



OCTOBER 2024

MONTHLY CONSTRUCTION WATER QUALITY MONITORING REPORT

October 2024

Project No: 3200-0645

Project: Transgrid Maragle 500/330 kV Substation

Private & Confidential

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APPENDICES

APPENDIX A: FIELD SHEET (UGL, 2024)

APPENDIX B: COA (ALS, 2024A), QA/QC ASSESSMENT (ALS, 2024B) AND QCR (ALS, 2024C)

APPENDIX C: OCTOBER 2024 SWQ MONITORING RESULTS

APPENDIX D: CALIBRATION CERTIFICATE

ABBREVIATIONS

Acronym	Full Form
°C	degrees Celsius
µS/cm	micro Siemens per centimetre
%	percent
Ag	Silver
Al	Aluminium
ALS	ALS Limited
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
As	Arsenic
Baseline Report	'Baseline Water Quality Report' (NGH, 2024)
CaCO ₃	Total Hardness
Cd	Cadmium
COA	'Certificate of Analysis' (ALS, 2024a)
Cr	Chromium
Cu	Copper
DGV	Default Guideline Values
DO	Dissolved Oxygen
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EPL	Environmental Protection Licence
Fe	Iron
Field Sheet	'Water Quality Monitoring Field Data Sheet' (UGL, 2024)
Hg	Mercury
km	kilometres
km/h	kilometre per hour
KNP	Kosciuszko National Park
kV	kilovolt
LOR	limit of reporting
mg/L	milligram per litre
mm	millimetre
Mn	Manganese
mV	millivolt
NATA	National Association of Testing Authorities, Australia
NEM	National Energy Market

ABBREVIATIONS

Acronym	Full Form
NGH	NGH Pty Ltd
Ni	Nickel
NSW	New South Wales
NTU	Nephelometric Turbidity Unit
Pb	Lead
ppm	parts per million
Pty Ltd	Proprietary Limited
QA/QC Assessment	'QA/QC Compliance Assessment to assist with Quality Review' (ALS, 2024b)
QCR	'Quality Control Report' (ALS, 2024c)
RS	Reference Site
Snowy 2.0	Snowy Scheme expansion project (EPBC 2018/8322)
Snowy Hydro	Snowy Hydro Limited
Snowy Scheme	Snowy Mountains Hydro-electric Scheme
SPC	specific conductance
SSGV	Site Specific Guideline Values
SW	surface water
SWQ	surface water quality
TDS	Total Dissolved Solids
The Methodology	'Pre-construction Water Quality Monitoring Program and Methodology' (NGH, 2022)
The Project	Construction of a 330 kV substation and overhead transmission lines between Nurenmerenmong, NSW and Cabramurra, NSW
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TP	Total Phosphorus
Transgrid	The Trustee for the NSW Electricity Operations Trust
TSS	Total Suspended Solids
UGL	UGL Limited
WQO	water quality objectives
Zn	Zinc

1. BACKGROUND

In 2020 Snowy Hydro Limited (Snowy Hydro) obtained approval (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 (Snowy 2.0).

To connect Snowy 2.0 to the National Energy Market (NEM), a new transmission connection was required. The Trustee for the New South Wales (NSW) Electricity Operations Trust (TransGrid) is constructing a 330 kilovolt (kV) substation and overhead transmission lines (the Project) to facilitate the connection of Snowy 2.0 to the existing electrical transmission network. The Project is located within Kosciuszko National Park (KNP) between Nurenmerenmong and Cabramurra, NSW, approximately 27 kilometres (km) east of Tumbarumba, NSW (Figure 1). UGL Limited (UGL) has been engaged on behalf of Transgrid to undertake the Project.

2. INTRODUCTION

The Project is adjacent to, and forms part of, the Snowy 2.0 project area and is located within KNP, an area of high conservation value. A total of 22 mapped waterways, tributaries of Yarrangobilly River and Tumut River, transect the Project Boundary (Figure 1).

One of the conditions of approval to meet the requirements outlined in the 'Environmental Impact Statement' (EIS) (Jacobs, 2020) and the Project's Environmental Protection Licence (EPL 21753) is to undertake regular surface water quality (SWQ) monitoring to mitigate environmental impacts on SWQ.

Pre-construction SWQ monitoring was undertaken by NGH Pty Ltd (NGH) between March 2022 and February 2024 to determine site specific baseline values for SWQ parameters prior to Project construction works. The pre-construction SWQ monitoring was undertaken using the 'Pre-construction Water Quality Monitoring Program and Methodology' (the Methodology) developed by NGH in 2022 (refer Section 3). Two years of pre-construction SWQ monitoring was analysed and summarised in the 'Baseline Water Quality Report' (Baseline Report) (NGH, 2024). The results were used to determine seasonal Site Specific Guideline Values (SSGV) for ongoing SWQ monitoring during the construction phase.

Construction for the Project commenced in March 2024. Construction SWQ monitoring will be undertaken by UGL on a monthly basis as per the revised methodology outlined in Section 3 to identify potential changes to SWQ that may be associated with the Project. SW samples from the construction SWQ monitoring would be analysed and presented in monthly Construction Water Quality Monitoring Reports.

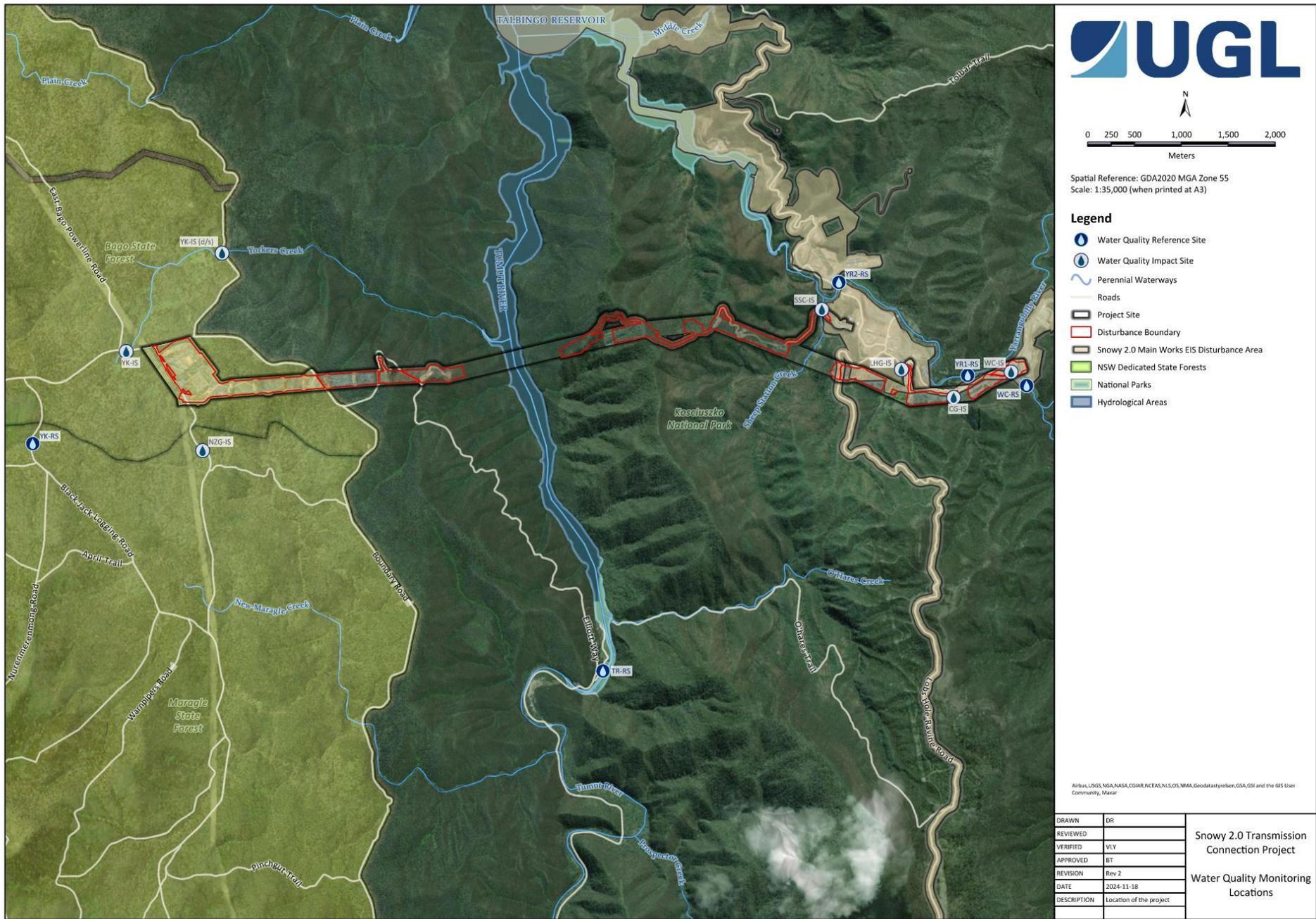


FIGURE 1 LOCALITY OF THE PROJECT AND SWQ MONITORING LOCATIONS

3. METHODOLOGY

The Methodology was prepared by NGH in 2022 to support the pre-construction SWQ monitoring for the Project. The Methodology detailed the water quality objectives (WQO) for the Project, identified the monitoring locations and outlined the methodology for surface water (SW) sampling during the pre-construction phase. The Methodology (NGH, 2022) took into account the Project location within an area of high conservation value where the WQO for physical and chemical stressors, as outlined in the ‘Australian and New Zealand Guidelines for Fresh and Marine Water Quality’ (ANZG) (ANZG, 2018), includes no change in biodiversity beyond natural variability and where possible, there should also be no change in water/sediment chemical and physical properties, including toxicants.

Monitoring locations are outlined in Table 1. Figure 2 and Figure 3 show the water quality monitoring locations in relation to the Project and Snowy 2.0.

The Methodology (NGH, 2022) has been revised for construction SWQ monitoring by taking into account the seasonal SSGV set out in the Baseline Report (NGH, 2024) (refer to Section 4.2).

Construction SWQ monitoring would be analysed against the seasonal SSGV where available and appropriate. The Default Guideline Values (DGV) for Upland Rivers (ANZG, 2018) would be applied to water quality parameters that were not assessed in the Baseline Report (NGH, 2024) or where a guideline range is more appropriate. Table 2 outlines the seasonal SSGV and DGV used to compare construction SWQ to pre-construction SWQ.

Table 1 Water quality monitoring locations outlined in the Methodology (NGH, 2022)

WATER QUALITY MONITORING LOCATIONS					
ID	Waterway	Site Type	Catchment	Latitude	Longitude
WC-RS	Wallace Creek	Reference	Yarrangobilly River	-35.794258	148.415253
WC-IS	Wallace Creek	Impact		-35.792982	148.413404
CG-IS	Cave Gully	Impact		-35.795495	148.406665
YR1-IS	Yarrangobilly River	Impact		-35.793358	148.408277
LHG-IS	Lick Hole Gully	Impact		-35.792890	148.400445
YR2-IS	Yarrangobilly River	Impact		-35.784656	148.392921
SSC-IS	Sheep Station Creek	Impact		-35.793243	148.391046
TR-RS	Talbingo Reservoir	Reference	Talbingo Reservoir	-35.822094	148.365690
YK-RS	Yorkers Creek	Reference	Yorkers Creek	-35.801126	148.297979
YK-IS (D/S)	Yorkers Creek	Impact		-35.782684	148.320040
NZG-IS	New Zealand Gully	Impact		-35.801575	148.318051
YK-IS	Yorkers Creek	Impact		-35.792209	148.308878

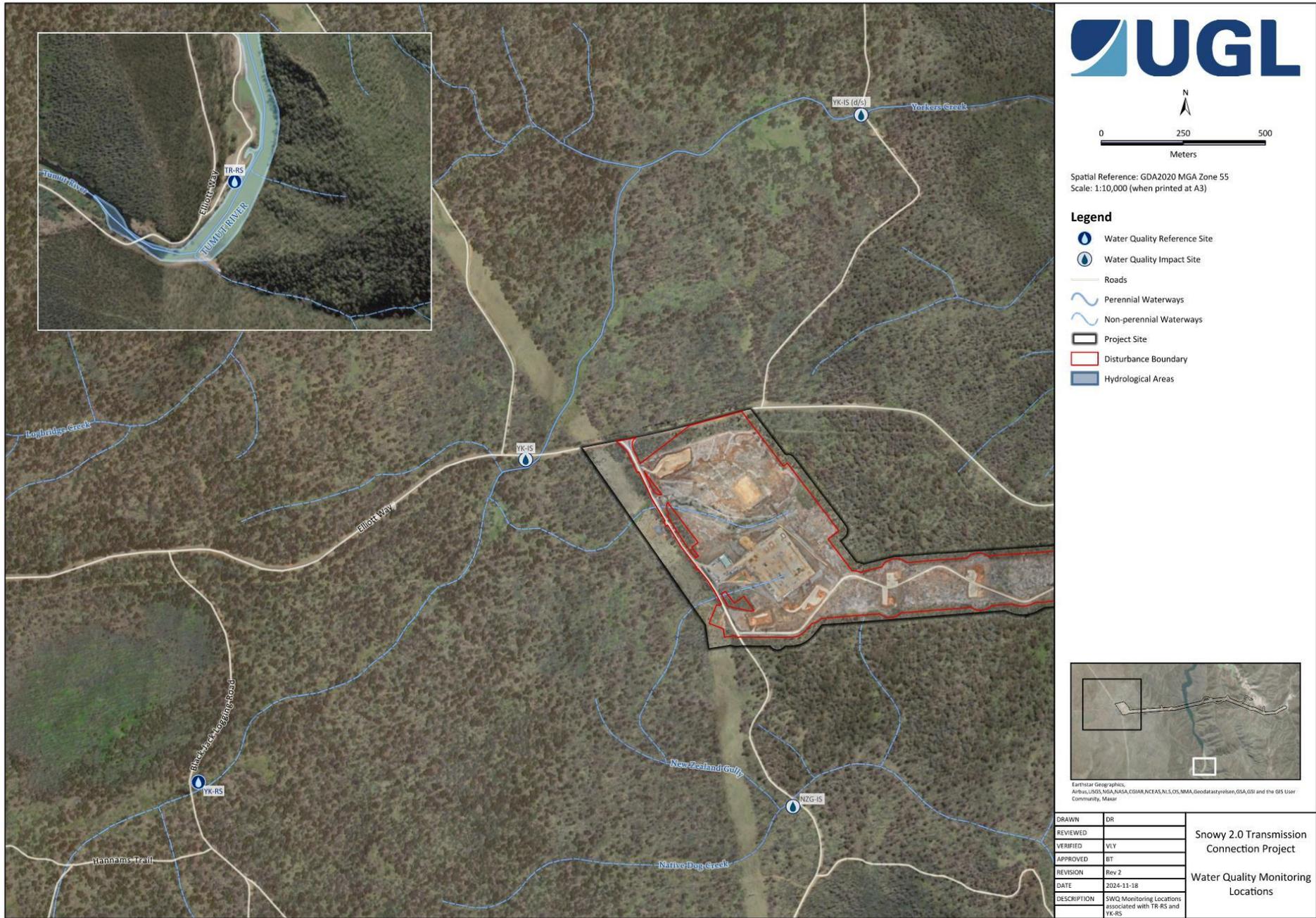


FIGURE 2 WATER QUALITY MONITORING LOCATIONS ASSOCIATED WITH REFERENCE SITE YR-RS AND TR-RS IN RELATION TO THE PROJECT

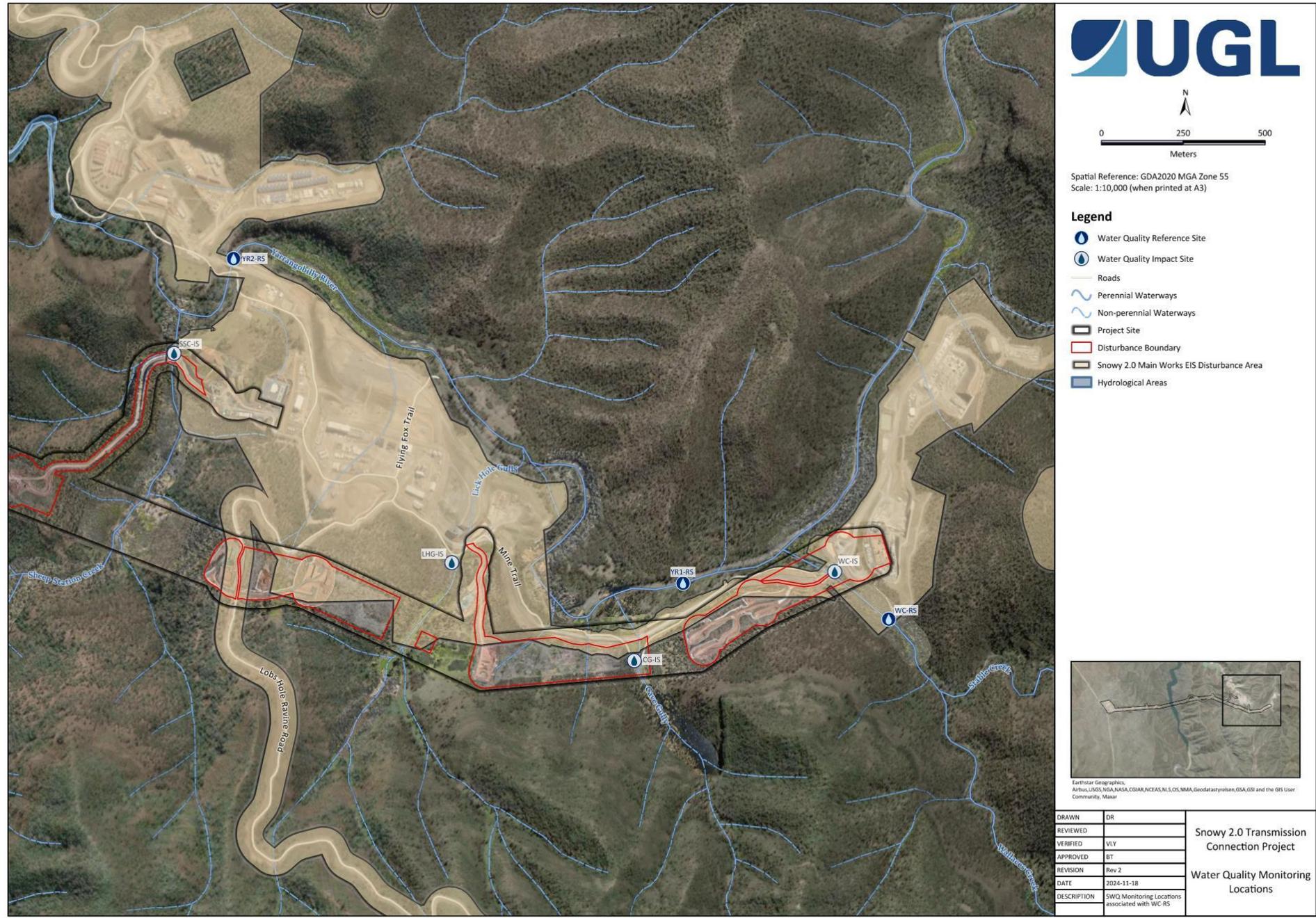


FIGURE 3 WATER QUALITY MONITORING LOCATIONS ASSOCIATED WITH REFERENCE SITE WC-RS IN RELATION TO THE PROJECT

Table 2 Seasonal SSGV (NGH, 2024) and DGV (ANZG, 2018) for water quality parameters

SURFACE WATER QUALITY GUIDELINE VALUES								
Parameter	Unit	WC-RS		TR-RS		YK-RS		DGV
		SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	
Temperature	°C*	-	-	-	-	-	-	-
Dissolved Oxygen (DO) ***	%#	96.2	89.7	91.3	95.5	89.6	88.7	90-110
DO	ppm ⁺	9.08	10.28	8.79	11.53	8.35	10.2	-
Specific Electrical Conductivity (EC)***	SPC [^] μS/cm ^{^^}	115	88	24	38.7	31	27.9	30-350
EC***	μS/cm	93.2	60.85	20.3	26.2	24	20.5	30-350
pH***	-	7.85	7.62	7.59	7.59	6.79	6.61	6.5-8
Redox	mV ^{##}	79.1	98.4	91.2	95.4	94.6	106.1	-
Turbidity***	NTU ^{**}	0.37	5.12	0.09	1.56	9	7.87	2-25
Dissolved Aluminium (Al)	mg/L ⁺⁺	0.03	0.04	0.03	0.015	0.36	0.32	0.027
Dissolved Arsenic (As)	mg/L	0.003	0.0003	0.003	0.0003	0.003	0.0003	0.0008
Dissolved Cadmium (Cd)	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.0006
Dissolved Chromium (Cr)	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Dissolved Copper (Cu)	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Cyanide	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.004
Dissolved Iron (Fe)	mg/L	0.03	0.02	0.04	0.02	0.41	0.23	0.3
Dissolved Lead (Pb)	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Dissolved Manganese (Mn)	mg/L	0.002	0.002	0.003	0.002	0.005	0.003	1.2
Dissolved Mercury (Hg)	mg/L	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00006

SURFACE WATER QUALITY GUIDELINE VALUES

Parameter	Unit	WC-RS		TR-RS		YK-RS		DGV
		SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	
Dissolved Nickel (Ni)	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.008
Total Nitrogen (TN)	mg/L	0.2	0.2	0.2	0.2	0.2	0.2	0.25
Total Phosphorus (TP)	mg/L	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Dissolved Silver (Ag)	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Dissolved Zinc (Zn)	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.0024
Ammonia	mg/L	0.013	0.013	0.013	0.013	0.013	0.013	0.013
Nitrogen Oxides	mg/L	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Reactive Phosphorous	mg/L	0.02	0.015	0.02	0.015	0.02	0.02	0.015
Total Hardness (CaCO ₃)	mg/L	47	30	7.5	8	1	7	-
Total Kjeldahl Nitrogen (TKN)	mg/L	0.2	0.2	0.1	0.2	0.1	0.2	-
Total Dissolved Solids (TDS)	mg/L	52	39	12.5	15	30	10	-
Total Suspended Solids (TSS)	mg/L	0.2	1	0.2	0.2	3	0.2	0.2
Total Al [@]	mg/L	-	-	-	-	-	-	0.027
Total As [@]	mg/L	-	-	-	-	-	-	0.0008
Total Cd [@]	mg/L	-	-	-	-	-	-	0.0006
Total Cr [@]	mg/L	-	-	-	-	-	-	0.00001
Total Cu [@]	mg/L	-	-	-	-	-	-	0.001
Total Pb [@]	mg/L	-	-	-	-	-	-	0.001
Total Mn [@]	mg/L	-	-	-	-	-	-	1.2
Total Ni [@]	mg/L	-	-	-	-	-	-	0.008

SURFACE WATER QUALITY GUIDELINE VALUES

Parameter	Unit	WC-RS		TR-RS		YK-RS		DGV
		SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	SSGV (Summer/Autumn)	SSGV (Winter/Spring)	
Total Ag [@]	mg/L	-	-	-	-	-	-	0.00002
Total Zn [@]	mg/L	-	-	-	-	-	-	0.0024
Total Fe [@]	mg/L	-	-	-	-	-	-	0.3
Total Hg [@]	mg/L	-	-	-	-	-	-	0.00006

* °C = degrees Celsius

% = percent

mV = millivolt

+ ppm = parts per million

^ SPC = specific conductance

** mg/L = milligram per litre

** NTU = Nephelometric Turbidity Unit

^^ μS/cm = micro Siemens per centimetre

@ parameter not analysed by NGH

*** assessed against DGV where guideline range is more appropriate for the parameter

4. BASELINE WATER QUALITY

4.1. Water Quality Objectives

Water quality objectives are outlined in Section 2.1 of the Baseline Report (NGH, 2024).

4.2. Site Specific Guideline Values

In accordance with the ANZG (ANZG, 2018), SSGV for the three Reference Sites (RS) (WC-RS, TR-RS and YK-RS) were derived from the results collected during the 24 month pre-construction SWQ monitoring period. The SSGV reflect the seasonality observed in the baseline data and are characterised by the drier months of Summer/Autumn (December to May) and wetter months of Winter/Spring (June to November) in accordance with the 'Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) methodology and derivatives developed to 2018 of the ANZG (ANZG, 2018).

Table 2 outlines the seasonal SSGV provided in the Baseline Report (NGH, 2024).

5. OCTOBER 2024 MONITORING

SW sampling was undertaken at 12 monitoring locations on 16 October 2024.

In accordance with the methodology outlined in Section 3, SW samples were either measured in situ using a calibrated YSI ProDSS Sonde Multiparameter Digital Water Quality Meter (refer to Appendix D) or analysed by National Association of Testing Authorities, Australia (NATA) accredited ALS Limited (ALS) laboratory. However, the following parameters were not measured:

- DO (ppm)
- EC ($\mu\text{S}/\text{cm}$)
- Redox (mV)

The 'Water Quality Monitoring Field Data Sheet' (Field Sheet) (UGL, 2024) is provided in Appendix A. The 'Certificate of Analysis' (COA) (ALS, 2024a), 'QA/QC Compliance Assessment to assist with Quality Review' (QA/QC Assessment) (ALS, 2024b) and 'Quality Control Report' (QCR) (ALS, 2024c) are attached in Appendix B.

5.1. Observations

Field observations during sampling are summarised in Table 3.

Table 3 Field observations during sampling

FIELD OBSERVATIONS		
Date	16.10.2024	
Weather	Sunny conditions on the day of sampling, with winds reaching a maximum of 24 kilometre per hour (km/h). A total of 3.4 millimetre (mm) rainfall was observed the day prior to sampling (15 October), with other notable rainfall events occurring on 5 October (15.4 mm), and 3 October (9.4 mm).	
ID	Observations	Photo
WC-RS	<ul style="list-style-type: none"> • Clear water and high flow rate • Vegetation along banks • Oxygen bubbling on surface 	

FIELD OBSERVATIONS

Date	16.10.2024	
Weather	Sunny conditions on the day of sampling, with winds reaching a maximum of 24 kilometre per hour (km/h). A total of 3.4 millimetre (mm) rainfall was observed the day prior to sampling (15 October), with other notable rainfall events occurring on 5 October (15.4 mm), and 3 October (9.4 mm).	
ID	Observations	Photo
WC-IS	<ul style="list-style-type: none"> • Clear water and high flow rate • Strong weed/vegetation growth on northern bank • Bubbles of air on the surface • Build-up of sticks and debris at sampling point 	
CG-IS	<ul style="list-style-type: none"> • Clear water, minimal flow • Visible sediment sticks and bark in water • Flora growing underwater 	
YR1-IS	<ul style="list-style-type: none"> • High flow rate, slight milky colouration • No sediment observed 	

FIELD OBSERVATIONS

Date	16.10.2024	
Weather	Sunny conditions on the day of sampling, with winds reaching a maximum of 24 kilometre per hour (km/h). A total of 3.4 millimetre (mm) rainfall was observed the day prior to sampling (15 October), with other notable rainfall events occurring on 5 October (15.4 mm), and 3 October (9.4 mm).	
ID	Observations	Photo
LHG-IS	<ul style="list-style-type: none"> • High silt deposition on bottom of the waterbody • Shallow wide gully • Vegetation growing in and around gully • Very little flow 	
YR2-IS	<ul style="list-style-type: none"> • High flow rate, high volume flow • Slight milky colouration, slight yellow/brown • Oxygen bubbling 	
SSC-IS	<ul style="list-style-type: none"> • Slight milky colouration • Fine sediment on base of waterbody • Sticks and debris in the waterway • Vegetation along both banks 	

FIELD OBSERVATIONS

Date	16.10.2024	
Weather	Sunny conditions on the day of sampling, with winds reaching a maximum of 24 kilometre per hour (km/h). A total of 3.4 millimetre (mm) rainfall was observed the day prior to sampling (15 October), with other notable rainfall events occurring on 5 October (15.4 mm), and 3 October (9.4 mm).	
ID	Observations	Photo
TR-RS	<ul style="list-style-type: none"> • High water level, relatively clear, becomes unclear at depth • Sand and gravel on bottom of waterbody 	
YK-IS (D/S)	<ul style="list-style-type: none"> • Very slight milky colouration to water • Sand and gravel evident in base of waterbody • Thick vegetation cover on either bank 	
NZG-IS	<ul style="list-style-type: none"> • Thick vegetation cover on either banks • Metals visible in water • Hoof marks on bank several meters up from the sampling point 	

FIELD OBSERVATIONS

Date	16.10.2024	
Weather	Sunny conditions on the day of sampling, with winds reaching a maximum of 24 kilometre per hour (km/h). A total of 3.4 millimetre (mm) rainfall was observed the day prior to sampling (15 October), with other notable rainfall events occurring on 5 October (15.4 mm), and 3 October (9.4 mm).	
ID	Observations	Photo
YK-IS	<ul style="list-style-type: none"> • Slight milky colouration • Sticks/debris along Creek • Vegetation present along both banks • Green looking algae observed • Silt upstream 	
YK-RS	<ul style="list-style-type: none"> • Slight yellow/brown colouration • Grasses/vegetation on either bank • Fine sediment settled at the bottom, visible sand size particles 	

5.2. Results

The results from the construction SWQ monitoring program have been reported for each respective catchment: Yarrangobilly River, Talbingo Reservoir, and Yorkers Creek.

- **Yarrangobilly River catchment** monitoring includes the reference site at Wallace Creek and impact sites at Yarrangobilly River, Wallace Creek, Cave Gully, Lick Hole Gully, and Sheep Station Creek.
- **Yorkers Creek catchment** monitoring includes the reference site at Yorkers Creek and impact sites at Yorkers Creek and New Zealand Gully.
- **Talbingo Reservoir** features a reference site located upstream within the reservoir, serving as an overall reference for monitoring sites in the Yarrangobilly River and Yorkers Creek catchments.

This reference site provides a baseline for the SWQ monitoring program.

The SWQ monitoring results for key physical and chemical parameters, along with site-specific trigger values, are detailed in Section 5.2.1. Results for dissolved and total metals, including site-specific trigger values, are covered in Sections 5.2.2 and 5.2.3. Upon review of the data, observations were noted between the reference and impact sites.

The complete table of results is attached in Appendix C.

5.2.1. Key Physical and Chemical Parameters

See below for results of key physical and chemical parameters.

Temperature

In October 2024, temperatures in the Yarrangobilly catchment experienced a slight decrease compared to the previous month, ranging from 9.3 °C to 12.7 °C, refer to Figure 4. Similarly, temperatures in the Talbingo Reservoir dropped from 10.2 °C in September 2024 to 9.5 °C in October 2024, refer to Figure 5. In contrast, the Yorkers Creek catchment showed a significant increase, with temperatures ranging from 11.1 °C to 18.3 °C during October 2024, as illustrated in Figure 6.

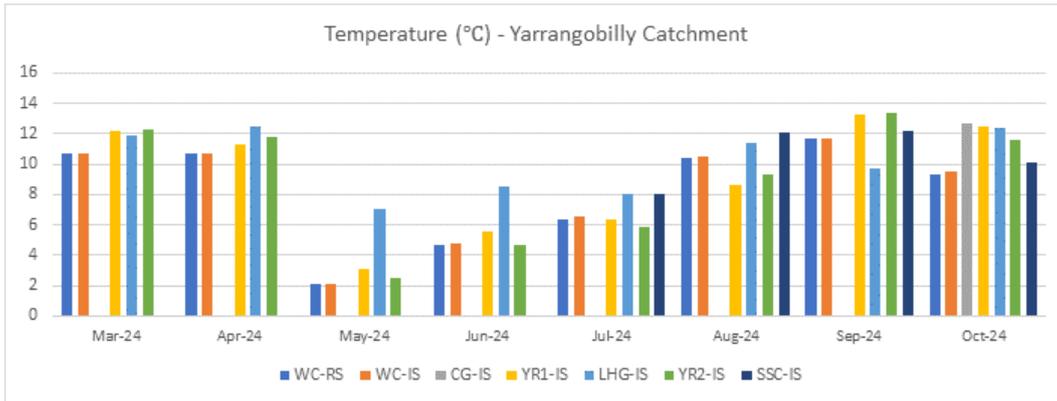


FIGURE 4 : TEMPERATURE FOR YARRANGOBILLY CATCHMENT

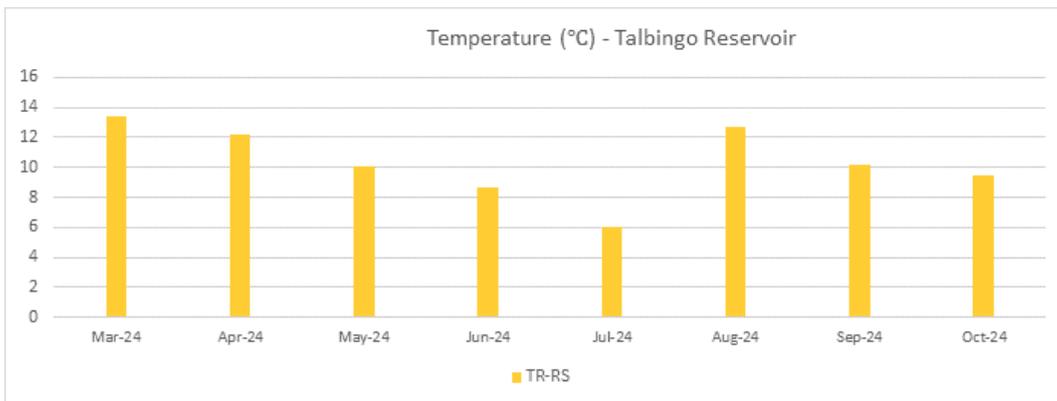


FIGURE 5: TEMPERATURE FOR TALBINGO RESERVOIR

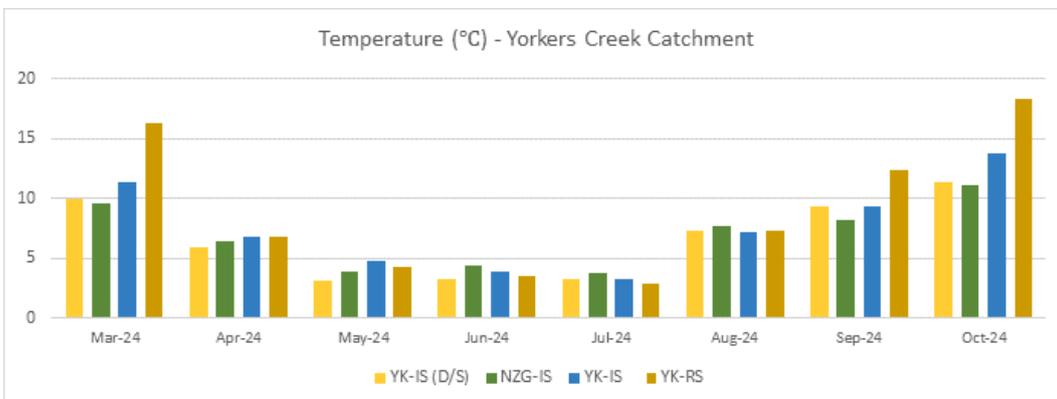


FIGURE 6: TEMPERATURE FOR YORKERS CREEK CATCHMENT

pH

pH values across all sites were within the SSGV range (6.5 to 8.0) in October 2024, with the exception of CG-IS, which recorded a value of 8.17, refer Figure 7 to Figure 9.

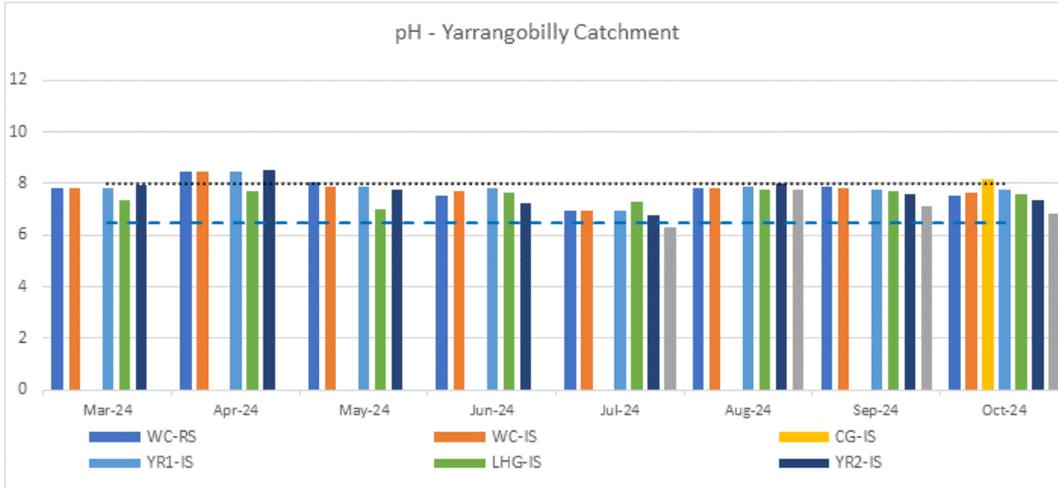


FIGURE 7: PH FOR YARRANGOBILLY CATCHMENT

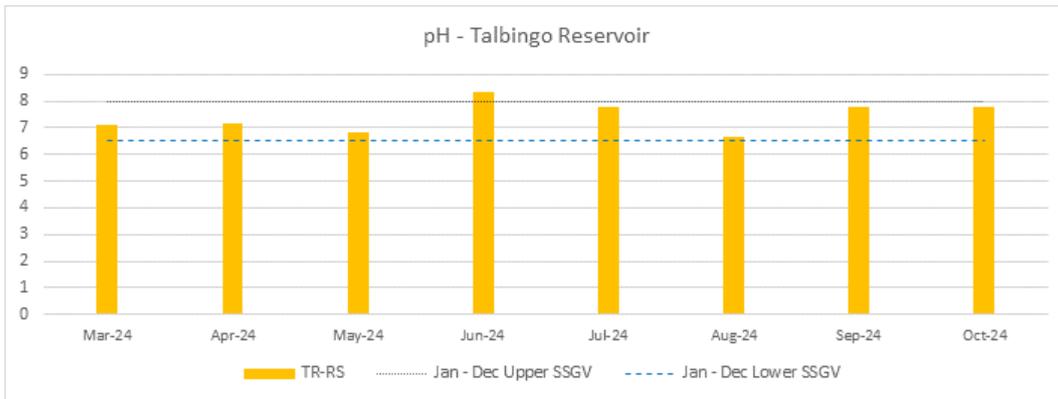


FIGURE 8: PH FOR TALBINGO RESERVOIR

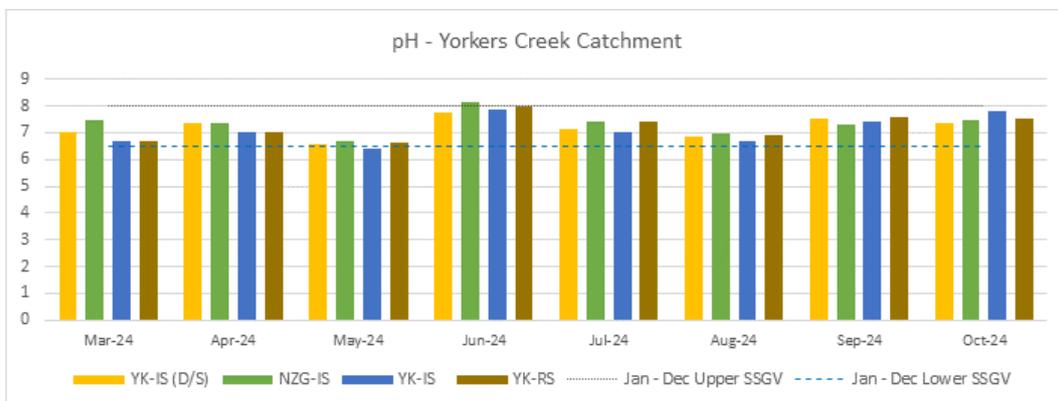


FIGURE 9: PH FOR YORKERS CREEK CATCHMENT

Dissolved Oxygen

DO (%) levels in the Yarrangobilly catchment were within the SSGV range (90 to 100), except at LHG-IS and SSC-IS, which showed slight decreases compared to the previous month, refer Figure 10. In the Talbingo Reservoir, DO values remained consistent with the SSGV range, refer Figure 11. In the Yorkers Creek catchment, all DO levels continued to fall below the SSGV, aligning with baseline monitoring for this period, refer Figure 12.

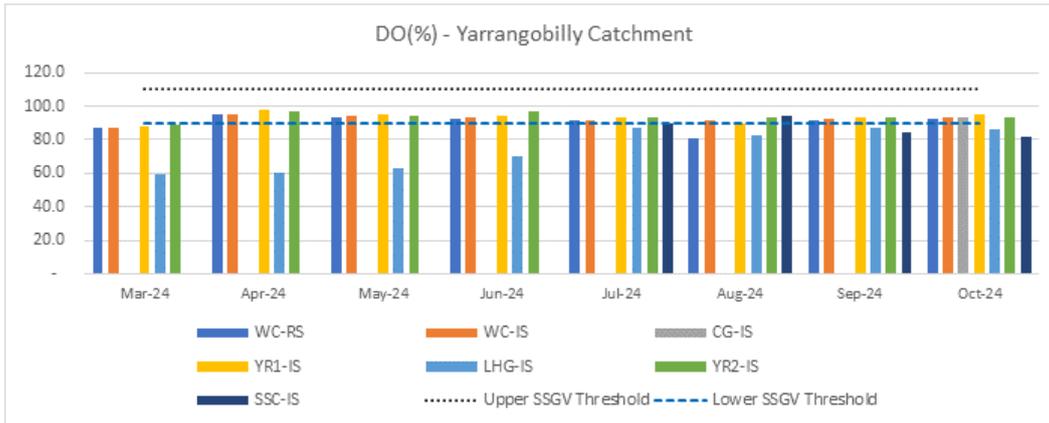


FIGURE 10: DO FOR YARRANGOBILLY CATCHMENT

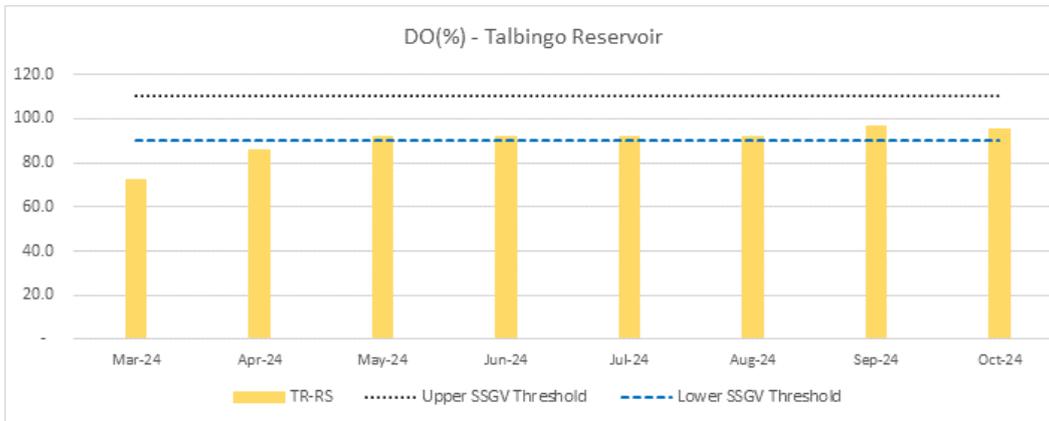


FIGURE 11: DO FOR TALBINGO RESERVOIR

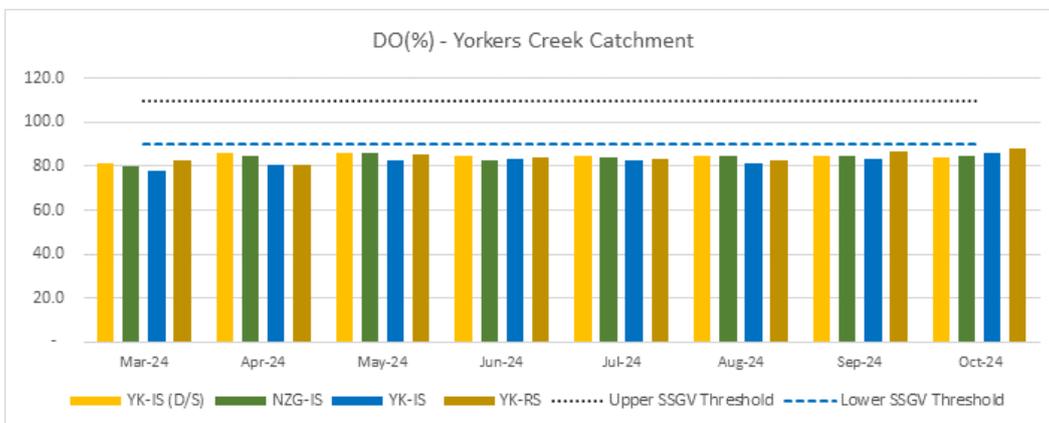


FIGURE 12: DO FOR YORKERS CREEK CATCHMENT

Specific Conductance

SPC ($\mu\text{S}/\text{cm}$) results for the Yarrangobilly catchment showed that all sites were below the June to November SSGV threshold ($88 \mu\text{S}/\text{cm}$), except for SSC-IS, which moderately exceeded the SSGV at $110.3 \mu\text{S}/\text{cm}$. LHG-IS and CG-IS were significantly above the SSGV, recording values of $432.4 \mu\text{S}/\text{cm}$ and $382.8 \mu\text{S}/\text{cm}$, respectively, consistent with baseline data, refer Figure 13. In contrast, Talbingo Reservoir remained below the June to November SSGV ($38.7 \mu\text{S}/\text{cm}$), recording $15.3 \mu\text{S}/\text{cm}$ in October 2024, refer Figure 14. Specific conductance in the Yorkers Creek catchment was also below the June to November SSGV ($27.9 \mu\text{S}/\text{cm}$) at all sites, except NZG-IS, which recorded $39.6 \mu\text{S}/\text{cm}$ in October 2024, refer to Figure 15.

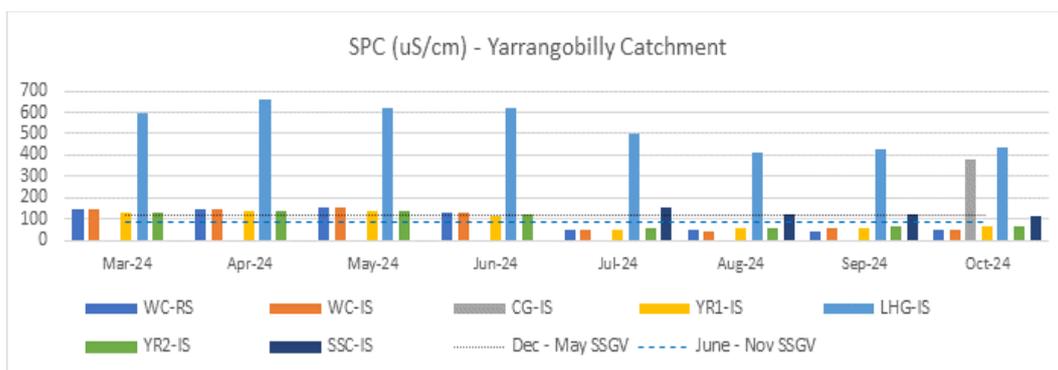


FIGURE 13: SPC FOR YARRANGOBILLY CATCHMENT

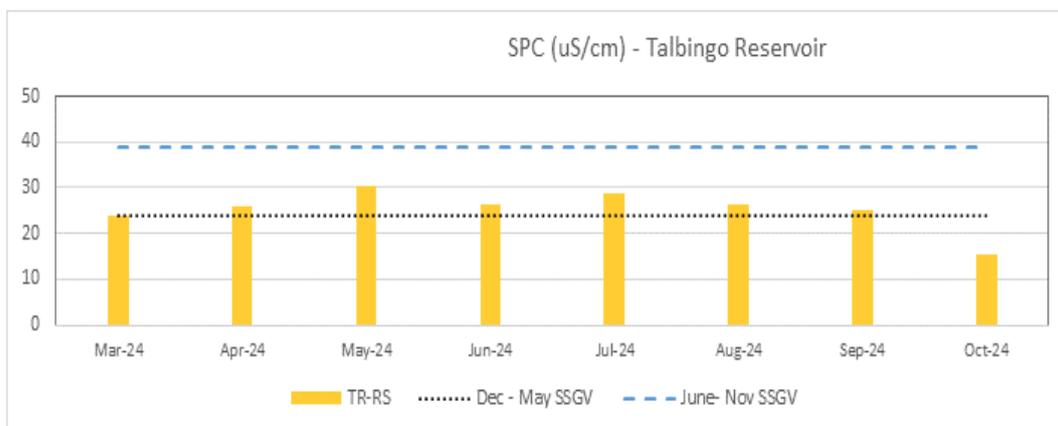


FIGURE 14: SPC FOR TALBINGO RESERVOIR

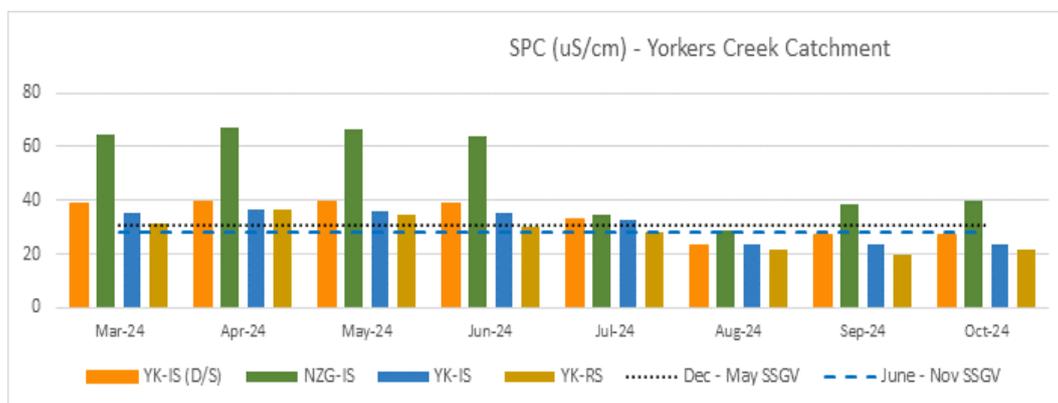


FIGURE 15: SPC FOR YORKERS CREEK CATCHMENT

Turbidity

Turbidity (NTU) levels in the Yarrangobilly catchment were below the June to November SSGV (5.12) at all sites, except for SSC-IS, which slightly exceeded the threshold with a value of 8.9, refer Figure 16. Turbidity at the reference sites in Talbingo Reservoir (TR-RS) and Yorkers Creek (YK-RS) remained above the SSGV for their respective catchments. In contrast, all impact sites within the Yorkers Creek catchment were either below the limit of reporting (LOR) or within the SSGV, refer Figure 17 and Figure 18.

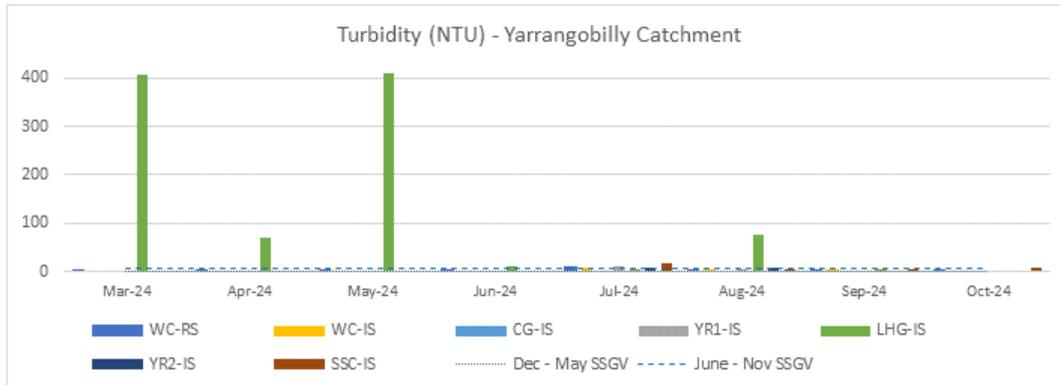


FIGURE 16: TURBIDITY FOR YARRANGOBILLY CATCHMENT

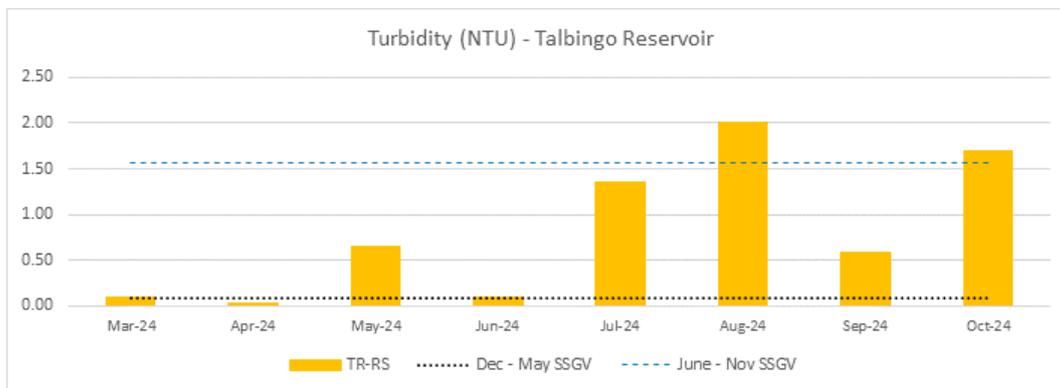


FIGURE 17: TURBIDITY FOR TALBINGO RESERVOIR

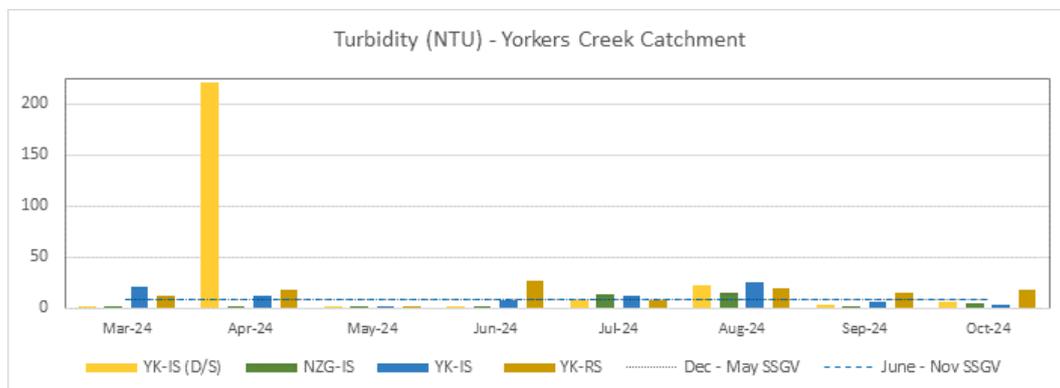


FIGURE 18: TURBIDITY FOR YORKERS CREEK CATCHMENT

Total Suspended Solids

TSS (mg/L) levels in the Yarrangobilly catchment exceeded the June to November SSGV (1.0 mg/L) at WC-IS (2.0 mg/L), YR1-IS (2.0 mg/L), and LHG-IS (3.0 mg/L), while all other sites were below the LOR, refer Figure 19. At Talbingo Reservoir (TR-RS), TSS also exceeded the SSGV (0.2 mg/L), recording 4.0 mg/L in October 2024 (see Figure 20). In the Yorkers Creek catchment, all sites recorded TSS levels above the SSGV (0.2 mg/L), with the reference site YK-RS showing the highest value at 22.0 mg/L, refer to Figure 21.

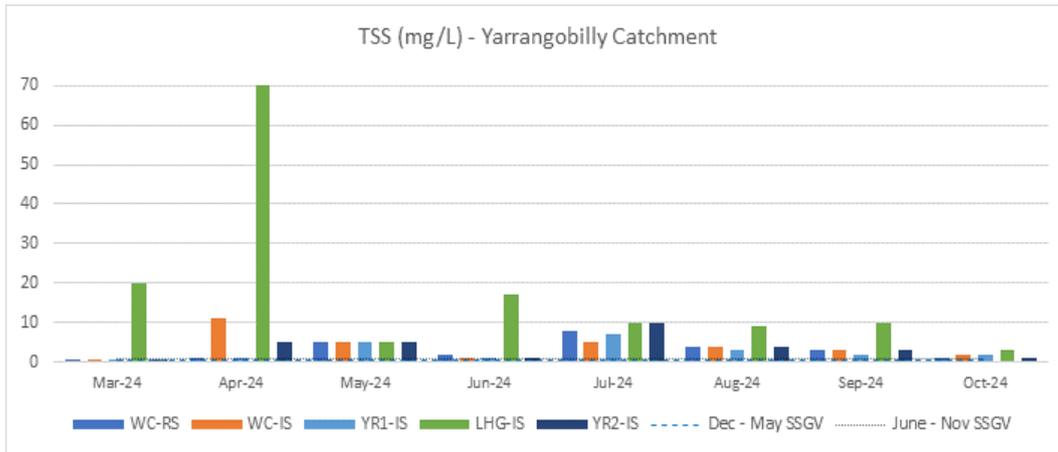


FIGURE 19: TSS FOR YARRANGOBILLY CATCHMENT

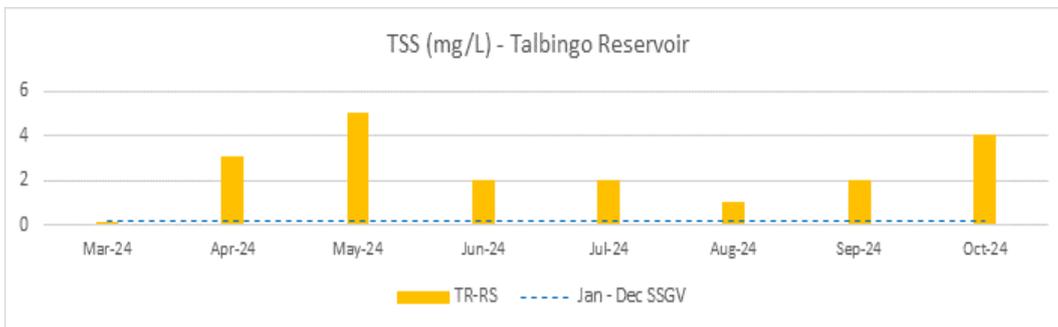


FIGURE 20: TSS FOR TALBINGO RESERVOIR

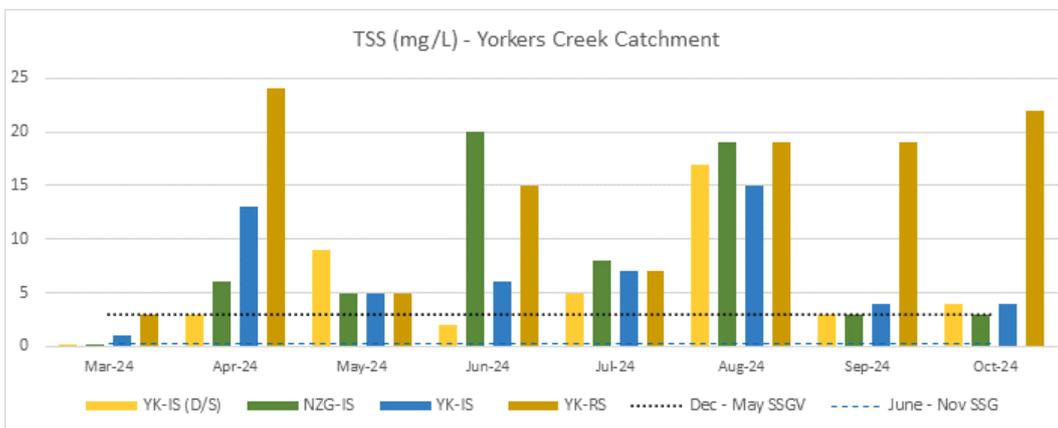


FIGURE 21: TSS FOR YORKERS CREEK CATCHMENT

Ammonia

Ammonia (mg/L) levels in the Yarrangobilly catchment were below the LOR at all sites except for YR1-IS and LHG-IS, which both recorded values of 0.02 mg/L, moderately exceeding the SSGV of 0.013 mg/L, refer Figure 22. Talbingo Reservoir (TR-RS) also showed ammonia levels slightly above the SSGV, recording 0.04 mg/L in October 2024, refer Figure 23. In the Yorkers Creek catchment, ammonia levels were below the LOR at most sites, except for YK-IS (D/S) and NZG-IS, which recorded values of 0.03 mg/L and 0.02 mg/L, respectively, both moderately exceeding the SSGV, refer Figure 24.

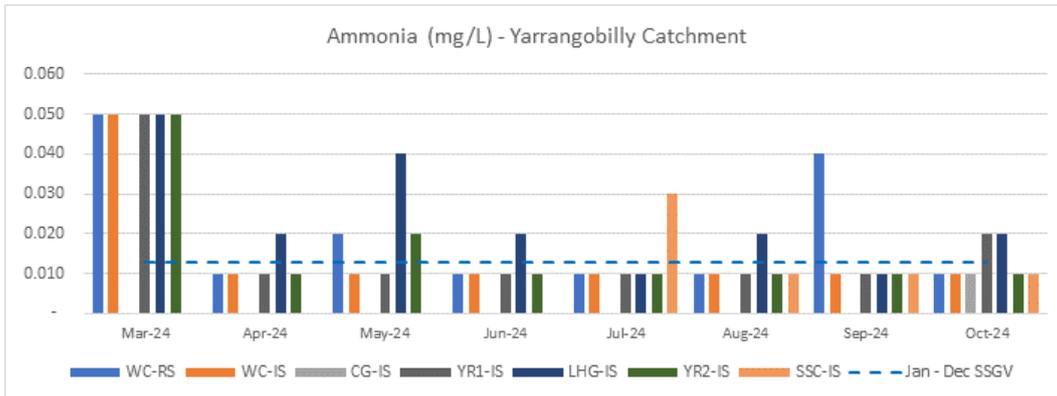


FIGURE 22: AMMONIA FOR YARRANGOBILLY CATCHMENT

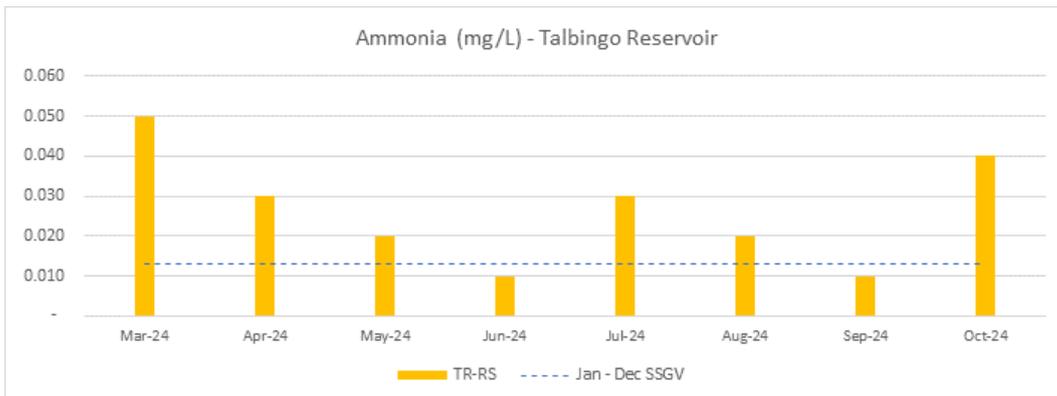


FIGURE 23: AMMONIA FOR TALBINGO RESERVOIR

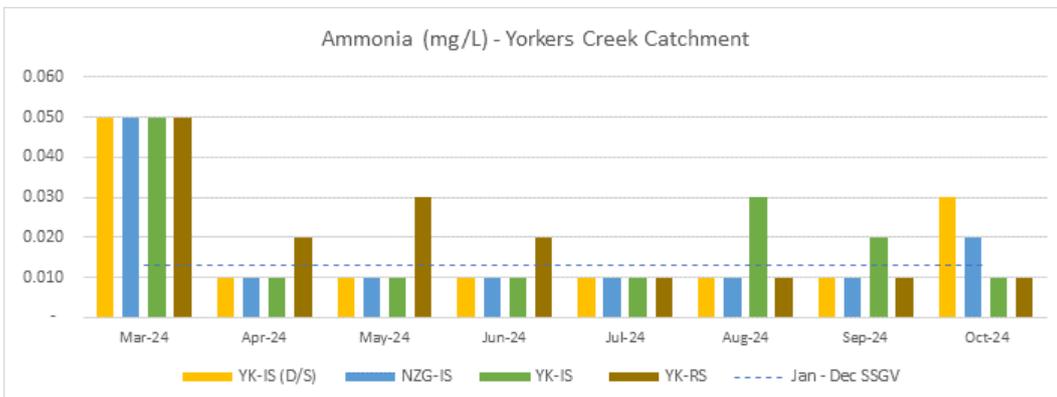


FIGURE 24: AMMONIA FOR YORKERS CREEK CATCHMENT

Nitrogen Oxides

Nitrogen Oxides (mg/L) levels exceeded the June to November SSGV (0.015 mg/L) at all reference sites and several impact sites. Reference sites WC-RS, TR-RS, and YK-RS recorded values slightly above the SSGV, ranging from 0.02 mg/L to 0.05 mg/L. Impact sites exceeding the SSGV included WC-IS (0.02 mg/L), SSC-IS (0.18 mg/L), YK-IS (D/S) (0.11 mg/L), and NZG-IS (0.07 mg/L). All other sites were below the LOR, refer Figure 25 to Figure 27.

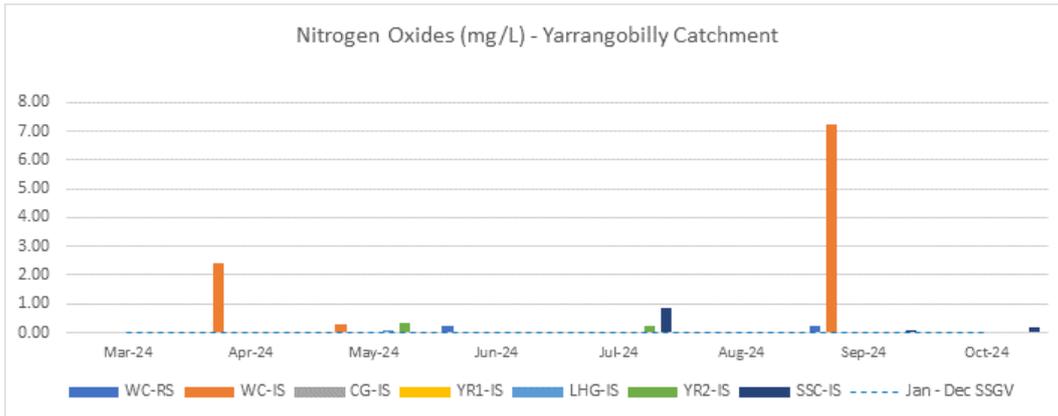


FIGURE 25: NITROGEN OXIDES FOR YARRANGOBILLY CATCHMENT

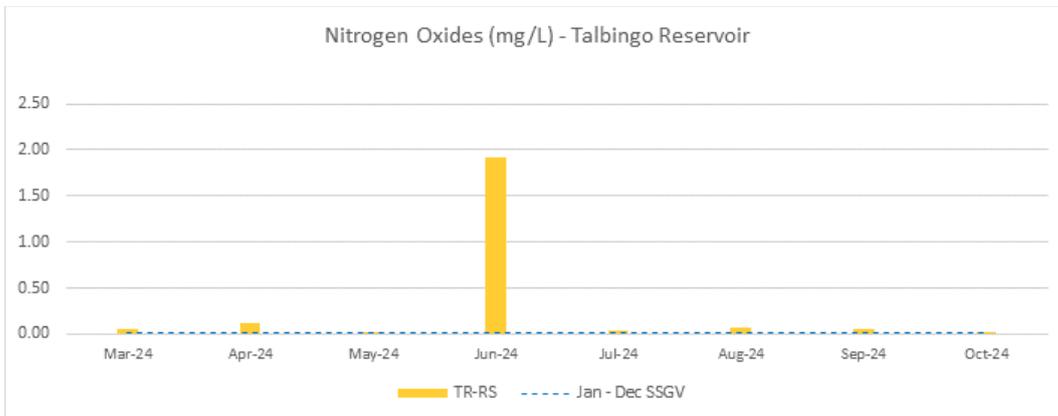


FIGURE 26: NITROGEN OXIDES FOR TALBINGO RESERVOIR

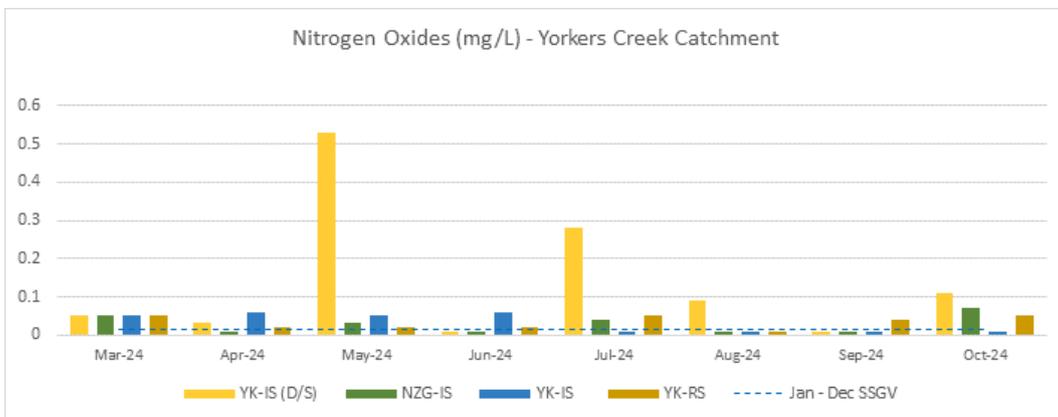


FIGURE 27: NITROGEN OXIDES FOR YORKERS CREEK CATCHMENT

Total Kjeldahl Nitrogen

TKN (mg/L) was below either the LOR or the June to November SSGV (0.02 mg/L) at all sites refer Figure 28 to Figure 30.

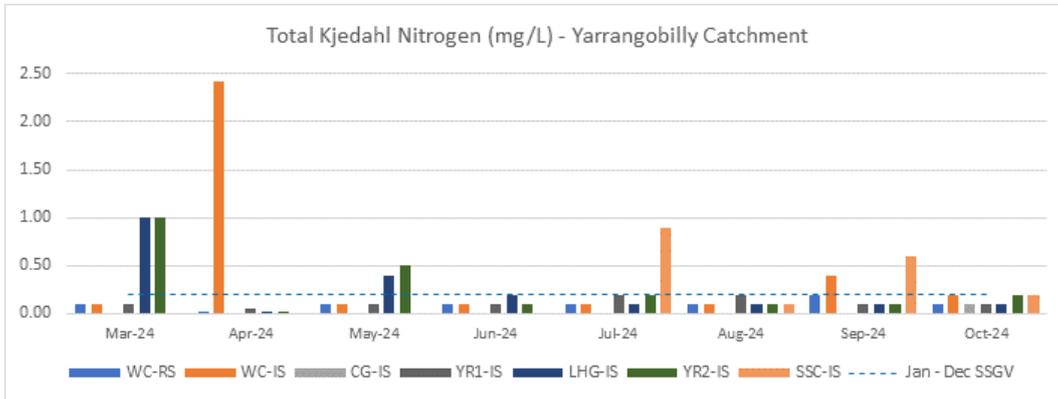


FIGURE 28: TOTAL KJEDAHL NITROGEN FOR YARRANGOBILLY CATCHMENT

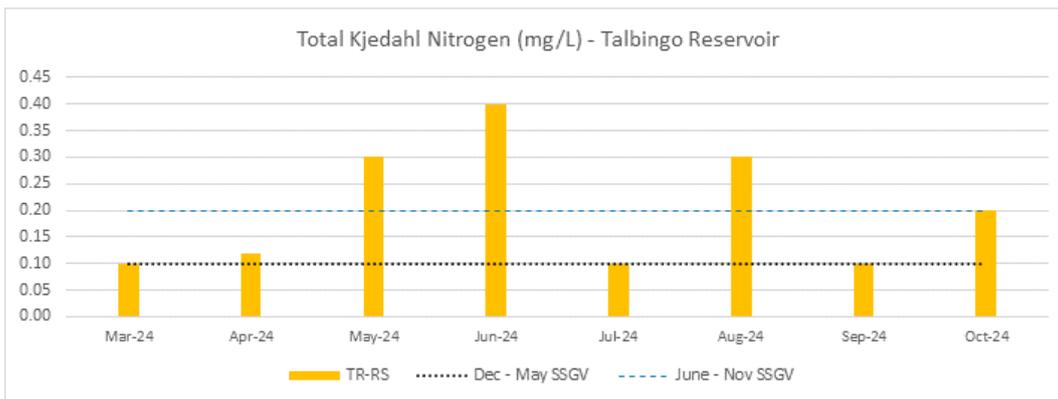


FIGURE 29: TOTAL KJEDAHL NITROGEN FOR TALBINGO RESERVOIR

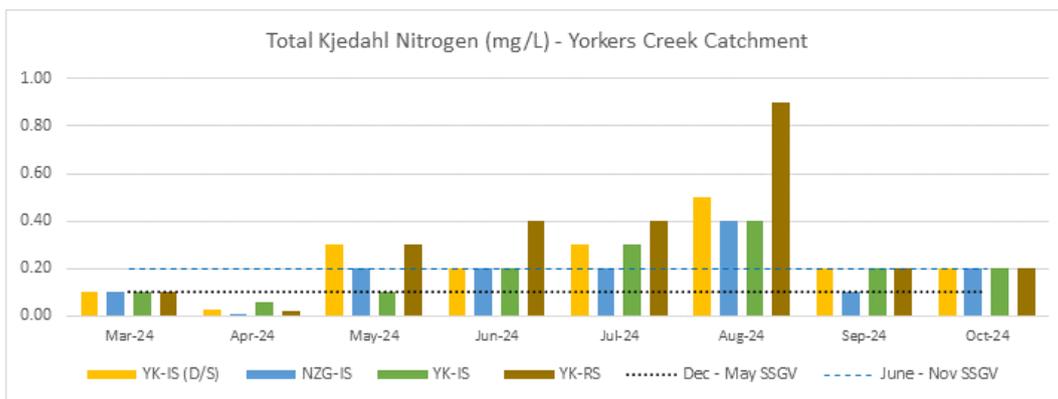


FIGURE 30: TOTAL KJEDAHL NITROGEN FOR YORKERS CREEK CATCHMENT

Total Hardness

CaCO₃ (mg/L) levels in the Yarrangobilly catchment exceeded the June to November SSGV (30 mg/L) at all sites, with CG-IS and LHG-IS recording significantly elevated values of 294 mg/L and 312 mg/L respectively, refer Figure 31. Talbingo Reservoir (TR-RS) also exceeded the June to November SSGV (8.0 mg/L), with a recorded value of 14 mg/L, consistent with the previous month, refer Figure 32. In the Yorkers Creek catchment, the reference site (YK-RS) and the impact site (YK-IS (D/S)) were below the June to November SSGV (7.0 mg/L), each recording 5.0 mg/L. The remaining two impact sites, NZG-IS and YK-IS, exceeded the SSGV with values ranging from 12 mg/L to 21 mg/L, refer to Figure 33.

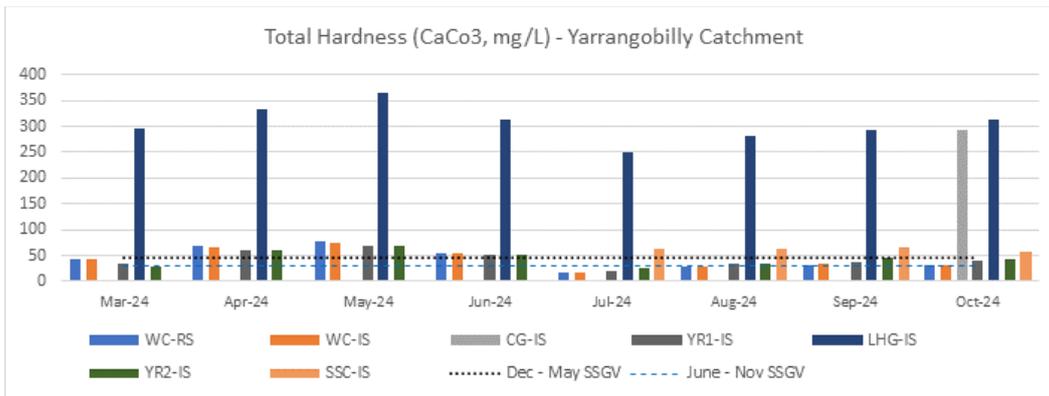


FIGURE 31: TOTAL HARDNESS FOR YARRANGOBILLY CATCHMENT

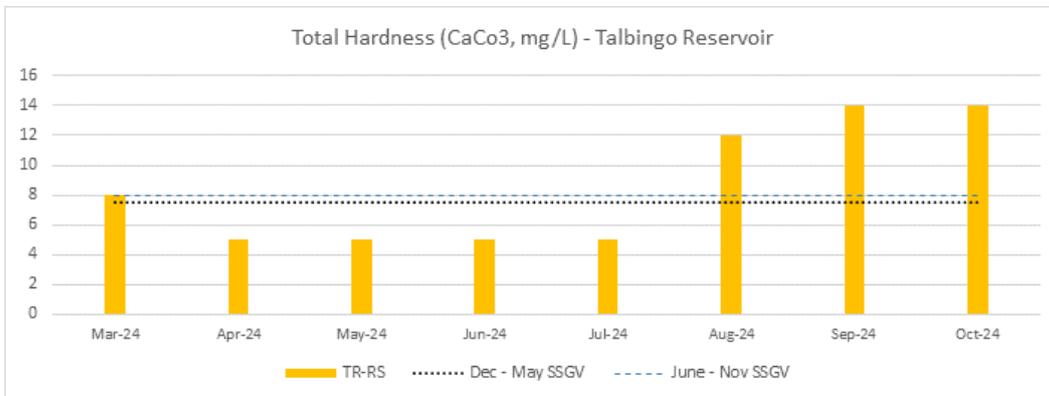


FIGURE 32: TOTAL HARDNESS FOR TALBINGO RESERVOIR

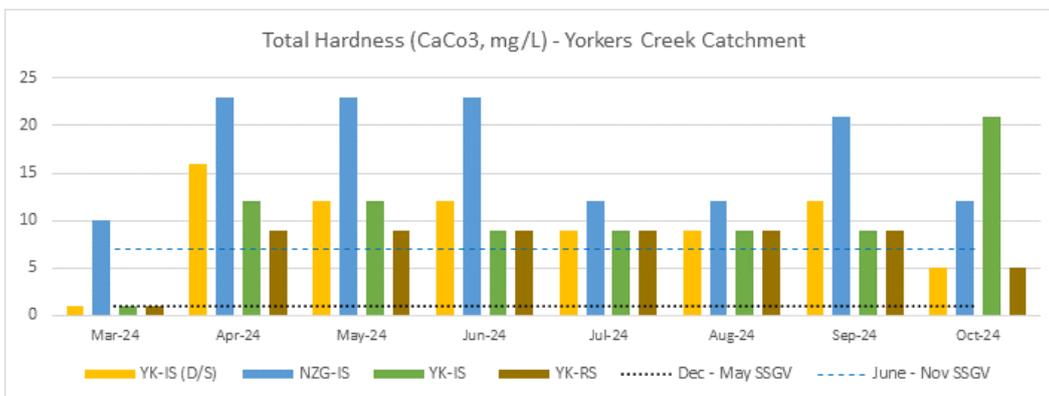


FIGURE 33: TOTAL HARDNESS FOR YORKERS CREEK CATCHMENT

Total Nitrogen

TN (mg/L) levels were either below the LOR or within the June to November SSGV (0.2 mg/L) at all sites, except for SSC-IS in the Yarrangobilly catchment and YK-IS (D/S) and NZG-IS in the Yorkers Creek catchment. The exceedances at these impact sites were minor, with TN values ranging from 0.3 mg/L to 0.4 mg/L, refer Figure 34 to Figure 36.

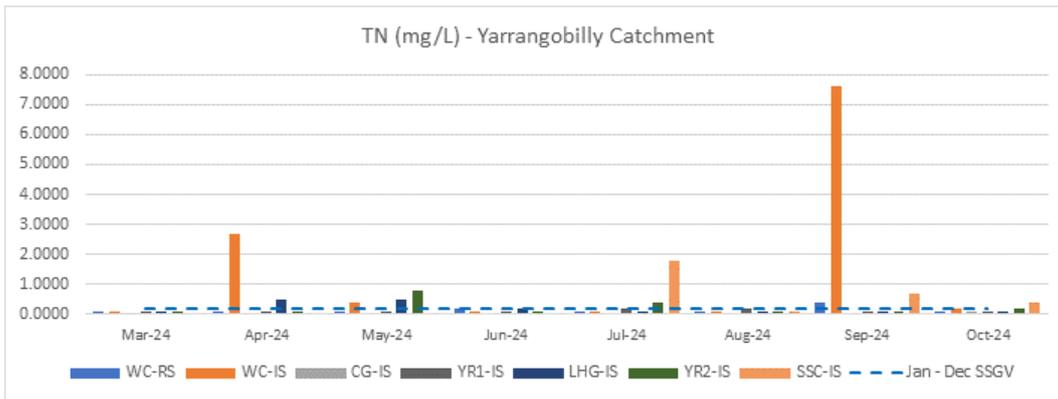


FIGURE 34: TOTAL NITROGEN FOR YARRANGOBILLY CATCHMENT

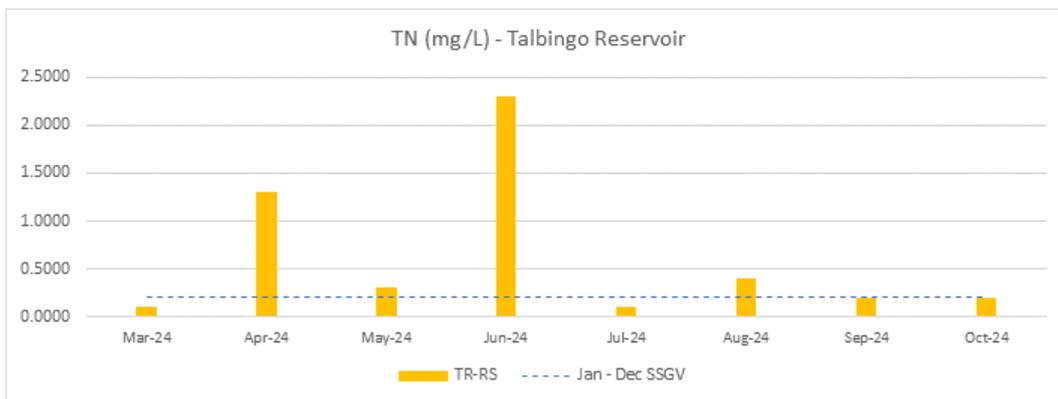


FIGURE 35: TOTAL NITROGEN FOR TALBINGO RESERVOIR

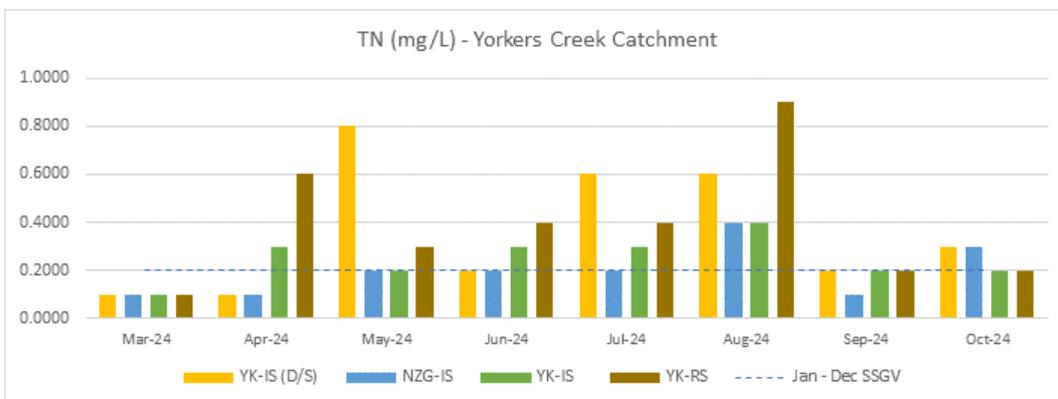


FIGURE 36: TOTAL NITROGEN FOR YORKERS CREEK CATCHMENT

Total Phosphorous

TP (mg/L) levels in the Yarrangobilly catchment and Talbingo Reservoir were below the June to November SSGV (0.02 mg/L) at most sites, except for WC-IS, which recorded a value of 0.03 mg/L, and YR2-IS, which recorded 0.05 mg/L, both exceeding the SSGV, refer Figure 37 and Figure 38. In the Yorkers Creek catchment, TP values exceeded the June to November SSGV at all monitored sites, refer to Figure 39.

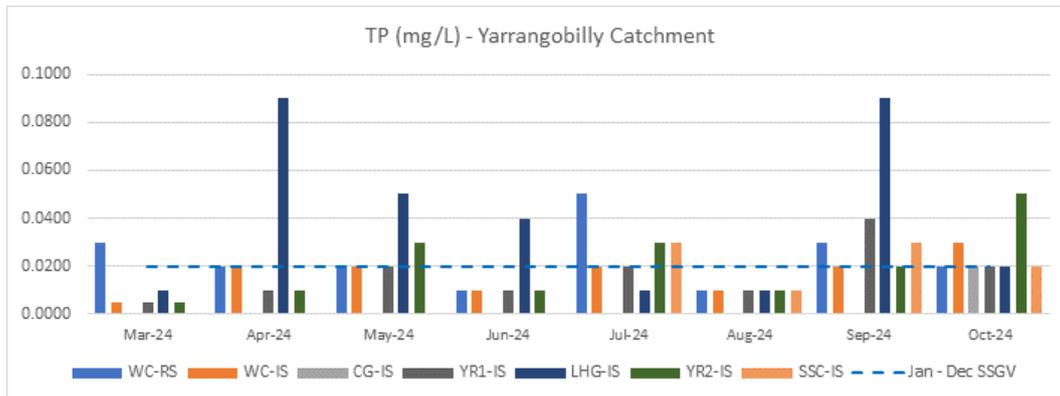


FIGURE 37: TOTAL PHOSPHOROUS FOR YARRANGOBILLY CATCHMENT

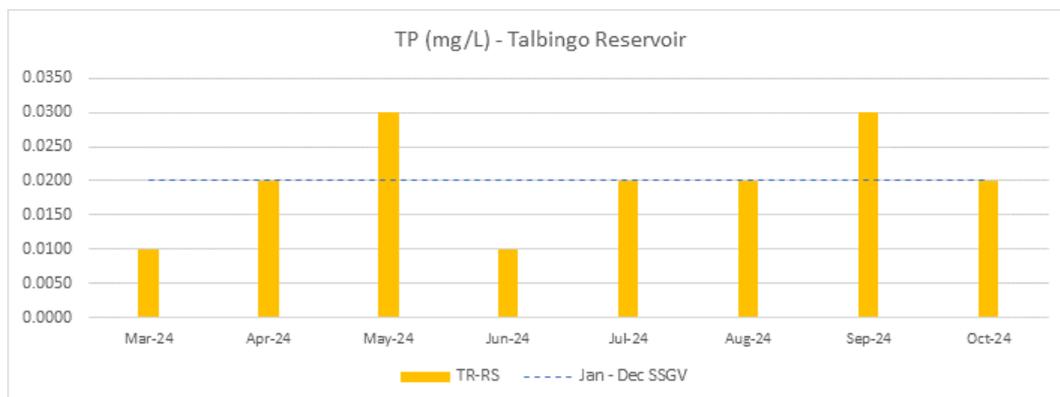


FIGURE 38: TOTAL PHOSPHOROUS FOR TALBINGO RESERVOIR

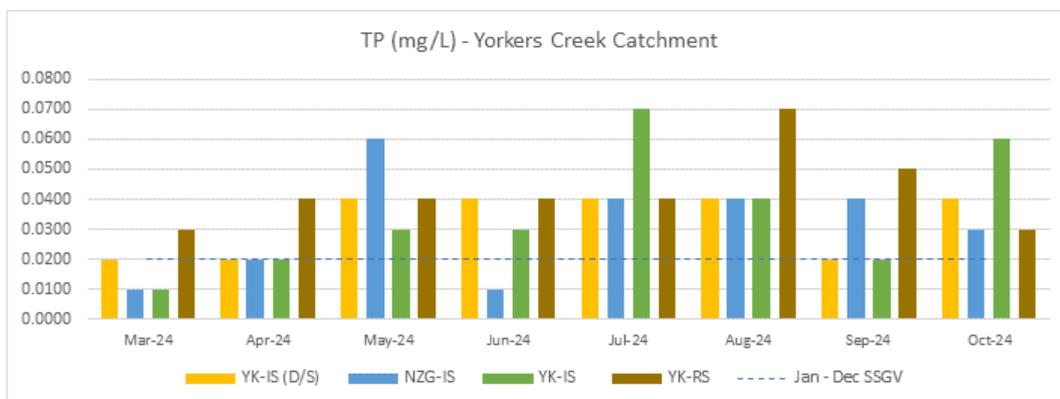


FIGURE 39: TOTAL PHOSPHOROUS FOR YORKERS CREEK CATCHMENT

5.2.2. Dissolved Metals

Dissolved metals exceeding the SSGV are listed in Table 4.

Table 4: Results for Dissolved Metals

DISSOLVED METALS RESULTS				
Analyte	Site	Result (mg/L)	SGV (mg/L)	Comment
Al	SSC-IS	0.08	0.04	Al (mg/L) levels were below the June to November SSGV at all sites except SSC-IS and TR-RS, which were both slightly above the SSGV.
	TR-RS	0.04	0.015	
Fe	LHG-IS	0.10	0.02	Fe (mg/L) levels exceeded the June to November SSGV at LHG-IS, while all other sites were either below the LOR or within their respective catchment SSGV.
Mn	LHG-IS	0.036	0.002	The reference sites at Talbingo Reservoir and Yorkers Creek, along with several impact sites, exceeded the June to November SSGV. LHG-IS was significantly above the SSGV.
	TR-RS	0.008		
	YK-RS	0.013	0.003	
	YK-IS (D/S)	0.010		
	NZG-IS	0.008		
	YK-IS	0.004		
Zn	YR1-IS	0.006	0.002	Zn (mg/L) levels were below the LOR or within the June to November SSGV at all sites, except for YR1-IS, TR-RS, and YK-IS (D/S), which exceeded the SSGV.
	TR-RS	0.013		
	YK-IS (D/S)	0.009		

5.2.3. Total Metals

Total metals exceeding the DGV are listed in Table 5.

Table 5: Results for Total Metals

TOTAL METALS RESULTS				
Analyte	Site	Result (mg/L)	SGV (mg/L)	Comment
Al	WC-RS	0.07	0.027	Al (mg/L) exceeded the DGV at all reference sites and impact sites.
	WC-IS	0.08		
	YR1-IS	0.08		
	LHG-IS	0.04		
	YR2-IS	0.07		
	SSC-IS	0.13		
	TR-RS	0.07		
	YK-RS	0.24		
	YK-IS (D/S)	0.22		
	NZG-IS	0.17		
	YC-IS	0.14		
Fe	YK-RS	0.45	0.3	The reference site at Yorkers Creek (YK-RS) recorded Fe (mg/L) levels exceeding the DGV, while all other sites were either below the LOR or within the DGV.

5.3. Discussion

Below is a summary of key observations and discussion points from the October monitoring results:

- Transmission line clearing and bulk earthworks activities were ongoing within the Yarrangobilly and Yorkers Creek catchment areas
- Impact sites within the Yarrangobilly catchment are influenced by other activities associated with the Snowy 2.0 project
- Cave Gully (CG-IS) had flowing water for the first time since the commencement of construction
- Fine sediment or sand was observed within the waterways at all sites within the Yorkers Creek catchment
- Horse hoof marks were evident on the bed and banks of the sampling site at New Zealand Gully (NZG-IS) within the Yorkers Creek Catchment
- Many of the results are recorded as below (<) the LOR
- The SSGV/DGV for a number of parameters is lower than the LOR from the laboratory
- Lick Hole Gully (LHG-IS) within the Yarrangobilly catchment was observed as being shallow with high silt deposition and low flow at the time of sampling. LGH-IS consistently recorded higher values across multiple parameters
- Temperature declined in Yarrangobilly and Talbingo in October but rose significantly in Yorkers Creek

- pH was mostly stable, with one exceedance in October at CG-IS
- DO showed marginal declines in October at some Yarrangobilly sites; consistent non-compliance in Yorkers Creek
- SPC and Turbidity showed similar patterns across both months, with consistent exceedances at specific sites
- Variability in ammonia and TN exceedances between months; TP consistently elevated in Yorkers Creek
- Persistent exceedances for dissolved Al, Fe, Mn, and Zn
- Total metals, particularly Al and Fe, showed widespread exceedances, with YK-RS recording the highest Fe levels in October

6. CONCLUSION

The results from the construction SWQ monitoring program were reported for three key catchments: Yarrangobilly River, Talbingo Reservoir, and Yorkers Creek. Each catchment had a reference site, with impact sites also monitored for comparison. Key parameters such as temperature, pH, DO, SPC, turbidity, TSS, ammonia, nitrogen oxides, TKN, CaCO₃, TN, TP and metals (both dissolved and total) were analysed.

In October 2024, temperatures in the Yarrangobilly catchment and Talbingo Reservoir showed slight decreases compared to September, while the Yorkers Creek catchment experienced a significant increase.

pH levels remained within the SSGV range (6.5 to 8.0) at most sites, except CG-IS in the Yarrangobilly catchment, which slightly exceeded the guideline. DO levels in the Yarrangobilly catchment generally met the SSGV, with minor declines at LHG-IS and SSC-IS, while Talbingo Reservoir remained compliant, and Yorkers Creek sites fell below the guideline. SPC exceeded the SSGV at SSC-IS, LHG-IS, and CG-IS in the Yarrangobilly catchment but aligned with baseline data, while Talbingo Reservoir and most Yorkers Creek sites remained within limits except NZG-IS, which showed a minor exceedance.

Turbidity levels were generally below the SSGV, except at SSC-IS in the Yarrangobilly catchment and the reference sites in Talbingo Reservoir and Yorkers Creek. TSS exceeded the SSGV at several Yarrangobilly sites and at all Yorkers Creek sites, with YK-RS recording the highest value.

Ammonia levels were typically below the LOR, with slight exceedances at YR1-IS, LHG-IS, TR-RS, YK-IS (D/S), and NZG-IS. Nitrogen Oxides exceeded the SSGV at all reference sites and multiple impact sites, with SSC-IS and YK-IS (D/S) showing the highest levels. TKN remained below the SSGV or LOR across all sites. Total Hardness (CaCO₃) exceeded the SSGV at all Yarrangobilly sites, with particularly high values at LHG-IS and CG-IS, while Talbingo Reservoir and some Yorkers Creek sites also exceeded the guideline. TN was generally below the SSGV, with minor exceedances at SSC-IS in Yarrangobilly and YK-IS (D/S) and NZG-IS in Yorkers Creek. TP exceeded the SSGV at WC-IS and YR2-IS in Yarrangobilly and at all Yorkers Creek sites. Dissolved metals showed exceedances for Al, Fe, Mn, and Zn, with LHG-IS displaying significant levels of Fe and Mn, and Zn exceeding the SSGV at YR1-IS, TR-RS, and YK-IS (D/S). Total metals exceeded the DGV for Al and Fe at multiple sites, with YK-RS recording the highest Fe levels.

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Appendix A: Field Sheet (UGL, 2024)

Water Quality Monitoring Field Data Sheet



ate:

Sample Run:

Sampling Purpose:

Samplers:

Sample ID	Sample Location	Time	Temp (°C)	Water Pressure (mmHg)	Dissolved Oxygen (%)	Conductivity (SPC-µS/cm)	pH	Turbidity FNU	TSS (mg/L)	Water level	Description
SGC-IS	East	8:51	10.1	scribble	81.5	110.3	6.83	7.76	scribble	scribble	Slightly turbid, colouration. Very fine sediment on base of waterbody. Sticks & leaves on banks & in water.
YRZ-IS	East	9:20	11.6	scribble	93.7	69.9	7.34	scribble 0.24	scribble	scribble	Clear water, colouration (brown yellow). Tannins in water, high flow, white tops with O ₂ bubbles.
WX-RS	East	9:41	9.3	scribble	92.7	52.0	7.55	scribble 0.33	scribble	scribble	Clear, high flow rate, oxygen bubbling.
WC-IS	East	9:58	9.5	scribble	93.3	52.1	7.66	scribble 0.35	scribble	scribble	+ build up of debris on rock in waterway.
YR1-IS	East	10:55	12.5	scribble	94.9	66.8	7.77	scribble 0.2	scribble	scribble	Slight yellow colouration, very clear.
LHG-IB	East	11:14	12.4	scribble	86.5	432.4	7.59	2.18	scribble	scribble	Excess silt deposition, shallow & wide waterway with veg. growing in water. Very little flow.
CG-IS	East	11:46	12.7	scribble	93.2	382.8	8.17	0.12	scribble	scribble	Visible sediment, sticks & bark debris in water. Flora growing in water.
TR-RS	Reservoir	13:53	9.5	scribble	95.2	15.3	7.78	0.27	scribble	scribble	Sand & gravel on bottom of waterbody, unclear at depth.
YK-RS	West	15:07	18.3	scribble	87.8	21.8	7.55	15.76	scribble	scribble	Light brown colouration, visible sand & metals.
YK-IS	West	15:22	13.7	scribble	86.3	23.7	7.83	5.02	scribble	scribble	Green coloured algae observed, silt upstream.
YK-IS(d)	West	15:39	11.3	scribble	84.0	27.0	7.36	4.01	scribble	scribble	Sand & small gravel on base of waterbody, sticks in waterbody. Light colouration.
NZG-IS	West	15:57	11.1	scribble	84.5	39.6	7.47	3.39	scribble	scribble	Metals visible in water, rocks & gravel on ground of waterbody. Animal tracks on bank.



Appendix B: COA (ALS, 2024a), QA/QC Assessment (ALS, 2024b) and QCR (ALS, 2024c)



CERTIFICATE OF ANALYSIS

Work Order	: ES2434038	Page	: 1 of 8
Client	: UGL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: CAMILLE PALMER	Contact	: Customer Services ES
Address	: Cnr Hill Rd & Pondage Link Rd HOMEBUSH BAY 2127	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 3200-0645 TransGrid Maragle 500/330kV Station. (Event 8C)	Date Samples Received	: 18-Oct-2024 10:00
Order number	: 4501837828	Date Analysis Commenced	: 19-Oct-2024
C-O-C number	: ----	Issue Date	: 25-Oct-2024 17:13
Sampler	: Lachlan Whiteford		
Site	: Maragle/Lobs Hole		
Quote number	: ES24UGLLIM0001_V3		
No. of samples received	: 12		
No. of samples analysed	: 12		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG020: It is recognised that total concentration is less than dissolved for some metal analytes. However, the difference is within experimental variation of the methods.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WC-RS	WC-IS	YR1-RS	LHG-IS	YR2-RS
Sampling date / time					16-Oct-2024 09:00	16-Oct-2024 09:40	16-Oct-2024 10:15	16-Oct-2024 10:45	16-Oct-2024 11:05
Compound	CAS Number	LOR	Unit	ES2434038-001	ES2434038-002	ES2434038-003	ES2434038-004	ES2434038-005	
				Result	Result	Result	Result	Result	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	46	39	60	362	71	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L	<1	2	2	3	1	
EA045: Turbidity									
Turbidity	----	0.1	NTU	1.3	1.4	2.0	2.2	1.8	
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO3	----	1	mg/L	31	31	41	312	43	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.04	0.01	0.03	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.006	<0.005	<0.005	
Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.001	0.036	0.002	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	0.10	<0.05	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.07	0.08	0.08	0.04	0.07	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	0.005	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	WC-RS	WC-IS	YR1-RS	LHG-IS	YR2-RS
Sampling date / time					16-Oct-2024 09:00	16-Oct-2024 09:40	16-Oct-2024 10:15	16-Oct-2024 10:45	16-Oct-2024 11:05
Compound	CAS Number	LOR	Unit	ES2434038-001	ES2434038-002	ES2434038-003	ES2434038-004	ES2434038-005	
				Result	Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS - Continued									
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	
Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.001	0.034	0.002	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Iron	7439-89-6	0.05	mg/L	0.10	0.12	0.09	0.26	0.08	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	0.02	0.02	<0.01	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.02	<0.01	0.01	0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	<0.01	0.01	0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.2	0.1	0.1	0.2	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L	0.1	0.2	0.1	0.1	0.2	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	0.02	0.02	0.05	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TR-RS	YK-IS(d/s)	NZG-IS	YK-IS	YK-RS
Sampling date / time				16-Oct-2024 11:55	16-Oct-2024 15:05	16-Oct-2024 15:45	16-Oct-2024 16:15	16-Oct-2024 16:45	
Compound	CAS Number	LOR	Unit	ES2434038-006	ES2434038-007	ES2434038-008	ES2434038-009	ES2434038-010	
				Result	Result	Result	Result	Result	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	38	24	26	40	21	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L	4	4	3	4	22	
EA045: Turbidity									
Turbidity	----	0.1	NTU	1.7	6.4	5.3	3.1	17.9	
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO3	----	1	mg/L	14	5	12	21	5	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.04	0.10	0.08	0.07	0.14	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	0.013	0.009	<0.005	<0.005	<0.005	
Manganese	7439-96-5	0.001	mg/L	0.008	0.010	0.008	0.004	0.013	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Iron	7439-89-6	0.05	mg/L	<0.05	0.12	0.11	0.06	0.15	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.07	0.22	0.17	0.14	0.24	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.002	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TR-RS	YK-IS(d/s)	NZG-IS	YK-IS	YK-RS
Sampling date / time					16-Oct-2024 11:55	16-Oct-2024 15:05	16-Oct-2024 15:45	16-Oct-2024 16:15	16-Oct-2024 16:45
Compound	CAS Number	LOR	Unit		ES2434038-006	ES2434038-007	ES2434038-008	ES2434038-009	ES2434038-010
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L		0.010	0.010	0.010	0.006	0.020
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L		0.11	0.28	0.27	0.23	0.45
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.002	mg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.04	0.03	0.02	0.01	0.01
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.02	0.11	0.07	<0.01	0.05
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.02	0.11	0.07	<0.01	0.05
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.2	0.2	0.2	0.2	0.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		0.2	0.3	0.3	0.2	0.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.02	0.04	0.03	0.06	0.03
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CG-IS	SSC-IS	----	----	----
Sampling date / time				16-Oct-2024 10:30	16-Oct-2024 07:40	----	----	----	
Compound	CAS Number	LOR	Unit	ES2434038-011	ES2434038-012	-----	-----	-----	
				Result	Result	----	----	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	298	100	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L	<1	1	----	----	----	
EA045: Turbidity									
Turbidity	----	0.1	NTU	1.0	8.9	----	----	----	
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO3	----	1	mg/L	294	58	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.08	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----	
Manganese	7439-96-5	0.001	mg/L	<0.001	0.001	----	----	----	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----	
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----	
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.13	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CG-IS	SSC-IS	----	----	----
Sampling date / time				16-Oct-2024 10:30	16-Oct-2024 07:40	----	----	----	
Compound	CAS Number	LOR	Unit	ES2434038-011	ES2434038-012	-----	-----	-----	
				Result	Result	----	----	----	
EG020T: Total Metals by ICP-MS - Continued									
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----	
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----	
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----	
Iron	7439-89-6	0.05	mg/L	<0.05	0.10	----	----	----	
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.002	mg/L	<0.002	<0.002	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	----	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.18	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.18	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.2	----	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	0.1	0.4	----	----	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	----	----	----	
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	----	----	----	



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2434038	Page	: 1 of 10
Client	: UGL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: CAMILLE PALMER	Telephone	: +61-2-8784 8555
Project	: 3200-0645 TransGrid Maragle 500/330kV Station. (Event 8C)	Date Samples Received	: 18-Oct-2024
Site	: Maragle/Lobs Hole	Issue Date	: 25-Oct-2024
Sampler	: Lachlan Whiteford	No. of samples received	: 12
Order number	: 4501837828	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA045: Turbidity						
Clear Plastic Bottle - Natural						
WC-RS, WC-IS,	----	----	----	19-Oct-2024	18-Oct-2024	1
YR1-RS, LHG-IS,						
YR2-RS, TR-RS,						
YK-IS(d/s), NZG-IS,						
YK-IS, YK-RS,						
CG-IS, SSC-IS						
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
WC-RS, WC-IS,	----	----	----	19-Oct-2024	18-Oct-2024	1
YR1-RS, LHG-IS,						
YR2-RS, TR-RS,						
YK-IS(d/s), NZG-IS,						
YK-IS, YK-RS,						
CG-IS, SSC-IS						
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
WC-RS, WC-IS,	----	----	----	19-Oct-2024	18-Oct-2024	1
YR1-RS, LHG-IS,						
YR2-RS, TR-RS,						
YK-IS(d/s), NZG-IS,						
YK-IS, YK-RS,						
CG-IS, SSC-IS						

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results. This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein. Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters. Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	22-Oct-2024	23-Oct-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	22-Oct-2024	23-Oct-2024	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	19-Oct-2024	18-Oct-2024	* (red)
ED093F: SAR and Hardness Calculations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	22-Oct-2024	13-Nov-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020B-F) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	22-Oct-2024	14-Apr-2025	✓



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020B-T) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	22-Oct-2024	14-Apr-2025	✓	22-Oct-2024	14-Apr-2025	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	24-Oct-2024	13-Nov-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	24-Oct-2024	13-Nov-2024	✓
EK026SF: Total CN by Segmented Flow Analyser							
Black Opaque Plastic Bottle - NaOH (EK026SF) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	25-Oct-2024	30-Oct-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	24-Oct-2024	13-Nov-2024	✓



Matrix: **WATER** Evaluation: ✘ = Holding time breach ; ✔ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	19-Oct-2024	18-Oct-2024	✘
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	24-Oct-2024	13-Nov-2024	✔
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	23-Oct-2024	13-Nov-2024	✔	23-Oct-2024	13-Nov-2024	✔
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	23-Oct-2024	13-Nov-2024	✔	23-Oct-2024	13-Nov-2024	✔
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) WC-RS, YR1-RS, YR2-RS, YK-IS(d/s), YK-IS, CG-IS, WC-IS, LHG-IS, TR-RS, NZG-IS, YK-RS, SSC-IS	16-Oct-2024	----	----	----	19-Oct-2024	18-Oct-2024	✘



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	34	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids	EA025	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids	EA025	3	12	25.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	12	25.00	12.50	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	6	40	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	6	40	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Method Blanks (MB) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	2	26	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids	EA025	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of 'filterable' residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids	EA025	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Metals by ICP-MS - Suite B	EG020B-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite B	EG020B-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).



Analytical Methods	Method	Matrix	Method Descriptions
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Total Cyanide by Segmented Flow Analyser	EK026SF	WATER	In house: Referenced to APHA 4500-CN C&O / ASTM D7511 / ISO 14403. Sodium hydroxide preserved samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)

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Work Order : ES2434038
Client : UGL LIMITED
Project : 3200-0645 TransGrid Maragle 500/330kV Station. (Event 8C)



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)



QUALITY CONTROL REPORT

Work Order	: ES2434038	Page	: 1 of 10
Client	: UGL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: CAMILLE PALMER	Contact	: Customer Services ES
Address	: Cnr Hill Rd & Pondage Link Rd HOMEBUSH BAY 2127	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 3200-0645 TransGrid Maragle 500/330kV Station. (Event 8C)	Date Samples Received	: 18-Oct-2024
Order number	: 4501837828	Date Analysis Commenced	: 19-Oct-2024
C-O-C number	: ----	Issue Date	: 25-Oct-2024
Sampler	: Lachlan Whiteford		
Site	: Maragle/Lobs Hole		
Quote number	: ES24UGLLIM0001_V3		
No. of samples received	: 12		
No. of samples analysed	: 12		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC
 * = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6136679)									
ES2434038-011	CG-IS	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	298	318	6.7	0% - 20%
ES2434038-001	WC-RS	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	46	40	13.9	No Limit
EA025: Total Suspended Solids dried at 104 ± 2 °C (QC Lot: 6136680)									
ES2434038-011	CG-IS	EA025: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
ES2434038-001	WC-RS	EA025: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EA045: Turbidity (QC Lot: 6131075)									
EN2413140-005	Anonymous	EA045: Turbidity	----	0.1	NTU	130	126	3.1	0% - 20%
EN2413155-014	Anonymous	EA045: Turbidity	----	0.1	NTU	243	249	2.4	0% - 20%
EA045: Turbidity (QC Lot: 6131076)									
ES2434038-010	YK-RS	EA045: Turbidity	----	0.1	NTU	17.9	19.7	9.6	0% - 20%
ES2434150-004	Anonymous	EA045: Turbidity	----	0.1	NTU	0.5	0.5	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136306)									
ES2433905-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.749	0.736	1.7	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.014	0.014	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136306) - continued									
ES2433905-001	Anonymous	EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.16	0.15	0.0	No Limit
ES2433905-011	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.04	1.03	1.1	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.84	1.82	0.9	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136307)									
ES2433905-001	Anonymous	EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
ES2433905-011	Anonymous	EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136311)									
ES2434131-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.004	0.006	42.7	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.077	0.079	2.8	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.022	0.021	5.6	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.04	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	1.34	1.36	1.8	0% - 20%
ES2434038-007	YK-IS(d/s)	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.010	0.010	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	<0.005	54.5	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.10	0.09	12.3	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136312)									



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6136312) - continued									
ES2434038-007	YK-IS(d/s)	EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6136295)									
ES2434038-003	YR1-RS	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.08	0.08	0.0	No Limit
EG020A-T: Iron	7439-89-6	0.05	mg/L	0.09	0.08	0.0	No Limit		
ES2434038-011	CG-IS	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit		
EG020T: Total Metals by ICP-MS (QC Lot: 6136296)									
ES2434038-003	YR1-RS	EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
ES2434038-011	CG-IS	EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6136309)									
ES2433905-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2433905-010	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6136310)									
ES2434038-010	YK-RS	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2434131-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6138048)									
ES2433634-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES2434038-004	LHG-IS	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 6140912)									
ES2434038-001	WC-RS	EK026SF: Total Cyanide	57-12-5	0.004 (0.002) *	mg/L	<0.002	<0.002	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 6140912) - continued									
ES2434038-011	CG-IS	EK026SF: Total Cyanide	57-12-5	0.004 (0.002) *	mg/L	<0.002	<0.002	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6137877)									
EN2413182-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.26	0.25	0.0	0% - 20%
EN2413182-013	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.06	99.6	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6137880)									
ES2434038-008	NZG-IS	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	<0.01	72.8	No Limit
ES2434091-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.65	0.65	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6131165)									
ES2434038-001	WC-RS	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2434038-010	YK-RS	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6137878)									
EN2413182-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EN2413182-013	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6137879)									
ES2434038-008	NZG-IS	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.07	0.04	47.2	No Limit
ES2434091-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.90	0.91	1.2	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6137874)									
EN2413182-004	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (2.0)*	mg/L	6.2	6.0	3.6	No Limit
EN2413182-014	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.9	0.9	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 6137875)									
ES2434038-005	YR2-RS	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	0.2	0.0	No Limit
ES2434090-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (1.0)*	mg/L	24.0	23.9	0.4	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6137873)									
EN2413182-004	Anonymous	EK067G: Total Phosphorus as P	----	0.01 (0.20)*	mg/L	1.07	1.04	3.4	No Limit
EN2413182-014	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.08	0.09	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 6137876)									
ES2434038-005	YR2-RS	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.05	0.06	31.7	No Limit
ES2434090-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01 (0.10)*	mg/L	3.04	3.14	3.5	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6131164)									
ES2434038-001	WC-RS	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2434038-010	YK-RS	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)
Method: Compound	CAS Number	LOR	Unit				LCS	Low
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6136679)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.5	87.0	109
				<10	293 mg/L	110	75.2	126
				<10	2410 mg/L	96.7	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6136680)								
EA025: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	93.3	83.0	129
				<1	1000 mg/L	86.1	81.0	111
				<1	879 mg/L	101	83.0	118
EA045: Turbidity (QCLot: 6131075)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	99.0	91.0	105
EA045: Turbidity (QCLot: 6131076)								
EA045: Turbidity	----	0.1	NTU	<0.1	40 NTU	99.2	91.0	105
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136306)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.7	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.5	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.2	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.1	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.7	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.5	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	93.6	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.6	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.2	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136307)								
EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	85.0	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136311)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.2	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.8	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.0	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.7	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.5	81.0	111



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
					LCS	Low	High	
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136311) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.8	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.9	82.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.3	81.0	117
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136312)								
EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	94.4	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6136295)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.8	82.0	120
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.5	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.6	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.0	86.0	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.9	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.4	85.0	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	91.4	85.0	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.6	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.6	79.0	117
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.5	85.0	117
EG020T: Total Metals by ICP-MS (QCLot: 6136296)								
EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	94.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6136309)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.1	83.0	105
EG035F: Dissolved Mercury by FIMS (QCLot: 6136310)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.1	83.0	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6138048)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	77.0	111
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6140912)								
EK026SF: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	94.1	73.0	133
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6137877)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.8	90.0	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6137880)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.4	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6131165)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.5	82.0	114



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6137878)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	100	91.0	113
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6137879)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	97.1	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6137874)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	86.6	69.0	123
				<0.1	1 mg/L	99.7	70.0	123
				<0.1	5 mg/L	93.3	70.0	123
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6137875)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	88.1	69.0	123
				<0.1	1 mg/L	110	70.0	123
				<0.1	5 mg/L	98.2	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6137873)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	96.0	71.3	126
				<0.01	0.442 mg/L	104	71.3	126
				<0.01	1 mg/L	99.4	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6137876)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	94.3	71.3	126
				<0.01	0.442 mg/L	100	71.3	126
				<0.01	1 mg/L	105	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6131164)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	101	85.0	117

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136306)							
ES2433905-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	98.3	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	95.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	98.7	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	96.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	75.6	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	98.5	70.0	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136306) - continued							
ES2433905-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	94.8	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	97.7	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6136311)							
ES2434038-008	NZG-IS	EG020A-F: Arsenic	7440-38-2	1 mg/L	87.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	95.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	101	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.0	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	95.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	102	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	92.5	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	94.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 6136295)							
EB2435660-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	94.6	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	93.1	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	95.5	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	93.3	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	99.0	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	95.1	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	95.8	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.3	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6136309)							
ES2433905-003	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	85.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6136310)							
ES2434038-009	YK-IS	EG035F: Mercury	7439-97-6	0.01 mg/L	94.0	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6138048)							
EM2417944-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	96.9	70.0	130
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 6140912)							
ES2434038-001	WC-RS	EK026SF: Total Cyanide	57-12-5	0.2 mg/L	87.0	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6137877)							
EN2413182-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	78.1	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6137880)							
ES2434038-008	NZG-IS	EK055G: Ammonia as N	7664-41-7	0.5 mg/L	94.5	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6131165)							
ES2434038-001	WC-RS	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	108	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6137878)							
EN2413182-004	Anonymous						

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 Work Order : ES2434038
 Client : UGL LIMITED
 Project : 3200-0645 TransGrid Maragle 500/330kV Station. (Event 8C)



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6137878) - continued							
EN2413182-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6137879)							
ES2434038-008	NZG-IS	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	99.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6137874)							
EN2413182-005	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	97.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 6137875)							
ES2434038-006	TR-RS	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	94.4	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6137873)							
EN2413182-005	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	111	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 6137876)							
ES2434038-006	TR-RS	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6131164)							
ES2434038-001	WC-RS	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	114	70.0	130



Appendix C: October 2024 SWQ Monitoring Results

Parameter		Dissolved Ag (mg/L)	Dissolved Zn (mg/L)	Ammonia (mg/L)	Nitrogen Oxides (mg/L)	Reactive Phosphorus (mg/L)	Total Hardness (mg/L) (CaCO3)	Total Kjeldahl Nitrogen (mg/L) (TKN)	TDS (mg/L)	TSS (mg/L)	Total Al (mg/L)	Total As (mg/L)	Total Cd (mg/L)	Total Cr (mg/L)	Total Cu (mg/L)	Total Pb (mg/L)	Total Mn (mg/L)	Total Ni (mg/L)	Total Ag (mg/L)	Total Zn (mg/L)	Total Fe (mg/L)	Total Hg (mg/L)
YARRANGOBILLY CATCHMENT																						
Default Guideline Value (DGV)		0.00002	0.0024	0.013	0.015	0.015	-	-	0.2	0.027	0.0008	0.0006	0.00001	0.001	0.001	1.2	0.008	0.00002	0.0024	0.3	0.00006	
Limit of Reporting (LOR)		0.001	0.005	0.010	0.010	0.010	1	0.1	10	1	0.01	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	0.0001
Dec - May Site Specific Guideline V		0.00002	0.002	0.013	0.015	0.020	47	0.2	52	0.2												
June - Nov SSGV		0.00002	0.002	0.013	0.015	0.015	30	0.2	39	1.0												
WC-RS	Mar-24	0.00001	0.001	0.050	0.05	0.005	42	0.1	70	0.1												
	Apr-24	0.001	0.005	0.010	0.01	-	70	0.01	-	1	0.02	0.001	0.0001	0.001	0.001	0.01	0.001	0.001	0.005	0.05	0.0001	
	May-24	0.001	0.005	0.020	0.01	0.01	77	0.1	102	5	0.01	0.001	0.0001	0.001	0.001	0.007	0.001	0.001	0.005	0.05	0.0001	
	Jun-24	0.001	0.005	0.010	0.23	0.01	53	0.1	81	2	0.01	0.001	0.0001	0.001	0.001	0.007	0.001	0.001	0.005	0.05	0.0001	
	Jul-24	0.001	0.005	0.010	0.01	0.01	17	0.1	38	8	0.09	0.001	0.0001	0.001	0.001	0.01	0.001	0.001	0.005	0.09	0.0001	
	Aug-24	0.001	0.032	0.010	0.01	0.01	28	0.1	51	4	0.06	0.001	0.0001	0.001	0.001	0.007	0.001	0.001	0.005	0.07	0.0001	
	Sep-24	0.001	0.005	0.040	0.22	0.01	31	0.2	65	3	0.04	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.005	0.05	0.0001	
	Oct-24	0.001	0.005	0.010	0.02	0.01	31	0.1	46	1	0.07	0.001	0.0001	0.001	0.001	0.004	0.001	0.001	0.005	0.1	0.0001	
WC-IS	Mar-24	0.00001	0.001	0.050	0.05	0.005	42	0.1	86	0.1												
	Apr-24	0.001	0.005	0.010	2.42	-	67	2.42	-	11	0.15	0.001	0.0001	0.001	0.001	0.022	0.004	0.001	0.005	0.22	0.0001	
	May-24	0.001	0.005	0.010	0.31	0.01	75	0.1	106	5	0.01	0.001	0.0001	0.001	0.001	0.006	0.001	0.001	0.005	0.05	0.0001	
	Jun-24	0.001	0.005	0.010	0.02	0.04	53	0.1	81	1	0.01	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.005	0.05	0.0001	
	Jul-24	0.001	0.005	0.010	0.01	0.01	17	0.1	42	5	0.11	0.001	0.0001	0.001	0.001	0.011	0.001	0.001	0.005	0.1	0.0001	
	Aug-24	0.001	0.006	0.010	0.03	0.01	28	0.1	45	4	0.06	0.001	0.0001	0.001	0.001	0.006	0.001	0.001	0.005	0.06	0.0001	
	Sep-24	0.001	0.017	0.010	7.21	0.01	33	0.4	113	3	0.02	0.001	0.0001	0.001	0.001	0.002	0.001	0.001	0.005	0.05	0.0001	
	Oct-24	0.001	0.005	0.010	0.02	0.01	31	0.2	39	2	0.08	0.001	0.0001	0.001	0.001	0.004	0.005	0.001	0.005	0.12	0.0001	
CG-IS	Mar-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Apr-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	May-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jun-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jul-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Aug-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sep-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Oct-24	0.001	0.005	0.010	0.01	0.01	294	0.1	296	1	0.01	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	0.0001	
YR1-IS	Mar-24	0.00001	0.001	0.050	0.05	0.005	34	0.1	66	0.1												
	Apr-24	0.001	0.005	0.010	0.05	-	61	0.05	-	1	0.01	0.001	0.0001	0.001	0.001	0.002	0.001	0.001	0.005	0.05	0.0001	
	May-24	0.001	0.005	0.010	0.01	0.01	68	0.1	95	5	0.01	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	0.0001	
	Jun-24	0.001	0.005	0.010	0.01	0.03	51	0.1	68	1	0.03	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	0.0001	
	Jul-24	0.001	0.005	0.010	0.01	0.01	19	0.2	48	7	0.17	0.001	0.0001	0.001	0.001	0.009	0.001	0.001	0.005	0.15	0.0001	
	Aug-24	0.001	0.005	0.010	0.01	0.01	33	0.2	55	3	0.12	0.001	0.0001	0.001	0.001	0.004	0.001	0.001	0.005	0.09	0.0001	
	Sep-24	0.001	0.005	0.010	0.02	0.01	38	0.1	68	2	0.06	0.001	0.0001	0.001	0.001	0.003	0.001	0.001	0.005	0.05	0.0001	
	Oct-24	0.001	0.006	0.020	0.01	0.01	41	0.1	60	2	0.08	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.005	0.09	0.0001	
LHG-IS	Mar-24	0.00001	0.006	0.050	0.05	0.005	297	0.1	330	20												
	Apr-24	0.001	0.005	0.020	0.02	-	332	0.02	-	70	0.25	0.003	0.0001	0.001	0.002	0.001	0.51	0.006	0.001	0.009	2.22	0.0001
	May-24	0.001	0.005	0.040	0.06	0.01	365	0.4	402	5	0.07	0.001	0.0001	0.001	0.001	0.001	0.177	0.001	0.001	0.005	1.09	0.0001
	Jun-24	0.001	0.005	0.020	0.02	0.01	313	0.2	339	17	0.38	0.002	0.0001	0.001	0.001	0.001	0.282	0.001	0.001	0.005	1.54	0.0001
	Jul-24	0.001	0.005	0.010	0.01	0.01	250	0.1	324	10	0.53	0.001	0.0001	0.001	0.002	0.001	0.033	0.001	0.001	0.005	0.16	0.0001
	Aug-24	0.001	0.006	0.020	0.01	0.01	282	0.1	360	9	0.09	0.001	0.0001	0.001	0.001	0.001	0.026	0.001	0.001	0.005	0.17	0.0001
	Sep-24	0.001	0.006	0.010	0.01	0.01	294	0.1	394	10	0.06	0.001	0.0001	0.001	0.001	0.001	0.051	0.001	0.001	0.005	0.19	0.0001
	Oct-24	0.001	0.005	0.020	0.01	0.01	312	0.1	362	3	0.04	0.001	0.0001	0.001	0.001	0.001	0.034	0.001	0.001	0.005	0.26	0.0001
YR2-IS	Mar-24	0.00001	0.001	0.050	0.05	0.005	27	0.1	58	0.1												
	Apr-24	0.001	0.005	0.010	0.01	-	61	0.01	-	5	0.02	0.001	0.0001	0.001	0.001	0.001	0.004	0.001	0.001	0.005	0.05	0.0001
	May-24	0.001	0.007	0.020	0.34	0.01	68	0.5	98	5	0.01	0.001	0.0001	0.001	0.001	0.001	0.002	0.001	0.001	0.007	0.05	0.0001
	Jun-24	0.001	0.005	0.010	0.01	0.01	51	0.1	76	1	0.03	0.001	0.0001	0.001	0.001	0.001	0.002	0.001	0.001	0.005	0.05	0.0001
	Jul-24	0.001	0.005	0.010	0.24	0.01	26	0.2	46	10	0.17	0.001	0.0001	0.001	0.001	0.001	0.012	0.001	0.001	0.007	0.16	0.0001
	Aug-24	0.001	0.005	0.010	0.01	0.01	33	0.1	59	4	0.11	0.001	0.0001	0.001	0.001	0.001	0.005	0.001	0.001	0.005	0.09	0.0001
	Sep-24	0.001	0.005	0.010	0.01	0.01	46	0.1	68	3	0.07	0.001	0.0001	0.001	0.001	0.001	0.006	0.001	0.001	0.005	0.07	0.0001
	Oct-24	0.001	0.005	0.010	0.01	0.01	43	0.2	71	1	0.07	0.001	0.0001	0.001	0.001	0.001	0.002	0.001	0.001	0.005	0.08	0.0001
SSC-IS	Mar-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Apr-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	May-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jun-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Jul-24	0.001	0.024	0.030	0.85	0.01	62	0.9	110	1	0.09	0.001	0.0001	0.001	0.001	0.001	0.006	0.001	0.001	0.025	0.4	0.0001
	Aug-24	0.001	0.005	0.010	0.01	0.01	62	0.1	110	5	0.21	0.001	0.0001	0.001	0.001							



Appendix D: Calibration Certificate

