

Pre-construction Water Quality Monitoring Report

Event 19 2023

Project Number: 22-013





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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.

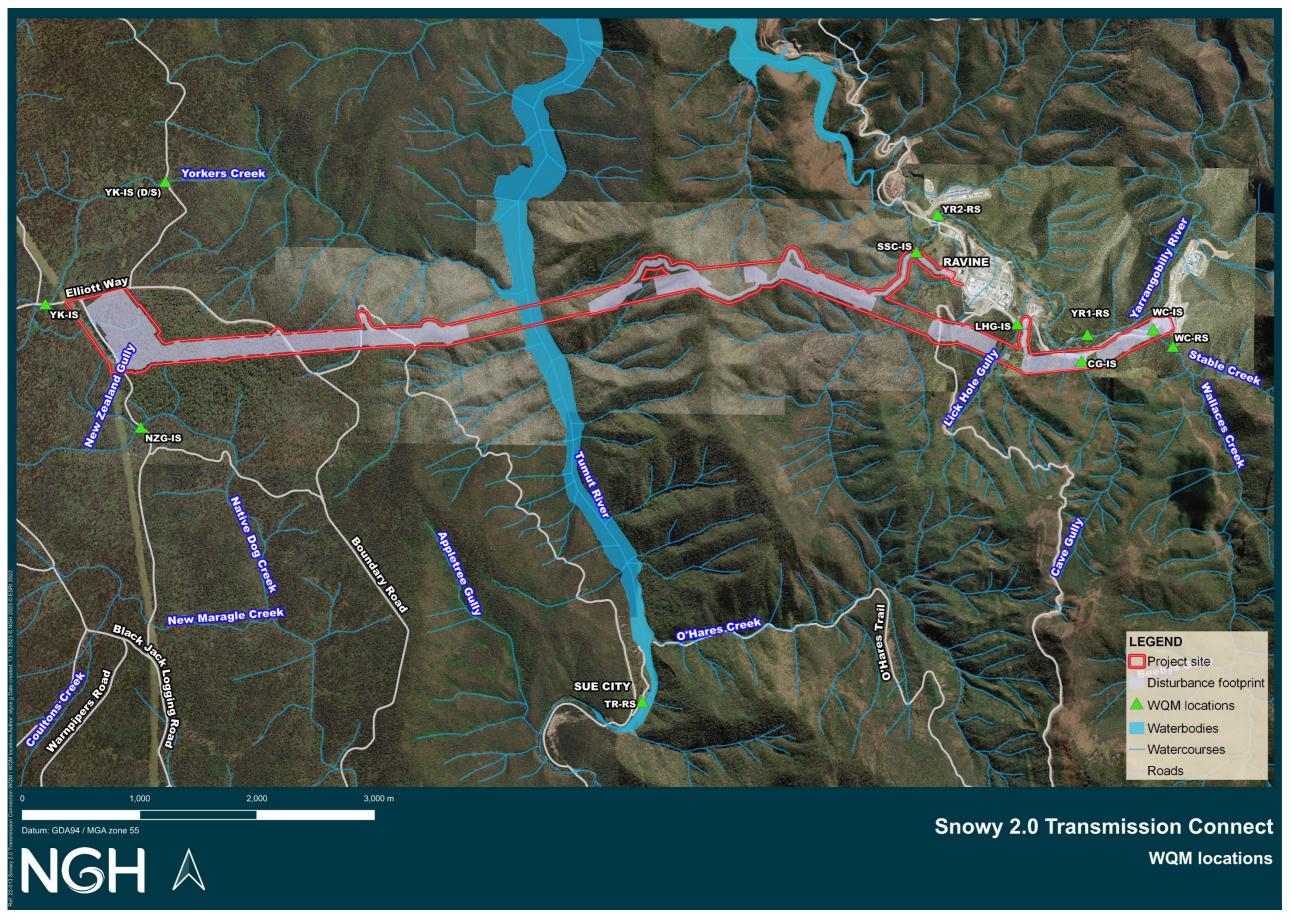


Figure 2-1 WQM locations

3. Monitoring event observations and results

Images for Wallaces Creek, Yarrangobilly River and New Zealand Gully 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 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 3-33. Field data and observations are provided in Appendix B.

3.1. Event 19

NGH has conducted 19 monthly sampling events since March 2022 (Event 1). Reports for each event were prepared following receival of the laboratory results (NGH 2022a – 2023i). The results of Event 1 through to Event 18 have been compared in this report to the results of Event 19.

NGH Environmental Scientists, Nicola Smith and Martin Wyburn, conducted the Event 19 monitoring with a UGL representative on 27 and 28 September 2023. The weather was overcast and slightly windy on the 27 September, and warm and sunny on the 28 September. Data from the Cabramurra SMHEA automatic weather station on 27 September 2023 (Station ID 072161) indicates that morning winds were from the west with speeds of 20 km/hr. During the afternoon, winds were from the west with speeds of 20 km/hr. Temperatures on the day included a low of 8.1°C and a high of 13.7°C. Data from the Tumbarumba weather station for 28 September 2023 (Station ID 072043) indicates that the weather was calm with temperatures ranging from a low of 3.5°C to a high of 24.0°C.

Clear flows were observed at most locations. However, cloudy flows were noted at LHG-IS, YK-IS (D/S), YK-IS and YK-RS. No hydrocarbon sheen or 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, the Yorkers Creek impact site and the Yorkers Creek reference site. Water was observed to have moderate to fast flows. Water levels within Talbingo Reservoir have replenished since the last sampling event, however the water level at the Sheep Station Creek site had decreased.



Figure 3-1 Wallaces Creek (WC-RS)

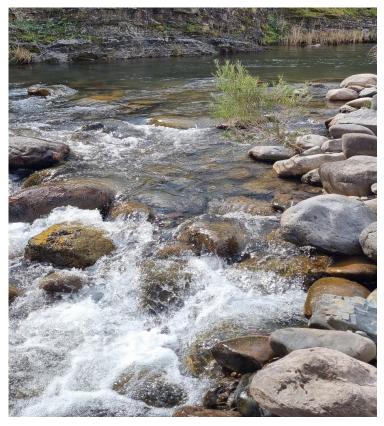


Figure 3-2 Yarrangobilly River (YR2-RS)



Figure 3-3 New Zealand Gully (NZG-IS)

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 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
WC-RS	Aluminium mg/L	0.027	0.04	The results for Aluminium have slightly decreased, when compared with results for Event 18.
	Chromium mg/L	0.0001	0.004	Results for Chromium are elevated, which is atypical of this sampling location. The results for Total Phosphorus have increased,
	Total Phosphorus mg/L	0.02	0.04	when compared with results for Event 18.
CG-IS	Aluminium	0.027	0.06	The results for Aluminium have remained

Site identification	Analyte	DGV	Result	Comment
	mg/L			consistent with results for Event 18.
	Chromium mg/L	0.00001	0.003	The results for Chromium are elevated, which is atypical for this location.
	Zinc mg/L	0.0024	0.004	Results for Zinc are consistent with prior sampling events.
LHG-IS	Aluminium mg/L	0.027	0.07	The results for Aluminium have decreased compared with results for Event 18.
	Lead mg/L	0.001	0.005	Results for Lead and Zinc have remained consistent with the results from Event 18.
	Zinc mg/L	0.0024	0.004	Results for Chromium have increased compared to results from Event 18
	Chromium mg/L	0.00001	0.003	The results for Copper have remained consistent with the results from Event 18.
	Copper mg/L	0.001	0.002	
WC-IS	Aluminium mg/L	0.027	0.04	Results for Aluminium have decreased when compared with Event 18.
	Chromium mg/L	0.00001	0.003	Results for Chromium are elevated, when compared to Event 18.
YK-IS (D/S)	Aluminium mg/L	0.027	0.34	Results for Aluminium are consistent with Event 18.
	Chromium	0.00001	0.007	Results for Chromium have increased, when compared to Event 18.
	mg/L	0.00001	0.007	Located within Bago State Forest and adjacent to an unsealed track. Unknown activities within the State Forest upstream.
				Sample taken upstream of culvert.
NZG-IS	Aluminium mg/L	0.027	0.19	Results for Aluminium and Lead have remained consistent, when compared with Event 18.
	Lead mg/L	0.001	0.004	The results for Total Phosphorus have increased, when compared to Event 18.
	Tatal	0.00	0.04	Located within Bago State Forest.
	Total Phosphorus mg/L	0.02	0.04	Sample taken upstream of timber supported unsealed track bridge. Banks heavily vegetated, shallow channel.

Site identification	Analyte	DGV	Result	Comment
YK-RS	Aluminium mg/L	0.027	0.69	Results for Aluminium have decreased slightly, when compared to Event 18.
	Copper mg/L	0.001	0.002	Copper, Lead and Total Phosphorous are elevated, compared with previous sampling events.
				Results for Zinc have decreased, when compared to Event 18.
	Lead mg/L	0.001	0.004	Results for Iron have remained consistent, when compared to Event 18.
	Total Phosphorus mg/L	0.02	0.08	Located within Bago State Forest and adjacent to an unsealed track. Unknown activities within the State Forest upstream.
	Zinc mg/L	0.002	0.003	Sample taken downstream of culvert under unsealed track. Flow through culvert is restricted upstream causing a wetland environment.
	Iron mg/L	0.3	0.53	upstream causing a wettand environment.
YK-IS	Aluminium mg/L	0.027	0.49	Results for Aluminium have remained consistent when compared with Event 18.
	Iron mg/L	0.3	0.32	Iron has slightly increased when compared to Event 18 (0.31 to 0.32).
	Copper mg/L	0.001	0.002	Results for Copper and Total Phosphorus are both elevated, when compared to Event 18, which is atypical of this site.
	Total Phosphorus mg/L	0.02	0.11	
YR1-RS	Aluminium mg/L	0.027	0.06	Results for Aluminium have decreased, when compared with Event 18.
	Chromium mg/L	0.00001	0.002	Results for Chromium are elevated, which is atypical of this location.
	Total Phosphorus mg/L	0.02	0.38	The results for Total Phosphorus are elevated, when compared to Event 18.
YR2-RS	Aluminium mg/L	0.027	0.06	Result for Aluminium have decreased, when compared to Event 18.
SSC-IS	Aluminium mg/L	0.027	0.25	Result for Aluminium have decreased since Event 18.
	Chromium mg/L	0.00001	0.002	Results for Chromium and Copper are elevated, which is atypical of this location. Results for Total Nitrogen and Total Phosphorus

Site identification	Analyte	DGV	Result	Comment
	Copper mg/L	0.001	0.002	have increased significantly, when compared to Event 18.
	Total Nitrogen mg/L	0.25	5	
	Total Phosphorus mg/L	0.02	0.04	
TR-RS	Lead mg/L	0.001	0.02	Result for Lead have increased since Event 18, which is atypical of this site.
	Total Phosphorous mg/L	0.02	0.003	Results for Total Phosphorous have increased, when compared to Event 18.

Dissolved Oxygen (DO%) at LHG-IS was below the 90 - 110 assigned DGV (refer to Figure 3-6).

Water temperatures ranged from 9.7 degrees Celsius at NZG-IS to 16.2 degrees Celsius at TR-RS, refer to Figure 3-4 and Figure 3-5.

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 3-33 display physico-chemical water quality through time for monitoring events 1 (March 2022) to 19 (September 2023). Where a DGV is available, these values are shown on the graph and have been included for dissolved oxygen (%), 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 have generally increased when compared with Event 18. TR-RS and YR1-RS both recorded notable increases in temperature during Event 19, from 8.3°C and 8.8°C during Event 18 to 16.2°C and 14.3°C, respectively, refer to Figure 3-4. Temperatures within the Yorkers Creek catchment have also increased. YK-RS recorded a notable increase in temperature, from 9°C during Event 18 to 16°C during Event 19, refer to Figure 3-5.

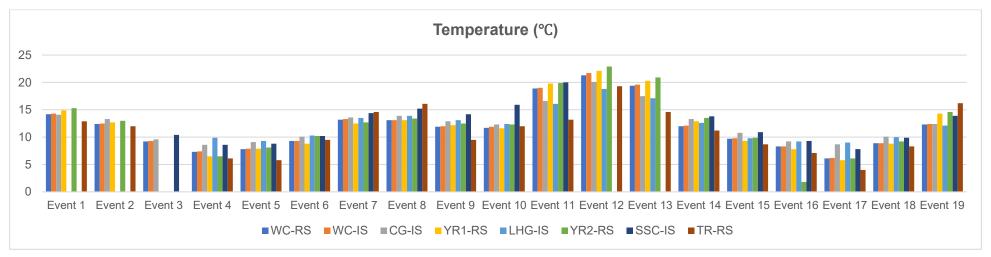


Figure 3-4 Temperature for Talbingo Reservoir catchment

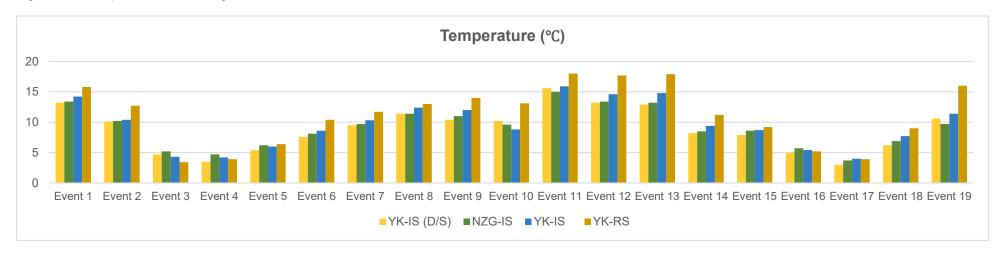


Figure 3-5 Temperature for Yorkers Creek catchment

All DO (%) results for the Talbingo Reservoir catchment, excluding LHG-IS were within the acceptable DGV range (90-110%) for Event 19. TR-RS recorded the highest DO (%) reading of 105.8%. It has recorded the highest reading over the last four events. LHG-IS recorded a reduction in DO (%) from 91.3 during Event 18 to 86.5 during Event 19, refer to Figure 3-6. DO (%) results for the Yorkers Creek catchment were all within the acceptable DGV value (90-110%), refer to Figure 3-7.

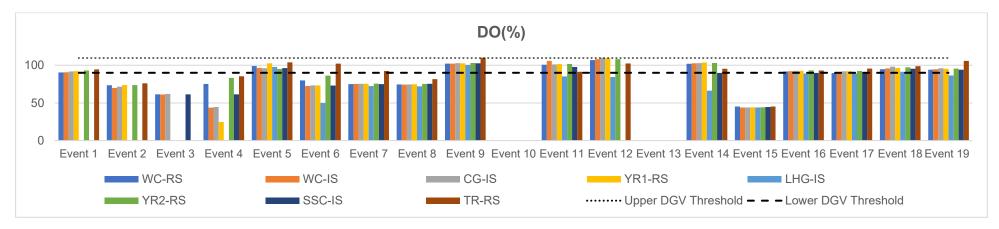


Figure 3-6 Dissolved oxygen (DO%) for Talbingo Reservoir catchment

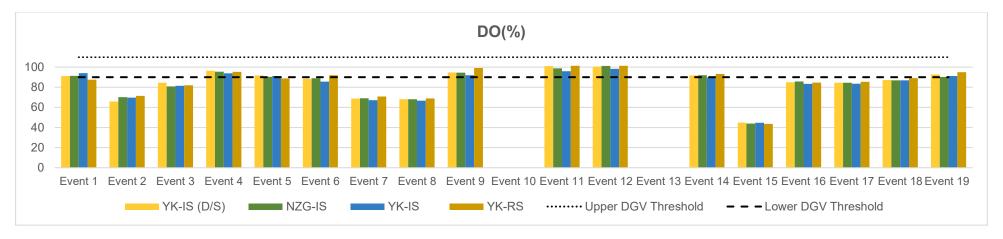


Figure 3-7 Dissolved oxygen (DO%) for Yorkers Creek catchment

The results for DO (ppm) for the Talbingo Reservoir catchment have all decreased in comparison with Event 18, refer to Figure 3-8. The highest reading for DO (ppm) was recorded at TR-RS (9.85 ppm). Results for DO (ppm) within the Yorkers Creek catchment have also decreased since Event 18; the highest reading for DO (ppm) was at YK-IS (D/S) (9.17 ppm), refer to Figure 3-9.

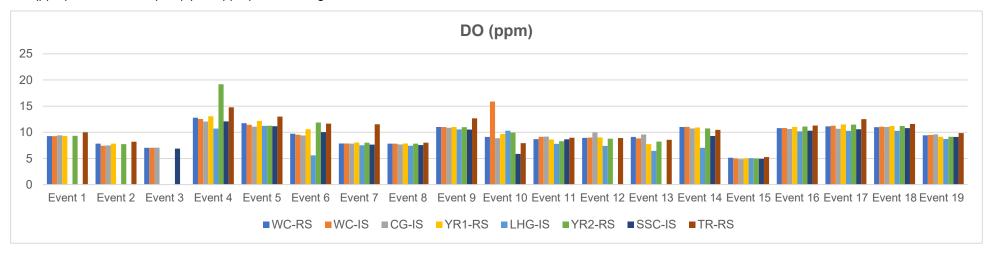


Figure 3-8 Dissolved Oxygen (ppm) for Talbingo Reservoir catchment

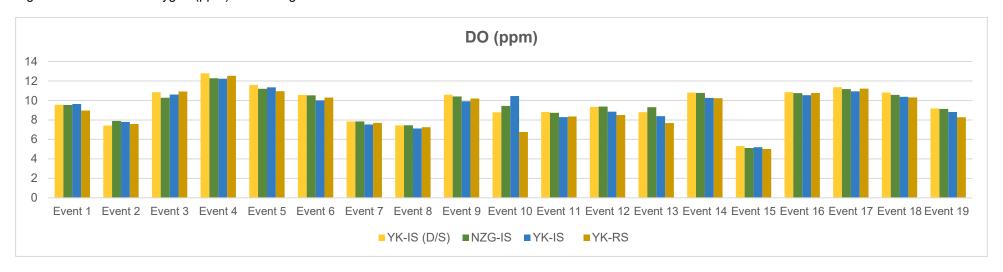


Figure 3-9 Dissolved Oxygen (ppm) for Yorkers Creek catchment

Results for specific conductance within the Talbingo Reservoir catchment have all shown an increase when compared to last four events, except for CG-IS and LHG-IS, which have decreased since Event 18, refer to Figure 3-10. LHG-IS and CG-IS returned elevated results of 529 μ S/cm and 481.4 μ S/cm, respectively. Results for specific conductance within the Yorkers Creek catchment for Event 19 have slightly decreased, excluding NZG-IS, which slightly increased from 44.5 μ S/cm during Event 18, to 46.6 μ S/cm during Event 19, refer to Figure 3-11.

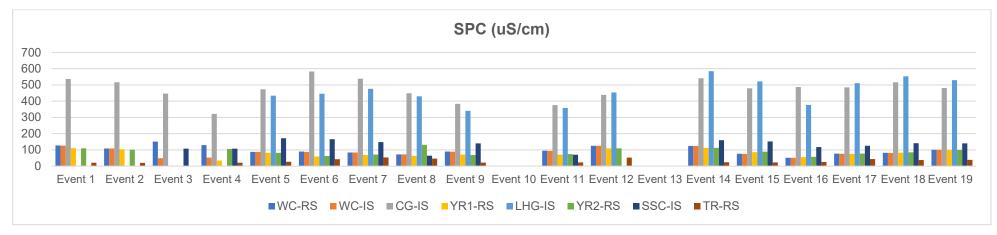


Figure 3-10 Specific Conductance (SPC µS/cm) for Talbingo Reservoir catchment

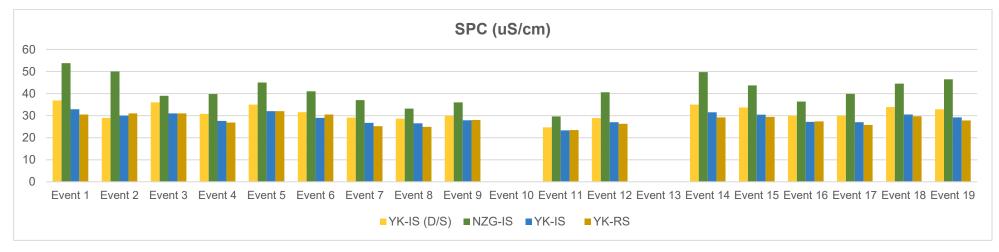


Figure 3-11 Specific Conductance (SPC µS/cm) for Yorkers Creek catchment

Conductivity readings within the Talbingo Reservoir catchment have slightly increased since Event 18, refer to Figure 3-12. Conductivity (μ S/cm) results for CG-IS and LHG-IS continues to be notably higher than the other sites, with readings above the upper DGV value (350 μ S/cm). Conductivity readings within the Yorkers Creek catchment have increased, refer to Figure 3-13. NZG-IS continues to return the highest reading for this catchment (32.9 μ S/cm), with a reading above the lower DGV value (30 μ S/cm).

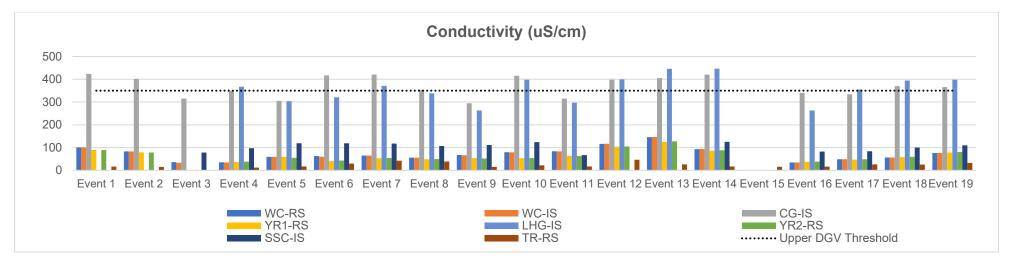


Figure 3-12 Conductivity (μ S/cm) for Talbingo Reservoir catchment

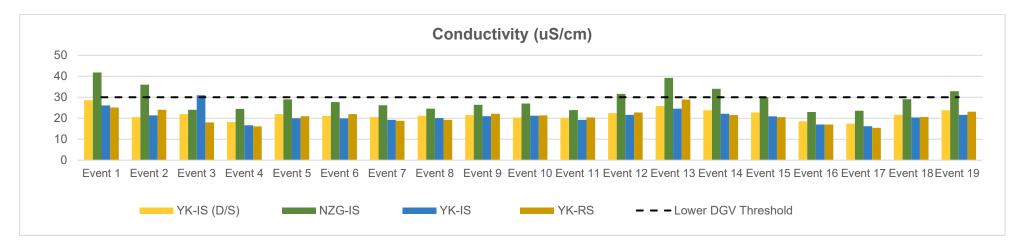


Figure 3-13 Conductivity (µS/cm) for Yorkers Creek catchment

Turbidity values were predominantly below the lower DGV thresholds (2 - 25 NTU) for the Talbingo Reservoir catchment, except for LHG-IS and SSC-IS (16.8 and 2.7 NTU respectively) for Event 19. Turbidity readings within the Talbingo Reservoir catchment have slightly decreased from Event 18 excluding LHG-IS, refer to Figure 3-14.

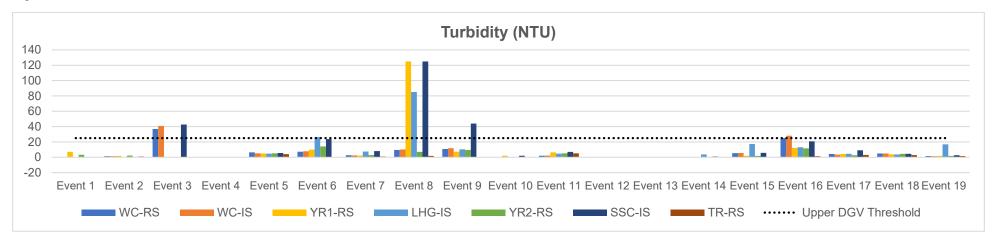


Figure 3-14 Turbidity (NTU) for the Talbingo Reservoir catchment

Turbidity readings within the Yorkers Creek catchment have slightly decreased since Event 18, refer to Figure 3-15. YK-RS registered the highest reading (21.8 NTU).

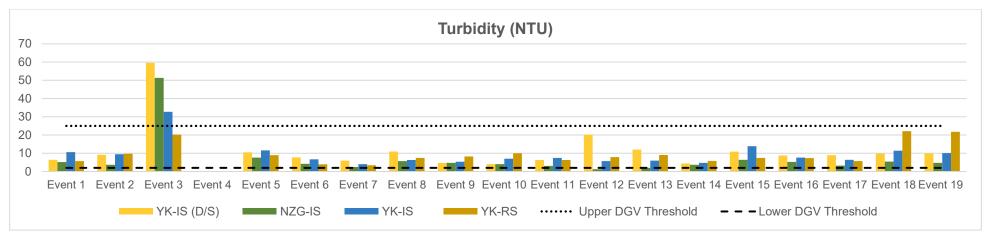


Figure 3-15 Turbidity (NTU) for the Yorkers Creek catchment

Results for total suspended solids (TSS) within the Talbingo Reservoir catchment for Event 19 were below the Limit of Reporting (LOR), with the exception of WC-RS (2 mg/L) and SSC-IS (5 mg/L), refer to Figure 3-17. Similarly, results for WC-RS and CG-IS for Event 19 were below the LOR, refer to Figure 3-18.

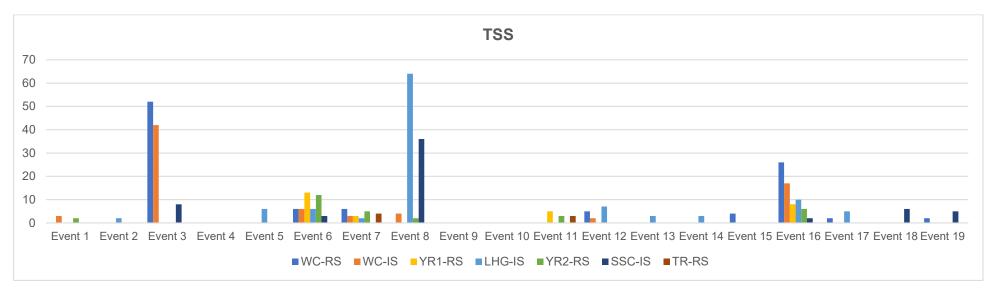


Figure 3-16 Total Suspended Solids for the Talbingo Reservoir catchment

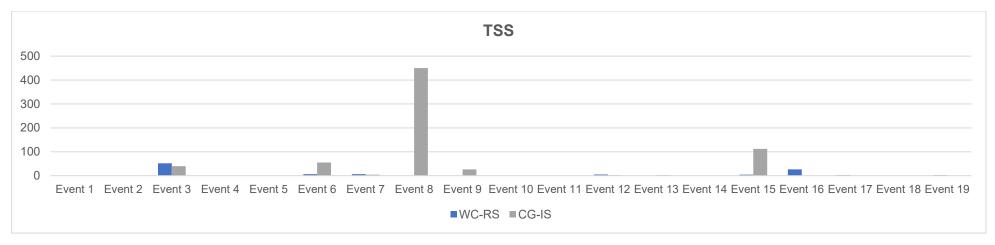


Figure 3-17 Total Suspended Solids for WC-RS and CG-IS, within the Talbingo Reservoir catchment

Results for total suspended solids were all below the LOR within the Yorkers Creek Catchment, refer to Figure 3-19.

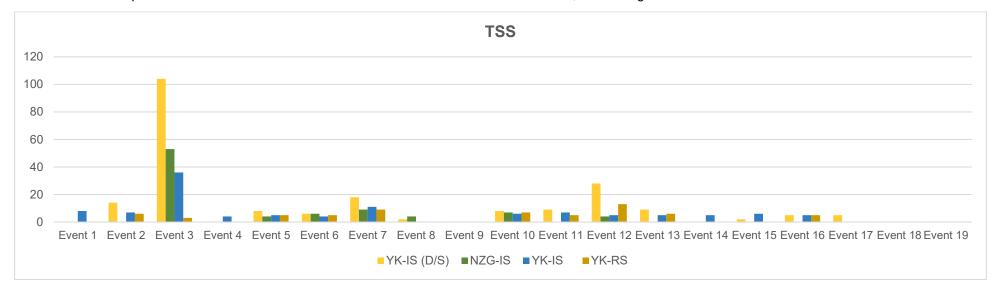


Figure 3-18 Total Suspended Solids for the Yorkers Creek catchment

Values of pH for the Talbingo Reservoir catchment have remained fairly consistent during Event 19. WC-RS, LHG-IS, SSC-IS and TR-RS all recorded a decrease in pH, while WC-IS, CG-IS, YR1-RS and YR2-RS all recorded an increase in pH. All sites had values of pH within the DGV range (6.5 – 8 pH units), refer to Figure 3-20. Values of pH for the Yorkers Creek catchment have decreased at all sites apart from NZG-IS, which registered an increase in pH units, refer to Figure 3-21. All sites had values of pH within the DGV range (6.5 – 8 pH units).

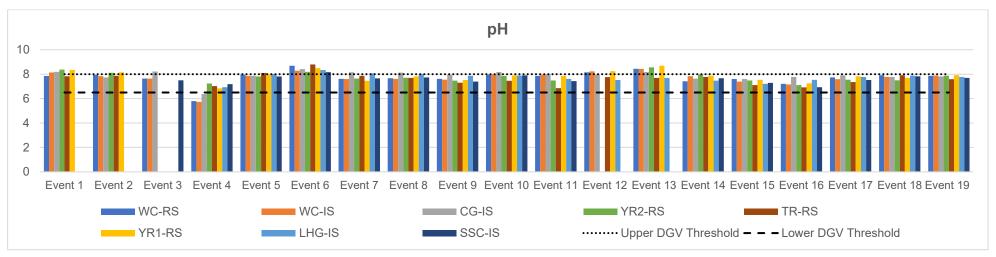


Figure 3-19 Potential of Hydrogen (pH) for Talbingo Reservoir catchment

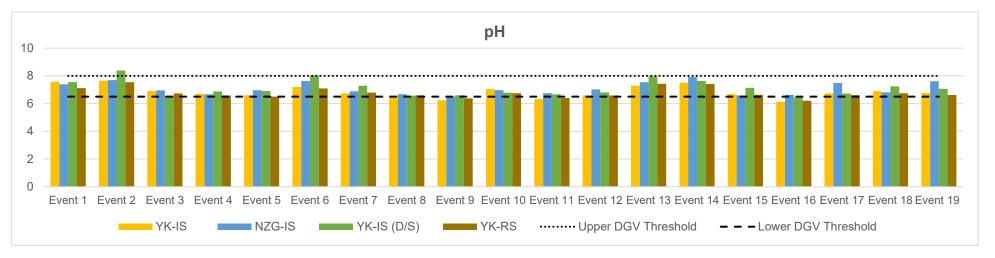


Figure 3-20 Potential of Hydrogen (pH) for Yorkers Creek catchment

The values for oxygen redox potential (ORP) within the Talbingo Reservoir catchment have increased at all sites, with the exception of LHG-IS (3.3 mV), a notable decrease from Event 18 (54.1 mV), refer to Figure 3-22. Within the Yorkers Creek catchment, ORP has increased at YK-IS (D/S) and YK-RS and decreased at NZG-IS and YK-IS, refer to Figure 3-23.

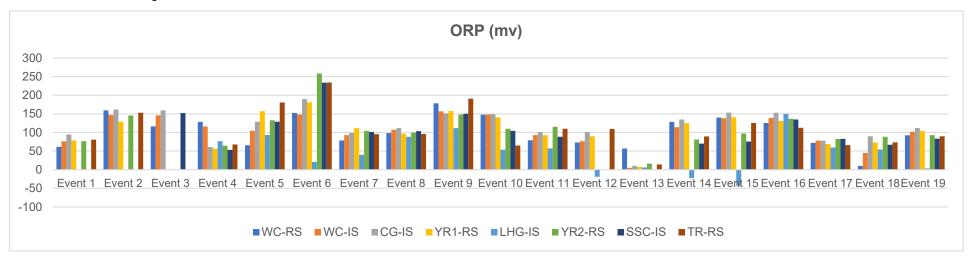


Figure 3-21 Oxygen Redox Potential (ORP) for Talbingo Reservoir catchment

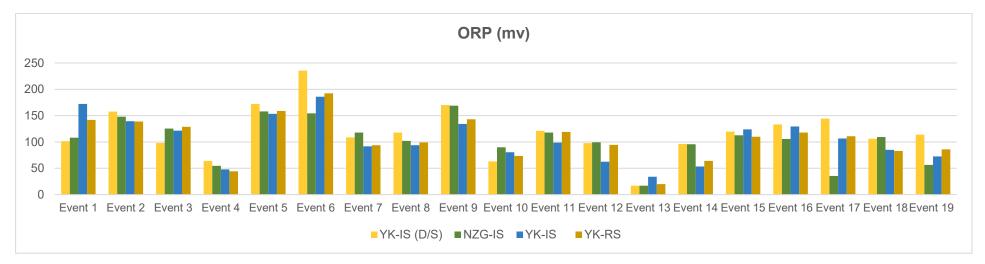


Figure 3-22 Oxygen Redox Potential (ORP) for Yorkers Creek catchment

Within the Talbingo Reservoir Catchment, Nitrogen Oxides (mg/L) were all below the laboratory LOR, refer to Figure 3-24. All results were below the DGV value of 0.15 mg/L. Similarly, results for the Yorkers Creek catchment were below the DGV (0.15 mg/L) across all sites, refer to Figure 3-25.

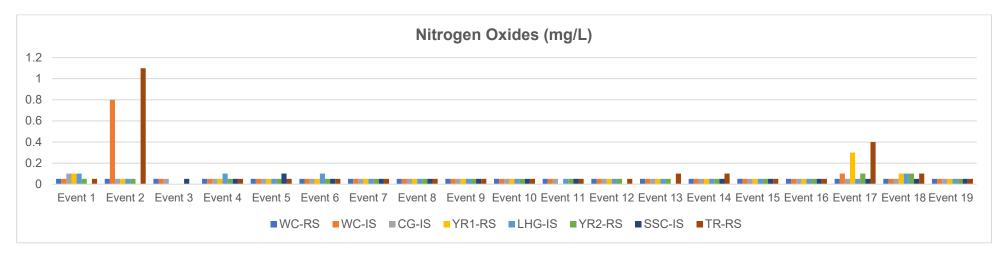


Figure 3-23 Nitrogen Oxides (mg/L) for the Talbingo Reservoir catchment

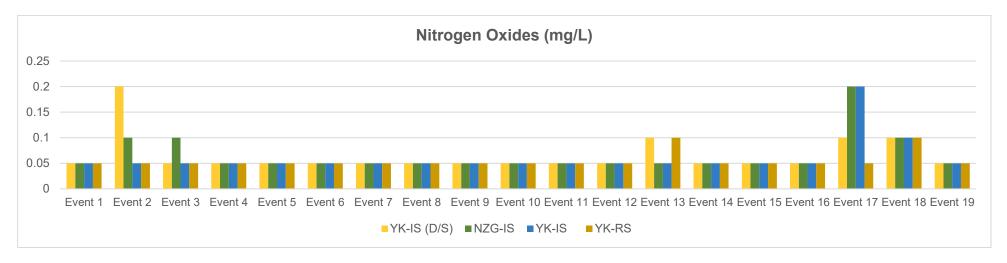


Figure 3-24 Nitrogen Oxides (mg/L) for the Yorkers Creek catchment

Results for Reactive Phosphorous (mg/L) were all below the laboratory's LOR (with the exception of WC-IS and YR1-RS) within the Talbingo Reservoir catchment, refer to Figure 3-26. A peak result of 0.07 mg/L was recorded at YR1-RS. Results for Reactive Phosphorous within the Yorkers Creek catchment were below the LOR, refer to Figure 3-27.

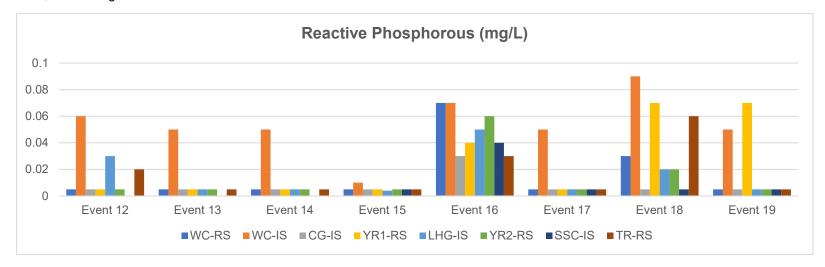


Figure 3-25 Reactive Phosphorous (mg/L) for the Talbingo Reservoir catchment

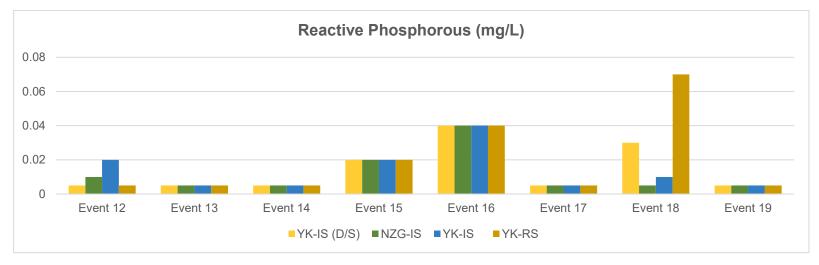


Figure 3-26 Reactive Phosphorous (mg/L) for the Yorkers Creek catchment

Total Hardness (CaCO₃, mg/L) within the Talbingo Reservoir catchment has remained consistent, with results varying from very soft at TR-RS (8 mg/L) to hard at LHG-IS (296 mg/L), refer to Figure 3-28. Results for Total Hardness (CaCO₃, mg/L) within the Yorkers Creek catchment were all below the laboratory's LOR, except for NZG-IS. NZG-IS recorded a decrease when compared to Event 18 (8 to 16 mg/L), refer to Figure 3-29.

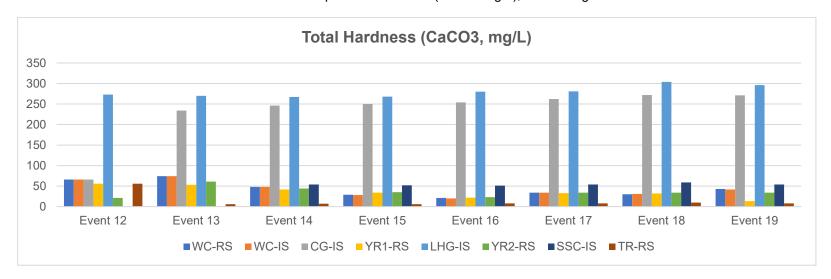


Figure 3-27 Total Hardness (CaCO₃) for the Talbingo Reservoir catchment

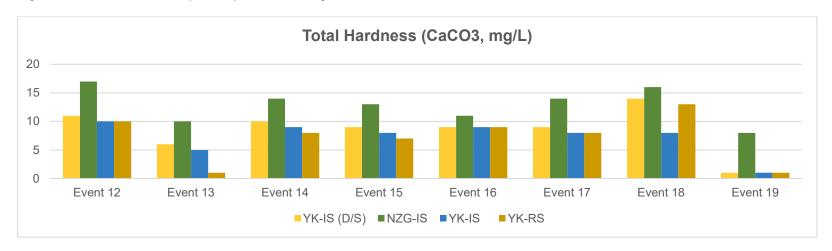


Figure 3-28 Total Hardness (CaCO₃) for the Yorkers Creek catchment

Results for Total Kjeldahl Nitrogen (TKN, mg/L) were below the LOR for all sites within the Talbingo Reservoir, excluding SSC-IS, which recorded 5 TKN (mg/L), refer to Figure 3-30. TKN results for the Yorkers Creek catchment were below the LOR for all sites, refer to Figure 3-31.

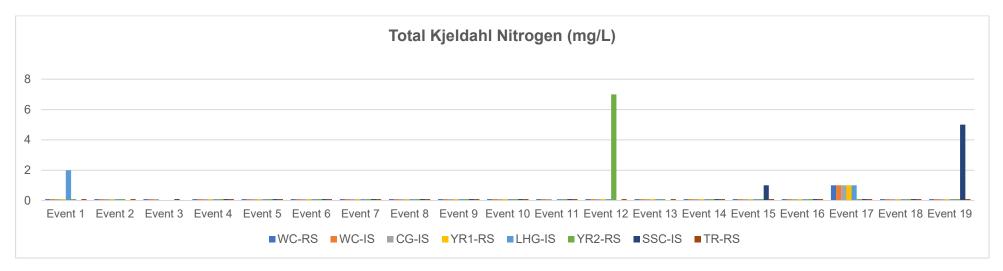


Figure 3-29 Total Kjeldahl Nitrogen (TKN) for the Talbingo Reservoir catchment

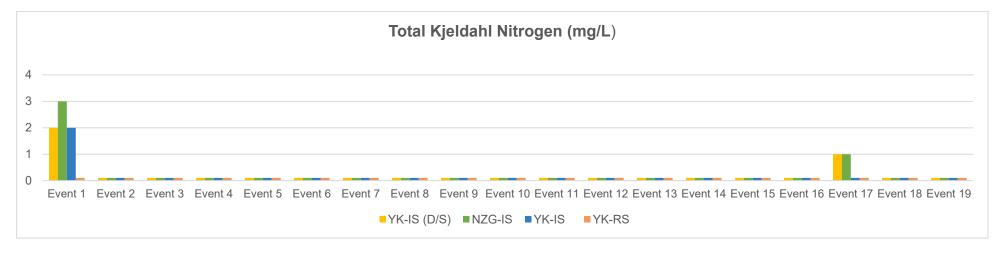


Figure 3-30 Total Kjeldahl Nitrogen (TKN) for the Yorkers Creek catchment

Ammonia (mg/L) levels were below the LOR for all sites within the Talbingo Reservoir and Yorkers Creek catchments for Event 19, refer to Figure 3-32 and Figure 3-33.

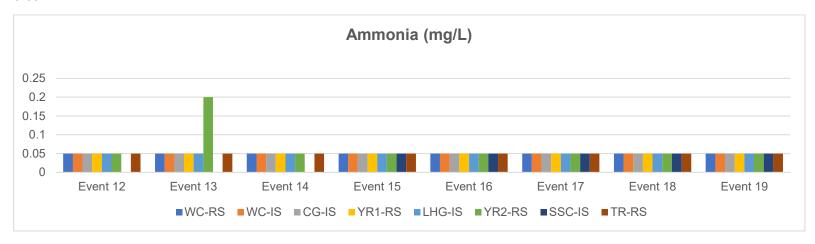


Figure 3-31 Ammonia (mg/L) for the Talbingo Reservoir catchment

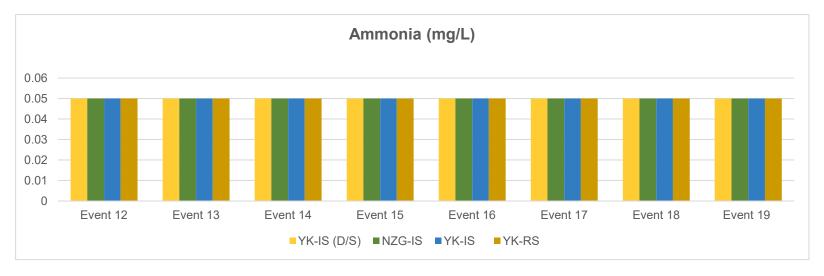


Figure 3-32 Ammonia (mg/L) for the Yorkers Creek catchment

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 TR-RS on 28 September 2023. DUP01 was analysed for metals and metalloids. The duplicate sample has been compared against the TR-RS 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). Results for Lead (Pb) and Manganese (Mn) returned a result of 33%, slightly above the acceptable range, but is less than 5 times the LOR, therefore the results were deemed negligible.
- 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 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 19 have increased across both catchments when compared to water temperatures for Event 18. This continues the trend an increase in temperature and can be attributed to seasonal changes.

Results for DO (%) have remained consistent across both catchments during Event 19. DO (ppm) have decreased across both catchments for Event 19.

Similarly, specific conductance (μ S/cm) and conductivity readings have remained consistent across both catchments when compared with results for Event 18. NZG-IS was one outlier that saw a notable increase. The pattern between sites is mostly reflective of the pattern for specific conductance.

pH has generally remained consistent within the Talbingo Reservoir catchment. pH results for the Yorkers Creek catchment generally decreased, with the exception of NZG-IS, which recorded an increase in pH. All sites had values of pH within the DGV range (6.5 – 8 pH units).

Turbidity (NTU) readings have decreased across both the Talbingo Reservoir catchment and the Yorker's Creek catchment, excluding LHG-IS, which increased.

The values for oxygen redox potential (ORP) within the Talbingo Reservoir catchment increased at all sites except for LHG-IS. Within the Yorkers Creek catchment, ORP has increased at YK-IS (D/S) and YK-RS, and decreased at YK-IS and NZG-IS.

Results for TSS were below the laboratory LOR, except for WC-RS (2 mg/L) and SSC-IS (5 mg/L).

Nitrogen Oxides (mg/L) were all below the laboratory LOR within both catchments. Results for all sites were below the DGV (0.15 mg/L).

Reactive Phosphorous (mg/L) were below the laboratory LOR at all sites within the Talbingo Reservoir catchment, with the exception of WC-IS and YR1-RS. Similarly, results for Reactive Phosphorous were below the LOR for all sites within the Yorkers Creek catchment.

Total Hardness (CaCO₃) remained consistent within the Talbingo Reservoir catchment for Event 19, varying from very soft at TR-RS (8 mg/L) to hard at LHG-IS (296 mg/L). Within the Yorkers Creek catchment, results were all below the laboratory's LOR, except for NZG-IS. NZG-IS recorded a decrease when compared to Event 18 (8 to 16 mg/L).

Results for Total Kjeldahl Nitrogen (TKN, mg/L) were below the laboratory LOR for both catchments, with the exception of SSC-IS (5 mg/L). Results for Ammonia were also below the laboratory LOR for both catchments.

Laboratory results for Event 19 were generally consistent with the results of the previous monitoring events, with most analytes reported below the Limit of Reporting. Results exceeded the DGV for:

- Aluminium (0.027 mg/L) at all sites, excluding TR-RS
- Chromium (0.00001 mg/L) at WC-RS, WC-IS, CG-IS, YR1-RS, LHG-IS, SSC-IS and YK-IS (D/S)
- Iron (0.3 mg/L) at YK-RS and YK-IS
- Total Nitrogen (0.25 mg/L) at SSC-IS
- Total Phosphorus (0.02 mg/L) at WC-RS, YR1-RS, YK-RS, YK-IS, SSC-IS, TR-RS and NZG-IS
- Zinc (0.0024 mg/L) at CG-IS, LHG-IS and YK-RS
- Lead (0.001 mg/L) at LHG-IS, NZG-IS, TR-RS and YK-RS.

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 16 June 2023.

NGH Pty Ltd. 2023h. Pre- construction Water Quality Monitoring Report: Event 17 June 2023.

NGH Pty Ltd. 2023i. Pre- construction Water Quality Monitoring Report: Event 18 June 2023.

TransGrid. 2021a. Snowy 2.0 Transmission Connection Project Submissions Report.

TransGrid. 2021b. Snowy 2.0 Transmission Connection Project Amendment Report.

Event 19 2023

APPENDIX A EVENT DATA TABLE

The content will be content			Sheen/ol/ grasse	Temp.	Dissolved Oxygen (DO	.00	Specific Sic (SPC	EC (uS/on)	gA4	Redax	Turbidity	A.	As .	Cd(mgL)	Cr(mg/L)	cu.	Cyanide	Fe	Po	Ma	Hg (mg/L)	Ni (mal)	TN TP	Ag (mg/L)	2n	Armoria	Nitrogen	Reactive	Total Hardness	Totai Kjedahi Nitrogen	TOS TSI
	240 Pe ser 907 (Mark) WC-89	Colorina WOM Colorina Value Control Value	grease No.	162	%) \$6.448 90.1	(ppm)	uSaloss)	14.104	444	(nV)	(NTU) 9.86	AAPP	n nana	0.0006	A. A	(mgL)	(IngiL)	(mg/L)	A AM	(Ing.L)	AMM	(mgt) (ngt) (mgt)	A 00000	A MILA	(MBE)	Chides A.MS	Phosphorous	(CxC02)	Nitrogen (TKN)	mgL (mg/
		Decid Decid	No.	12.4 9.2 7.3	83 83	7.84 7.86 10.78	108 181 1288	36 36 36,3	7.66 7.66	1984 1983 1284	N 10	0018 0018	2.00018 2.00018 3.00018	2.0000 2.0000 2.0000	E0081 E0081	0.0001 0.0001	0.001 0.001	1.000 1.000	0.0000 0.0000 0.0000	0001 0.0000 0.0000	2.0000 2.0000 2.0000	2.00E	67 600 67 600 67 600	0.0001 0.0001	5001 5001		- 12			41 41	10 E
		David David David	-	93 132 13.1	78.86 78.8 78.8	9.74 7.67 7.64	894 994 714	62.7 64.6	100	1924 797 984	716 240 140	0011	2.000 H	2.0000 2.0000 2.0000	C0081	0.000F	0.001	100	0.000	1002	13000 13000 13000	2300E	07 000 07 000 01 000	0.00001 0.00001	5001 5001					41 41	46 4 13 4
		Erect 10 Erect 11	No.	112	100.0	8.12 8.7	NO.	79.5 79.5 83.9	740 780 780	107.6 167.6 79.1	100 100	6613 663	2.000mg	2.0000 2.0000	C0081	0.0001 0.0001	0.001 0.001	108 108	0.000	5004 5004	2.0000 2.0000	2.000 2.000 2.000	21 000 21 000	0-00001 0-00001	0019		200			21 21	-
		Eart 12 Eart 13 Eart 14	- No.	21.3 19.4 12	100.8	8.12 9.11	1269	116.1 161.8 83.2	1.00 7.00	73.1 17 1283	100	0011 003	2.00012 2.00012 2.00012	2.0001 2.0001 2.0001	C0081 C0081	0.0001 0.0001	0.001	100	0.000	2.000 2.000 2.000	2.0000 2.0000 2.0000	1000	21 030 21 030 21 03	0.00001 0.00001	5003 5003	101		100	1	- 1	2
		Dani II Dani II Dani II	-	82 61 83	91.8 91.7	11.0	113 267 267	363 65 664	720 720 720 730	125.0 21.0 23.4	1922 629	073 011 023	1 000 TE	2 March	C00001		0.001 0.001 0.001	100 100 100		1001 1002 1002		100	07 000 1 000 01 007	0.00001 0.00001 0.00001	6002 6002 6003	100		227	É	E.	#
		Monthly Mo		12.3 6.10	65.20 200.85	5.0 5.0	100.0 51.30	26.1 26.90	1.00	10.40 10.40	101	001 001	030	0.00	0.00	0.00	2.00 2.00	0.02 0.01	5.00 5.00	E002 E00	2.000D 2.000	5.000 5.00	012 001 012 001	5.00 5.00	000	E05	008 008	921	2100 2100	010 010	100 51
		Mean Count St. Day		19.00	85.62 17.00 16.66	9.45 18.00	98.0 17.00 26.63	10.18 16.00 26.10	7.7% 1930 0.58	103.60 19.00 63.23	6.00 18.00 8.71	010 1930 018	0.00 19:00 0:00	0.00 19.00 0.00	0.00 19.00 0.00	0.00 19.00 0.00	100 1800 100	1800 1800 510	100 1930 100	100 1900 100	100 1930 100	100 1930 100	030 008 9600 1930 089 011	19.00 19.00	900 900 000	8.00 8.00	9.00 19.00	9.00 9.00	6312 830 1869	919 1900 921	90 30 20 30
	wes	David David David	No.	163 128 93	60 E	7.64 7.63	126.7 126 68	105.8 10.3 30	786	76 1658 1658	0.32 1.36 60.77	001 0011	2.000 to 2.000 to 2.000 to	6 00001 6 00001	C0081	0.000 0.000 0.000	0.001	100	0.000	0001 0002 0.000	1 0000 1 0000 1 0000	1000	01 000 01 000	6-0000Y 6-0000Y	0001 0001		-			01 01	-
		Destil Destil	-	78 93	964 7236	11.65 5.55	87 864	603 603	7.85 5.25	1013	126 238	0011 0011	1000	2.0000 2.0000	0.00001 0.00001	0.000F	0.00 0.00	100	0.000	2 000 E	5.0000 5.0000		1 60	5-0000 5-0000	5001						2
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## PATE 19		Min blax Mean		5.80 22.10 13.36	2640 10840 8646	13.00 13.00	34.70 111.70	20160 20160	5.00 7.00	7.00 190.90 ME 73	0.10 124.60 13.33	002 047 033	030 030 630	0.00	0.00 0.00	0.00 0.00	100	0.01 0.30	100 101 100	500 500 500	5.00 5.00	5.00 5.00	010 001 130 038	500 500 500	000 001	0.00 0.00 0.00	038 030 037	9.01 9.07	1336 5630	100	73.00 53 73.00 53.0
## PATE 19	LHQ-IS	Count St. Dev Event 1		471	3600 23.11	180	16.00 22.36	17.00 36.67	0.85	18.00 62.08	17:00 28:01	1800 012 001	1800 030 1,000rs	18-00 0-00 2-00000	0.00 0.00 0.000000	18.00 0.00 0.00	1800 5.00 0.001	1800 0.08 0.02	18:00 5:00 0:0008	18:00 5:00 5:001	18:00 5:00 0:000018	18.00 5.00 6.0008	18:00 18:00 0.28 0.08	500 0-00001	98.00 0.00 0.001	E-00	1700 006 01	8.00 0.03	1646	1700 622 2	22.20 3.0 22.20 3.0
## PATE 19		Decid Decid	No same			lan.	L	301	-	20.2		6018	1000	1000	220000	5001	-	100	2000	1002	-	1000	47 000 67 000	2000			-			- 11	==
## PATE 19		Dani S Dani S Dani T	- No.	93 193 138	24	5.50 7.54	685.6 676.2	300 f 371.3	13	20.1 20.8 20.8	2633 7.45	0018 0018	2.00018 2.00018	2.00001 2.00001	2.000000 2.0000000	00001 00001	0.001	2.000 2.000	0.000	2.000E	0.00001 0.00001	2.000 2.000	61 000 61 000	0-0000Y 0-0000Y	0000		61			01 01	
## PATE 19		Eart 10 Eart 10		13.1 12.4 16.1	100.0	10.00 10.31 7.8	3606	263.3 267.6 267	7.86 7.89 7.60	101.7 63.5 54.9	100	018 008 008	2.00012 2.00012 2.00012	1000	2.000000 2.000000 2.000000	20001 20001	0.001	0.000 0.00 0.000	0.000 0.000 0.000	5.000 5.017 5.008	0.00000 0.000000 0.000000	0.000E	61 560 61 600 61 600	0.00001	5000 5000 5000		008 008 008	E	E		
## PATE 19		Bank 13 Bank 13 Bank 14	- 1	18.8 17.1 12.6	M3	74 640 740	1004	300.3 201.6 201.6	7.0 77 7.07	791 6 327	51 50 38	500 513 500	1000	1000	10000	6001 6001		010 008 010	Ī	100 100 1000	Ē	100	11 500 11 500 11 600	Ē	Ē	10	Ē	3-D 5000	20 20 20	- 1	
## PATE 19		East 15 East 17	-	92 92	#	102 102 1020	522 3764 811	363.2 366	730 736 737	402 1088 597	1727 1323 437	007 038 009	10000 10000 10000	1000	2.00000 2.00000 2.00000	230 230	200	0.04 0.19 0.06	1000	5007 5013 0008		0008 0002	01 000 01 000 1 000	2-000 2-000 2-000	500 500 500	10	1	325	2	- 1	-
		Report 18 Mars Mars	- 2	12.1 9.00 13.4	000 000	8.71 8.71 9.94	529 529 530	386.2 363.20 gas so	7.88 7.77 6.90	32 4120	173 168 100	014 007 001	1.000m 1.000m 0.00	0.00 0.00	0.000	0.00 0.00 0.00	0.001 0.001	0.07 0.01 0.01	100 100	5000 5000 500	100 100	0000 0000 0000	01 000 010 001 200 ***	0-00001 0-00001 0-000	000	5.05 5.05	900	3.00 3.00	200 200 200 M	0.10 0.10 20**	104 AV
		Mean Count St. Dev		12.32 16.00 3.00	73.45 16.00 36.84	15.00 16.00	14.00	367 66 16.00 66.62	7.73 1600 0.36	45.94 16.00	1321 1500 2127	0.10 1800 0.12	0.00 18:00 0.00	18.00	0.00 18.00 0.00	0.00 18.00	1800	1800 1800	100 1800 100	1602 1800 502	1800 1800	100 1600	028 001 1800 1800 048 002	18.00	900 900	E05 E00	1800	5.00 5.00	279.68 830 1360	1800 048	30 M 60 1800 W
	YR2RS	David David David	No. No. No servole	16.3	716	932 726	1064	89.2 79.3	13	763	3.28 2.29	0013	2.00018 2.00018	6 0000H	2.00000 2.000000	E-0001	0.001	100	0.0000	E 003	0.00001 0.00001	2.00E	01 000 01 000	6-3000Y	6001		0.00			01 01	3 4
		Desid Desid	- No.	8.1 10.2	8536 862 863	1126	1052 50 60	35.6 55 63.5	7.00	132.6 258.3	1621	0018 0018	2.000 to 2.000 to 2.000 to	6 00001 6 00001	2.00000 2.000000 2.000000	0.0001 0.0001	0.001	100	0.000	2 000E	-	1000	01 000 01 000 01 000	6-3000Y 6-3000Y	0001 0001					01 01	-
		Dani II Dani II Dani II	-	13.4 12.8 12.3	103	7.84 10.87 9.84	1316	87 821 833	127 747 738	99.5 168.1 108.6	7.06 8.06	029 022		1000		5 000 P	2.00 2.00 2.00	200 200 200	Ξ	5002 5003 5003		100			500						2 1
		Seni II Seni II Seni II	2	19.8 22.8 20.9	101.8	8.79 8.79	768	105 107.4	7.00	110	107 51	0.1 003 0018	8 00018 8 00018 8 00018	2.000V	2.00000 2.00000 2.000000	0.000 0.000 0.000	0.001 0.001	0.00 0.02	0.000 0.000	5.000 5.000	0.00001 0.00001	2.000 2.000 2.000	61 600 61 600 61 600	0.00001 0.00001	6007 6007	02	008 008	200	-		1 1
		Earth 14 Earth 15 Earth 15	-	12	#2 #2	100	100 847 969	38.2	7.0	972 1964	189	000 000 040	1000	1000	2.00000 2.000000 2.000000	2000 2000 2000	281	000 000 020	2.000	E001 E003		1001	61 C00 61 C00	-	5002	101	-	336	ä		-
		Erent 18 Brant 19 Min	-	92 165 180	673 864 6420	9.14 9.16	10 100 100	10.4 80 36.20	74 7.88 7.10	883 927 16.00	5.00 18 5.00	017 006 001	2.00018 2.00018 0.00	2.000F	2.000000 2.0000000 0.000	0.0001 0.0001	0.007 0.007 0.000	000 004 001	5.001 5.00	E002 E001	0.000FE	0001 1300 100	61 000 61 000 610 001	5.0000 5.0000	500	2.08 2.08	61 008	9.00	34 34 2138	01 01 010	100 11 10 11
March Marc		Mean Count		22.80 12.38 18.00	108.20 88.81 36.00	10.00	121.60 51.00	07.60 60.09 17.00	7.75 1730	268.30 108.71 17.60	1621 626 1700	0.05 0.10 18.00	0:30 0:30 18:00	0.00	0.00 0.00 18.00	0.00 0.00 18.00	100 100	039 006 1600	100 100 1800	E 00 E 00	E 00 E 00 18.00	E00 E00 1830	010 000 010 001 9600 1600	500 500 1800	001 000 900	0.30 0.07 8.00	0.10 0.06 18.00	0.06 0.01 8.00	6130 3575 830	700 048 1800	1000 00 1017 17 1800 W
March Marc	990-6	St. Day Event 1 Event 2	No flow	8.30	15.86	2.80	21.09	26.93	0.39	10.38	479	012	0.30	0.00	0.00	0.00	100	0.07	5.00	5.00	5.00	5.00	000 001	5.00	5.00	0.08	632	5.02	1281	140	3132 31
March Marc		Desil Desil	- No.	12.4 8.6 8.8	614 962	12.00	108 108 172	963 130	7.0 7.00 7.00	1933 53.1 128.7	1.0	2.00019 2.00019 2.00019	2.000 to 2.000 to 2.000 to	6 00001 6 00001	2.00000 2.00000 2.000000	0.0001 0.0001	0.001	100	0.000	2 000E	-	1000	61 000 61 000	6-3000Y 6-3000Y	0001 0001		600 61			01 01	
March Marc		David David	-	164 162	73 733	7.66	1678 638	117.6 106.9	7.00 7.70	1011	E 00 10 E 10	122	1000	2.0000 2.0000	2.000000 2.0000000	6 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	200	026 540	0.000	5011 5011	0.00000 0.000000		1 10	5-0000 5-0000	6002 6002		-				
March Marc		Eart 10 Eart 11 Eart 12	No. No. No few	20	677	1.00	600	93.7 67.3	7.66	1043		03	2.00018 2.00019	2.00001 2.00001	0.000000	0.0001	0.001	112	0.000	5.000 5.000	0.00001	0.000E	61 600	6-0000Y	0007		028			87	20 1
March Marc		Eart 13 Eart 14 Eart 15	No fee	128	800	931	1959	125.6	7.67 7.29	03.8 73.6	÷	018 011	1.00019 1.00019	2.00001 2.00001	2.000000 2.000000	6-0001 6-0001	0.001	0.07 0.08	0.000	5.001 5.000	0.00000 0.000000	1000 1000	01 000	0.00001	5001	5.00	000			47	2 1
March Marc		Eart 15 Eart 17 Eart 18	No.	7.8 7.8	80 80 80	10.30	126 126	82.8 83.8 905.3	7.00 7.00	136 82.6 66.8	20.87 5.16 6.62	079 04	2.000 to 2.000 to 2.000 to	6 00001 6 00001	2,000000 2,000000 2,0000000	60001 60001	0.001	622 638	1000	5.007 5.002 5.001	-	1003 1003	61 000 61 000 61 000	0.000	6003 6003	101	000	100	-	01 01	7 1
March Marc		Min Max Mean		7.80 20.80	4630 10240	6.92 12.09	63.80 172.00	6730 0140	6.00 8.17	53.10 233.60	1.00 124.60	000 173	000 030	030	0.00	0.00 0.00	100	001 072	5.00 5.01	5.00 5.00	500 500	100 100	010 001 500 008	500 501	500 501	508 508	038 010	021 004	9130 9930	010 500	100 E1
March Marc	18-84	Count St. Day		15.00 3.62 12.8	1400 1708	18.00 2.67 9.89	14.00 33.00 21.1	16.00 16.67 16.2	1930 031 7.60	15.00 65.02 80.1	14.00 32.88 6.07	963 661	19.00	0.00	0.00	15.00 0.00 0.00	15.00 5.00	1500 025 043	10.00	10:00 5:01 5:00	100	1000	127 001 0.7 001	15.00 5.00	10.00 0.00	E00 E00	18.00 0.01	0.02	600 276	127	037 12 63 1
March Marc		Emil Emil Emil	No Service No Service	- 13 - 6.1	N 83	12	20.00	93	7.00	163 674	ő	0011	2.0001E	£ 200001	220000	6081	0.001	1000	0.000	E001	0.00000 0.000000	2300E	11 000 01 001	6-00001	5001		- 11			61	2 1
March Marc		Dani S Dani S Dani T	-	14 14 164	100.0 100.0	13.01 11.00 11.03	27 04 129	29.8 62.8	18	1803 2338 954	63 101	0011 0011	2.00018 2.00018 2.00018	2.0000 2.0000 2.0000	2.00000 2.00000 2.000000	6001 6001	0.001 0.001	2.000 2.000	0.0000 0.0000 0.0000	2.000E	0.00000 0.00000 0.000000	2008 2008	61 600 61 600	0-00001 0-00001	5001 5001		000 000			- 27	2 1
March Marc		Dani S Dani S Dani S	No.	9.5 12	- 111	10 er 7.60	218	38.1 32	72 73 746	190.8 66.6	200	008	2.00018 2.00018	2.00001 2.00001	2.000000 2.0000000	C-0001	0.001	2.000 2.000	0.000	E000 E000	0.00001 0.00001	2.000 2.000	61 000 61 000	0-0000Y 0-0000Y	0007		000			07 07	-
March Marc		Eart 12 Eart 13	No.	193	102.3	5.57 5.57	123	65.7 26	7.2% 7.7	108.6	10	0011	2.00018 2.00018	2.00001 2.00001	2.000000 2.0000000	C-0001	0.001	007	0.000	1000 1000	0.00001 0.00001	2.000 2.000	7 0-009	0-0000Y 0-0000Y	000T	101	000 51	0.02	-	01 01	
March Marc		East 15 East 15 East 17	-	17	83 83 83	6.27 11.20 12.4	227 213 638	16.7 16.6 26.3	7.00 6.00 7.34	126.3 112.6 66.1	1.0	6611 668 663	1.00011 1.00011	2 MARCH	2.00002 2.00002 2.00002	2000 2000 2000	0.801	0.04 0.05 0.05	1000	100 100 100	0.00001 0.00001	2.00E	61 062 61 063 56 00*	0.00001	6001 6001	100	000 000 000	10	Ħ		#
March Marc		Earth 18 Earth 19 Min	-	83 162 600	98.7 106.8 45.30	9.85 9.27	37.6 38.7 26.00	28.6 32.2 9.30	7.00 7.00 6.86	733 893 1680	3.77 1.7 431	011 0011 001	2.00018 2.00018 0.00	2.0000 2.0000 0.00	2.000002 2.000002 0.00	0.0001 0.0001	0.001	01 01 001	100	5.000 5.000 5.000	100	1000 1000 100	61 000 61 000 610 001	0-00001 0-00001	5002 5007 500	2.01 2.01	61 000 000	206	10 1 430	01 01 010	71 A1
March Marc		Mean Count		19.30	111.00 82.14 16.00	10.78 10.29 18.00	12.00 32.37 16.00	20.70 20.90 96.00	8.80 7.61 1830	233.90 108.61 18.00	134 134 1750	011 003 9630	0.00 0.00 18.00	0.00 0.00 18.00	0.00 0.00 18.00	0.00 0.00 18.00	100 100 1800	0.10 0.03 18.00	100 100 1830	500 500 1800	5.00 5.00 18.00	5.00 5.00 18.00	700 005 006 001 1600 1600	500 500 1800	5.00 9.00 98.00	5.05 5.05 8.00	014 014 1800	0.06 0.02 8.00	1343 5343 836	0.10 0.10 19.00	7100 40 2106 54 1800 18
Mail	YK-19 (D/9)	St. Dev Event I Event 2	No.	132 133	11.0 H.1	232 336 7,42	12.13 369 29	1032 284 203	78	1278 1214 1878	140 6.0 8.1	003 036 0018	0.00 1.00019 1.00019	0.00 1.0000 4.0000	0.00 1.000000 1.0000000	0.00	0.00 0.00 0.00	0.03 0.30 0.30	100	100 1000 1000	100	100	143 001 02 000	200 2000 2000	5.00 0.00 0.00	E-00	928 938 92	10	17.07	2	20 1
Mail		Emil Emil Emil	No.	27 28 24 74	96.4 91.8	12.79 11.6 11.6	36 308 38 314	22 18.2 22 21.1	6.00	66 1724 234.4	1000	6011 6011 6711	1.0000 1.00000 1.00000	1000	100000	2001 2001	0.001 0.001	0.000 0.000 0.000	2.000 2.000 2.000	100		1000	61 668 61 688	0.00001 0.00001	5001 5001 5001		008 008 008				-
Mail		Emil Emil Emil	-	9.5 11.4 13.4	917	7.84 7.44 15.00	261 264 266	203 212 218	728 637 64	108.6 118 179	6 108 107	000 000 000	1000	1000		0.000 0.000 0.000 0.000	201	1 000 1 000 1 000		100			1 50	1-0007 1-0007	Ē						7
Mail		East 10 East 11 East 13	- No.	10.2 10.6 13.2	101.1 100.1	8.78 8.82 9.34	267	20.3 20.2 22.4	12 12 21	1212 1212	632 2622	028 042 028	1000	2 AND 1	10000	6001 6001	100	0.23 0.07 0.27	j	100 100 100		1000	61 001 61 007	1000				200	Ė	-	-
Mail		Eart 13 Eart 14 Eart 15	-	128 82 78	11.0		36	20.8 23.8 22.7	7.66 7.66			026 027 036	2.00018 2.00018 2.00018	2.0000 2.0000 2.0000	\$40000 \$40000 \$40000	0.0001 0.0001	0.001 0.001	031 037 031	0.000 0.000 0.000	5.000 5.000 5.000	-	2.00E	01 000 01 000	0.0000 0.0000 0.0000	0001 0001	2.00 2.00	20 000	10	÷	- 11	-
Mail		East 15 East 17 East 15	No.	1 02	÷	1136 1136 1030	20.0 20.0 20.0	774 217	610 672 726	1333 1664 1068	12 10 10	030 030 038	1000	1000	100000 100000 100000	0.000 0.0001		027 026 026		100 100		5.001 5.000 5.000	11 000 11 000 11 000	1000	5000	100	1	100	Ħ		-
Mail		Min blax Mean		100 11.00	66 80 101 10 86 44	5.31 12.79	24.70 36.60	17.60 28.60 20.60	6.00 8.30 7.70		400 0040 1149	042 042 03*	000 030 500	0.00 0.00 0.00	0.00	0.00 0.01		0.01 0.07 0.07	100 100 100	500 501 502	100 100 100	100 100 100	010 001 800 017 073 AF	500 500 544	5.00 5.00 5.00	505 505 507	008 028 027	9.01 9.04 9.0*	100	030 200 025	100 ES
Mail	N29-19	Count St. Day		19.00 3.00 13.4	1700 1471 913	1800 180 2,14	17.00 3.36 53.4	2.62 41.4	1900 0.86 7.30	19.00 47.11 106.1	19.00 12.13	99.00 0.15 0.14	19:00 0:00 1:000/4	0.00	19.00 0.00 1.000007	18.00 0.00 0.001	1900 5.00 0.801	1800 6.18 6.21	19.00	19:30 5:00 5:005	19:30 5:00 0:00001	19:00 5:00 5:000	206 006 206 006	19.00 5.00 0.0007	900 000	E-00 E-00	19.00 0.04 0.04	8.00 0.01	381	947 247	100 NO 107 D
		Eart 2 Eart 3 Eart 3	- N	192 53 67	102 103 104	7,80 10,27 10,28	30 30 304	36 26 26.6	100 630 647	128.6 128.6	107	601 601 601	1000	1000	1000	6001 6001			Ī	100	Ē	100	61 000 61 000	Ē	Œ		Ē	E	Ė	- 1	8 1
		East I Dest I Dest I	-	82 81 97	-	10.00 10.00 7.84	2	29 277 262	740 640	1942 1978	7.68 6.18 2.66	0018 0018 0018	1000	1000	100000	2001 2001		100				100	1 20 1 20 1 20 1 20	1000	E						-
		Eart S Eart S Eart S	- 2	H	161	10.01 2.01 2.11	36	26.6 27 23.4	61 62 67	100	27 4 313	010 017 027	1000	1000	10000	2001 2001	100	0.00 0.00 0.00		100 100 100				1-0007 1-0007 1-0007	500						30
		East 12 East 13 East 14	- No.	134 132 5.8	101.2	9.38 9.31 16.77	69.7	21.6 20.2 34	7.00 7.50 7.50	99.3 17 95.8	12 2 368	012 011 034	1.000m 1.000m 1.000m	2.00001 2.00001	10000	0.000 0.000 0.000	0.001	0.74 0.74 0.3	0.000	100			61 000 61 000	0.00001 0.00001 0.00001	500 500 500	101	000 000 000	0.01 0.000 0.000	- 1	-	
		East 15 East 16 East 17	-	14 17 17	03 87 81	8.12 16.36	43.7 26.4 26.9	20 23 23.6	6.00 5.00	112.8 105.6 25.5	641 53 339	631 63 63	2.00012 2.00012 2.00012	1000	100001	2.00E	0.001	0.18 0.21 0.26	2.000 2.000 2.000	1000 1000 1000	0.00001 0.00001	1.000 1.000	61 560 61 600 12 607	0.00001	6001 6001	101	001	100			噩
		Report 18 Mars	2		602 6180	10 10 10	663 2640 2640	20.1 32.9 20.00	7.0 7.0	100.0 56.0 17.00	1.00 (2 120	022 019 002	1000	1000	0.00	0.001 0.001	100	0.74 0.74	100	100 100 100	100	100	01 000 01 001 010 001	500	500	100	21 028	2000 2000 2001	1	27 27 280	- 1
		Mean Count		9.77 9.77 19.00	101 20 8423 1700	12.38 9.17 18.00	53.80 51.81 17.00	21.80 20.18 10.00	730 739 1930	104.00 104.00	5133 639 1800	630 613 9630	000 000 1900	0.00 0.00 19.00	0.00 0.00 19.00	0.00 0.00 19.00	1.00 1.00 18.00	822 811 1800	100 100 1930	500 500 1930	5.00 5.00 19.00	1.00 1.00 19.30	000 007 030 002 1900 1900	500 500 1800	5.00 5.00 96.00	5.05 5.05 8.00	020 027 1800	0.04 0.01 8.00	1700 1286 830	300 030 950	26.70 GB
	76-9	St. Dev Event I Event 2	No.	328 162 104	1430 54	1.00 9.03 7.8	633 328 36	261 214	7.00 7.00 7.00	172.4 179.3	1121 1046 846	0.00 0.01 0.018	000 1000 1000 1	2.000 2.0000 2.0000	0.00 1.000000 1.0000000	0.00	0.00 0.00 0.00	0.08 0.0 0.2	100	500 5011 5001	100	100	0.75 0.00 0.7 0.00 0.7 0.00	200 2000 2000	5.00 0.00 0.00	E-00	004 008 008	9.01	306	2	20 00
Marie Mari		East I East I East I	-	63 62 6	61.8 61.2	10.6 10.23 11.36	21 276 32	31 964 35	67 68	121.6 48.1 183.6	1077 1143	0011 0011 0011	1.000m 1.000m 1.000m	100	100000	2001 2001	0.001 0.001 0.001	1.000 1.000 1.000	-			1000	1 100	0.00001 0.00001 0.00001	1		100			- 11	#
Marie Mari		Emil Emil Emil	-	193 124 17	#72 #84	7.54 7.52 9.82	267 263 279	192 201 21	675 687	90.7 90.8 194.2	101 120 120	011 011 024	1000	1000		0.000 0.000 0.000 0.000	201	529 529 539		100			1 10	1-0007 1-0007	Ē						30
		East 10 East 11 East 13	- No.	163	96 963	12.00 8.20 8.94	203	212 192 214	100	90.1 96.6 62.1	7 747 122	030 038 03	1000	2 AND 1	10000	6001 6001	100	54 129	j	100 100 100		1000	61 600 61 600 61 600	1000	100			257		-	#
		East 13 East 14 East 15	20	168 94 87	## #7		201	26.6 22.1 20.9	730 730 648	34 533 1238		030 036 042	100	2.0000 2.0000 2.0000		100			Ξ		≣		0 000 01 000 01 007		E	-	Ē	200 200 182	Ħ		#
		Earth 17 Earth 17	2	- 14 - 17	04 84	10.00 10.00 10.37	27.2 27 30.0	16.2 20.4	675 63	1265 1067 85	741 641 1142	038 038 048	2.00078 2.00078 2.00078	2.0000 2.0000 2.0000	100000 100000	6001 6001	0.001 0.001		0.000 0.000 1.000	5.007 5.007 5.008	-	1000 1000	01 000 02 001 01 000	0.0000 0.0000 0.0000	0000 0000	101 101	600 60 61	9.04 9.00 9.01	ΕĒ	i.	÷ 🗔
		Monthly Monthly March	-	11.6 4.00 15.80	81.2 61.72 88.30	130 130 133	29.2 23.30 32.90	21.6 96.20 36.00	679 619 748	72.0 36.00 183.00	101 406 3077	049 049	000 000	0.00 0.00	0.00	0.00 0.00 0.00	100	0.00 0.01 0.09	100	500 500 501	100 100	100 100	010 001 000 011	500 500	500 001	505 506	008 028	9.01 9.04	100	010 200	100 E1
	W.06	Count St. Dev		19.00 3.77	1700 1389	18:00	2.07 2.07	241 14.00	1930 0.86	19.00	18.00 5.65	900 018	19-20 000	19:00	19.00 0.00	19.00	100	1800 5.76	19.00	19:30 5:00	19.00	19.00	100 1000 118 000	1800 1800	900 500	8.00 0.00	1800 004	8.00 0.01	830 232	1900 046	1000 No.
Design by 172 744 289 747 20 9 034 20001 00001 0001 0001 0001 0001 0001 0		fact fact fact	-	127 24 25	71.4 60 96.3	7.68 10.66 12.63	31 31 31 269	24 18 18 1	7.56 6.73 6.98	138.8 128.8 46.2	8.27 20.28	6011 6011 6011	1.00011 1.00011	2 MARCH	100000	2000 2000 2000	0.801	0.00 0.000 0.000	1000	100	0.00001 0.00001	2.00E		0.00001	6001 6001		00E				-
Design by 172 744 289 747 20 9 034 20001 00001 0001 0001 0001 0001 0001 0		Earth Senis Senis	- 1	64 104 117	11.3 20.8	10.00 10.20 7.69	30 303 362	21 22 34 14 1	739 679	1924 1924	241 241	-	1000	1000	1000	6001 6001		100 100 110	Ī	Ī	Ē	100	1 100	Ē	Œ		Ē	E	Ė	- 1	2
Design by 172 744 289 747 20 9 034 20001 00001 0001 0001 0001 0001 0001 0		David David David	20	14 151	#1	736 193 676	28	22.1 22.6	12	99.1 1632 738	7.65 826 10	018 030 038	1007	1000	100000 100000 100000	0.000 0.000 0.000		0.07 0.76 0.21	100	100 100 100		100	01 000 01 000 01 001	1000	500		=			i i	# 1
1		Bank G Bank G Bank G	-	177 178	1013 1013	7.65 11	263	20.7 20.7 20.9	65 638 7.0	165 165 20	120 700 0	038 038 038	100m	100	100000	2000 2000 2000	0.001 0.001	100 141 137 137	2000 2000 2000			1000	1 000 1 000	0.00001 0.00001 0.00001	5001 5001	2.01 2.01 3.07	10 11	100	- 1		#
## 1		Dani II Dani II Dani II	-	92 92 92 23	04 87 84	162 1627 1527	294 274 274 288	20.1 20.1 20.4	60 62	100	7.65 7.65 7.37 1.37	047 036 036	1 000 TE	2 March	100000		0.001 0.001 0.001	041 028 023		500 500 500 500		100	61 600 61 600 61 607	0.00001 0.00001 0.00001		100		100	E		#
## 15 15 15 15 15 15 15 15		East 18 East 18 Min	-	340	E140	10.31 8.27 8.62	29.7 27.8 23.90	20.6 23.1 16.60	623 630 630	20 20 M	20.13 21.8 2.61	071 089 669	1000	1000	0.00	100 100	100	047 043 081	100	5.00° 5.00° 5.00	100	100 100 100	61 000 61 001 610 001	1 000 1 000	0000 0000 0000	100	61 038	941	100	41 41 410	
		Mean Count		15.00 15.00 19.00	101 30 8525 1700	9.13 9.13 19.00	32.00 28.18 17.00	20.50 20.54 90.00 57*	575 677 1936 A	100.00 100.34 10.00	20 13 8 50 18 50	0.71 0.28 96.00	0.00 0.00 19.00	0.00 0.00 19-00	0.00 0.00 19.00	0.00 0.00 18:00	100 100 100	536 536 1600	100 100 1930	501 501 1930	100 100 100 100	100 100 100 100	041 042 940 1930 138	500 500 1900	100 100 100	0.05 0.05 8.00	0.10 0.06 19.00	5.07 5.02 8.00	713 830	0.10 0.10 10.00	200 10 200 10 200 10
	ited on half the I init of seconds	an and			12.77					11.0	8.07	est.			- mil			end				-81	- 000		and a	and					

APPENDIX B OBSERVATIONS AND FIELD DATA

	- /) = [7				to hir				
J13 Pre-constr	ruction WQM	Grease/oil/ sheen	Temperature (℃)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	рН	Oxidation Reduction Potential (mV)	Turbidity (NTU)
	Month	20	12.3	94.0	9.43	100.5	76.1	7.87	92.4	(.6
WC-RS	Comment	Clea	r, me	deum	flon	/				
	Month	20	12.4	94.7	9.48	100.5	76.3	7.82	101.6	1.3
wc-is	Comment	Clea	m		n Ca	st C				
	Month	NO	12.4	96.1	9.60	481.4	366.0	7.82	111.4	0.0
CG-IS	Comment				*	a+10	~ , sl.	ight	E(0~	Ç4
	Month	14.3	95.3	9-15	98.2		7.97	104	104.5	1.8
YR1-RS	Comment		14.3	95.3	9.15	98.2 Past	78/1	7.92		

-- 3/ 5/ 9

22-013 Pre-cons	truction WQM	Grease/oil/ sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	рН	Oxidation Reduction Potential (mV)	Turbidity (NTU)
	Month	NO	12.1	86.5	8.71	529	398.2	7.77	3.3	(6.8
LHG-IS	Comment						egeto			
	Month	20	14.6	95.6	9.14	99.9	80-0	7.88	92.7	1.9
YR2-RS	Comment	Fast	Flor	~ , n	ned in	m le	re(
	Month	NO	13.9	94.0	9.13	139.8	1101	7.69	83.4	2.7
ssc-Is	Comment	low					i flo		ĊS	
	Month	NO	16.2	105.8	9.85	38.7	32.2	7.59	89,5	1.7
TR-RS	Comment						010000			
	Month	10-6	92.8	9-17	32.9	23.8	7.07	7.07	113.9	9.9
YK-IS (D/S)	Comment	Slig	92.8 10.6 Jut +				23.8 Flov			

	2	8+n Se	eptem	ber:	Sum	1 cle	ar sh	cies,	wan	~
22-013 Pre-const	ruction WQM	Grease/oil/ sheen	Temperature (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (ppm)	Specific Conductivity (SPC uS/cm)	Conductivity (uS/cm)	рН	Oxidation Reduction Potential (mV)	Turbidity (NTU)
1	Month	20	9.7	90.2	9.13	46.5	32.9	7.61	56.6	4.7
NZG-IS	Comment		mal 1		flow		n ba.	~K		
	Month	20	11.4	91.2	8.82	29.2	21.6	6.76	72.5	10.1
YK-IS	Comment	depo	osits	of n		paqi		· S		
	Month	20	16.0	95.0	8.27	27.8	23.1	6.62	85.9	21.8
YK-RS	Comment		sid I		s in	,			a	

APPENDIX C LABORATORY CERTIFICATES



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NATA Accredited Laboratory

Number: 9597

Accredited for compliance with ISO/IEC 17025 - Testing

NGH Environmental

35 Kincaid Street

Wagga Wagga NSW 2650

Attention: Nicola Smith

LABORATORY ANALYSIS REPORT

Report Number:2309-0088 Page 1 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: Order # Date Analysis Commenced

29-September-2023

 it ID. <u>Test</u> ime sample taken	Result	(units)	Method Reference	Limit of Reporting
C-RS 19.23 12.43pm				
Aluminium (dissolved)	0.04	mg/L	APHA 3030 B/3120 B	0.03
Ammonia as N	<0.1	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)	0.004	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	43	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)	2.16	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	<0.1	mg/L	LTM-W-014	0.1
Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01
Phosphorus, Total	0.04	mg/L	LTM-W-030	0.01
Silver (dissolved)	< 0.00002	mg/L	* APHA 3030 B/3120 B	0.0000
Total Dissolved Solids	6	mg/L	LTM-W-035	2
Total Kjeldahl Nitrogen	<0.2	mg/L	LTM-W-034	0.2



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LABORATORY ANALYSIS REPORT

Report Number:2309-0088 Page 2 of 17

For all enquiries related to this report please quote document number: 2309-0088

<u>Facility:</u> <u>Order #</u> <u>Date Analysis Commenced</u>

29-September-2023

				_, ~, p.,	
EAL ID	Client ID. Test Date/Time sample taken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0252	WC-RS 27.09.23 12.43pm				
	Total Suspended Solids	2	mg/L	APHA 2540 D	0.2
	Zinc (dissolved)	<0.002	mg/L	APHA 3030 B/3120 B	0.002
23Sep-0253	WC-IS 27.09.23 12.52pm				
	Aluminium (dissolved)	0.04	mg/L	APHA 3030 B/3120 B	0.03
	Ammonia as N	<0.1	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)	13.3	mg/L	APHA 3030 B/3120 B	2
	Chromium (dissolved)	0.003	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)	0.02	mg/L	APHA 3030 B/3120 B	0.01
	Lead (dissolved)	<0.001	mg/L	APHA 3030 B/3120 B	0.001
	Magnesium (dissolved)	2.13	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	<0.1	mg/L	LTM-W-014	0.1
	Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01



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Report Number:2309-0088 Page 3 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: Order # Date Analysis Commenced

29-September-2023

EAL ID	Client ID. Date/Time sample t	<u>Test</u> aken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0253	WC-IS 27.09.23 12.52pn	n				
	_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	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	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
23Sep-0254	CG-IS 27.09.23 1.08pm					
		Aluminium (dissolved)	0.06	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	99.1	mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	0.003	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	271	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)	5.63	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



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LABORATORY ANALYSIS REPORT

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For all enquiries related to this report please quote document number: 2309-0088

Facility: Order # Date Analysis Commenced

29-September-2023

EAL ID	Client ID. Date/Time sample	<u>Test</u> taken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0254	CG-IS 27.09.23 1.08pm					
	-	Nickel (dissolved)	0.002	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	<0.1	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	155	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)	0.004	mg/L	APHA 3030 B/3120 B	0.002
23Sep-0255	YR1-RS 27.09.23 1.18pm					
		Aluminium (dissolved)	0.06	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	13.3	mg/L	APHA 3030 B/3120 B	2
		Chromium (dissolved)	0.002	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



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Report Number:2309-0088 Page 5 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: Order # Date Analysis Commenced

29-September-2023

EAL ID	Client ID. Date/Time sample t	<u>Test</u> aken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0255	YR1-RS 27.09.23 1.18pm					
	•	Lead (dissolved)	< 0.001	mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	2.08	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	<0.1	mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	0.07	mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.38	mg/L	LTM-W-030	0.01
		Silver (dissolved)	<0.00002	mg/L	* APHA 3030 B/3120 B	0.0000
		Total Dissolved Solids	3	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
23Sep-0256	LHG-IS 27.09.23 1.35pm					
		Aluminium (dissolved)	0.07	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	0.003	mg/L	APHA 3030 B/3120 B	0.0000



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LABORATORY ANALYSIS REPORT

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Facility: Order# **Date Analysis Commenced**

29-September-2023

EAL ID	Client ID. Date/Time sample	<u>Test</u>	Result	(units)	Method Reference	Limit of Reporting
		arcii				
23Sep-0256	LHG-IS 27.09.23 1.35pm					
		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	296	mg/L	LTM-W-038	2
		Iron (dissolved)	0.05	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.005	mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	6.34	mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.012	mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003	mg/L	APHA 3030 B/3120 B	0.0000
		Nickel (dissolved)	0.002	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	<0.1	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	144	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)	0.004	mg/L	APHA 3030 B/3120 B	0.002
23Sep-0257	YR2-RS 27.09.23 1.57pm					
	27.07.23 1.37pm	Aluminium (dissolved)	0.06	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	mg/L	LTM-W-042	0.1
				-		



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NGH Environmental

35 Kincaid Street

Wagga Wagga NSW 2650

Attention: Nicola Smith

LABORATORY ANALYSIS REPORT

Report Number:2309-0088 Page 7 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: <u>Order #</u> <u>Date Analysis Commenced</u>

29-September-2023

EAL ID	Client ID.	<u>Test</u>	Result	(units)	Method Reference	Limit of
	Date/Time sample t	aken				Reporting
23Sep-0257	YR2-RS 27.09.23 1.57pm					
		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)	13.7	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)	0.04	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	<0.1	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	10	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



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LABORATORY ANALYSIS REPORT

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For all enquiries related to this report please quote document number: 2309-0088

Facility: Order# **Date Analysis Commenced**

29-September-2023

EAL ID Client ID. Test Date/Time sample taken	Result	(units)	<u>Method Reference</u>	Limit of Reporting
23Sep-0258				
Aluminium (dissolved)	0.25	mg/L	APHA 3030 B/3120 B	0.03
Ammonia as N	<0.1	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)	12.9	mg/L	APHA 3030 B/3120 B	2
Chromium (dissolved)	0.002	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	54	mg/L	LTM-W-038	2
Iron (dissolved)	0.09	mg/L	APHA 3030 B/3120 B	0.01
Lead (dissolved)	0.001	mg/L	APHA 3030 B/3120 B	0.001
Magnesium (dissolved)	5.36	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	5	mg/L	* APHA 4500-Norg B + 4110 B	0.2
Nitrate/Nitrite as N	<0.1	mg/L	LTM-W-014	0.1
Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01
Phosphorus, Total	0.04	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	5	mg/L	LTM-W-034	0.2



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For all enquiries related to this report please quote document number: 2309-0088

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29-September-2023

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EAL ID	Client ID. Date/Time sample	<u>Test</u> taken	<u>Result</u>	(units)	Method Reference	Limit of Reporting
23Sep-0258	SSC-IS 27.09.23 2.09pm					
	•	Total Suspended Solids	5	mg/L	APHA 2540 D	0.2
		Zinc (dissolved)	<0.002	mg/L	APHA 3030 B/3120 B	0.002
23Sep-0259	TR-RS 28.09.23 12.52pr	m				
		Aluminium (dissolved)	<0.03	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	3.04	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	8	mg/L	LTM-W-038	2
		Iron (dissolved)	0.02	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)	0.002	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	<0.1	mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01



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Tuesday, November 14, 2023

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LABORATORY ANALYSIS REPORT

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For all enquiries related to this report please quote document number: 2309-0088

Facility: Order# **Date Analysis Commenced**

29-September-2023

EAL ID	Client ID. Date/Time sample t	<u>Test</u> aken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0259	TR-RS 28.09.23 12.52pn	1				
	r	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	11	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
23Sep-0260	YK-IS(d/s) 28.09.23 1.13pm					
		Aluminium (dissolved)	0.34	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	0.007	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)	0.003	mg/L	APHA 3030 B/3120 B	0.001
		Mercury (dissolved)	<0.00003	mg/L	APHA 3030 B/3120 B	0.0000



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EAL ID	Client ID.	<u>Test</u>	Result	(units)	Method Reference	Limit of
	Date/Time sample	taken			1	Reporting
23Sep-0260	YK-IS(d/s) 28.09.23 1.13pm					
		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	<0.1	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	9	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
23Sep-0261	NZG-IS 28.09.23 1.36pm					
		Aluminium (dissolved)	0.19	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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)	3.04	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	8	mg/L	LTM-W-038	2
		Iron (dissolved)	0.14	mg/L	APHA 3030 B/3120 B	0.01



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LABORATORY ANALYSIS REPORT

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EAL ID	Client ID. Date/Time sample t	<u>Test</u>	Result	(units)	Method Reference	Limit of Reporting
23Sep-0261	NZG-IS 28.09.23 1.36pm					
	•	Lead (dissolved)	0.004	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	<0.1	mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.04	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
23Sep-0262	YK-IS 28.09.23 1.52pm					
		Aluminium (dissolved)	0.49	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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



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EAL ID	Client ID. Date/Time sample t	<u>Test</u> aken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0262	YK-IS 28.09.23 1.52pm					
		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)	0.32	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)	0.004	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	0.1	mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.11	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
23Sep-0263	YK-RS 28.09.23 2.03pm					_
		Aluminium (dissolved)	0.69	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	mg/L	LTM-W-042	0.1



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<u>Facility:</u> <u>Order #</u> <u>Date Analysis Commenced</u>

29-September-2023

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EAL ID	Client ID. Date/Time sample t	<u>Test</u>	Result	(units)	Method Reference	Limit of Reporting
23Sep-0263	YK-RS 28.09.23 2.03pm					
		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)	0.53	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.004	mg/L	APHA 3030 B/3120 B	0.001
		Magnesium (dissolved)	<2.00	mg/L	APHA 3030 B/3120 B	2
		Manganese (dissolved)	0.007	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	<0.1	mg/L	LTM-W-014	0.1
		Ortho-Phosphate as P	<0.01	mg/L	LTM-W-030	0.01
		Phosphorus, Total	0.08	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)	0.003	mg/L	APHA 3030 B/3120 B	0.002



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<u>Facility:</u> <u>Order #</u> <u>Date Analysis Commenced</u>

29-September-2023

EAL ID	Client ID. Date/Time sample t	<u>Test</u> taken	Result	(units)	Method Reference	Limit of Reporting
23Sep-0264	DUP01 28.09.23 12.52pm	n				
		Aluminium (dissolved)	<0.03	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)	0.02	mg/L	APHA 3030 B/3120 B	0.01
		Lead (dissolved)	0.004	mg/L	APHA 3030 B/3120 B	0.001
		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
		Silver (dissolved)	< 0.00002	mg/L	* APHA 3030 B/3120 B	0.0000
		Zinc (dissolved)	<0.002	mg/L	APHA 3030 B/3120 B	0.002
23Sep-0265	Water Blank 27.09.23					
		Aluminium (dissolved)	<0.03	mg/L	APHA 3030 B/3120 B	0.03
		Ammonia as N	<0.1	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



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http://science-health.csu.edu.au/eal

NGH Environmental

35 Kincaid Street

Wagga Wagga NSW 2650

Attention: Nicola Smith



NATA Accredited Laboratory

Tuesday, November 14, 2023

Number: 9597

Accredited for compliance with ISO/IEC 17025 - Testing

LABORATORY ANALYSIS REPORT

Report Number:2309-0088 Page 16 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: Order # Date Analysis Commenced

29-September-2023

Sample TypeCollected ByDate ReceivedWaterClient29-September-2023

EAL ID	Client ID. Date/Time sample t	<u>Test</u> taken	<u>Result</u>	(units)	Method Reference	Limit of Reporting
23Sep-0265	Water Blank 27.09.23					
		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	<0.1	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.



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Tuesday, November 14, 2023



NATA Accredited Laboratory

Number: 9597

Accredited for compliance with ISO/IEC 17025 - Testing

NGH Environmental

35 Kincaid Street

Wagga Wagga NSW 2650

Attention: Nicola Smith

LABORATORY ANALYSIS REPORT

Report Number:2309-0088 Page 17 of 17

For all enquiries related to this report please quote document number: 2309-0088

Facility: Order# **Date Analysis Commenced**

29-September-2023

Sample Type **Date Received** Collected By Water Client 29-September-2023

EAL ID Method Reference Limit of Client ID. **Test** Result (units) 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

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CONTACT:	Nicola Smith		J							,sA ,	from to		s						
	35 Kincaid Street					, ,	s			IA) :	(e		oru						
ADDRESS:	Wagga Wagga					ι	oru	•		tals			 yds				 	******	
	ABN: 31 124 444 622	622				ıəbo	yds			əΜ			oyo						
TELEPHONE:	0410 411 660	099	E-mail	nicola.s@ngł	nicola.s@nghconsulting.com.au		ьро			bevio		sino	A evit			***************************************	 		
SAMPLE IDENTIFICATION	NATURE OF SAMPLE	DATE SAMPLED	TIME	CONTAINER TYPE	NUMBER OF CONTAINERS	lstoT	lstoT	Cyan	Total Total	Disso Cd, C	Toal I	mmA	Кеас				 		
WC-RS	Water	27/9/23/2:	12:43	SAR.	^	>	>	7	2	>		>							
MC-IS	Water	27 19 23	25.2	7	*	>	>	2.	7	7	>	1	7						
SI-90	Water	27 9/23 1:	00:-	3	0	>>	>	7	>	7	1	>	7						
YR1-RS	Water	27/0/23	. 18	ţ.	U	2.	<u></u>	2	5	7)	>	1						
SI-9HT	Water	27/9/2	58:1:	47	4	>	7	2	7	1	7	1							
YR2-RS	Water	27/9(231:5	L5:1	27	1.7	>	7	7	7		7	\ <u></u>	7						
SI-OSS	Water	27/0/22	60:72	, ,	ser,	>	\\ \alpha	7	7	\ <u></u>		1	7						
TR-RS	Water	28 9 23	25:7	16.0	47	7		7.	7	1	1	1	1						
YK-IS (d/s)	Water	28 1912	51:13	4	47	>	13	7	,	>	7	1	1						·
NZG-IS	Water	28/9/23	95:11	1	1	×		7		7		1							
YK-IS	Water	28/9/23	2.5:1	*	· · · · · · · · · · · · · · · · · · ·	1		,	/	7									
YK-RS	Water	28/9/2	2.03	, ^	7) .		1	7	/	7	7	\ <u></u>							
DUP01	Water	23 a 23	12:52	4	and from					_							 		
WATER BLANK	Water	and the second	-wath,	1	(S)	>	7	7	7	>	3								
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www.csu.edu.au CRICOS Provider Numbors for Charles Sturt University are 00005F (NSW), 01947G (VIC) and 02960B (ACT). ABN: 83 878 708 551

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/
	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 67%	0.000015	0.0005	0.00001	0.001
	Event 3	RPD% - Acceptable Range except Mn DUP01	0% 0.015	0% 0.00015	0% 0.00001	0%	0% 0.0001	0% 0.001	0% 0.005	0% 0.0005	0.0005	0% 0.000015	0% 0.0005	0% 0.00001	0% 0.001
	LVEITES	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	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
	Tyont F	RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Event 5	DUP01 WC-RS	0.015 0.015	0.00015 0.00015	0.00001 0.00001	0.000005 0.000005	0.0001 0.0001	0.001 0.001	0.005 0.005	0.0005 0.0005	0.0005 0.0005	0.000015 0.000015	0.0005 0.0005	0.00001 0.00001	0.001
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.00
	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	0.00
		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%	0.00015 0%	0.00001 0%	0.00005	0.0001 0%	0.001 0%	0.005 0%	0.0005 0%	0.0005 0%	0.000015 0%	0.0005 0%	0.00001 0%	0.001
	Event 8	RPD% - Acceptable Range 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	1.79	0.00015	0.00001	0.000005	0.0001	0.001	0.73	0.0005	0.011	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	3.409090909	0%	0%	0%	0%	0%	5.633802817	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	0.00
		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	0.00
		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	0.00
		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	0.01
	Event 11	RPD% - Acceptable Range DUP01	0% 0.03	0% 0.00015	0% 0.00001	0%	0% 0.0001	0% 0.001	11.76 0.02	0% 0.0005	0% 0.0005	0% 0.000015	0% 0.0005	0% 0.00001	0%
	Lveiit II	WC-RS	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.02	0.0005	0.0005	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0.02	0%	0%	0%	0%	0%	0%
	Event 12	DUP01	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.02	0.0005	0.006	0.000015	0.0005	0.00001	0.00
		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	0.00
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	60%	0%	85%	0%	0%	0%	33%
		DUP01	0.03	0.00015	0.00001	0.000005	0.0001	0.001	0.02	0.0005	0.0005	0.000015	0.0005	0.00001	0.002
	Event 13	WC-IS	0.015	0.00015	0.00001	0.000005	0.0001	0.001	0.02	0.0005	0.0005	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	33%	0%	0%	0%	0%	0%	0%	0,0005	0%	0%	0%	0%	20%
	Event 14	DUP01 WC-RS	0.04 0.04	0.00015 0.00015	0.00001 0.00001	0.000005 0.000005	0.0001 0.0001	0.001 0.001	0.02 0.03	0.0005	0.0005 0.0005	0.000015 0.000015	0.0005 0.0005	0.00001 0.00001	0.00
	Evolit 14	RPD% - Acceptable Range	0%	0%	0.00007	0%	0%	0%	20%	0.0003	0.0003	0%	0%	0.00007	92%
		DUP01	0.08	0.00015	0.00001	0.000005	0.0001	0.001	0.06	0.0005	0.001	0.000015	0.0005	0.00001	0.00
	Event 15	WC-RS	0.11	0.00015	0.00001	0.000005	0.0001	0.001	0.09	0.0005	0.001	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	16%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%
		DUP01	0.67	0.00015	0.00001	0.000005	0.0001	0.001	0.39	0.0005	0.004	0.000015	0.0005	0.00001	0.00
	Event 16	WC-IS	0.6	0.00015	0.00001	0.000005	0.0001	0.001	0.34	0.0005	0.004	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	6% 0.4	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	33%
	Event 17	DUP01 YK-RS	0.4	0.00015 0.00015	0.00001 0.00001	0.000005 0.000005	0.0001 0.0001	0.001 0.001	0.3 0.23	0.0005 0.0005	0.011 0.009	0.000015 0.000015	0.0005 0.0005	0.00001 0.00001	0.00
	Event 17	RPD% - Acceptable Range	18%	0.00073	0.00007	0.000003	0.0007	0%	13%	0.0003	10%	0%	0%	0%	0.00
		DUP01	0.72	0.00015	0.00001	0.000005	0.0001	0.001	0.49	0.001	0.021	0.000015	0.002	0.00001	0.00
	Event 18	YK-RS	0.71	0.00015	0.00001	0.000005	0.0001	0.001	0.47	0.0005	0.037	0.000015	0.001	0.00001	0.02
		RPD% - Acceptable Range	1%	0%	0%	0%	0%	0%	2%	33%	28%	0%	33%	0%	58%
		DUP01	0.015	0.00015	0.00001	0.000005	0.001	0.001	0.02	0.004	0.001	0.000015	0.0005	0.00001	0.00
	Event 19	TR-RS	0.015	0.00015	0.00001	0.000005	0.001	0.001	0.02	0.002	0.002	0.000015	0.0005	0.00001	0.00
		RPD% - Acceptable Range	0%	0%	0%	0%	0%	0%	0%	33%	33%	0%	0%	0%	0%
	Event 1	Nothing above LOR	<0.02	<0.0003	<0.00002	<0.0001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003	<0.001	<0.00002	<0.0
	Event 2	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	<0.0
iter Blank	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	<0.0
Rei Dialik	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	<0.0
	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	<0.0
	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	<0.0
	Event 7 Event 8	Nothing above LOR Nothing above LOR	<0.03 <0.03	<0.0003 <0.0003	<0.00002 <0.00002	<0.00001	<0.0002 <0.0002	<0.002 <0.002	<0.01 <0.01	<0.001 <0.001	<0.001 <0.001	<0.00003	<0.001	<0.00002 <0.00002	<0.0
	Event 9	Nothing above LOR Nothing above LOR	<0.03	<0.0003	<0.00002	<0.00001 <0.00001	<0.0002	<0.002	<0.01	<0.001	<0.001	<0.00003 <0.00003	<0.001 <0.001	<0.00002	<0.0
		Nothing above LOIX	\0.03	-0.0003	-0.00002	-0.0000 I	*U.UUUZ	~U.UUZ	\U.U1	-U.UU I	-U.UU1	-0.00003	VU.UU I	+	
	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	<0.0

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

RPD %
$$|(X 2 - X 1)|/((X 2 + X 1)/2)$$

How to calculate the Relative Percent Difference (RPD)

The basic equation for RPD is $RPD = \frac{\mid R1 - R2 \mid}{\left(\frac{R1 + R2}{2}\right)} \times 100,$

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

Instrument Serial No. YSI Pro DSS 15J101503



Air-Met Scientific Pty Ltd 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	1	1 4
•	Fuses	1	1/2
	Capacity	1	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	8 8
Display	Intensity	1	· ·
	Operation (segments)	✓	
Grill Filter	Condition	1	
	Seal	✓	
PCB	Condition	1	
Connectors	Condition	1	
Sensor	1. pH/ORP	1	
	2. Turbidity	1	
	3. Conductivity	1	
	4. D.O	1	
	5. Temp	1	
	6. Depth	1	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation	1 to 1	
Download	Operation		
Other tests:		The same of the sa	

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
2. pH 7.00		pH 7.00		393774	pH 7.02
3. pH 4.00		pH 4.00		399527	pH 3.98
4. ORP		235.6 mV		A405006/B398193	235.4 mV
5. SPC		2760uS/cm		385789	2764 uS/cm
6. D.O		0%		391223	-0.20%
7. Turbidity		100 NTU		396426	99.60 NTU
8. Temp		22.0 °C		MultiTherm	22.0 °C

Calibrated by:

Guido Camera

Calibration date:

20/09/2023

Next calibration due:

18/03/2024