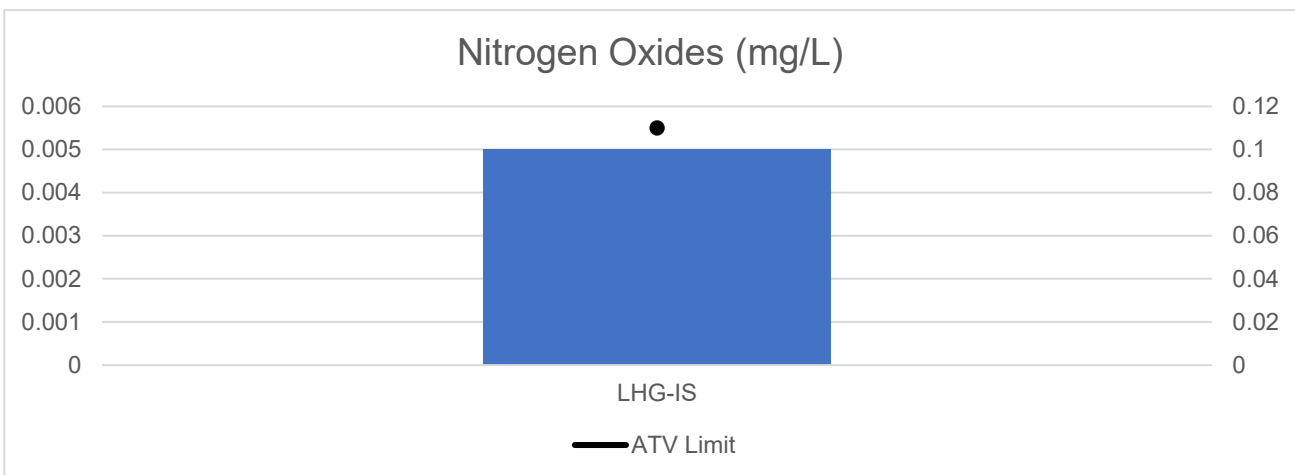


Figure 3-32 Nitrogen Oxides (mg/L) for Lick-Hole Gully Impact Site

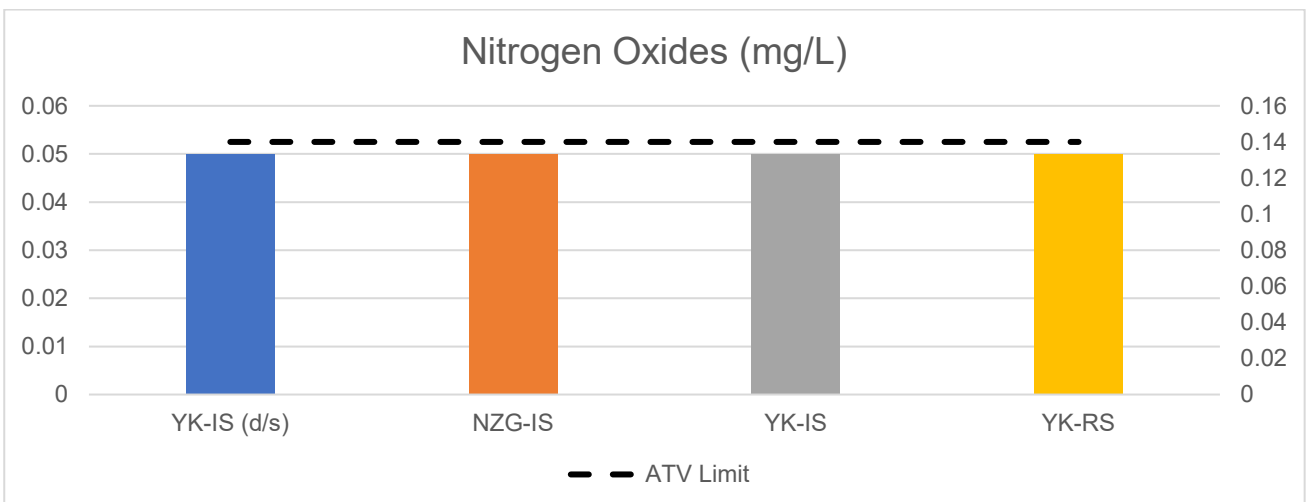


Figure 3-33 Nitrogen Oxides (mg/L) for Yorkers Creek Catchment

All Reactive phosphorus (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. Refer to Figure 3-34, Figure 3-35 and Figure 3-36.

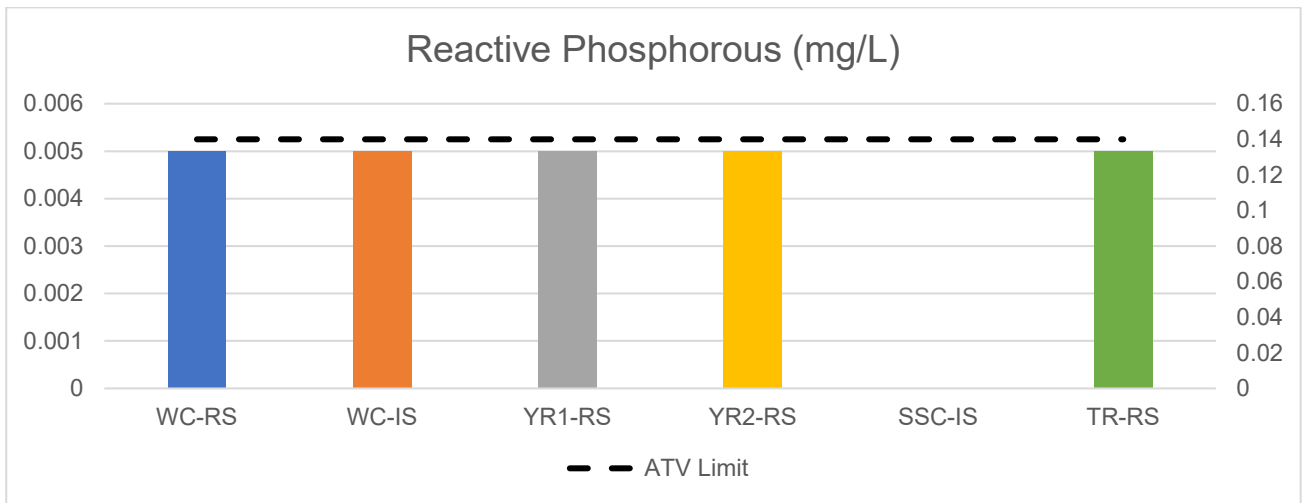


Figure 3-34 Reactive phosphorus (mg/L) for Talbingo Reservoir Catchment

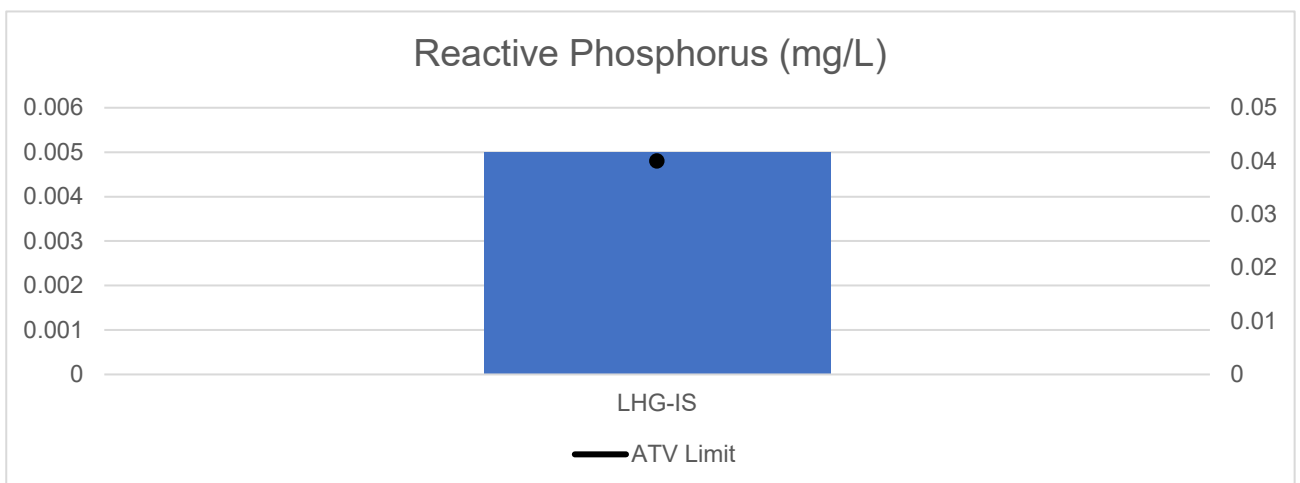


Figure 3-35 Reactive phosphorus (mg/L) for Lick-Hole Gully Impact Site

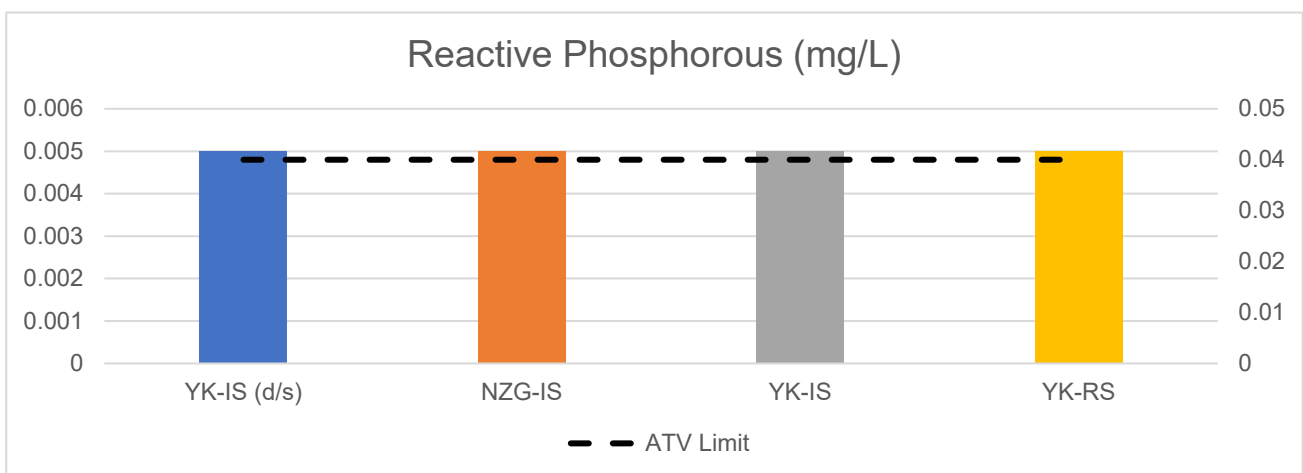


Figure 3-36 Reactive phosphorus (mg/L) for Yorkers Creek Catchment

All Total Hardness (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. The result for TR-RS was notably lower than the other sampling locations in the Talbingo Reservoir Catchment (8 mg/L). The result for NZG-IS was notably higher than the other sampling locations within its catchment (10 mg/L). Refer to Figure 3-37, Figure 3-38 and Figure 3-39.

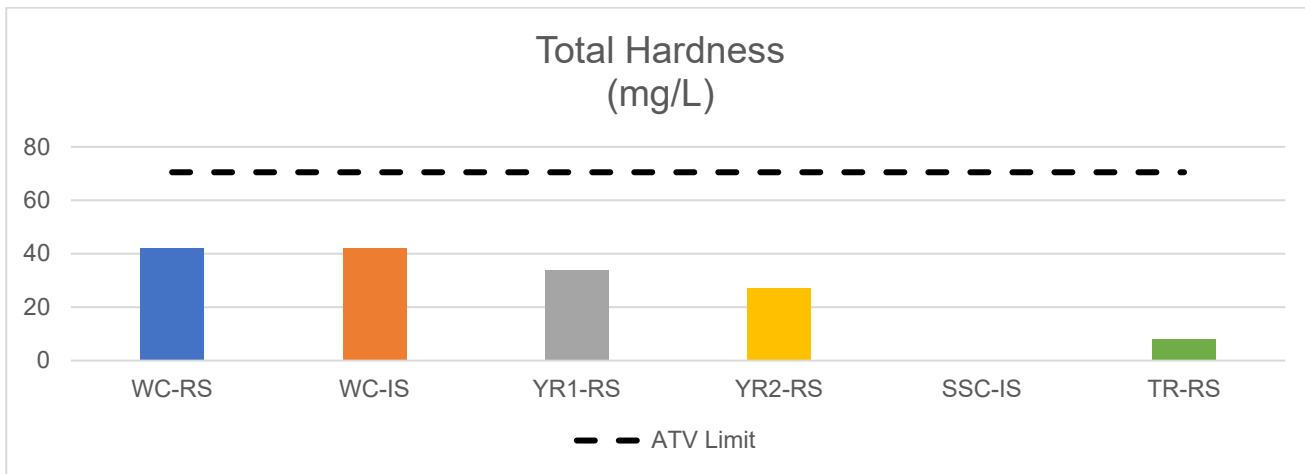


Figure 3-37 Total Hardness (mg/L) for Talbingo Reservoir Catchment

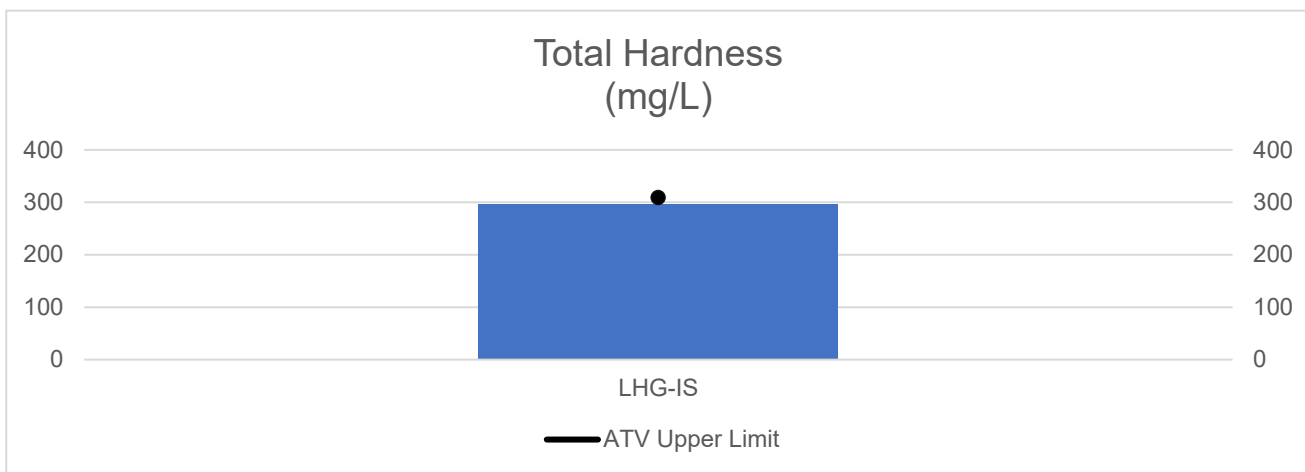


Figure 3-38 Total Hardness (mg/L) for Lick-Hole Gully Impact Site

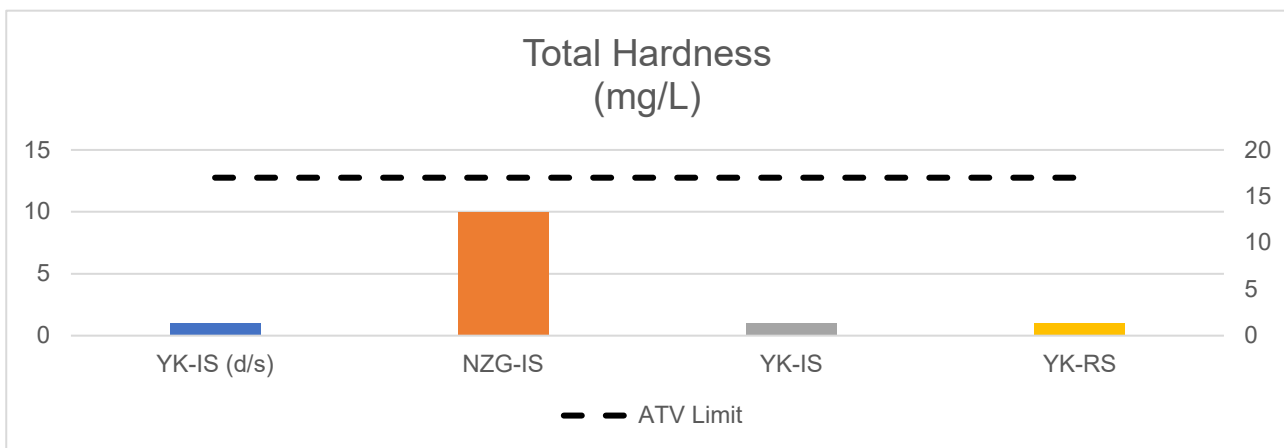


Figure 3-39 Total Hardness (mg/L) for Yorkers Creek Catchment

All Total Kjeldahl Nitrogen (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. The result for YR2-RS was notably higher than the other sampling locations in the Talbingo Reservoir Catchment (1 mg/L.) Refer to Figure 3-40, Figure 3-41 and Figure 3-42.

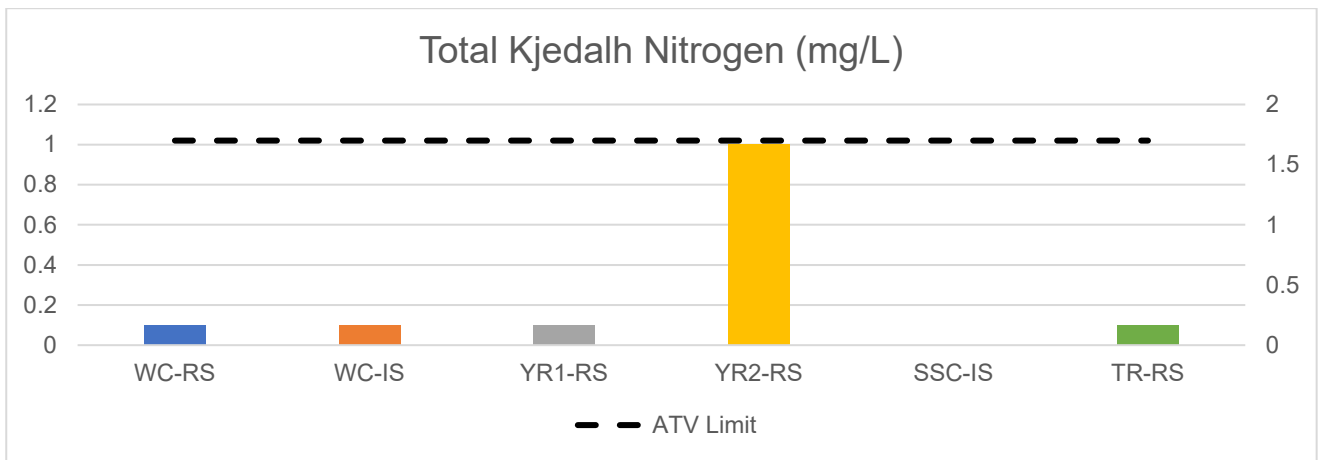


Figure 3-40 TKN (mg/L) for Talbingo Reservoir Catchment

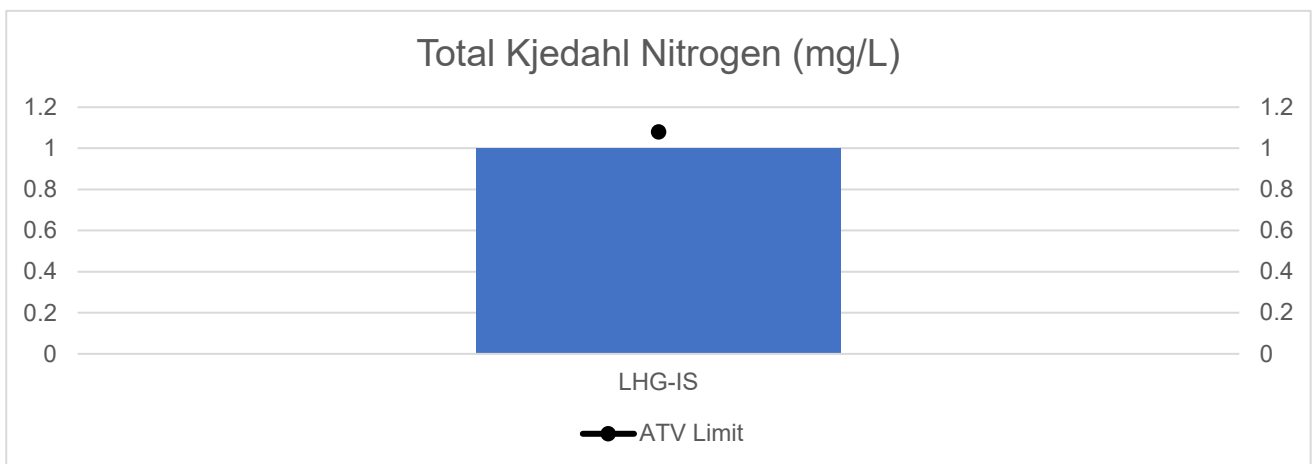


Figure 3-41 TKN (mg/L) for Lick-Hole Gully Impact Site

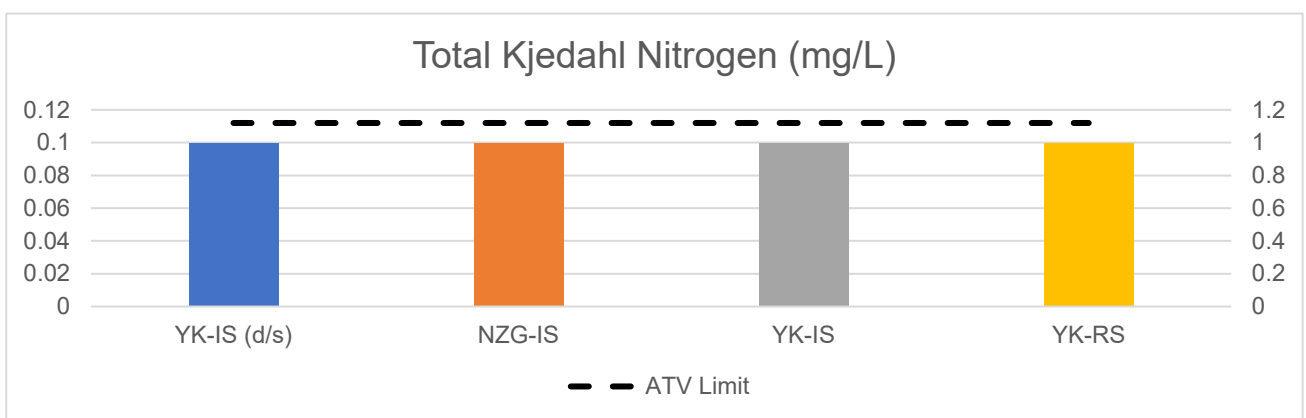


Figure 3-42 TKN (mg/L) for Yorkers Creek Catchment

All Total Dissolved Solids (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. Refer to Figure 3-43, Figure 3-44 and Figure 3-45.

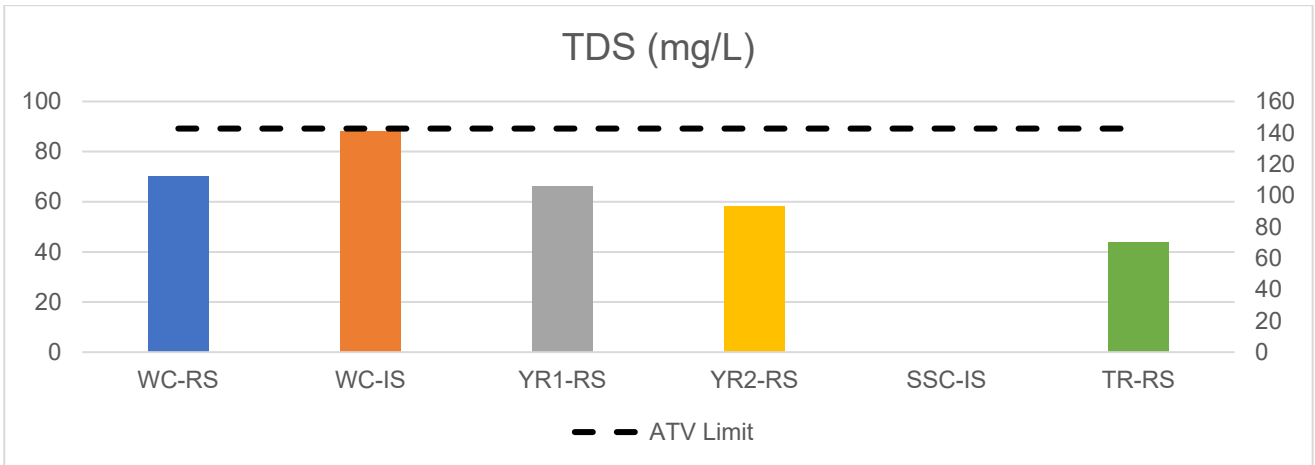


Figure 3-43 Total Dissolved Solids (mg/L) for Talbingo Reservoir Catchment

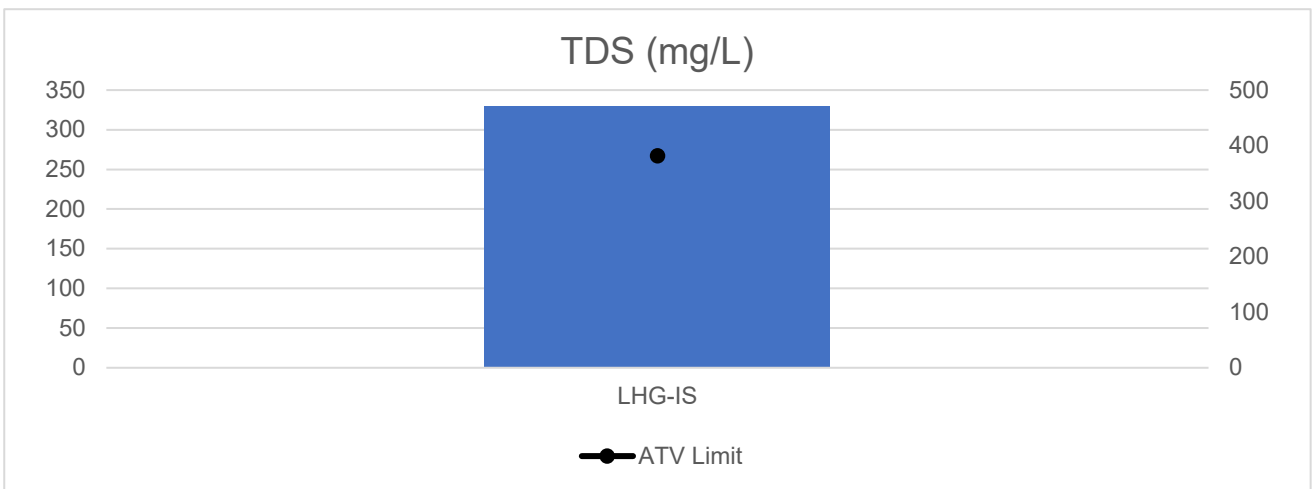


Figure 3-44 Total Dissolved Solids (mg/L) for Lick-Hole Gully Impact Site

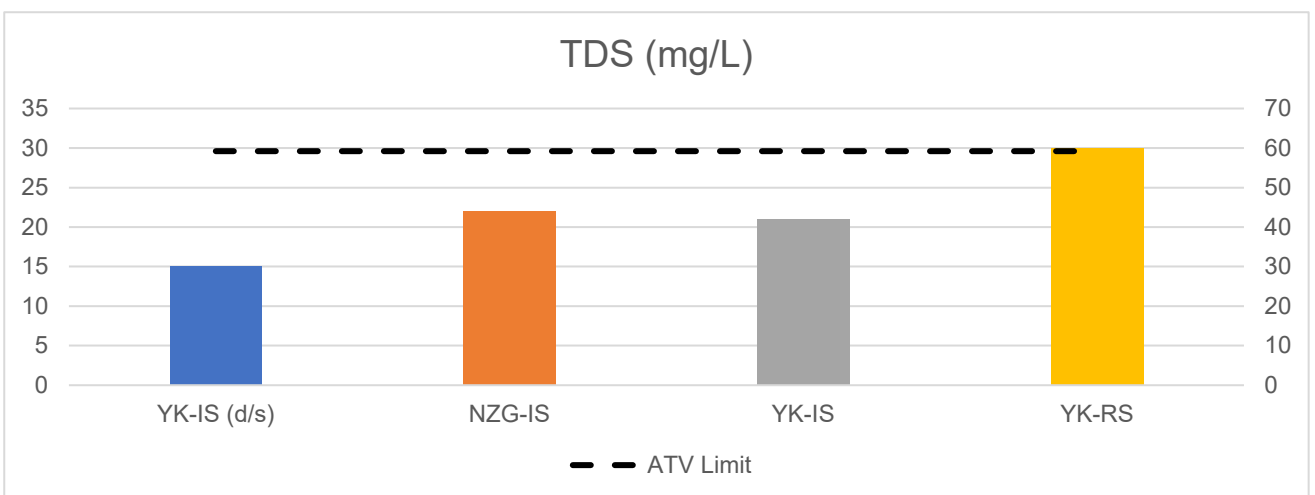


Figure 3-45 Total Dissolved Solids (mg/L) for Yorkers Creek Catchment

All Total Suspended Solids (mg/L) results for the Talbingo Reservoir, LHG-IS and Yorkers Creek catchments were below the site-specific ATV. The result for YK-RS were notably higher than the other sampling locations within the Yorkers Creek catchment. Refer to Figure 3-46, Figure 3-47 and Figure 3-48.

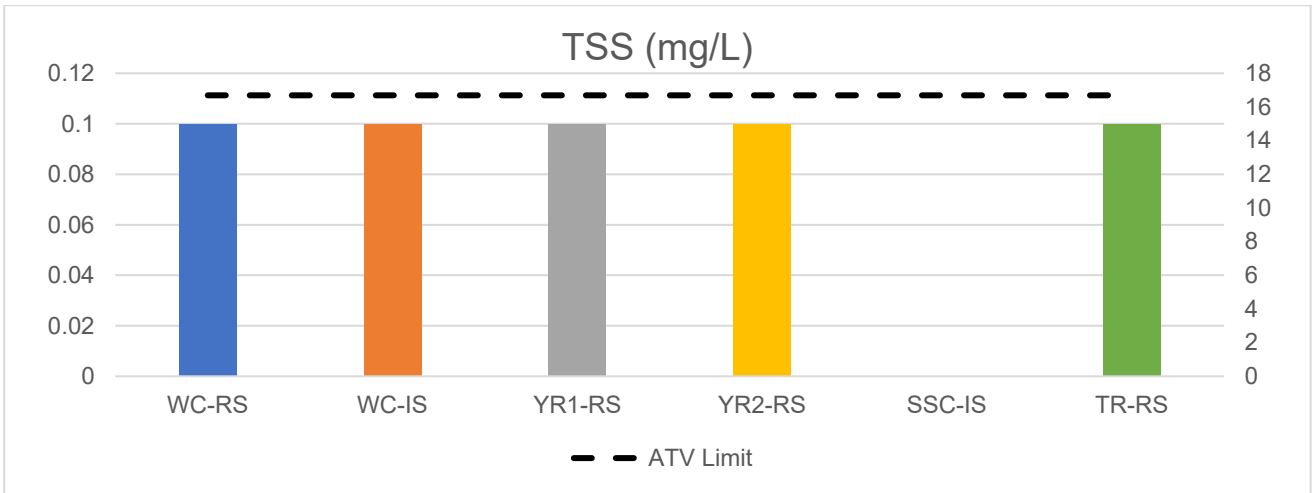


Figure 3-46 Total Suspended Solids (mg/L) for Talbingo Reservoir Catchment

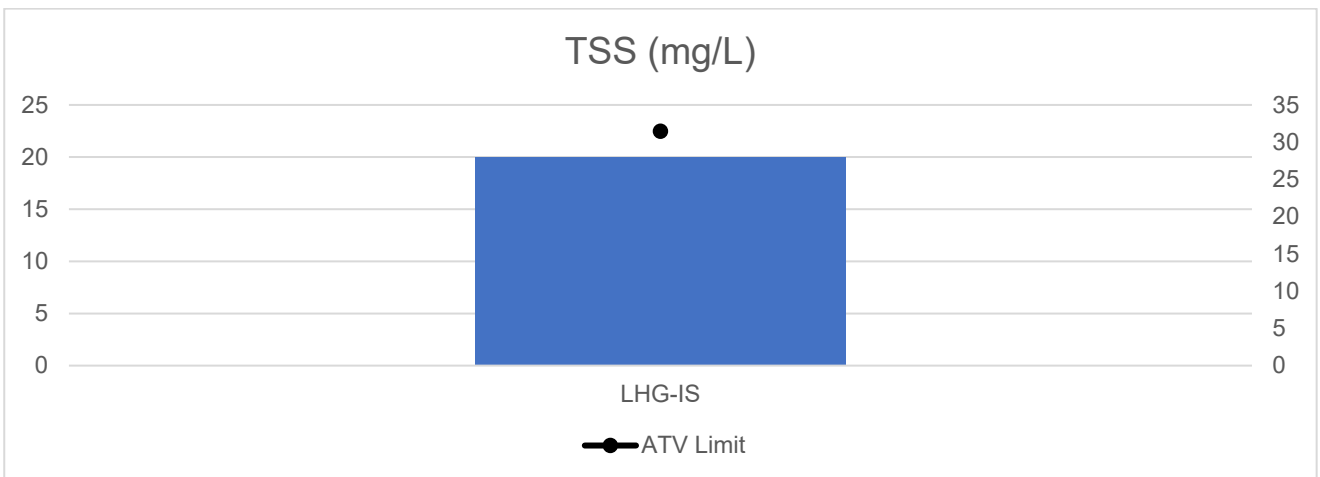


Figure 3-47 Total Suspended Solids (mg/L) for Lick-Hole Gully Impact Site

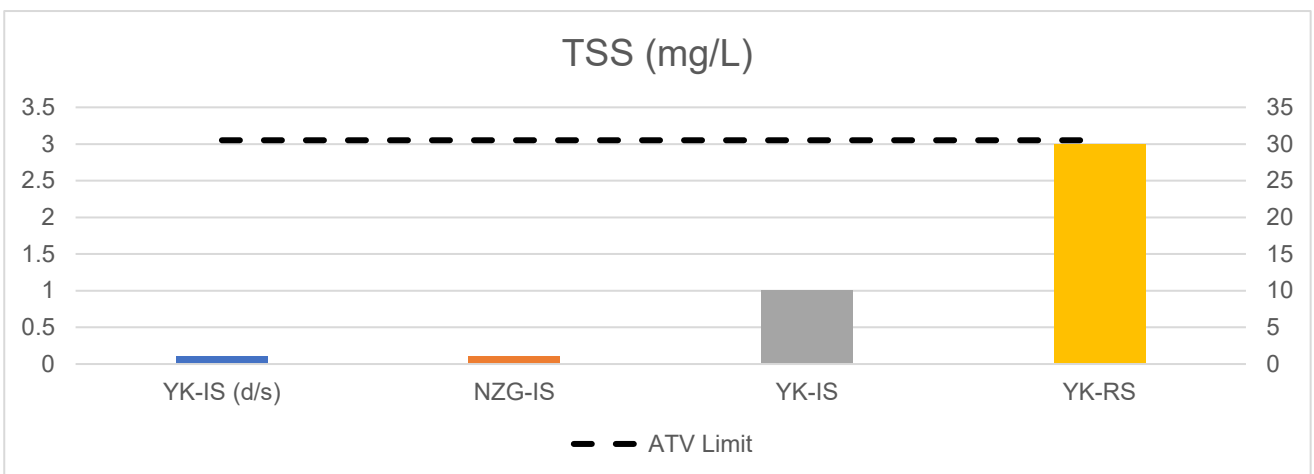


Figure 3-48 Total Suspended Solids (mg/L) for Yorkers Creek Catchment

3.2. Quality Assurance / Quality Control

A Quality Assurance and Quality Control (QA/QC) program was undertaken as part of this investigation including:

- A field duplicate sample, at a rate of one per 20 samples, was taken (DUP01) from the WQM site YK-IS on 26 March 2024. DUP01 was analysed for metals and metalloids. The duplicate sample has been compared against the YK-IS sample by Relative Percentage Difference (RPD) and has returned within an acceptable range (less than 30% for inorganic or less than 5 times the laboratory LOR).
- A water blank was supplied by the laboratory; the results were below the laboratory LOR for all analytes.

NGH consider the QA/QC program to have been effective and the data reliable and representative to achieve the objectives of the investigation.

Refer to Appendix C for the laboratory analysis certificate, Appendix D for the RPD Table and Appendix E for the calibration certificates.

4. Conclusion

Water temperatures for Event 1C are considered to be consistent with seasonal changes in the area.

All analytes tested for have generally returned results within the ATV range or below the trigger value for both catchments and for LHG-IS. Results for analytes that exceeded these values are as follows:

- Specific EC at NZG-IS (64.2 $\mu\text{S}/\text{cm}$)
- Conductivity at NZG-IS (45.3 $\mu\text{S}/\text{cm}$)
- Turbidity at LHG-IS (408.5 NTU)
- Iron at YK-RS (0.66 mg/L).

All results and statistics are provided in Appendix A.

5. References

- Jacobs Pty Ltd. 2020. *Snowy 2.0 Transmission Connection Project EIS*.
- NGH Pty Ltd. 2022. *Pre-construction Water Quality Monitoring Program and Methodology*.
- NGH Pty Ltd. 2022a. *Pre-construction Water Quality Monitoring Report: Event 1 April 2022*.
- NGH Pty Ltd. 2022b. *Pre-construction Water Quality Monitoring Report: Event 2 April 2022*.
- NGH Pty Ltd. 2022c. *Pre-construction Water Quality Monitoring Report: Event 3 May and June 2022*.
- NGH Pty Ltd. 2022d. *Pre-construction Water Quality Monitoring Report: Event 4 June 2022*.
- NGH Pty Ltd. 2022e. *Pre-construction Water Quality Monitoring Report: Event 5 July 2022*.
- NGH Pty Ltd. 2022f. *Pre-construction Water Quality Monitoring Report: Event 6 August 2022*.
- NGH Pty Ltd. 2022g. *Pre-construction Water Quality Monitoring Report: Event 7 October 2022*.
- NGH Pty Ltd. 2022h. *Pre-construction Water Quality Monitoring Report: Event 8 October 2022*.
- NGH Pty Ltd. 2022i. *Pre-construction Water Quality Monitoring Report: Event 9 November 2022*.
- NGH Pty Ltd. 2022j. *Pre-construction Water Quality Monitoring Report: Event 10 December 2022*.
- NGH Pty Ltd. 2023a. *Pre-construction Water Quality Monitoring Report: Event 11 January 2023*.
- NGH Pty Ltd. 2023b. *Pre- construction Water Quality Monitoring Report: Event 12 February 2023*.
- NGH Pty Ltd. 2023c. *Pre- construction Water Quality Monitoring Report: Event 13 March 2023*.
- NGH Pty Ltd. 2023d. *Pre- construction Water Quality Monitoring Report: Event 14 April 2023*.
- NGH Pty Ltd. 2023e. *Pre- construction Water Quality Monitoring Report: Event 15 June 2023*.
- NGH Pty Ltd. 2023f. *Pre- construction Water Quality Monitoring Report: Event 16 June 2023*.
- NGH Pty Ltd. 2023g. *Pre- construction Water Quality Monitoring Report: Event 17 July 2023*.
- NGH Pty Ltd. 2023h. *Pre- construction Water Quality Monitoring Report: Event 18 August 2023*.
- NGH Pty Ltd. 2023i. *Pre- construction Water Quality Monitoring Report: Event 19 September 2023*.
- NGH Pty Ltd. 2023j. *Pre- construction Water Quality Monitoring Report: Event 20 October 2023*.
- NGH Pty Ltd. 2023k. *Pre- construction Water Quality Monitoring Report: Event 21 November 2023*.
- NGH Pty Ltd. 2023l. *Pre- construction Water Quality Monitoring Report: Event 22 December 2023*.
- NGH Pty Ltd. 2024a. *Pre- construction Water Quality Monitoring Report: Event 23 January 2024*.
- NGH Pty Ltd 2024b. *Pre-construction Water Quality Monitoring Report Event 24 February 2024*.
- NGH Pty Ltd 2024c. *Baseline Water Quality Report March 2024*.
- NGH Pty Ltd 2022k. *Construction WQM Program and Methodology Report November 2022*.
- TransGrid. 2021a. *Snowy 2.0 Transmission Connection Project Submissions Report*.
- TransGrid. 2021b. *Snowy 2.0 Transmission Connection Project Amendment Report*.

APPENDIX A EVENT DATA TABLE

22-013 Pre-construction WOM		Sheet oil/ grasse	W Temp. (°C)	Dissolv ed Oxygen (DO %)	DO (ppm)	Specific EC (SPC uS/cm)	EC (uS/cm)	pH	Redox (mv)	Turbidit y (NTU)	Al (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Cyanide (mg/L)	Fe (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Ni (mg/L)	TN (mg/L)	TP (mg/L)	Ag (mg/L)	Zn (mg/L)	Ammoni a (mg/L)	Nitroge n Oxides	Reactiv e Phosph orus	Total Hardnes s (CaCO3)	Total Kjeldahl Nitroge n (TKN)	TDS mg/L	TSS (mg/L)	
DOV (Default Qualitative Value)		No	-	90-110	-	33-355	6.5-8	-	2-25	0.027	0.0008	0.0006	0.00001	0.001	0.004	0.3	0.001	1.2	0.0001	0.008	0.25	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
WC-IS	No	6.1	87.8	9.2	14.8	247.9	7.9	65.8	0.8	0.023	0.0006	0.0006	0.00001	0.003	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
WC-IS	No	10.7	87.1	9.65	145.9	105.9	7.83	41.5	0.1	0.023	0.00018	0.00008	0.00001	0.002	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
CG-IS	No Flow																																
YH-IS	No	12.2	88.2	9.47	125.4	97.7	7.81	53.8	0.1	0.02	0.00018	0.00008	0.00001	0.002	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
LHG-IS	Yes	11.9	89.2	9.38	498	447.2	7.35	17.2	0.03	0.02013	0.00005	0.0001	0.001	0.003	0.001	0.18	0.002	0.02	0.00018	0.0003	0.1	0.01	0.00001	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
YH-IS	No	12.3	88.8	9.47	130.8	99.1	7.80	49.2	0.1	0.02	0.00018	0.00008	0.00001	0.002	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
SSC-IS	No Flow																																
TR-IS	No	13.4	72.5	7.57	24	187	7.1	65	0.1	0.013	0.00018	0.00008	0.00001	0.002	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.01	0.00001	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
YK-IS (SS)	No	19	81.6	9.21	39.1	27.9	7.62	63.2	0.1	0.023	0.00018	0.00008	0.00001	0.002	0.007	0.3	0.002	0.002	0.00002	0.0002	0.1	0.02	0.00002	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
NG-IS	No	9.8	80.2	9.13	64.3	45.1	7.45	31.3	0.1	0.01	0.00013	0.00005	0.00001	0.001	0.003	0.18	0.002	0.002	0.00018	0.0003	0.1	0.01	0.00001	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
YK-IS	No	11.4	78	8.83	38	28.9	8.1	61.1	0.14	0.02013	0.00005	0.0001	0.001	0.003	0.1	0.002	0.02	0.002	0.00018	0.0003	0.1	0.01	0.00001	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	
YK-IS	Yes	18.3	82.5	8.06	31.8	26.2	6.89	64.5	0.24	0.02013	0.00005	0.0001	0.001	0.003	0.18	0.002	0.02	0.002	0.00018	0.0003	0.1	0.01	0.00001	0.0024	0.013	0.015	0.015	-	-	-	-	0.2	

APPENDIX B OBSERVATIONS AND FIELD DATA

22-013 EVENT 25

SUNNY, FEW CLOUDS
SLIGHT WIND

26103124

22-013 Pre-construction WQM		Grease/oil/sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
WC-RS	Month	NO	10.7	87.5	9.72	143.6	104.3	7.80	25.9	-4.74
	Comment	low water level, fast clear flow								
WC-IS	Month	NO	10.7	87.1	9.68	145.9	105.9	7.83	41.9	-4.80
	Comment	low water level, fast clear flow								
CG-IS	Month									
	Comment	DRY !!!								
YR1-RS	Month	NO	12.2	88.2	9.49	129.4	97.7	7.81	53.8	-4.62
	Comment	low water level, fast clear flow								

22-013 Pre-construction WQM		Grease/oil/sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
LHG-IS	Month	YES	11.9	59.2	6.38	596	447.2	7.35	-17.2	408.50
	Comment	sheen / tannin in water surface present low slow flow, turbid.								
YR2-RS	Month	NO	12.3	88.5	9.47	130.8	99.1	7.93	43.2	-4.55
	Comment	low water level, clear fast flow								
SSC-IS	Month									
	Comment	DRY!!!								
TR-RS	Month	NO	13.4	72.5	7.57	24.0	18.7	7.10	55.0	-4.38
	Comment	low water level flow , moderate flow								
YK-IS (D/S)	Month	NO	10.0	81.6	9.21	39.1	27.9	7.02	63.2	-1.36
	Comment	low water level, moderate flow, woody debris over creek.								

22-013 Pre-construction WQM		Grease/oil/shoen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	pH	Oxidation Reduction Potential (mV)	Turbidity (NTU)
NZG-IS	Month	NO	9.6	80.2	9.13	64.2	45.3	7.45	31.3	-2.92
	Comment	low water level, clear moderate flow part of bank eroded into creek. woody debris, mica visible on surface creek bed.								
YK-IS	Month	NO	13.4 11.4	72.5 78.0	7.57 8.53	84.0 35.0	10.7 25.9	7.70 6.70	55.0 41.1	4.38 21.44
	Comment	turbid / opaqueness, low water level, moderate flow. mica visible on creek bed. <u>! DUPOI !!</u>								
YK-RS	Month	YES	16.3	82.5	8.09	31.5	26.2	6.69	64.5	12.24
	Comment	white coating on surface (possibly bacteria?) turbid / opaqueness. low water level with slow flow.								

APPENDIX C LABORATORY CERTIFICATES



NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 1 of 17

For all enquiries related to this report please quote document number: 2403-0083

Facility:	Order #	Date Analysis Commenced
	3842	26-March-2024
Sample Type	Collected By	Date Received
Water	Client	26-March-2024

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
24Mar-0243	WC-RS 26.03.24 8.31am	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	13.1 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO ₃	42 mg/L	LTM-W-038	2
		Iron (dissolved)	0.03 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	2.25 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.03 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	70 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2



NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 2 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0243	WC-RS 26.03.24 8.31am	Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0244	WC-IS 26.03.24 8.38am	Aluminium (dissolved)	0.03 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	13.1 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	42 mg/L	LTM-W-038	2
		Iron (dissolved)	0.03 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	2.22 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 3 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0244	WC-IS 26.03.24 8.38am	Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	88 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0245	CG-IS	Aluminium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	dry mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	dry mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	dry mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	dry mg/L	LTM-W-038	2
		Iron (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	dry mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 4 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0245	CG-IS	Nickel (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	dry mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	dry mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	dry mg/L	LTM-W-030	0.01
		Phosphorus, Total	dry mg/L	LTM-W-030	0.01
		Silver (dissolved)	dry mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	dry mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	dry mg/L	LTM-W-034	0.2
		Total Suspended Solids	dry mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.002
24Mar-0246	YR1-RS 26.03.24 8.53am	Aluminium (dissolved)	0.05 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	13.5 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	34 mg/L	LTM-W-038	2
		Iron (dissolved)	0.03 mg/L	APHA 3030 B/3120 B	0.01

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 5 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0246	YR1-RS 26.03.24 8.53am	Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	66 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0247	LHG-IS 26.03.24 9.12am	Aluminium (dissolved)	0.20 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	108 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	0.001 mg/L	APHA 3030 B/3120 B	0.0000

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 6 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0247	LHG-IS 26.03.24 9.12am	Copper (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	297 mg/L	LTM-W-038	2
		Iron (dissolved)	0.18 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.005 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	6.57 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.040 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	330 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	1 mg/L	LTM-W-034	0.2
		Total Suspended Solids	20 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	0.006 mg/L	APHA 3030 B/3120 B	0.002

24Mar-0248	YR2-RS 26.03.24 9.35am	Aluminium (dissolved)	0.03 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 7 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0248	YR2-RS 26.03.24 9.35am	Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	10.9 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	27 mg/L	LTM-W-038	2
		Iron (dissolved)	0.02 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.001 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	58 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	1 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 8 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0249	SSC-IS				
		Aluminium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	dry mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	dry mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	dry mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO ₃	dry mg/L	LTM-W-038	2
		Iron (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	dry mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	dry mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	dry mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	dry mg/L	LTM-W-030	0.01
		Phosphorus, Total	dry mg/L	LTM-W-030	0.01
		Silver (dissolved)	dry mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	dry mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	dry mg/L	LTM-W-034	0.2

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 9 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0249	SSC-IS				
		Total Suspended Solids	dry mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	dry mg/L	APHA 3030 B/3120 B	0.002
24Mar-0250	TR-RS 26.03.24 11.16am				
		Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	3.33 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	8 mg/L	LTM-W-038	2
		Iron (dissolved)	0.05 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.005 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 10 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0250	TR-RS 26.03.24 11.16am	Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	44 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0251	YK-IS(d/s) 26.03.24 11.36am	Aluminium (dissolved)	0.31 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	<2 mg/L	LTM-W-038	2
		Iron (dissolved)	0.26 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.006 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 11 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0251	YK-IS(d/s) 26.03.24 11.36am	Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.02 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	15 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0252	NZG-IS 26.03.24 11.57am	Aluminium (dissolved)	0.14 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	4.01 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	10 mg/L	LTM-W-038	2
		Iron (dissolved)	0.18 mg/L	APHA 3030 B/3120 B	0.01

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 12 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0252	NZG-IS 26.03.24 11.57am	Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	22 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002

24Mar-0253	YK-IS 26.03.24 12.11pm	Aluminium (dissolved)	0.45 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 13 of 17

For all enquiries related to this report please quote document number: 2403-0083

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
	3842	26-March-2024
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	Client	26-March-2024

<u>EAL ID</u>	<u>Client ID.</u> Date/Time sample taken	<u>Test</u>	<u>Result (units)</u>	<u>Method Reference</u>	<u>Limit of Reporting</u>
24Mar-0253	YK-IS 26.03.24 12.11pm	Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	<2 mg/L	LTM-W-038	2
		Iron (dissolved)	0.40 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.018 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	21 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	1 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.002
24Mar-0254	YK-RS 26.03.24 12.22pm	Aluminium (dissolved)	0.60 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1



NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2403-0083

Page 14 of 17

For all enquiries related to this report please quote document number: 2403-0083

Facility:	Order #	Date Analysis Commenced
	3842	26-March-2024
Sample Type	Collected By	Date Received
Water	Client	26-March-2024

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
24Mar-0254	YK-RS 26.03.24 12.22pm	Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Total Hardness as CaCO3	<2 mg/L	LTM-W-038	2
		Iron (dissolved)	0.66 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.013 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.03 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	30 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	3 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.002



NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 15 of 17

For all enquiries related to this report please quote document number: 2403-0083

Facility:	Order #	Date Analysis Commenced
	3842	26-March-2024
Sample Type	Collected By	Date Received
Water	Client	26-March-2024

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
24Mar-0255	DUP01 26.03.24 12.11pm	Aluminium (dissolved)	0.45 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic (dissolved)	<0.0003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.0000
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Iron (dissolved)	0.40 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Manganese (dissolved)	0.018 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Zinc (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.002

24Mar-0256	WATER BLANK	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.013 mg/L	LTM-W-042	0.1
		Arsenic (dissolved)	<0.003 mg/L	APHA 3030 B/3120 B	0.0003
		Cadmium (dissolved)	<0.0002 mg/L	APHA 3030 B/3120 B	0.0000
		Calcium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.0000
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002

NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083

Page 16 of 17

For all enquiries related to this report please quote document number: 2403-0083

Facility:	Order #	Date Analysis Commenced
	3842	26-March-2024
Sample Type	Collected By	Date Received
Water	Client	26-March-2024

EAL ID	Client ID. Date/Time sample taken	Test	Result (units)	Method Reference	Limit of Reporting
24Mar-0256	WATER BLANK				
		Total Hardness as CaCO3	<2 mg/L	LTM-W-038	2
		Iron (dissolved)	<0.01 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00 mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003 mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	0.2
		Nitrate/Nitrite as N	<0.015 mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01 mg/L	LTM-W-030	0.01
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	<2 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	0.2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002

Note:

** NATA Accreditation does not cover the performance of this service.*



NGH Environmental
35 Kincaid Street
Wagga Wagga NSW 2650
Attention: Nicola Smith

Friday, April 12, 2024



NATA Accredited Laboratory
Number: 9597
Accredited for compliance with ISO/IEC
17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number: 2403-0083
Page 17 of 17

For all enquiries related to this report please quote document number: 2403-0083

Facility:	Order #	Date Analysis Commenced			
	3842	26-March-2024			
Sample Type	Collected By	Date Received			
Water	Client	26-March-2024			
EAL ID	Client ID.	Test	Result (units)	Method Reference	Limit of Reporting
	Date/Time sample taken				

Signed Michael Glazier, Laboratory Manager.

All samples analysed as received.
All soil results are reported on a dry basis.
The EAL takes no responsibility for the end use of results within this report.
This report shall not be reproduced except in full.
This report replaces any previously issued report

APPENDIX D RPD TABLE

Event 24	DUP01	0.80	0.00015	0.001	0.001	0.002	0.001	0.72	0.002	0.021	0.000015	0.001	0.00001	0.002
	YK-RS	0.79	0.00015	0.001	0.001	0.002	0.001	0.72	0.002	0.021	0.000015	0.00	0.00001	0.002
	RPD% - Acceptable Range	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	DUP01	0.45	0.00015	0.00001	0.000005	0.001	0.001	0.4	0.0005	0.018	0.000015	0.0005	0.00001	0.004
Event 25	YK-IS	0.45	0.00015	0.00001	0.000005	0.001	0.001	0.4	0.0005	0.018	0.000015	0.0005	0.00001	0.004
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Water Blank	Event 1	Nothing above LOR	<0.02	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 2	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 3	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 4	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 5	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 6	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 7	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 8	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 9	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 10	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 11	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 12	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 13	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 14	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 15	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 16	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 17	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 18	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 19	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 20	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 21	Nothing above LOR	-	-	-	-	-	-	-	-	-	-	-	-	-
	Event 22	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 23	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 24	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002
	Event 25	Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.002

$$RPD\% = \frac{|(X_2 - X_1)|}{((X_2 + X_1)/2)}$$

How to calculate the Relative Percent Difference (RPD)

The basic equation for RPD is

$$RPD = \frac{|R1 - R2|}{\left(\frac{R1 + R2}{2}\right)} \times 100,$$

where

R1 is sample 1, and

R2 is sample 2.

R1 and R2 are your sample and duplicate values. Basically, this equation has you calculate the RPD by dividing the difference between the sample and duplicate by the average of the two. Using absolute value signs ensures the RPD doesn't end up as a negative percentage, which wouldn't make sense when looking for a percent difference.

The equation you plug into Excel looks like this:

$$=ABS((B3-C3)/AVERAGE(B3:C3)*100)$$

ABS stands for Absolute Value. Using the cell labels in the equation, as seen above (B3, C3), allows you to use the equation down for all your sample/duplicate pairs so you don't have to write a new equation each time. You can do this by clicking on the cell with the equation in it, then click and drag the bottom right corner of the cell down for the rest of your samples.

APPENDIX E CALIBRATION CERTIFICATES

Multi Parameter Water Meter

Instrument **YSI Pro DSS**
Serial No. **21K104033**



Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH/ORP	✓	
	2. Turbidity	✓	
	3. Conductivity	✓	
	4. D.O	✓	
	5. Temp	✓	
	6. Depth	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00	pH 7.00		413975	pH 7.07
2. pH 4.00	pH 4.00		405966	pH 4.07
3. mV	235.60 mV		A406331/B398193	237.0 mV
4. EC	2760 µS/cm		406852	2776 µS/cm
6. D.O	0%		407802	-0.2%
7. Temp	22.0 °C		MultiTherm	21.8 °C
8. Tubidity	100 NTU		413972	98.7 NTU

Calibrated by: _____ Christopher Nicdao

Calibration date: 18/03/2024

Next calibration due: 17/04/2024