



NGH



Pre-construction Water Quality Monitoring Report

Event 10 2022

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Table of contents

1.	Introduction	3
2.	Program and methodology	3
3.	Monitoring event observations and results	5
3.1.	Event 10	5
3.1.1.	Results	7
3.1.2.	Quality Assurance / Quality Control.....	18
4.	Conclusion	19
5.	References	20

Figures

Figure 2-1	WQM locations	4
Figure 3-1	Wallace's Creek (WC-IS)	6
Figure 3-3	Wallace's Creek (WC-RS).....	6
Figure 3-2	Talbingo Reservoir (TR-RS).....	6
Figure 3-4	Temperature for Talbingo Reservoir catchment	9
Figure 3-5	Temperature for Yorkers Creek catchment.....	9
Figure 3-6	Dissolved oxygen (DO%) for Talbingo Reservoir catchment.....	10
Figure 3-7	Dissolved oxygen (DO%) for Yorkers Creek catchment	10
Figure 3-8	Dissolved Oxygen (ppm) for Talbingo Reservoir catchment	11
Figure 3-9	Dissolved Oxygen (ppm) for Yorkers Creek catchment.....	11
Figure 3-10	Specific Conductance (SPC $\mu\text{S}/\text{cm}$) for Talbingo Reservoir catchment.....	12
Figure 3-11	Specific Conductance (SPC $\mu\text{S}/\text{cm}$) for Yorkers Creek catchment	12
Figure 3-12	Conductivity ($\mu\text{S}/\text{cm}$) for Talbingo Reservoir catchment.....	13
Figure 3-13	Conductivity ($\mu\text{S}/\text{cm}$) for Yorkers Creek catchment.....	13
Figure 3-14	Turbidity (NTU) for the Talbingo Reservoir catchment	14
Figure 3-15	Turbidity (NTU) for CG-IS, within the Talbingo Reservoir catchment.....	14
Figure 3-16	Turbidity (NTU) for the Yorkers Creek catchment.....	14
Figure 3-17	Total Suspended Solids for the Talbingo Reservoir catchment.....	15
Figure 3-18	Total Suspended Solids for CG-IS, within the Talbingo Reservoir catchment	15
Figure 3-19	Total Suspended Solids for the Yorkers Creek catchment	16
Figure 3-20	Potential of Hydrogen (pH) for Talbingo Reservoir catchment	16
Figure 3-21	Potential of Hydrogen (pH) for Yorkers Creek catchment	17
Figure 3-22	Oxygen Redox Potential (ORP) for Talbingo Reservoir catchment.....	17
Figure 3-23	Oxygen Redox Potential (ORP) for Yorkers Creek catchment	18

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

In 2020 Snowy Hydro Limited (Snowy Hydro) obtained approval (application number SSI 9208 and EPBC 2018/8322) to expand the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme), by linking the existing Tantangara and Talbingo reservoirs through a series of underground tunnels and constructing a new underground hydro-electric power station (referred to as 'Snowy 2.0').

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 pre-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 pre-construction surface water quality monitoring is to collect baseline data prior to Project construction works. Baseline data will be compared to 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 Pre-construction Water Quality Monitoring Program and Methodology (the Program) (NGH 2022) 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 Default Guideline Values (DGV) for Upland Rivers has been provided for physical and chemical stressors and is detailed in the Program (NGH 2022).

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

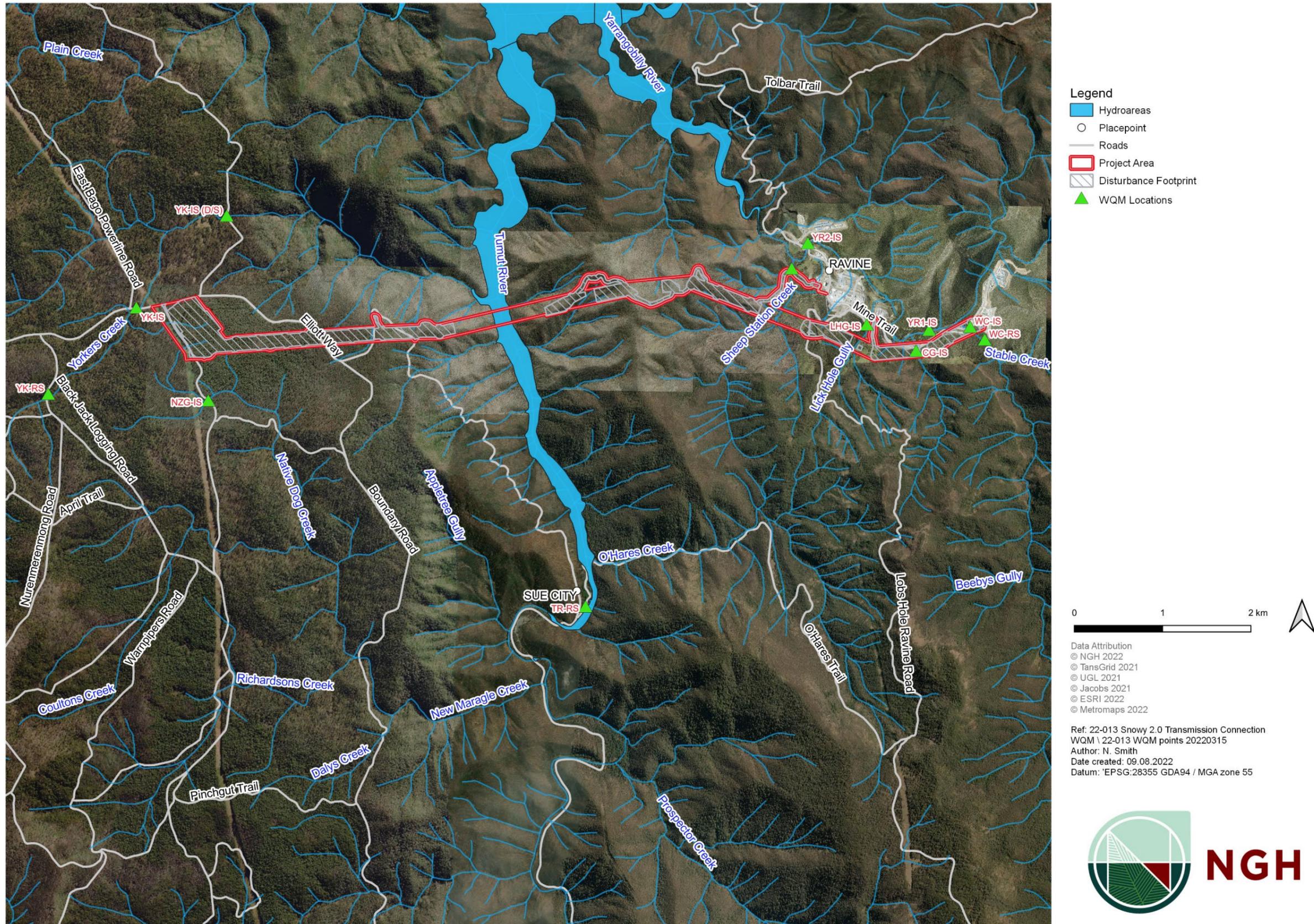


Figure 2-1 WQM locations

3. Monitoring event observations and results

Images for Wallace's Creek and Talbingo Reservoir are provided as Figure 3-1 to Figure 3-3. Water quality results for each site and are provided in Appendix A. Results are highlighted where they exceed the default guideline value (refer to the Program (NGH 2022)). Table 3-1 identifies exceedances of the DGVs for metals, cyanide and nutrients. Physico-chemical results have been provided in Figure 3-4 to Figure 3-23. Field data and observations are provided in Appendix B.

3.1. Event 10

NGH conducted the first, second and third rounds of sampling in March (Event 1), April (Event 2), May and early June (Event 3), late June (Event 4), July (Event 5), August (Event 6), early October (Event 7), late October (Event 8) and November (Event 9) 2022. Reports for each event were prepared following receipt of the laboratory results (NGH 2022a; 2022b; 2022c; 2022d; 2022e; 2022f; 2022g; 2022h; 2022i). The results of Event 1 through to Event 9 have been included in this report and compared to the results of Event 10.

NGH Environmental Scientist, Claire Hobbs, conducted the monitoring event with a UGL representative on 15 and 16 December 2022, Event 10. The weather was rainy, cool, with a slight breeze. Data from the Cabramurra SMHEA automatic weather station on 15 December 2022 (Station ID 072161) indicates that wind speeds were from the south-southwest, with speeds of 15km/hr in the morning, tracking to the west-southwest in the afternoon, with speeds of 13km/hr. Temperatures on the day included a low of -0.8°C and a high of 11.4°C. Data from the Tumbarumba weather station for 16 December 2022 (Station ID 072043) indicates that winds were from the East, with speeds of 15km/hr. Temperatures reached a low of 3.0°C. No data was available regarding maximum temperature on 16 December 2022.

Generally, water flow was observed to be relatively clear, with no hydrocarbon sheen and no odours observed. 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, the Yorkers Creek impact site and Yorkers Creek reference site. Flow was observed to have maintained an elevated level compared to Events 1 and 2 in all channels as a result of the wet weather or snow melt.



Figure 3-1 Wallace's Creek (WC-IS)



Figure 3-2 Wallace's Creek (WC-RS)



Figure 3-3 Talbingo Reservoir (TR-RS)

3.1.1. Results

The results indicate that the water quality in the locations where samples were taken generally meets the DGVs for Upland Rivers with a 99% species protection level for toxicants. Locations where a laboratory result was returned for a physical or chemical stressor was above the DGV are provided in Table 3-1.

Table 3-1 Results above the DGV for Upland Rivers with 99% species protection level

Site identification	Analyte	DGV	Result	Comment
YR1-RS	Zinc mg/L	0.0024	0.006	Higher than other sampling events.
TR-RS	Aluminium mg/L	0.027	0.05	Results for Event 10 have slightly decreased since Event 9.
WC-RS	Zinc mg/L	0.0024	0.019	Higher than other sampling events.
WC-IS	Zinc mg/L	0.0024	0.02	Higher than other sampling events.
CG-IS	Zinc mg/L	0.0024	0.042	Always returns a high total dissolved solid result.
	Total Dissolved Solids (TDS)		299	Results for Event 10 show an increase in Zinc, when compared to previous sampling events.
LHG-IS	Aluminium mg/L	0.027	0.06	Always returns a high total dissolved solid result.
	Zinc mg/L	0.0024	0.005	Results for Event 10 show a decrease in Aluminium and an increase in Zinc, when compared to previous sampling events.
	Total Dissolved Solids (TDS)		300	
YR2-RS	Aluminium mg/L	0.027	0.22	Receives flow from CG-IS and LHG-IS.
SSC-IS	Aluminium mg/L	0.027	0.3	Results for Aluminium have decreased since Event 9.
	Zinc mg/L	0.0024	0.007	Results for Zinc have increased compared to previous sampling events.
YK-IS (D/S)	Aluminium mg/L	0.027	0.25	Located within Bago State Forest and adjacent to an unsealed track. Unknown activities within the State Forest upstream.
	Zinc mg/L	0.0024	0.003	

Site identification	Analyte	DGV	Result	Comment
	Total Suspended Solids (TSS)	0.2	8	Sample taken upstream of culvert.
NZG-IS	Aluminium mg/L	0.027	0.17	Located within Bago State Forest.
	Total Suspended Solids (TSS)	0.2	7	Sample taken upstream of timber supported unsealed track bridge. Banks heavily vegetated, shallow channel.
YK-RS	Aluminium mg/L	0.027	0.36	Located within Bago State Forest and adjacent to an unsealed track. Unknown activities within the State Forest upstream.
	Iron (mg/L)	0.3	0.31	Sample taken downstream of culvert under unsealed track. Flow through culvert is restricted upstream causing a wetland environment.
	Total Suspended Solids (TSS)	0.2	7	
YK-IS	Aluminium mg/L	0.027	0.33	Located within Bago State Forest and adjacent to Elliott Way (road). Unknown activities within the State Forest upstream.
	Total Suspended Solids (TSS)	0.2	6	

CG-IS and LHG-IS displayed elevated values for total dissolved solids compared to the other sampling locations. Total suspended solids (TSS) at YK-IS (D/S), YK-IS, YK-RS and NZG-IS were above the 0.2mg/L assigned DGV (refer to Figure 3-18).

Water temperatures ranged from 8.8 degrees Celsius at YK-IS to 15.9 degrees Celsius at SSC-IS.

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 time series, Figure 3-4 to Figure 3-23, display physico-chemical water quality through time for monitoring Event 1 (March), Event 2 (April), Event 3 (May/June), Event 4 (June), Event 5 (July), Event 6 (August), Event 7 (early October), Event 8 (late October), Event 9 (November) and Event 10 (December). Where a DGV is available, these values are shown on the graph and have been included for dissolved oxygen (%), conductivity, pH and turbidity.

Temperatures within the Talbingo Reservoir catchment have generally decreased since Event 8 and Event 9, refer to Figure 3-4. However, SSC-IS (15.9°C) and TR-RS (12°C) registered an increase, when compared to Event 9 (14.2°C and 9.5°C, respectively). Temperatures have also decreased within the Yorkers Creek catchment, refer to Figure 3-5.

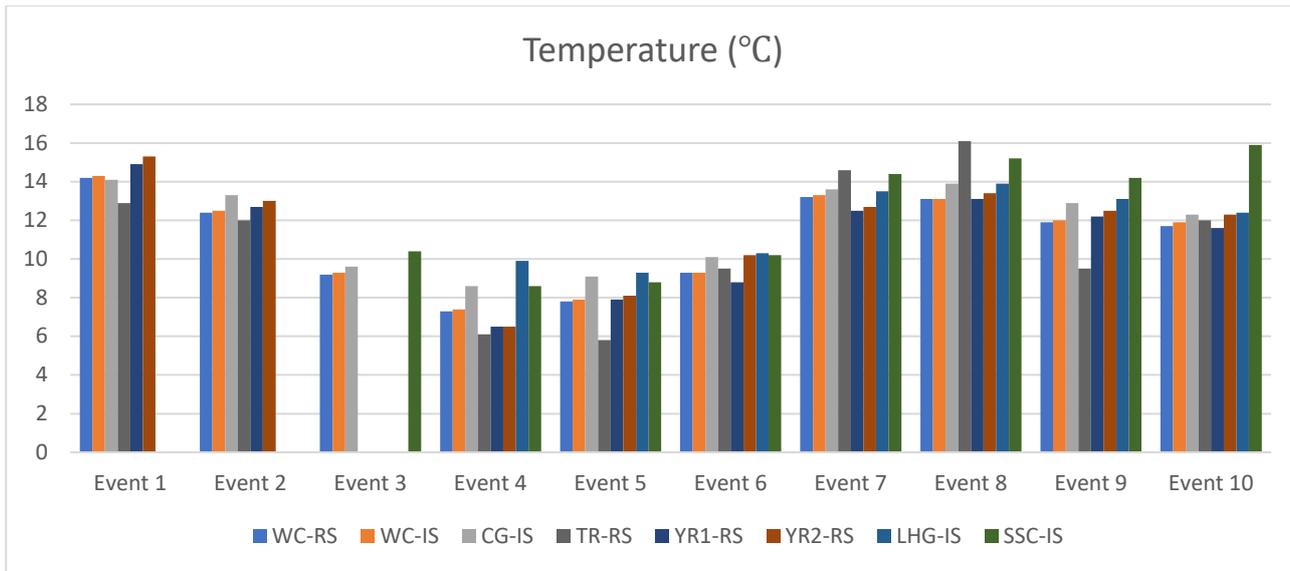


Figure 3-4 Temperature for Talbingo Reservoir catchment

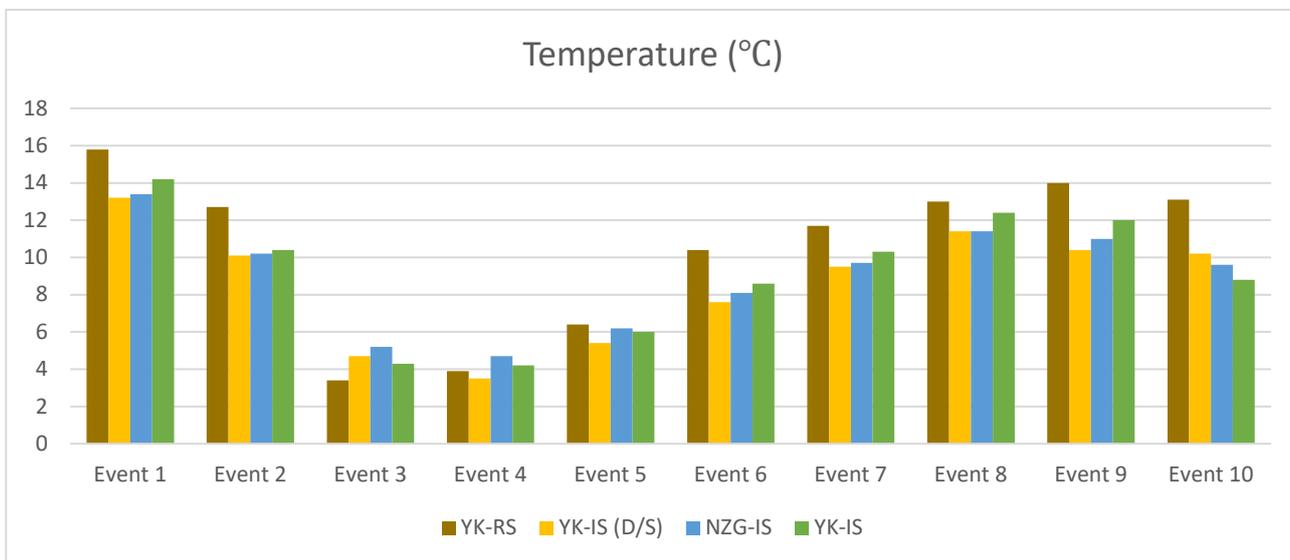


Figure 3-5 Temperature for Yorkers Creek catchment

Due to an equipment supply issue, dissolved oxygen (DO%) readings have not been included for Event 10. The results for Event 1 through to Event 9 have been included in Figure 3-6 and Figure 3-7.

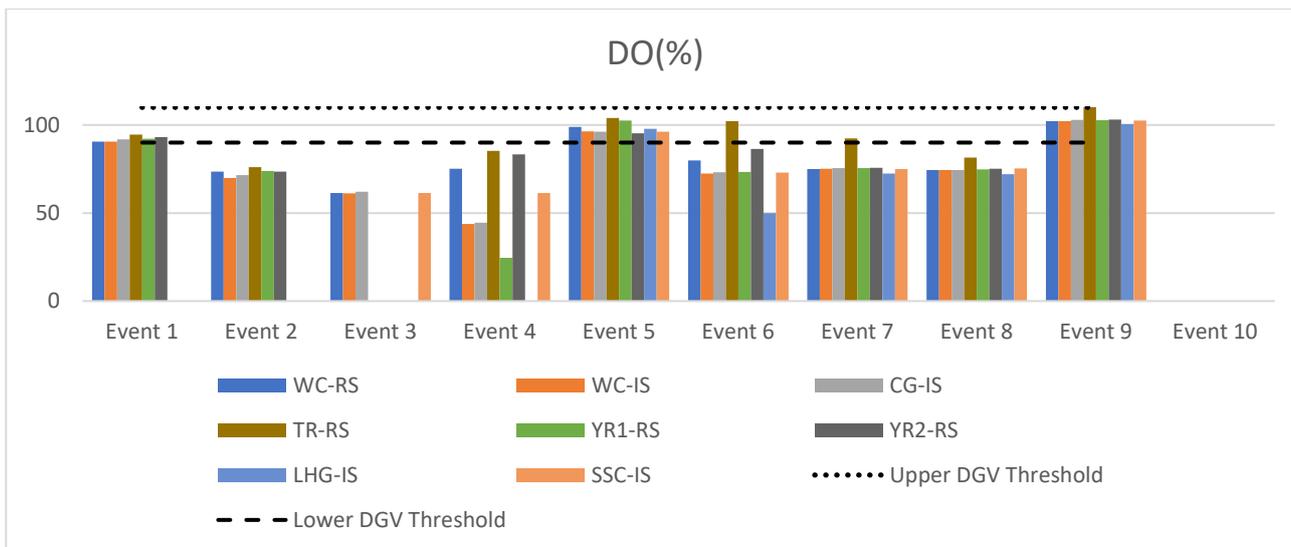


Figure 3-6 Dissolved oxygen (DO%) for Talbingo Reservoir catchment

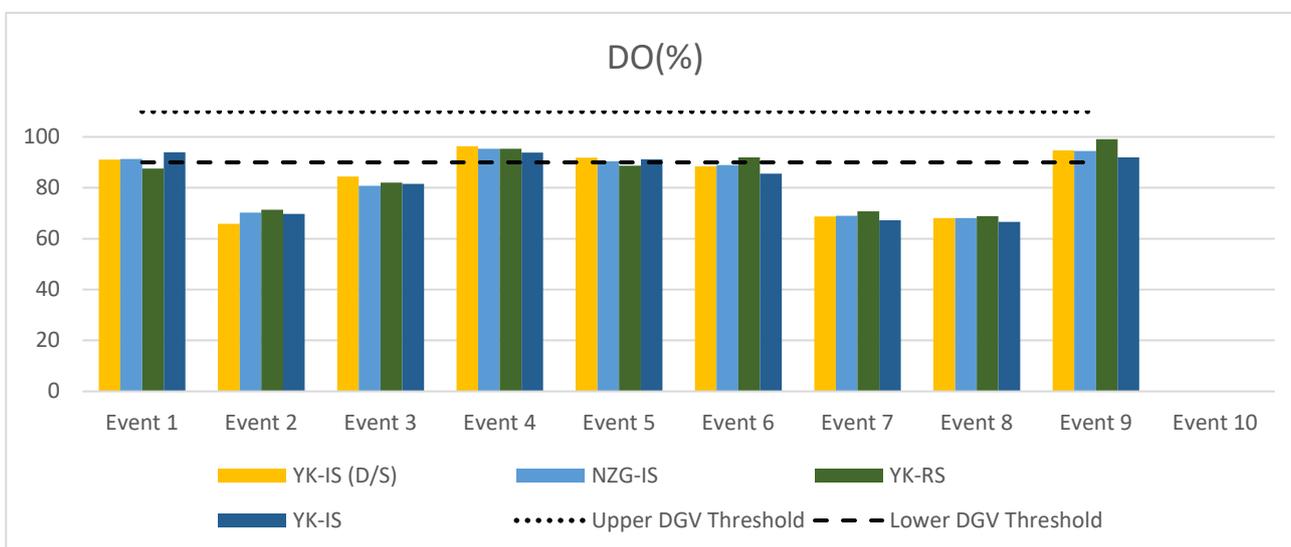


Figure 3-7 Dissolved oxygen (DO%) for Yorkers Creek catchment

The results for DO (ppm) for the Talbingo Reservoir catchment show a general decrease when compared to Event 9, refer to Figure 3-8. The only site to record an increase in DO (ppm) within the Talbingo Reservoir catchment was WC-IS, with a peak result of 15.88ppm. Similarly, most of the sites within the Yorkers Creek catchment recorded a decrease in DO (ppm), refer to Figure 3-9. One site (YK-IS) returned a reading of 10.45 ppm, up from 9.92 ppm during Event 9.

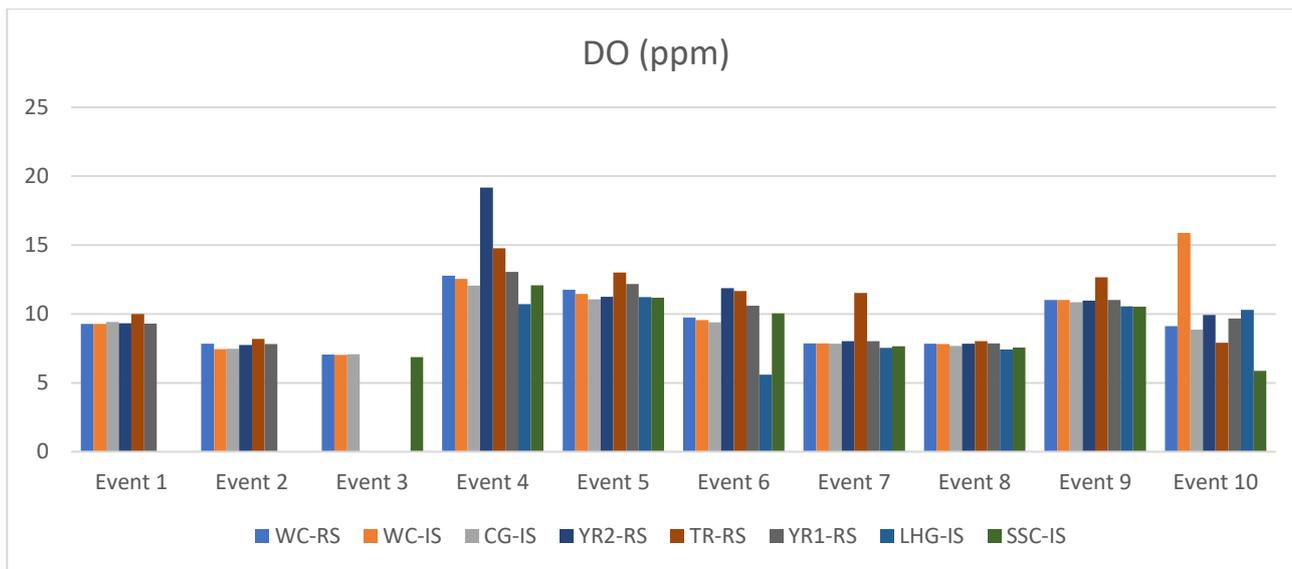


Figure 3-8 Dissolved Oxygen (ppm) for Talbingo Reservoir catchment

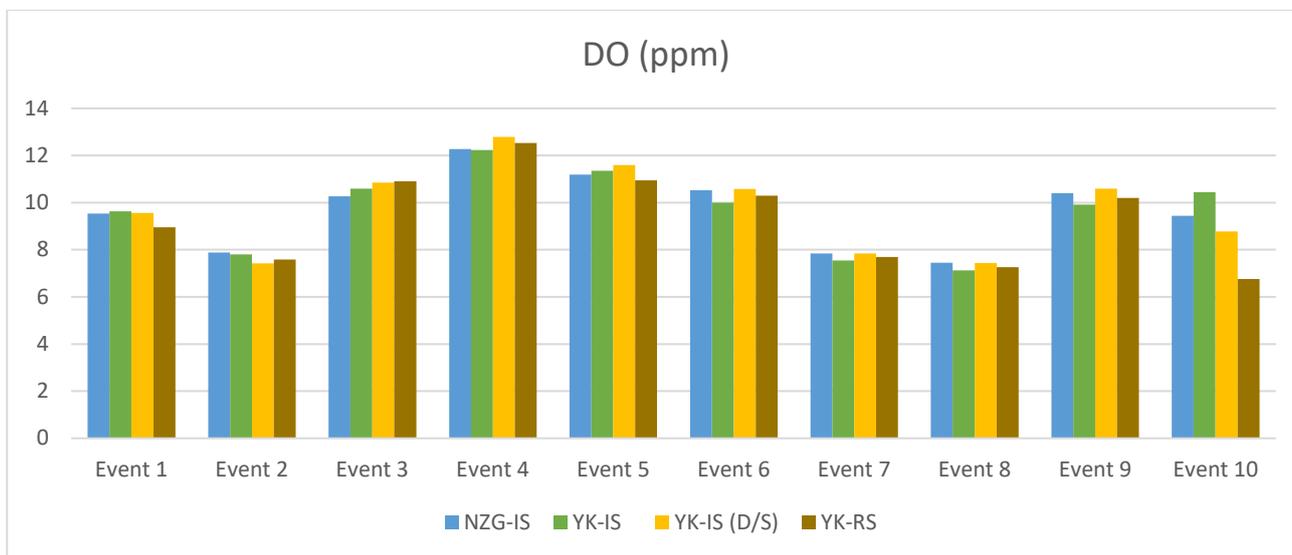


Figure 3-9 Dissolved Oxygen (ppm) for Yorkers Creek catchment

Due to an equipment supply issue, specific conductance (uS/cm) readings have not been included for Event 10. The results for Events 1 through to Event 9 have been included in Figure 3-10 and Figure 3-11.

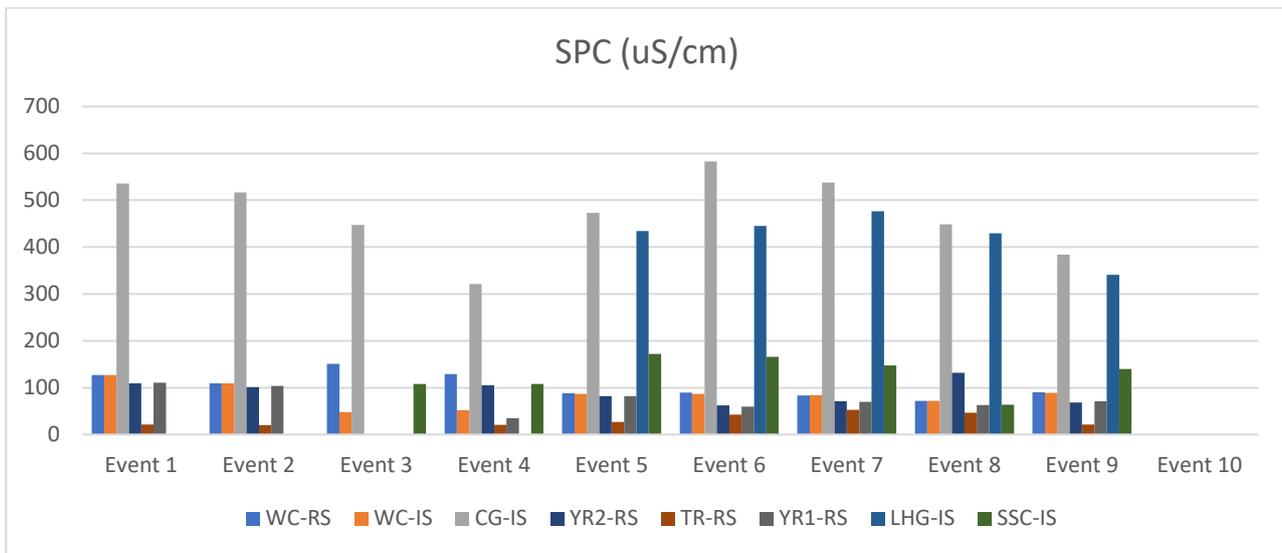


Figure 3-10 Specific Conductance (SPC $\mu\text{S}/\text{cm}$) for Talbingo Reservoir catchment

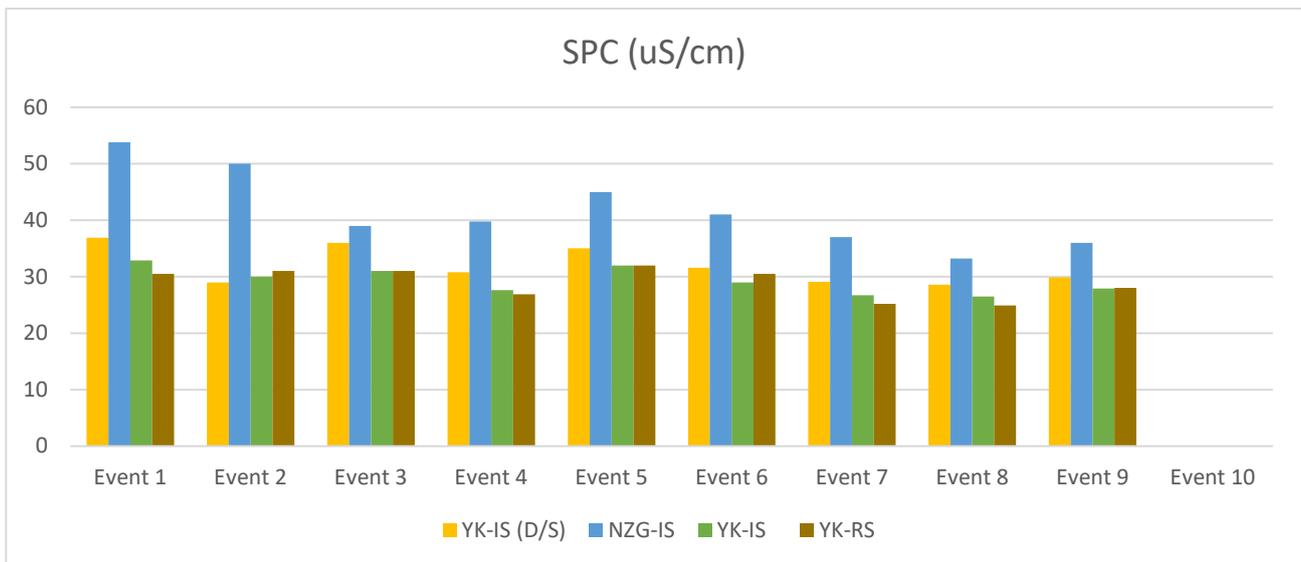


Figure 3-11 Specific Conductance (SPC $\mu\text{S}/\text{cm}$) for Yorkers Creek catchment

Conductivity during Event 10 has generally increased, when compared to Event 9. Conductivity at CG-IS for has increased from 294.9 $\mu\text{S}/\text{cm}$ in Event 9 to 415.7 $\mu\text{S}/\text{cm}$ in Event 10, which is above the upper DGV threshold, refer to Figure 3-12. Similarly, LHG-IS has a reading of 397.9 $\mu\text{S}/\text{cm}$ for Event 10, which is also above the upper DGV for conductivity. In comparison, results for the Yorkers Creek catchment continue to return relatively low conductivity readings, refer to Figure 3-13. This is considered likely a result of the geology upstream. The pattern between sites is mostly reflective of the pattern for specific conductance.

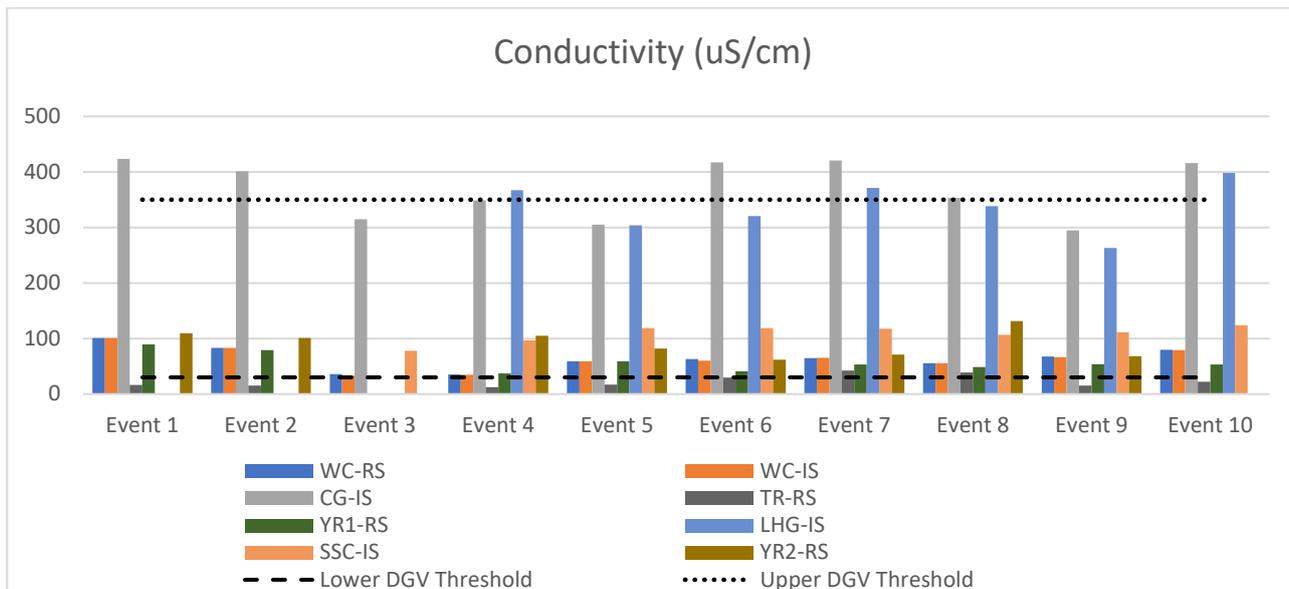


Figure 3-12 Conductivity (µS/cm) for Talbingo Reservoir catchment

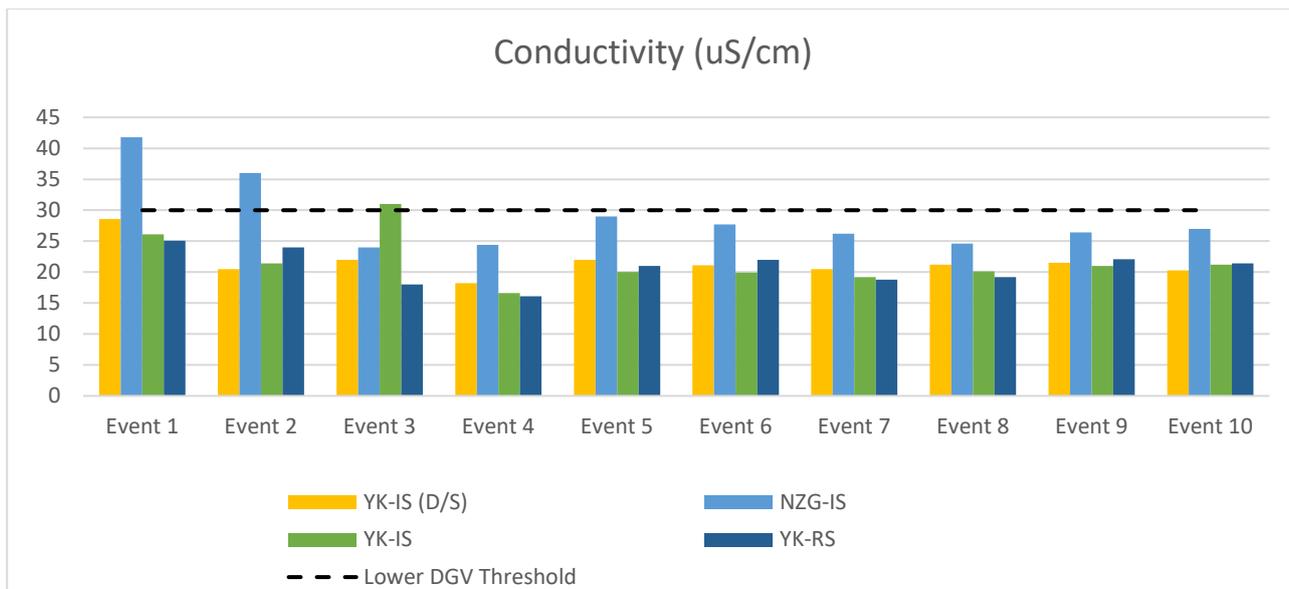


Figure 3-13 Conductivity (µS/cm) for Yorkers Creek catchment

Turbidity values were below the upper DGV threshold at all sites, during Event 10. Turbidity readings within the Talbingo Reservoir catchment have notably decreased since Event 8 and Event 9, refer to Figure 3-14 and Figure 3-15. Turbidity readings within the Yorkers Creek showed a slight decrease at YK-IS (D/S) and NZG-IS. YK-RS and YK-IS both experienced a slight increase in turbidity, refer to Figure 3-16.

Turbidity readings at WC-RS, WC-IS, CG-IS, YR1-RS, LHG-IS, YR2-RS and TR-RS were all below the limit of reporting (LOR). Due to an equipment supply issue, turbidity results for Event 10 were derived from laboratory samples rather than a water quality meter, which could account for the low readings.

The results for CG-IS have been provided in Figure 3-15 in this report to more accurately display the other sampling locations in the Talbingo reservoir catchment.

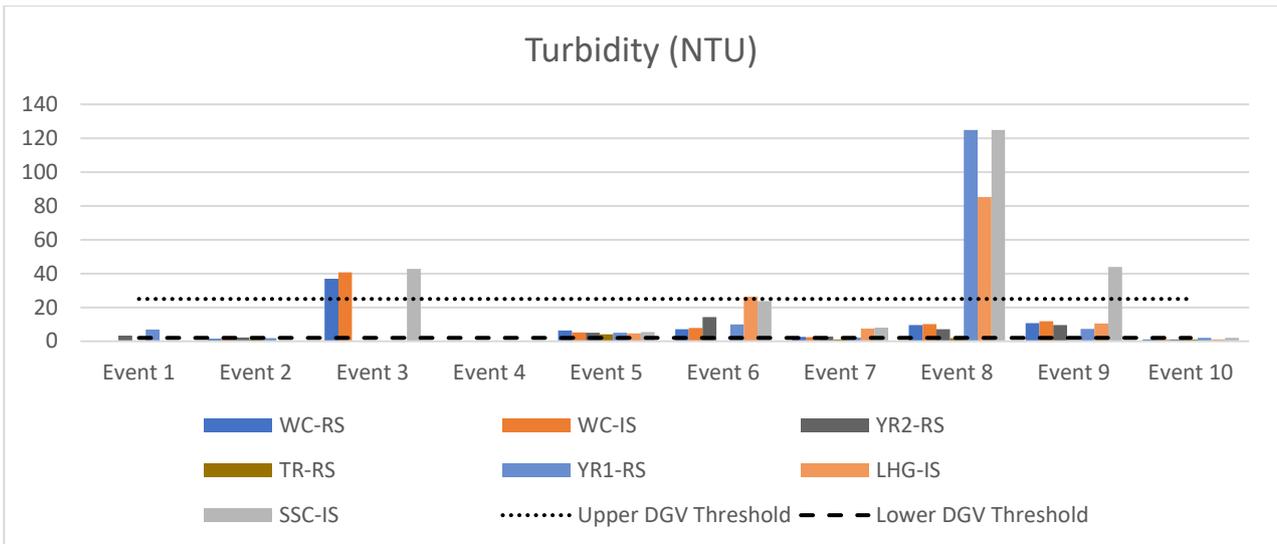


Figure 3-14 Turbidity (NTU) for the Talbingo Reservoir catchment

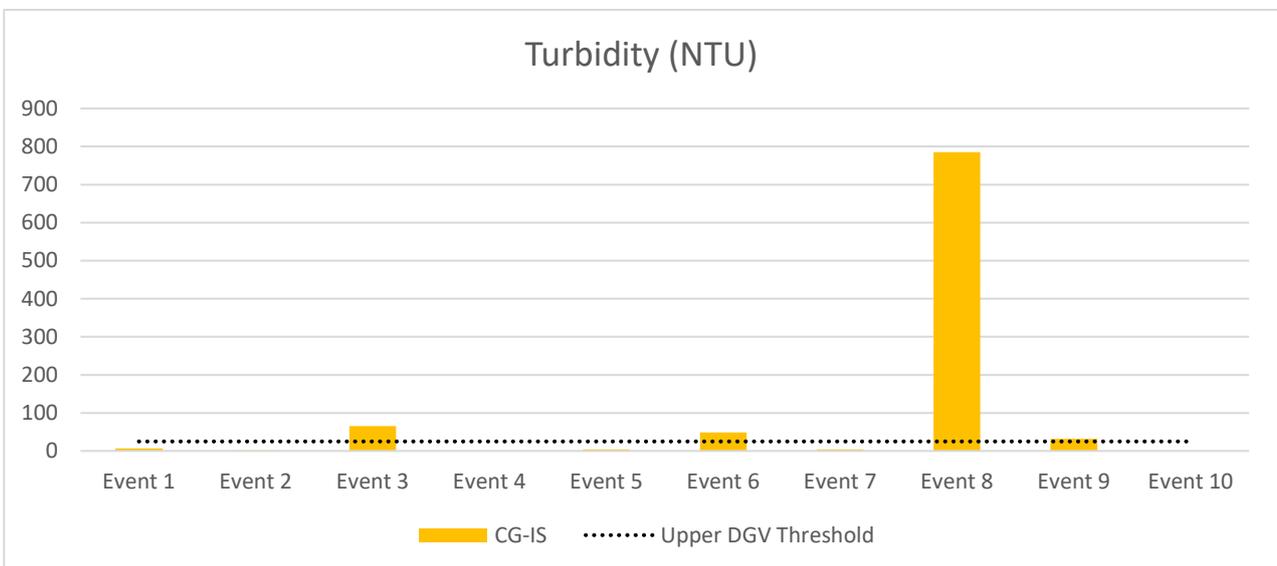


Figure 3-15 Turbidity (NTU) for CG-IS, within the Talbingo Reservoir catchment

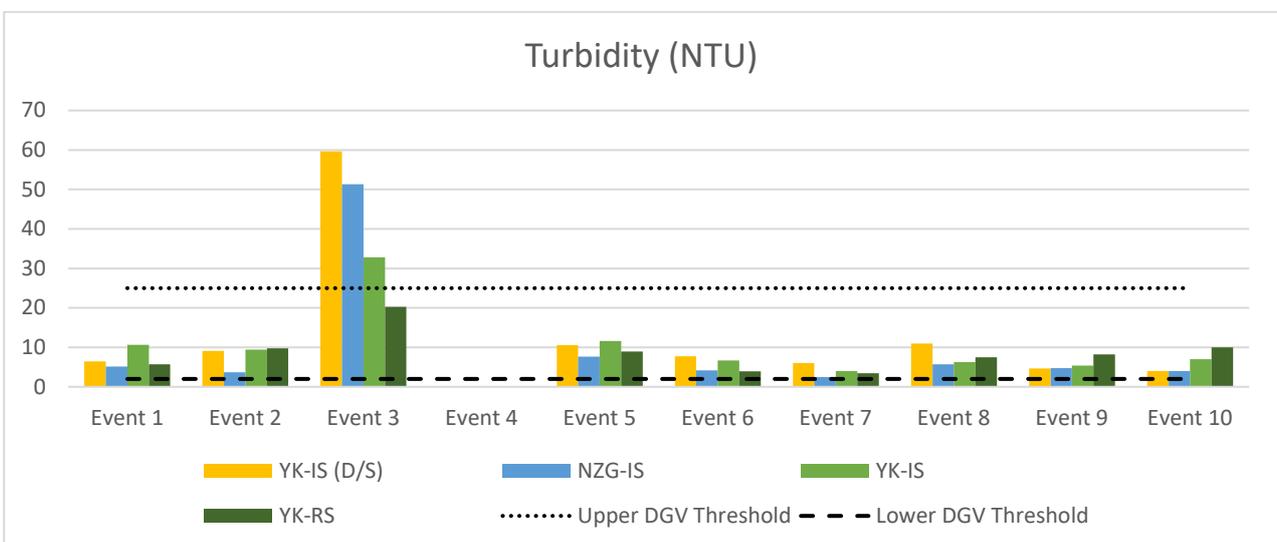


Figure 3-16 Turbidity (NTU) for the Yorkers Creek catchment

Total suspended solids for the Talbingo Reservoir catchment remained largely consistent with the results from Event 9, refer to Figure 3-17 and Figure 3-18. There was a slight increase in total suspended solids within the Yorkers Creek catchment, with NZG-IS and YK-RS returning readings of 7 mg/L, refer to Figure 3-19.

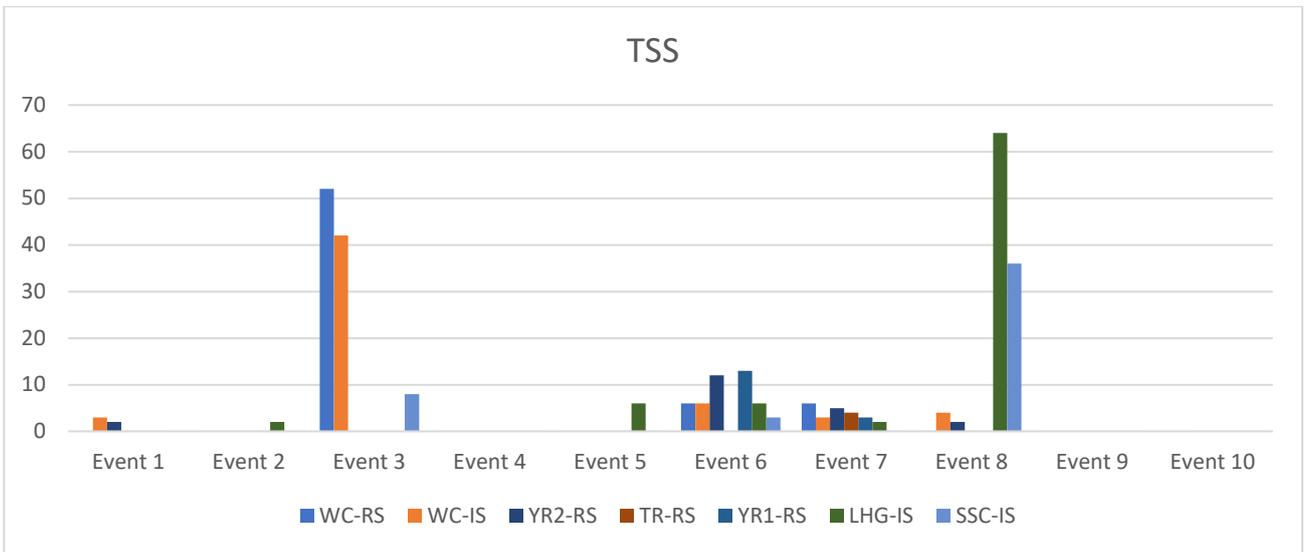


Figure 3-17 Total Suspended Solids for the Talbingo Reservoir catchment

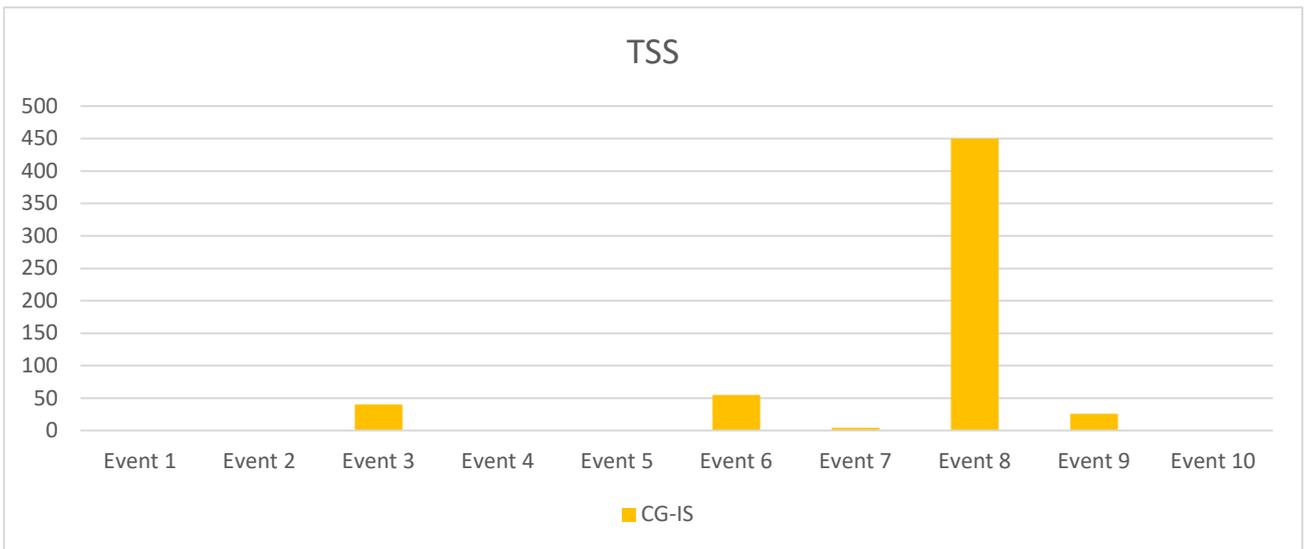


Figure 3-18 Total Suspended Solids for CG-IS, within the Talbingo Reservoir catchment

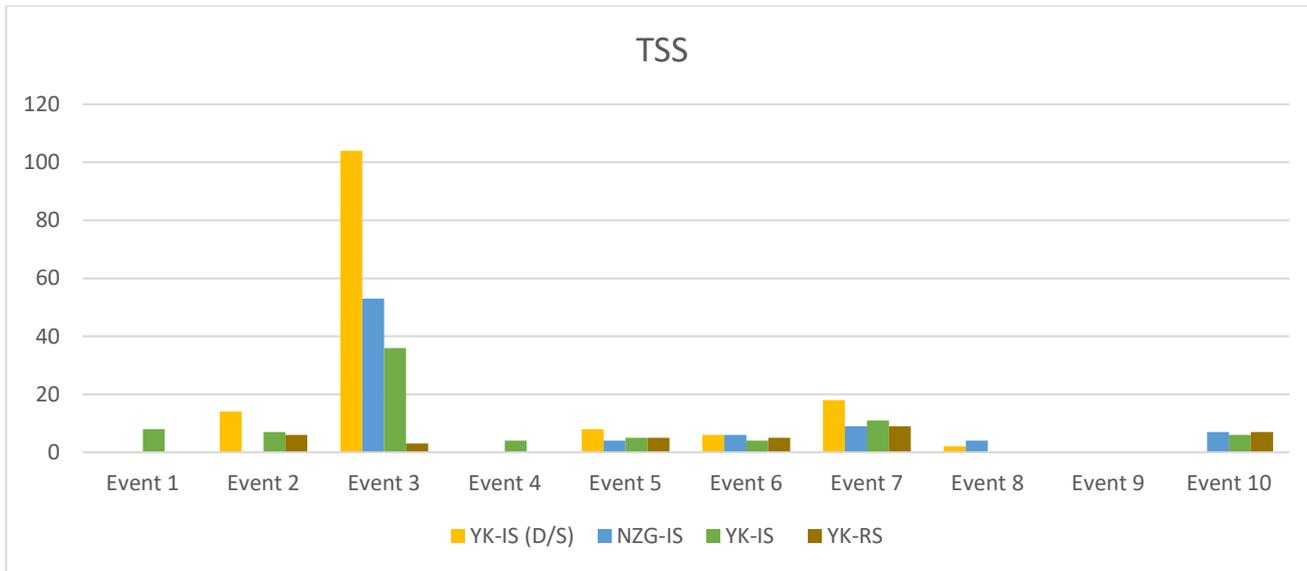


Figure 3-19 Total Suspended Solids for the Yorkers Creek catchment

Values of pH for the Talbingo Reservoir catchment have remained relatively consistent with Event 8 and Event 9. All of the sites had values of pH that fell within the DGV range of 6.5 to 8 pH units, except for CG-IS (8.18), refer to Figure 3-20.

Values of pH for the Yorkers Creek catchment indicate that there has been an increase in pH since Event 9, refer to Figure 3-21. All sites fell within the DGV range value of 6.5 to 8 pH units.

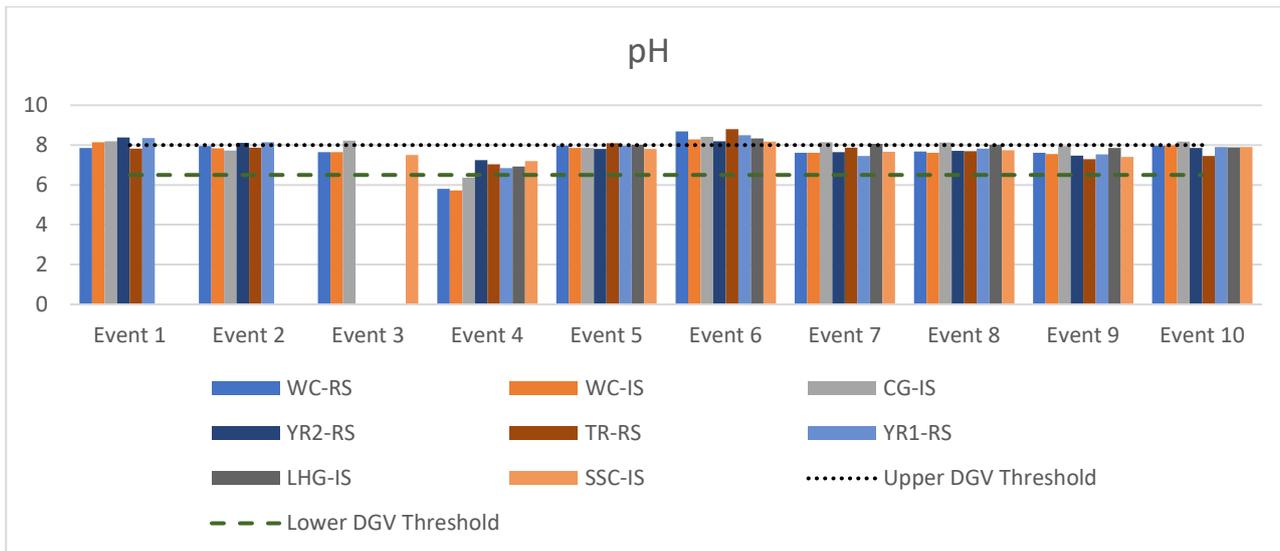


Figure 3-20 Potential of Hydrogen (pH) for Talbingo Reservoir catchment

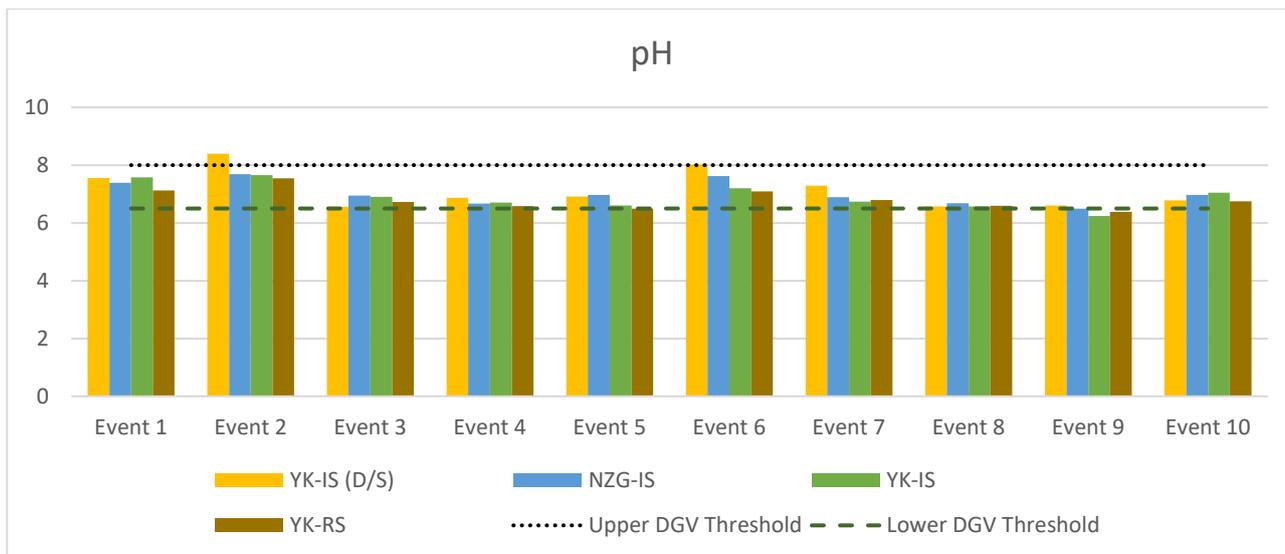


Figure 3-21 Potential of Hydrogen (pH) for Yorkers Creek catchment

The values for the oxygen redox potential during Event 10 have decreased at all sites within the Talbingo and Yorkers Creek catchments, when compared with results from Event 9, refer to Figure 3-22 and Figure 3-23. TR-RS recorded the largest decrease from 190.8mV during Event 9 to 64.6mV during Event 10.

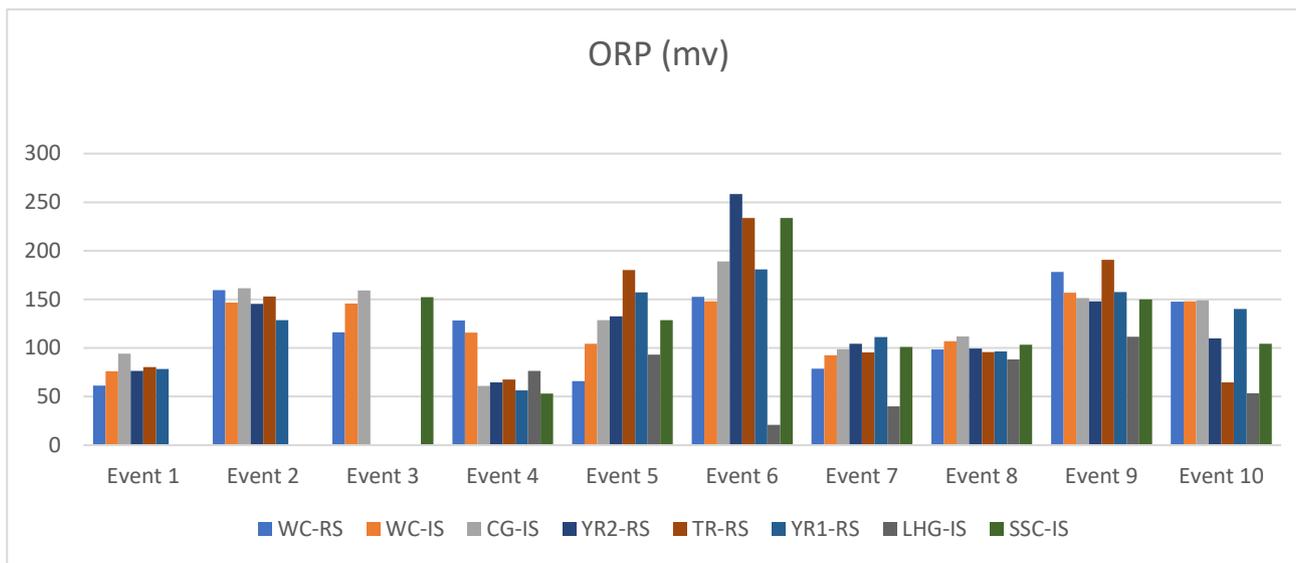


Figure 3-22 Oxygen Redox Potential (ORP) for Talbingo Reservoir catchment

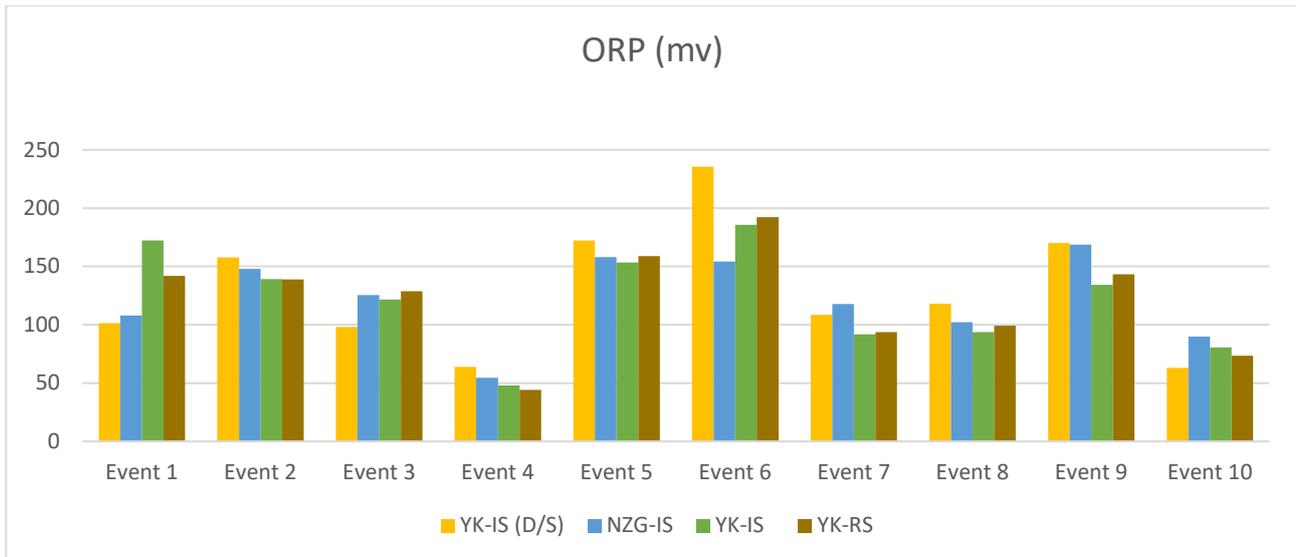


Figure 3-23 Oxygen Redox Potential (ORP) for Yorkers Creek catchment

3.1.2. 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 WC-RS on 15 December 2022. DUP01 was analysed for metals and metalloids. The duplicate sample has been compared against the WC-RS sample by Relative Percentage Difference (RPD) and has returned within an acceptable range or less than 30% for inorganic (or less than 5 times the laboratory limit of reporting (LOR)).
- A water blank was supplied by the laboratory. The water blank sample was analysed for metals and metalloids. There were no exceedances of the sample results above the LORs.

NGH have considered the high RPD value provided for Aluminium (158.62%). Given that the results for Aluminium during Event 10 have been largely consistent with other sampling events, it is considered likely that this was an isolated occurrence. 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 had generally decreased within the Talbingo Reservoir and Yorkers Creek catchments, compared to the water temperatures for Event 9. Water quality monitoring results for Event 10 generally showed an increase in water quality parameters, compared to the results of Event 9. Results for Event 10 also showed a decrease in dissolved oxygen (ppm) and oxygen redox potential (ORP) at most sites, when compared to the results for Event 9.

Laboratory results for Event 10 were generally consistent with the results of the previous monitoring events with the majority of analytes reported below the Limit of Reporting. Results exceeded the DGV for:

- Total suspended solids (0.2 mg/L) at YK-IS (D/S), NZG-IS, YK-IS and YK-RS
- Iron (0.3 mg/L) at YK-RS
- Aluminium (0.027 mg/L) at most sites (TR-RS, LHG-IS, YR2-RS, SSC-IS, YK-IS (D/S), NZG-IS, YK-RS, YK-IS)
- Zinc (0.0024 mg/L) at most sites (YR1-RS, WC-RS, WC-IS, CG-IS, LHG-IS, SSC-IS, YK-IS (D/S))
- Total dissolved solids at CG-IS and LHG-IS, which is a pattern that has carried through all events.

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*.
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- 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*.
- 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 WQM		Sheen/ oil/ grease	°C Temp. ()	Dissolve Oxygen (DO%)	DO (ppm)	Specific EC (SPC uS/cm)	EC (uS/cm)	pH	Redox (mV)	Turbidity (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)	TDS (mg/L)	TSS (mg/L)	Zn (mg/L)	
DOV (Default Guidance Value)		-	90-110	-	30-350	-	6.5-8	-	2-25	0.027	0.00015	0.00005	0.00001	0.00001	0.001	0.004	0.3	0.001	1.2	0.00006	0.008	0.25	0.02	0.00002	-	0.2	0.0024	
WC-RS	Event 1	No	14.2	90.5	9.28	126.8	100.7	7.85	61.2	0.37	0.01	0.00015	0.00001	0.00005	0.0001	0.001	0.03	0.0005	0.011	0.00015	0.0005	3	0.005	0.00001	12	0.1	0.001	
	Event 2	but on seagr	12.4	73.5	7.84	109	83.1	7.95	159.4	1.49	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.001	0.00015	0.0005	0.1	0.005	0.00001	1	0.1	0.001	
	Event 3	No	9.2	81.3	7.05	151	36	7.64	116.3	36.98	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	50	52	0.001	
	Event 4	No	7.3	75.1	12.76	128.9	35.3	8.8	128.4	5.8	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.004	0.00015	0.0005	0.1	0.005	0.00001	19	0.1	0.001	
	Event 5	No	7.8	98.9	11.76	88	59	7.98	65.8	6.45	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	56	0.1	0.001	
	Event 6	No	9.3	79.86	9.74	89.6	62.7	8.69	152.6	7.15	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	44	6	0.001	
	Event 7	No	13.2	74.9	7.87	83.5	64.6	7.62	78.7	2.62	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	53	6	0.001	
	Event 8	No	13.1	74.5	7.84	71.8	55.4	7.87	98.4	9.52	0.079	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0002	0.00015	0.0005	0.1	0.008	0.00001	39	0.1	0.001	
	Event 9	No	11.9	102.1	11.02	90	67.5	7.62	178.4	10.72	0.38	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.004	0.00015	0.0005	0.1	0.002	0.00001	24	0.1	0.001	
	Event 10	No	11.7	91.2	9.12	79.5	79.7	147.8	0.5	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.08	0.0005	0.004	0.00015	0.0005	0.1	0.005	0.00001	74	0.1	0.019		
Min			7.30	61.30	7.05	71.80	35.30	5.80	61.20	0.37	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	0.00	1.00	0.10	0.00		
Max			14.20	102.10	12.76	151.00	100.70	8.69	178.40	36.98	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Mean			11.01	81.18	9.43	104.29	64.38	7.68	118.70	8.42	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.01	0.00	37.20	6.47	0.00	
Count			10.00	9.00	10.00	9.00	10.00	10.00	10.00	9.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
St. Dev			2.42	13.30	1.90	26.20	20.20	0.73	41.41	11.38	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
WC-IS	Event 1	No	14.3	90.6	9.28	126.7	100.8	8.14	76	0.32	0.01	0.00015	0.00001	0.00005	0.0001	0.001	0.03	0.0005	0.011	0.00015	0.0005	0.1	0.005	0.00001	80	3	0.001	
	Event 2	No	12.5	69.9	7.44	109	83.3	7.84	146.8	1.39	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.002	0.00015	0.0005	0.1	0.005	0.00001	63	0.1	0.001	
	Event 3	No	9.3	81.2	7.03	48	33	7.64	145.8	40.77	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.02	0.00001	41	42	0.001	
	Event 4	No	7.4	43.7	12.55	52.3	35	5.73	115.9	0.22	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.02	0.00001	27	0.1	0.001	
	Event 5	No	7.9	96.4	11.45	67	59	7.86	104.3	5.24	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.004	0.00015	0.0005	0.1	0.005	0.00001	48	0.1	0.001	
	Event 6	No	9.3	72.36	9.55	86.6	60.3	8.28	148	7.78	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	47	6	0.001	
	Event 7	No	13.3	75.1	7.86	83.8	65.1	7.61	92.6	2.41	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	4	3	0.001	
	Event 8	No	13.1	74.4	7.82	71.7	55.4	7.62	107.1	10.1	0.076	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.001	0.00015	0.0005	0.1	0.01	0.00001	7	4	0.001	
	Event 9	No	12	102.2	11.02	88.7	66.6	7.55	156.8	11.79	0.36	0.00015	0.00001	0.00005	0.0001	0.001	0.08	0.0005	0.003	0.00015	0.0005	0.1	0.02	0.00001	6	0.1	0.001	
	Event 10	No	11.9	92.2	9.31	110.7	69.3	7.8	149	14.8	0.15	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.004	0.00015	0.0005	0.1	0.005	0.00001	68	0.1	0.001	
Min			7.40	43.70	7.03	48.00	33.00	5.73	76.00	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	0.00	1.00	0.10	0.00		
Max			14.30	102.20	11.45	126.70	100.80	8.28	156.80	40.77	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Mean			11.10	76.21	9.99	83.76	63.77	7.63	124.13	8.92	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.01	0.00	38.50	5.85	0.00	
Count			10.00	9.00	10.00	9.00	10.00	10.00	10.00	9.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
St. Dev			2.42	13.30	1.90	26.20	20.20	0.73	41.41	11.38	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
CG-IS	Event 1	No	14.1	91.8	9.43	536	423.6	8.19	94.3	4.47	0.21	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.002	0.00015	0.0005	0.1	0.005	0.00001	293	0.1	0.001	
	Event 2	No	13.3	71.6	7.48	517	401.2	7.73	161.4	1.36	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.001	0.00015	0.0005	0.1	0.005	0.00001	293	0.1	0.001	
	Event 3	No	9.6	62.1	7.07	447	315	8.22	159.2	65.1	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	270	40	0.001	
	Event 4	No	8.6	44.57	12.06	321.3	349	6.37	61.1	0.22	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.05	0.00001	268	0.1	0.001	
	Event 5	No	9.1	96.1	11.07	473	365	7.88	128.7	4.22	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	293	0.1	0.001	
	Event 6	No	10.1	73.2	9.14	583	472	8.42	198.2	48.5	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	36	18	0.001	
	Event 7	No	13.6	75.5	7.84	538	420.8	8.15	98.8	3.75	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.05	0.0005	0.0005	0.00015	0.0005	0.1	0.005	0.00001	243	4	0.002	
	Event 8	No	13.9	74.5	7.88	448.3	353.6	8.13	111.9	785.48	1.06	0.00015	0.00001	0.00005	0.0001	0.001	0.52	0.0005	0.011	0.00015	0.0005	0.1	0.35	0.00001	277	450	0.002	
	Event 9	No	12.9	102.9	10.86	384	294.9	7.95	151.2	32.04	0.44	0.00015	0.00001	0.00005	0.0001	0.001	0.09	0.0005	0.002	0.00015	0.0005	0.1	0.02	0.00001	232	28	0.001	
	Event 10	No	12.3	82.3	8.87	415.7	318	149.1	0.2	0.015	0.00015	0.00001	0.00005	0.0001	0.001	0.02	0.0005	0.002	0.00015	0.0005	0.1	0.005	0.00001	299	0.1	0.042		
Min			8.60	44.57																								

APPENDIX B OBSERVATIONS AND FIELD DATA

EVENT 10 15 + 16 DECEMBER 2022

* TURBIDITY IN LAB ANALYSIS

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	11.7		9.12	79.5	79.5	7.97	147.8	
	Comment	DUPLICATE DUPOI TAKEN HERE FAST FLOWING CLEAR.								
WC-IS	Month	NO	11.9		15.88		79.2	7.99	148.0	
	Comment	FLOWING. GRAVEL ON BANK.								
CG-IS	Month	NO	12.3		8.87		415.7*	8.18	149.1	
	Comment	TURBID, FAST FLOWING.								
YR1-RS	Month	NO	11.6		9.68		53.1	7.91	140.3	
	Comment	CLEAR, SLIGHTLY LOWER FLOW LIKELY DUE TO LESS RAIN THAN PREVIOUS EVENT								

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	ND	12.4		10.31		397.9	7.89	53.5	
	Comment	CLEAR, FLOWING								
YR2-RS	Month	ND	12.3		9.94		109.8 53.3	7.86	109.8	
	Comment	LEVEL LOWER THAN LAST EVENT, ROCKS EXPOSED ON BANK.								
SSC-IS	Month	ND	15.9		5.87		123.7	7.91	104.5	
	Comment	SLIGHTLY OPAQUE, STEADY FLOW								
TR-RS	Month	ND	12.0		7.92		22.0	7.46	64.6	
	Comment	CLEAR, MUCH SAME AS LAST MONTH								
YK-IS (D/S)	Month	ND	10.2		8.78		20.3	6.78	63.1	
	Comment	CLEAR, FAST FLOWING								

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)
NZG-IS	Month	ND	9.6		9.44		27.0	6.97	90.0	
	Comment	CLEAR + STEADY FLOW.								
YK-IS	Month	ND	8.8		10.45		21.2	7.05	80.5	
	Comment	CLEAR. EVIDENCE HOLES ON BANK								
YK-RS	Month	ND	13.1		6.76		21.4	6.75	73.6	
	Comment	CLEAR + STEADY FLOW.								

APPENDIX C LABORATORY CERTIFICATES

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Street

Wagga Wagga NSW 2650

Attention: Nicole Isles



NATA Accredited Laboratory
Number: 9597

Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 1 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0182	WC-RS 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.08 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	74 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.019 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Strret

Wagga Wagga NSW 2650

Attention: Nicole Isles



NATA Accredited Laboratory
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REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number:2212-0063

Page 2 of 15

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<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0183	WC-IS 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.08 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	68 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.020 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Strret

Wagga Wagga NSW 2650

Attention: Nicole Isles



NATA Accredited Laboratory
Number: 9597

Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number:2212-0063

Page 3 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0184	CG-IS 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.02 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	299 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	<1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.042 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Strret

Wagga Wagga NSW 2650

Attention: Nicole Isles



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ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number:2212-0063

Page 4 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0185	YR1-IS 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.15 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	67 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	2 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.006 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 5 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0186	LHG-IS 15.12.22	Aluminium (dissolved)	0.06 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.10 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.017 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	310 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	<1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.005 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 6 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0187	YR2-IS 15.12.22	Aluminium (dissolved)	0.22 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.16 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	63 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 7 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0188	SSC-IS 15.12.22	Aluminium (dissolved)	0.30 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.14 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	189 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	2 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.007 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 8 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0189	TR-RS 16.12.22	Aluminium (dissolved)	0.05 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.07 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	37 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	<1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.007 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number:2212-0063

Page 9 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0190	YK-RS (d/s) 16.12.22	Aluminium (dissolved)	0.25 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.23 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.004 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	30 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	8 mg/L	APHA 2540 D	0.2
		Turbidity	4 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 10 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0191	NZG-IS 16.12.22	Aluminium (dissolved)	0.17 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.15 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.003 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	39 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	7 mg/L	APHA 2540 D	0.2
		Turbidity	4 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

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Wagga Wagga NSW 2650

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Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 11 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0192	YK-IS 16.12.22	Aluminium (dissolved)	0.33 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.26 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.006 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	35 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	6 mg/L	APHA 2540 D	0.2
		Turbidity	7 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Street

Wagga Wagga NSW 2650

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Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number: 2212-0063

Page 12 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022
<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0193	YK-RS 16.12.22	Aluminium (dissolved)	0.36 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Cyanide	<0.002 mg/L	* APHA 4500-CN E	0.002
		Iron (dissolved)	0.31 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.009 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	31 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	7 mg/L	APHA 2540 D	0.2
		Turbidity	10 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.002 mg/L	APHA 3030 B/3120 B	0.002

NGH Environmental

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Strret

Wagga Wagga NSW 2650

Attention: Nicole Isles



NATA Accredited Laboratory
Number: 9597

Accredited for compliance with
ISO/IEC 17025 - Testing

REPLACEMENT LABORATORY ANALYSIS REPORT

This Report Replaces Report Sent on 20/01/2023

Report Number:2212-0063

Page 13 of 15

For all enquiries related to this report please quote document number: 2212-0063

<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u>
		16-December-2022

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0194	DUP01 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		Copper (dissolved)	<0.002 mg/L	APHA 3030 B/3120 B	0.002
		Iron (dissolved)	0.09 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	0.005 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Turbidity	1 NTU	APHA 2130 B	1
		Zinc (dissolved)	0.006 mg/L	APHA 3030 B/3120 B	0.002
22Dec-0195	WATER BLANK 15.12.22	Aluminium (dissolved)	<0.03 mg/L	APHA 3030 B/3120 B	0.03
		Arsenic	<0.0003 mg/L	Analysis by Melbourne (acc no: 992)	
		Cadmium (dissolved)	<0.00002 mg/L	APHA 3030 B/3120 B	0.002
		Chromium (dissolved)	<0.00001 mg/L	APHA 3030 B/3120 B	0.002
		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

Wednesday, February 15, 2023

Suite 1/39 Fitzmaurice Strret

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		16-December-2022

<u>Sample Type</u>	<u>Collected By</u>	<u>Date Received</u>
Water	C. Hobbs	16-December-2022

<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>
22Dec-0195	WATER BLANK 15.12.22				
		Iron (dissolved)	<0.01 mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Manganese (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.001
		Mercury	<0.00003 mg/L	Analysis by ALS Melbourne (acc no: 992)	
		Nickel (dissolved)	<0.001 mg/L	APHA 3030 B/3120 B	0.01
		Nitrogen, total	<0.2 mg/L	* APHA 4500-Norg B + 4110 B	2
		Nitrate/Nitrite as N	<0.1 mg/L	LTM-W-014	0.1
		Phosphorus, Total	<0.01 mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002 mg/L	* APHA 3030 E/3120 B	0.002
		Total Dissolved Solids	<2 mg/L	LTM-W-035	2
		Total Kjeldahl Nitrogen	<0.2 mg/L	LTM-W-034	2
		Total Suspended Solids	<0.2 mg/L	APHA 2540 D	0.2
		Turbidity	<1 NTU	APHA 2130 B	1
		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
Suite 1/39 Fitzmaurice Strret
Wagga Wagga NSW 2650
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REPLACEMENT LABORATORY ANALYSIS REPORT

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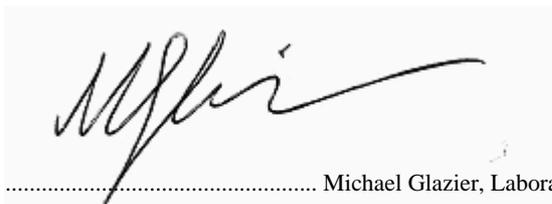
Report Number:2212-0063

Page 15 of 15

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<u>Facility:</u>	<u>Order #</u>	<u>Date Analysis Commenced</u> 16-December-2022
<u>Sample Type</u> Water	<u>Collected By</u> C. Hobbs	<u>Date Received</u> 16-December-2022

<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>
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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

		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)	Ag (mg/L)	Zn (mg/L)	
DUP01	Event 1	DUP01	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.003	0.000015	0.0005	0.00001	0.001
		YR1-IS	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.003	0.000015	0.0005	0.00001	0.001
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 2	DUP01	<0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.001	0.000015	0.0005	0.00001	0.001
		WC-IS	<0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.002	0.000015	0.0005	0.00001	0.001
		RPD% - Acceptable Range except Mn	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%
	Event 3	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		Yk-IS (D/S)	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Event 4	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Event 5	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Event 6	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Event 7	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.005	0.0005	0.0005	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Event 8	DUP01	1.79	0.00015	0.00001	0.000005	0.0001	0.001	0.73	0.0005	0.011	0.000015	0.0005	0.00001	0.002	
	SSC-IS	1.73	0.00015	0.00001	0.000005	0.0001	0.001	0.69	0.0005	0.011	0.000015	0.0005	0.00001	0.002	
	RPD% - Acceptable Range	3.4090909	0%	0%	0%	0%	0%	5.63380282	0%	0%	0%	0%	0%	0%	
Event 9	DUP01	0.35	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.003	0.000015	0.0005	0.00001	0.001	
	WC-RS	0.36	0.00015	0.00001	0.000005	0.0001	0.001	0.08	0.0005	0.004	0.000015	0.0005	0.00001	0.001	
	RPD% - Acceptable Range	2.82	0%	0%	0%	0%	0%	28.57	0%	0%	0%	0%	0%	0%	
Event 10	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.09	0.0005	0.005	0.000015	0.0005	0.00001	0.006	
	WC-RS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.08	0.0005	0.004	0.000015	0.0005	0.00001	0.019	
	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	11.76	0%	0%	0%	0%	0%	0%	

Water Blar	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

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

How to calculate the Relative Percent Difference (RPD)

The basic equation for RPD is $RPD = \frac{|R1 - R2|}{\frac{R1 + R2}{2}} \times 100$,

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 Quatro Pro Plus**
Serial No. **09K101343**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments	
Battery	Charge Condition	✓		
	Fuses	✓		
	Capacity	✓		
Switch/keypad	Operation	✓		
	Display	Intensity	✓	
		Operation (segments)	✓	
Grill Filter	Condition	✓		
	Seal	✓		
PCB	Condition	✓		
Connectors	Condition	✓		
Sensor	1. pH	✓		
	2. mV	✓		
	3. EC	✓		
	4. D.O	✓		
	5. Temp	✓		
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	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		386467	pH 7.01
2. pH 4.00		pH 4.00		389384	pH 4.01
3. ORP		236.9mV		375760/378285	236.9mV
4. EC		2760uS		377099	2760uS
5. D.O		100%			100.5%-753.9mmHg
6. Temp		22.7oC		MultiTherm 09000528	21.4oC

Calibrated by: Leonard Westerman-Cox

Calibration date: 9/12/2022

Next calibration due: 8/01/2023