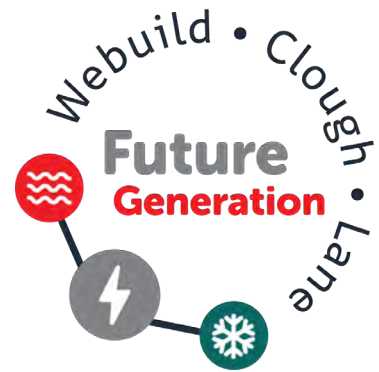




REPORT

EPL 21266 – BI-ANNUAL MONITORING REPORT DECEMBER 2022 – MAY 2023

S2-FGJV-ENV-REP-0078

Rev B

JUNE 2023

ABSTRACT

This document provides a summary of surface- and ground-water quality and associated information for monitoring conducted as part the Snowy 2.0 project, across monitoring locations pertaining to Environmental Protection Licence (EPL) 21266.

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Rev.	Date	Reason for Issue	Responsible	Accountable	Endorsed

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1. INTRODUCTION

Snowy 2.0 was declared State Significant Infrastructure and Critical State Significant Infrastructure by the NSW Minister for Planning under the provisions of the NSW Environmental Planning and Assessment Act 1979 and is defined in Clause 9 of Schedule 5 of the State Environmental Planning Policy (State and Regional Development) 2011.

An Infrastructure Approval No. SSI 9208 based on the Environmental Impact Statement (EIS) submitted for the Snowy 2.0 Exploratory Works was received on February 7, 2019.

An Environment Protection Licence No. 21266 (EPL - 21266) under Section 55 of the Protection of the Environment Operations Act 1997 (NSW) was issued to Snowy Hydro Ltd (Snowy Hydro) on May 9, 2019, by the New South Wales Environment Protection Authority (NSW EPA) for land based extractive activities at Lobs Hole and Talbingo Reservoir in Kosciuszko National Park. During this reporting period there has been two variations to EPL 21266. An EPL variation was issued on 06 July 2022 which covered spoil management conditions (O5.1-O5.8). An EPL variation was issued on 05 October 2022 which covered the addition of surface water and groundwater monitoring points, and multiple condition updates. A summary of the variations is provided in Table 1-3.

Webuild, Clough, and Lane have formed the Future Generation Joint Venture (Future Generation) and have been engaged by Snowy Hydro to deliver both Stage 2 of Exploratory Works and Snowy 2.0 Main Works. As required by EPL - 21266 Future Generation have undertaken a monthly monitoring program to assess the influence of the Snowy 2.0 Main Works project on groundwater and receiving surface water quality across the Project, specifically the work sites of Talbingo, Lobs Hole, Tantangara, Marica and Rock Forest.

This report has been prepared by Ben Chapman, Water Management Specialist for Future Generation. Ben holds a Bachelor of Environmental Science, a Masters of Environment and Business Management and a Certificate 3 in Water Operations. Ben has over 18 years' experience in environmental auditing and compliance.

Jessica Adams, Environmental Coordinator for Future Generation. Jess holds a Bachelor of Environmental, and a Master of Environmental Law and Policy with 9 years' experience in environmental assessment, management and reporting across various construction and infrastructure projects.

This report has been reviewed by Dr Ellen Porter, Environmental Manager for Future Generation. Ellen holds a PhD in Organic Geochemistry, is a Certified Environmental Practitioner (no. 1080), and has 11 years' experience in the field of environmental assessment, monitoring and reporting. Therefore, this report has been prepared by and reviewed by suitably qualified and experienced persons fulfilling the requirement of condition R4.3 of EPL 21266.

1.1. Purpose

The purpose of this report is to provide a six (6) monthly update of surface water and groundwater monitoring undertaken for the Snowy 2.0 project in accordance with Condition R4.2 of EPL 21266.

Section 2, Condition P1.2 of EPL 21266 identifies the points required for monitoring, these points are presented on **Figures 1.1 – 1.5** of **Appendix A** and listed in **Table 1.1** below.

Table 1-1: EPL21266 Location Names, Co-Ordinates, and Description

Name	X	Y	Location	Sample Type	Description
EPL 01	148.413	-35.792	Lobs Hole	Groundwater	Wallace Creek Bridge
EPL 02	148.413	-35.792	Lobs Hole	Groundwater	Wallace Creek Bridge
EPL 04	148.415	-35.788	Lobs Hole	Groundwater	Lobs Hole Portal Access
EPL 05	148.416	-35.785	Lobs Hole	Surface Water	Yarrangobilly River, upstream of the exploratory tunnel and construction pad
EPL 06	148.412	-35.793	Lobs Hole	Surface Water	Wallaces Creek, upstream of the confluence of Yarrangobilly River and Wallaces Creek
EPL 08	148.401	-35.789	Lobs Hole	Surface Water	Yarrangobilly River, downstream of Lick Hole Gully
EPL 09	148.387	-35.782	Lobs Hole	Surface Water	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir
EPL 10	148.38	-35.773	Lobs Hole	Reservoir Water	Talbingo Reservoir, upstream of Lobs Hole STP/PWTP diffuser outlet and water intake point
EPL 11	148.375	-35.771	Lobs Hole	Reservoir Water	Talbingo Reservoir, downstream of Lobs Hole STP/PWTP diffuser outlet
EPL 12	148.414	-35.789	Lobs Hole	Surface Water	Yarrangobilly River, immediately downstream of portal pad
EPL 14	148.405	-35.794	Lobs Hole	Surface Water	Yarrangobilly River, downstream of road construction areas
EPL 15	148.404	-35.792	Lobs Hole	Surface Water	Yarrangobilly River, downstream of road construction areas
EPL 16	148.393	-35.785	Lobs Hole	Surface Water	Yarrangobilly River, downstream of road construction areas
EPL 24	148.389	-35.78	Lobs Hole	Surface Water	Yarrangobilly River tributary (Watercourse 2), directly downstream of road
EPL 25	148.415	-35.788	Lobs Hole	Groundwater	Portal Access
EPL 26	148.488	-35.794	Marica	Surface Water	Eucumbene River, downstream of Marica Road
EPL 27	148.488	-35.794	Marica	Surface Water	Eucumbene River, upstream of Marica Road

EPL 28	148.654	-35.748	Tantangara	Reservoir Water	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River. Variable location dependent on tide and reservoir levels.
EPL 29	148.661	-35.793	Tantangara	Reservoir Water	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River
EPL 30	148.652	-35.801	Tantangara	Surface Water	Kellys Plain Creek, downstream of accommodation camp and laydown areas
EPL 31	148.648	-35.806	Tantangara	Surface Water	Kellys Plain Creek, upstream of accommodation camp and laydown areas
EPL 32	148.659	-35.79	Tantangara	Reservoir Water	Tantangara Reservoir, Tantangara Intake. Downstream of construction works
EPL 33	148.664	-35.795	Tantangara	Surface Water	Murrumbidgee River, downstream of Tantangara reservoir outlet
EPL 34	148.633	-35.865	Tantangara	Surface Water	Nungar Creek, upstream of Tantangara Road
EPL 35	148.633	-35.865	Tantangara	Surface Water	Nungar Creek, downstream of Tantangara Road
EPL 36	148.668	-35.952	Rock Forest	Surface Water	Camerons Creek, upstream of works in Rock Forest
EPL 37	148.675	-35.948	Rock Forest	Surface Water	Camerons Creek, downstream of works in Rock Forest
EPL 38	148.653	-35.769	Tantangara	Reservoir Water	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities
EPL 39	148.639	-35.761	Tantangara	Reservoir Water	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works
EPL 40	148.623	-35.755	Tantangara	Reservoir Water	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works
EPL 41	148.381	-35.772	Talbingo	Reservoir Water	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir
EPL 42*	148.375	-35.772	Talbingo	Discharge Point	Diffuser outlet discharging into Talbingo Reservoir from Lobs Hole STP/PWTP
EPL 43*	148.381	-35.772	Talbingo	Volume Outflow	Lobs Hole STP/PWTP Final Volume Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.
EPL 44*	148.417	-35.787	Lobs Hole	Volume Inflow – PWTP	Lobs Hole (MAT Portal) PWTP Inflow Volume Monitoring Point
EPL 45*	148.393	-35.783	Talbingo	Volume Inflow – Ex-Camp STP	Lobs Hole Ex-Camp STP Inflow Volume Monitoring Point

EPL 46	148.657	-35.795	Tantangara	Discharge Point	Diffuser outlet discharging into Tantangara Reservoir from Tantangara STP / PWTP
EPL 47	148.392	-35.783	Talbingo	Volume Inflow – Main Camp STP	Talbingo Main Camp STP Inflow Monitoring Point
EPL 48	148.656	-35.802	Tantangara	Volume Inflow STP	Tantangara STP Inflow Volume Monitoring Point
EPL 49	148.65	-35.791	Tantangara	Volume Inflow PWTP	Tantangara PWTP Inflow Volume Monitoring Point
EPL 50	148.651	-35.791	Tantangara	Volume Outflow	Tantangara STP/PWTP final effluent quality and volume monitoring point
EPL 51	148.66	-35.794	Tantangara	Surface Water	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet.
EPL 52^	148.338	-35.778	Lobs Hole	Surface Water	Talbingo Reservoir, upstream of GF01 emplacement area
EPL 53^	148.391	-35.774	Lobs Hole	Surface Water	Talbingo Reservoir upstream East of GF01 emplacement area
EPL 54^	148.389	-35.775	Lobs Hole	Surface Water	Talbingo Reservoir Upstream West of GF01 emplacement area
EPL 55^	148.387	-35.778	Lobs Hole	Surface Water	Yarrangobilly River, Surface Water Downstream of GF01 emplacement area
EPL 56^	148.391	-35.774	Lobs Hole	Groundwater	Ground Water Upstream East from GF01 emplacement area
EPL 57^	148.389	-35.775	Lobs Hole	Groundwater	Ground Water Upstream West from GF01 emplacement area
EPL 58^	148.389	-35.777	Lobs Hole	Groundwater	Ground Water Downstream from GF01 emplacement area
EPL 59^	148.644	-35.761	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB1
EPL 60^	148.644	-35.760	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB2
EPL 61^	148.648	-35.76	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB3
EPL 62^	148.649	-35.762	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB4
EPL 63^	148.649	-35.763	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB5
EPL 64^	148.64	-35.767	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB6
EPL 65^	148.648	-35.7641	Tantangara	Surface Water	Tantangara Leachate Basin Tan-SW-SB7
EPL 66^	148.651	-35.763	Tantangara	Surface Water	Tantangara Leachate Basin Downstream East from Tantangara emplacement area Tan-SW-DSE
EPL 67^	148.642	-35.760	Tantangara	Surface Water	Nungar Creek Surface Water Downstream West from Tantangara emplacement area Tan-SW-DSW

EPL 68^	148.644	-35.760	Tantangara	Groundwater	Ground Water Downstream East from Tantangara emplacement area Tan-GW-DSE
EPL 69^	148.650	-35.763	Tantangara	Groundwater	Ground Water Downstream West from Tantangara emplacement area Tan-GW-DSW
EPL 70^	148.645	-35.770	Tantangara	Groundwater	Ground Water Upstream from Tantangara emplacement area Tan-GW-US

*these EPL points do not require any water quality monitoring for the purposes of EPL21266

^ GPS Coordinates are a guide only, ground truthing is required and sampling locations will be determined based on conditions in field.

1.2. Conditions of Report

As per Section 6, Condition R4.3 of EPL 21266 this report must include the information listed in **Table 1.2**.

Table 1-2: EPL 21266 Environmental Monitoring Report Requirements

Environmental Monitoring Report requirement	Report Section
Results of all water quality monitoring undertaken in the preceding six (6) month period	Appendix B, Appendix C
Results of all weather monitoring undertaken in the preceding six (6) month period	Section 2
Assessment of historical trends in all water sampling data for each monitoring point inclusive of the current six (6) month period	Section 3
Identification of instances where the water quality objective triggers for each relevant pollutant were exceeded at receiving water locations and/or where the predicted discharge water quality was exceeded at sediment basin discharge points;	Section 3, Appendix C, Appendix D
Include details of any actions taken by the Licensee in response to exceedances identified including but not limited to: i. additional monitoring ii. remedial actions; and iii. activation of trigger, action, response plans (TARPs);	Sections 3 and 4
Recommendations for future actions in relation to monitoring and/or management	Section 4

1.3. EPL Variations in Reporting Period

During the reporting period Dec 2022 and May 2023, there were no variations of EPL 21266.

1.4. Project Updates

This bi-annual monitoring update includes Dec 2022 – May 2023 EPL sampling rounds. This period included significant progress of the Main Works package of the Snowy 2.0 Project. A summary of construction activities at each site is outlined below.

1.4.1. Talbingo – (Talbingo Adit Portal / Talbingo Intake / Main Camp / Ex Camp / GF01)

- Pipeline installation connecting MAT CWTP to Talbingo CWTP
- Talbingo Intake excavation, shotcrete and drilling works ongoing
- Construction water treatment plant installation

- TBM assembly
- Spoil emplacement ongoing at GF01
- Completion of groundwater borehole installation at GF01

1.4.2. **Lobs Hole – (Mat Portal / Main Yard / ECVT / Ravine Road)**

- Hydroseeding carried out throughout Lobs Hole
- Asphalt works on Ravine Road completed
- Drill & Blast works ongoing in the tunnel
- Movement of tunnel spoil material under permitted process ongoing
- TBM2 disassembly ongoing
- Stage 5 earthworks complete at Main Yard
- Surface drainage works ongoing at Main Yard
- Fill and spoil processing ongoing from ECVT and Talbingo at Main Yard

1.4.3. **Marica**

- Excavation of the shaft ongoing
- Upstream surge shaft office area car park extension complete
- Marica camp extension commenced
- Road maintenance works, including culvert installation

1.4.4. **Tantangara**

- Works continuing the installation of the slurry treatment plant at Fill 3
- Road works being carried out along Quarry Trail
- GHD conducting geological boring near sinkhole from the road
- ERSER control works along spoil road, S1 and S2 laydown areas
- Geotechnical and ground consolidation works at the surface depression from inside the EIS boundary
- Tantangara Road maintenance works

1.4.5. **Trunk Services**

- Maintenance of ERSER controls underway
- Weed spraying completed along Trunk Services
- HDD drilling ongoing
- Ongoing monitoring and inspections completed for Gooandra trail
- Road maintenance works

1.4.6. Rock Forest

- Storage of materials including delivery of segments 24/7
- Sediment basin expansion completed
- SHL subcontractor expansion works ongoing
- Weed spraying completed

2. WEATHER MONITORING RESULTS

2.1. Weather Stations

There are several weather stations along the alignment of the Project that report real-time data. These include:

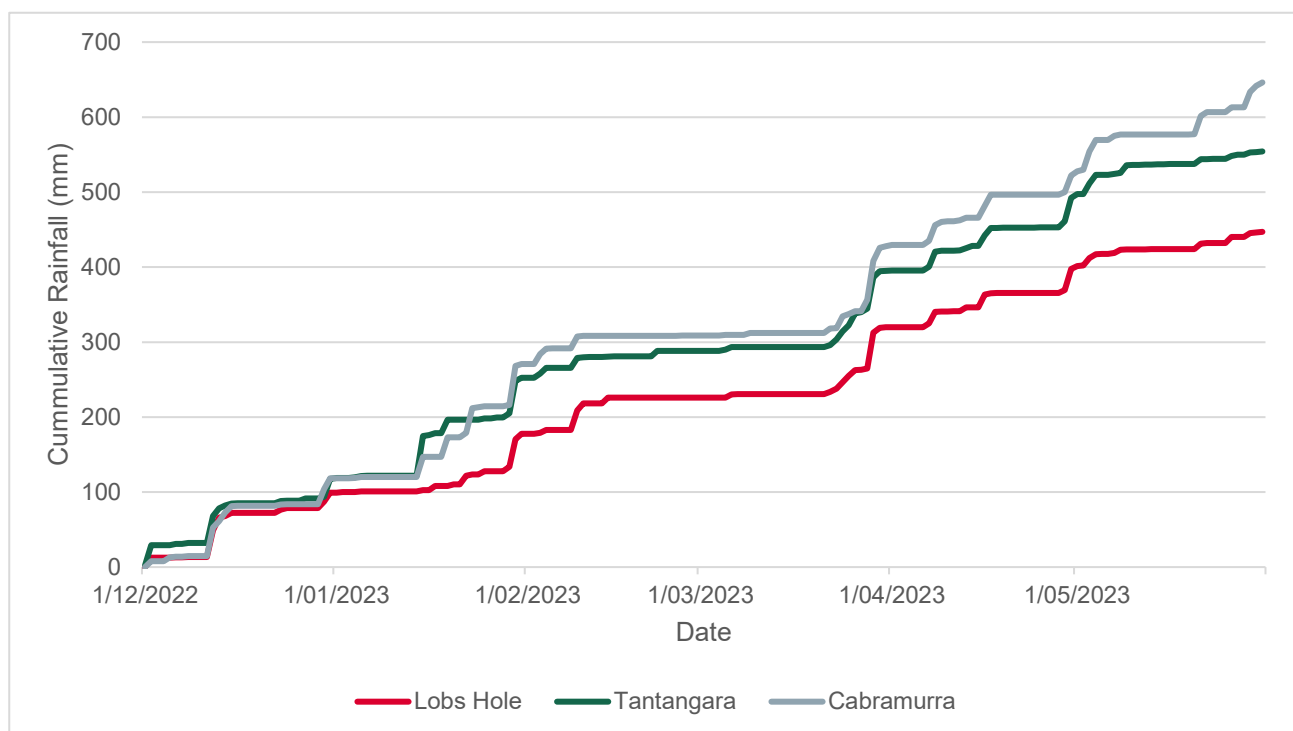
- “Lobs Hole” - an automatic weather station managed by Future Generation in Lobs Hole Main Yard.
- “Cabramurra” - an automatic weather station located near the lookout in the Cabramurra township managed by the Bureau of Meteorology (BoM)
- “Tantangara” - an automatic weather station managed by Future Generation in Tantangara construction site.

The Tantangara and Lobs Hole gauges are in sub-alpine environments, with elevations of approximately 1200 m and 600 m, respectively. Cabramurra records substantially higher annual rainfall amount than the lower-elevation gauges at Lobs Hole and Tantangara. Tantangara and Lobs Hole weather stations record actual onsite conditions at the respective construction sites, while Cabramurra weather station, at 1470 m is representative of conditions at Marica which has an elevation of 1480 m and is approximately 15 km north of the Cabramurra Station.

2.2. Rainfall Data

The cumulative rainfall between December 2022 and May 2023 is presented in **Figure 2-1**.

Figure 2-1: Cumulative Rainfall across Lobs Hole, Tantangara and Cabramurra



At each of the three rainfall recording sites (Tantangara, Lobs Hole, and Cabramurra), the highest volume of rain that fell in a single day are as follows:

- 48.2 mm at Lobs Hole – 29/03/2023
- 52.4 mm at Cabramurra (Marica) – 30/01/2023
- 53.0 mm at Tantangara – 15/01/2023

On the five-day time scale, the heaviest precipitation events were as follows:

- Lobs Hole: 66.4 mm between the 25 and 29 March 2023;
- Cabramurra (Marica): 88.4 mm between 26 of March and 30 March 2023; and
- Tantangara: 74.6 mm between 15 and 19 January 2023

Table 2-1: Recorded rainfall (mm) across Snowy 2.0 worksites. Long Term Average (LTA) rainfall data from BOM. Lobs Hole average rainfall taken from Tumbarumba total weather station. Tantangara taken from Adaminaby Alpine Tourist Park Weather Station

	Tantangara		Cabramurra (Marica)		Lobs Hole	
Month	Monthly (mm)	LTA	Monthly	LTA	Monthly	LTA
December	117.6	59.4	118.6	90.1	99	69.0
January	134.8	58.8	152	75.6	78.8	64.2
February	35.8	52.4	38.2	79.4	48	54.6
March	106.8	56	119.2	86.9	94.2	65.3
April	97.2	46.4	92.8	76.4	77.4	66.1
May	62	47.1	119.8	94.2	49.6	82.6

Following the trends outlined in the previous Bi-annual Monitoring Report, the Summer and Autumn rainfall produced generally much higher than average rainfall for the region (**Table 2-1**).

2.3. Temperature Data

Figure 2-1 to Figure 2-4 show temperature maximum and minimums across the project at Lobs Hole and Cabramurra weather stations.

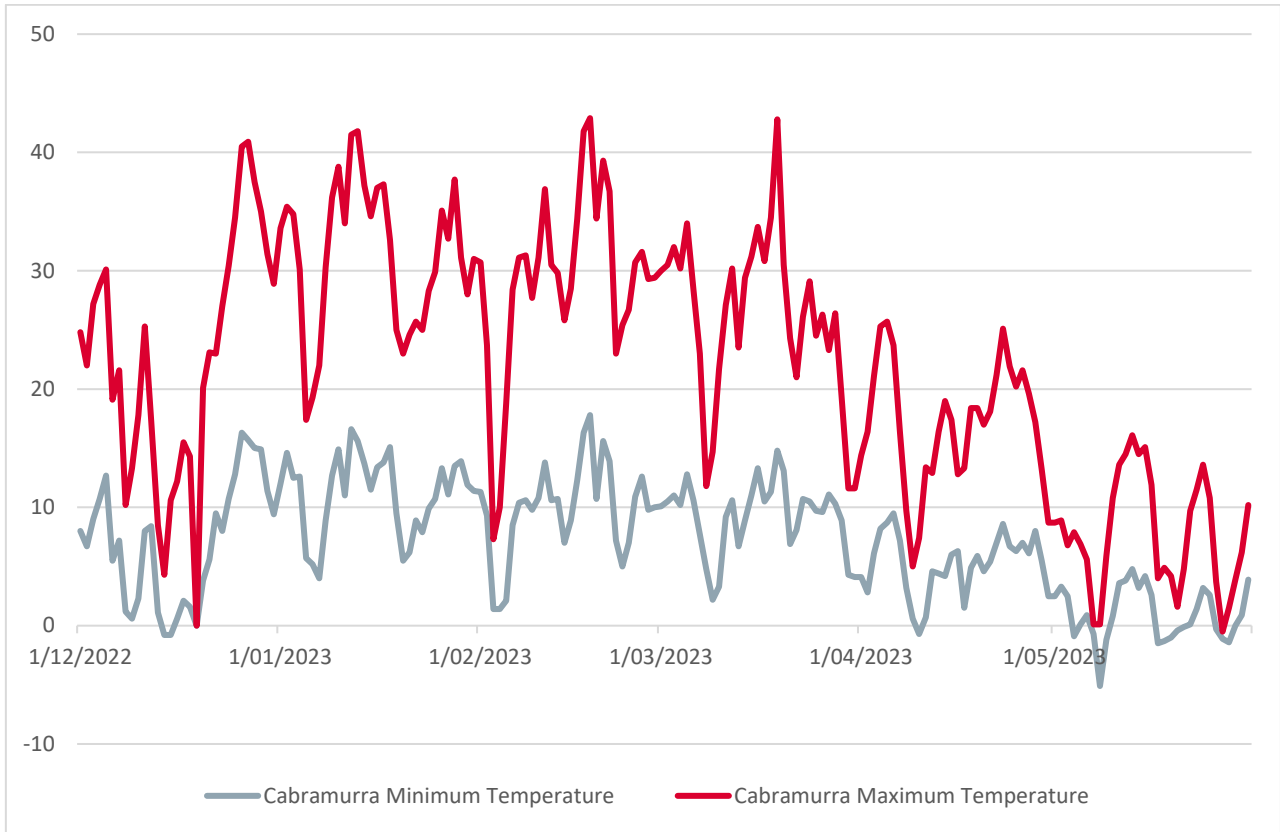


Figure 2-2: Cabramurra (Marica) - Minimum and Maximum Temperatures

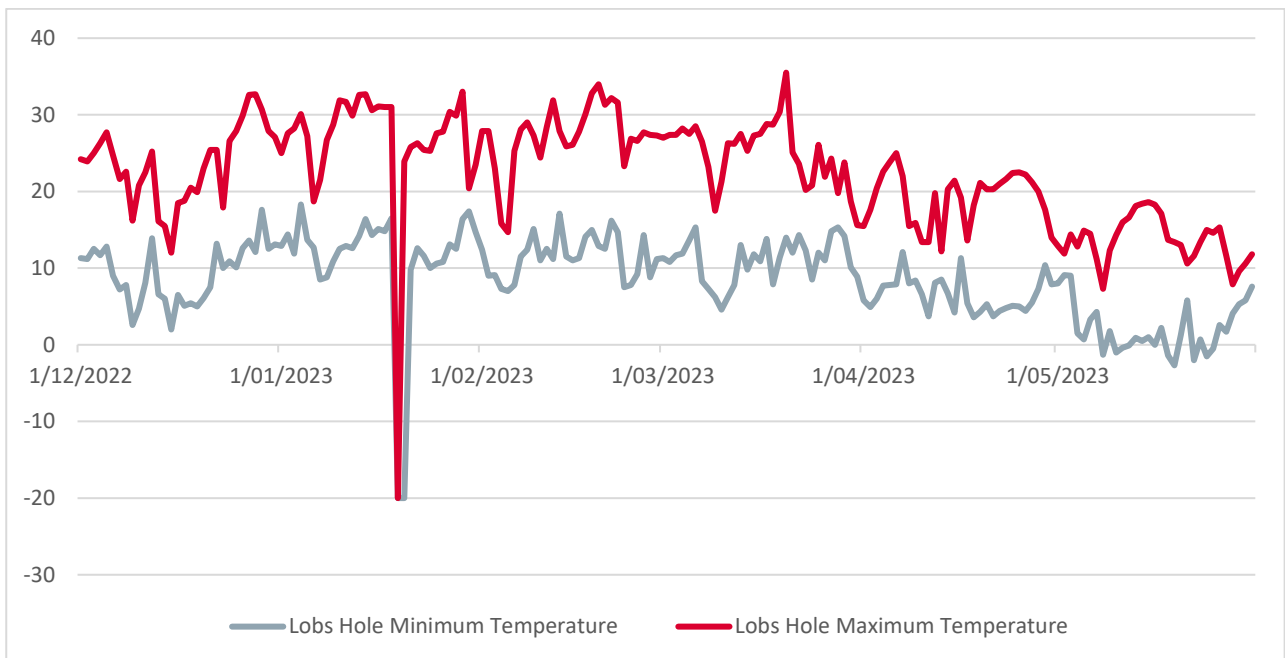


Figure 2-3: Lobs Hole - Minimum and Maximum Temperatures

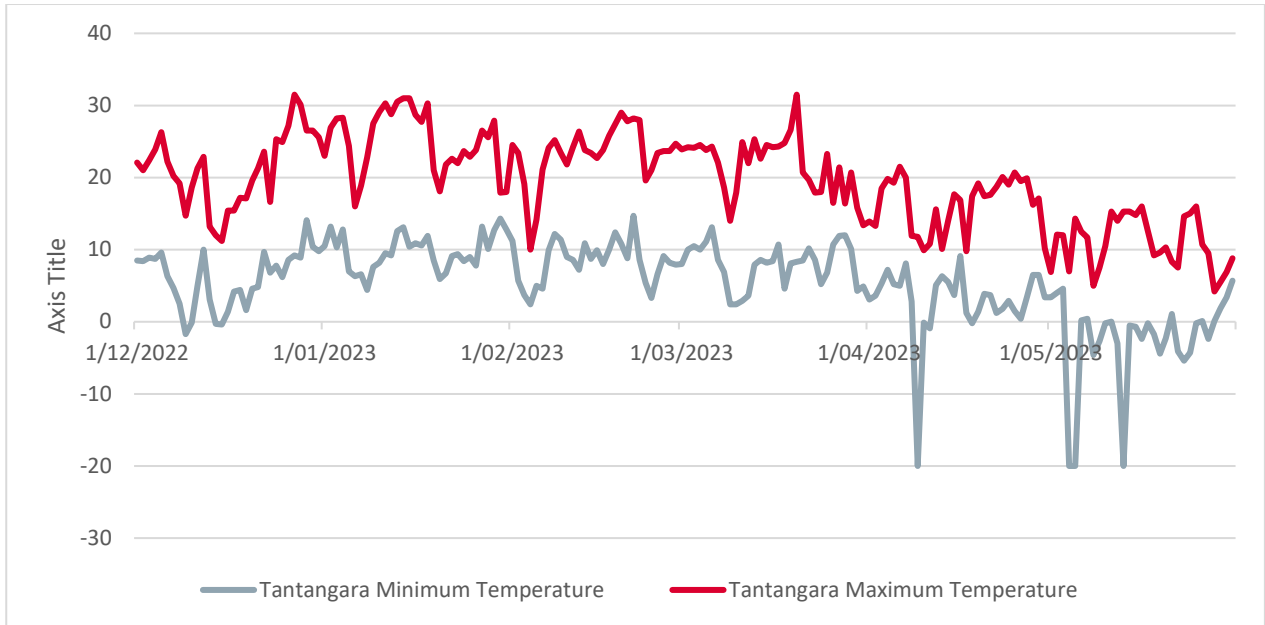


Figure 2-4: Tantangara - Minimum and Maximum Temperatures

3. MONITORING RESULTS

3.1. December 2022 – May 2023 Water Quality Monitoring

Water Quality Monitoring results are provided in **Appendix B** and **C** for monthly EPL monitoring rounds. The sampling work was performed in accordance with:

- S2-FGJV-ENV-PLN-0010 Water Management Plan – Snowy 2.0 Main Works
- AS 5667:1 - Water quality- Sampling: Guidance on the design of sampling programs and the preservation and handling of samples;
- AS 5667:4 - Water quality - Sampling: Guidance on the sampling of lakes, natural and man made;
- AS 5667:6 - Water quality - Sampling: Guidance on the sampling of rivers and streams; and
- AS 5667:11 - Water quality- Sampling: Guidance on the sampling of groundwater.

3.2. In situ Monitoring

Under Section 6 Condition R4.1, the EPA must be notified of any *in situ* pollution concentrations that exceed, or are outside the range of, relevant water quality trigger values within licenced premises (Condition R4.1 a) or at the designated EPL monitoring points (Condition R4.1 b).

Table 3-1: Number of Concentrations Exceeding or Outside the Range of Water Quality Objectives for Monthly EPL Monitoring

Water Quality Objectives	DO (%)	EC (µS/cm)	pH	Turbidity (NTU)	Comment
Range	90-110	>350 surface / groundwater >30 reservoirs	6.5-8	>25	
2022					
Dec	12	0	7	12	The DO saturation was low in the river and watercourses in December 2022. However this is consistent from natural variations and therefore not attribute to construction related impacts. Most EC readings were within WQO range for the month. The pH was slightly elevated however the level of elevation is consistent with upstream variations and are therefore considered to be natural variation.
2023					
Jan	19	0	6	11	The exceedances in DO are related to changes in water temperature upstream and downstream and periods of heavy rainfall. DO results are consistent with historical results for EPL 10 and EPL11. There were only a few EC exceedances for the month. pH exceedances are minor and are unlikely to be the result of background impacts. Turbidity exceedances are reflective of rainfall events effecting runoff.
Feb	17	5	25	17	The DO exceedances are minor in surface waterways. The DO was recorded outside the range on a few occasions in the reservoir likely due to an algal bloom. There are some EC exceedances for groundwater, however within the historical variation for EPL points. pH and turbidity variations are reflective of historical variations and heavy rainfall conditions.
March	21	6	12	18	The DO and pH remain within the historical variations for most locations. Most upstream data is comparable with EPL results. EC exceedances are reflective of historical variations in data. Some turbidity exceedances are reflective of rainfall events. Variations and exceedances are reflective of natural historical changes.

April	21	7	10	7	The DO and pH variations are consistent with historical and upstream data. The EC exceedances were found at upstream locations only. Most turbidity results were minor, below 40 NTU and consistent with historical data. EPL 24 recorded an NTU of 100, reflective of conditions following a rain event.
May	17	9	4	12	There were a few exceedances for DO and turbidity due to runoff from rainfall events. Generally exceedances were minor and mostly related to upstream

All *in situ* monitoring results are presented in **Appendix B – Field Monitoring Data**.

Dissolved Oxygen and Electrical Conductivity was variable for the last 6 months, with Electrical Conductivity being considerably low for most months. The Dissolved Oxygen was high but reflective of the change in season from low to high temperatures and the presence of heavier rainfall.

After rainfall, it is expected that the waterbodies (rivers and reservoirs) within the project would see an increase in Electrical Conductivity concentrations, which is consistent with the in-situ monitoring results for the 6-month period. Turbidity is also known to vary significantly following a rain event, with sampling in December, January, February, March, April and May occurring during or directly following a significant rain event, which would account for the higher turbidity readings. pH is also variable within the project EPL sampling locations with exceedances generally marginally lower than the WQO.

Throughout the reporting period, rainfall events above the design criteria were experienced at all sites (Figure 2-1), including:

- 12th – 16th December 2022 (59.0 mm – Lobs Hole, 53mm – Tantangara)
- 15th - 20th January 2023 (74.6 mm - Tantangara)
- 29th January – 2nd February 2023 (49.8 mm - Lobs Hole, 52.8 mm – Tantangara)
- 9th - 14th of February (35.4 mm - Lobs Hole)
- 22nd – 26th March 2023 (32 mm – Lobs Hole, 44.4 mm – Tantangara)
- 27th – 31st March 2023 (57.4 mm – Lobs Hole, 57.0 mm – Tantangara)
- 29th April - 2nd May 2023 (46.4 mm – Lobs Hole)
- 30th April – 4th May 2023 (61.6 mm Tantangara)

During high rainfall events which resulted in basin overtopping, water samples were collected for comprehensive water testing and the EPA were notified of the releases in accordance with R4.1 of EPL 21266.

3.3. Groundwater Monitoring

3.3.1. EPL 1, 2, 4, 25

Groundwater sampling was undertaken in February 2023 and May 2023 for EPL locations 1, 2, 4 and 25. Groundwater piezometer data is currently being processed for the Q1 and Q2 period. This report will be updated once the groundwater data is finalised.

Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, Laboratory analytes in February 2023 and May 2023 were less than, or within, relevant water quality trigger values except for:

- Nitrogen (total);

- Copper (dissolved);
- Iron (dissolved);
- Lead (dissolved);
- Nickel (dissolved);
- Zinc (dissolved).

The metals exceedances are representative of natural conditions as these metals occur naturally within the project area. The minor metals exceedances for zinc, iron, nickel and copper fall within standard fluctuations in this well, and the iron exceedance remains consistent with previous quarterly results. The nutrient exceedances fall within standard variation for these wells.

3.3.2. GF01

Groundwater sampling at GF01 was undertaken during February, March, April and May 2023.

Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, Laboratory analytes between February 2023 and May 2023 were less than, or within, relevant water quality trigger values except for:

- Ammonia as N;
- Nitrogen (total);
- Iron;
- Copper;
- Reactive and total phosphorus;
- Aluminium;
- Chromium;
- Copper;
- Lead;
- Zinc.

GF01 sampling locations are monitored on a weekly basis for in-situ parameters and monthly for comprehensive parameters. Sampling at GF01 has recently commenced since installation of the groundwater monitoring bores. Exceedances including phosphorus, ammonia, nitrogen, TSS, aluminium, copper, lead, zinc, oil and grease were suspected to be a result of a fault from the installation process and is therefore, not representative of background conditions. The respective well has been purged with continual weekly monitoring on in-situ parameters, however did not improve. This well was decommissioned and reinstalled. Exceedances in iron which are consistent with historical data trends. Copper levels recorded marginal exceedances. Other analytes were within the WQO range. The TARP has been triggered for nutrient exceedances.

3.4. Surface Water

Surface water monitoring has been split up into:

- Talbingo and Tantangara Reservoirs;
- Lobs Hole;
- Tantangara; and

- Marica and Rock Forest.

3.4.1. Talbingo and Tantangara Reservoirs

Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, laboratory analytes in December 2022 to May 2023 were less than, or within, relevant water quality trigger values except for:

- Nitrite + Nitrate as N;
- Nitrogen;
- Aluminium (dissolved);
- Copper (dissolved);
- Chromium;
- Cyanide; and
- Iron;
- Zinc (dissolved).

The in situ samples were generally compliant the WQOs. Those that did exceed were only minor and remain within historical variation. Elevated nutrient concentrations are likely a result of algae blooms in the reservoirs and/or decomposing plant material releasing nutrients. These exceedances remain within historical variations. Dissolved Oxygen, Electrical Conductivity and Turbidity exceedances were consistent across the project, upstream and downstream which is likely attributed to varying river flows. Metal concentrations, including aluminium, zinc, and iron that exceeded the WQO are consistent with background concentrations, including upstream levels, and are found to naturally occur in soils in the areas. Investigations into oil and grease exceedances determined the laboratory were providing erroneous results. The laboratory was advised an a different laboratory is now being utilised which has resolved this issue. This was further supported by no visible indication of oil and grease were observed during sampling. Increases in nutrients and metals are likely caused by rainfall and runoff due to results exceedance WQOs upstream. The exceedances of the water quality objectives within the Talbingo and Tantangara Reservoirs are not considered to be caused or added to by the ongoing construction works of Snowy 2.0. These exceedances did not trigger the need for further sampling, remedial actions or TARPs.

3.4.2. Lobs Hole Surface Water

The predominant water body within the Lobs hole region is the Yarrangobilly River (**Appendix A**). It along with its tributaries constitute the EPL surface water sampling locations within the Lobs Hole area. Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, laboratory analytes between December 2022 and May 2023 were less than, or within, relevant water quality trigger values except for:

- Nitrite + Nitrate as N;
- Nitrogen (total);
- Arsenic (dissolved)
- Aluminium (dissolved);
- Chromium (dissolved);
- Iron (dissolved);

- Manganese (dissolved);
- Nickel (dissolved);
- Copper (dissolved);
- Lead (dissolved); and
- Zinc (dissolved).

Majority of WQO analytes were within parameters. Exceedances were generally consistent between upstream and downstream results. The more significant exceedances of total Phosphorous at EPL 24 were displaying concentrations that likely originated from biological materials with no evidence of depleted dissolved oxygen, indicating that any eutrophication is unlikely in these water bodies. EPL 24 is often dry and stagnant water leads to exceedances of WQO. Investigations into oil and grease exceedances determined the laboratory were providing erroneous results. The laboratory was advised an a different laboratory is now being utilised which has resolved this issue. This was further supported by no visible indication of oil and grease were observed during sampling. The TARP has been triggered for nutrient exceedances at GF01.

3.4.3. Marica Surface Water

The predominant water body within the Marica are the headwaters of the Eucumbene River (**Appendix A**). Two samples are taken up and downstream of the Snowy 2.0 disturbance areas to make up the EPL sampling locations. Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, sampling results between December 2022 and May 2023 were less than, or within, relevant water quality trigger values with the exception of:

- Nitrogen (total);
- Ammonia as N;
- Phosphorus;
- Lead (dissolved);
- Zinc (dissolved);
- Oil and grease.

The exceedances to the water quality objectives within the Marica surface waters are considered natural in origin and not caused or added to by the ongoing construction works of Snowy 2.0 as results were generally consistent with upstream results. These exceedances did not trigger the need for further sampling, remedial actions, or TARPs.

3.4.4. Tantangara Surface Water

The predominant water bodies within the Tantangara region are the Nungar and Kelly's Plain Creeks (**Appendix A**). They, along with the outflow of the Tantangara Reservoir (behind the dam wall), make up the EPL surface water sampling locations within the Tantangara area. Analyte concentrations that exceed or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, results from monthly EPL sampling between December 2022 and May 2023 were less than, or within, relevant water quality trigger values except for:

- Nitrite + Nitrate as N;
- Nitrite + Nitrate (filtered)

- Cyanide (dissolved);
- Copper (dissolved);
- Iron (dissolved);
- Lead (dissolved);
- Nitrogen (total);
- Aluminium (dissolved);
- Chromium (dissolved); and
- Zinc (dissolved).

Majority of WQO analytes were within parameters. Similarly with the Lobs Hole and Marica surface water EPL sampling points, elevated concentrations above the WQO of metals and nutrients are all likely attributed to natural conditions. Exceedances were generally consistent between upstream and downstream results. Exceedance of ammonia is reflective of conditions following a rain event. Investigations into oil and grease exceedances determined the laboratory were providing erroneous results. The laboratory was advised, and a different laboratory is now being utilised which has resolved this issue. This was further supported by no visible indication of oil and grease were observed during sampling. The exceedances to the water quality objectives within the Tantangara surface waters are not considered to be caused or added to by the ongoing construction works of Snowy 2.0. These exceedances did not trigger the need for further sampling, remedial actions, or TARPs.

3.4.5. Rock Forest Surface Water

The predominant water body within Rock Forest is Cameron's Creek (**Appendix A**). Two samples are taken, up and downstream of the Snowy 2.0 disturbance areas to make up the EPL sampling locations. Analyte concentrations that exceed, or are outside the range of relevant water quality trigger values are presented in **Appendix C**. Generally, results from December 2022 and May 2023 were less than, or within, relevant water quality trigger values with the exception of:

- Ammonia as N;
- Phosphorus;
- Cyanide;
- Nitrogen (total);
- Aluminium (dissolved);
- Iron (dissolved);
- Oil and grease.

The monitoring results demonstrate that the water quality in the Rock Forest has consistency across multiple EPL monitoring events with the exceedances likely to be related to the decades of agricultural use. High nitrogens are likely caused by remanent cow excrement while increased metals can be attributed to standard natural/background concentrations in the surrounding soils. The accumulation of Iron was probably due to increasing rainfall and runoff. The oil and grease exceedances were evident in upstream and downstream locations, indicating the source of this contaminant being related to laboratory issues or from upstream.



The exceedances to the water quality objectives within the Rock Forest surface waters are not caused or added to by the ongoing construction works of Snowy 2.0. These exceedances did not trigger the need for further sampling, remedial actions or TARPs.

4. DISCUSSION

4.1. EPA Notifiable Events

See below the EPA notified events that triggered TARPs to be enacted onsite.

Table 4-1: Events Triggering TARP Implementation and EPA Notification

Date	Location	Event ID	Event	Outcome
02/12/22	Lobs Hole	S2-FGJV-ENV-INC-2172	Sediment basin overtopping	Basins to commence desilting, as planned. Develop a basin maintenance schedule and carry out required maintenance works.
30/01/23	Talbingo	S2-FGJV-ENV-INC-2396	Dilute leachate leaving spoil emplacement Area.	Improvement of basin, including shotcreting. Divert underfill drains into leachate basin. Carry out comprehensive laboratory testing. Install standpipe and pump at GF01.
02/02/23	Ravine Rd	S2-FGJV-ENV-INC-2413	Standpipe left on	Consultation with construction before operating plant or equipment if required to leave running. Drains to be kept free of obstructions and any blockage after construction activities. Environment team to include drain checks during pre-rainfall weekly inspections. Fitters to contact work area supervisor before commencing work in respective areas, and to always remain with pumps if they are required to be left running. Mechanic / fitter to check and service pumps with construction delegate present.
08/04/23	Lobs Hole	S2-FGJV-ENV-INC-2639	Sediment basin overtopping	Environment team to secure additional vacuum trucks from dewatering to support dewatering activities Environment team to liaise with construction to connect additional pump fittings to new basin to enable dewatering Procure additional pumps

4.2. Recommendations

As noted throughout the report, the 6 monthly report for December 2022 to May 2023 will be revised with groundwater information once these results have been received.

Nutrient exceedances are being investigated to determine the source with ongoing sampling at the relevant EPL locations and other locations being undertaken in accordance with the TARP. In accordance with the Surface Water Management Plan, the results from comprehensive water quality monitoring result in actions being implemented at a later time than in situ sampling due to the delay in receiving laboratory results. Considering this, response actions based on the comprehensive monitoring are being undertaken as soon as reasonably practicable. A greater depth of understanding of water quality impacts and impact mechanisms can be gained from the comprehensive monitoring and this information is being applied to establish specific improvements to the water management system. A more efficient method of receiving comprehensive results is being investigated.

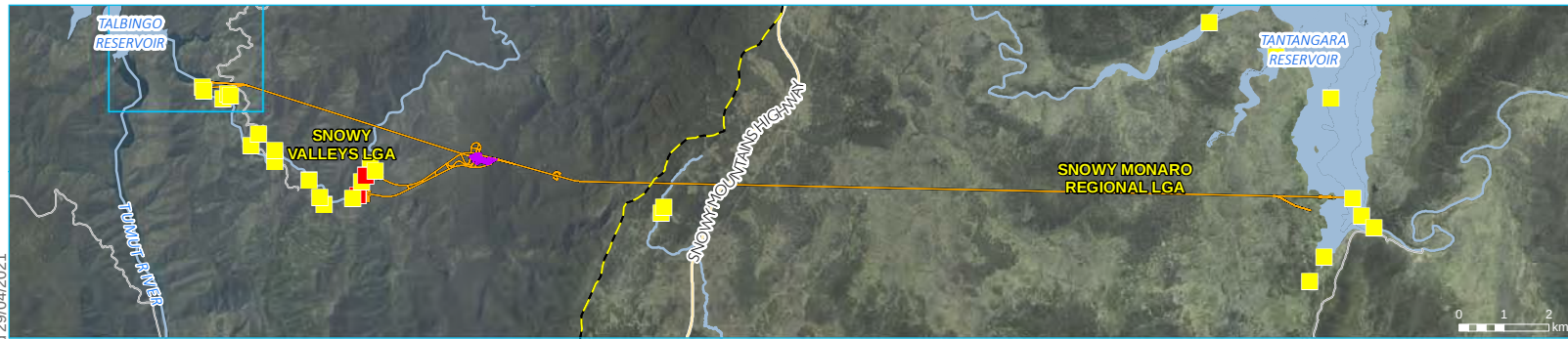
The laboratory was identified as the source of the oil and grease exceedances. To resolve this issue, a different laboratory will be utilised moving forward for water testing. This transition commenced in April and May 2023.

Andrew McLeod from SEEC is a qualified CPESC and will continue carrying out ERS&D assessments across the project to monitor, review and improve water and ERS&D management.

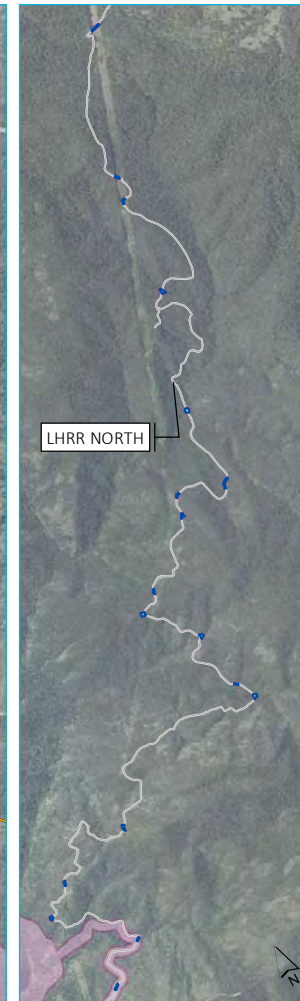
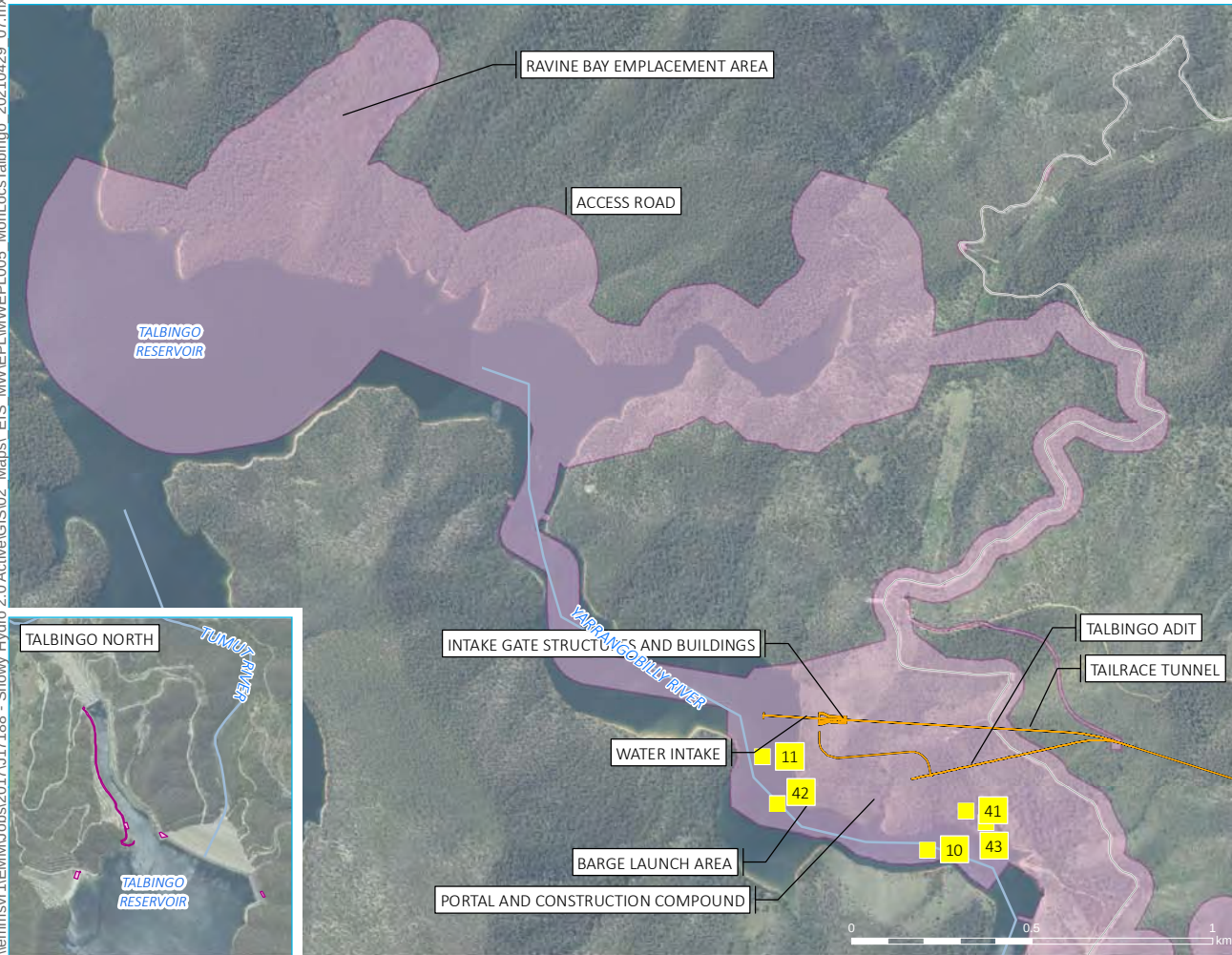


APPENDIX A – SNOWY 2.0 – EPL SAMPLING LOCATIONS

\\emmsvr1\EMMAJ\obs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MWIEPL\MWIEPL005 MonLocsTalbingo 20210429 07.mxd 29/04/2021



- KEY**
- EPL monitoring point
 - Groundwater
 - Surface water
 - Existing environment
 - Main road
 - Local road
 - Watercourse
 - Waterbodies
 - Local government area boundary
 - Snowy 2.0 Main Works operational elements
 - Tunnels, portals, intakes, shafts
 - Power station
 - Licence Premise



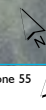
The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Talbingo Reservoir

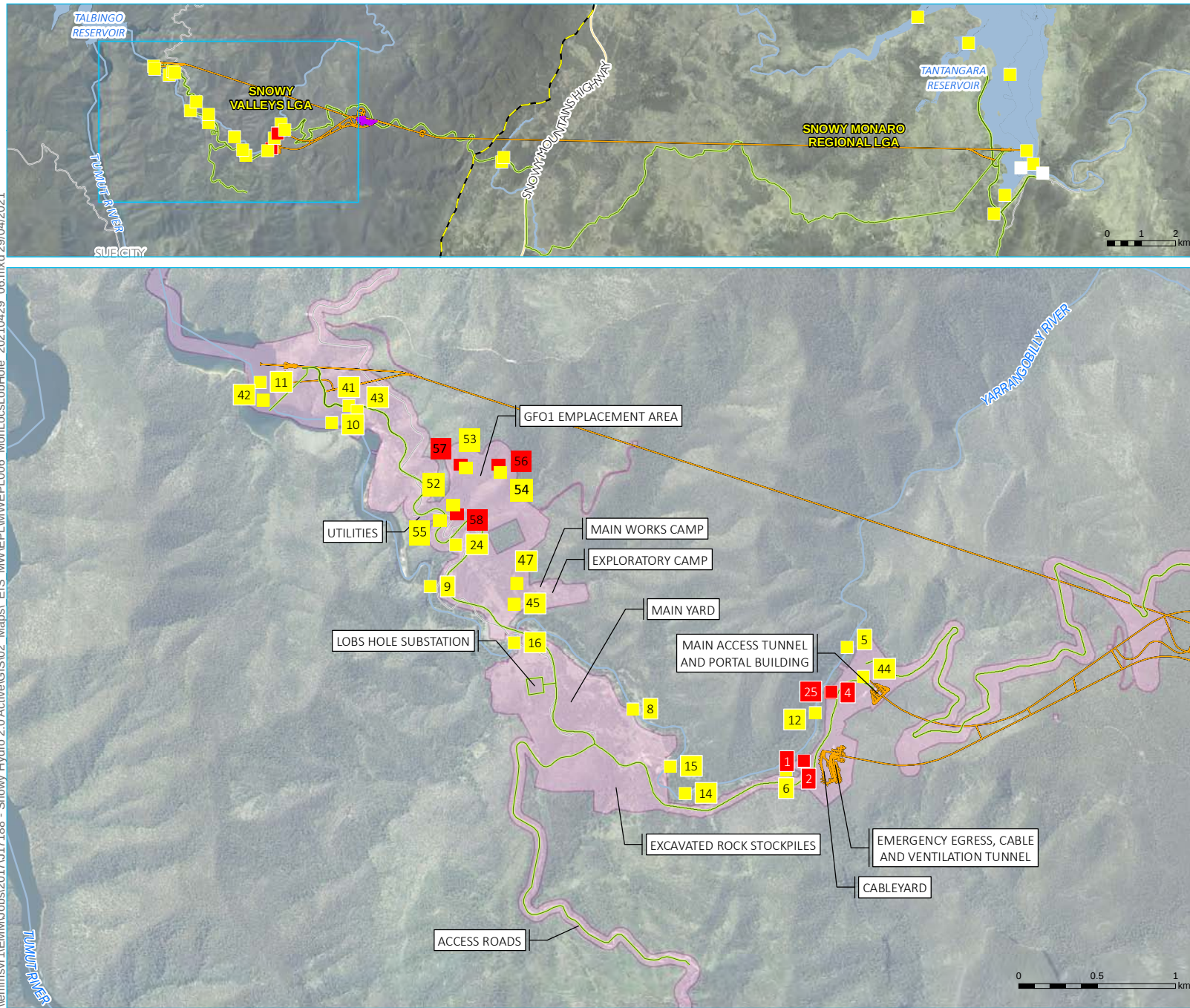
Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55



Snowy 2.0
Main Works
Figure 1

\\lemmsvr1\EMMM\Jobs\2017\17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021



- KEY**
- EPL monitoring point
 - Groundwater
 - Surface water
 - Existing environment
 - Main road
 - Local road
 - Watercourse
 - Waterbodies
 - Local government area boundary
 - Snowy 2.0 Main Works operational elements
 - Tunnels, portals, intakes, shafts
 - Power station
 - Utilities
 - Licence Premise

The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Lobs Hole

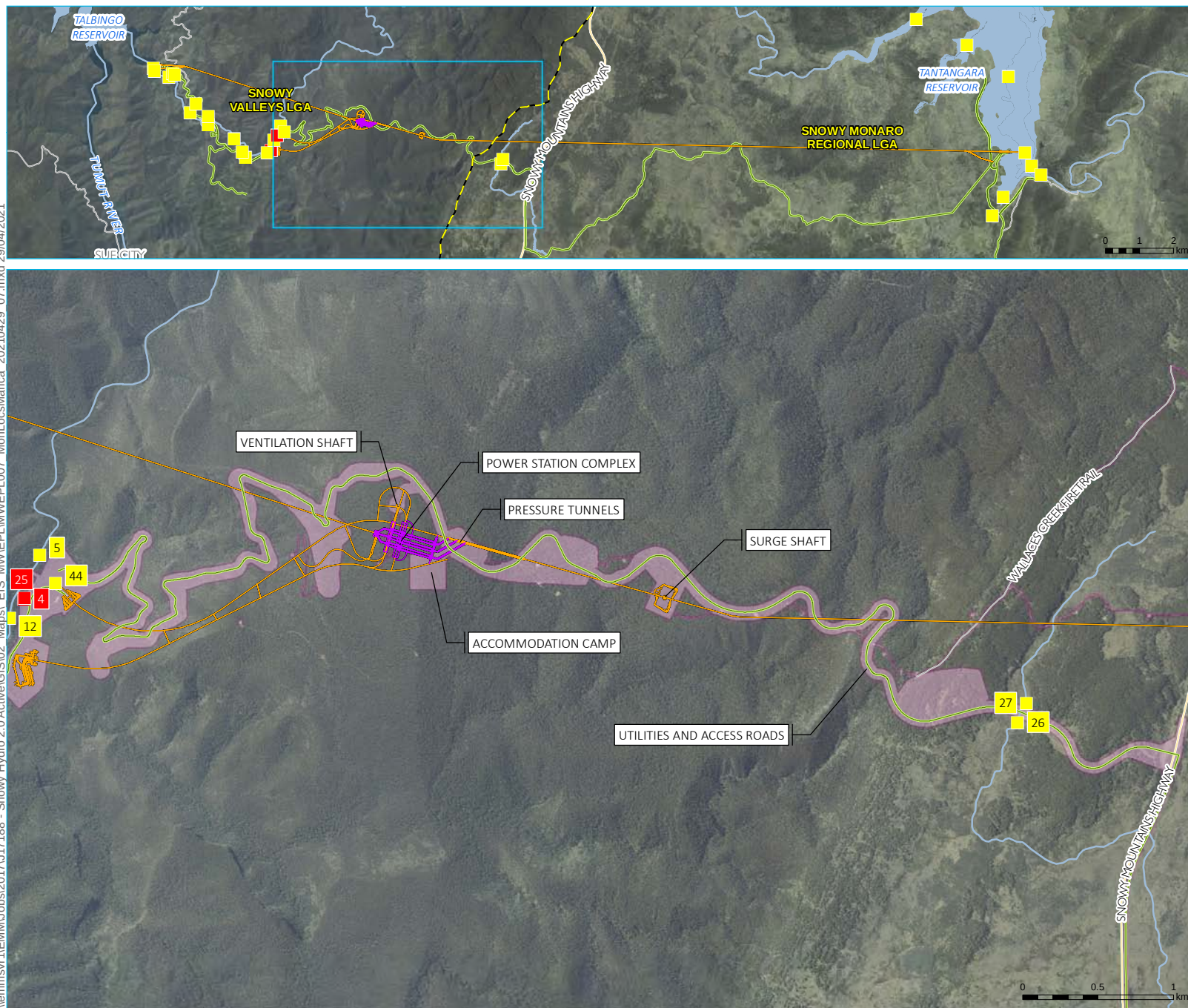
Snowy 2.0
Main Works
Figure 2

Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55



\\lemmsvr1\EMM\Jobs\2017\17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL007 MonLocsMarica 20210429 07.mxd 29/04/2021



- KEY**
- EPL monitoring point
 - Groundwater
 - Surface water
 - Existing environment
 - Main road
 - Local road
 - Watercourse
 - Waterbodies
 - Local government area boundary
 - Snowy 2.0 Main Works operational elements
 - Tunnels, portals, intakes, shafts
 - Power station
 - Utilities
 - Licence Premise

The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Marica

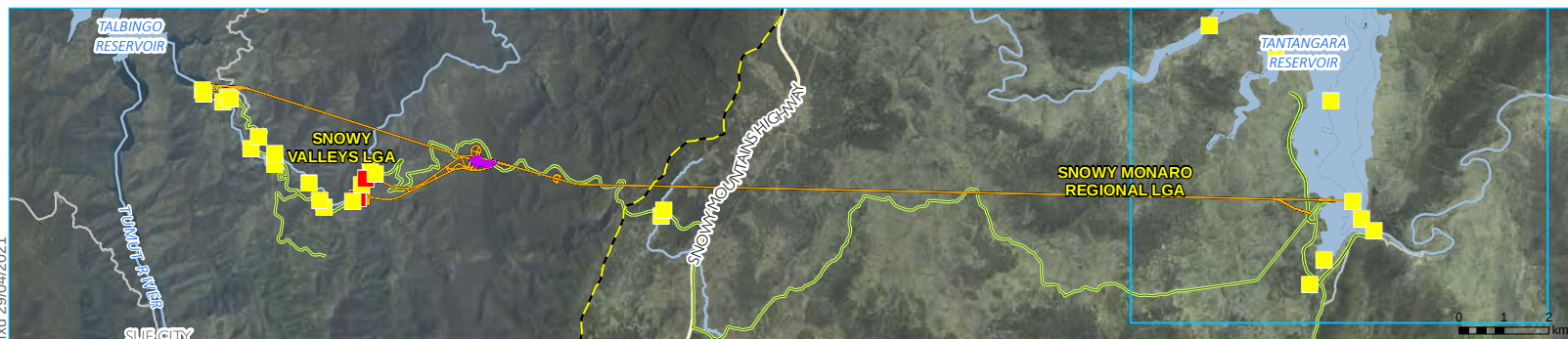
Snowy 2.0
Main Works
Figure 3



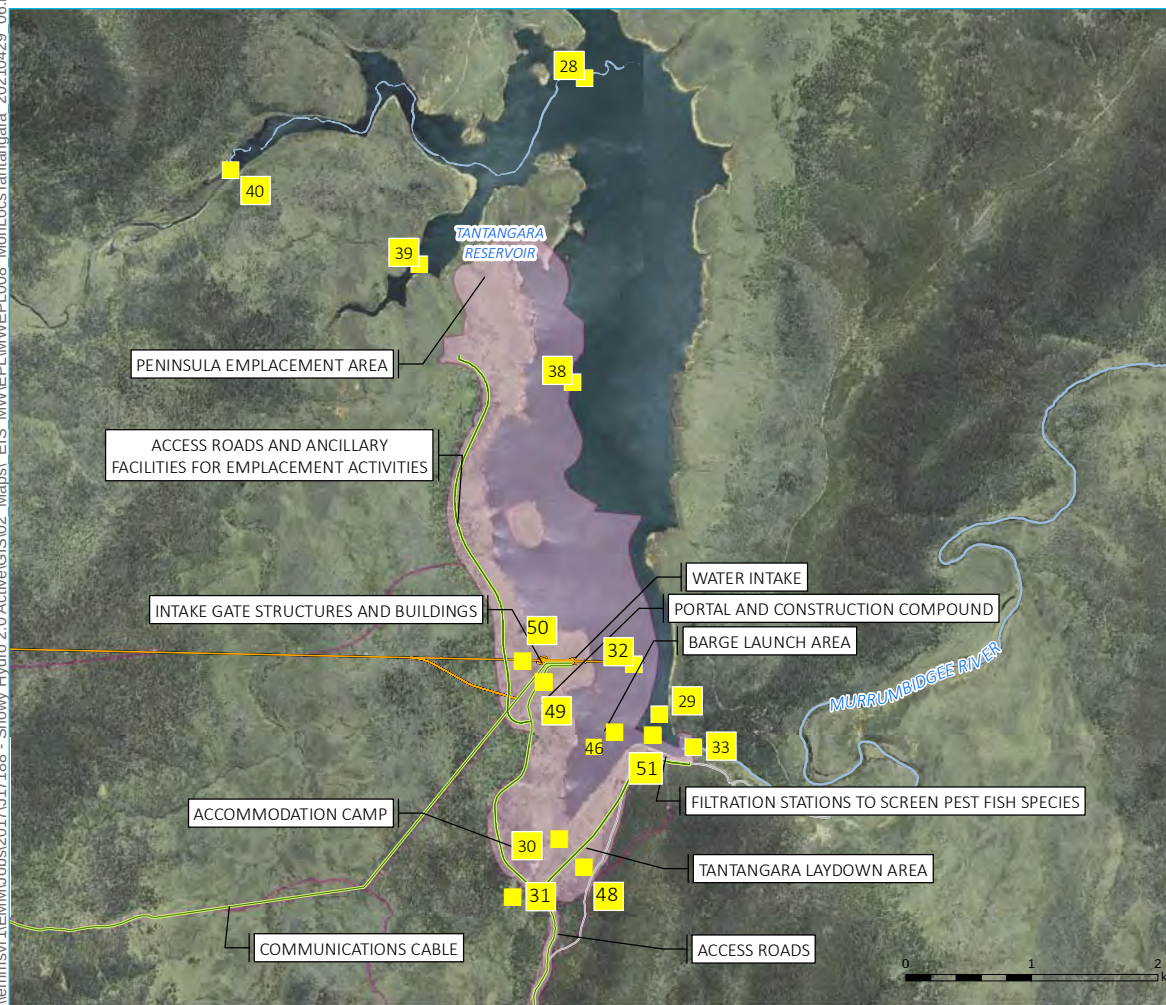
Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55

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- KEY**
- EPL monitoring point
 - Groundwater
 - Surface water
 - Existing environment
 - Main road
 - Local road
 - Watercourse
 - Waterbodies
 - Local government area boundary
 - Snowy 2.0 Main Works operational elements
 - Tunnels, portals, intakes, shafts
 - Power station
 - Utilities
 - Licence Premise



The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Tantangara Reservoir

Snowy 2.0
Main Works
Figure 4

Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55



\\emmsvr1\EMMAJ\obs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL009 MonLocsRockForest_20210429_06.mxd 29/04/2021



Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)



- KEY**
- EPL monitoring point
 - Surface water
 - Existing environment
 - Main road
 - Local road
 - Watercourse
 - Snowy 2.0 Main Works operational elements
 - Tunnels, portals, intakes, shafts
 - Utilities
 - Licence Premise

The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Rock Forest

Snowy 2.0
Main Works
Figure 5





APPENDIX B – IN SITU RESULTS TABLES

December 2022 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring December 2022



Table 1 - Surface Water Quality Data
River and Minor Watercourses

Table 1 - Surface Water Quality Data River and Minor Watercourses			Water Quality Objectives (see note 1)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
3/12/2022, 8:30 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	14.46	72.1	7.36	66	44	7.38	138	0	Sunny weather, clear runny water - turbidity confirmed with the manual turbidity reader	This location is upstream of works and is therefore representative of background conditions. NTU readings was validated using the manual turbidity reader.
3/12/2022, 9:30 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	15.36	91.9	9.2	103	67	7.88	189	0	Sunny weather, clear runny water - turbidity confirmed with the manual turbidity reader	NTU reading was validated using the manual turbidity reader.
3/12/2022, 12:19 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	18.8	69.1	6.44	85	55	8.37	185	0	Clear and sunny. Very clear water.	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location. pH is slightly elevated however no direct source was identified. This will be monitored.
3/12/2022, 12:30 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	19.33	73.1	6.74	83	54	8.32	180	0	Clear and sunny, very clear water	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location. pH is slightly elevated however no direct source was identified. This will be monitored.
3/12/2022, 9:00 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	15.07	70.7	7.12	73	47	7.67	164	0	Clear running water, sunny weather, turbidity confirmed with manual	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location.
3/12/2022, 8:45 am	EPL14	Yarrangobilly River, downstream of road construction areas	16.27	73.2	7.18	87	56	7.73	210	0	Sunny weather, clear runny water - turbidity confirmed with the manual turbidity reader	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location.
3/12/2022, 11:45 am	EPL15	Yarrangobilly River, downstream of road construction areas	16.61	83.8	8.16	76	49	8.27	202	0	-	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location. pH is slightly elevated however no direct source was identified. This will be monitored.
3/12/2022, 11:45 am	EPL16	Yarrangobilly River, downstream of road construction areas	18.87	65	6.04	77	50	8.25	196	0	Clear and sunny. Very clear water.	NTU reading was validated using the manual turbidity reader. DO is representative of background conditions for December 2022 and is within range of historical results at this location. pH is slightly elevated however no direct source was identified. This will be monitored.
3/12/2022, 2:09 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	21.58	60.2	5.3	86	56	7.41	153	39.2	Clear and sunny.	DO and pH are representative of background conditions for December 2022 and is within range of historical results at this location.
2/12/2022, 3:45 pm	EPL26	Eucumbene River downstream of Marica Road	13.9	99.4	10.3	23.5	19.5	7.27	-76.6	4.55	-	-
2/12/2022, 3:48 pm	EPL27	Eucumbene River upstream of Marica Road	14	90.6	9.3	23.6	19.4	7.55	-114.2	3.47	-	This location is upstream of works and is therefore representative of background conditions.
4/12/2022, 3:50 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	10.2	90.5	10.2	16.5	14.9	7.51	-54.7	4.58	-	-
4/12/2022, 3:52 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	10.3	90.2	10.3	17.6	15.9	7.55	-61.8	6.34	-	-
3/12/2022, 3:45 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	17.5	82.5	7.9	22.5	17	6.80	-54.3	2.22	-	DO is generally representative of background conditions for December 2022 and is within range of historical results at this location.
3/12/2022, 3:07 pm	EPL34	Nungar Creek, upstream of Tantangara Road	18.9	91.5	8.5	14.2	10.5	6.76	-44.3	4	Strong flow fine weather	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 3:12 pm	EPL35	Nungar Creek, downstream of Tantangara Road	19	93.9	8.7	14.3	10.5	6.89	-71.6	4.27	-	-
3/12/2022, 2:19 pm	EPL36	Camerons Creek, upstream of works in Rock Forest	21.8	70.1	6.2	46.8	32.4	6.91	-109.1	3.48	Fine weather steady flow clear	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 2:27 pm	EPL37	Camerons Creek, downstream of works in Rock Forest	22.5	89	7.7	47.2	32.3	6.89	-69.7	5.47	-	DO is generally representative of background conditions for Decemeber 2022 and is within range of historical results at this location.

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Table 2 - Reservoir Water Quality Data Talbingo and Tantangara Reservoirs			Water Quality Objectives (see note 2)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
4/12/2022, 12:35 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	23.19	93.4	7.99	59	38	8.1	143	1	-	pH is slightly elevated however no direct source was identified. This will be monitored.
4/12/2022, 9:23 am	EPL11	Talbingo Reservoir, downstream of outlet	21.8	100.5	8.82	57	37	7.8	130	0	-	NTU reading was validated using the manual turbidity reader.
3/12/2022, 10:25 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	16.8	90.7	8.8	17.8	13.7	7.0	5.0	2.8	-	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 11:10 am	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	16.9	94.4	9.1	17.6	13.5	7.1	80.7	2.6	-	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 10:59 am	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	16.9	94.4	9.2	17.5	13.5	7.6	101.7	2.5	-	-
3/12/2022, 10:50 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	16.6	93.8	9.1	17.6	13.6	7.3	64.6	2.2	-	-
3/12/2022, 9:29 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	16.6	76	7.4	16.0	12.4	7.5	36.1	3.3	Clear low wind sunny	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 9:53 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	15.8	90.8	9.0	19.5	15.4	7.4	46.8	2.6	-	This location is upstream of works and is therefore representative of background conditions.
3/12/2022, 11:16 am	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	16.9	94.2	9.1	17.6	13.5	7.4	114.0	2.0	-	-

Table 3 - Treated Water Quality Data *Talbingo*

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	700	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
4/12/2022, 3:50 pm	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	24.83	57.7	4.77	654	419	9.48	195	144	No discharge to Talbingo Reservoir.	Exceedances due to continual vairability in water quality arriving at the plant. Changes made to the plant to address this vairability and
5/12/2022, 10:00 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	21.64	95.9	8.43	371	241	8.31	567	139	Re-tested on 5/12/2022	reach WQO. No was being discharged to the reservoir at the time of sampling.

Table 4 - Treated Water Quality Data
Tantangara

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
27/12/2022, 9:15 am	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	17.1	36.2	3.5	26	19.50	8.0	69.5	1.6	-	No was being discharged to the reservoir at the time of sampling.

Notes:

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

December 2022 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring January 2023

Table 1 - Surface Water Quality Data
River and Minor Watercourses

Water Quality Objectives (see note 1)												
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)					
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25					
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
7/1/2023, 9:14 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	13.92	93.5	9.65	84	54	7.59	87	0	Clear water, moderate flow, moderate water level, no odours,	This location is upstream of works and is therefore representative of background conditions.
7/1/2023, 9:52 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	12.73	86.5	9.17	95	62	8.00	144	51.4	Manual turb taken, moderate water level, moderate flow, no odours, brown turbid water.	These exceedances remain within historical variation for this EPL location.
7/1/2023, 11:45 am	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	18.06	98.9	9.35	91	59	7.93	155	3.1	High flow, moderate water level, no odours, clear water.	-
7/1/2023, 2:08 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	20.57	93.2	8.37	87	57	8.15	132	0	Sunny day, no rain last 24 hrs, low flow	Turbidity was so low as the river was very clear and pH was only a minor exceedance indicating no significant impact on the river.
7/1/2023, 9:32 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	14.15	94.6	9.71	84	54	7.90	136	5	Manual turbidity taken, no odours, moderate flow, clear water, moderate water level	-
7/1/2023, 11:05 am	EPL14	Yarrangobilly River, downstream of road construction areas	15.72	98.6	9.79	84	55	7.88	147	0.5	Manual turb taken, low flow, low water level, no distinct odours, clear water.	Turbidity was low as the river was very clear.
7/1/2023, 11:24 am	EPL15	Yarrangobilly River, downstream of road construction areas	17.08	82.1	7.92	86	56	7.97	151	1.4	Manual turb completed, moderate water level, clear, moderate flow, no odours	Turbidity was so low as the river was very clear and DO is only slightly below the WQO range indicating so significant impact to the river.
7/1/2023, 2:46 pm	EPL16	Yarrangobilly River, downstream of road construction areas	8.11	99	8.79	86	56	8.10	135	0	Very clear water, low flow, no rain last 24 hrs	Turbidity was so low as the river was very clear and pH was only a minor exceedance indicating no significant impact on the river.
19/1/2023, 7:41 am	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	19.08	80.2	7.43	71	50	6.80	-7	477	After heavy rain fall.	The turbidity exceedance was due to the sampling being collected after a period of heavy rainfall and after the gully had been dry for weeks.
15/1/2023, 2:26 pm	EPL26	Eucumbene River downstream of Marica Road	17.85	128	12.2	-	21	6.86	115.0	59.9	Fine, sunny. Sampled following storm and heavy rainfall previous evening.	A spike in turbidity is consistent with expected conditions following rainfall with elevated DO also consistent with rainfall.
15/1/2023, 2:32 pm	EPL27	Eucumbene River upstream of Marica Road	18.37	102.8	9.7	-	21	6.79	127.0	76.3	Sampled following storm & heavy rainfall the previous evening.	This location is upstream of works and is therefore representative of background conditions.
15/1/2023, 4:28 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	21.85	138.5	12.2	-	18	6.34	177.0	44.6	Sampled following rainfall earlier in day.	A spike in turbidity is consistent with expected conditions following rainfall with elevated DO also consistent with rainfall. pH exceedance is marginal and of no concern.
16/1/2023, 7:24 am	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	12.66	127.6	13.6	-	16	6.58	161.0	20.3	-	DO exceedances are minor and likely correlate with flowing water and lower temperatures.
14/1/2023, 9:10 am	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	18.17	133.1	12.6	-	0.12	6.66	156.0	2.54	-	DO exceedances are minor and likely correlate with flowing water and lower temperatures.
14/1/2023, 8:59 am	EPL34	Nungar Creek, upstream of Tantangara Road	16.34	122.9	12.0	-	0.14	7.57	79.0	9.59	-	This location is upstream of works and is therefore representative of background conditions.
14/1/2023, 9:03 am	EPL35	Nungar Creek, downstream of Tantangara Road	16.17	179.9	17.7	-	0.12	7.36	94.0	8.26	-	The dissolved oxygen concentration is consistent with the upstream location and indicates no impact from the project.
14/1/2023, 9:06 am	EPL36	Camerons Creek, upstream of works in Rock Forest	15.84	164.4	16.3	-	0.29	7.40	120.0	13.83	-	This location is upstream of works and is therefore representative of background conditions.
14/1/2023, 9:08 am	EPL37	Camerons Creek, downstream of works in Rock Forest	16.02	252.2	24.9	-	0.29	7.18	137.0	21.2	-	The DO exceedance correlates with lower temperatures in Camerons Creek, where colder temperatures increases the amount of DO water can hold.

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Water Quality Objectives (see note 2)												
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)					
-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20					
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
8/1/2023, 10:51 am	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	21.16	54.6	4.85	64	42	7.8	190	7.2	Turbid water, brown colour, storm caused the colour	This DO exceedance value is consistent with historical results for EPL10 and is unlikely due to project related impacts.
8/1/2023, 10:30 am	EPL11	Talbingo Reservoir, downstream of outlet	20.98	59.3	5.49	62	40	7.9	166	14.4	Brown colour, turbid water, storm caused the turbid colour in the water	This DO exceedance value is consistent with historical results for EPL11 and is unlikely a result of project related impacts.
12/1/2023, 3:09 pm	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	19.45	161.2	14.8	-	13	6.5	116.0	4.7	Horiba 1 used to sample - no EC reading available. Fine, sunny.	This location is upstream of works and is therefore representative of background conditions.
12/1/2023, 4:44 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	21.07	89.6	8.0	-	12	6.4	192.0	3.6	No EC reading available on equipment. Fine, sunny.	This location is upstream of works and is therefore representative of background conditions.
12/1/2023, 4:26 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	20.86	99.9	8.9	-	12	6.8	167.0	3.8	No EC reading available on equipment. Fine, sunny.	-
12/1/2023, 3:17 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	20.28	143.9	13.0	-	12	6.9	153.0	3.1	No EC reading available on equipment. Fine, sunny.	Variation is common for this location as tide and reservoir levels could impact DO.
12/1/2023, 2:39 pm	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	19.41	161.7	14.9	-	13	6.8	-	7.4	No EC reading available on equipment. Fine, sunny.	Variation is common for this location as tide and reservoir levels could impact DO.
12/1/2023, 2:54 pm	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	19.4	168.3	15.5	-	13	6.5	-	8.9	No EC reading available on equipment. Fine, sunny.	This location is upstream of works and is therefore representative of background conditions.
12/1/2023, 4:57 pm	EPL46	Tantangara Reservoir	21.07	90.9	8.1	-	12	6.4	-	3.6	No EC reading available on equipment. Fine, sunny.	The pH exceedance is minor and is unlikely to be indicative of project related impacts.
12/1/2023, 4:49 pm	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	20.99	188.2	16.8	-	12	6.5	-	3.5	No EC reading available on equipment. Fine, sunny.	-

Table 3 - Treated Water Quality Data *Talbingo*

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	700	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
9/1/2023, 7:50 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	19.01	104.2	9.66	228	147	8.56	154	27.3	-	No discharge was occurring at the time of sampling. Water is not discharged from the RO unless it meets water quality objectives. Therefore this sample with minor exceedances in pH and turbidity was adjusted to fall within WQ prior to discharging.

Table 4 - Treated Water Quality Data *Tantangara*

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
13/1/2023, 8:57 am	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	21.5	173.0	15.1	-	0.05	7.3	117.0	0.5	No EC reading available on equipment.	No discharge was occurring at the time of sampling.

Notes:

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

February 2023 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring February 2023

Table 1 - Surface Water Quality Data
River and Minor Watercourses

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
8/2/2023, 8:45 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	16.52	94.9	9.26	100	65	7.64	48	0	Water looks clear, ph has moderate alkalinity, clear sky, no wind	This location is upstream of works and is therefore representative of background conditions.
8/2/2023, 9:40 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	15.34	97.2	9.73	128	83	8.19	104	0	Water clean	pH remains within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 12:06 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	19.79	88.7	8.09	114	74	8.13	117	0	Water flowing, clear water, no odour.	pH and DO remain within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 1:45 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	21.2	92.8	8.24	105	69	8.01	116	0	Clear flowing water, no colour.	pH remains within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 9:17 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	16.67	99.8	9.71	101	66	8.05	52	0	Clear sky, water clean, odourless, no oil and grease.	pH remains within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 10:06 am	EPL14	Yarrangobilly River, downstream of road construction areas	17.1	100.7	9.71	103	67	8.13	116	0	Clear water	pH remains within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 11:32 am	EPL15	Yarrangobilly River, downstream of road construction areas	19.44	85.4	7.85	106	69	8.29	109	0	Clear water, flowing, no odour.	pH and DO remain within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 2:05 pm	EPL16	Yarrangobilly River, downstream of road construction areas	21.06	101.1	9	106	69	8.30	100	0	Clear flowing water, no odour, no colour.	pH remains within historical variation with minor exceedances of the WQO. The river per the field comments was clear during sampling.
8/2/2023, 1:20 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	20.48	72.1	6.49	173	113	6.84	47	223	Water has small flow, cloudy colour.	DO and turbidity remain within historical variation for low water levels during sampling.
3/2/2023, 12:09 pm	EPL26	Eucumbene River downstream of Marica Road	10.85	108	12.0	-	18	7.34	182.0	6.4	-	-
3/2/2023, 12:19 pm	EPL27	Eucumbene River upstream of Marica Road	9.34	-	16.6	-	18	6.76	220.0	5.7	-	This location is upstream of works and is therefore representative of background conditions.
5/2/2023, 3:06 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	18.84	-	13.9	220	15	8.14	127.0	11.4	-	Slightly elevated pH is within historical background ranges but will be monitored.
5/2/2023, 3:16 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	18.6	-	13.9	260	17	8.47	104.0	27.1	-	Slightly elevated pH is within historical background ranges but will be monitored.
5/2/2023, 2:31 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	19.21	-	12.8	230	15	11.15	24.0	6.2	-	The turbidity exceedance were minor and are within historical background ranges. pH will be monitored further though no visible causes or impacts were observed during sampling .
4/2/2023, 3:44 pm	EPL34	Nungar Creek, upstream of Tantangara Road	9.57	-	14.3	140	9	6.42	203.0	10.2	-	This location is upstream of works and is therefore representative of background conditions.
4/2/2023, 3:34 pm	EPL35	Nungar Creek, downstream of Tantangara Road	9.62	-	19.5	140	9	6.16	259.0	10.5	-	pH is consistent with upstream values and historical variation.
4/2/2023, 4:18 pm	EPL36	Camerons Creek, upstream of works in Rock Forest	11.37	94.1	10.3	40	26	6.75	230.0	24	-	This location is upstream of works and is therefore representative of background conditions.
4/2/2023, 1:37 pm	EPL37	Camerons Creek, downstream of works in Rock Forest	10.94	-	12.8	43	28	6.39	234.0	12.3	-	pH is generally consistent with upstream values and is within historical variation.

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Water Quality Objectives (see note 2)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
12/2/2023, 11:18 am	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	23.69	112.9	9.56	82	53	8.8	81	35.2	Clear water, green tinge, no distinct odours, no debris present, no visible sheen	DO, pH, and turbidity are within historical background ranges though there was evidence of an algal bloom.
12/2/2023, 11:39 am	EPL11	Talbingo Reservoir, downstream of outlet	23.77	110.1	9.31	80	52	8.8	91	16.5	Green clear water, fish present, no distinct odour, no sheen	DO and pH are within historical background ranges though there was evidence of an algal bloom.
5/2/2023, 9:03 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	14.41	135.8	13.9	20.0	13	6.5	259.0	10.7	Fine, light breeze.	This location is upstream of works and is therefore representative of background conditions.
5/2/2023, 10:01 am	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	16.41	140.7	13.8	19.0	12	7.4	152.0	6.7	-	This location is upstream of works and is therefore representative of background conditions.
5/2/2023, 9:51 am	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	16.4	129.7	12.7	20.0	13	7.7	182.0	7.8	-	The DO exceedance likely relates to standard fluctuations on Tantangara Reservoir.
5/2/2023, 9:47 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	15.88	84.6	8.4	19.0	12	8.0	169.0	30.4	-	The exceedances are minor and likely relate to standard fluctuations on Tantangara Reservoir which also fall within the same range as upstream locations.
5/2/2023, 9:26 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	12.71	93.5	9.9	20.0	13	6.3	255.0	8.7	-	This location is upstream of works and is therefore representative of background conditions.
5/2/2023, 9:17 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	11.89	169.6	18.3	18.0	12	6.5	257.0	16.9	-	This location is upstream of works and is therefore representative of background conditions.
5/2/2023, 10:23 am	EPL46	Diffuser outlet discharging into Tantangara Reservoir from Tantangara STP/PWTP	16.42	112.7	11.0	18.0	12	7.6	174.0	6.8	-	The DO exceedance is minor and likely relates to standard fluctuations on Tantangara Reservoir.
5/2/2023, 10:14 am	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	16.46	114.6	11.2	18.0	12	8.6	119.0	6.7	-	The DO and pH exceedances for EPL51 are minor and are likely related to standard fluctuations on Tantangara Reservoir. These exceedances also correlate closely with upstream locations.

Table 3 - Treated Water Quality Data

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	700	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
19/2/2023, 3:38 pm	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	26.09	65	5.26	195	127	7.93	336	0	Full reservoir, sunny day, no smell to water	Water discharging at the time of sampling.

Table 4 - Treated Water Quality Data

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
12/2/2023, 2:03 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	17.9	-	-	7	4.72	6.0	388.0	0.6	Technical issue with the water meter. DO unavailable.	Water not discharged at the time of in-situ sampling.

Table 5 - Groundwater Quality Data

Water Quality Objectives (see note 4)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	30 - 350	-	6.5 - 8.0	-	-

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity	Field Comments / Context	Context
2/2/2023, 1:28 pm	EPL1	Wallace Creek Bridge	20.66	30.8	2.76	418	272	7.31	-8	377	-	The EC exceedance falls within historical variation for this well.
2/2/2023, 2:37 pm	EPL2	Wallace Creek Bridge	22.83	10.3	0.89	1070	682	7.66	-152	150	No odour, low turbidity	The EC exceedance falls within historical variation for this well.
7/2/2023, 3:58 pm	EPL4	Portal Access	22.6	14.0	1.21	1,260	807	7.64	-101	1000	Hydrogen sulphide odour. Highly turbid. Brown sediment.	The EC exceedance falls within historical variation for this well.
7/2/2023, 4:17 pm	EPL25	Portal Access	20.4	31.7	2.85	479	311	6.67	-31	1000	Slight hydrogen sulphide odour. Highly turbid, grey sediment.	The EC exceedance falls within historical variation for this well.

Table 6 - Spoil Emplacement Water Quality Data

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
9/2/2023, 1:23 pm	EPL52	GF01 sediment basin	24.72	72.3	6	290.0	189	10.2	14	117	Shotcreting basin	Shotcreting works were ongoing in the basin which accounts for exceedances of pH and turbidity.
9/2/2023, 1:04 pm	EPL53	GF01 surface water upstream east	28.07	60.6	4.74	110	71	8.58	60	247	Very low quantity of water at sampling point. No running water. Sample collected from stagnant water in the drain	The turbidity and low DO exceedances are likely a result of the sample being taken from a stagnant pool of water.
-	EPL54	GF01 surface water upstream west	-	-	-	-	-	-	-	-	No water present	Checked weekly for water, however remained dry for the month of February.
9/2/2023, 1:31 pm	EPL55	GF01 surface water downstream	21.3	70.5		233		7.96	114	787	-	Sampled collected after a rainfall event which typically increases turbidity to above WQ.
18/2/2023, 11:28 am	EPL56	GF01 groundwater upstream east	19.66	22.3	2.02	3770	2410	12.32	-91	78.5	-	There was an error during the install process for this well that has caused these significant exceedances of EC and turbidity.
-	EPL57	GF01 groundwater upstream west	-	-	-	-	-	-	-	-	-	Bore install is not finalised.
18/2/2023, 12:04 pm	EPL58	GF01 groundwater downstream	21.26	21.5	1.9	101	66	6.41	144	16.3	-	Low DO and pH is characteristic of groundwater within the project area

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

Note 4: Water Quality Objective values for groundwater reference the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for pH and electrical conductivity.

March 2023 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring March 2023

Table 1 - Surface Water Quality Data
River and Minor Watercourses

Table 1 - Surface Water Quality Data River and Minor Watercourses			Water Quality Objectives (see note 1)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
4/3/2023, 9:20 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	16.73	123.4	11.98	125	81	7.62	105	0	Clear flowing water, no visible oil and grease, odorless	This location is upstream of works and is therefore representative of background conditions.
4/3/2023, 10:10 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	15.63	119.8	11.92	150	98	7.97	146	0	Clear flowing water, no odor, no visible oil or grease.	DO remains within historical variation for this location and is generally consistent with upstream DO in March.
4/3/2023, 12:35 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	19.77	127.9	11.68	130	85	8.19	139	0	Clear visible flowing water	DO and pH remain within historical variation for this location and are generally consistent with upstream in March.
4/3/2023, 12:55 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	20.13	122.5	11.11	128	83	8.18	140	0	Clear visible flowing water	DO and pH remain within historical variation for this location and are generally consistent with upstream in March.
4/3/2023, 9:50 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	16.98	120.5	11.65	125	81	7.96	139	0	Clear flowing water, no visible oil and grease , no odor.	DO remains within historical variation for this location and is generally consistent with upstream DO in March.
4/3/2023, 10:25 am	EPL14	Yarrangobilly River, downstream of road construction areas	17.56	133.6	12.76	128	83	7.99	138	0	Clear flowing water, no odor	DO remains within historical variation for this location and is generally consistent with upstream DO in March.
4/3/2023, 12:15 pm	EPL15	Yarrangobilly River, downstream of road construction areas	19.66	132.7	12.14	127	83	8.24	134	0		DO and pH remain within historical variation for this location and are generally consistent with upstream in March.
4/3/2023, 1:20 pm	EPL16	Yarrangobilly River, downstream of road construction areas	20.39	131.9	11.9	129	84	8.28	133	0	Clear flowing water	DO and pH remain within historical variation for this location and are generally consistent with upstream in March.
4/03/2023	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	-	-	-	-	-	-	-	-	Gully dry at the time of sampling, no sample collected.	-
1/3/2023, 11:26 am	EPL26	Eucumbene River downstream of Marica Road	12.67	95.8	10.17	33	21	5.10	204	0	Clear water, fast flowing, no odour, no sheen. Sunny, light wind, light cloud cover.	These exceedances remain within historical variation for this location.
1/3/2023, 11:38 am	EPL27	Eucumbene River upstream of Marica Road	12.81	91.3	9.7	34	22	5.78	276	0	Clear and sunny. Clear water, algae growth on bottom of creek. No sheen no odour.	This location is upstream of works and is therefore representative of background conditions.
8/3/2023, 12:46 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	14.98	123.9	12.5	30	20	7.16	127	0.6	-	DO remains within historical variation for this location and is generally consistent with upstream DO in March.
8/3/2023, 1:07 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	15.01	122.7	12.37	25	17	7.21	180	0	-	DO and EC remain within historical variation for this location and are generally consistent with upstream DO in March.
8/3/2023, 12:05 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	12.78	103.2	10.92	26	17	7.00	207	0	-	EC remain within historical variation for this location and are generally consistent with upstream DO in March.
8/3/2023, 10:52 am	EPL34	Nungar Creek, upstream of Tantangara Road	12.58	120.1	12.77	22	14	7.24	203	2.4	-	This location is upstream of works and is therefore representative of background conditions.
8/3/2023, 11:27 am	EPL35	Nungar Creek, downstream of Tantangara Road	11.71	111.6	12.1	21	14	7.08	207	0	-	These exceedances are consistent with upstream readings for March and remain within historical variation for this location.
8/3/2023, 10:16 am	EPL36	Camerons Creek, upstream of works in Rock Forest	11.68	127.1	13.8	47	31	6.49	112.0	23.2	-	This location is upstream of works and is therefore representative of background conditions.
8/3/2023, 10:34 am	EPL37	Camerons Creek, downstream of works in Rock Forest	12.61	129.6	13.8	46	3	7.04	182.0	19.6	-	-

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Table 2 - Reservoir Water Quality Data Talbingo and Tantangara Reservoirs			Water Quality Objectives (see note 2)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
12/3/2023, 11:35 am	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	21.39	108.3	9.58	70	46	8.02	133	8.4	Clear water, no rain, sunny	This exceedance is generally consistent with upstream readings for March and remain within historical variation for this location.
12/3/2023, 11:15 am	EPL11	Talbingo Reservoir, downstream of outlet	21.2	85.7	7.6	63	42	8.04	114	54.1	Clear water, no rain, sunny	These exceedances remain within historical variation for this location.
16/3/2023, 9:35 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	16.9	88.9	8.6	36.0	23	7.74	134.0	3.6		This location is upstream of works and is therefore representative of background conditions.
9/3/2023, 8:29 am	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	15.34	86.6	8.7	23.0	15	6.92	220.0	6.3		This location is upstream of works and is therefore representative of background conditions.
9/3/2023, 8:34 am	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	15.27	91.6	9.2	24.0	16	6.95	212.0	4.8	-	-
16/3/2023, 10:21 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	16.68	71.2	6.9	26.0	17	7.88	171.0	3.2	-	These exceedances remain within historical variation for this location.
9/3/2023, 9:31 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	11.62	91.4	9.9	23.0	15	7.08	206.0	8.0	-	-
9/3/2023, 9:45 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	12.36	97.8	10.5	25.0	16	7.10	212.0	5.3	-	This location is upstream of works and is therefore representative of background conditions.
9/3/2023, 8:08 am	EPL46	Tantangara Reservoir	14.61	88.1	9.0	26.0	17	6.72	183.0	4.5	-	
16/3/2023, 10:49 am	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	17.3	68.8	6.6	24.0	15	7.76	175.0	4.1	-	These exceedances remain within historical variation for this location.

Table 3 - Treated Water Quality Data
Talbingo

Table 3 - Treated Water Quality Data <i>Talbingo</i>			Water Quality Objectives (see note 3)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	-	-	700	-	6.5 - 8.0	-	25		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
15/3/2023, 9:11 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	25.75	57.4	4.68	76	50	8.96	90	52.3	Water collected from RO discharge point. QC01 and QC02taken at this point. No odour or sheen, looks clear.	This exceedance remains within historical variation for this location.

Table 4 - Treated Water Quality Data
Tantangara

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
8/3/2023, 1:55 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	17.3	90.9	8.7	7	0.01	7.02	195.0	0.0	-	-

Table 4 - Surface Water Quality Data
GF01 Surface Water and Groundwater

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
-	EPL52	GF01 sediment basin	-	-	-	-	-	-	-	-	No water to be able to sample.	This location is upstream of works and is therefore representative of background conditions.
-	EPL53	GF01 surface water upstream east	-	-	-	-	-	-	-	-	No flowing water to be able to sample.	-
-	EPL54	GF01 surface water upstream west	-	-	-	-	-	-	-	-	No flowing water to be able to sample.	-
25/3/2023, 3:10 pm	EPL55	GF01 surface water downstream	21.14	73.5	6.53	190	124	7.72	160	243	Brown murky water. Slight flow after ~30mm of rain over a 5 day period. No sheen no odour. Comprehensive sample taken.	Results are representative of surface water in the area subsequent to a rain event. With no water from the Basin impacts are unlikely to result from site activities.
19/3/2023, 8:08 am	EPL56	GF01 groundwater upstream east	14.56	48.3	4.91	520	333	11.75	4	259	No sheen, no odour. Clear colour with visible clumps of grey sediment in hydrasleeve. No rain in previous days. Well was purged on 11/3. SWL: 34.935	There was an error during the install process for this well that has caused these significant exceedances of EC and turbidity however, these values have decresed since February.
-	EPL57	GF01 groundwater upstream west	-	-	-	-	-	-	-	-	-	Bore install is not finalised.
18/3/2023, 2:15 pm	EPL58	GF01 groundwater downstream	22.78	94.9	8.16	1170	79	6.20	157	476	Relatively clear, brown sediment in bottom of hydra sleeve, no odour, no visible sheen. Comprehensive sample collected.	Elevated EC and turbidity will be monitored however do not appear to relate to surface impacts at this time.

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

Note 4: Water Quality Objective values for groundwater reference the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for pH and electrical conductivity.

April 2023 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring April 2023



Table 1 - Surface Water Quality Data
River and Minor Watercourses

Table 1 - Surface Water Quality Data River and Minor Watercourses			Water Quality Objectives (see note 1)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
9/4/2023, 9:30 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	13.74	94.3	9.77	81	53	8.07	85	12.6	Overcast. Clear and fast flowing water, no sheen, no odour.	This location is upstream of works and is therefore representative of background conditions.
9/4/2023, 11:20 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	12.53	89.1	9.48	116	75	8.29	199	6.3	Overcast. Clear with moderate flow, no odour, no sheen.	These minor variations in DO and pH remain within historical ranges for the waterways and are generally consistent with upstream conditions.
9/4/2023, 2:30 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	13.28	87.7	9.18	133	87	8.3	192	11.9	-	These minor variations in DO and pH remain within historical ranges for the waterways and are generally consistent with upstream conditions.
9/4/2023, 3:31 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	13.31	82.6	8.64	84	55	8.2	198	6.5	Cloudy, fast flow.	These minor variations in DO and pH remain within historical ranges for the waterways and are generally consistent with upstream conditions.
9/4/2023, 9:50 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	12.49	77.9	8.3	75	49	7.93	148	13.5	Overcast. Clear, fast flowing water, no sheen, no odour, slightly turbid.	This minor variation in DO remains within historical ranges for the waterways.
9/4/2023, 11:40 am	EPL14	Yarrangobilly River, downstream of road construction areas	12.24	76.1	8.15	80	52	8.14	201	6.3	Fast flowing, overcast, slightly turbid, no sheen, no odour.	These minor variations in DO and pH remain within historical ranges for the waterways and are generally consistent with upstream conditions.
9/4/2023, 12:00 pm	EPL15	Yarrangobilly River, downstream of road construction areas	11.9	90.6	9.78	82	53	8.14	198	7.3	Fast flowing current, clear water, no sheen, no odour. Overcast.	These minor variation in pH remains within historical ranges for the waterways and are generally consistent with upstream conditions.
9/4/2023, 2:55 pm	EPL16	Yarrangobilly River, downstream of road construction areas	13.16	69.7	7.32	85	55	8.13	202	10.4	-	These minor variations in DO and pH remain within historical ranges for the waterways and are generally consistent with upstream conditions.
10/4/2023, 7:25 am	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	14.11	78.5	8.06	156	101	7.01	109	100	Water level is high. Slight grey tint, no smell.	DO and turbidity are consistent with historical ranges at this location.
4/4/2023, 12:16 pm	EPL26	Eucumbene River downstream of Marica Road	11.6	100	10.87	30	19	7.3	177	0	Clear, sunny day. Fast flowing, no visible sheen.	-
4/4/2023, 11:55 am	EPL27	Eucumbene River upstream of Marica Road	11.49	104.4	11.38	30	19	7.46	148	4.2	Clear, sunny day. Slow flowing, no visible sheen	This location is upstream of works and is therefore representative of background conditions.
4/4/2023, 7:16 am	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	9.03	116.3	13.43	54	35	7.35	138	8.8	Clear, sunny day. No visible sheen	This minor variation in pH remains within historical ranges for the waterways and are generally consistent with upstream conditions.
4/4/2023, 7:33 am	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	8.78	118.1	13.72	0	0	7.21	191	7.8	Clear, sunny day. No visible sheen	This location is upstream of works and is therefore representative of background conditions.
4/4/2023, 7:55 am	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	10.71	78	8.66	37	24	6.96	171	10.7	Foggy day. Minimal flow, green tinge.	This minor variation in DO remains within historical ranges for the waterways.
4/4/2023, 9:12 am	EPL34	Nungar Creek, upstream of Tantangara Road	10.33	109.8	12.3	18	11	7.27	169	6	Clear, sunny day. Fast flowing, no visible sheen.	This location is upstream of works and is therefore representative of background conditions.
4/4/2023, 9:24 am	EPL35	Nungar Creek, downstream of Tantangara Road	10.45	109.6	12.24	17	11	7.21	160	7.2	Clear, sunny day. Fast flowing, no visible sheen	These minor variations in DO and EC remain within historical ranges for the waterways and are consistent with upstream conditions.
4/4/2023, 10:04 am	EPL36	Camerons Creek, upstream of works in Rock Forest	10.45	96.7	10.8	43	28	7.07	210.0	16.8	Clear, sunny day. Flowing, no visible sheen, turbid.	This location is upstream of works and is therefore representative of background conditions.
4/4/2023, 10:23 am	EPL37	Camerons Creek, downstream of works in Rock Forest	12.6	102	10.9	44	29	7.34	220.0	16.3	Clear, sunny day. Flowing, no visible sheen, turbid.	-

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Table 2 - Reservoir Water Quality Data Talbingo and Tantangara Reservoirs			Water Quality Objectives (see note 2)									
			Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)		
			-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20		
Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
12/4/2023, 12:00 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	15.83	73.9	7.32	67	43	7.9	270	13.3	Clear water with green tinge, no odours, no sheen present. Overcast, cold	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
12/4/2023, 11:45 am	EPL11	Talbingo Reservoir, downstream of outlet	16	72.4	7.14	69	45	7.92	267	16.9	No sheen present, clear water with green tinge no distinct odours,	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
2/4/2023, 10:51 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	15.43	84.3	8.5	23.0	15	7.4	224.0	6.1	Clear, sunny day. No algae growth.	This location is upstream of works and is therefore representative of background conditions.
2/4/2023, 10:07 am	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	15.77	85.2	8.5	29.0	19	7.3	172.0	7.7	Clear sunny day, visible algae growth on surface	This location is upstream of works and is therefore representative of background conditions.
2/4/2023, 10:25 am	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	16.09	85.4	8.4	26.0	17	7.3	201.0	38.7	Clear, sunny day. Visible algae growth on surface	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
2/4/2023, 10:36 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	16.27	88	8.6	26.0	17	7.4	210.0	7.8	Clear, sunny day. Minimal algae growth below surface.	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
2/4/2023, 11:17 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	14.9	88.6	9.0	24.0	15	7.5	226.0	6.5	Clear, sunny day. No algae.	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
2/4/2023, 11:23 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	14.64	97.9	9.9	22.0	14	7.4	234.0	4.7	Clear, sunny day. No algae visible.	This location is upstream of works and is therefore representative of background conditions.
2/4/2023, 10:14 am	EPL46	Tantangara Reservoir	16.04	84.2	8.3	27.0	18	7.3	187.0	20.7	Clear, sunny day. Visible algae growth on surface.	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works. Turbidity is a minor exceedance.
2/4/2023, 9:56 am	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	15.2	93.2	9.4	34.0	22	7.3	124.0	9.2	Clear sunny day, visible algae growth on water surface	-

Table 3 - Treated Water Quality Data

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	700	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
12/4/2023, 1:00 pm	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	15.78	69.9	6.92	547	350	7.76	335	15.1	Clear water with white particles, sample taken while RO is discharging, no odours, no sheen.	-

Table 4 - Treated Water Quality Data

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
4/4/2023, 4:47 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	16.9	114.3	11.1	210	137.00	5.2	231.0	5.0	-	The EC and pH were marginally outside the WQO range. Discharge was not occurring at the time of sampling.

Table 4 - Surface Water Quality Data

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
7/4/2023, 3:45 pm	EPL52	GF01 sediment basin	17.9	85.4	8.09	559	358	9.1	134	80.3	Overcast with light rain. Basin level low, slightly turbid water. No sheen, no odour.	This location is upstream of works and is therefore representative of background conditions.
-	EPL53	GF01 surface water upstream east	-	-	-	-	-	-	-	-	No water to sample at sampling point.	-
-	EPL54	GF01 surface water upstream west	-	-	-	-	-	-	-	-	No water to sample at sampling point.	-
7/4/2023, 3:53 pm	EPL55	GF01 surface water downstream	16.95	68.2	6.59	243	158	8.03	162	205	Overcast with slight rain. Slight flow of water, sampled from turbid puddle. No sheen no odour.	This location was sampled following rainfall from a slightly flowing puddle which is known to increase turbidity.
7/4/2023, 3:12 pm	EPL56	GF01 groundwater upstream east	16.08	49.5	4.87	566	362	11.48	9	354	Overcast with light rain. No sheen, no odour, brown sediment. SWL: 29.331	This location is upstream of works and is therefore representative of background conditions.
-	EPL57	GF01 groundwater upstream west	-	-	-	-	-	-	-	-	Well not installed yet.	Well was installed at the end of April and will be sampled in the next months monitoring round.
7/4/2023, 3:31 pm	EPL58	GF01 groundwater downstream	16.5	32.9	3.21	274	178	6.27	216	305	SWL: 6.876. Overcast with light rain. No sheen, no odour, brown sediment settled in hydra sleeve.	These exceedances are characteristic of groundwater at GF01.

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

Note 4: Water Quality Objective values for groundwater reference the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for pH and electrical conductivity.

May 2023 EPL 21266 In Situ Water Quality Measurements
EPL Monthly Monitoring May 2023

Table 1 - Surface Water Quality Data
River and Minor Watercourses

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
4/5/2023 9.34am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	8.24	94.3	66.5	57	37	6.60	-18	38.7	Fast flow, clear Sky, fairly clear water	This location is upstream of works and is therefore representative of background conditions.
4/05/2023 8:46	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	7.26	75.6	9.12	63	41	6.83	225	37.8	Fast flow, had a bit of rain recently. More turbid than usual.	These minor exceedances remain within background conditions for the waterways.
4/5/2023, 11:50 am	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	10.66	86.7	9.63	59	38	7.72	230	14.4	QA samples done eurofins + Als. Fast flowing water received due to a bit of rainfall and turbidity higher due to this .	The minor exceedance remain within background conditions for the waterways.
4/5/2023, 12:30 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	10.84	64.6	7.15	52	34	7.51	237	20.4	Als sample was taken. A high flowing level of water seen due to the rainfall.	The minor exceedances remain within background conditions for the waterways.
4/5/2023, 8:26 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	7.84	70	8.33	49	32	6.69	208	37.2	fast flow, water fairly clean, clear sky, some turbidity	These minor exceedances remains within background conditions for this waterway.
4/5/2023, 9:07 am	EPL14	Yarrangobilly River, downstream of road construction areas	7.75	71.1	8.47	51	33	6.82	241	34.3	Fast flow, had a lot of rain recently. More turbid than usual.	These minor exceedances remain within background conditions for the waterways.
4/5/2023, 9:34 am	EPL15	Yarrangobilly River, downstream of road construction areas	8.33	75.8	8.9	50	32	6.86	252	33.3	Fast flow, had a bit of rain recently. Turbidity higher than usual.	These minor exceedances remain within background conditions for the waterways.
4/5/2023, 1:05 pm	EPL16	Yarrangobilly River, downstream of road construction areas	11.25	67.5	7.4	53	34	7.6	198	14.8	-	This minor exceedance remain within background conditions for the waterways.
4/5/2023, 12:45 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	12.72	62.8	6.66	87	57	6.81	210	80.7	High flowing water due to rainfall. ALS sampling taken	Heavy rainfall an runoff causing DO and turbidity exceedances
25/5/2023 12.46pm	EPL26	Eucumbene River downstream of Marica Road	5.71	87.7	11.01	16	10	6.86	267	5.8	Windy, sunny, cold, high flow, low EC	Low EC and DO due to low temperatures
25/5/2023 12.42	EPL27	Eucumbene River upstream of Marica Road	5.85	91.7	11.55	14	9	7.47	249	6.6	Windy,cold,sunny, high flow, low EC	This location is upstream of works and is therefore representative of background conditions.
10/5/2023, 9:37 am	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	7.21	110.6	13.36	33	21	8.05	263	10	Clear sunny day. Fast flowing with no visible sheen.	This location is upstream of works and is therefore representative of background conditions.
10/5/2023, 10:01 am	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	7.06	92.6	11.26	26	17	7.61	283	7.5	Clear sunny day. Fast flowing with no visible sheen.	This location is upstream of works and is therefore representative of background conditions.
10/5/2023, 9:04 am	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	10.75	124	13.75	29	19	8.47	272	5.9	Clear sunny day. Fast flowing and no visible sheen.	This location is upstream of works and is therefore representative of background conditions.
10/5/2023, 1:17 pm	EPL34	Nungar Creek, upstream of Tantangara Road	10.55	107.6	11.98	19	12	7.87	266	9.8	Fast flowing water with no visible sheen. Clear ans sunny day. QA1 and QC1.	This location is upstream of works and is therefore representative of background conditions.
11/5/2023, 9:38 am	EPL35	Nungar Creek, downstream of Tantangara Road	7.64	158.2	18.9	15	10	8.32	245	9.9	Clear sunny day. Fast flowing waterway with np visible sheen	This location is upstream of works and is therefore representative of background conditions.
11/5/2023, 10:58 am	EPL36	Camerons Creek, upstream of works in Rock Forest	9.39	75.3	8.6	43	28	7.14	273.0	61.5	Sunny day. Stagnant water with turbidity. No visible sheen.	This location is upstream of works and is therefore representative of background conditions.
11/5/2023, 11:12 am	EPL37	Camerons Creek, downstream of works in Rock Forest	9.82	103.2	11.7	45	29	7.22	283.0	48.4	QA ROK. Clear sunny day. No visible sheen. Turbid, slow moving water.	

Table 2 - Reservoir Water Quality Data
Talbingo and Tantangara Reservoirs

Water Quality Objectives (see note 2)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	20 - 30	-	6.5 - 8.0	-	1 - 20

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
14/5/2023, 1:20 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	14.21	89.9	9.23	48	31	7.6	199	0	No wind, calm clear water	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
14/5/2023, 12:45 pm	EPL11	Talbingo Reservoir, downstream of outlet	13.49	114.8	11.96	54	35	7.91	147	0	Sunny day, calm water. No wind. Clear water. No smell. No oil or grease visible. QA taken here	DO percentages higher than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
30/5/2023, 12:10 pm	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	7.07	75.1	9.1	20.0	13	7.3	257.0	18.6	Cloudy weather, windy, turbid water, drizzle	This location is upstream of works and is therefore representative of background conditions.
30/5/2023, 1:17 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	8.24	71.2	0.9	27.0	17	7.5	261.0	4.5		This location is upstream of works and is therefore representative of background conditions.
30/5/2023, 1:39 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	7.86	63	7.5	25.0	16	7.4	291.0	0.0	Clear water, overcast, windy	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
2/4/2023, 10:36 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	16.27	88	8.6	26.0	17	7.4	210.0	7.8	Clear, sunny day. Minimal algae growth below surface.	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
30/5/2023, 8:46 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	7.45	135.8	16.3	43.0	27	8.7	163.0	23.5	Windy, rain, clear water	DO percentages higher than the WQO is characteristic of these locations and indicates no impact from ongoing construction works.
30/5/2023, 11:58 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	7.65	107	12.8	21.0	14	7.6	235.0	67.7	Cloudy, windy, slightly turbid	This location is upstream of works and is therefore representative of background conditions.
30/5/2023, 1:27 pm	EPL46	Tantangara Reservoir	7.98	53.5	6.3	25.0	16	7.4	282.0	0.0	QA, EPL46, Clear water, overcast, sunny	DO percentages lower than the WQO is characteristic of these locations and indicates no impact from ongoing construction works. Turbidity is a minor exceedance.
30/5/2023, 1:23 pm	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	8.01	73.1	86.6	26.0	17	7.5	267.0	0.0	Windy, clear water, overcast	-

Table 3 - Treated Water Quality Data
Talbingo

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	700	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
7/5/2023, 11:43 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	13.11	116.2	12.2	380	247	8.23	403	0	Clear water, minimal smell.	-

Table 5 - Treated Water
Tantangara

Water Quality Objectives (see note 3)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	200	-	6.5 - 8.0	-	25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
10/5/2023, 11:58 am	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	12.6	93.8	10.0	129	84.00	7.7	180.0	5.4	-	No exceedances

Table 6 - Surface Water Quality Data
GF01 Surface Water and Groundwater

Water Quality Objectives (see note 1)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	90 - 110	-	30 - 350	-	6.5 - 8.0	-	2 - 25

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)	Field Comments	Context
1/5/2023, 2:15 pm	EPL52	GF01 sediment basin	14.26	70.2	7.18	635	406	8.29	160	340	Cloudy weather, brown coloured water, fairly turbid appearance. About 1/4 level of basin	This location is upstream of works and is therefore representative of background conditions.
-	EPL53	GF01 surface water upstream east	-	-	-	-	-	-	-	-	No water to sample at sampling point.	-
-	EPL54	GF01 surface water upstream west	-	-	-	-	-	-	-	-	No water to sample at sampling point.	-
1/5/2023, 2:30 pm	EPL55	GF01 surface water downstream	15.16	66.7	6.69	361	234	7.55	172	66.7	Fast Flowing water, looks clear, cloudy weather	This location was sampled following rainfall from a slightly flowing puddle which is known to increase turbidity.
2/5/2023, 3:29 pm	EPL56	GF01 groundwater upstream east	13.67	34.3	3.55	825	528	11.75	-6	417	Final reading of contaminated well.	This location is upstream of works and is therefore representative of background conditions.
	EPL57	GF01 groundwater upstream west	-	-	-	-	-	-	-	-	Cannot sample. Bore unfinished.	Well was installed at the end of April and will be sampled in the next months monitoring round.
20/5/2023, 9:13 am	EPL58	GF01 groundwater downstream	13.17	48	5.03	544	348	6.5	260	410	Sulphuric smell. Cloudy weather. Water level 6m 27.5cm.	These exceedances are characteristic of groundwater at GF01.

Table 7 - Groundwater Quality Data
Groundwater

Water Quality Objectives (see note 4)							
Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity (NTU)
-	-	-	30 - 350	-	6.5 - 8.0	-	-

Date and Time	EPL Site ID	Location Description	Temp (°C)	DO (%)	DO (mg/L)	EC (µS/cm)	TDS (mg/L)	pH	Redox (mV)	Turbidity	Field Comments / Context	Context
26/5/2023, 9:50 am	EPL1	Wallace Creek Bridge	14.08	97.8	10.02	1,117	744	7.81	-109	129	Clear water, hydrogen sulphide odour, no sheen.	
6/5/2023, 12:10 pm	EPL2	Wallace Creek Bridge	13.52	66.7	6.94	420	273	6.72	12	390	Hydrogen sulphide odour, turbid dark grey sediment, no sheen.	
31/5/2023, 5:00 pm	EPL4	Portal Access	13.98	99.8	10.27	640	410	7.44	193	0	Cloudy water	
6/5/2023, 10:50 am	EPL25	Portal Access	13.06	72.2	7.59	516	330	6.54	36	0	Grey sediment water settled in sleeve, slight hydrogen sulfide odour	

Note 1: Water Quality Objective values for the Yarrangobilly River and Minor Watercourses refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 2: Water Quality Objective values for Talbingo Reservoir are the default trigger values for physical and chemical stressors in south-east Australia (freshwater lakes and reservoirs) that are reported in Tables 3.3.2 and 3.3.3 of ANZECC/ ARMCANZ (2000).

Note 3: Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

Note 4: Water Quality Objective values for groundwater reference the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for pH and electrical conductivity.



APPENDIX C – LABORATORY RESULTS TABLES



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 31 December 2022

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuszko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 5 October 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters.

A map showing the location of each of the EPL named sampling points is provided after the results tables.

Reservoir Results

Overall the insitu samples were compliant against the WQOs. Those that did exceed were only minor and remain within historical variation. Minor exceedances of metals and select nutrients (Phosphorous) occurred within Talbingo and Tantangara reservoirs. These exceedances although above the WQO were consistent with background conditions in the reservoirs and remained within historical variation. Oil and grease exceedances remain under investigation and likely pertain to sampling error or discrepancies with the laboratory rather than any direct impact from Snowy 2.0 construction activities, further supported by no visible indication of oil and grease were observed during sampling.

Surface Water Results

Yarrangobilly River consistently displays results outside the WQO range for select in-situ sampling results (DO, Turbidity and pH) and do not stray from typical variation in the December 2022 EPL monitoring round. As the results are displaying Oil and Grease concentrations in majority of the EPL locations project wide, it is likely that these results pertain to sampling or laboratory error which remains under investigation, further no visible indication of oil and grease were observed during sampling. Cyanide and metal exceedances were minor however aluminium exceeded WQO in most surface water EPL locations, which is consistent with previous months of monitoring and baseline data. NTU of 0 was validated using the manual turbidity reader.

Discharge Results

The exceedances at the final discharge points are due to continual variability in water quality arriving at the plant. Changes can be made to the plant to address this variability and reach WQO. This is an ongoing process but is managed with no water discharged to the reservoir until WQO are achieved.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biochemical Oxygen Demand	mg/L	2	1/5 [^]

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
8.1	7.8	7.0	7.1	7.6	7.3	7.5	7.4	6.9	7.4
59	57	17.8	17.6	17.5	17.6	16.0	19.5	18.6	17.6
143	130	5.0	80.7	101.7	64.6	36.1	46.8	40.1	114.0
23.19	21.8	16.8	16.9	16.9	16.6	16.6	15.8	16.9	16.9
93.4	100.5	90.7	94.4	94.4	93.8	76	90.8	94.4	94.2
1	0	2.8	2.6	2.5	2.2	3.3	2.6	2.0	2.0
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
28	28	7.6	7.8	7.4	7.4	6.5	9	7.4	7.3
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
50	60	<10	<10	<10	<10	<10	<10	<10	<10
50	150	<10	<10	<10	<10	<10	<10	<10	<10
3	2	3	2	3	3	3	3	2	1
<5	<5	9	7	6	15	11	10	<5	7
<4	<4	340	5	230	6	4	4	4	<4
10	11	9	8.3	7	8.2	12	9.5	<5	5.7
32	24	59	63	75	34	54	43	82	73
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	25	<1	<1	<1	<1	<1	<1	<1	<1
1	<1	1	2	2	<1	1	<1	<1	<1
<50	60	140	120	130	110	200	150	130	110
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
8	6	18	11	11	13	11	10	11	10
<1	<1	<1	2	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	12	91	24	<5	21	<5	5	<5
2	8	3	-	-	-	-	-	-	2
<5	<5	<5	-	-	-	-	-	-	<5

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

[^] 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 December 2022- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analyses			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Arsenic (dissolved)	µg/L	1	0.8
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Copper (dissolved)	µg/L	1	1
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	1
Manganese (dissolved)	µg/L	5	1,200
Nickel (dissolved)	µg/L	1	8
Silver (dissolved)	µg/L	5	0.02
Zinc (dissolved)	µg/L	5	2.4

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
7.4	7.88	8.37	8.32	7.67	7.73	8.27	8.25	7.41	7.27	7.55	7.51	7.55	6.80	6.76	6.89	6.91	6.89
66.0	103.0	85.0	83.0	73	87	76	77	86	23.5	23.6	16.5	17.6	22.5	14.2	14.3	46.8	47.2
138	189	185	180	164	210	202	196	153	-76.6	-114.2	-54.7	-61.8	-54.3	-44.3	-71.6	-109.1	-69.7
14.46	15.36	18.8	19.33	15.07	16.27	16.61	18.87	21.58	13.9	14	10.2	10.3	17.5	18.9	19	21.8	22.5
72.1	91.9	69.1	73.1	70.7	73.2	83.8	65	60.2	99.4	90.6	90.5	90.2	82.5	91.5	93.9	70.1	89.0
0	0	0	0	0	0	0	0	39.2	4.55	3.47	4.58	6.34	2.22	4	4.27	3.48	5.47
<5	<5	<5	<5	<5	<5	<5	<5	9.1	<5	<5	<5	<5	<5	<5	<5	<5	<5
33	51	41	39	36	41	37	38	36	12	12	8.3	8	10	5.3	5.4	18	18
<5	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	<5	<5	12	<5	<5	<5	<5
30	30	20	10	<10	20	10	10	30	<10	<10	<10	<10	10	<10	<10	50	60
30	220	70	10	120	20	10	10	80	<10	<10	<10	<10	40	<10	<10	120	110
4	9	5	6	6	8	5	5	2	3	4	4	4	3	2	4	4	4.0
<5	6	<5	<5	6	<5	<5	5	8	8.0	<5	6	8	13	<5	7	<5	18
<4	<4	<4	<4	<4	4	<4	<4	<4	4	5	<4	<4	<4	5	5	<4	4
13	7	22	20	10	14	16	21	12	8	9	<5	<5	<5	<5	12	15	13
28	32	39	32	51	26	35	46	70	29	20	46	47	41	45	40	23	28
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	<50	<50	<50	<50	<50	<50	100	<50	<50	60	90	230	190	190	270	310
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
6	6	<5	5.0	<5	<5	<5	<5	150	<5	<5	6	<5	40	6.0	6	<5	<5
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	<5	12	<5	<5	<5	<5

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 31 December 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day		
Outflow [#]	ML/day		4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	0.2/2 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	0.1/0.3 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	2	5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	-	0.3298	0.0424	0.0901	0.0540	0.0740	-
-	0.2090	-	-	-	-	-	-
8.31	-	-	-	-	-	-	8
371	-	-	-	-	-	-	26
567	-	-	-	-	-	-	69.5
21.64	-	-	-	-	-	-	17.1
95.9	-	-	-	-	-	-	36.2
139	-	-	-	-	-	-	1.6
22	-	-	-	-	-	-	<5
15	-	-	-	-	-	-	<5
19	-	-	-	-	-	-	<5
130	-	-	-	-	-	-	10
240	-	-	-	-	-	-	10
5	-	-	-	-	-	-	2
65	-	-	-	-	-	-	<5
<4	-	-	-	-	-	-	<4
<5	-	-	-	-	-	-	22
750	-	-	-	-	-	-	14
1	-	-	-	-	-	-	<1
51	-	-	-	-	-	-	<1
7	-	-	-	-	-	-	4
390	-	-	-	-	-	-	<50
2	-	-	-	-	-	-	<1
23	-	-	-	-	-	-	<5
5	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
270	-	-	-	-	-	-	10
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5

Note: Treated water was not being discharged at Talbingo and Tantangara Reservoirs at the time of EPL sampling

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 31 January 2023

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuszko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 6 July 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters. A map showing the location of each of the EPL named sampling points is provided after the results tables.

Reservoir Results: Overall the insitu monitoring results were compliant against WQO's for both Tantangara and Talbingo reservoirs. Those that did have exceedances were minor and remained within historical values. Oil and grease exceedances remain under investigation with QAQC sampling being conducted to understand the root cause. Slightly elevated concentrations of total Phosphorus at EPL38 and EPL39 are not of concern to water quality and remain within historical variation. The Aluminium and Iron exceedances at EPL28 are not likely to be a direct impact from the Snowy 2.0 project as this EPL location is upstream of construction activities. Faecal coliform concentrations at EPL10 and EPL11 likely due to natural occurrences in soil and water such as algal blooms and of other members of the bacteria family that are also included in the analysis, rather than any impact of faecal contamination from project related activities as the discharge results for coliforms are within criteria.

Surface Water Results: The Yarrangobilly River consistently displays results outside of WQO range for select parameters however does not stray from typical variation in this monitoring period, with the upstream location displaying similar exceedances. The more significant exceedances of total Phosphorous at EPL24 and EPL37 are displaying concentrations that likely originated from biological materials with no evidence of depleted dissolved oxygen, indicating that any eutrophication is unlikely in these water bodies. These levels will be closely monitored in the coming events. Oil and grease elevated results remains under investigation however, exceedances were also present at the upstream locations (EPL5, EPL28, EPL29), indicating no impact from project related activities. There are elevated results for EPL24 for select nutrients and metals. The river was dry at the start of the reporting period so the sample taken later in the month is representative of dry conditions per the baseline studies which indicate frequent exceedances of the WQO. The Aluminium exceedance at EPL24 is being checked with the laboratory and will remain under investigation. Elevated Aluminium, Nitrogen and Iron results and minor exceedances of cyanide at EPL 34, 35, 36, 37 display consistent results upstream and downstream of construction activities.

Discharge Results: The exceedances at the final discharge points are due to continual variability in water quality arriving at the plant where changes can be made to address this variability and reach WQO. This is an ongoing process but is managed with no water discharged to the reservoir until WQO are achieved. The RO was not discharging at the time of sampling for both EPL41 and EPL50.

The Tantangara and Marica EPL sampling locations for in-situ data were collected with a piece of equipment that had errors with EC and ORP for some of the locations. As a result, this data is missing.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.



Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 January 2023 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100^
Biochemical Oxygen Demand	mg/L	2	1/5^

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
7.8	7.9	6.5	6.4	6.8	6.9	6.8	6.5	6.4	6.5
64	62	-	-	-	-	-	-	-	-
190	166	116.0	192.0	167.0	153.0	-	-	-	-
21.16	20.98	19.45	21.07	20.86	20.28	19.41	19.4	21.07	20.99
54.6	59.3	161.2	89.6	99.9	143.9	161.7	168.3	90.9	188.2
7.2	14.4	4.7	3.6	3.8	3.1	7.4	8.9	3.6	3.5
< 5	< 5	16	<5	<5	<5	< 5	< 5	< 5	20
27	24	5.4	8	8	8	8.2	10	7.8	5.5
< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
20	20	120	120	60	90	9	120	110	60
20	20	120	120	60	90	9	120	110	60
3	2	3	2	<1	2	2	3	2	4
10	<5	9	9	7	19	23	9	10	5
<4	<4	<4	<4	6	<4	<4	4	5	4
<5	<5	8	80	12	5.4	<5	<5	<5	<5
31	15	60	46	51	45	24	21	37	52
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	380	260	270	280	260	230	250	250
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	16	9	9	14	16	28	8	10
<1	<1	<1	<1	<1	<1	`	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
12	10	<1	-	-	-	-	-	-	2
<5	<5	<5	-	-	-	-	-	-	<5

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

^ 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 January 2023- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Arsenic (dissolved)	µg/L	1	0.8
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Copper (dissolved)	µg/L	1	1
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	1
Manganese (dissolved)	µg/L	5	1,200
Nickel (dissolved)	µg/L	1	8
Silver (dissolved)	µg/L	5	0.02
Zinc (dissolved)	µg/L	5	2.4

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
7.59	8.00	7.93	8.15	7.90	7.88	7.97	8.10	6.80	6.86	6.79	6.34	6.58	6.66	7.57	7.36	7.40	7.18
84	95	91	87	84	84	86	86	71	-	-	-	-	-	-	-	-	-
87	144	155	132	136	147	151	135	-7	115.0	127.0	177.0	161.0	156.0	79.0	94.0	120.0	137.0
13.92	12.73	18.06	20.57	14.15	15.72	17.08	8.11	19.08	17.85	18.37	21.85	12.67	18.17	16.34	16.17	15.84	16.02
93.5	86.5	98.9	93.2	94.6	98.6	82.1	99	80.2	128	102.8	138.5	127.6	133.1	122.9	179.9	164.4	252.2
0	51.4	3.1	0	5	0.5	1.4	0	477	59.9	76.3	44.6	20.3	2.54	9.59	8.26	13.83	21.2
< 5	< 5	< 5	< 5	9.6	< 5	< 5	< 5	320	<5	<5	16	12	<5	<5	<5	13.0	7.8
44	51	46	46	44	45	46	46	160	15	15	13	9.6	8	7.5	7.3	17	18
<5	<5	<5	<5	<5	<5	<5	<5	17	<5	<5	<5	<5	<5	<5	<5	<5	26
40	20	30	20	230	30	110	180	280	<10	20	200	170	150	260	150	190	350
40	20	30	20	760	270	110	180	1200	<10	20	220	180	150	260	150	370	540
3	8	4	4	4	4	4	4	3	3	3	5	4	2	3	2	4	4
<5	8	<5	<5	<5	<5	<5	<5	640	<5	9	<5	22	9	15	7	7	120
<4	<4	<4	<4	<4	<4	<4	<4	<4	6	7	<4	4	4	5	5	6	<4
23	10	<5	<5	<5	18	<5	<5	17	7.2	7.3	<5	<5	<5	<5	<5	<5	<5
15	28	17	22	17	14	27	15	30000	12	16	13	22	7	35	52	56	69
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	4	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	<50	<50	<50	<50	<50	<50	<50	60	<50	90	70	170	400	410	670	730
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	75	7	7	7	<5	24	<5	<5	6	<5
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.0
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	<5	<5	<5	<5	<5	<5

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 January 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day		
Outflow [#]	ML/day		4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	0.2/2 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	0.1/0.3 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	2	5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	-	0.5400	0.0367	0.0948	0.0563	0.0948	-
-	0.2114	-	-	-	-	-	-
8.56	-	-	-	-	-	-	7.3
228	-	-	-	-	-	-	-
154	-	-	-	-	-	-	117
19.01	-	-	-	-	-	-	21.5
104.2	-	-	-	-	-	-	173
27.3	-	-	-	-	-	-	0.5
<5	-	-	-	-	-	-	<5
21	-	-	-	-	-	-	7.3
<5	-	-	-	-	-	-	<5
100	-	-	-	-	-	-	190
220	-	-	-	-	-	-	220
4	-	-	-	-	-	-	3
30	-	-	-	-	-	-	5
<4	-	-	-	-	-	-	5
<5	-	-	-	-	-	-	<5
320	-	-	-	-	-	-	<5
<1	-	-	-	-	-	-	<1
22	-	-	-	-	-	-	<1
2	-	-	-	-	-	-	<1
<50	-	-	-	-	-	-	<50
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
<5	-	-	-	-	-	-	<5
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5

Note: Treated water was not being discharged at Talbingo and Tantangara Reservoirs at the time of EPL sampling

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 28 February 2023

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuzko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 5 October 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters.

A map showing the location of each of the EPL named sampling points is provided after the results tables.

Groundwater Results: The metals exceedances for EPL1, EPL2 and EPL4 are representative of natural conditions as these metals occur naturally within the project area. The EPL25 minor metals exceedances for zinc, nickel and copper fall within standard fluctuations in this well, and the iron exceedance remains consistent with previous quarterly results. Shallower wells (EPL1 and EPL25) are more likely to see higher nutrient exceedances as nutrients likely leach through the soil into the aquifer during rainfall. The nutrient exceedances fall within standard variation for these wells with no evidence of impacts to Yarrangobilly River.

Surface Water Results: EPL36 and EPL37 (Rock Forest) and EPL26 and EPL27 (Marica) displayed similar exceedances at the upstream and downstream locations, indicating it is unlikely that these exceedances are due to any project related impacts and more likely pertain to off-site sources or natural background conditions. There were no metal or nutrient exceedances for any of the Lobs Hole EPL sites except for EPL24 which displayed exceedances for aluminium and phosphorous. EPL24 during the dryer months holds little water which becomes stagnant. It states in the SWMP that frequent exceedances of the WQO are likely to occur in the summer months. During the February sampling round, there was a slight flow of water with the sample collected from the deepest puddle which consisted of exceedances in aluminium and phosphorous which are likely attributed to the higher turbidity reading. Tantangara surface water EPL points displayed results that are consistent with previous monitoring rounds, with minor exceedances for select nutrients and metals.

Reservoir Results: There were no metals exceedances for Tantangara Reservoir in the February 2023 monitoring round, with minor exceedances of phosphorous that remain within historical variation. The Oil and Grease concentrations remain under investigation with a stronger focus on determining if naturally occurring oils could be causing the concentrations rather than project related impacts. Slight nutrient exceedances on the reservoirs could be attributed to algal blooms occurring as a result of warmer weather. EPL10 and EPL11 results are consistent with previous monitoring rounds except for the thermotolerant (faecal) coliform results. The coliform analysis includes all coliforms that can survive in thermotolerant conditions, indicating that these results could have been a result of an algal bloom in the reservoir or other other organic origins. EPL41 also didn't display any exceedances for coliforms, indicating the exceedances on the reservoir aren't a result of faecal contamination being discharged to the reservoir.

Discharge Results: EPL41 was discharging to Talbingo Reservoir on the day of sampling with in-situ parameters falling within WQO, apart from a minor temperature exceedance. Exceedance in Aluminium is currently being investigated. EPL50 results remained mostly within water quality with the exception of zinc.

GF01 Results: EPL54 was dry during the month of February and as a result, could not be sampled. EPL57 was not sampled due to access issues. EPL52, EPL53 and EPL55 were sampled for in-situ parameters following rainfall which caused enough water to collect in-situ however, not enough to complete a comprehensive sample. EPL56 exceedances were suspected to be a result of grout contamination in the well occuring the install process and is therefore, not representative of background conditions. This well will be decommissioned and redrilled. This well has been purged with continual weekly monitoring on in-situ parameters. EPL58 results are consistent with groundwater accross Lobs Hole and will be monitored on a weekly basis for any changes in parameters.

Tantangara Results: Tantangara spoil emplacement area works had not commenced in February 2023.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: February 2023 Groundwater

				EPL1 (RMSB6)	EPL2 (RSMB7)	EPL4 (RSMB9)	EPL25 (RSMB8)
Analyte	Unit	Limit of Reporting	Water Quality Objective Value*				
Physiochemical							
pH	pH Unit	-	6.5-8	7.66	7.31	7.64	6.67
Electrical Conductivity	µS/cm	-	30-350	1,070	418	1260	479
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	-152	-8	-101	-31
Temperature	°C	-	No Water Quality Objective Value	22.83	20.66	22.62	20.41
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value	10.3	30.8	14	31.7
Turbidity	NTU	-	No Water Quality Objective Value	150	377	1000	1000
Nutrients							
Nitrogen (Total)	µg/L	10	250	1,800	300	700	700
Reactive Phosphorus	µg/L	1	15	<50	<50	<50	<50
Metals							
Aluminium (dissolved)	µg/L	5	27	6	7	<5	13
Copper (dissolved)	µg/L	0.5	1	<1	160	37	5
Iron (dissolved)	µg/L	2	300	200	<50	<5	2,700
Lead (dissolved)	µg/L	0.1	1	<1	<1	<1	2
Manganese (dissolved)	µg/L	0.5	1,200	150	210	260	970
Nickel (dissolved)	µg/L	0.5	8	12	5	6	9
Silver (dissolved)	µg/L	0.01	0.02	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	2.4	<5	20	<5	8

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.



Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 28 February 2023 - Talbingo and Tantangara

Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100^
Biochemical Oxygen Demand	mg/L	2	1/5^

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
8.8	8.8	6.5	7.4	7.7	8.0	6.3	6.5	8.6
82	80	20	19	20	19	20	18	18
81	91	259	152	182	169	255	257	119
23.69	23.77	14.41	16.41	16.4	15.88	12.71	11.89	16.46
112.9	110.1	135.8	140.7	129.7	84.6	93.5	169.6	114.6
35.2	16.5	10.7	6.7	7.8	30.4	8.7	16.9	6.7
5	<5	8.1	<5	<5	5.2	5.9	7.6	5.4
35	32	6.4	9.8	9.7	9.6	10	8.7	6.3
50	<5	<5	<5	7	6	<5	<5	34
110	90	110	150	140	210	120	160	130
110	90	110	150	140	210	120	170	130
5	4	<1	<1	<1	<1	<1	<1	<1
15	13	8	17	17	<5	11	13	<5
<4	<4	<4	<4	<4	<4	<4	<4	<4
8	15	<5	41	24	13	30	<5	<5
11	15	14	22	20	24	23	26	29
<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	2	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	60	250	160	160	150	150	190	230
<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	68	<5	<5	<5	<5	<5	<5
<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5
220000**	26000**	<1	-	-	-	-	-	<1
<5	<5	<5	-	-	-	-	-	<5

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

** Algal blooms can present as faecal coliforms - green tinge noted in Talbingo Reservoir water at time of sampling.

^ 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.



Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 28 February 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Arsenic (dissolved)	µg/L	1	0.8
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Copper (dissolved)	µg/L	1	1
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	1
Manganese (dissolved)	µg/L	5	1,200
Nickel (dissolved)	µg/L	1	8
Silver (dissolved)	µg/L	5	0.02
Zinc (dissolved)	µg/L	5	2.4

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
7.64	8.19	8.13	8.01	8.05	8.13	8.29	8.30	6.84	7.34	6.76	8.14	8.47	11.15	6.42	6.16	6.75	6.39
100	128	114	105	101	103	106	106	173	-	-	220	260	230	140	140	40	43
48	104	117	116	52	116	109	100	47	182	220	127	104	24	203	259	230	234
16.52	15.34	19.79	21.2	16.67	17.1	19.44	21.06	20.48	10.85	9.34	18.84	18.6	19.21	9.57	9.62	11.37	10.94
94.9	97.2	88.7	92.8	99.8	100.7	85.4	101.1	72.1	108	-	-	-	-	-	-	94.1	-
0	0	0	0	0	0	0	0	223	6.4	5.7	11.4	27.1	6.2	10.2	10.5	24	12.3
5.2	5.7	12	<5	<5	5	<5	<5	130	<5	<5	<5	<5	<5	<5	<5	8.6	<5
51	67	54	54	53	52	53	52	69	15	15	12	10	13	8.3	8.6	19	19
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	34	31	<5	<5	<5	<5
70	<10	50	60	20	50	50	90	30	60	130	150	160	130	120	110	230	300
70	70	60	60	20	50	50	90	240	60	130	160	180	130	120	110	400	310
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	6	<5	6	<5	5	6	<5	31	<5	<5	19	<5	10	<5	7	11	5
<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
<5	8.8	<5	7.8	8.5	8.1	6.4	30	<5	<5	9.8	17	<5	<5	11	<5	62	5
7	<5	<5	8	9	11	10	8	120	12	<5	12	17	10	31	29	54	41
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	<50	<50	<50	<50	<50	<50	200	<50	<50	60	80	110	260	250	830	730
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	7	<5	<5	<5	<5	<5	<5	580	<5	<5	<5	<5	<5	<5	<5	<5	<5
<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	8	8	<5	<5	<5	<5	<5	<5	<5

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 28 February 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day	-	-
Outflow [#]	ML/day	-	4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350/- [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L		5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	-	0.41996	0.03796	0.11654	0.05404	0.09761	-
-	0.36082	-	-	-	-	-	-
7.93	-	-	-	-	-	-	5.95
195	-	-	-	-	-	-	7.39
336	-	-	-	-	-	-	388
26.09	-	-	-	-	-	-	17.9
65	-	-	-	-	-	-	-
0	-	-	-	-	-	-	0.58
<5	-	-	-	-	-	-	<5
26	-	-	-	-	-	-	<5
450	-	-	-	-	-	-	<5
790	-	-	-	-	-	-	40
790	-	-	-	-	-	-	160
4	-	-	-	-	-	-	<1
10	-	-	-	-	-	-	<5
<4	-	-	-	-	-	-	<4
<5	-	-	-	-	-	-	<5
500	-	-	-	-	-	-	21
<1	-	-	-	-	-	-	<5
3	-	-	-	-	-	-	<1
31	-	-	-	-	-	-	2
100	-	-	-	-	-	-	<50
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
11	-	-	-	-	-	-	18
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5

Note: Treated water was not being discharged at Tantangara Reservoirs at the time of EPL sampling.

There is no 100th percentile limit for Nitrogen (Total).

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 28 February 2023 - GF01

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Arsenic (dissolved)	µg/L	1	0.8
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Copper (dissolved)	µg/L	1	1
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	1
Manganese (dissolved)	µg/L	5	1,200
Nickel (dissolved)	µg/L	1	8
Silver (dissolved)	µg/L	5	0.02
Zinc (dissolved)	µg/L	5	2.4

EPL52	EPL53	EPL54	EPL55	EPL56	EPL57	EPL58
10.2	8.58	Dry	7.96	12.32	-	6.41
290.0	110.0	Dry	233.0	3770	-	101
14	60	Dry	114	-91	-	144
24.72	28.07	Dry	21.3	19.66	-	21.26
72.3	60.6	Dry	70.5	22.3	-	21.5
117	247	Dry	787	78.5	-	16.3
-	-	Dry	-	8.6	-	22
-	-	Dry	-	680	-	37
-	-	Dry	-	340	-	12
-	-	Dry	-	720	-	600
-	-	Dry	-	780	-	1800
-	-	Dry	-	<1	-	6
-	-	Dry	-	15	-	17
-	-	Dry	-	5	-	<4
-	-	Dry	-	<5	-	<5
-	-	Dry	-	310	-	12
-	-	Dry	-	<1	-	<1
-	-	Dry	-	500	-	<1
-	-	Dry	-	15	-	17
-	-	Dry	-	60	-	<50
-	-	Dry	-	5	-	3
-	-	Dry	-	<5	-	16
-	-	Dry	-	2	-	3
-	-	Dry	-	<5	-	<5
-	-	Dry	-	<5	-	13

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 31 March 2023

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuszko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 5 October 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters.

A map showing the location of each of the EPL named sampling points is provided after the results tables.

Oil and Grease: In the March 2023 monitoring round for the Lobs Hole EPL sampling locations only, oil and grease samples were analysed at two separate laboratories that use the same methodology. The primary laboratory which is where samples are usually sent returned results with exceedances in majority of the locations. The secondary laboratory provided results at all Lobs EPL locations as non-detectable concentrations. Following these results, it is likely that the O&G exceedances in the previous months are due to primary laboratory error during analysis. As such, in the following monitoring rounds, further investigation will be conducted by sending samples to both laboratories. The results provided in this report are from the primary laboratory, however pending the following months results, it is likely that the secondary laboratory results will be utilised.

Surface Water Results: Lobs Hole and Marica surface water EPL points showed no exceedances other than Nitrogen in EPL5, EPL8, EPL15, EPL26 and EPL27 and a minor Zinc exceedances at EPL15, EPL26 and EPL27. The nitrogen exceedances also occur in the upstream locations indicating no influence from project related activities. The Tantangara and Rock Forest surface water EPL monitoring locations displayed minor exceedances for metals that are representative of background conditions and also occurred in the upstream monitoring locations. EPL 24 is located in a gully, at the time of sampling the gully was dry, therefore a sample was not collected.

Reservoir Results: Thermotolerant coliform results at EPL10, EPL11 and EPL51 exceeded the WQO. The coliform analysis includes all coliforms that can survive in thermotolerant conditions, indicating that these results could have been a result of an algal bloom in the reservoir or other organic origins. EPL41 also didn't display any exceedances for coliforms, indicating the exceedances on the reservoir aren't a result of faecal contamination being discharged. Tantangara reservoir also displayed minor exceedances for nutrients as well as some O&G exceedances. These remain consistent with previous months of monitoring and are also present in the upstream sampling locations. EPL10 and EPL11 on Talbingo Reservoir displayed no other exceedances beyond expected variation.

Discharge Results: EPL41 was discharging to Talbingo Reservoir on the day of sampling with in-situ parameters falling within WQO, apart from a minor temperature exceedance. Nutrient results for Ammonia, Nitrogen and Phosphorus are elevated and these elevated concentrations are currently being investigated. EPL50 results remained mostly within water quality with the exception of a minor phosphorous exceedance and oil and grease. Discharge was not occurring at the time of sampling.

GF01 Results: GF01 sampling locations are monitored on a weekly basis for in-situ parameters. EPL56 exceedances were suspected to be a result of a fault during install process and is therefore, not representative of background conditions. This well has been purged with continual weekly monitoring on in-situ parameters, however will be redrilled and the current well decommissioned. Nutrient exceedances in the groundwater wells are consistent with background conditions and expected concentrations. EPL52, EPL53 and EPL54 were not samples due to not enough water being present and EPL57 was also unable to be sampled as the well had not been completed.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 31 March 2023 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	1	13
Chromium (III+VI) (dissolved)	µg/L	1	1
Copper (dissolved)	µg/L	1	14
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	3.4
Manganese (dissolved)	µg/L	5	1,900
Nickel (dissolved)	µg/L	1	11
Silver (dissolved)	µg/L	5	0.05
Zinc (dissolved)	µg/L	5	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100^
Biochemical Oxygen Demand	mg/L	2	1/5^

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
8.0	8.04	7.7	6.9	7.0	7.9	7.1	7.1	6.7	7.8
70	63	36.0	23.0	24.0	26.0	23.0	25.0	26.0	24.0
133	114	134.0	220.0	212.0	171.0	206.0	212.0	183.0	175.0
21.39	21.2	16.9	15.34	15.27	16.68	11.62	12.36	14.61	17.3
108.3	85.7	88.9	86.6	91.6	71.2	91.4	97.8	88.1	68.8
8.4	54.1	3.6	6.3	4.8	3.2	8.0	5.3	4.5	4.1
<5	<5	<5	<5	<5	38	<5	<5	<5	<5
34	33	6.4	5.7	5.8	9.8	5.6	6.7	6	5.3
<5	<10	<5	<5	<5	<5	<5	<5	<5	<5
730	200	70	80	70	100	100	80	80	160
730	230	70	80	70	100	100	80	80	160
1	1	<1	2	3	<1	3	3	4	<1
11	9	56	18	9	24	11	12	17	<5
<4	<5	9	<4	<4	5	<4	<4	<4	<4
13	<5	24	130	24	22	10	-	15	14
11	17	15	29	14	17	26	23	<5	15
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	200	200	100	150	280	190	200	200
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	8	<5	25	<5	<5	<5
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
7300	4800	24	-	-	-	-	-	-	57
<5	<5	<5	-	-	-	-	-	-	<5

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

^ 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.



Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 March 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Arsenic (dissolved)	µg/L	1	0.8
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Copper (dissolved)	µg/L	1	1
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	1
Manganese (dissolved)	µg/L	5	1,200
Nickel (dissolved)	µg/L	1	8
Silver (dissolved)	µg/L	5	0.02
Zinc (dissolved)	µg/L	5	2.4

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
7.62	7.97	8.19	8.18	7.96	7.99	8.24	8.28	Dry	5.1	5.78	7.16	7.21	7	7.24	7.08	6.49	7.04
125	150	130	128	125	128	127	129	Dry	33	34	30	25	26	22	21	47	46
105	146	139	140	139	138	134	133	Dry	204	276	127	180	207	203	207	112	182
16.73	15.63	19.77	20.13	16.98	17.56	19.66	20.39	Dry	12.67	12.81	14.98	15.01	12.78	12.58	11.71	11.68	12.61
123.4	119.8	127.9	122.5	120.5	133.6	132.7	131.9	Dry	95.8	91.3	123.9	122.7	103.2	120.1	111.6	127.1	129.6
0	0	0	0	0	0	0	0	Dry	0	0	0.6	0	0	2.4	0	23.2	19.6
<5	<5	<5	<5	<5	<5	<5	<5	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5
64	77	66	64	64	65	65	66	Dry	16	16	7.3	6	7.8	5	5.3	11	11
6	<5	5	<5	<5	<5	5	<5	Dry	<5	<5	<5	<5	<5	<5	<5	72	43
1,900	210	430	<10	30	90	2,500	90	Dry	550	850	70	50	120	130	110	260	140
1,900	210	430	<10	80	90	2,500	90	Dry	550	850	70	50	120	130	110	350	220
1	6	2	2	1	2	2	2	Dry	<1	<1	3	3	3	3	3	4	4
<5	<5	<5	<5	<5	<5	<5	<5	Dry	<5	<5	9	11	9	12	13	22	23
<4	<4	<4	<4	<4	<4	<4	<4	Dry	<4	<4	<4	<4	<4	<4	<4	8	5
15	22	5	11	22	18	12	16	Dry	19	10	24	23	52	17	19	<5	11
<5	<5	10	8	<5	5	10	6	Dry	10	19	14	14	<5	41	27	41	44
<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	<50	<50	<50	<50	<50	<50	Dry	<50	<50	100	70	240	360	420	790	980
<1	<1	<1	<1	<1	<1	<1	<1	Dry	2	1	<1	<1	<1	<1	<1	<1	<1
<5	9	<5	<5	<5	<5	<5	<5	Dry	<5	<5	8	<5	11	6	7	51	22
<1	<1	<1	<1	<1	<1	<1	<1	Dry	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	<5	<5	<5	<5	7	<5	Dry	6	6	<5	<5	<5	<5	<5	<5	<5

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 March 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day	-	-
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	mg/L	5	0.2/2 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	mg/L	10	0.35 [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	mg/L	5	0.1/0.3 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	5	5

EPL 41	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	0.47474	0.03868	0.12510	0.05613	0.12939	-
8.27	-	-	-	-	-	7
76	-	-	-	-	-	7
90	-	-	-	-	-	195
25.75	-	-	-	-	-	17.3
57.4	-	-	-	-	-	90.9
52.3	-	-	-	-	-	0
<5	-	-	-	-	-	<5
<5	-	-	-	-	-	<5
0.81	-	-	-	-	-	<5
1100	-	-	-	-	-	60
1100	-	-	-	-	-	70
3	-	-	-	-	-	3
0.11	-	-	-	-	-	6
<4	-	-	-	-	-	6
<5	-	-	-	-	-	30
67	-	-	-	-	-	<5
<1	-	-	-	-	-	<1
<1	-	-	-	-	-	<1
10	-	-	-	-	-	<1
<50	-	-	-	-	-	<50
<1	-	-	-	-	-	<1
<5	-	-	-	-	-	<5
<1	-	-	-	-	-	<1
<5	-	-	-	-	-	<5
9	-	-	-	-	-	<5
<1	-	-	-	-	-	<1
<5	-	-	-	-	-	<5

Note: Treated water was not being discharged to Tantangara Reservoirs at the time of EPL sampling

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 31 March 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL52	EPL53	EPL54	EPL55	EPL56	EPL57	EPL58
Dry	Dry	Dry	7.72	11.75	-	6.2
Dry	Dry	Dry	190.0	520	-	1170
Dry	Dry	Dry	160	4	-	157
Dry	Dry	Dry	21.14	14.56	-	22.78
Dry	Dry	Dry	73.5	48.3	-	94.9
Dry	Dry	Dry	243	259	-	476
Dry	Dry	Dry	25	160	-	390
Dry	Dry	Dry	56	150	-	32
Dry	Dry	Dry	<5	190	-	130
Dry	Dry	Dry	70	400	-	440
Dry	Dry	Dry	3300	790	-	810
Dry	Dry	Dry	5	1	-	1
Dry	Dry	Dry	99	67	-	29
Dry	Dry	Dry	<4	<4	-	<4
Dry	Dry	Dry	29	13	-	<5
Dry	Dry	Dry	6	170	-	<5
Dry	Dry	Dry	No result	No result	-	No result
Dry	Dry	Dry	<1	<1	-	1
Dry	Dry	Dry	3	1.0	-	6
Dry	Dry	Dry	<1	130	-	<1
Dry	Dry	Dry	13	370	-	5
Dry	Dry	Dry	1	11	-	3
Dry	Dry	Dry	8	11	-	20
Dry	Dry	Dry	<50	50	-	<50
Dry	Dry	Dry	7500	2700	-	4400
Dry	Dry	Dry	<1	<1	-	<1
Dry	Dry	Dry	22	28	-	39
Dry	Dry	Dry	5	<5	-	38
Dry	Dry	Dry	150	140	-	190
Dry	Dry	Dry	<1	<1	-	3
Dry	Dry	Dry	12	170	-	9
Dry	Dry	Dry	<5	<5	-	<5
Dry	Dry	Dry	<5	<5	-	<5
Dry	Dry	Dry	<5	11	-	12
Dry	Dry	Dry	29	52	-	29

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARM CANZ (2000), they are not pollutant limits imposed by EPL 21266.



Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 March 2023 - Treated Water

Date
1/03/2023
2/03/2023
3/03/2023
4/03/2023
5/03/2023
6/03/2023
7/03/2023
8/03/2023
9/03/2023
10/03/2023
11/03/2023
12/03/2023
13/03/2023
14/03/2023
15/03/2023
16/03/2023
17/03/2023
18/03/2023
19/03/2023
20/03/2023
21/03/2023
22/03/2023
23/03/2023
24/03/2023
25/03/2023
26/03/2023
27/03/2023
28/03/2023
29/03/2023
30/03/2023
31/03/2023

EPL 43	EPL 50
Discharge volume (Megalites)	
0.56	0.03
-	0.05
-	-
0.03	-
-	-
-	-
0.56	-
-	-
-	-
-	-
0.04	-
-	0.33
-	0.33
-	-
0.06	-
-	-
-	-
-	-
0.11	-
-	-
-	0.14
-	0.05
-	-
-	-
-	0.19
-	0.78
-	0.09
-	0.45
2.50	0.91
-	1.17
-	0.95

- Water not discharged on this day



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 30 April 2023

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuszko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 5 October 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters.

A map showing the location of each of the EPL named sampling points is provided after the results tables.

Oil and Grease: Further to the investigation in the March 2023 monitoring round, Lobs Hole oil and grease samples were sent to the primary laboratory as well as a secondary laboratory to further demonstrate the primary laboratory is producing inaccurate results. It was determined the secondary laboratory results are more accurate following a clean-up step which removes any naturally occurring hydrocarbons, and as such the secondary laboratory will be utilised moving forward for oil and grease. For this month's sampling round, reported oil and grease results for all Lobs Hole sampling points are from the secondary laboratory whereas all other results for oil and grease are from the primary laboratory.

Surface Water Results: Exceedances across Lobs Hole, Marica and Tantangara are consistent with upstream exceedances demonstrating water quality levels are not a result of Project construction activities. There was a minor exceedance of phosphorous at EPL 26, and an exceedance of nitrogen at EPL 24, and ammonia at EPL 30. These exceedances are reflective of water quality following a rain event.

Reservoir Results: During the April period for sampling, the Dissolved Oxygen was outside the WQO the parameters for EPL10, EPL11, EPL28, EPL29, EPL32, EPL38, EPL39 and EPL46 sites. Both Lobs Hole and Tantangara demonstrated DO outside the parameters upstream and downstream which is likely attributed to varying river flows. Total phosphorus was high for EPL10, an upstream sampling point demonstrating exceedances are not related to the project. EPL29, EPL32, EPL38, EPL39, EPL40, EPL46 exceeded phosphorus water quality criteria. EPL 39, EPL 38 and EPL 40 are located upstream of the project construction activities demonstrating exceedances at the downstream EPLs at Tantangara are not related to the Project. EPL 28 exceeded the zinc water quality criteria, however EPL 28 is an upstream monitoring location and therefore the exceedance is not project related. Exceedances of faecal coliforms is consistent with upstream results indicating the presence of algal blooms. EPLs were compliant for most other analyte testing.

Discharge Results: At the time of sampling at EPL 50, discharge was not occurring. At the time of sampling EPL 41, discharge was occurring. The results of EPL 41 include exceedances against the EPL of TSS, Ammonia, Nitrogen and Phosphorus. In accordance with the Surface Water Management Plan, the TARP has been triggered. As outlined in the plan, the results are findings from comprehensive water quality monitoring which result in actions being implemented at a later time than in-situ sampling due to the delay in receiving laboratory results. Considering this, response actions based on the comprehensive monitoring are being undertaken as soon as reasonable practicable. A greater depth of understanding of water quality impacts and impact mechanisms can be gained from the comprehensive monitoring and this information is being applied to establish specific improvements to the water management system.

GF01 Results: GF01 sampling locations are monitored on a weekly basis for in-situ parameters. EPL56 exceedances were suspected to be a result of a fault during install process and is therefore, not representative of background conditions. This well has been purged with continual weekly monitoring on in-situ parameters, however will be redrilled and the current well decommissioned. The TARP has been triggered for nutrient exceedances at EPL 52, 55 and 58. EPL53 and EPL54 were not sampled due to the lack of water being present and EPL57 was also unable to be sampled as the well had not been completed.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 30 April 2023 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Physiochemical			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	No Water Quality Objective Value
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL1 (RMSB6)	EPL2 (RSMB7)	EPL4 (RSMB9)	EPL25 (RSMB8)	EPL56	EPL57	EPL58
-	-	-	-	11.48	Not active	6.27
-	-	-	-	566	Not active	274
-	-	-	-	9	Not active	216
-	-	-	-	16.08	Not active	16.5
-	-	-	-	49.5	Not active	32.9
-	-	-	-	354	Not active	305
-	-	-	-	310	Not active	350
-	-	-	-	200	Not active	91
-	-	-	-	250	Not active	61
-	-	-	-	640	Not active	1000
-	-	-	-	760	Not active	11000
-	-	-	-	2	Not active	2
-	-	-	-	100	Not active	310
-	-	-	-	<4	Not active	<4
-	-	-	-	<5	Not active	<5
-	-	-	-	130	Not active	120
-	-	-	-	3600	Not active	11000
-	-	-	-	<1	Not active	<1
-	-	-	-	<1	Not active	9
-	-	-	-	63	Not active	4.0
-	-	-	-	190	Not active	7
-	-	-	-	2	Not active	35
-	-	-	-	15	Not active	58
-	-	-	-	<50	Not active	70
-	-	-	-	3100	Not active	3800
-	-	-	-	<1	Not active	4
-	-	-	-	87	Not active	65
-	-	-	-	<5	Not active	30
-	-	-	-	500	Not active	230
-	-	-	-	<1	Not active	5
-	-	-	-	140	Not active	14
-	-	-	-	<5	Not active	<5
-	-	-	-	<5	Not active	<5
-	-	-	-	<5	Not active	22
-	-	-	-	<5	Not active	22

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.



Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 30 April 2023 - Talbingo and Tantangara Reservoir



Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3		1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	1	13
Chromium (III+VI) (dissolved)	µg/L	1	1
Copper (dissolved)	µg/L	1	14
Iron (dissolved)	µg/L	50	300
Lead (dissolved)	µg/L	1	3.4
Manganese (dissolved)	µg/L	5	1,900
Nickel (dissolved)	µg/L	1	11
Silver (dissolved)	µg/L	5	0.05
Zinc (dissolved)	µg/L	5	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100^
Biochemical Oxygen Demand	mg/L	2	1/5^

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
7.9	7.92	7.4	7.3	7.3	7.4	7.5	7.4	7.3	7.3
67	69	23.0	29.0	26.0	26.0	24.0	22.0	27.0	34.0
270	267	224.0	172.0	201.0	210.0	226.0	234.0	187.0	124.0
15.83	16	15.43	15.77	16.09	16.27	14.9	14.64	16.04	15.2
73.9	72.4	84.3	85.2	85.4	88	88.6	97.9	84.2	93.2
13.3	16.9	6.1	7.7	38.7	7.8	6.5	4.7	20.7	9.2
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
27	26	5.8	7.7	7.8	7.8	7.6	9.2	8	5.8
6	<5	<5	10	<5	<5	<5	<5	6	21
110	120	<10	30	30	30	60	60	150	<10
0.11	0.12	<10	30	30	30	60	60	150	<10
<5	<5	4	3	3	3	3	3	3	4
16	<5	8	22	18	21	14	20	28	7
4	<4	<4	<4	<4	<4	<4	<4	<4	5
<5	<5	27	<5	<5	50	<5	9.2	<5	<5
16	14	6	40	47	47	42	43	48	42
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	2	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<50	<50	220	310	310	280	210	210	310	340
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	260	<5	<5	<5	<5	<5	<5	690
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<5	<5	150	<5	<5	<5	<5	<5	<5	<5
462	277	49	-	-	-	-	-	-	40
<5	<5	<5	-	-	-	-	-	-	<5

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

^ 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 30 April 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37	EPL52	EPL53	EPL54	EPL55
8.07	8.29	8.3	8.2	7.93	8.14	8.14	8.13	7.01	7.3	7.46	7.35	7.21	6.96	7.27	7.21	7.07	7.34	9.06	Dry	Dry	8.03
81	116	133	84	75	80	82	85	156	30	30	54	0	37	18	17	43	44	559	Dry	Dry	243
85	199	192	198	148	201	198	202	109	177	148	138	191	171	169	160	210	220	134	Dry	Dry	162
13.74	12.53	13.28	13.31	12.49	12.24	11.9	13.16	14.11	11.6	11.49	9.03	8.78	10.71	10.33	10.45	10.45	12.6	17.9	Dry	Dry	16.95
94.3	89.1	87.7	82.6	77.9	76.1	90.6	69.7	78.5	100	104.4	116.3	118.1	78	109.8	109.6	96.7	102	85.4	Dry	Dry	68.2
12.6	6.3	11.9	6.5	13.5	6.3	7.3	10.4	100	0	4.2	8.8	7.8	10.7	6	7.2	16.8	16.3	80.3	Dry	Dry	205
<5	<5	<5	<5	5	<14	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	6.2	8	<5	Dry	Dry	<5
32	51	36	36	32	35	33	34	31	<35	<35	<35	<35	<35	<35	<35	<35	<35	180	Dry	Dry	86
12	<5	<5	<5	<5	<5	11	10	<5	<5	160	33	<5	6	<5	<5	<5	<5	22	Dry	Dry	11
80	<10	140	120	150	100	110	70	750	< 10	< 10	< 10	< 10	80	20	10	180	100	6000	Dry	Dry	600
80	<10	140	120	150	100	110	70	1300	<10	<10	<10	<10	80	20	10	260	260	24000	Dry	Dry	5400
20	3	3	2	3	3	3	3	3	5	6	6	4	4	3	3	6	5	3	Dry	Dry	3
14	29	18	9	13	30	30	16	17	38	12	18	180	18	19	10	37	32	17	Dry	Dry	15
<4	<4	<5	<4	<4	<4	<4	<5	<5	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	Dry	Dry	<4
<2	<2	<2	2	2	3	<2	3	3	<5	150	7.4	<5	<5	<5	9.9	34	<5	<5	Dry	Dry	<5
100	8	92	120	83	100	81	69	0.11	<5	<5	12	140	30	18	18	30	43	30	Dry	Dry	9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	Dry	Dry	<50
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	Dry	Dry	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	2	3	1	<1	2	1	3	2	3	29	Dry	Dry	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	Dry	Dry	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	2	3	1	<1	2	1	3	2	3	8	Dry	Dry	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	Dry	Dry	<1
90	<50	70	90	80	80	70	60	140	<50	<50	<50	<50	450	140	150	610	530	<50	Dry	Dry	<50
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	Dry	Dry	50
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Dry	Dry	<1
<5	6	<5	<5	<5	<5	<5	<5	130	<5	<5	<5	<5	28	5	<5	<5	<5	<5	Dry	Dry	88
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	Dry	Dry	10
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Dry	Dry	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	Dry	Dry	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	Dry	Dry	<5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	Dry	Dry	<5
<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	Dry	Dry	9
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	Dry	Dry	<5

* Water Quality Objective values for surface water refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.
 - Samples not required

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 30 April 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day (average)	-	-
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	%	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	5	5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	-	0.000	0.047	0.129	0.056	0.123	-
7.76	-	-	-	-	-	-	5.2
547	-	-	-	-	-	-	210
335	-	-	-	-	-	-	231
15.78	-	-	-	-	-	-	16.9
69.9	-	-	-	-	-	-	114.3
15.1	-	-	-	-	-	-	5
18	-	-	-	-	-	-	<5
30	-	-	-	-	-	-	8.3
8	-	-	-	-	-	-	<5
1000	-	-	-	-	-	-	<10
2600	-	-	-	-	-	-	400
3	-	-	-	-	-	-	3
210	-	-	-	-	-	-	12
5	-	-	-	-	-	-	4
<2	-	-	-	-	-	-	7.6
100	-	-	-	-	-	-	5
100	-	-	-	-	-	-	5
1.2	-	-	-	-	-	-	2
1	-	-	-	-	-	-	2
<50	-	-	-	-	-	-	<50
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5
18	-	-	-	-	-	-	8
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<5

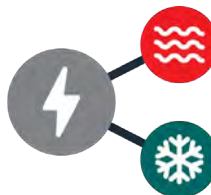
Note: Treated water was not being discharged at Tantangara Reservoirs at the time of EPL sampling

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site



Future Generation
Webuild • Clough • Lane

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 30 April 2023 - Treated Water

Date
1/04/2023
2/04/2023
3/04/2023
4/04/2023
5/04/2023
6/04/2023
7/04/2023
8/04/2023
9/04/2023
10/04/2023
11/04/2023
12/04/2023
13/04/2023
14/04/2023
15/04/2023
16/04/2023
17/04/2023
18/04/2023
19/04/2023
20/04/2023
21/04/2023
22/04/2023
23/04/2023
24/04/2023
25/04/2023
26/04/2023
27/04/2023
28/04/2023
29/04/2023
30/04/2023

EPL 43	EPL 50
Discharge volume (Megalites)	
0.80	0.21
0.57	-
-	-
-	-
-	0.57
-	-
0.95	0.57
0.48	0.91
0.69	-
0.37	0.50
-	-
0.68	0.60
-	0.07
0.29	0.18
0.18	0.07
0.25	-
0.22	0.09
0.04	0.20
-	0.42
-	-
-	-
-	0.13
0.37	-
-	-
-	0.25
-	0.19
0.24	0.06
-	-
-	-
0.36	-

- Water not discharged on this day



Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 31st May 2023

Environmental Protection Licence No:	21266
Licensee:	Snowy Hydro Limited
Licensee address:	PO Box 332, Cooma, NSW 2630
Premises:	Snowy 2.0 Pumped Hydro Power Station Talbingo and Tantangara, Kosciuszko National Park and Rock Forest, Kosciuzko NSW 2642
EPA Public Register:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=21266&id=21266&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

Monthly water sampling and analysis is performed as part of the Snowy 2.0 Approval Conditions, Environmental Protection Licence No 21266 - Variation 5 October 2022, and the approved Water Management Plan to ensure that works are not impacting on nearby receiving waters.

A map showing the location of each of the EPL named sampling points is provided after the results tables.

Groundwater Results: Exceedances of electrical conductivity and nitrogens are consistent with historical data. Two locations, EPL 2 and 25, reported exceedances in Iron which are consistent with historical data trends. Copper levels at EPL 2 and EPL 4 recorded marginal exceedances. Other analytes were within the WQO range. Due to an issue with the laboratory, EPL 4 nitrogen is currently unavailable, this report will be updated once testing is complete.

Surface Water Results: There were exceedances of Dissolved Oxygen, Turbidity, Nitrogen and Ammonia likely due to heavy rainfall as the exceedances are reflected in the upstream and downstream EPL sampling locations. Aluminum was above WQO range for most EPLS, including upstream and downstream. Most analyte readings were within the WQO range. There was an exceedance of Iron at EPL 26, this is being investigated.

Reservoir Results: BOD and Coliform exceedance at EPL 28 is reflective of upstream conditions. Exceedance of Coliforms at EPL 51 is consistent with exceedances upstream results indicating the presence of algal blooms. Minor exceedances of Electrical Conductivity and turbidity are reflected upstream and downstream. Dissolved Oxygen variations are mostly consistent upstream and downstream. All other analytes were within the WQO range.

Discharge Results: At the time of sampling at EPL 41 and EPL 50 were discharging. EPL 50 was within the licence limits and WQO. EPL 41 exceeded the licence limit for Ammonia and Nitrogen and the WQO for Aluminium and Chromium. In accordance with the Surface Water Management Plan, the TARP has been triggered. As outlined in the plan, the results are findings from comprehensive water quality monitoring which result in actions being implemented at a later time than insitu sampling due to the delay in receiving laboratory results. Considering this, response actions based on the comprehensive monitoring are being undertaken as soon as reasonable practicable. A greater depth of understanding of water quality impacts and impact mechanisms can be gained from the comprehensive monitoring and this information is being applied to establish specific improvements to the water management system.

GF01 Results: GF01 sampling locations are monitored on a weekly basis for in-situ parameters. EPL56 exceedances were suspected to be a result of a fault during install process and is therefore, not representative of background conditions. This well has been purged with continual weekly monitoring on in-situ parameters, however will be redrilled and the current well decommissioned. The TARP has been triggered for nutrient exceedances at EPL 52, 55 and 58. EPL53 and EPL54 were not sampled due to the lack of water being present and EPL57 was also unable to be sampled as the well had not been completed.

The publication of this pollution monitoring data is carried out in accordance with section 66 (6) of the Protection of the Environment Operations Act 1997 (NSW).

Snowy Hydro Limited gives no warranty or representation regarding the data suitability for any particular purpose.

Snowy Hydro Limited excludes all liability to any person for loss or damage of any kind (however caused, including but not limited to by negligence) arising whether directly or indirectly from or relating in any way to the use of this data, whether in whole or in part.

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: May 2023 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Physiochemical			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	No Water Quality Objective Value
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value
Nickel (dissolved)	µg/L	1	8
Nickel (total)	µg/L	1	No Water Quality Objective Value
Silver (dissolved)	µg/L	5	0.02
Silver (total)	µg/L	5	No Water Quality Objective Value
Zinc (dissolved)	µg/L	5	2.4
Zinc (total)	µg/L	5	No Water Quality Objective Value

EPL1 (RMSB6)	EPL2 (RSMB7)	EPL4 (RSMB9)	EPL25 (RSMB8)	EPL56	EPL57	EPL58
7.81	6.72	7.44	6.54	7.33	Not active	6.07
1117	420	640	516	285	Not active	346
-109	12	193	36	226	Not active	208
14.08	13.52	13.98	13.06	13.91	Not active	14.41
97.8	66.7	99.8	72.2	42.8	Not active	25
129	390	0	0	0	Not active	895
-	-	-	-	3,470	Not active	260
-	-	-	-	125	Not active	108
-	-	-	-	20	Not active	20
-	-	-	-	2,100	Not active	1,500
1,200	800	-	600	2,900	Not active	10,200
<10	<10	<10	<10	130	Not active	50
-	-	-	-	2.23	Not active	20
-	-	-	-	<4	Not active	<4
-	-	-	-		Not active	<5
20	10	20	<10	10	Not active	<10
-	-	-	-	22800	Not active	180
-	-	-	-	<1	Not active	<1
-	-	-	-	8	Not active	<1
-	-	-	-	2	Not active	3
-	-	-	-	62	Not active	4
4	3	11	<1	14	Not active	14
-	-	-	-	522	Not active	81
240	3,020	<50	4,340	<50	Not active	<50
-	-	-	-	37900	Not active	450
<1	<1	<1	<1	<1	Not active	2
-	-	-	-	313	Not active	9
145	208	200	1,110	108	Not active	28
-	-	-	-	15300	Not active	38
7	<1	2	10	1	Not active	2
-	-	-	-	82	Not active	3
<1	<1	<1	<1	<1	Not active	<1
-	-	-	-	<1	Not active	<1
<5	<5	<5	<5	<5	Not active	10
-	-	-	-	317	Not active	14

* Water Quality Objective values for groundwater refer to the default trigger values for physical and chemical stressors in south-east Australia (upland rivers) for the protection of 99% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.



Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 01 - 31st May 2023 - Talbingo and Tantangara

Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	pH Unit	-	6.5-8
Electrical Conductivity	µS/cm	-	20-30
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	1-20
Laboratory analytes			
Total suspended solids	mg/L	5	No Water Quality Objective Value
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	10
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350
Reactive Phosphorus	µg/L	1	5
Phosphorus (Total)	µg/L	5	10
Inorganics			
Cyanide Total	µg/L	4	7
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100^
Biochemical Oxygen Demand	mg/L	2	1/5^

EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
7.64	7.91	7.3	7.5	7.4	7.32	8.67	7.61	7.5
48	54	20	27	25	20	43	21	26
199	147	257	261	291	257	163	235	267
14.21	13.49	7.07	8.24	7.86	7.07	7.45	7.65	8.01
89.9	114.8	75.1	71.2	63	75.1	135.8	107	73.1
0	0	18.6	4.5	0	18.6	23.5	67.7	0
<5	<5	18	<5	<5	<5	<5	16	<5
22	22	2	7	2	2	<1	<1	2
<10	<10	<10	<10	<10	30	30	50	<10
100	<100	200	200	200	100	<100	200	200
100	<100	200	200	200	200	200	200	200
<10	<10	<10	<10	<10	<10	<10	<10	<10
<10	<10	0.02	0.01	<0.01	0.01	0.01	0.02	<0.01
<4	<4	<4	<4	<4	<4	<4	<4	<4
<1	<1	<1	<1	<1	<1	<1	<1	<1
30	20	20	30	50	40	30	50	40
<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1
50	70	<50	100	120	100	60	60	110
<1	<1	<1	<1	<1	<1	<1	<1	<1
6	6	7	2	4	3	5	7	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1
<5	<5	<5	<5	<5	<5	<5	<5	<5
2	<1	60	-	-	-	-	-	14
<2	<2	13	-	-	-	-	-	<2

* Water Quality Objective values for Talbingo and Tantangara Reservoir refer to the default trigger values for physical and chemical stressors in south-east Australia (fresh lakes and reservoirs) for the protection of 95% of aquatic species ANZECC / ARMCANZ (2000), they are not pollutant limits imposed by EPL 21266.

** Algal blooms can present as faecal coliforms - green tinge noted in Talbingo Reservoir water at time of sampling.

^ 90th percentile concentration limits / 100 percentile concentration limits

- Sample not required at this location.

Monthly EPL Sampling: 01 - 31st May 2023 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Field			
pH	-	-	6.5-8
Electrical Conductivity	µS/cm	-	30-350
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	No Water Quality Objective Value
Dissolved Oxygen	% saturation	-	90-110
Turbidity	NTU	-	2-25
Laboratory analytes			
TSS	mg/L	5	No Water Quality Objective Value
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	13
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	250
Reactive Phosphorus	µg/L	1	15
Phosphorus (Total)	µg/L	5	20
Inorganics			
Cyanide Total	µg/L	4	4
Hydrocarbons			
Oil and Grease	mg/L	5	5
Metals			
Aluminium (dissolved)	µg/L	5	27
Aluminium (total)	µg/L	5	No Water Quality Objective Value
Arsenic (dissolved)	µg/L	1	0.8
Arsenic (total)	µg/L	1	No Water Quality Objective Value
Chromium (III+VI) (dissolved)	µg/L	1	0.01
Chromium (III+VI) (total)	µg/L	1	No Water Quality Objective Value
Copper (dissolved)	µg/L	1	1
Copper (total)	µg/L	1	No Water Quality Objective Value
Iron (dissolved)	µg/L	50	300
Iron (total)	µg/L	50	No Water Quality Objective Value
Lead (dissolved)	µg/L	1	1
Lead (total)	µg/L	1	No Water Quality Objective Value
Manganese (dissolved)	µg/L	5	1,200
Manganese (total)	µg/L	5	No Water Quality Objective Value

EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
6.60	6.83	7.72	7.51	6.69	6.82	6.86	7.6	6.81	6.86	7.47	8.05	7.61	8.47	7.87	8.32	7.14	7.22
57	63	59	52	95	51	50	53	87	16	14	33	26	25	29	15	43	45
-18	225	230	237	208	241	252	198	210	267	249	263	283	272	266	245	273	283
8.24	7.26	10.66	10.84	7.84	7.75	8.33	11.25	12.72	5.71	5.85	7.21	7.06	10.75	10.55	7.64	9.39	9.82
66.5	75.6	86.7	64.6	70	71.1	75.8	67.5	62.8	87.7	91.7	110.6	92.6	124	107.6	158.2	75.3	103.2
38.7	37.8	14.4	20.4	37.2	34.3	33.3	14.8	80.7	5.8	6.6	10	7.5	5.9	9.8	9.9	61.5	48.4
9	7	8	7	<5	<5	<5	6	13	<5	<5	<5	<5	<5	<5	<5	<5	<5
22	31	26	24	36	41	41	24	30	9	9	7	7	5	<1	<1	11	11
40	30	30	70	160	20	100	30	50	10	10	<10	<10	<10	<10	<10	<10	30
500	<100	200	400	100	<100	300	300	500	<100	<100	100	100	100	<100	100	100	300
500	<100	200	400	300	<100	100	300	1,300	600	<100	100	100	100	<100	100	200	500
<10	<10	<10	<10	<10	<100	100	300	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
20	20	20	10	<10	10	10	20	20	<10	<10	20	20	<10	<10	<10	20	20
<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
<1	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1	<5	<5	<5	<5	<5
80	<10	170	160	30	30	30	120	70	<10	<10	40	60	60	30	30	150	60
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1	<1	<1	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	2	<1	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	<50	120	130	<50	<1	<1	2	60	4,340	<50	60	110	140	2	<1	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	<1	3	5	<1	<1	<1	<1	29	2	2	4	6	4	6	3	81	18
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31st May 2023 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*
Flow Rate			
Inflow [#]	ML/day	-	-
Outflow [#]	ML/day	-	4.32 (EPL 43 / 50)
Field			
pH	pH Unit	-	6.5-8.5
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value
Temperature	°C	-	15
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value
Turbidity	NTU	-	<25
Laboratory analytes			
Total suspended solids	mg/L	5	5/10
Hardness as CaCO ₃ (filtered)	mg/L	1	No Water Quality Objective Value
Nutrients			
Ammonia as N	µg/L	5	200/2000 [^]
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value
Nitrogen (Total)	µg/L	10	350/- [^]
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value
Phosphorus (Total)	µg/L	5	100/300 [^]
Inorganics			
Cyanide Total	µg/L	4	No Water Quality Objective Value
Hydrocarbons			
Oil and Grease	mg/L	5	2/5 [^]
Metals			
Aluminium (dissolved)	µg/L	5	55
Arsenic (dissolved)	µg/L	0.2	13
Chromium (III+VI) (dissolved)	µg/L	0.2	1
Copper (dissolved)	µg/L	0.5	14
Iron (dissolved)	µg/L	2	300
Lead (dissolved)	µg/L	0.1	3.4
Manganese (dissolved)	µg/L	0.5	1,900
Nickel (dissolved)	µg/L	0.5	11
Silver (dissolved)	µg/L	0.01	0.05
Zinc (dissolved)	µg/L	1	8
Biological			
Faecal Coliforms	CFU/100mL	1	10/100 [^]
Biological Oxygen Demand	mg/L	<5	5

EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
-	-	0.00	0.12013	0.07510	0.12837	0.22823	-
-	0.021	-	-	-	-	-	-
8.23	-	-	-	-	-	-	7.69
380	-	-	-	-	-	-	129
403	-	-	-	-	-	-	180
13.11	-	-	-	-	-	-	12.55
116.2	-	-	-	-	-	-	93.8
0	-	-	-	-	-	-	5.4
<5	-	-	-	-	-	-	<5
22	-	-	-	-	-	-	<1
440	-	-	-	-	-	-	<10
<10	-	-	-	-	-	-	100
2,800	-	-	-	-	-	-	300
<10	-	-	-	-	-	-	<10
20	-	-	-	-	-	-	10
<4	-	-	-	-	-	-	<4
<1	-	-	-	-	-	-	<1
260	-	-	-	-	-	-	<10
<1	-	-	-	-	-	-	<1
15	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<50	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<50
<1	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<5	-	-	-	-	-	-	<1
<1	-	-	-	-	-	-	<1
<2	-	-	-	-	-	-	<5

Note: Treated water was not being discharged at Tantangara Reservoirs at the time of EPL sampling.

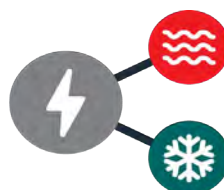
There is no 100th percentile limit for Nitrogen (Total).

* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

- Samples not required

[^] 90 Percentile concentration limit/100 Percentile limit

[#] Inflows to STP and CWTP do not directly correspond to outflow at RO as much of the water is reused on site



Future Generation
Webuild • Clough • Lane

Snowy Hydro 2.0 Main Works
Monthly EPL Sampling: 01 - 31 May 2023 - Treated Water

Date
1/05/2023
2/05/2023
3/05/2023
4/05/2023
5/05/2023
6/05/2023
7/05/2023
8/05/2023
9/05/2023
10/05/2023
11/05/2023
12/05/2023
13/05/2023
14/05/2023
15/05/2023
16/05/2023
17/05/2023
18/05/2023
19/05/2023
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21/05/2023
22/05/2023
23/05/2023
24/05/2023
25/05/2023
26/05/2023
27/05/2023
28/05/2023
29/05/2023
30/05/2023
31/05/2023

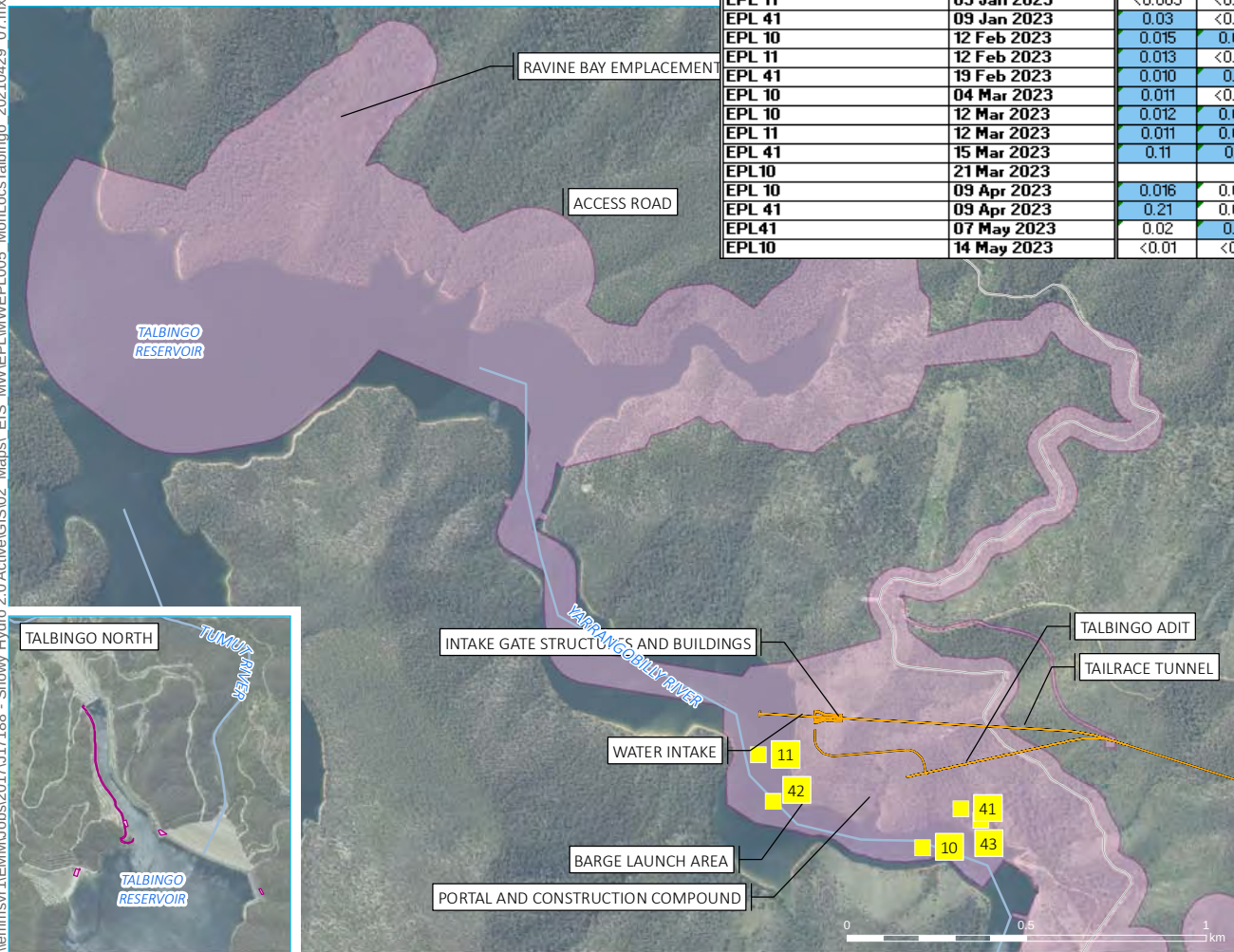
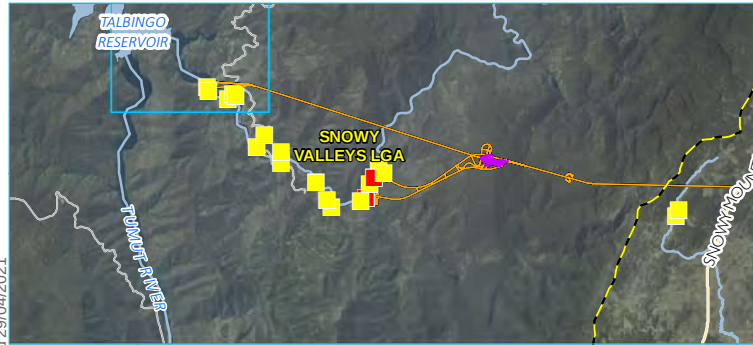
EPL 41	EPL 50
Discharge volume (Megalites)	
0.24	1.16
0.29	-
0.27	0.23
-	0.57
-	0.32
0.43	0.59
0.23	-
-	-
0.09	-
-	0.75
-	-
-	-
0.10	-
-	-
-	-
-	-
0.68	0.19
-	-
-	-
-	-
-	-
0.39	0.19
0.51	0.45
-	-
0.51	-
0.35	0.10
0.45	0.19
-	-
0.49	-
1.00	-
-	0.03

- Water not discharged on this day



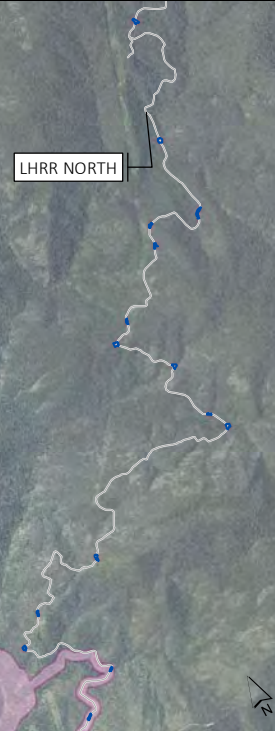
APPENDIX D – EXCEEDANCE MAP

\\emmsvr1\EMM\Jobs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL005 MonLocsTalbingo 20210429 07.mxd 29/04/2021



EQL												
Snowy 2.0 - Surface Water Guidelines												
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil												
EPL	Date	Total Phosphorus as P (Organic Phosphate as P)	Ammonia as N	Nitrogen (Total)	Aluminium (filtered)	Arsenic (filtered)	Chromium (II+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Zinc (filtered)	Oil and Grease
EPL 10	04 Dec 2022	<0.005	<0.005	0.05	0.032	<0.001	<0.001	0.001	<0.05	<0.001	<0.005	10,000
EPL 11	04 Dec 2022	<0.005	<0.005	0.15	0.024	<0.001	0.0025	<0.001	0.06	<0.001	<0.005	11,000
EPL 41	05 Dec 2022	0.065	0.019	0.24	0.75	0.001	0.051	0.007	0.39	0.002	0.27	<5,000
EPL 10	09 Jan 2023	0.010	<0.005	0.02	0.031	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 11	09 Jan 2023	<0.005	<0.005	0.02	0.015	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	09 Jan 2023	0.03	<0.005	0.22	0.320	<0.001	0.022	0.002	<0.05	<0.001	<0.005	<5,000
EPL 10	12 Feb 2023	0.015	0.050	0.11	0.011	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	8,200
EPL 11	12 Feb 2023	0.013	<0.005	0.09	0.015	<0.001	0.002	<0.001	0.06	<0.001	<0.005	15,000
EPL 41	19 Feb 2023	0.010	0.45	0.79	0.50	<0.001	0.003	0.031	0.10	<0.001	0.011	<5,000
EPL 10	04 Mar 2023	0.011	<0.005	0.73	0.011	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 10	12 Mar 2023	0.012	0.055	<0.01	0.027	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	23,000
EPL 11	12 Mar 2023	0.011	0.032	0.16	0.013	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	15 Mar 2023	0.11	0.81	1.1	0.067	<0.001	<0.001	0.010	<0.05	<0.001	0.009	<5,000
EPL 10	21 Mar 2023											13,000
EPL 10	09 Apr 2023	0.016	0.006	0.11	0.016	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	09 Apr 2023	0.21	0.008	2.6	0.10	<0.001	0.012	0.001	<0.05	<0.001	0.018	6,300
EPL 41	07 May 2023	0.02	0.44	2.8	0.26	<0.001	0.015	<0.001	<0.05	<0.001	<0.005	<1,000
EPL 10	14 May 2023	<0.01	<0.01	0.1	0.03	<0.001	<0.001	<0.001	0.05	<0.001	<0.005	<1,000

		Total Phosphorus as P (Organic Phosphate as P)	Ammonia as N	Nitrogen (Total)	Aluminium (filtered)	Arsenic (filtered)	Chromium (II+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Zinc (filtered)	Oil and Grease
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL		0.005	0.005	0.01	0.005	0.001	0.001	0.001	0.05	0.001	0.005	1,000
Snowy 2.0 - Surface Water Guidelines				0.25	0.027	0.0008	0.00001	0.001	0.3	0.001	0.0024	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil												
EPL 10	04 Dec 2022	<0.005	<0.005	0.05	0.032	<0.001	<0.001	0.001	<0.05	<0.001	<0.005	10,000
EPL 11	04 Dec 2022	<0.005	<0.005	0.15	0.024	<0.001	0.0025	<0.001	0.06	<0.001	<0.005	11,000
EPL 41	05 Dec 2022	0.065	0.019	0.24	0.75	0.001	0.051	0.007	0.39	0.002	0.27	<5,000
EPL 10	09 Jan 2023	0.010	<0.005	0.02	0.031	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 11	09 Jan 2023	<0.005	<0.005	0.02	0.015	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	09 Jan 2023	0.03	<0.005	0.22	0.320	<0.001	0.022	0.002	<0.05	<0.001	<0.005	<5,000
EPL 10	12 Feb 2023	0.015	0.050	0.11	0.011	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	8,200
EPL 11	12 Feb 2023	0.013	<0.005	0.09	0.015	<0.001	0.002	<0.001	0.06	<0.001	<0.005	15,000
EPL 41	19 Feb 2023	0.010	0.45	0.79	0.50	<0.001	0.003	0.031	0.10	<0.001	0.011	<5,000
EPL 10	04 Mar 2023	0.011	<0.005	0.73	0.011	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 10	12 Mar 2023	0.012	0.055	<0.01	0.027	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	23,000
EPL 11	12 Mar 2023	0.011	0.032	0.16	0.013	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	15 Mar 2023	0.11	0.81	1.1	0.067	<0.001	<0.001	0.010	<0.05	<0.001	0.009	<5,000
EPL 10	21 Mar 2023											13,000
EPL 10	09 Apr 2023	0.016	0.006	0.11	0.016	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005	<5,000
EPL 41	09 Apr 2023	0.21	0.008	2.6	0.10	<0.001	0.012	0.001	<0.05	<0.001	0.018	6,300
EPL 41	07 May 2023	0.02	0.44	2.8	0.26	<0.001	0.015	<0.001	<0.05	<0.001	<0.005	<1,000
EPL 10	14 May 2023	<0.01	<0.01	0.1	0.03	<0.001	<0.001	<0.001	0.05	<0.001	<0.005	<1,000



The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Talbingo Reservoir

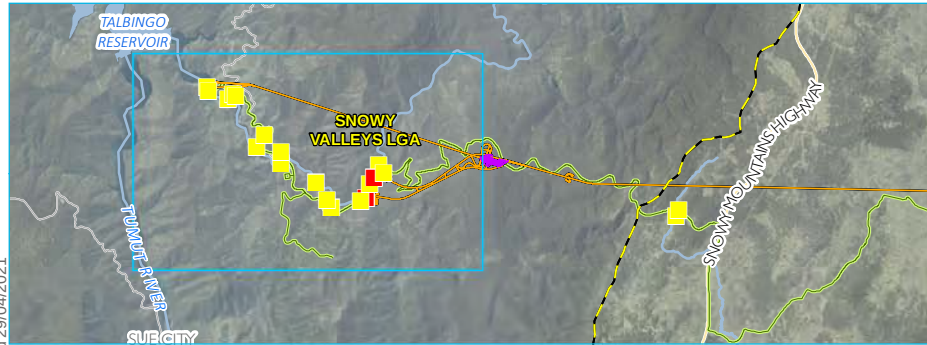
Snowy 2.0
Main Works
Figure 1

Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

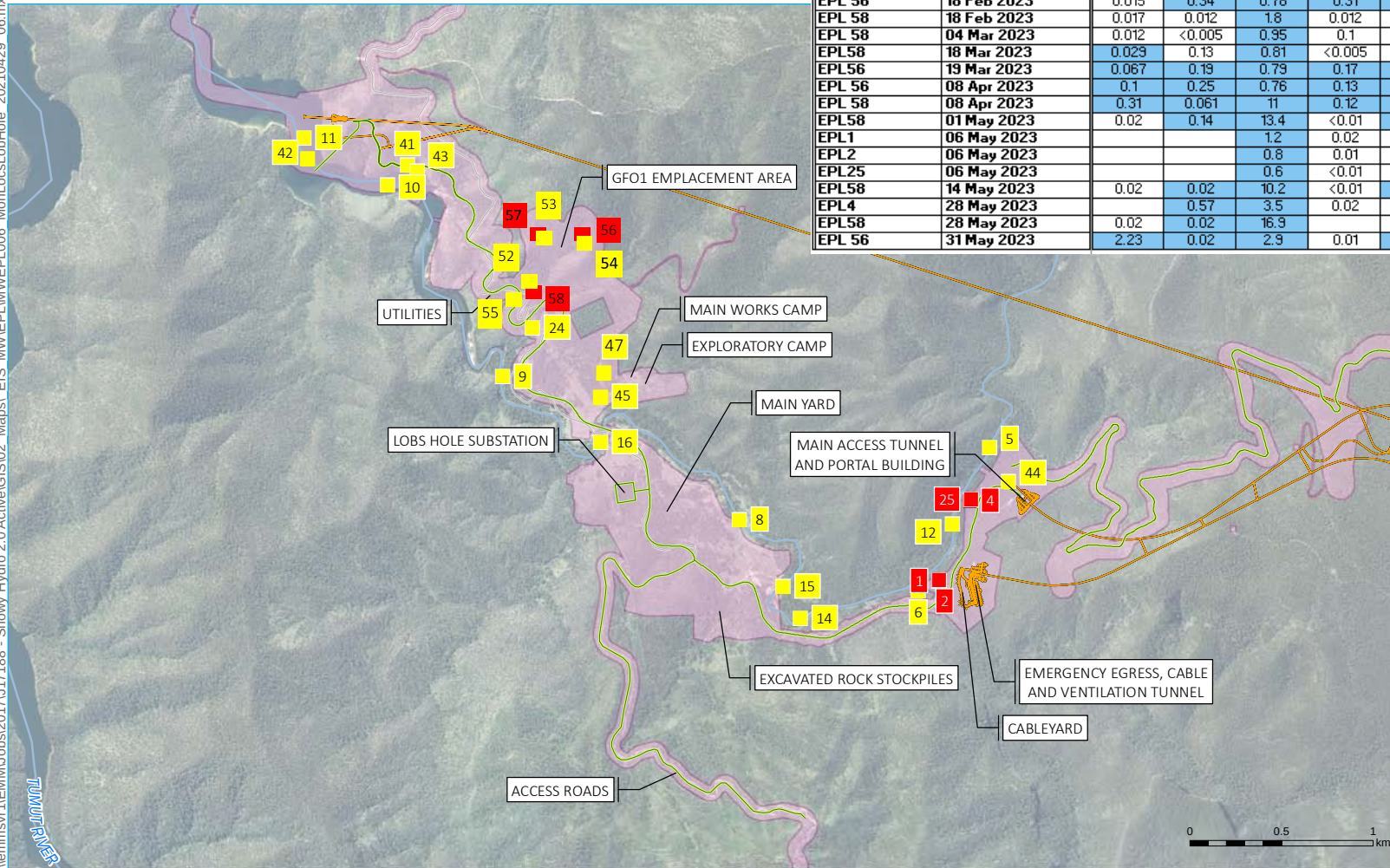
GDA 1994 MGA Zone 55



\\lemmsvr1\EMMM\Jobs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL006 MonLocs\lobHole 20210429 06.mxd 29/04/2021



EQL		0.005	0.005	0.01	0.005	0.001	0.001	0.05	0.001	0.001	1,000
Snowy 2.0 - Surface Water Guidelines				0.25	0.027	0.00001	0.001	0.3	0.001	0.008	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil >=0m, <2m											
EPL 1	02 Feb 2023	0.06		1.8	0.006		<0.001	0.2	<0.001	0.012	
EPL 2	02 Feb 2023	0.06		0.3	0.007		0.16	<0.05	<0.001	0.005	
EPL25	07 Feb 2023	4.1		0.7	0.013		0.005	2.7	0.002	0.009	
EPL4	07 Feb 2023	0.36		0.7	<0.005		0.037	<0.05	<0.001	0.006	
EPL 56	18 Feb 2023	0.015	0.34	0.78	0.31	0.50	0.015	0.06	0.005	0.002	<5,000
EPL 58	18 Feb 2023	0.017	0.012	1.8	0.012	<0.001	0.017	<0.05	0.003	0.003	<5,000
EPL 58	04 Mar 2023	0.012	<0.005	0.95	0.1	<0.001	0.013	0.27	0.006	0.003	160,000
EPL58	18 Mar 2023	0.023	0.13	0.81	<0.005	<0.001	0.003	<0.05	<0.001	0.003	<5,000
EPL56	19 Mar 2023	0.067	0.19	0.79	0.17	0.13	0.011	0.05	<0.001	<0.001	13,000
EPL 56	08 Apr 2023	0.1	0.25	0.76	0.13	0.063	0.002	<0.05	<0.001	<0.001	<5,000
EPL 58	08 Apr 2023	0.31	0.061	11	0.12	0.004	0.035	0.07	0.004	0.005	<5,000
EPL58	01 May 2023	0.02	0.14	13.4	<0.01	0.003	0.014	<0.05	0.002	0.002	<5,000
EPL1	06 May 2023			1.2	0.02	<0.001	0.004	0.24	<0.001	0.007	
EPL2	06 May 2023			0.8	0.01	<0.001	0.003	3.02	<0.001	<0.001	
EPL25	06 May 2023			0.6	<0.01	<0.001	<0.001	4.34	<0.001	0.01	
EPL58	14 May 2023	0.02	0.02	10.2	<0.01	0.004	0.053	<0.05	0.003	0.003	<5,000
EPL4	28 May 2023		0.57	3.5	0.02		0.011	<0.05	<0.001	0.002	
EPL58	28 May 2023	0.02	0.02	16.9							
EPL 56	31 May 2023	2.23	0.02	2.9	0.01	0.002	0.014	<0.05	<0.001	0.001	<5,000



The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Lobs Hole

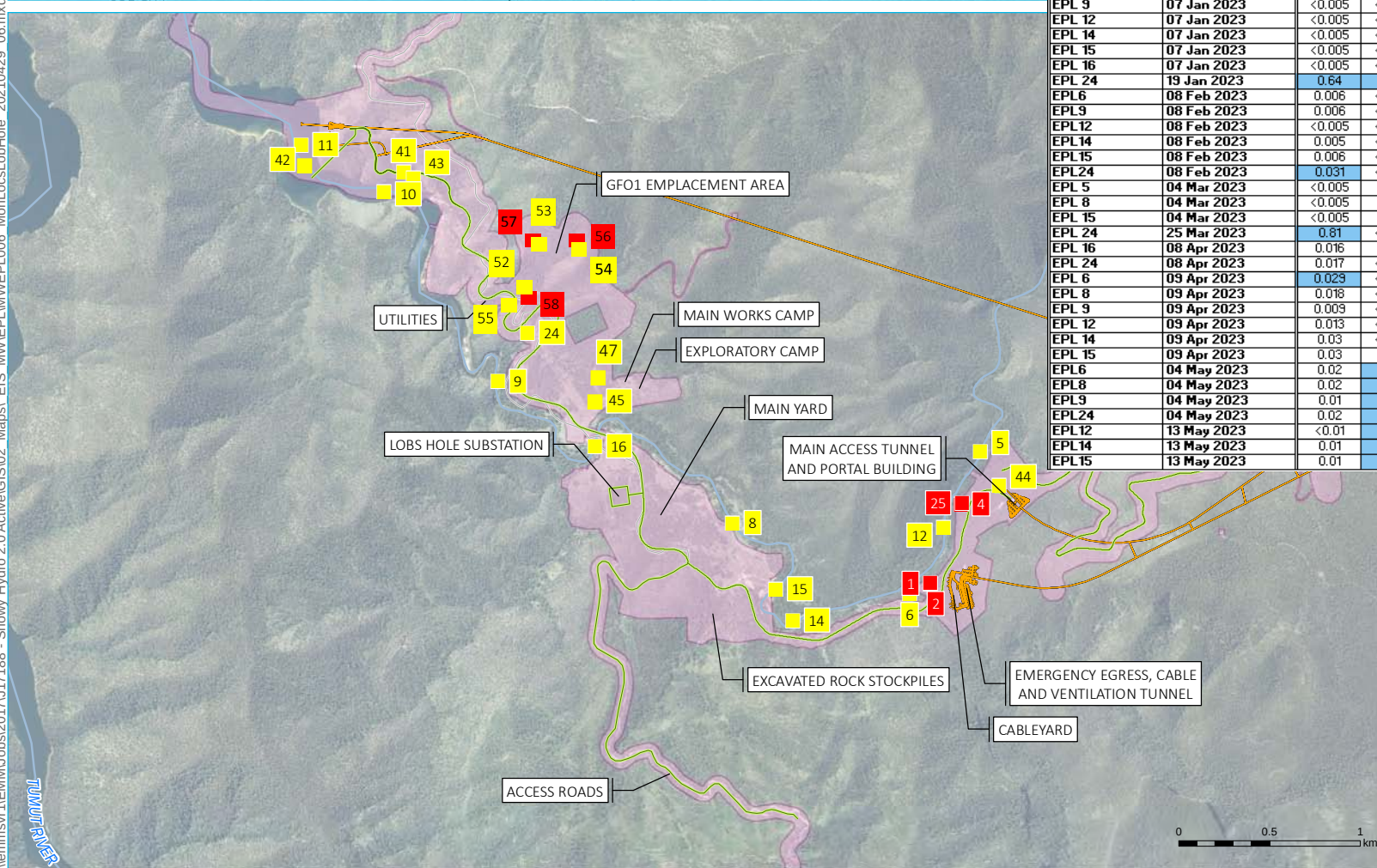
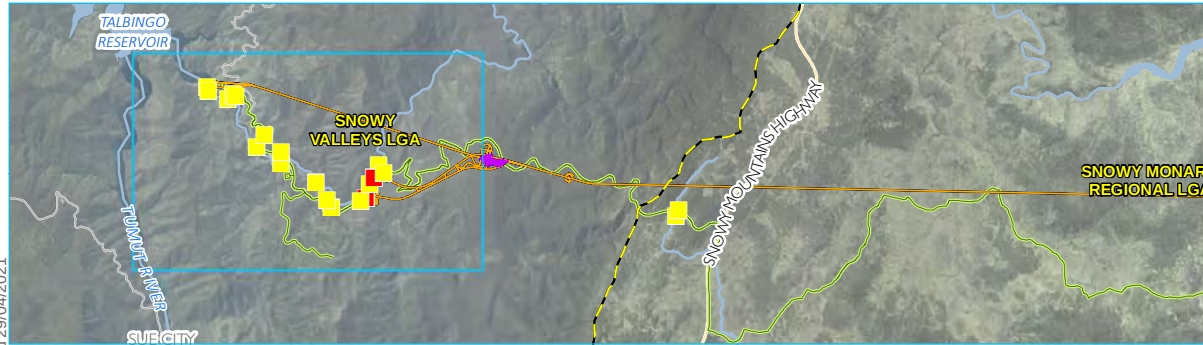
Snowy 2.0
Main Works
Figure 2

Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55



\\lemmsvr1\EMMMJobs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021



		Total Phosphorus as P (Organic Phosphate as P)	Ammonia as N	Nitrogen (Total)	Aluminium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Zinc (filtered)	Oil and Grease
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL		0.005	0.005	0.01	0.005	0.001	0.001	0.005	1,000
Snowy 2.0 - Surface Water Guidelines				0.25	0.027	0.00001	0.001	0.0024	
EPL 5	03 Dec 2022	<0.005	<0.005	0.03	0.028	<0.001	<0.001	<0.005	13,000
EPL 6	03 Dec 2022	0.006	<0.005	0.22	0.032	<0.001	<0.001	<0.005	7,400
EPL 8	03 Dec 2022	<0.005	<0.005	0.07	0.039	<0.001	<0.001	<0.005	22,000
EPL 9	03 Dec 2022	<0.005	<0.005	0.01	0.032	<0.001	<0.001	<0.005	20,000
EPL 12	03 Dec 2022	0.006	<0.005	0.12	0.051	<0.001	<0.001	<0.005	10,000
EPL 14	03 Dec 2022	<0.005	<0.005	0.02	0.026	<0.001	<0.001	<0.005	14,000
EPL 15	03 Dec 2022	<0.005	<0.005	0.01	0.035	<0.001	<0.001	<0.005	16,000
EPL 16	03 Dec 2022	0.005	<0.005	0.01	0.046	<0.001	<0.001	<0.005	21,000
EPL 24	03 Dec 2022	0.008	0.007	0.08	0.07	<0.001	<0.001	<0.005	12,000
EPL 5	07 Jan 2023	<0.005	<0.005	0.04	0.15	<0.001	<0.001	<0.005	23,000
EPL 6	07 Jan 2023	0.008	<0.005	0.04	0.28	<0.001	<0.001	<0.005	10,000
EPL 8	07 Jan 2023	<0.005	<0.005	0.03	0.17	<0.001	<0.001	<0.005	<5,000
EPL 9	07 Jan 2023	<0.005	<0.005	0.02	0.22	<0.001	<0.001	<0.005	<5,000
EPL 12	07 Jan 2023	<0.005	<0.005	0.76	0.17	<0.001	<0.001	<0.005	<5,000
EPL 14	07 Jan 2023	<0.005	<0.005	0.27	0.14	<0.001	<0.001	<0.005	18,000
EPL 15	07 Jan 2023	<0.005	<0.005	0.11	0.27	<0.001	<0.001	<0.005	<5,000
EPL 16	07 Jan 2023	<0.005	<0.005	0.18	0.15	<0.001	<0.001	<0.005	<5,000
EPL 24	19 Jan 2023	0.64	0.017	1.2	30	0.004	0.001	<0.005	17,000
EPL 6	08 Feb 2023	0.006	<0.005	0.07	<0.005	<0.001	<0.001	<0.005	8,800
EPL 9	08 Feb 2023	0.006	<0.005	0.06	0.008	<0.001	<0.001	<0.005	7,800
EPL 12	08 Feb 2023	<0.005	<0.005	0.02	0.009	<0.001	<0.001	<0.005	8,500
EPL 14	08 Feb 2023	0.005	<0.005	0.05	0.011	<0.001	<0.001	<0.005	8,100
EPL 15	08 Feb 2023	0.006	<0.005	0.05	0.01	<0.001	<0.001	<0.005	6,400
EPL 24	08 Feb 2023	0.031	<0.005	0.24	0.12	<0.001	<0.001	<0.005	<5,000
EPL 5	04 Mar 2023	<0.005	0.006	1.9	<0.005	<0.001	<0.001	<0.005	
EPL 8	04 Mar 2023	<0.005	0.005	0.43	0.01	<0.001	<0.001	<0.005	
EPL 15	04 Mar 2023	<0.005	0.005	2.5	0.01	<0.001	<0.001	0.007	
EPL 24	25 Mar 2023	0.81	<0.005	1.7	0.01	<0.001	<0.001	<0.005	12,000
EPL 16	08 Apr 2023	0.016	0.01	0.07	0.069	<0.001	<0.001	<0.005	<5,000
EPL 24	08 Apr 2023	0.017	<0.005	1.2	0.11	<0.001	<0.001	<0.005	<5,000
EPL 6	09 Apr 2023	0.029	<0.005	<0.01	0.008	<0.001	<0.001	<0.005	<5,000
EPL 8	09 Apr 2023	0.016	<0.005	0.14	0.092	<0.001	<0.001	<0.005	<5,000
EPL 9	09 Apr 2023	0.009	<0.005	0.12	0.12	<0.001	<0.001	<0.005	<5,000
EPL 12	09 Apr 2023	0.013	<0.005	0.15	0.083	<0.001	<0.001	<0.005	<5,000
EPL 14	09 Apr 2023	0.03	<0.005	0.1	0.1	<0.001	<0.001	<0.005	<5,000
EPL 15	09 Apr 2023	0.03	0.011	0.11	0.081	<0.001	<0.001	<0.005	<5,000
EPL 6	04 May 2023	0.02	0.03	<0.1	<0.01	<0.001	<0.001	<0.005	<1,000
EPL 8	04 May 2023	0.02	0.03	0.2	0.17	<0.001	<0.001	<0.005	<1,000
EPL 9	04 May 2023	0.01	0.07	0.4	0.16	0.001	<0.001	<0.005	<1,000
EPL 24	04 May 2023	0.02	0.05	1.3	0.07	<0.001	0.003	<0.005	<1,000
EPL 12	13 May 2023	<0.01	0.16	0.3	0.03	<0.001	<0.001	<0.005	<1,000
EPL 14	13 May 2023	0.01	0.02	<0.1	0.03	<0.001	<0.001	<0.005	<1,000
EPL 15	13 May 2023	0.01	0.1	0.1	0.03	<0.001	<0.001	<0.005	<1,000

design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.
Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

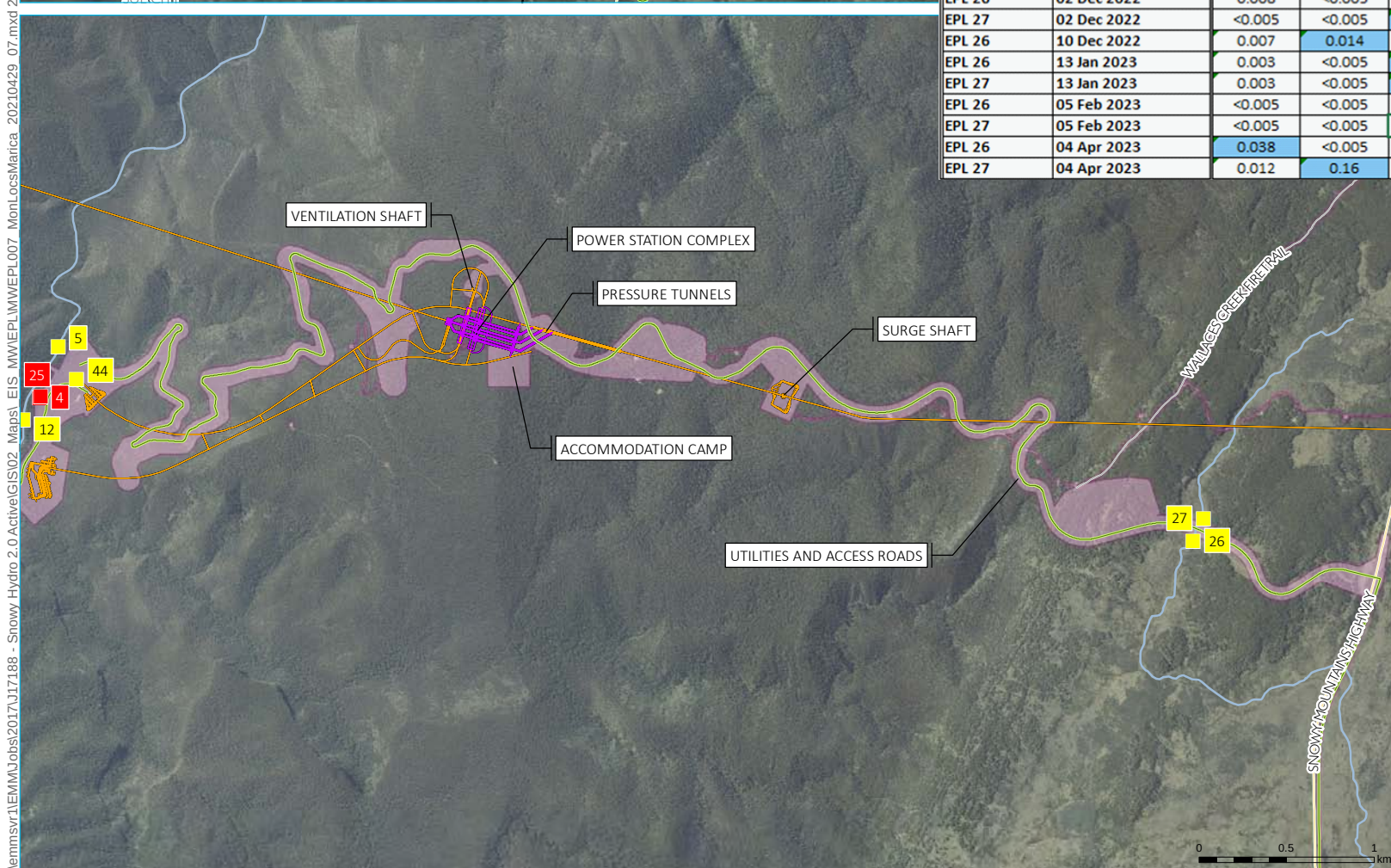
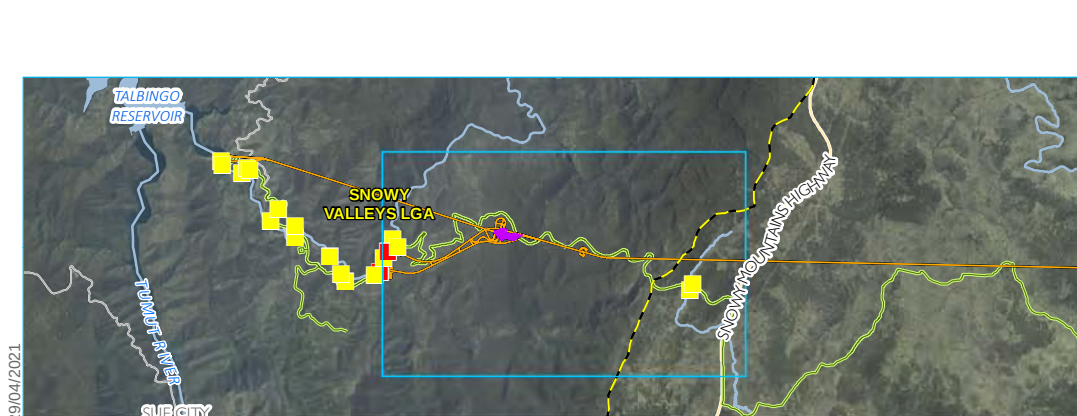
EPL Premise and monitoring point maps - Lobs Hole

Snowy 2.0
Main Works
Figure 3

Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

GDA 1994 MGA Zone 55





Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

		Total Phosphorus as P (Organic Phosphate as P)	Ammonia as N	Cyanide Total	Aluminium (filtered)	Chromium (III+VI) (filtered)	Zinc (filtered)	Oil and Grease
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL		0.005	0.005	0.004	0.005	0.001	0.005	1,000
Snowy 2.0 - Surface Water Guidelines				0.004	0.027	0.00001	0.0024	
NEPM 2013 Table 18(6) ESLs for Comm/Ind, Coarse Soil								
EPL 26	02 Dec 2022	0.008	<0.005	0.004	0.029	<0.001	<0.005	8,400
EPL 27	02 Dec 2022	<0.005	<0.005	0.005	0.020	<0.001	<0.005	9,400
EPL 26	10 Dec 2022	0.007	0.014	<0.004	<0.005	0.001	<0.005	6,200
EPL 26	13 Jan 2023	0.003	<0.005	0.006	0.012	<0.001	<0.005	7,200
EPL 27	13 Jan 2023	0.003	<0.005	0.007	0.016	<0.001	<0.005	7,300
EPL 26	05 Feb 2023	<0.005	<0.005	<0.004	0.012	<0.001	0.008	<5,000
EPL 27	05 Feb 2023	<0.005	<0.005	<0.004	<0.005	<0.001	0.008	9,600
EPL 26	04 Apr 2023	0.038	<0.005	<0.004	<0.005	0.002	<0.005	<5,000
EPL 27	04 Apr 2023	0.012	0.16	<0.004	<0.005	0.003	<0.005	13,000

The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

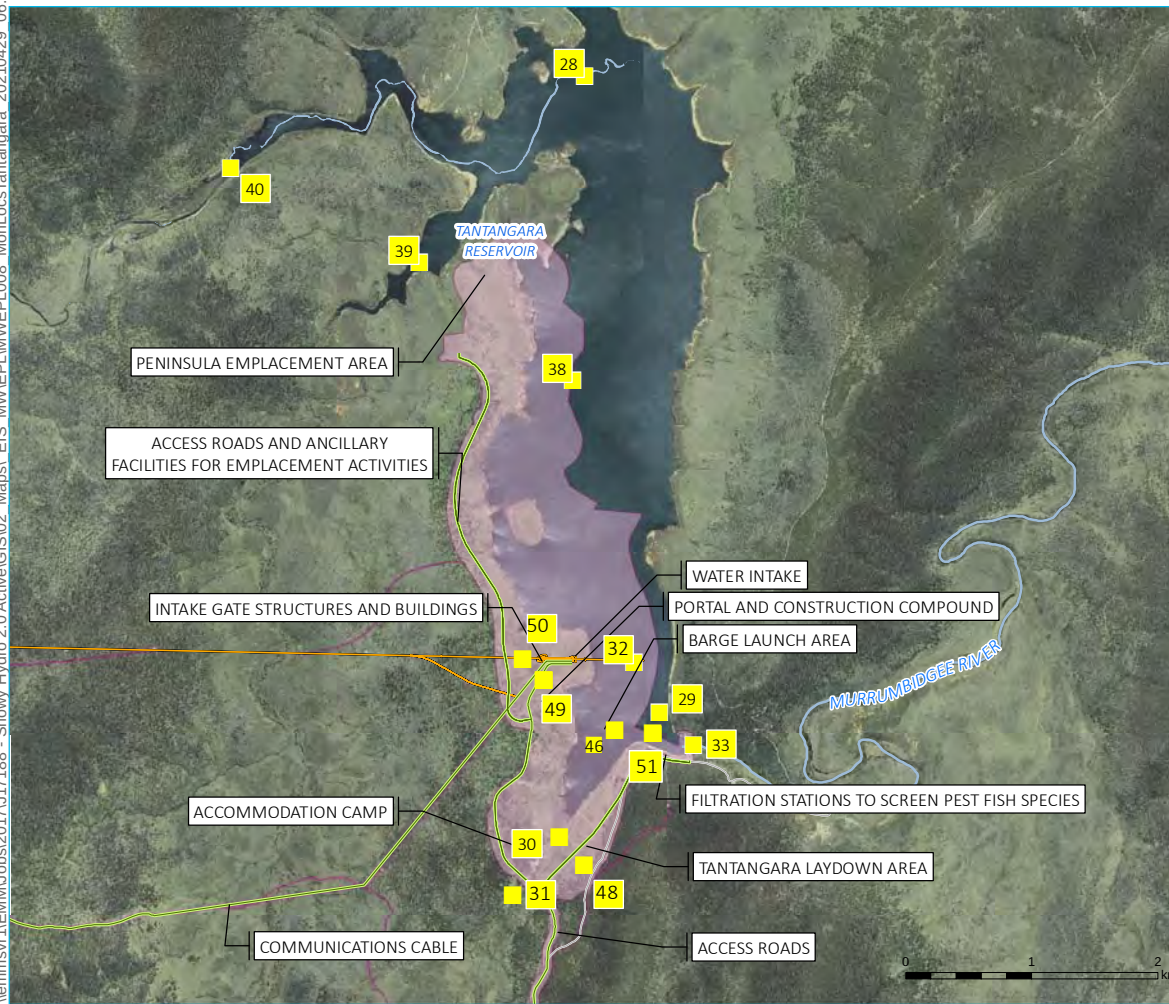
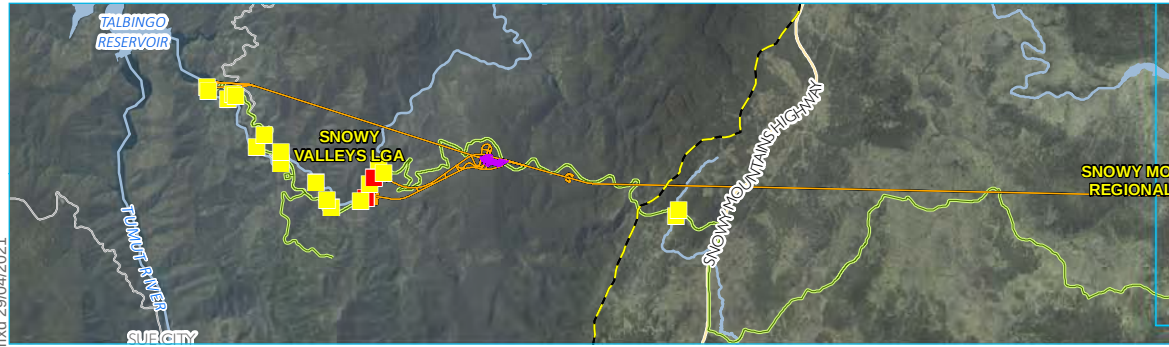
Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Marica

Snowy 2.0
Main Works
Figure 4

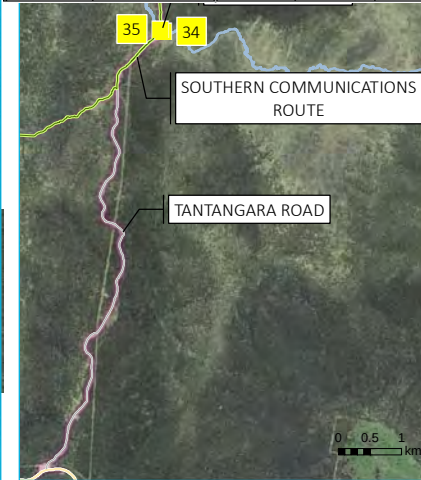


\\emmsvr1\EMM\Jobs\2017\17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL008 MonLocsTantangara 20210429 06.mxd 29/04/2021



Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

		Total Phosphorus as P (Organic Phosphate as P)		Ammonia as N		Cyanide Total		Nitrogen (Total)		Aluminium (filtered)		Chromium (III+VI) (filtered)		Copper (filtered)		Iron (filtered)		Oil and Grease	
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L
EQL		0.005	0.005	0.004	0.01	0.005	0.001	0.001	0.05	1,000									
Snowy 2.0 - Surface Water Guidelines																			
NEPM 2013 Table 18(6) EQLs for Comm/Ind, Coarse Soil																			
EPL 28	03 Dec 2022	0.009	<0.005	0.34	<0.01	0.059	<0.001	0.001	0.14	9,000									
EPL 29	03 Dec 2022	0.007	<0.005	0.005	<0.01	0.063	<0.001	0.002	0.12	8,300									
EPL 32	03 Dec 2022	0.006	<0.005	0.23	<0.01	0.075	<0.001	0.002	0.13	6,500									
EPL 35	03 Dec 2022	0.007	<0.005	0.005	<0.01	0.040	<0.001	<0.001	0.19	12,000									
EPL 38	03 Dec 2022	0.015	<0.005	0.006	<0.01	0.034	<0.001	<0.001	0.11	8,200									
EPL 39	03 Dec 2022	0.011	<0.005	0.004	<0.01	0.054	<0.001	0.001	0.20	12,000									
EPL 40	03 Dec 2022	0.010	<0.005	0.004	<0.01	0.043	<0.001	<0.001	0.15	9,500									
EPL 51	03 Dec 2022	0.007	<0.005	<0.004	<0.01	0.073	<0.001	<0.001	0.11	5,700									
EPL 28	12 Jan 2023	0.009	<0.005	<0.004	0.12	0.06	<0.001	<0.001	0.38	8,000									
EPL 29	12 Jan 2023	0.009	<0.005	<0.004	0.12	0.046	<0.001	<0.001	0.26	80,000									
EPL 32	12 Jan 2023	0.007	<0.005	0.006	0.06	0.051	<0.001	<0.001	0.27	12,000									
EPL 38	12 Jan 2023	0.019	<0.005	<0.004	0.09	0.045	<0.001	<0.001	0.28	5,400									
EPL 29	05 Feb 2023	0.017	<0.005	<0.004	0.15	0.022	<0.001	<0.001	0.16	41,000									
EPL 30	05 Feb 2023	0.019	<0.005	<0.004	0.16	0.012	<0.001	<0.001	0.06	17,000									
EPL 32	05 Feb 2023	0.017	0.007	<0.004	0.14	0.020	<0.001	<0.001	0.16	24,000									
EPL 34	05 Feb 2023	<0.005	<0.005	<0.004	0.12	0.031	<0.001	<0.001	0.26	11,000									
EPL 38	05 Feb 2023	<0.005	0.006	<0.004	0.21	0.024	<0.001	<0.001	0.15	13,000									
EPL 39	05 Feb 2023	0.011	<0.005	<0.004	0.12	0.023	<0.001	<0.001	0.15	30,000									
EPL 46	05 Feb 2023	0.013	0.009	<0.004	0.16	0.019	<0.001	<0.001	0.16	37,000									
EPL 30	08 Mar 2023	0.009		<0.004		0.014	<0.001	<0.001	0.10	24,000									
EPL 31	08 Mar 2023	0.011		<0.004		0.014	<0.001	<0.001	0.07	23,000									
EPL 33	08 Mar 2023	0.009		<0.004		<0.005	<0.001	<0.001	0.24	52,000									
EPL 34	08 Mar 2023	0.012	<0.005	<0.004		0.041	<0.001	<0.001	0.36	17,000									
EPL 35	08 Mar 2023	0.013		<0.004		0.027	<0.001	<0.001	0.42	19,000									
EPL 50	08 Mar 2023	0.006		0.006		<0.005	<0.001	<0.001	<0.05	30,000									
EPL 29	09 Mar 2023	0.018		<0.004		0.029	<0.001	<0.001	0.20	130,000									
EPL 32	09 Mar 2023	0.015		<0.004		0.010	<0.001	<0.001	0.21	16,000									
EPL 39	09 Mar 2023	0.011		<0.004		0.026	<0.001	<0.001	0.28	10,000									
EPL 46	09 Mar 2023	0.017		<0.004		<0.005	<0.001	<0.001	0.20	15,000									
EPL 28	16 Mar 2023	0.056	<0.005	0.009	0.07	0.015	<0.001	<0.001	0.20	24,000									
EPL 38	16 Mar 2023	0.024	<0.005	0.005	0.10	0.017	<0.001	<0.001	0.15	22,000									
EPL 51	16 Mar 2023	<0.005	<0.005	<0.004	0.16	0.015	<0.001	<0.001	0.20	14,000									
EPL 28	02 Apr 2023	0.008	<0.005	<0.004	<0.01	0.006	0.002	<0.001	0.22	27,000									
EPL 38	02 Apr 2023	0.021	<0.005	<0.004	0.03	0.047	<0.001	<0.001	0.28	50,000									
EPL 40	02 Apr 2023	0.020	<0.005	<0.004	0.06	0.043	<0.001	<0.001	0.21	9,200									
EPL 30	04 Apr 2023	0.018	0.033	<0.004	<0.01	0.012	0.001	<0.001	<0.05	7,400									
EPL 35	04 Apr 2023	0.010	<0.005	<0.004	0.01	0.018	0.003	<0.001	0.15	9,900									
EPL 50	04 Apr 2023	0.012	<0.005	<0.004	0.40	0.005	0.002	<0.001	<0.05	22,000									



design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Tantangara Reservoir

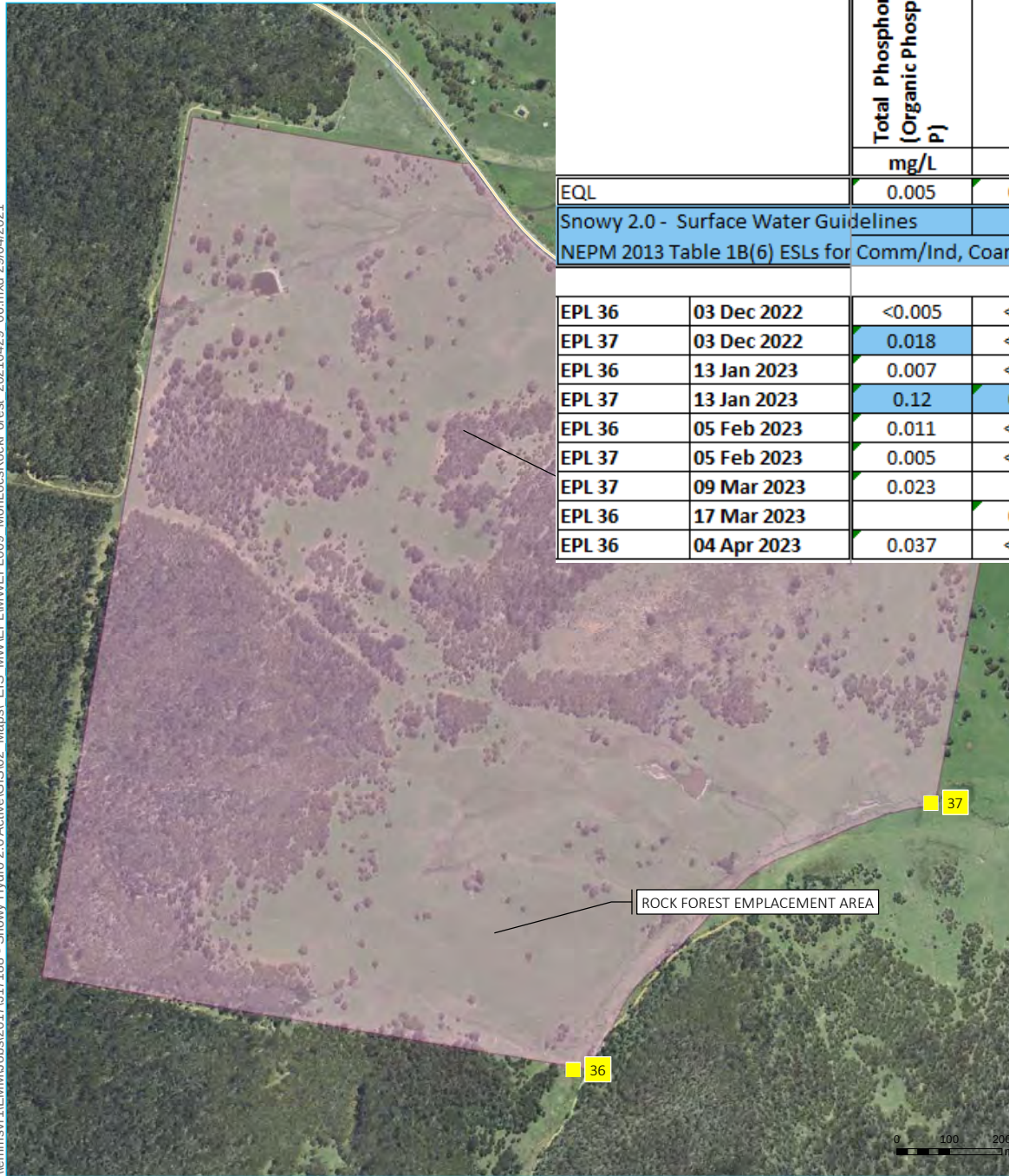
Snowy 2.0
Main Works
Figure 5



GDA 1994 MGA Zone 55



\\lemmsvr1\EMMAJ\obs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MW\EPL009 MonLocsRockForest 20210429 06.mxd 29/04/2021



Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

		Total Phosphorus as P (Organic Phosphate as P)	Ammonia as N	Cyanide Total	Nitrogen (Total)	Aluminium (filtered)	Chromium (III+VI) (filtered)	Iron (filtered)	Oil and Grease
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL		0.005	0.005	0.004	0.01	0.005	0.001	0.05	1,000
Snowy 2.0 - Surface Water Guidelines				0.004	0.25	0.027	0.00001	0.3	
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil									
EPL 36	03 Dec 2022	<0.005	<0.005	<0.004	0.12	0.023	<0.001	0.27	15,000
EPL 37	03 Dec 2022	0.018	<0.005	0.004	0.11	0.028	<0.001	0.31	13,000
EPL 36	13 Jan 2023	0.007	<0.005	0.006	0.370	0.056	<0.001	0.670	<5,000
EPL 37	13 Jan 2023	0.12	0.026	<0.004	0.540	0.069	<0.001	0.730	<5,000
EPL 36	05 Feb 2023	0.011	<0.005	<0.004	0.400	0.054	<0.001	0.830	62,000
EPL 37	05 Feb 2023	0.005	<0.005	<0.004	0.310	0.041	<0.001	0.730	<5,000
EPL 37	09 Mar 2023	0.023		0.005		0.044	<0.001	0.98	11,000
EPL 36	17 Mar 2023		0.072		0.35				
EPL 36	04 Apr 2023	0.037	<0.005	<0.004	0.26	0.030	0.002	0.61	30,000



GDA 1994 MGA Zone 55

The disturbance area is an estimation of the area required for construction works based on the current level of project design. Detailed design is still required to be completed, therefore it is expected that the precise location of the disturbance area may move within the broader construction envelope and consequently there will be some further refinements to the disturbance area.

Note that the Approved Exploratory Works disturbance area (SSI 9208) will also be a disturbance area for Main Works, even following surrender of the Exploratory Works Approval. The cumulative disturbance area for the Main Works and approved Exploratory Works is therefore presented in this figure.

EPL Premise and monitoring point maps - Rock Forest

Snowy 2.0
Main Works
Figure 6

