REPORT

EPL 21266 – BI-ANNUAL MONITORING REPORT
JUNE 2022 – NOVEMBER 2022

S2-FGJV-ENV-REP-0070

Rev A

JANUARY 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.

Revision Record

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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 Jess 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, labelled Basin labelled GF01 - SW - SB in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 53^	148.391	-35.774	Lobs Hole	Surface Water	Talbingo Reservoir upstream East of GF01 emplacement area labelled GF01 - SW - USE in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 54^	148.389	-35.775	Lobs Hole	Surface Water	Talbingo Reservoir Upstream West of GF01 emplacement area labelled GF01 - SW - USW in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 55^	148.387	-35.778	Lobs Hole	Surface Water	Yarrangobilly River, Surface Water Downstream of GF01 emplacement area labelled GF01 - SW - DS in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 56^	148.391	-35.774	Lobs Hole	Groundwater	Ground Water Upstream East from GF01 emplacement area labelled GF01 - GW - USE in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 57^	148.389	-35.775	Lobs Hole	Groundwater	Ground Water Upstream West from GF01 emplacement area labelled GF01 - GW - USW in 'Leachate Detection Procedure - GF01' (DOC22/650275)
EPL 58^	148.389	-35.777	Lobs Hole	Groundwater	Ground Water Downstream from GF01 emplacement area labelled GF01 - GW - DS in 'Leachate Detection Procedure - GF01' (DOC22/650275)

EPL 59^	148.644	-35.761	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB1 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 60^	148.644	-35.760	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB2 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 61^	148.648	-35.76	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB3 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 62^	148.649	-35.762	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB4 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 63^	148.649	-35.763	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB5 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 64^	148.64	-35.767	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB6 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 65^	148.648	-35.7641	Tantangara	Surface Water	Tantangara Leachate Basin labelled Tan-SW-SB7 in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 66^	148.651	-35.763	Tantangara	Surface Water	Tantangara Leachate Basin Downstream East from Tantangara emplacement area labelled Tan-SW-DSE in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 67^	148.642	-35.760	Tantangara	Surface Water	Nungar Creek Surface Water Downstream West from Tantangara emplacement area labelled Tan-SW-DSW in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 68^	148.644	-35.760	Tantangara	Groundwater	Ground Water Downstream East from Tantangara emplacement area labelled Tan-GW-DSE in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 69^	148.650	-35.763	Tantangara	Groundwater	Ground Water Downstream West from Tantangara emplacement area labelled Tan-GW-DSW in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)
EPL 70^	148.645	-35.770	Tantangara	Groundwater	Ground Water Upstream from Tantangara emplacement area labelled Tan-GW-US in 'Leachate Detection Procedure - Tantangara' (DOC22/798284)

*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

Table 1-3 outlines the amendments included in each variation of EPL 21266 between June 2022 and November 2022.

Table 1-3: EPL Variation within this reporting period

Date of Variation	Changes outlined
06 July 2022	• **Operation conditions O5.1 - O5.8 have been included on the Licence.**
05 October 2022	• **Condition A1.3: The note underneath this condition has been amended to update approved** • **scheduled development works** • **Condition P1.2: Surface water monitoring points 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 65, 66 and 67 have been added** • **Condition P1.2: Groundwater monitoring points 56, 57, 58, 68, 69, and 70 have been added** • **Condition M2: The sampling method and frequency of pollutant monitoring for points 52 to 70 has been added** • **Condition U1: Assessment of Diffuse Source Water Pollution Management PRP has been added** • **Condition U2: Generator emission improvements program has been added**

1.4. Project Updates

This bi-annual monitoring update includes June 2022 – November 2022 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)

- Talbingo Intake at excavation level RL 581.

- Talbingo Adit portal beginning to assemble TBM and supporting facilities (WTP, Grout Plant, etc)
- Main Camp covered walkways and close out items ongoing
- Talbingo Adit Portal and Main Camp earthworks footprint complete
- GF01 clearing commenced and leachate preparation works commenced
- GF01 expect to begin taking TBM spoil in January 2023

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

- TBM finished tunneling in Mat Portal at the start of October. Disassembly of the TBM has commenced
- Disassembaly of portal facilities has commenced including; discharge conveyor, drive station and grout plant
- Drill and blast activities (Blasting, bolting, shotcreting, mucking, drilling) are occuring at CT07, CT01, CP01, CP02, turning bay, MAT02
- Stage 5 earthworks is ongoing.
- Ashfelting of Ravine Road close to completion.
- Main Yard fill and materials processing ongoing from TBMs spoil.
- Level spreader and rock-lined batter chute rectification works close to completion.
- TBM 1 progressing in ECVT Portal.

1.4.3. Marica

- Surge shaft excavation is ongoing.
- Underground utilities installation including trenching in the shaft and laydown area is ongoing.
- FRP works, aggregate storage shed installation and generator installation in progress.
- Sharft pad surface drainage FRP works in progress.
- Marica Trail Road widening between CH0 – CH2100 build to IFC design.
- Bottom HDD pad facilities installation complete and in use.
- Horizontal directional drilling is ongoing through the borehole.
- All accommodation blocks installation completed and commissioned. Installation of covered walkways in progress.

1.4.4. Tantangara

- HRT Adit TBM continues operating in geohazards conditions. Remediation works are ongoing.
- Gate shaft excavation is ongoing. Shed structural installation in progress.
- Warehouse completed and workshop installation works are ongoing.
- All accommodation blocks installation completed.

- Tantangara road maintenance is ongoing with LEED.
- Quarry trail road widening from FGJV.
- Batch Plant in operation.
- Works ongoing on Tantangara Spoil Road. The earthworks are completed up to the spoil area. Pavement to be installed after the intake blasting
- Water treatment plant operational.

1.4.5. Trunk Services

- Trenching along the alignment ongoing.
- Clearing carried out for drill pads and towards Tantangara.
- Site rehabilitation progressing.
- ERSED improvement actions and items largely complete.
- Water Quality Monitoring ongoing.
- Underboring commenced.

1.4.6. Rock Forest

- Site operational as laydown area

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 previous Biannual Monitoring Report (S2-FGJV-ENV-REP-0052*)* noted above-average rainfall. The conditions for this reporting period followed a similar pattern with La Nina conditions.

The cumulative rainfall between June 2022 and M 2022 is presented in **Figure 2-1.**

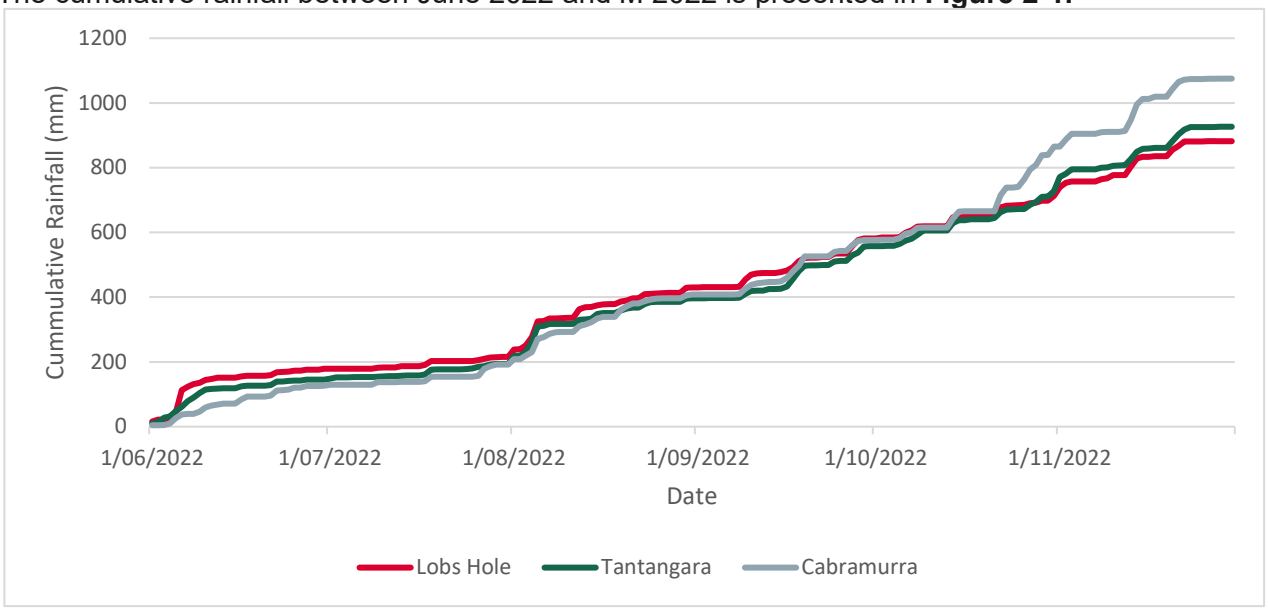


Figure 2-1: Cumulative Rainfall across Lobs Hole, Tantangara and Cabramurra.

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:

- 67.4 mm at Lobs Hole – 06/06/2022
- 49.6 mm at Cabramurra (Marica) – 22/10/2022
- 47.4 mm at Tantangara – 05/08/2022

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

- Lobs Hole: 111.4 mm between the 5 and 9 June 2022;
- Cabramurra (Marica): 105.4 mm between 13 and 17 November 2022; and
- Tantangara: 115 mm between 1 and 5 July 2022

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
June	145.4	57.8	127	122.7	178.6	102.2
July	48.6	53.8	64.4	114.1	36.6	104.0
August	202.8	59.7	217.2	129.7	215.2	106.6
September	160.4	60.1	167.6	126.7	151.4	90.5
October	170.2	67.8	289.4	111.7	130.8	95.3
November	199.2	58.9	209.6	122.2	169.2	76.9

Following the trends outlined in the previous Bi-annual Monitoring Report, the Winter and Spring rainfall produced generally much higher than average rainfall for the region (**Table 2-1**), caused by the continuation and strengthening of La Nina in the Tropical Pacific.

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.

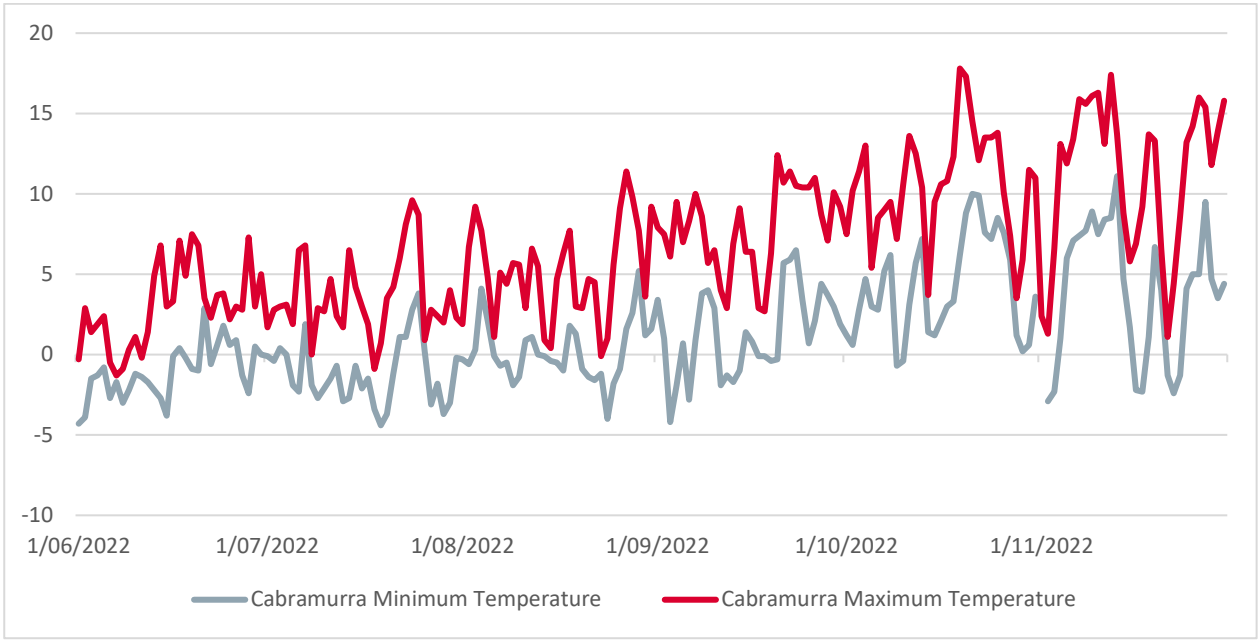


Figure 2-2: Cabramurra (Marica) - Minimum and Maximum Temperatures

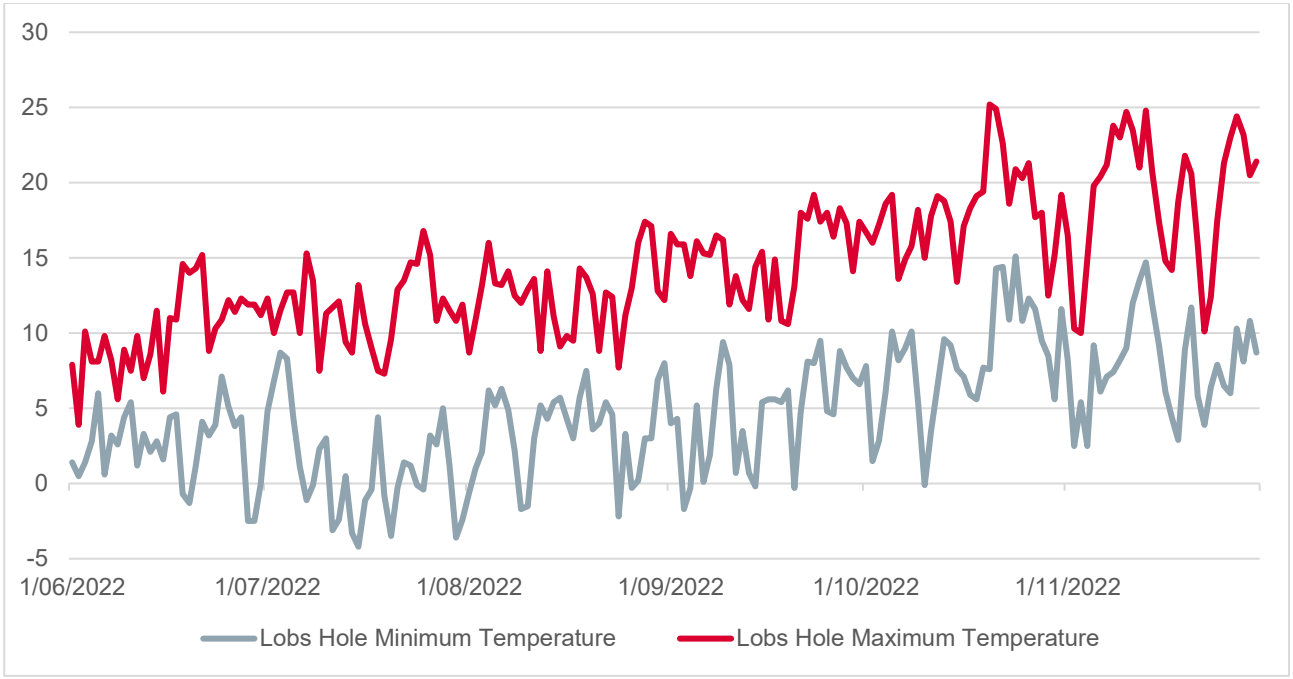


Figure 2-3: Lobs Hole - Minimum and Maximum Temperatures

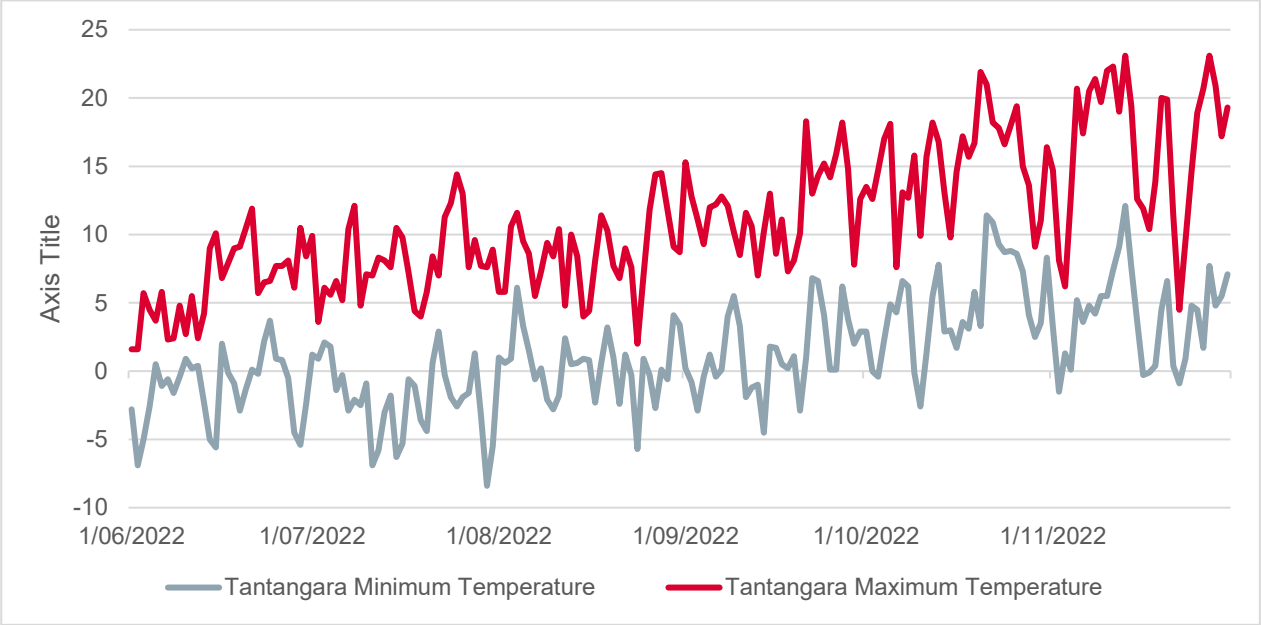


Figure 2-4: Tantangara - Minimum and Maximum Temperatures

3. MONITORING RESULTS

3.1. June 2022 – November 2022 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					
Jun	20	17	13	2	Low pH and EC are generally representative of the background conditions in June 2022 with most exceedances only marginally less than WQO criteria though a decreasing trend is becoming apparent.
Jul	12	10	3	1	Low DO, pH, and EC are generally representative of background conditions for July 2022 and are consistent with previous results.
Aug	5	4	17	7	The elevated turbidity is likely a result of significant rainfall and ground saturation on site. Low pH is generally representative of the background conditions in August 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent.
Sep	23	0	14	9	Much like the previous months of monitoring, low DO is representative of background conditions. Elevated turbidity is likely a result of sampling being conducted after rainfall. pH marginally exceeded the WQO with marginal lower concentrations reported, rather than significant exceedances.
Oct	10	0	15	0	Similar to previous monitoring, DO and pH variations are likely a result of typical background conditions with only marginal exceedances or values less than the WQO.
Nov	10	0	5	4	EC, Turbidity and pH were generally within the range baseline data with a select few locations marginally exceeding the WQO. These results are considered representative of background conditions. DO concentrations were less than the WQO for a number of locations, which is consistent with the previous months of monitoring of a downward facing trend.

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

Dissolved oxygen across most of the EPL sampling locations is typically lower than the WQO. As the WQO were derived from the default trigger values for physical and chemical stressors in south-

east Australia (upland rivers and freshwater lakes/reservoirs), it is evident that results during winter/spring months are on a downward trend and are consistently reported as less than the WQO. Electrical conductivity across the project EPL sampling locations is also more commonly lower than the adopted WQO during winter/spring months. After snow melt and rainfall, it is expected that the waterbodies (rivers and reservoirs) within the project would see a decrease 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 June, August, September, October, and November 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, several higher-than-average rainfall events were experienced at all sites (Figure 2-1), including:

- 1 – 5 June (45.2mm – Lobs Hole, 48.8 – Tantangara)
- 6 – 10 June (99.4mm – Lobs Hole, 65.6mm – Tantangara)
- 26 – 20 July (37.6mm – Marica)
- 30 July – 3 August (36mm – Lobs Hole, 36.8mm - Tantangara)
- 1 – 5 August (79.6mm – Marica)
- 4 – 8 August (83mm – Lobs Hole, 86.6mm – Tantangara)
- 9 – 13 August (34.8mm – Lobs Hole)
- 12 – 16 August (32.8mm – Tantangara, 46.2mm – Marica)
- 19 – 23 August (48mm – Marica)
- 9 – 13 September (43mm – Lobs Hole, 38.2mm – Marica)
- 16 – 20 September (44.2mm – Lobs Hole, 71.6mm – Tantangara, 77.2mm – Marica)
- 24 – 28 September (53mm – Lobs Hole, 37.6mm – Tantangara, 46.8mm – Marica)
- 6 – 10 October (34.2mm – Lobs Hole, 41.4mm – Tantangara)
- 14 – 18 October (32.6mm Lobs Hole, 35mm – Tantangara, 50.8mm – Marica)
- 22 – 26 October (30.6mm – Lobs Hole, 99mm – Marica)
- 27 – 31 October (54.6mm – Tantangara, 101.2mm – Marica)
- 1 – 5 November (45.2mm – Lobs Hole, 67.8mm – Tantangara, 39.4mm – Marica)
- 13 – 17 November (58.4mm – Lobs Hole, 54mm Tantangara, 105.4mm – Marica)
- 20 – 24 November (45.6mm – Lobs Hole, 64mm – Tantangara, 55.2mm – Marica)

Exceedances of the water quality objectives were present in the upstream, downstream and basin sampling locations. When downstream and basin results were compared to the predicted discharge quality characterises, exceedances were consistent with the likely ranges.

Water samples were collected for comprehensive water testing and the EPA were notified of the releases in accordance with R4.1 of EPL 21266.

Dissolved oxygen (DO%), pH, Turbidity (NTU) and Electrical Conductivity (EC µS/cm) numbers show variance from the WQO with consistency across the 6 months. Where values occurred outside the WQO range - they were noted to be both upstream, downstream of the Snowy 2.0 construction

envelope. In winter months and early spring, DO concentrations are typically higher when water temperature is low. Similarly, EC and Turbidity fluctuate with wet weather conditions and pH according to the SWMP frequently exceeded the WQO in summer/spring. Therefore, it has been determined that these exceedances are not impacts resulting from Snowy 2.0 work activities and are indicative of existing background conditions rather than impacts from the project.

3.3. Groundwater Monitoring

Groundwater sampling was undertaken in August and November 2022. Groundwater piezometer data is currently being processed for the Q3 and Q4 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 August and November 2022 were less than, or within, relevant water quality trigger values except for:

- Nitrogen (total);
- Reactive Phosphorous;
- Copper (filtered);
- Iron (filtered);
- Manganese (filtered);
- Nickel (filtered); and
- Zinc (filtered).

Nutrient exceedances of the relevant water quality objectives occurred in two groundwater boreholes for phosphorous (EPL4 and EPL1) and all wells for nitrogen. These exceedances are likely caused from natural background conditions and were consistent with previous monitoring rounds. Metal exceedances were also generally consistent with background conditions, with the consistent iron exceedances suggesting potential for acid mine drainage, coupled with hydrogen sulphide odours. Further comments on groundwater are summarised below:

- Groundwater quality was generally within the previously noted results and background range.
- Localised differences in monitoring bores situated in fractured rock aquifers should be expected as differences in fracture size, frequency and connectivity all affect the aquifer flow and transmission of geochemistry into groundwater.
- Tailrace tunnelling commenced at Lobs Hole in June 2021. Groundwater modelling suggests that construction activities are not likely to impact the surrounding environment until approximately 3 to 4 years into the Snowy 2.0 project. Groundwater assessment for Q3 and Q4 2022 has not been finalised due to weather induced access restrictions delaying data collection. This report will be updated once data is available.
- Significant wet weather events were experienced throughout winter and spring with the continuation of the La Nina during this reporting period. This would have caused groundwater recharge through fire impacted areas, which could have led to the increased concentrations of some metals as similar increases in metals have been observed in surface water on site.

Based on the information above, groundwater exceedances between June 2022 to November 2022 data are not impacts resulting from Snowy 2.0 work activities and are indicative of background data. These exceedances did not trigger the need for further sampling, remedial actions or TARPs.

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 June 2022 to November 2022 were less than, or within, relevant water quality trigger values except for:

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

Elevated nutrient concentrations are likely a result of algae blooms in the reservoirs and/or decomposing plant material releasing nutrients. Metal concentrations that exceeded the WQO are consistent with background concentrations and are found to naturally occur in soils in the areas. Elevated oil and grease concentrations are present in majority of the EPL sampling locations across the project, including upstream, indicating the sources of this aren't likely project related however, further investigation into these concentrations is being investigated. The monitoring results demonstrate that the water quality in the Tantangara and Talbingo Reservoir has consistency across multiple EPL monitoring events with the exceedances not shown to have increased since the onset of the proximal construction of Snowy 2.0.

The exceedances to 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 June 2022 and November 2022 were less than, or within, relevant water quality trigger values except for:

- Nitrite + Nitrate as N;
- Cyanide;
- Nitrogen;

- Aluminium (filtered);
- Chromium (filtered);
- Copper (filtered);
- Lead (filtered); and
- Zinc (filtered).

The monitoring results demonstrate that the water quality in Lobs Hole has consistency across multiple EPL monitoring events with the exceedances not shown to have increased since the onset of the proximal construction of Snowy 2.0. Elevated nutrients and metals are likely a result of naturally elevated conditions during rainfall and/or winter months. Oil and grease concentrations have been found to be present in majority of the EPL sampling locations across the project, including upstream, indicating the sources of this aren't likely project related however, further investigation into these concentrations is being investigated.

The exceedances to the water quality objectives within the Lobs Hole 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.

3.4.3. 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 June 2022 and November 2022 were less than, or within, relevant water quality trigger values with the exception of:

- Nitrite + Nitrate as N;
- Cyanide;
- Aluminium (filtered); and
- Chromium (filtered)

The monitoring results demonstrate that the water quality in Marica displays similar results across multiple EPL monitoring events with the exceedances showing consistency with background conditions and have not shown to have increased since the onset of the proximal construction of Snowy 2.0.

The exceedances to the water quality objectives within the Marica surface waters are natural in origin 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.

3.4.4. 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 June 2022 and November 2022 were less than, or within, relevant water quality trigger values except for:

- Nitrite + Nitrate as N;

- Cyanide;
- Nitrogen (total);
- Aluminium (filtered);
- Chromium (filtered); and
- Zinc (filtered).

The monitoring results demonstrate that the water quality in the Tantangara has consistency across multiple EPL monitoring events with the exceedances not shown to have increased since the onset of the proximal construction of Snowy 2.0. 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. Elevated oil and grease concentrations are present in majority of the EPL sampling locations across the project, including upstream, indicating the sources of this aren't likely project related however, further investigation into these concentrations is being investigated.

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 June 2022 and November 2022 were less than, or within, relevant water quality trigger values with the exception of:

- Nitrite + Nitrate as N;
- Nitrogen (total);
- Aluminium (filtered);
- Copper (filtered);and
- Iron (filtered).

Minimal construction works were completed between June 2022 and November 2022 at Rock Forest Area. 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 oil and grease exceedances were evident in upstream and downstream locations, indicating the source of this contaminant being from upstream agricultural uses.

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
04/06/22	Tantangara	S2-FGJV-ENV-INC-1559	Failure of ERSED controls, Spoil Road	Works along spoil road were halted immediately and focus was solely placed on remediation. Thorough review and substantial improvement were made to ERSED controls. Capacity of the sediment basin at the end of the spoil road was increased, sediment curtain installation was scheduled, additional coir logs were utilised at the site of impact. In situ and comprehensive water sampling was completed. A follow up meeting with wider team to discuss immediate actions and planning for further permanent rectification was conducted.
16/06/22	Lobs Hole	S2-FGJV-ENV-INC-1598	Unauthorised release of process water entering river.	Immediate corrective action was taken to pump the water from the temporary basin identified to be leaking, to a permanent sediment basin. Water sampling was undertaken at impact site, upstream and downstream of the discharge point within the Yarrangobilly River. Further controls implemented included incorporating an additional bund outside the basin and repair works was completed.
21/06/22	Marica	S2-FGJV-ENV-INC-1614	Sediment laden water entering creek	Moxy water cart was immediately deployed to the area to remove water from the sump at dip creek and impact immediately ceased. In-situ and comprehensive water sampling was completed upstream, downstream and at impact site as per Surface Water Management Plan. Review of dewatering plan including ensuring all onsite water carts were scheduled to be fitted with necessary fitting to allow for dewatering of sumps and sediment basin & sump capacity/lining was enhanced to account for increased volume of water received due to rain combined with snowmelt
21/06/22	Lobs Hole	S2-FGJV-ENV-INC-1620	Overtopping of sediment basin	Water level reduced to minimise overtopping. Water sampling was undertaken at impact site including upstream and downstream of the discharge point within the river and overtopped basin identifying the basin to have basic water as a result of TBM spoil reuse nearby. Implementing further testing and characterization of TBM spoil materials outlining conditions for re-use to prevent re-occurrence.
04/08/22	Lobs Hole	S2-FGJV-ENV-INC-1747	Unauthorised release of process water entering river	Additional pump utilised to increase pumping capacity and cease overtopping. Water sampling undertaken upstream and downstream of the discharge point Review of dewatering plan and operations along Main Yard. Further surface works completed to enlarge leachate sump and pumping capacity was improved to facilitate efficient leachate water transport from Main Yard to appropriately lined turkeys nest, where it can be processed for treatment.
04/08/22	Lobs Hole	S2-FGJV-ENV-INC-1750	Unauthorised release of process water entering river	Water sampling undertaken upstream and downstream of the discharge point. Review of dewatering plan and operations including the enlargement of leachate basin and completion of surface works to segregate dirty storm water from leachate. Pumping capacity was improved to facilitate efficient leachate water transport from Lick Hole Gully to an appropriately lined

				turkeys nest. where it can be processed by MAT Portal Construction Water Treatment Plant.
05/08/22	Marica	S2-FGJV-ENV-INC-1753	Sediment laden water entering waterways.	High volumes of water overwhelmed the environmental controls onsite. In order to minimise the impact additional rock checks, woah-boys and coir logs were installed to slow down the water along with sediment fencing to contain runoff. Sampling of the affected area was undertaken.
24/08/22	Lobs Hole	S2-FGJV-ENV-INC-1805	Unauthorised release of process water entering river.	Immediate actions were taken to excavate the sump before the boundary to cease flow to the river. Water sampling undertaken upstream and downstream of the discharge point. Review of controls and operations including shotcreting the basin and establishing a standpipe to take leachate water from Mainyard. Completing capping and surface drainage of Mainyard. Specialist evaluation and establishment of a weekly inspection routine of north-eastern boundary to prevent re-occurrence.
17/10/22	Trunk Services	S2-FGJV-ENV-INC-2001	Unauthorised release of drill fluid beyond clearing boundary.	Cease work was placed on drilling operations and immediate containment and remediation works commenced to prevent frac-out from entering river. Sandbags and coir logs were immediately installed to contain release and Vac truck was deployed to remediate impacted site and prevent further mobilisation of spilled fluid. Water sampling undertaken upstream and downstream of the discharge point.

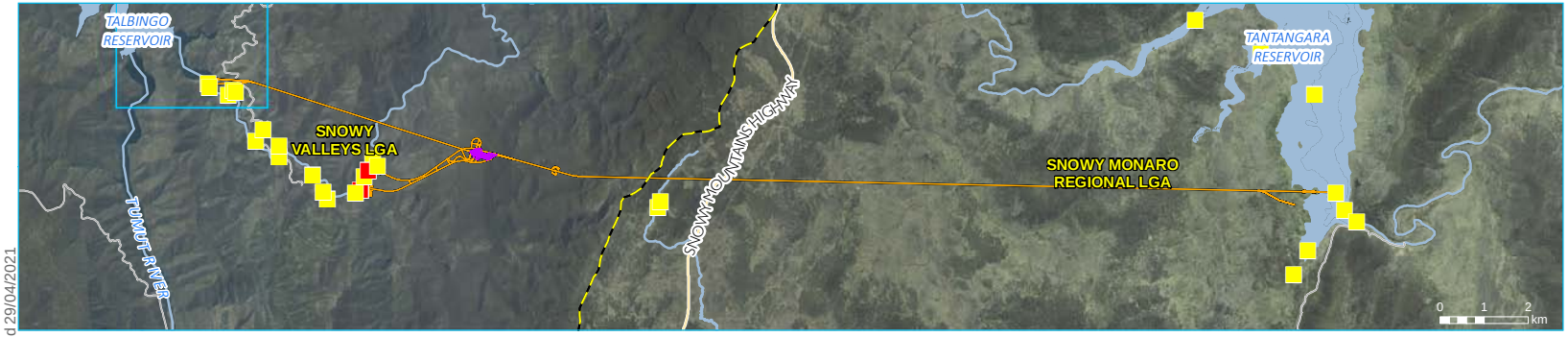
4.2. Recommendations

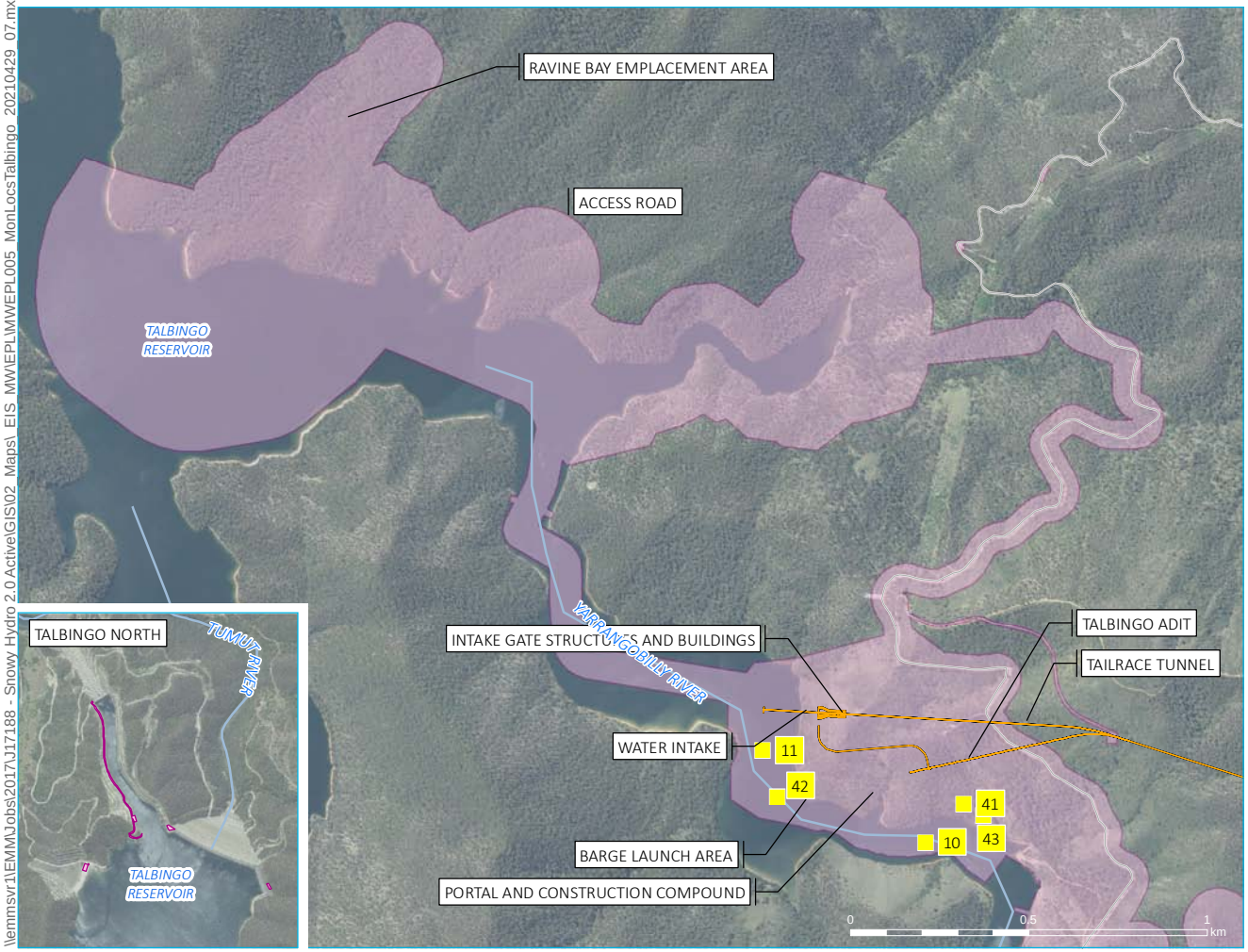
As noted throughout the report the 6 monthly report for June to November 2022 will be revised with groundwater information once these results have been received.

The oil and grease exceedances are being investigated to determine the source. Sampling processes have been reviewed and further training provided to the sampling team with no change to the results. Further assessment using sampling blanks, trip blanks, and inter-laboratory testing will be undertaken.

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

APPENDIX A – SNOWY 2.0 – EPL SAMPLING LOCATIONS





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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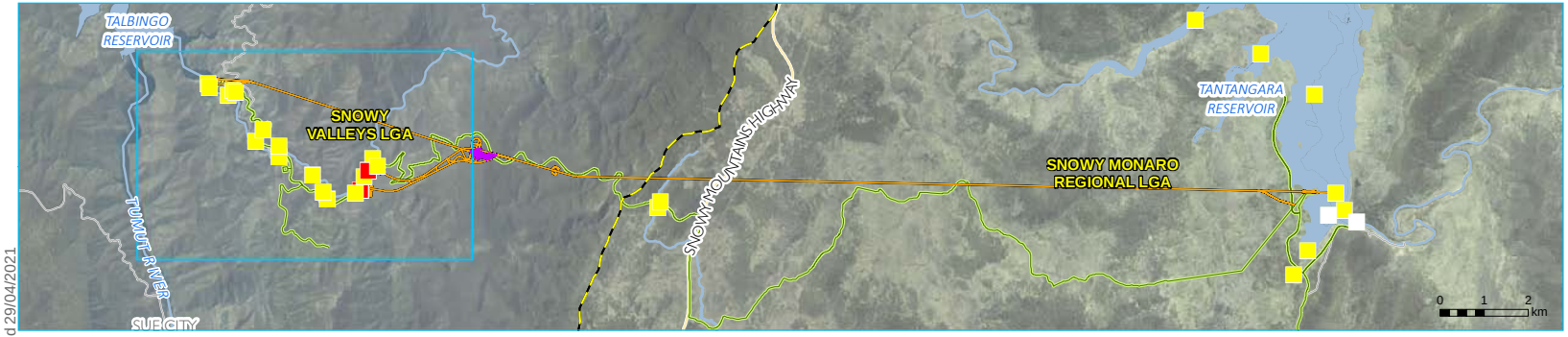

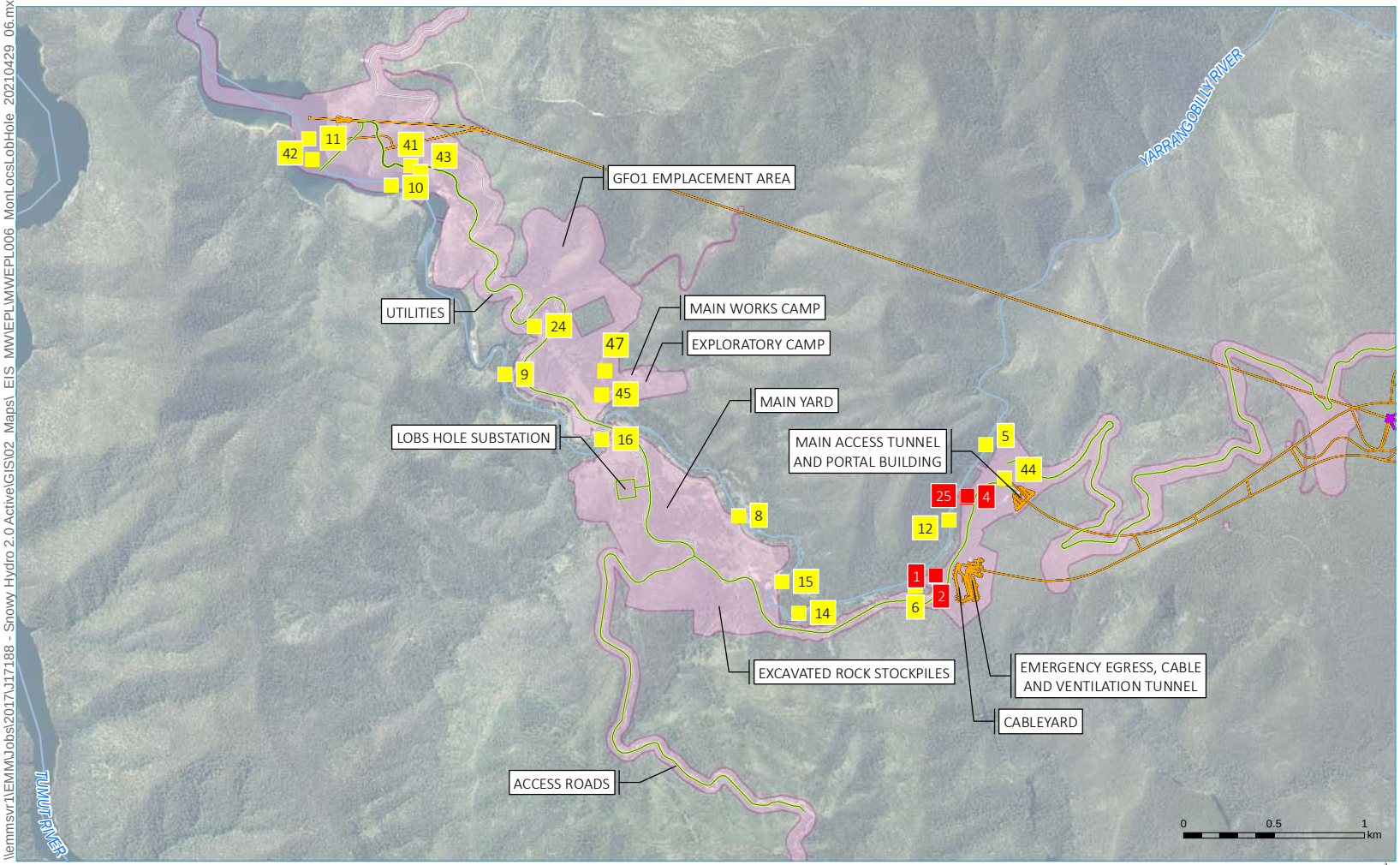

KEY

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 - Lobs Hole

Snowy 2.0
Main Works
Figure 2

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

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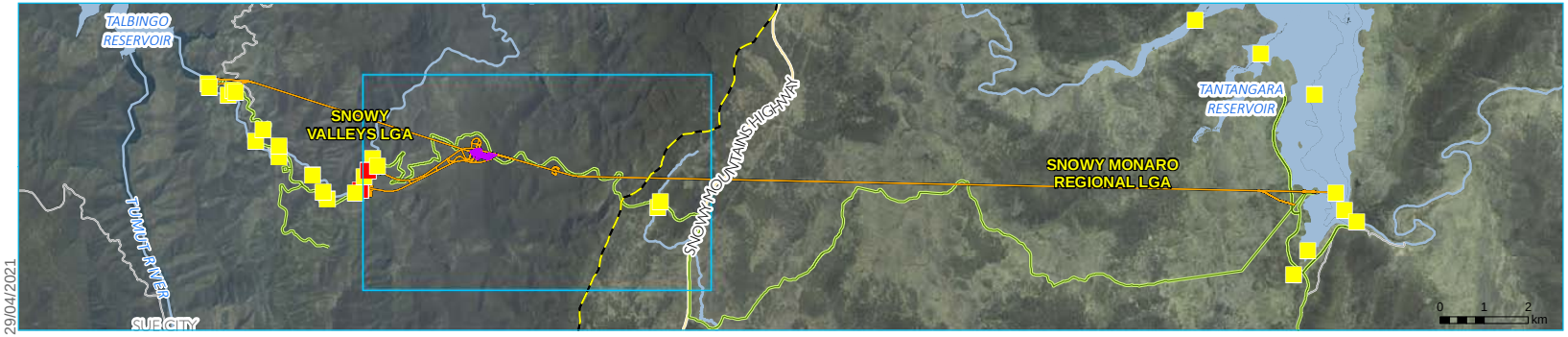

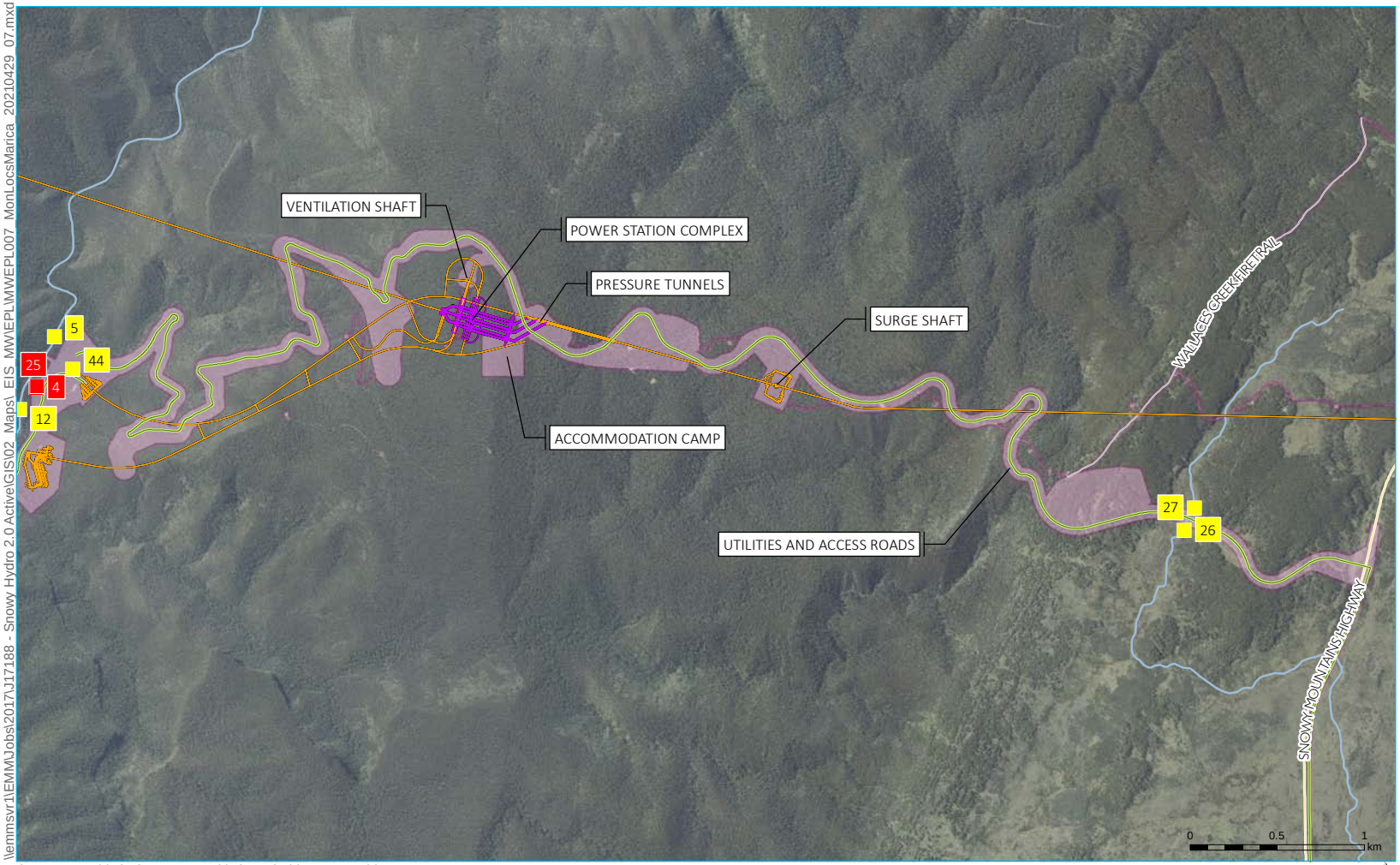

KEY

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 - Marica

Snowy 2.0
Main Works
Figure 3

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

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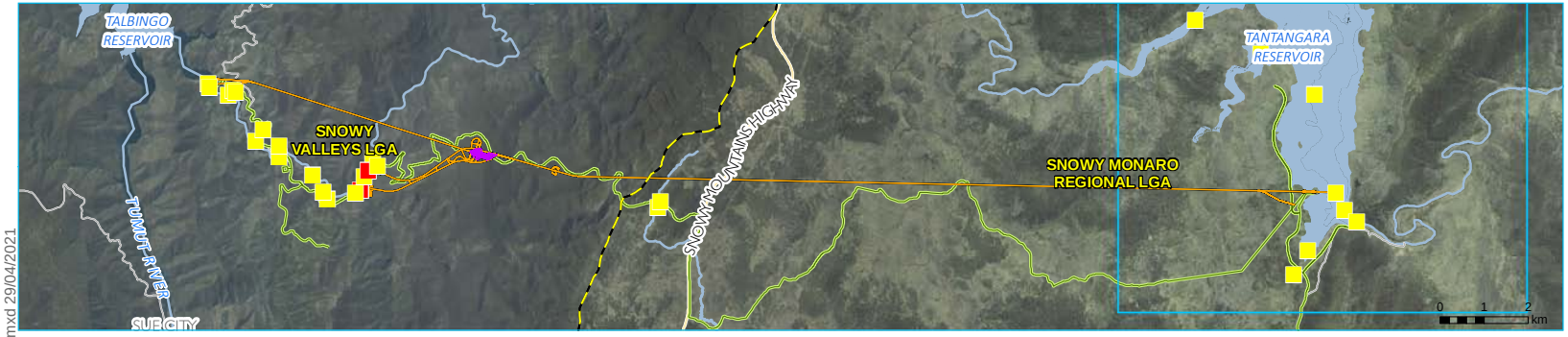

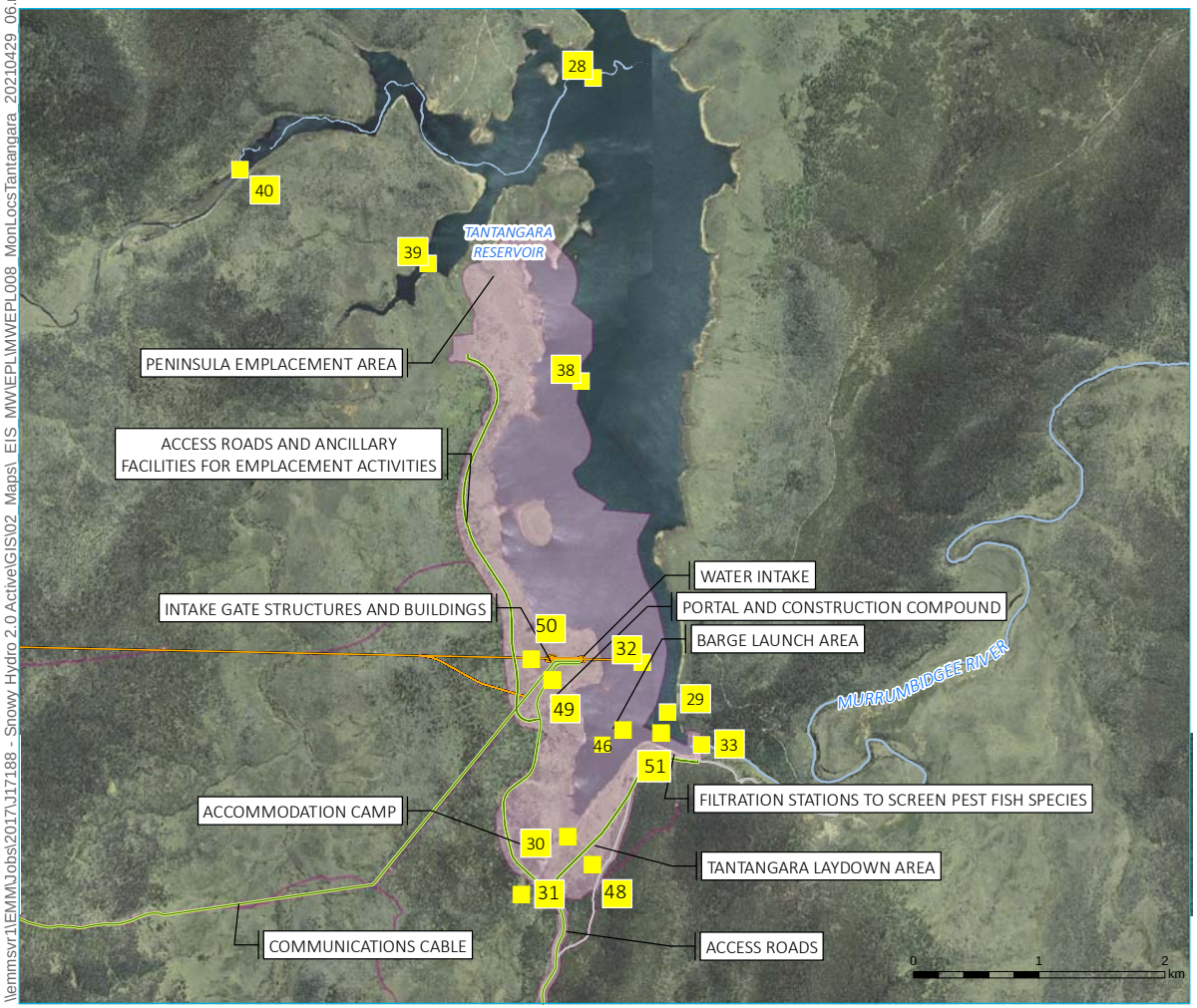

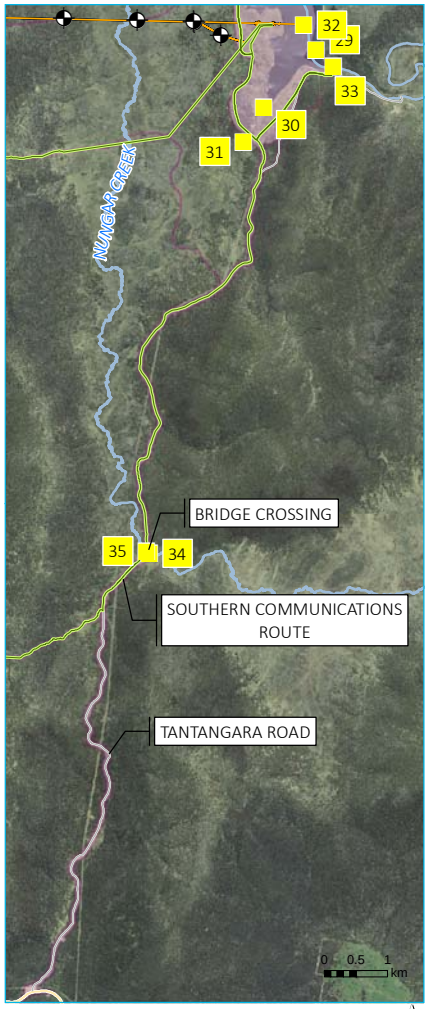

KEY

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

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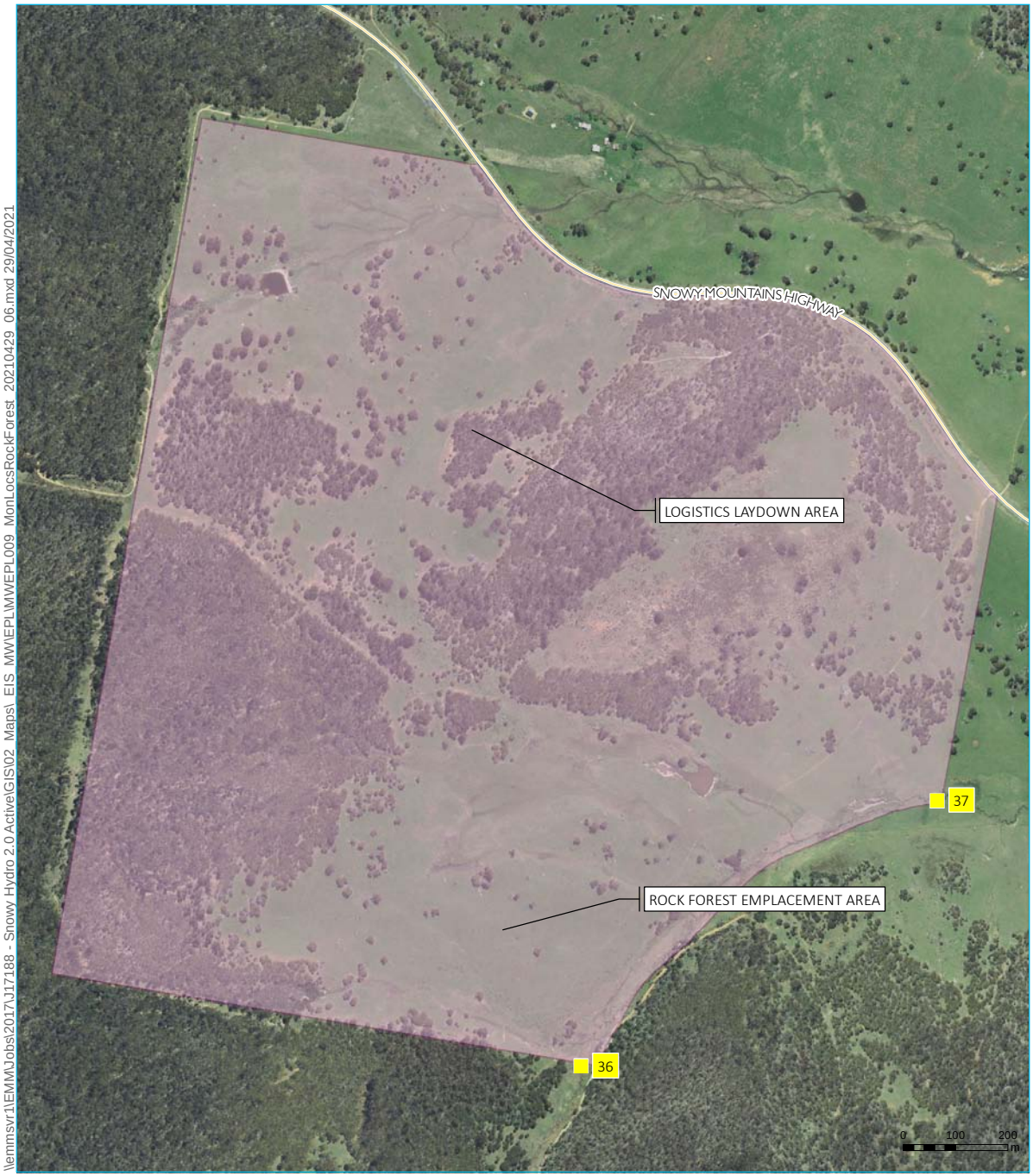

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KEY

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

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

GDA 1994 MGA Zone 55

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snowy 2.0

EMM creating opportunities

APPENDIX B – IN SITU RESULTS TABLES

Future Generation
Webuild • Clough • Lane

June 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring 3-30 June 2022

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	Context
11/6/2022, 8:30 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	7.2	88.5	10.7	52.0	34.0	6.0	196.0	-	High flowing river, fast flow. Turbidity reading error.	This location is upstream of works and is therefore representative of background conditions.
11/6/2022, 10:00 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	8.5	87.7	10.3	50.0	32.0	6.1	232.0	24.3	High fast flowing water. Brown turbid.	pH and DO are generally representative of the background conditions in June 2022 and within range of baseline data.
11/6/2022, 12:30 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	7.6	84.8	10.1	62.0	40.0	7.0	209.0	5.7	Fast flowing, slight turb.	DO is generally representative of the background conditions in June 2022 and within range of baseline data.
29/6/2022, 8:10 am	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	4.7	109.9	14.1	61.0	40.0	7.5	241.0	5.0	Medium flow, clear water.	-
11/6/2022, 9:00 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	7.0	84.4	10.3	55.0	35.0	6.0	210.0	-	Fast flowing water looks slightly green turbid.	pH and DO are generally representative of the background conditions in June 2022 and within range of baseline data.
11/6/2022, 10:30 am	EPL14	Yarrangobilly River, downstream of road construction areas	7.7	85.1	10.2	74.0	48.0	7.0	192.0	6.5	Water level high, fast flowing. Brownish turb.	DO is generally representative of the background conditions in June 2022 and within range of baseline data.
11/6/2022, 11:00 am	EPL15	Yarrangobilly River, downstream of road construction areas	7.5	84.6	10.1	54.0	35.0	7.0	197.0	5.6	Fast flowing, slight turbid.	DO is generally representative of the background conditions in June 2022 and within range of baseline data.
11/6/2022, 1:00 pm	EPL16	Yarrangobilly River, downstream of road construction areas	7.6	85	10.2	56.0	36.0	6.9	213.0	6.3	High flow and slight turbid.	DO is generally representative of the background conditions in June 2022 and within range of baseline data.
11/6/2022, 2:00 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	10.6	82.9	9.2	74.0	48.0	7.1	165.0	103.0	Very turbid, high flow.	DO is representative of background conditions and significantly elevated compared to previous months. The turbidity is consistently high in this location though the spring upstream was also turbid.
14/6/2022, 11:59 am	EPL26	Eucumbene River downstream of Marica Road	5.5	84.5	10.7	17.3	17.6	6.5	230.3	3.2	-	Low DO, pH, and EC are generally representative of background conditions for June 2022 and are consistent with previous results.
14/6/2022, 12:35 pm	EPL27	Eucumbene River upstream of Marica Road	5.7	83.3	10.5	17.3	17.6	6.5	220.2	1.1	-	This location is upstream of works and is therefore representative of background conditions.
3/6/2022, 1:57 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	6.4	85.2	10.8	17.2	18.2	7.9	185.0	12.3	-	Low DO and EC are generally representative of background conditions for June 2022 and are consistent with previous results.
3/6/2022, 1:26 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	5.2	91.7	11.6	14.3	15.0	7.2	190.0	7.0	Clear water, snow cover.	Low EC is representative of background conditions for June 2022 and are consistent with previous results.
3/6/2022, 3:36 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	7.3	91.1	11.0	16.3	18.3	7.5	182.7	2.7	-	Low EC is representative of background conditions for June 2022 and are consistent with previous results.
3/6/2022, 2:48 pm	EPL34	Nungar Creek, upstream of Tantangara Road	2.1	90.9	12.5	8.1	9.10	7.2	199.8	3.0	-	This location is upstream of works and is therefore representative of background conditions.
3/6/2022, 2:37 pm	EPL35	Nungar Creek, downstream of Tantangara Road	2.1	124.0	17.1	8.2	9.75	7.5	189.4	3.4	High water level, fast flow	Low EC is representative of background conditions for June 2022 and are consistent with previous results. The increase in DO was potentially due to the increase in flow and water level but will be monitored.
18/6/2022, 2:40 pm	EPL36	Camerons Creek, upstream of works in Rock Forest	5.0	88.2	11.3	21.4	22.8	6.3	243.4	3.7	-	This location is upstream of works and is therefore representative of background conditions.
24/6/2022, 7:43 am	EPL37	Camerons Creek, downstream of works in Rock Forest	6.1	101.4	12.6	22.3	22.8	6.0	247.1	8.7	QA ROK1.	Low EC and pH are representative of background conditions in June 2022 and consistent with previous results.

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
12/6/2022, 3:40 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	10.0	78.3	8.9	31.0	20.0	6.2	263.0	-	Clear water, rain last 48 hours. Turbidity reading error.	pH and DO are generally representative of the background conditions in June 2022. EC will be monitored.
12/6/2022, 3:25 pm	EPL11	Talbingo Reservoir, downstream of outlet	10.0	83.8	9.5	30.0	20.0	6.3	242.0	-	Clear water, rain last 48 hrs. Turbidity reading error.	pH and DO are generally representative of the background conditions in June 2022.
15/6/2022, 2:12 pm	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	5.1	108.7	13.8	11.4	11.7	6.8	240.9	3.5	-	This location is upstream of works and is therefore representative of background conditions.
15/6/2022, 3:16 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	5.1	89.3	11.4	14.4	14.95	6.1	263.5	4.0	-	Low pH and EC are generally representative of the background conditions in June 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
15/6/2022, 3:06 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	4.8	88	11.3	14.0	14.95	6.1	266.0	3.5	Clear.	Low pH and EC are generally representative of the background conditions in June 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
15/6/2022, 2:56 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	4.3	87.8	11.4	12.3	13	5.9	277.6	4.6	-	Low pH and EC are generally representative of the background conditions in June 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
15/6/2022, 2:34 pm	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	4.8	89.8	11.5	9.6	10.4	5.9	260.2	3.1	-	Low pH and EC are generally representative of the background conditions in June 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
15/6/2022, 2:42 pm	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	5.1	86.4	11.0	11.7	12.35	6.0	264.2	2.9	-	Low pH and EC are generally representative of the background conditions in June 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
-	EPL51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	-	-	-	-	-	-	-	-	-	Water not collected from this location in June 2022.

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	-	-

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
29/6/2022, 9:30 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	15.7	101.1	10.0	38.8	25.20	7.6	223.0	0.9	Clear water.	No discharge was occuring at the time of sampling.

Table 4 - Treated Wate
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	-	-

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
30/6/2022, 12:15 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	4.0	132.2	17.3	343	372.45	7.6	232.2	1.3	-	No discharge was occuring 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.

July 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring July 2022

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	Context
2/7/2022, 8:15 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	7.08	104.8	12.7	62	40	6.88	148	0	Turbidity sensor malfunction	This location is upstream of works and is therefore representative of background conditions.
2/7/2022, 9:10 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	7.33	117.5	14.14	61	40	6.4	205	6.5	Used turbidity tube	pH and DO are generally representative of the background conditions in July 2022 and within range of baseline data.
2/7/2022, 2:20 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	8.03	104.4	12.35	69	45	6.94	213	0	Turbidity sensor malfunction	-
2/7/2022, 3:15 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	8.07	106.6	42	65	12.6	6.66	177	5		-
2/7/2022, 8:40 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	6.87	108	13.15	64	42	6.69	159	0	Turbidity sensor malfunction	-
2/7/2022, 11:30 am	EPL14	Yarrangobilly River, downstream of road construction areas	7.62	108.5	12.96	64	42	6.92	190	0	Turbidity sensor malfunction	-
2/7/2022, 12:15 pm	EPL15	Yarrangobilly River, downstream of road construction areas	7.62	105.1	12.57	62	40	6.68	208	0	Turbidity sensor malfunction	-
2/7/2022, 4:30 pm	EPL16	Yarrangobilly River, downstream of road construction areas	8.08	104.4	12.34	64	42	6.68	201	5	QA taken here	-
2/7/2022, 2:55 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	9.95	94.9	10.72	72	47	6.64	123	33	-	Turbidity is consistently high in this location.
4/7/2022, 6:12 am	EPL26	Eucumbene River downstream of Marica Road	6.2	80.7	10.0	12.9	13	6.5	282.9	20.4	-	Low DO, pH, and EC are generally representative of background conditions for July 2022 and are consistent with previous results.
4/7/2022, 6:14 am	EPL27	Eucumbene River upstream of Marica Road	6.1	78.3	9.7	13.0	13	6.4	279.5	6.5	-	This location is upstream of works and is therefore representative of background conditions.
3/7/2022, 2:40 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	5.8	82.9	10.4	12.7	13	7.9	236.8	9.0	Steady flow, clear water. Slightly overcast, light SSE wind.	Low DO and EC are generally representative of background conditions for July 2022 and are consistent with previous results.
3/7/2022, 2:35 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	5.8	81.8	10.2	13.0	13.65	7.2	238.2	10.7	Steady flow, clear water. Slightly overcast, light SSE wind.	Low DO and EC are generally representative of background conditions for July 2022 and are consistent with previous results.
3/7/2022, 2:47 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	5.1	78.7	10.0	12.1	13	7.5	249.6	4.4	Steady flow, clear water. Slightly overcast, light SSE wind.	Low DO and EC are generally representative of background conditions for July 2022 and are consistent with previous results.
3/7/2022, 2:48 pm	EPL34	Nungar Creek, upstream of Tantangara Road	4	79.8	10.5	7.9	8.45	7.2	263.4	7.9	Low flow, clear water. Slightly overcast, light SSE wind.	This location is upstream of works and is therefore representative of background conditions.
3/7/2022, 2:50 pm	EPL35	Nungar Creek, downstream of Tantangara Road	3.9	116.1	15.3	8.8	9.75	7.0	266.6	8.1	Low flow, clear water. Slightly overcast, light SSE wind.	Low EC is representative of background conditions for July 2022 and are consistent with previous results. The increase in DO was potentially due to the increase in water flow and is consistent with June 2000 results but will continue to be monitored.
11/7/2022, 1:17pm	EPL36	Camerons Creek, upstream of works in Rock Forest	1.8	96.8	13.5	17.9	20.8	7.3	261.2	13.2	Ligh SSW breeze, partly cloudy. Low flow, clear water.	This location is upstream of works and is therefore representative of background conditions.
11/7/2022, 1:20pm	EPL37	Camerons Creek, downstream of works in Rock Forest	2.9	102.8	13.9	22.5	25.35	7.4	201.7	7.3	Ligh SSW breeze, partly cloudy. Low flow, clear water.	Low EC is representative of background conditions in July 2022 and consistent with previous results.

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
3/7/2022, 11:15 am	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	9.4	91.3	11.6	32.6	41	7.35	159	2	Clear water	-
3/7/2022, 11:56 am	EPL11	Talbingo Reservoir, downstream of outlet	9.4	91.3	80	35.1	15	7.38	100	3	Clear water	-
8/7/2022, 10:44 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	4.7	81.6	10.5	10.9	11.7	7.7	168.8	4.1	Clear water, fine weather. Very light NE winds, glassy conditions.	This location is upstream of works and is therefore representative of background conditions.
8/7/2022, 4:05 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	4.9	81.5	10.4	11.9	12.35	6.4	291.0	4.7	Clear water, fine weather. Very light NE winds, glassy conditions.	This location is upstream of works and is therefore representative of background conditions.
8/7/2022, 4:03 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	4.9	88.7	11.4	11.9	12.35	6.4	293.9	4.7	Clear water, fine weather. Very light NE winds, glassy conditions.	Low DO is representative of background conditions in July 2022.
8/7/2022, 3:57 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	4.8	85.5	11.0	11.9	12.35	6.5	306.0	8.8	Clear water, fine weather. Very light NE winds, glassy conditions.	Low DO is representative of background conditions in July 2022.
8/7/2022, 3:46 pm	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	4.6	105.3	13.6	9.9	10.4	7.2	268.7	5.4	Clear water, fine weather. Very light NE winds, glassy conditions.	-
8/7/2022, 3:55 pm	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	4.6	93	12.0	9.8	10.4	7.1	267.3	5.7	Clear water, fine weather. Very light NE winds, glassy conditions.	This location is upstream of works and is therefore representative of background conditions.

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
4/7/2022, 8:20 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	12.06	84.5	9.07	93.6	59.9	7.61	249	1.00	Clear water	-

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
30/6/2022, 12:15 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	3.7	67.7	8.9	337	370.50	7.3	231.0	1.0	-	No discharge was occuring 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.

Future Generation
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August 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring August 2022

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
7/8/2022, 11:54 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	8.28	95.7	11.25	49	32	6.45	242	25	Samples collected during significant rain event 118 mm over 7 days	This location is upstream of works and is therefore representative of background conditions.
7/8/2022, 12:19 pm	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	8.9	97.2	11.26	55	36	6.60	245	40	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
7/8/2022, 12:42 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	8.59	95.7	11.17	65	42	6.60	247	30	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
7/8/2022, 2:42 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	9.03	96.5	37	56	37	6.65	256	40	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
7/8/2022, 11:00 am	EPL12	Yarrangobilly River, immediately downstream of portal pad	7.83	94.2	11.21	52	34	6.45	232	19	Samples collected during significant rain event 118 mm over 7 days	pH is representative of the background conditions in August 2022 and within range of baseline data.
6/8/2022, 1:01 pm	EPL14	Yarrangobilly River, downstream of road construction areas	8.35	92.7	10.88	79	51	7.12	235	75	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
6/8/2022, 1:03 pm	EPL15	Yarrangobilly River, downstream of road construction areas	8.2	95.2	11.22	53	34	7.13	220	110	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site and turbidity at this location is often elevated
7/8/2022, 1:09 pm	EPL16	Yarrangobilly River, downstream of road construction areas	8.64	96.4	11.24	56	36	6.57	248	35	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
6/8/2022, 1:48 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	10.93	95.3	10.52	52	34	6.77	236	50	Samples collected during significant rain event 118 mm over 7 days	The elevated turbdity is likely a result of significant rainfall and ground saturation on site
5/8/2022, 10:30 am	EPL26	Eucumbene River downstream of Marica Road	5.6	86.5	10.9	13.2	13.6	6.77	27.8	15	Samples collected during significant rain event 118 mm over 7 days	Low DO is representative of background conditions for August 2022 and are consistent with previous results.
5/8/2022, 10:50 am	EPL27	Eucumbene River upstream of Marica Road	5.7	85.3	10.7	13.3	13.7	6.53	50.7	2.8	Samples collected during significant rain event 118 mm over 7 days	This location is upstream of works and is therefore representative of background conditions.
19/8/2022, 2:18 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	7.8	93.1	11.1	11.1	10.4	5.93	283.1	20	Showers, strong flow, clear water, strong NNW winds (20-30 km), showers, partly cloudy	Low DO, pH, and EC are generally representative of background conditions for August 2022 and are consistent with previous results.
19/8/2022, 2:03 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	7.7	93.7	11.1	11.8	11.7	5.85	292.0	11	Showers, strong flow, clear water, strong NNW winds (20-30 km), showers, partly cloudy	Low DO, pH, and EC are generally representative of background conditions for August 2022 and are consistent with previous results.
19/8/2022, 1:47 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	6.3	98.9	12.2	9.4	9.75	6.18	275.2	6.2	Showers, steady flow, clear water, strong NNW winds (20-30 km), showers, partly cloudy	Low DO, pH, and EC are generally representative of background conditions for August 2022 and are consistent with previous results.
19/8/2022, 12:56 pm	EPL34	Nungar Creek, upstream of Tantangara Road	5.6	96.0	12.1	7.2	7.15	6.55	220.0	3.9	Showers, strong flow, clear water, strong NNW winds (20-30 km), showers, partly cloudy	-
19/8/2022, 12:49 pm	EPL35	Nungar Creek, downstream of Tantangara Road	6.5	98.2	12.3	7.2	7.8	6.99	187.1	3.2	Showers, strong flow, clear water, strong NNW winds (20-30km), showers, partly cloudy	-
11/7/2022, 1:20 pm	EPL36	Camerons Creek, upstream of works in Rock Forest	1.8	96.8	13.5	17.9	20.8	7.34	261.2	13	-	-
11/7/2022, 1:17 pm	EPL37	Camerons Creek, downstream of works in Rock Forest	2.9	102.8	13.9	22.5	25.35	7.36	201.7	7.3	-	-

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
21/8/2022, 11:43 am	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	10.8	105.1	-	51.9	34	7.7	-	-	Error with YSI - fields not completed weren't available	-
21/8/2022, 11:28 am	EPL11	Talbingo Reservoir, downstream of outlet	10.4	101	-	51.2	33	7.6	-	-	Error with YSI - fields not completed weren't available	-
21/8/2022, 11:59 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	6.6	97.3	12.0	10.4	10.4	5.9	280.9	3.9	QA_TAN done here	This location is upstream of works and is therefore representative of background conditions.
21/8/2022, 12:27 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	6.4	93.8	11.6	9.4	9.75	5.8	279.4	5.6	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	This location is upstream of works and is therefore representative of background conditions.
21/8/2022, 12:22 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	6.3	88.5	11.0	10.4	10.4	5.7	284.0	6.2	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	Low pH and EC are generally representative of the background conditions in August 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
21/8/2022, 12:14 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	6.3	85.7	10.6	10.2	10.4	5.9	283.2	5.6	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	Low pH and EC are generally representative of the background conditions in August 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.
21/8/2022, 11:25 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	6.1	102.5	12.7	9.1	9.1	6.7	229.7	3.4	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	-
21/8/2022, 11:44 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	6.2	90.4	11.2	10.7	11.05	6.1	264.3	3.7	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	This location is upstream of works and is therefore representative of background conditions.
21/8/2022, 12:37 pm	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	6.4	88.9	11.0	9.5	9.75	5.9	221.4	6.3	Clear water, brisk NE wind (10-15km), partly cloudy, scattered showers.	Low pH and EC are generally representative of the background conditions in August 2022. DO is only slightly less than criteria though a decreasing trend is becoming apparent and will be monitored.

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
21/8/2022, 12:25 pm	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	18.51	113.4	10.6	657	420	9.35	215	1.70	-	There was no discharge 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
19/8/2022, 12:50 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	10.4	61.1	6.8	7	5.85	6.3	277.5	0.6	-	There was no discharge at the time of sampling..

Table 4 - 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
09/08/2022. 1:55pm	EPL1	Wallace Creek Bridge	15.8	133.5	13.17	1170	746	7.62	231	0.0		
09/08/2022. 2;08pm	EPL2	Wallace Creek Bridge	15.3	123.2	12.32	430	280	6.86	71.0	21.7		
29/088/2022, 08:55am	EPL4	Portal Access	12.4	115.6	12.29	1,560	998	7.49	142	0.0		
10/8/2022, 9:41 am	EPL25	Portal Access	11.7	113.8	12.33	443	288	6.59	92	94.6		

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.

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.

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September 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring September 2022

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
5/9/2022, 2:05 pm	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	10.65	118.4	13.6	65	642	7.59	152	1.5	Medium Flow, clear water	This location is upstream of works and is therefore representative of background conditions.
5/9/2022, 2:49 pm	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	10.78	105.4	13.58	83	83	8.03	170	1.4	Clear water, low flow	The source of the slightly elevated pH is unknown but will be monitored.
5/9/2022, 3:29 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	10.58	125.6	13.98	68	44	7.86	155	0.9	Medium flow, clear water	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
6/9/2022, 9:26 am	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	6.98	120.9	14.69	75	49	7.73	-37	1.1	Clear water, medium flow	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
5/9/2022, 2:30 pm	EPL12	Yarrangobilly River, immediately downstream of portal pad	10.58	125.6	13.98	67	44	7.86	155	0.9	Low flow, clear water	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
5/9/2022, 4:38 pm	EPL14	Yarrangobilly River, downstream of road construction areas	10.17	127.7	14.35	78	51	7.90	210	1.1	Low flow, clear water, no rain last 24 hrs	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
5/9/2022, 3:52 pm	EPL15	Yarrangobilly River, downstream of road construction areas	10.58	118.8	13.22	70	45	7.92	189	0.8	Clear water, low flow, no rain last 24 hours	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
6/9/2022, 9:10 am	EPL16	Yarrangobilly River, downstream of road construction areas	6.98	120.9	14.69	75	49	7.73	155	1.1	Clear water, medium flow, no rain last 48 hrs, QA taken here	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
6/9/2022, 8:43 am	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	8.24	129.6	15.26	62	40	7.60	96	3.9	Clear water, low flow	DO is elevated but representative of background conditions in September 2022 and is consistent with previous results at this location.
10/9/2022, 4:28 pm	EPL26	Eucumbene River downstream of Marica Road	8.3	83.3	9.8	17.7	16.9	7.32	65.5	5.25	-	DO is low but representative of background conditions in September 2022 and is consistent with previous results at this location.
10/9/2022, 4:14 pm	EPL27	Eucumbene River upstream of Marica Road	8.3	81.4	9.6	19.3	18.4	7.75	55.4	6.06	QA taken here	This location is upstream of works and is therefore representative of background conditions.
10/9/2022, 1:36 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	9.4	75.1	8.6	14.2	13	6.47	239.9	12.3	Light breeze, clear water, steady flow, scattered showers	pH and DO are low however are representative of background conditions in September 2022 near Tantangara Reservoir.
10/9/2022, 1:22 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	9.5	78.6	9.0	13.5	12.35	6.47	245.7	8.17	-	pH and DO are low however are representative of background conditions in September 2022 near Tantangara Reservoir.
10/9/2022, 12:56 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	7.9	73.6	8.7	10.1	9.75	6.99	250.3	3.88	Strong flow, heaps of water discharging from reservoir, overcast, fresh breeze, scattered showers	DO is low but representative of background conditions in September 2022 and is consistent with previous results in Tantangara Reservoir.
10/9/2022, 12:23 pm	EPL34	Nungar Creek, upstream of Tantangara Road	8.1	78.7	9.3	9.1	8.45	6.41	233.5	4.29	Strong flow, scattered showers, overcast, light breeze	This location is upstream of works and is therefore representative of background conditions.
10/9/2022, 12:11 pm	EPL35	Nungar Creek, downstream of Tantangara Road	8	73.5	8.7	8.2	7.8	6.46	241.6	5.22	Strong flow, overcast, scattered showers, light breeze	pH and DO are low however are representative of background conditions in September 2022.
11/9/2022, 9:04 am	EPL36	Camerons Creek, upstream of works in Rock Forest	9.4	82.6	9.5	25.2	23.4	6.74	195.0	3.83	Steady flow, scattered showers, overcast light breeze	This location is upstream of works and is therefore representative of background conditions.
11/9/2022, 9:06 am	EPL37	Camerons Creek, downstream of works in Rock Forest	9.5	89.7	10.3	22.0	20.15	6.44	215.3	5.65	QA-ROK done here Steady flow, scattered showers, light breeze	pH and DO are low however are generally representative of background conditions in September 2022.

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
23/9/2022, 12:15 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	12.31	79.4	8.5	53	34	7.6	194	0	-	DO is low but is consistent with previous results for Talbingo Reservoir. The turbidity reading appears erroneous at this location.
23/9/2022, 12:02 pm	EPL11	Talbingo Reservoir, downstream of outlet	12.57	90.6	9.63	72	47	7.9	178	2.2	-	-
11/9/2022, 10:51 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	7.8	84.6	10.1	11.7	11.05	6.1	300.3	4.2	Sampled following rainfall. Sunny, moderate breeze.	This location is upstream of works and is therefore representative of background conditions.
11/9/2022, 11:34 am	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	7.8	82	9.8	10.4	9.75	6.4	271.0	3.4	Sampled following rainfall. Fine, moderate wind.	pH and DO are low however are representative of background conditions in September 2022 and consistent with previous results from Tantangara Reservoir.
11/9/2022, 11:19 am	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	7.8	91.3	10.9	10.2	9.75	6.1	279.5	3.0	Sampled following rainfall. Sunny, moderate wind. QA taken at EPL32.	pH is low however are representative of background conditions in September 2022 and consistent with previous results from Tantangara Reservoir.
11/9/2022, 11:07 am	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	7.7	83.9	10.0	11.5	11.05	7.0	282.5	3.2	Sampled following rainfall. Sunny, moderate wind.	DO is low but representative of background conditions in September 2022 and is consistent with previous results in Tantangara Reservoir.
11/9/2022, 9:58 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	7.2	90.6	10.9	9.6	9.75	6.1	192.6	9.0	Shallow water. Sampled after recent rainfall.	This location is upstream of works and is therefore representative of background conditions.
11/9/2022, 10:28 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	7.2	86.6	10.5	10.9	10.4	6.0	278.6	4.3	Shallow water, sampled following rainfall. Sunny, moderate wind.	This location is upstream of works and is therefore representative of background conditions.
11/9/2022, 11:45 am	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	7.7	85.1	10.2	10.3	9.75	6.3	265.5	3.3	Sampled following rainfall. Sunny, moderate wind.	pH and DO are low however are representative of background conditions in September 2022 and consistent with previous results from Tantangara Reservoir.

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
24/9/2022, 8:20 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	13.85	24.5	2.52	199	128	9.05	130	21.60	-	Treated water was not being discharged to Talbingo 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
11/9/2022, 7:43 am	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	8.3	72.6	8.5	6	5.20	7.2	172.9	0.3	-	Treated water was not being discharged to Tantangara 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.

October 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring October 2022

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
4/10/2022, 8:25 am	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	9.51	85.7	9.78	54	35	6.86	97	8	-	This location is upstream of works and is therefore representative of background conditions.
4/10/2022, 8:51 am	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	8.9	91.5	10.6	77	50	7.62	128	9	-	-
4/10/2022, 11:48 am	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	10.87	90.1	9.97	81	53	7.53	170	7	-	-
4/10/2022, 1:21 pm	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	13.07	62.7	6.59	66	0.043	7.75	134	7	-	DO is low but representative of background conditions in October 2022 and is within range of historical results at this location.
4/10/2022, 12:59 pm	EPL12	Yarrangobilly River, immediately downstream of portal pad	10.99	92.7	10.23	59	39	7.53	71	6	-	-
4/10/2022, 9:45 am	EPL14	Yarrangobilly River, downstream of road construction areas	9.49	87.6	10.01	80	52	7.58	153	6	-	DO is low but representative of background conditions in October 2022 and is within range of historical results at this location.
4/10/2022, 11:25 am	EPL15	Yarrangobilly River, downstream of road construction areas	10.42	92.6	10.35	66	43	7.60	160	7.5	-	-
4/10/2022, 12:13 pm	EPL16	Yarrangobilly River, downstream of road construction areas	10.98	87.1	9.6	66	43	7.50	176	6	-	DO is low but representative of background conditions in October 2022 and is within range of historical results at this location.
4/10/2022, 1:48 pm	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	16.62	64.9	6.32	57	37	7.34	127	6	-	DO is low but representative of background conditions in October 2022 and is within range of historical results at this location.
-	EPL26	Eucumbene River downstream of Marica Road	-	-	-	-	-	-	-	-	Results not available due to water monitor malfunction.	Results not available due to laboratory issues.
-	EPL27	Eucumbene River upstream of Marica Road	-	-	-	-	-	-	-	-	Results not available due to water monitor malfunction.	Results not available due to laboratory issues.
1/10/2022, 1:25 pm	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	10.2	83.8	9.4	12.5	11.7	6.38	218.1	5.5	Partly cloudy, strong flow, light breeze.	pH and DO are low however are representative of background conditions in October 2022 and consistent with previous results near Tantangara Reservoir.
1/10/2022, 1:10 pm	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	9.9	90.6	10.3	10.7	9.75	6.03	245.3	4.16	Light breeze, strong flow, partly cloudy.	pH is low however is representative of background conditions in October 2022 and consistent with previous results near Tantangara Reservoir.
1/10/2022, 12:40 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	9.1	89.5	10.3	10.8	9.75	5.94	248.5	3.7	Partly cloudy, clear water, strong flow.	pH and DO are low however are representative of background conditions in October 2022 and consistent with previous results near Tantangara Reservoir.
1/10/2022, 12:03 pm	EPL34	Nungar Creek, upstream of Tantangara Road	8.6	85.7	10.0	7.9	7.15	5.94	227.8	3.56	Partly cloudy, strong flow, clear water.	This location is upstream of works and is therefore representative of background conditions.
1/10/2022, 11:52 am	EPL35	Nungar Creek, downstream of Tantangara Road	8.5	92.5	10.8	7.9	7.8	5.94	229.2	3.76	Partly cloudy, strong flow, clear water, light wind.	pH is low however is representative of background conditions in October 2022 and consistent with previous results near Tantangara Reservoir and at Nungar Creek.
1/10/2022, 10:51 am	EPL36	Camerons Creek, upstream of works in Rock Forest	9.5	106.4	12.1	22.5	20.8	8.24	88.8	4.56	Light breeze, overcast, clear water, light flow.	This location is upstream of works and is therefore representative of background conditions.
1/10/2022, 11:11 am	EPL37	Camerons Creek, downstream of works in Rock Forest	10.2	89.8	10.1	20.6	18.2	6.37	214.2	5.24	QA-ROK sampled here. Partly cloudy, light breeze, light flow.	The source for the variation in DO and pH relative to the upstream sample at Rock Forest is unknown, with no visible indication of the reason. This will be monitored.

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
30/10/2022, 2:15 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	17.6	108.7		56.2	37	7.8		2.7	Sunny, no wind. DO and Redox data not available due to water quality meter error.	-
30/10/2022, 2:00 pm	EPL11	Talbingo Reservoir, downstream of outlet	17.2	107.1		55.4	36	7.8		2.76	Sunny, no wind. DO and Redox data not available due to water quality meter error.	-
2/10/2022, 10:50 am	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	9.5	110.9	12.7	11.0	10.4	6.0	216.4	3.8	Fine weather, partly cloudy, 12km winds, clear water.	This location is upstream of works and is therefore representative of background conditions.
2/10/2022, 12:29 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	9.3	92.3	10.6	11.1	10.4	6.1	261.7	3.1	-	This location is upstream of works and is therefore representative of background conditions.
2/10/2022, 12:14 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	9.5	92.7	10.6	11.1	10.4	6.3	253.9	3.2	QA_TAN done here.	pH is low however are representative of background conditions in October 2022 and consistent with previous results from Tantangara Reservoir.
2/10/2022, 12:02 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	9.3	93.5	10.7	12.1	11.05	6.1	269.5	3.0	-	pH is low however are representative of background conditions in October 2022 and consistent with previous results from Tantangara Reservoir.
2/10/2022, 10:59 am	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	8.8	91	10.6	9.9	9.1	6.0	237.5	2.6	-	pH is low however are representative of background conditions in October 2022 and consistent with previous results from Tantangara Reservoir.
2/10/2022, 11:33 am	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	8.3	96.5	11.4	10.7	10.4	5.9	227.9	2.6	-	This location is upstream of works and is therefore representative of background conditions.
2/10/2022, 12:33 pm	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	9.4	92.4	10.6	11.2	10.4	6.1	261.4	3.8	Sampled following rainfall. Sunny, moderate wind.	pH is low however are representative of background conditions in October 2022 and consistent with previous results from Tantangara Reservoir.

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
30/10/2022, 4:16 pm	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	20.54	107.4	9.65	346	225	8.09	504	30.20	-	No discharge was occurring 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
1/10/2022, 1:42 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	10.9	78.8	8.7	7	6.50	6.5	205.8	1.7	-	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.

Future Generation
Webuild • Clough • Lane

November 2022 EPL 21266 In Situ Water Quality Measurements

EPL Monthly Monitoring November 2022

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
6/11/2022, 1:44 pm	EPL5	Yarrangobilly River, upstream of the exploratory tunnel and construction pad	12.15	91	9.77313	48	31	6.87	177	16.7	-	This location is upstream of works and is therefore representative of background conditions.
6/11/2022, 2:29 pm	EPL6	Wallaces Creek, upstream of Yarrangobilly River and Wallaces Creek confluence	13.95	94.4	9.73	60	39	6.96	-23	24.5	Overcast, slightly turbid	-
7/11/2022, 2:14 pm	EPL8	Yarrangobilly River, downstream of Lick Hole Gully	11.24	94	10.3	62	40	7.65	-60	23.6	Highly rapid water, water levels had risen but not flooding. Slight turbid.	-
7/11/2022, 7:01 am	EPL9	Yarrangobilly River, downstream of the accommodation camp and upstream of Talbingo Reservoir	10.43	103	11.51	57	37	7.21	144	18.1	Sunny, clear water, rapid flow,	-
6/11/2022, 2:03 pm	EPL12	Yarrangobilly River, immediately downstream of portal pad	12.23	92.3	9.89	50	33	6.88	-18	13.7	Overcast, slightly turbid	-
7/11/2022, 7:51 am	EPL14	Yarrangobilly River, downstream of road construction areas	10.11	100	11.26	72	47	7.56	167	17.3	Sunny, clear flowing water, high water level	-
7/11/2022, 8:04 am	EPL15	Yarrangobilly River, downstream of road construction areas	10.18	94.3	10.5	54	35	7.56	174	18.1	Sunny, clear rapid water, high water level	-
6/11/2022, 3:37 pm	EPL16	Yarrangobilly River, downstream of road construction areas	13.31	94.9	9.93	54	35	7.36	-44	26.2	Cloudy, slightly turbid	Turbidity slightly exceeds the WQO, however is generally represntative of the Yarrangobilly River in November 2022. No source of the turbidity could be identified.
7/11/2022, 7:18 am	EPL24	Yarrangobilly River tributary (Watercourse 2), directly downstream of road	11.28	96.8	10.6	57	37	7.01	77	16.5	Sunny, clear running water,	-
9/11/2022, 3:39 pm	EPL26	Eucumbene River downstream of Marica Road	7.2	67.3	8.1	14.5	14.3	6.01	207.4	4.73	Fine weather, steady flow, clear QA done here	pH and DO are low however are representative of background conditions and are consistent with previous results.
9/11/2022, 3:48 pm	EPL27	Eucumbene River upstream of Marica Road	7.3	68.5	8.3	14.6	14.3	6.13	183.3	10.2	Steady flow, clear, fine weather	This location is upstream of works and is therefore representative of background conditions.
13/11/2022, 11:18 am	EPL30	Kellys Plain Creek, downstream of accommodation camp and laydown areas	13.1	51.9	5.5	19.6	16.5	7.44	-100.2	17.6	Sampled following heavy rain. Creek flooded.	DO is low however generally representative of background conditions in November 2022. DO will be monitored further.
13/11/2022, 10:59 am	EPL31	Kellys Plain Creek, upstream of accommodation camp and laydown areas	12.8	78.9	8.4	16.8	14.3	7.23	-93.3	7.79	Sampled following heavy rain.	DO is low however generally representative of background conditions in November 2022. DO will be monitored further.
10/11/2022, 12:06 pm	EPL33	Murrumbidgee River, downstream of Tantangara reservoir outlet	16.2	69.9	6.4	18.5	14.3	6.13	245.2	7.56	Fine conditions.	pH and DO are low however are consistent with previous results near Tantangara Reservoir.
10/11/2022, 11:09 am	EPL34	Nungar Creek, upstream of Tantangara Road	12.3	80.4	8.6	10.8	9.1	6.58	60.7	2.48	Fine conditions.	This location is upstream of works and is therefore representative of background conditions.
10/11/2022, 11:31 am	EPL35	Nungar Creek, downstream of Tantangara Road	13.1	72.4	7.6	11.9	9.75	6.90	137.2	2.48	Fine conditions.	DO is low however generally representative of background conditions in November 2022 and consistent with previous results in the area.
9/11/2022, 3:43 pm	EPL36	Camerons Creek, upstream of works in Rock Forest	12.4	64.1	6.8	26.4	22.75	6.18	204.1	2.6	Steady flow, fine weather	This location is upstream of works and is therefore representative of background conditions.
9/11/2022, 3:45 pm	EPL37	Camerons Creek, downstream of works in Rock Forest	14.2	66.4	6.8	32.5	26.65	6.53	173.4	2.97	Clear, steady flow, fine weather QA-ROK done here	DO is low however generally representative of background conditions in November 2022 and consistent with previous results in the area.

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
5/11/2022, 1:37 pm	EPL10	Talbingo Reservoir, downstream of road works and upstream of water intake point	15.82	99.6	9.87	42	28	7.6	-60	18.9	Calm day, full dam, little to no turbid	-
5/11/2022, 11:33 am	EPL11	Talbingo Reservoir, downstream of outlet	15.73	107.5	10.67	44	29	7.9	-73	48	Overcast, windy, clear water green tinge	
12/11/2022, 1:05 pm	EPL28	Tantangara Reservoir, upstream in the mouth of the Murrumbidgee River	15.6	93.8	9.3	16.9	13.4	7.6	-50.0	7.0	Fine, calm conditions.	This location is upstream of works and is therefore representative of background conditions.
12/11/2022, 2:42 pm	EPL29	Tantangara Reservoir, downstream of works area and upstream of lower Murrumbidgee River	17.6	92.9	8.9	17.9	13.5	7.5	-62.6	2.3	Fine, calm conditions.	This location is upstream of works and is therefore representative of background conditions.
12/11/2022, 2:30 pm	EPL32	Tantangara Reservoir, Tantangara Intake. Downstream of construction works	16.5	94.9	9.3	17.4	13.5	7.5	-82.0	2.0	Fine, calm conditions.	-
12/11/2022, 2:20 pm	EPL38	Tantangara Reservoir, variable location dependant on tide and reservoir levels. Between the emplacement area and the ancillary facilities for emplacement activities	15.7	93.5	9.3	16.9	13.4	7.6	-116.5	2.0	Fine, calm conditions. QA taken at EPL 38.	-
12/11/2022, 1:26 pm	EPL39	Confluence of Nungar Creek and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of Tantangara construction works	15.4	90.7	9.1	15.5	12.4	6.8	-6.0	2.4	Fine, calm conditions.	-
12/11/2022, 1:55 pm	EPL40	Confluence of the upper Murrumbidgee River and Tantangara Reservoir, variable location dependent on tide and reservoir levels. Upstream of works	14.7	88.3	9.0	17.3	14	7.3	-31.5	1.7	Fine, calm conditions.	This location is upstream of works and is therefore representative of background conditions.
12/11/2022, 2:48 pm	EPL 51	Tantangara Reservoir, downstream of Tantangara STP/PWTP diffuser outlet	17.3	95.2	9.1	17.8	13.6	7.3	-85.1	2.0	Fine, calm conditions.	-

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
7/11/2022, 9:01 am	EPL41	Lobs Hole STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Talbingo Reservoir.	15.34	68.8	6.87	95.8	0.613	9.55	161	1000	Grey, highly turbid	No discharge was occurring 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**
13/11/2022, 12:19 pm	EPL50	Tantangara STP/PWTP Final Effluent Quality Monitoring Point. Downstream of final treatment, prior to discharge to Tantangara Reservoir.	15.4	42.1	4.2	9	7.20	7.4	-126.9	0.0	Turbidity under range.	No discharge was occurring at the time of sampling.

Table 4 - 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**
11/11/2022, 4:04 pm	EPL1	Wallace Creek Bridge	19.58	19.8	1.81	965	617	7.72	-91	302	Hydrogen sulphide odour, dark grey sediment in bottom of bore.	Elevated EC is consistent with, and within range of previous data.
11/11/2022, 4:29 pm	EPL2	Wallace Creek Bridge	21.97	24.5	2.14	177	115	7.79	-67	621	Hydrogen sulphide odour, brown sediment in bottom of bore.	Elevated EC is consistent with, and within range of previous data.
11/11/2022, 1:25 pm	EPL4	Portal Access	17.0	8.9	0.86	999	639	7.52	-96	278		Elevated EC is consistent with, and within range of previous data.
11/11/2022, 2:38 pm	EPL25	Portal Access	18.7	20	1.87	394	256	6.64	-3	1000	Grey sediment/sludge	Elevated EC is consistent with, and within range of previous data.

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.

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: 03-30 June 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, 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 13 May 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.

No discharge was occuring at the time the samples at EPL 41 or EPL50 were collected.
No BOD or faecal coliform samples were collected in June 2022.
Elevated nitrogen, nitrates, and phosphorus presence are likely due to the recent rain events.

Any exceeding values are likely representative of background conditions after a wet weather event of approximately 151 mm of rain between 1- 13 June 2022 at Lobs Hole, 118 mm of rain between 1 - 13 June 2022 at Tantangara, and 50 mm of rain between 1 - 7 June at Marica.

The trigger action response plans included in the water management plan have been followed for all analytes with concentrations exceeding the respective water quality values. At this time, no further action is required.

Based on water quality results from upstream of the site, and a review of site activity and weather, exceedances are not related to the site works.

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 2.0 Main Works
Monthly EPL Sampling: 03-30 June 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
Field												
pH	pH Unit	-	6.5-8	6.18	6.26	6.8	6.14	6.07	5.9	5.92	5.96	-
Electrical Conductivity	µS/cm	-	20-30	31	30	11.4	14.4	14	12.3	9.6	11.7	-
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	263	242	240.9	263.5	266	277.6	260.2	264.2	-
Temperature	°C	-	No Water Quality Objective Value	9.98	10.02	5.1	5.1	4.8	4.3	4.8	5.1	-
Dissolved Oxygen	% saturation	-	90-110	78.3	83.8	108.7	89.3	88	87.8	89.8	86.4	-
Turbidity	NTU	-	1-20	-	-	3.49	4.03	3.52	4.57	3.09	2.89	-
Laboratory analytes												
Total suspended solids	mg/L	5	No Water Quality Objective Value	13	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	11.00	11.00	7.5	8.5	9.1	8.0	5.4	8.0	6.7
Nutrients												
Ammonia as N	µg/L	5	10	31.0	<5	<5	<5	<5	<5	<5	<5	16.0
Nitrite + Nitrate as N (NOx)	µg/L	2	10	60.0	80.0	<10	20.0	20.0	10	<10	<10	20.0
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	140	130	120	140	120	120	120	90	90.0
Nitrogen (Total)	µg/L	10	350	200	200	130	160	140	130	120	100	100
Reactive Phosphorus	µg/L	1	5	7.0	5.0	3.0	<1	<1	<1	<1	<1	7.0
Phosphorus (Total)	µg/L	5	10	13.0	<5	12.0	7.0	<5	39.0	9.0	17.0	8.0
Inorganics												
Cyanide Total	µg/L	4	7	<4	<4	5.00	4.00	5.00	<4	<4	<4	<4
Hydrocarbons												
Oil and Grease	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5
Metals												
Aluminium (dissolved)	µg/L	5	55	28.0	25.0	27	22	25	25	17	15	92.0
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	0.5	14	4.0	9.0	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	2	300	<50	<50	<50	80	80	60	<50	<50	<50
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	-	-	-	-	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	2	1/5^	-	-	-	-	-	-	-	-	-

* 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: 03-30 June 2022 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	5.99	6.14	6.96	7.48	6.03	6.97	6.96	6.93	7.1	6.5	6.5	7.9	7.2	7.5	7.2	7.5	6.3	6.0
Electrical Conductivity	µS/cm	-	30-350	52	50	62	61	55	74	54	56	74.0	17.3	17.3	17.2	14.3	16.3	8.1	8.2	21.4	22.3
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	196	232	209	241	210	192	197	213	165.0	230.3	220.2	185.0	190.0	182.7	199.8	189.4	243.4	247.1
Temperature	°C	-	No Water Quality Objective Value	7.24	8.48	7.62	4.69	6.96	7.69	7.54	7.63	10.6	5.5	5.7	6.4	5.2	7.3	2.1	2.1	5.0	6.1
Dissolved Oxygen	% saturation	-	90-110	88.5	87.7	84.8	109.9	84.4	85.1	84.6	85	82.9	84.5	83.3	85.2	91.7	91.1	90.9	124.0	88.2	101.4
Turbidity	NTU	-	2-25	-	24.3	5.7	5	-	6.5	5.6	6.3	103.0	3.2	1.1	12.3	7.0	2.7	3.0	3.4	3.7	8.7
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	21	32	29	6.1	21	15	33	14	7.6	<5	<5	10.0	8.5	<5	<5	<5	<5	<5
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	23	22	29	27	23	35	23	24	35	9.3	10	6.0	7.2	9.0	<5	<5	12	10
Nutrients																					
Ammonia as N	µg/L	5	13	<5	<5	<5	<5	<5	7	<5	<5	<5	10.0	<5	<5	<5	<5	<5	13.0	<5	<5
Nitrite + Nitrate as N (NOx)	µg/L	10	15	40.0	20.0	60.0	60.0	120	50.0	50.0	60.0	90.0	60.0	<10	20.0	<10	<10	<10	10.0	40.0	30.0
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	450	10.0	390	210	100	580	460	430	380	<10	40.0	160	170	510	390	400	130	200
Nitrogen (Total)	µg/L	10	250	460	80.0	450	270	220	630	520	490	460	60.0	40.0	180	170	510	390	400	170	210
Reactive Phosphorus	µg/L	1	15	8.0	14.0	9.0	5.0	8.0	12.0	10.0	10.0	15.0	3.0	3.0	2.0	5.0	1.0	1.0	1.0	4.0	4.0
Phosphorus (Total)	µg/L	5	20	41.0	<5	11.0	15.0	16.0	20.0	28.0	9.0	37.0	6.0	19.0	10.0	7.0	6.0	8.0	5.0	18.0	46.0
Inorganics																					
Cyanide Total	µg/L	4	4	<4	<4	<4	<4	<4	4.0	<4	7.0	<4	<4	<4	<4	<4	<4	<4	<4	<4	4.0
Hydrocarbons																					
Oil and Grease	mg/L	5	No Water Quality Objective Value	<5	<5	<5	14.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	7.9	<5	<5	<5	5.7
Metals																					
Aluminium (dissolved)	µg/L	5.0	27	58.0	36.0	25.0	19.0	110	28.0	44.0	45.0	57.0	25.0	5.0	22.0	12.0	15.0	21.0	20.0	32.0	32.0
Arsenic (dissolved)	µg/L	1.0	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1.0	0.01	<1	<1	<1	<1	<1	<1	<1	<1	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	12.0	<1	<1	2.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	50.0	300	7.0	<50	50.0	<50	100	70.0	60.0	60.0	70.0	<50	<50	70.0	<50	120	60.0	60.0	160	160
Lead (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5.0	1,200	<5	<5	<5	<5	<5	<5	<5	<5	17.0	<5	<5	<5	<5	7.0	<5	<5	<5	<5
Nickel (dissolved)	µg/L	1.0	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5.0	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5.0	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<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: 03-30 June 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 46	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate												
Inflow#	ML/day			-	-	1.00	0.05	-	0.07	-	0	-
Outflow#	ML/day		4.32 (EPL 43 / 50)	-	0.070	-	-	-	-	-	-	0.10
Field												
pH	pH Unit	-	6.5-8.5	7.63	-	-	-	-	-	-	-	7.55
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)	38.8	-	-	-	-	-	-	-	342.9
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	223	-	-	-	-	-	-	-	232.2
Temperature	°C	-	15	15.69	-	-	-	-	-	-	-	4
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value	101.1	-	-	-	-	-	-	-	132.2
Turbidity	NTU	-	<25	0.89	-	-	-	-	-	-	-	1.25
Laboratory analytes												
Total suspended solids	mg/L	5	5/10	<5	-	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	6.6	-	-	-	-	-	-	-	200
Nutrients												
Ammonia as N	mg/L	5	0.2/2^	<5	-	-	-	-	-	-	-	0.85
Nitrite + Nitrate as N (NOx)	µg/L	2	No Water Quality Objective Value	470	-	-	-	-	-	-	-	4900
Kjeldahl Nitrogen Total	mg/L	10	No Water Quality Objective Value	1.7	-	-	-	-	-	-	-	4.6
Nitrogen (Total)	µg/L	10	0.35	2100	-	-	-	-	-	-	-	9500
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value	2	-	-	-	-	-	-	-	-
Phosphorus (Total)	mg/L	5	0.1/0.3^	0.074	-	-	-	-	-	-	-	0.24
Inorganics												
Cyanide Total	µg/L	4	No Water Quality Objective Value	10	-	-	-	-	-	-	-	6
Hydrocarbons												
Oil and Grease	mg/L	5	2/5^	<5	-	-	-	-	-	-	-	<5
Metals												
Aluminium (dissolved)	µg/L	5	55	250	-	-	-	-	-	-	-	29
Arsenic (dissolved)	µg/L	0.2	13	<1	-	-	-	-	-	-	-	2
Chromium (III+VI) (dissolved)	µg/L	0.2	1	73	-	-	-	-	-	-	-	180
Copper (dissolved)	µg/L	0.5	14	10	-	-	-	-	-	-	-	1
Iron (dissolved)	µg/L	2	300	<50	-	-	-	-	-	-	-	<50
Lead (dissolved)	µg/L	0.1	3.4	<1	-	-	-	-	-	-	-	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	-	-	-	-	-	-	-	<5
Nickel (dissolved)	µg/L	0.5	11	<1	-	-	-	-	-	-	-	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	-	-	-	-	-	-	-	<5
Zinc (dissolved)	µg/L	1	8	39	-	-	-	-	-	-	-	22
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	-	-	-	-	-	-	-	-	-
Biological Oxygen Demand	mg/L		5	-	-	-	-	-	-	-	-	-

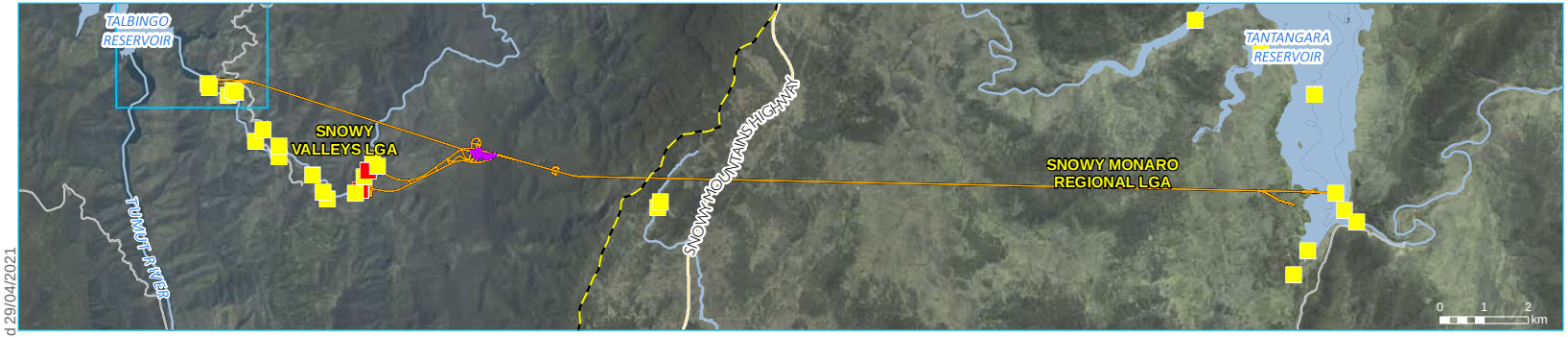
Note: Treated water was not being discharged at Talbingo or Tantangara Reservoirs at the time of EPL sampling

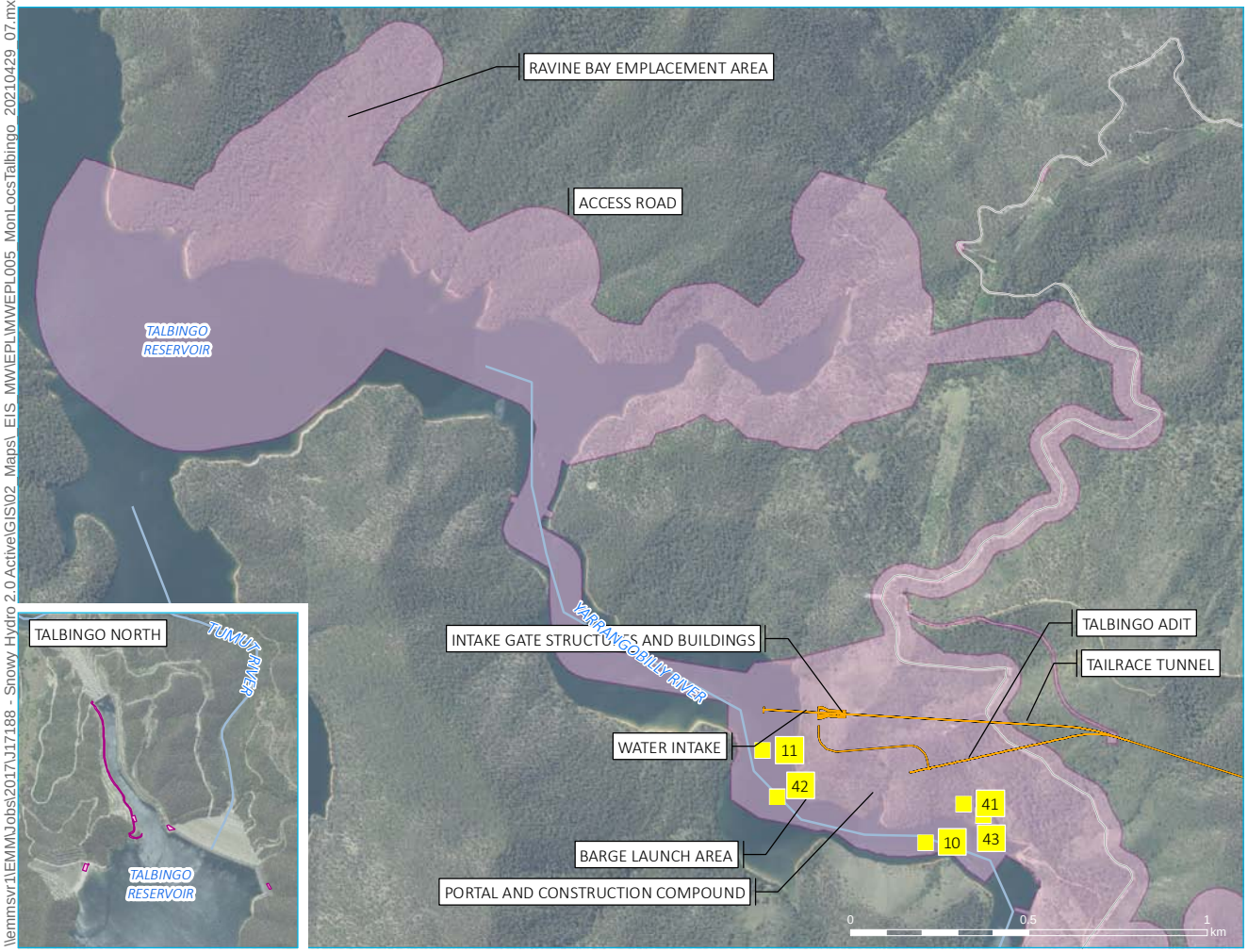
* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

\- 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





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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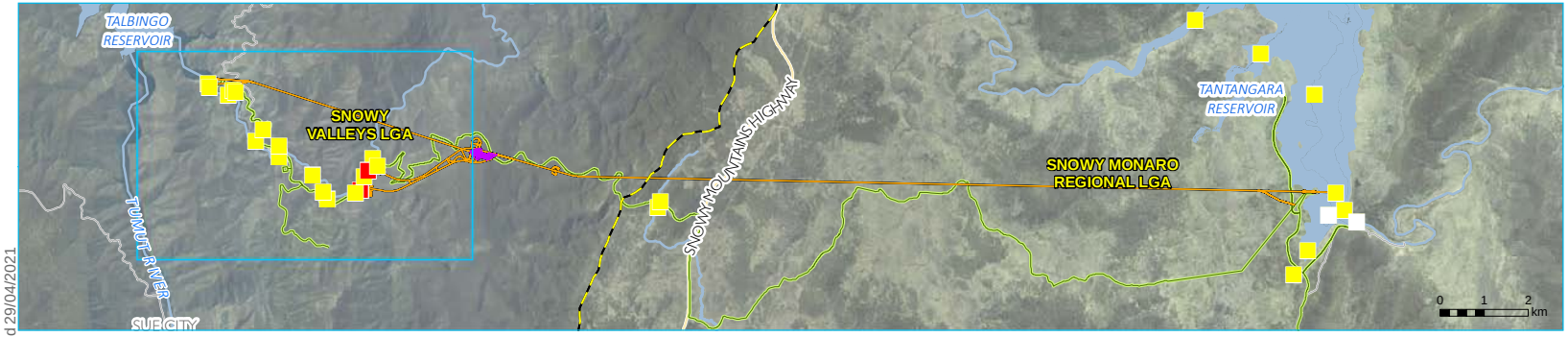

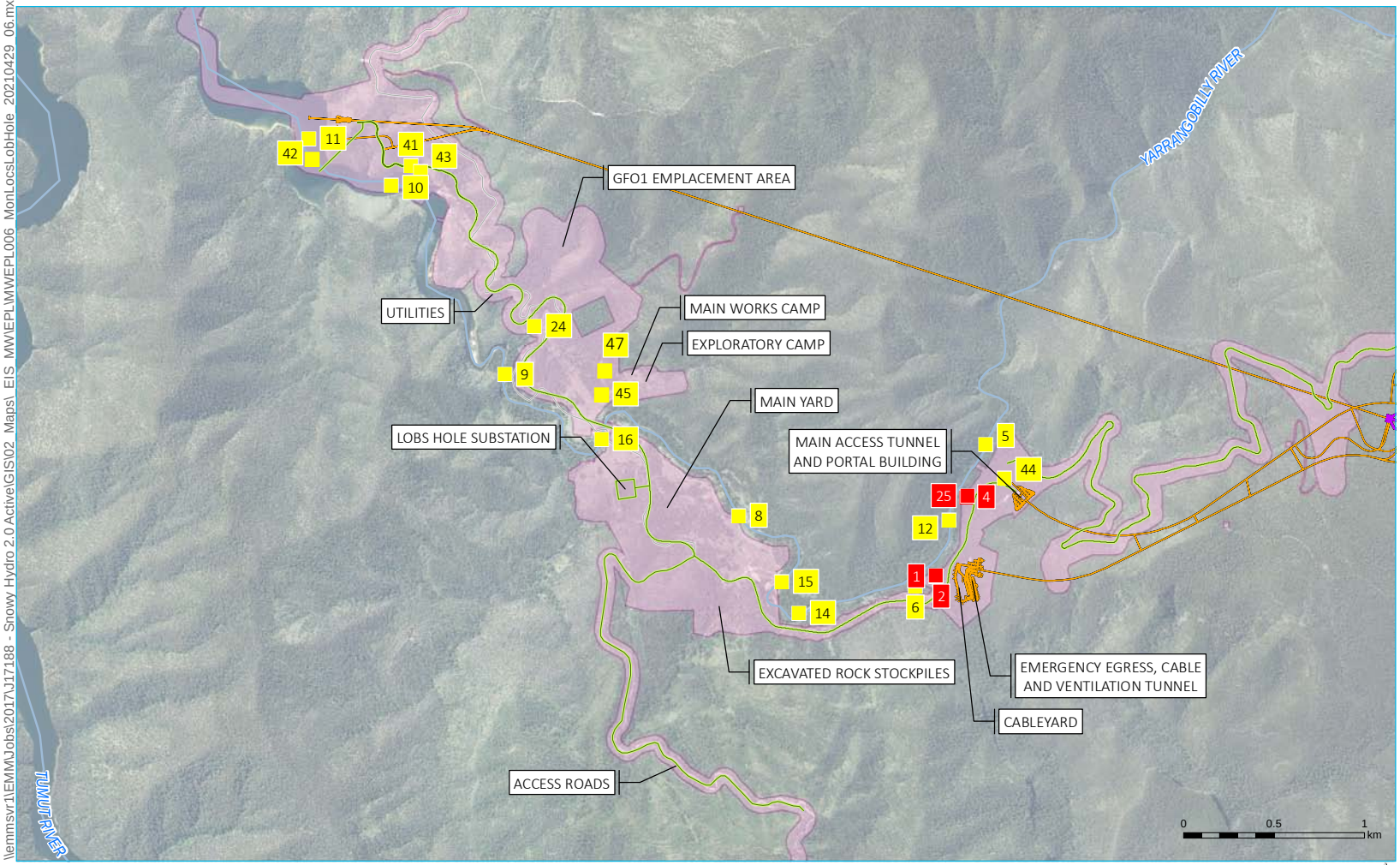

KEY

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 - Lobs Hole

Snowy 2.0
Main Works
Figure 2

\\emmsvr1\EMMJobs\2017\117188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MWEPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021

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

GDA 1994 MGA Zone 55

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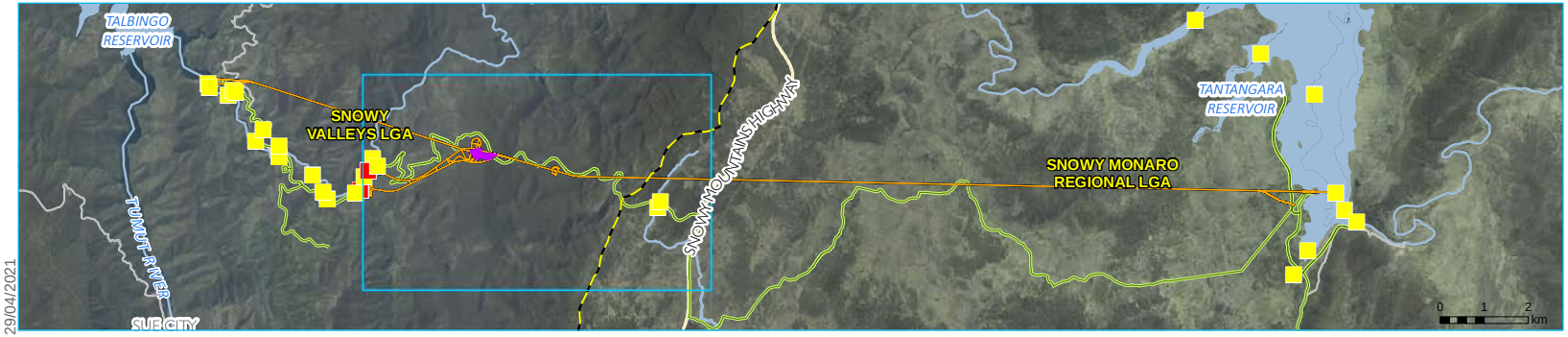

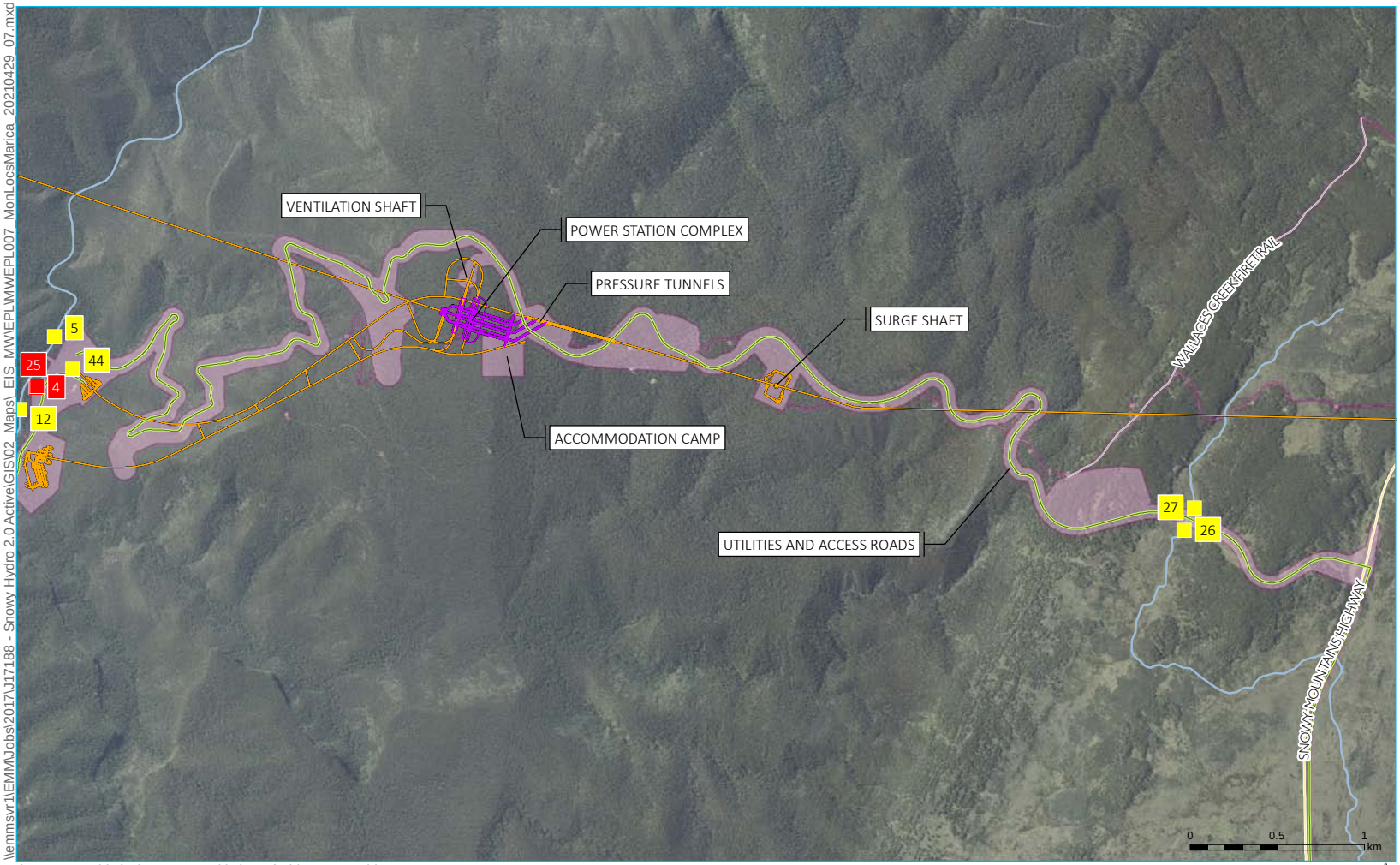

KEY

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 - Marica

Snowy 2.0
Main Works
Figure 3

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

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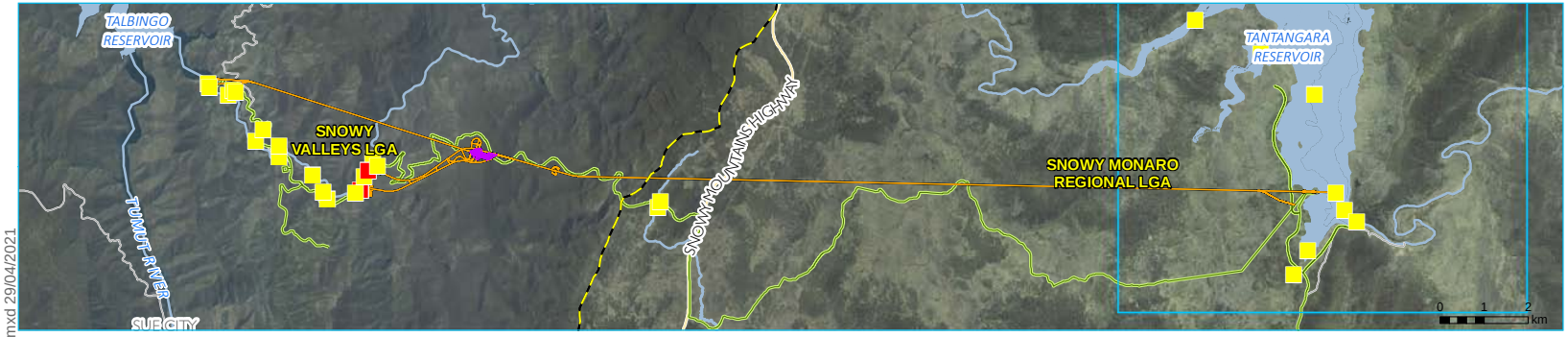

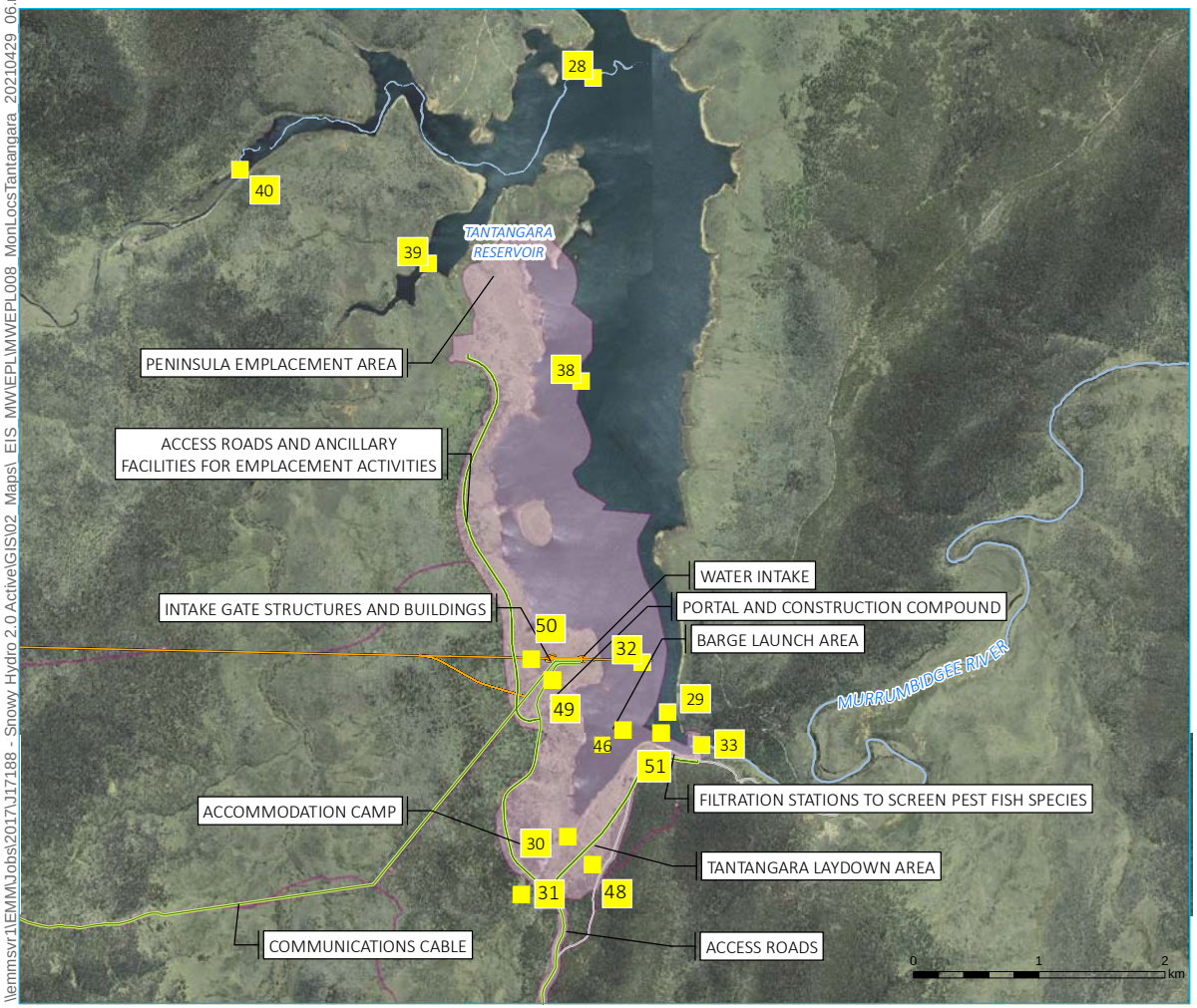

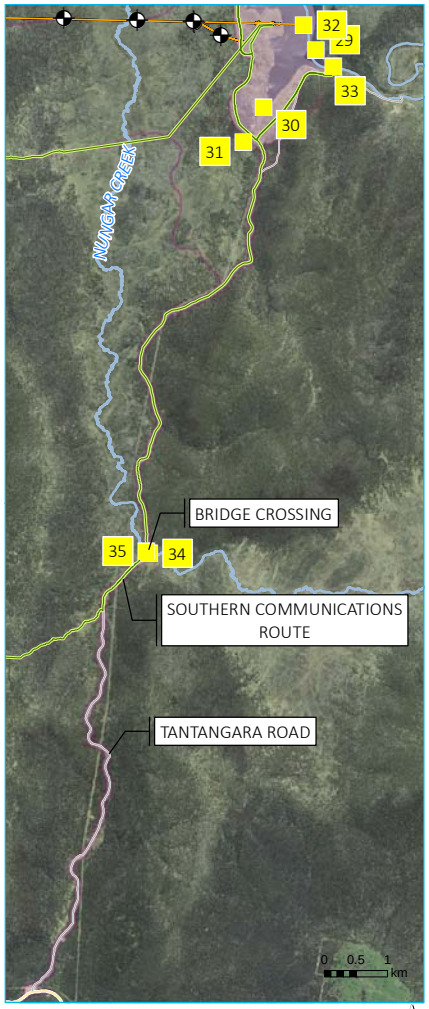

KEY

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

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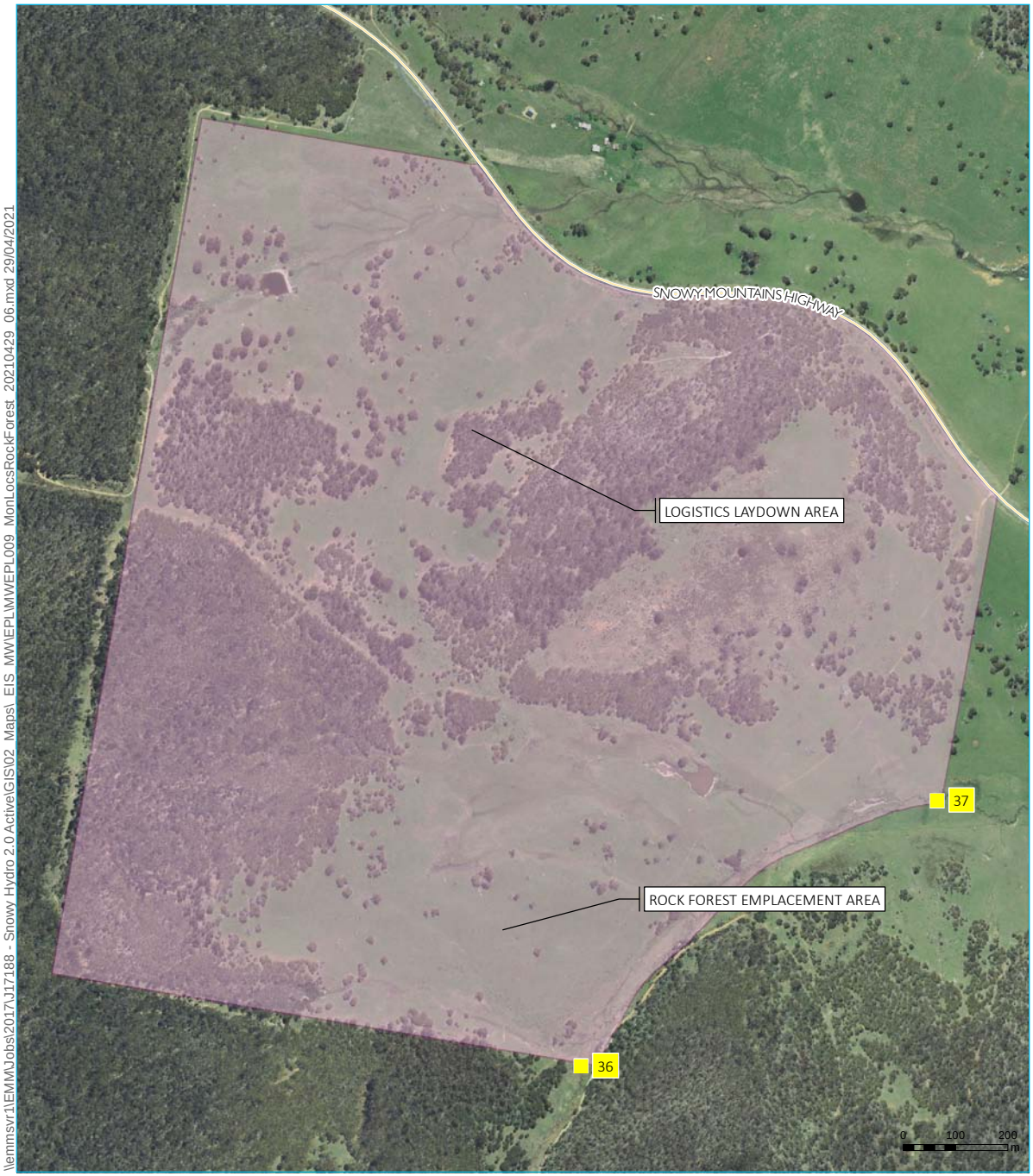

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KEY

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

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

GDA 1994 MGA Zone 55

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snowy 2.0

EMM creating opportunities

Snowy Hydro 2.0 Main Works EPL Sampling: 02 - 11 July 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, 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 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.

No BOD samples and limited feacal coliform samples were collected in July 2022.
Exceedance of oil and grease at EPL 31 is upstream of the project at Kellys Plain Creek.
Exceedances at Rock Forest, Lobs Hole, Marica and Tantangara are consistent upstream and downstream of the project, with the exception of EPL 24.

The trigger action response plans included in the water management plan have been followed for all analytes with concentrations exceeding the respective water quality values. At this time, no further action is required.

Based on water quality results from upstream of the site, and a review of site activity, exceedances are not related to the site works.

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 2.0 Main Works
Monthly EPL Sampling: 02 - 11 July 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
Field												
pH	pH Unit	-	6.5-8	7.35	7.38	7.74	6.39	6.42	6.52	7.24	7.09	8.09
Electrical Conductivity	µS/cm	-	20-30	32.6	35.1	10.90	11.90	11.90	11.90	9.9	9.8	12.8
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	159	100	168.80	291	293.90	306.00	268.7	267.3	227.1
Temperature	°C	-	No Water Quality Objective Value	9.4	9.4	4.70	4.90	4.90	4.80	4.6	4.6	5
Dissolved Oxygen	% saturation	-	90-110	91.3	91.3	81.60	81.50	88.70	85.50	105.3	93	72.9
Turbidity	NTU	-	1-20	2	3	4.10	4.71	4.70	8.84	5.43	5.7	8.06
Laboratory analytes												
Total suspended solids	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	13	13	6.5	6.4	6.5	6.3	5.1	4.9	6.6
Nutrients												
Ammonia as N	µg/L	5	10	<5	<5	38	<5	<5	<5	<5	10	<5
Nitrite + Nitrate as N (NOx)	µg/L	2	10	50	50	20	50	70	20	50	310	20
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	10	30	190	120	280	150	440	300	50
Nitrogen (Total)	µg/L	10	350	60	80	210	170	350	170	490	610	60
Reactive Phosphorus	µg/L	1	5	7	1	3	2	7	4	1	2	1
Phosphorus (Total)	µg/L	5	10	7	<5	<5	<5	<5	<5	<5	<5	19
Inorganics												
Cyanide Total	µg/L	4	7	<4	<4	<4	<4	<4	<4	<4	<4	5
Hydrocarbons												
Oil and Grease	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	27
Metals												
Aluminium (dissolved)	µg/L	5	55	<5	6	22	24	26	24	10	9	150
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	0.5	14	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	2	300	<50	<50	<50	<50	<50	<50	<50	<50	<50
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	26	1	-	-	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	2	1/5^	-	-	-	-	-	-	-	-	-

* 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: 02 - 11 July 2022 - Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	6.9	6.4	6.94	6.66	6.69	6.92	6.68	6.7	6.6	6.5	6.4	7.9	7.2	7.5	7.2	7.0	7.3	7.4
Electrical Conductivity	µS/cm	-	30-350	62.0	61.0	69.0	65.0	64.0	64.0	62.0	64.0	72.0	12.9	13.0	12.7	13.0	12.1	7.9	8.8	17.9	22.5
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	148	205	213	177	159	190	208	201.0	123.0	282.9	279.5	236.8	238.2	249.6	263.4	266.6	261.2	201.7
Temperature	°C	-	No Water Quality Objective Value	7.08	7.33	8.03	8.07	6.87	7.62	7.62	8.1	10.0	6.2	6.1	5.8	5.8	5.1	4.0	3.9	1.8	2.9
Dissolved Oxygen	% saturation	-	90-110	104.8	117.5	104.4	106.6	108	108.5	105.1	104.4	94.9	80.7	78.3	82.9	81.8	78.7	79.8	116.1	96.8	102.8
Turbidity	NTU	-	2-25	0	6.5	0	5	0	0	0	5.0	33.0	20.4	6.5	9.0	10.7	4.4	7.9	8.1	13.2	7.3
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	13	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	27	27	30	28	28	29	28	30	33	8.4	8.8	6.5	6.4	6.3	4.3	4.6	11	11
Nutrients																					
Ammonia as N	µg/L	5	13	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nitrite + Nitrate as N (NOx)	µg/L	10	15	<10	<10	<10	<10	<10	<10	<10	<10	90	20	110	20	60	30	<10	<10	290	60
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	<10	40	40	40	20	<10	<10	<10	30	50	70	40	30	90	50	50	180	390
Nitrogen (Total)	µg/L	10	250	10	40.0	50	40	30	20	20	<0.01	130	70.0	180.0	60	90	110	50	60	470	450
Reactive Phosphorus	µg/L	1	15	3	10	4	4	3	4	4	4	7	3	<1	1	1	<1	<1	1	4	4
Phosphorus (Total)	µg/L	5	20	<5	<5	<5	<5	<5	18	10	10	<5	17	16	8	13	9	<5	<5	19	14
Inorganics																					
Cyanide Total	µg/L	4	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	5	4	<4	<4	4	4	<4	<4
Hydrocarbons																					
Oil and Grease	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	70	<5	<5	<5	<5	<5
Metals																					
Aluminium (dissolved)	µg/L	5.0	27	41	11	26	25	25	29	40	23	25	35	31	14	150	110	120	73	150	170
Arsenic (dissolved)	µg/L	1.0	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1.0	0.01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	5.0	3.0	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	50.0	300	<50	<50	<50	<50	<50	<50	<50	<50	50	50	<50	<50	<50	70	<50	<50	340	360
Lead (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5.0	1,200	<5	<5	<5	<5	<5	<5	<5	<5	47	<5	<5	<5	<5	5	<5	<5	<5	9
Nickel (dissolved)	µg/L	1.0	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5.0	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5.0	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6	<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: 02 - 11 July 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 46	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate												
Inflow#	ML/day			-	-	0.55	0.02	-	0.03	-	0.21	-
Outflow#	ML/day		4.32 (EPL 43 / 50)	-	0.030	-	-	-	-	-	-	0.00
Field												
pH	pH Unit	-	6.5-8.5	7.61	-	-	-	6.41	-	-	-	7.28
Electrical Conductivity	µS/cm	-	700 (EPL 41) / 200 (EPL 50)	93.6	-	-	-	11.9	-	-	-	337.4
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	249	-	-	-	297.2	-	-	-	231
Temperature	°C	-	15	12.06	-	-	-	4.9	-	-	-	3.7
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value	84.5	-	-	-	93.3	-	-	-	67.7
Turbidity	NTU	-	<25	1	-	-	-	6.14	-	-	-	0.96
Laboratory analytes												
Total suspended solids	mg/L	5	5/10	<5	-	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	58	-	-	-	-	-	-	-	200
Nutrients												
Ammonia as N	mg/L	5	0.2/2^	0.54	-	-	-	-	-	-	-	0.88
Nitrite + Nitrate as N (NOx)	µg/L	2	No Water Quality Objective Value	310	-	-	-	-	-	-	-	20
Kjeldahl Nitrogen Total	mg/L	10	No Water Quality Objective Value	0.01	-	-	-	-	-	-	-	0.06
Nitrogen (Total)	µg/L	10	350	320	-	-	-	-	-	-	-	80
Reactive Phosphorus	µg/L	1	No Water Quality Objective Value	21	-	-	-	-	-	-	-	160
Phosphorus (Total)	mg/L	5	0.1/0.3^	0.075	-	-	-	-	-	-	-	260
Inorganics												
Cyanide Total	µg/L	4	No Water Quality Objective Value	22	-	-	-	-	-	-	-	6
Hydrocarbons												
Oil and Grease	mg/L	5	2/5^	<5	-	-	-	-	-	-	-	<5
Metals												
Aluminium (dissolved)	µg/L	5	55	390	-	-	-	-	-	-	-	29
Arsenic (dissolved)	µg/L	0.2	13	<1	-	-	-	-	-	-	-	2
Chromium (III+VI) (dissolved)	µg/L	0.2	1	280	-	-	-	-	-	-	-	180
Copper (dissolved)	µg/L	0.5	14	76	-	-	-	-	-	-	-	1
Iron (dissolved)	µg/L	2	300	<50	-	-	-	-	-	-	-	<50
Lead (dissolved)	µg/L	0.1	3.4	3	-	-	-	-	-	-	-	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	-	-	-	-	-	-	-	<5
Nickel (dissolved)	µg/L	0.5	11	2	-	-	-	-	-	-	-	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	-	-	-	-	-	-	-	<5
Zinc (dissolved)	µg/L	1	8	250	-	-	-	-	-	-	-	22
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	19	-	-	-	-	-	-	-	-
Biological Oxygen Demand	mg/L		5	-	-	-	-	-	-	-	-	-

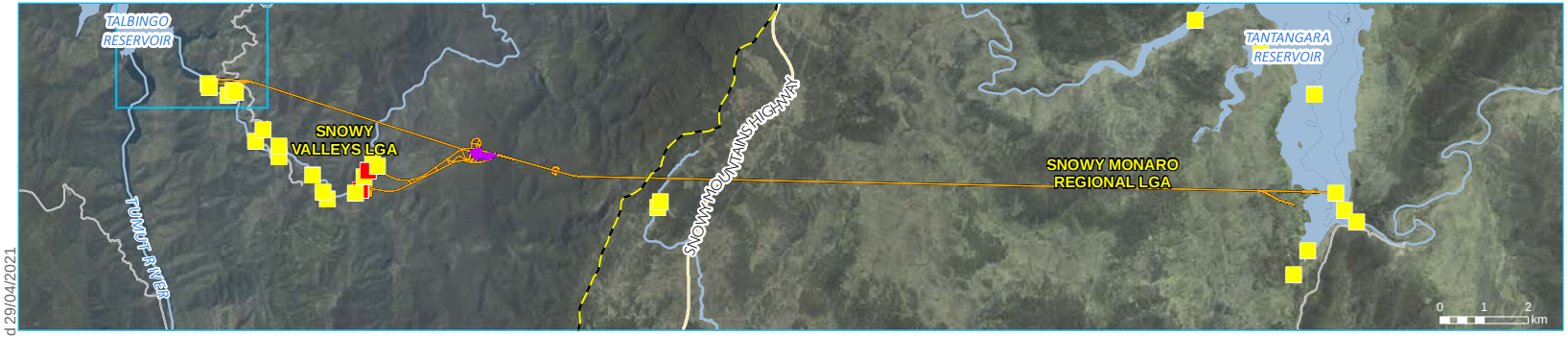
Note: Treated water was not being discharged at Talbingo or Tantangara Reservoirs at the time of EPL sampling

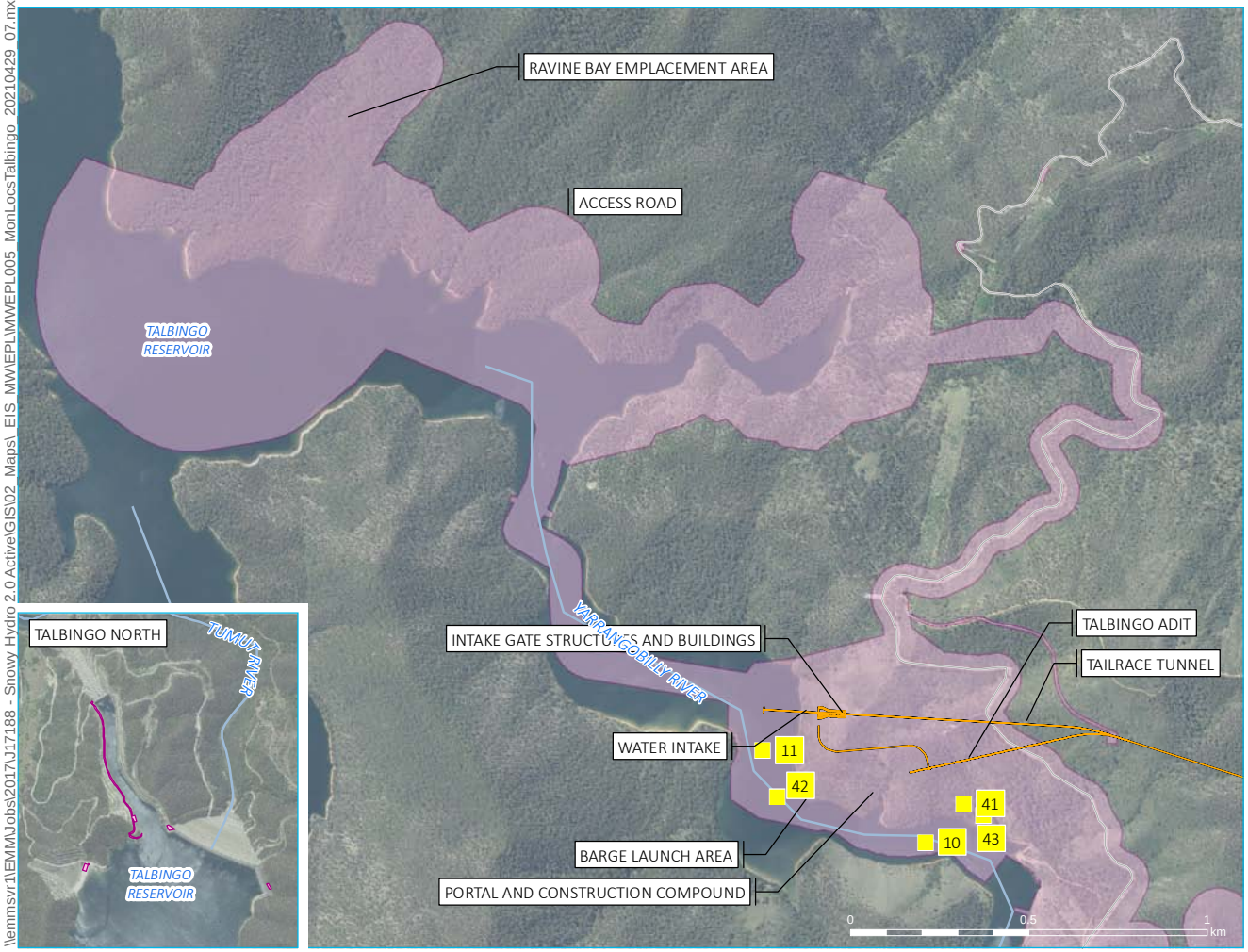
* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

\- 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





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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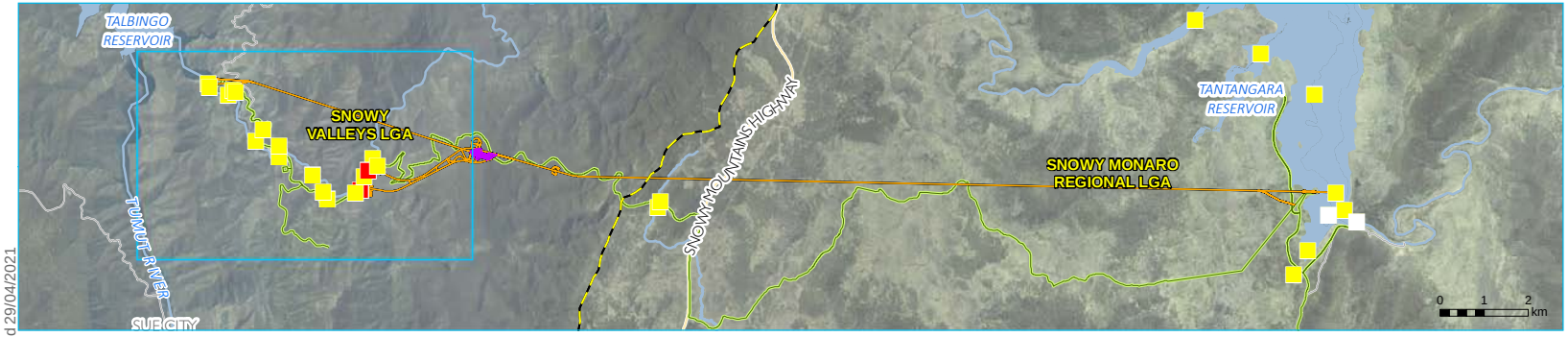

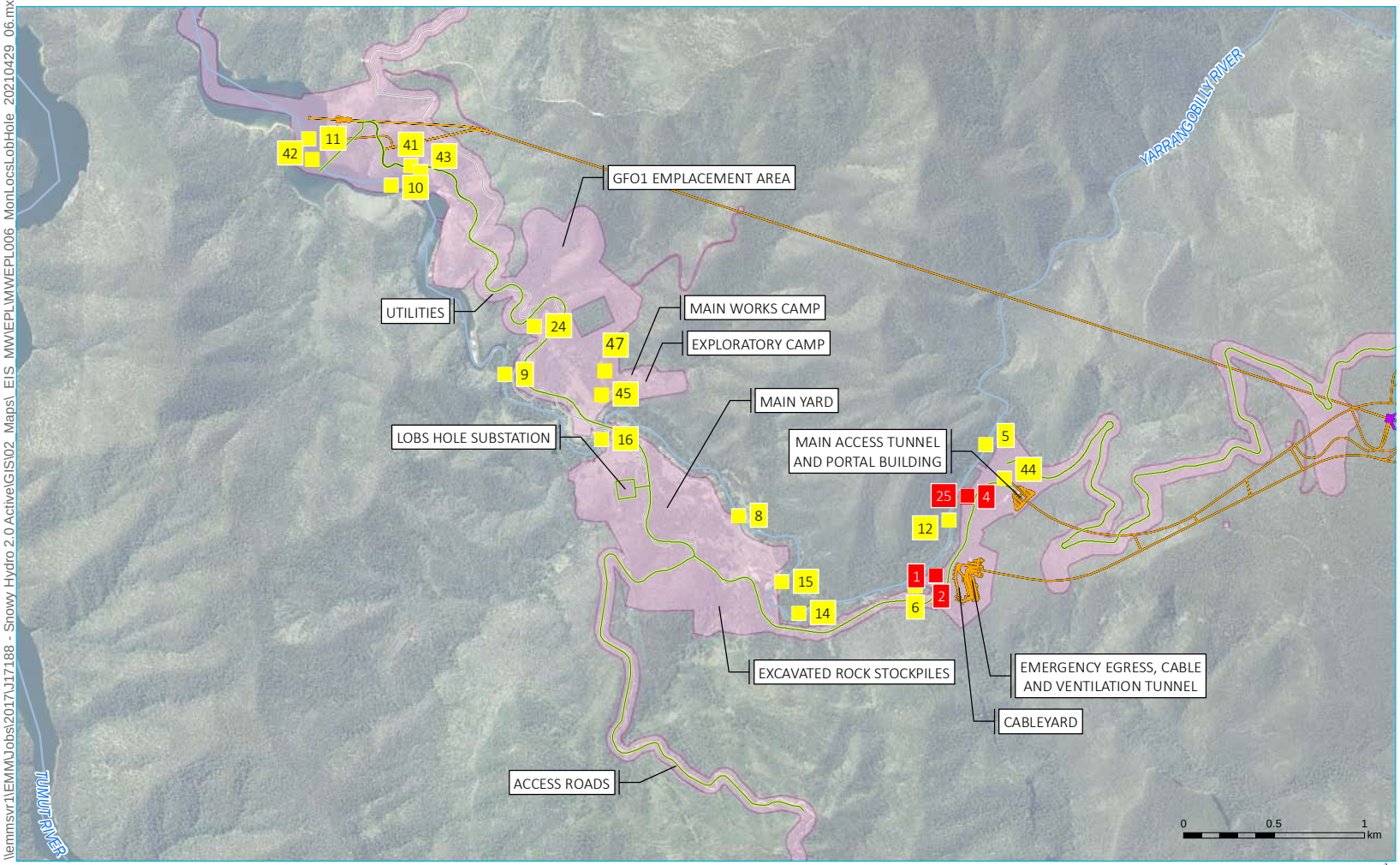

KEY

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

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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

\\emmsvr1\EMMJobs\2017\117188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MWEPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021

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

GDA 1994 MGA Zone 55

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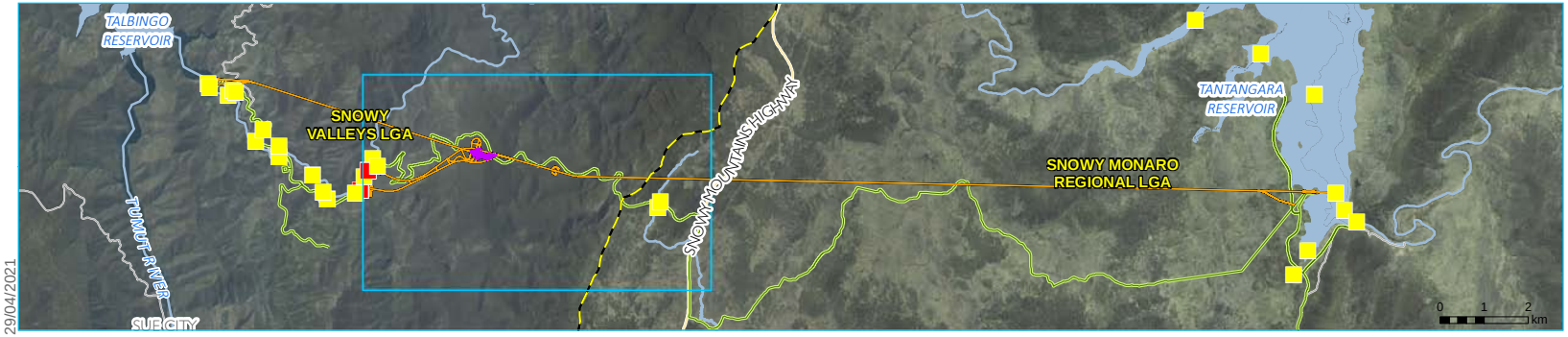

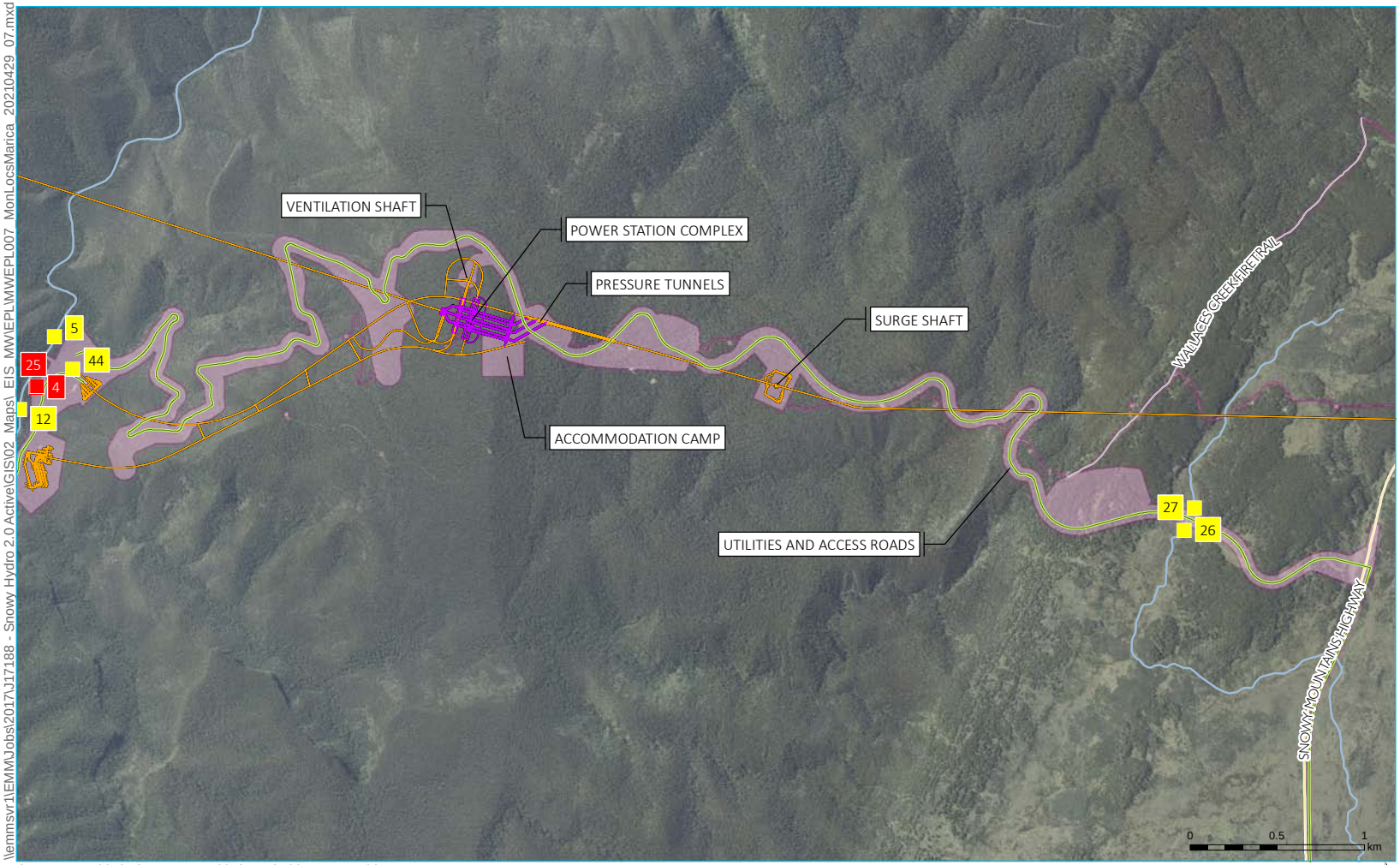

KEY

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 - Marica

Snowy 2.0
Main Works
Figure 3

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

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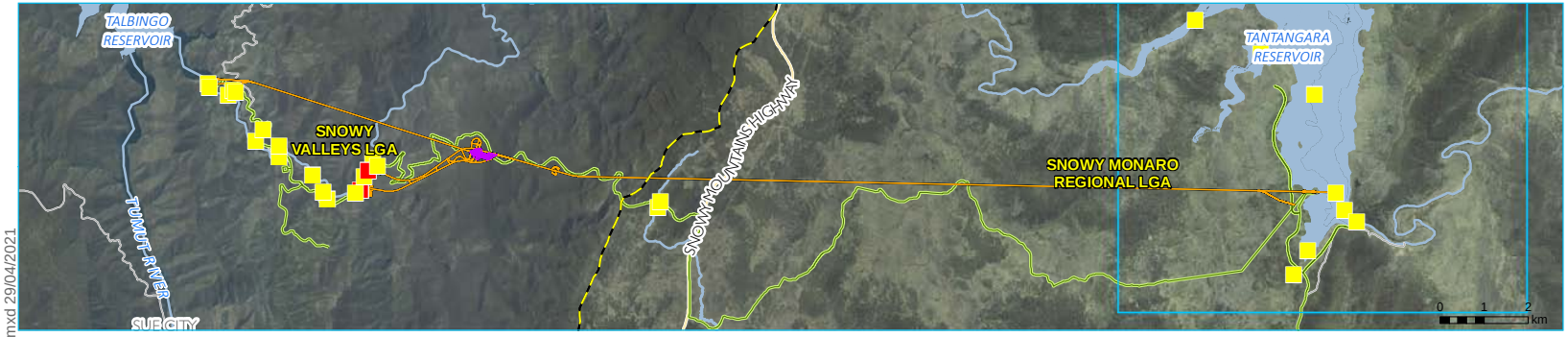

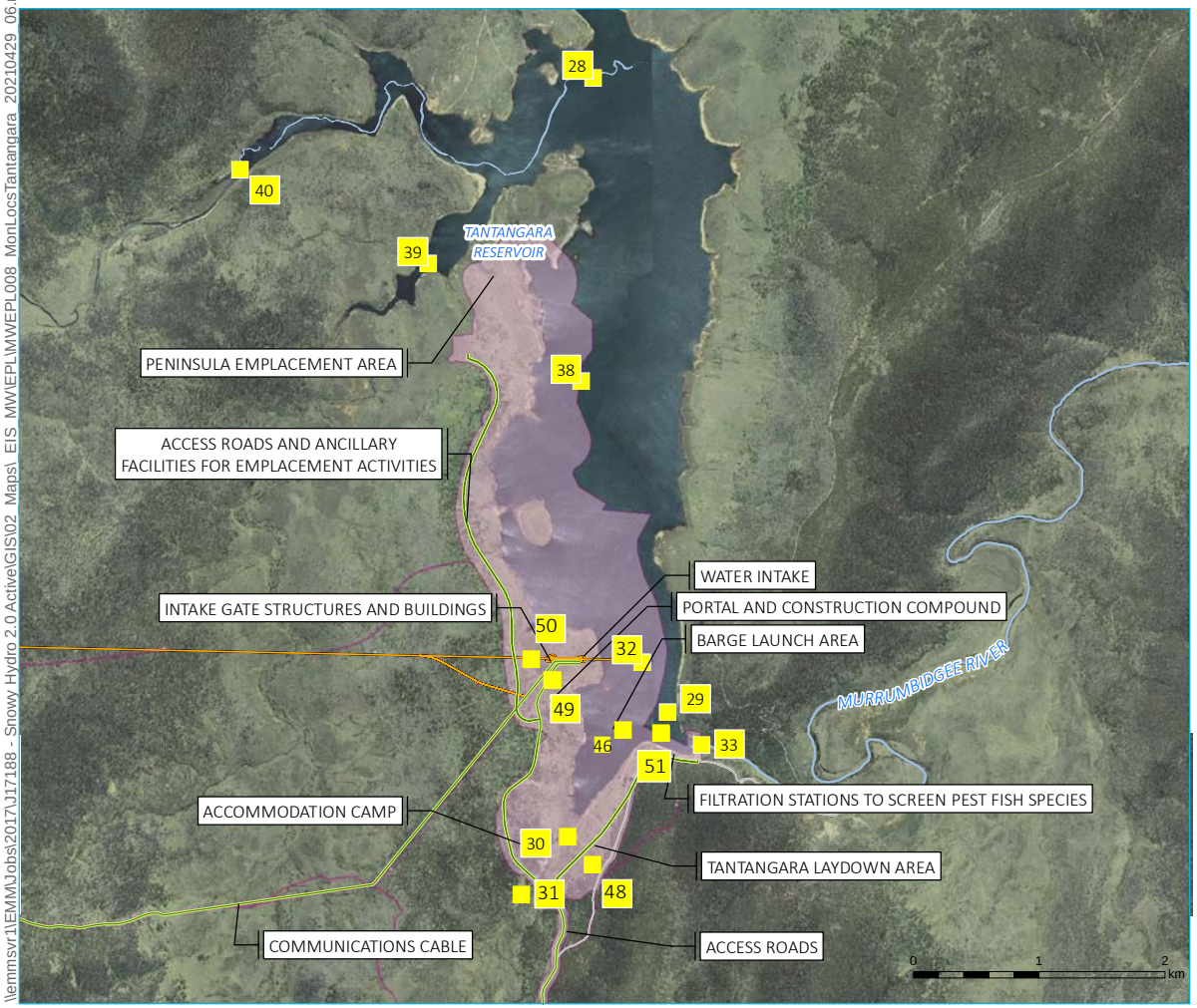

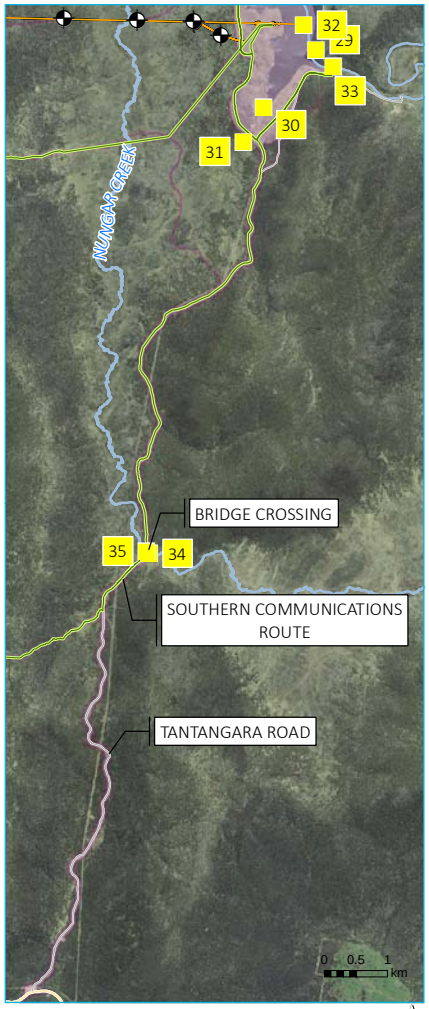

KEY

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

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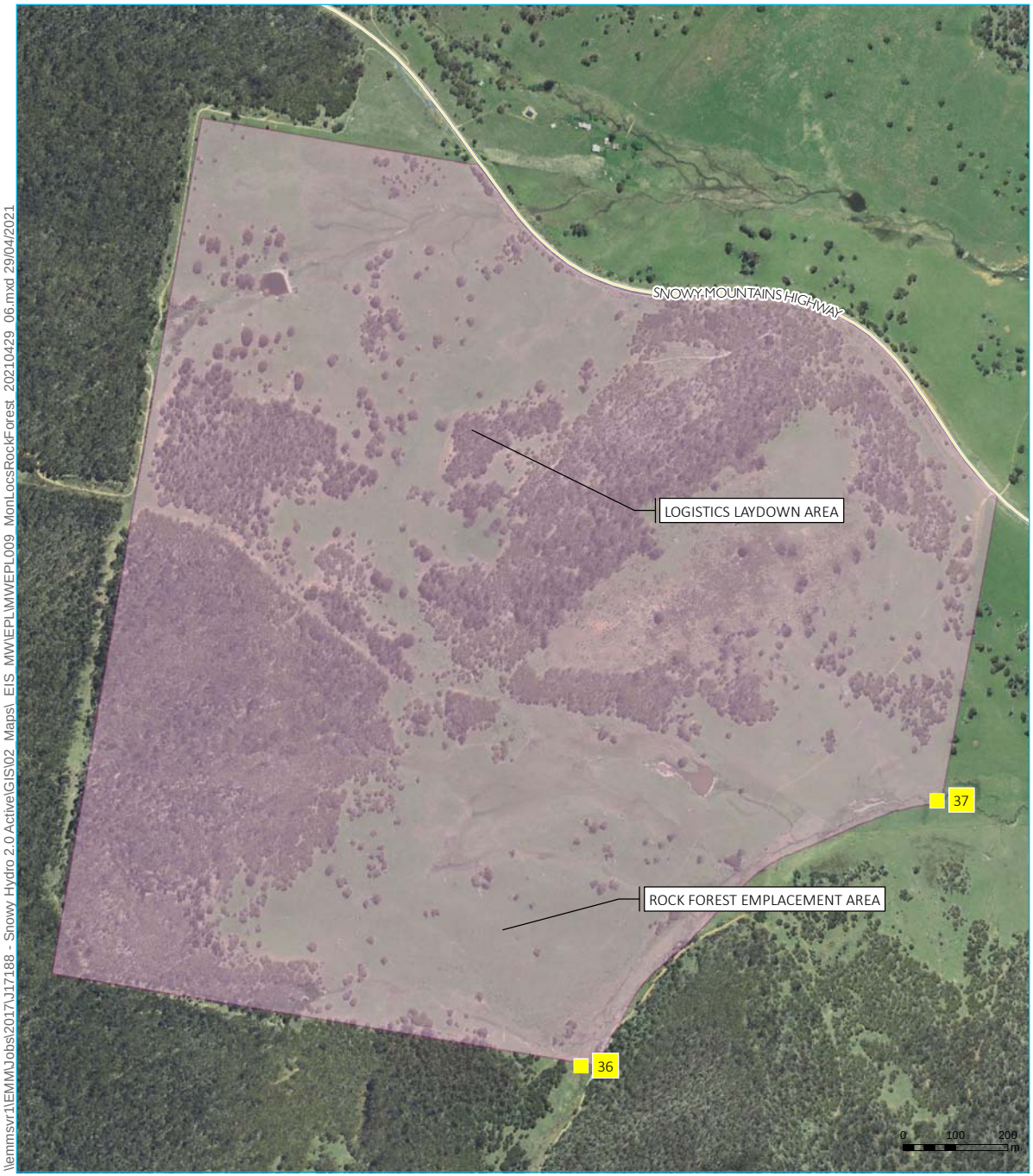

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KEY

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.
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EPL Premise and monitoring point maps - Rock Forest

Snowy 2.0
Main Works
Figure 5

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

GDA 1994 MGA Zone 55

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snowy 2.0

EMM creating opportunities

Snowy Hydro 2.0 Main Works EPL Sampling: 05 - 21 August 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, 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 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.

Sampling in August was undertaken during significant rainfall events leading to high water flows and levels, and ground saturation.
No discharge was occuring at the time of sampling at the discharge locations.
Exceedances at Rock Forest, Lobs Hole, Marica and Tantangara are generally consistent upstream and downstream of the project for surface water results.
Groundwater exceedances are generally consistent with background levels and previous groundwater monitoring results.

The trigger action response plans included in the water management plan have been followed for all analytes with concentrations exceeding the respective water quality values. At this time, no further action is required.

Based on water quality results from upstream of the site, and a review of site activity, exceedances are not related to the site works.

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 2.0 Main Works

Monthly EPL Sampling: 05 - 21 August 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
Field												
pH	pH Unit	-	6.5-8	7.69	7.64	5.93	5.75	5.68	5.88	6.71	6.14	5.87
Electrical Conductivity	µS/cm	-	20-30	51.9	51.2	10.4	9.4	10.4	10.2	9.1	10.7	9.5
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	-	-	280.9	279.4	284	283.2	229.7	264.3	221.4
Temperature	°C	-	No Water Quality Objective Value	10.8	10.4	6.6	6.4	6.3	6.3	6.1	6.2	6.4
Dissolved Oxygen	% saturation	-	90-110	105.1	101	97.3	93.8	88.5	85.7	102.5	90.4	88.9
Turbidity	NTU	-	1-20	-	-	3.86	5.64	6.23	5.61	3.36	3.71	6.27
Laboratory analytes												
Total suspended solids	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	17.00	22.00	5.40	5.30	<5	<5	<5	5.6	5.3
Nutrients												
Ammonia as N	µg/L	5	10	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	100	630	100	130	150	110	50.0	70.0	130
Nitrogen (Total)	µg/L	10	350	100	630	100	130	150	110	50.0	70.0	130
Reactive Phosphorus	µg/L	1	5	10.0	50.0	<1	<1	<1	<1	<1	<1	<1
Phosphorus (Total)	µg/L	5	10	<5	<5	29.0	15.0	28.0	24.0	16.0	19.0	15.0
Inorganics												
Cyanide Total	µg/L	4	7	10.0	<4	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons												
Oil and Grease	mg/L	5	5	<5	<5	<5	<5	7	<5	9	<5	21
Metals												
Aluminium (dissolved)	µg/L	5	55	<5	5.0	41.0	110	89.0	240	110	25.0	93.0
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	0.2	1	<1	<1	<1	<1	2.0	<1	<1	<1	<1
Copper (dissolved)	µg/L	0.5	14	<1	3.0	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	2	300	<50	<50	<50	70.0	80.0	120	70.0	<50	60.0
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	10.0	5.0	<5	<5	<5	5.0	<5	<5	<5
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	6	5	-	-	-	-	-	-	<1
Biochemical Oxygen Demand	mg/L	2	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.

^ 90th percentile concentration limits / 100 percentile concentration limits

\- Sample not required at this location.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 09 - 10 August 2022 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL1 (RMSB6)	EPL2 (RSMB7)	EPL4 (RSMB9)	EPL25 (RSMB8)
Physiochemical							
pH	pH Unit	-	6.5-8	7.62	6.86	7.49	6.59
Electrical Conductivity	µS/cm	-	30-350	1,170	430	1,560	443
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	231	71.0	142	92
Temperature	°C	-	No Water Quality Objective Value	15.8	15.3	12.4	11.7
Dissolved Oxygen	% saturation	-	No Water Quality Objective Value	133.5	123.2	115.6	113.8
Turbidity	NTU	-	No Water Quality Objective Value	0.0	21.7	0.0	94.6
Nutrients							
Nitrogen (Total)	µg/L	10	250	300	1,300	500	300
Reactive Phosphorus	µg/L	1	15	<50	<50	290	<50
Metals							
Aluminium (dissolved)	µg/L	5	27	<5	<5	<5	6
Copper (dissolved)	µg/L	0.5	1	<1	5.0	<1	12.0
Iron (dissolved)	µg/L	2	300	<50	1,800	<50	880
Lead (dissolved)	µg/L	0.1	1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,200	170	160	90	1200
Nickel (dissolved)	µg/L	0.5	8	17.0	3.0	2	13.0
Silver (dissolved)	µg/L	0.01	0.02	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	2.4	<5	11.0	<5	27.0

* 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: 05 - 21 August 2022- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	6.5	6.6	6.6	6.65	6.45	7.12	7.13	6.6	6.8	6.8	6.5	5.9	5.9	6.2	6.6	7.0	7.3	7.4
Electrical Conductivity	µS/cm	-	30-350	49.0	55.0	65.0	56.0	52.0	79.0	53.0	56.0	52.0	13.2	13.3	11.1	11.8	9.4	7.2	7.2	17.9	22.5
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	242	245	247	256	232	235	220	248.0	236.0	27.8	50.7	283.1	292.0	275.2	220.0	187.1	261.2	201.7
Temperature	°C	-	No Water Quality Objective Value	8.28	8.9	8.59	9.03	7.83	8.35	8.2	8.6	10.9	5.6	5.7	7.8	7.7	6.3	5.6	6.5	1.8	2.9
Dissolved Oxygen	% saturation	-	90-110	95.7	97.2	95.7	96.5	94.2	92.7	95.2	96.4	95.3	86.5	85.3	93.1	93.7	98.9	96.0	98.2	96.8	102.8
Turbidity	NTU	-	2-25	25	40	30	40	19	75	110	35.0	50.0	15.0	2.8	19.5	10.7	6.2	3.9	3.2	13.2	7.3
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	20	30	20	25	12	46	31	27	11.0	<5	15.0	12.0	<5	<5	<5	<5	<5	6.2
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	18	23	27	21	20	35	23	21	22.0	8.7	8.4	<5	5.5	5.3	<5	<5	8.3	9.1
Nutrients																					
Ammonia as N	µg/L	5	13	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	110	60.0	200	420	310	200	450	370	150	210	130	60.0	70.0	180	40.0	60.0	110	190
Nitrogen (Total)	µg/L	10	250	120	210	210	540	350	270	550	590	190	220	140	60.0	70.0	180	40.0	60.0	110	190
Reactive Phosphorus	µg/L	1	15	5.0	4.0	4.0	4.0	4.0	5.0	5.0	4.0	4.0	2.0	3.0	6.0	5.0	4.0	4.0	3.0	3.0	4.0
Phosphorus (Total)	µg/L	5	20	38.0	34.0	<5	6.0	60.0	13.0	<5	<5	11.0	23.0	10.0	7.0	6.0	51.0	<5	12.0	19.0	14.0
Inorganics																					
Cyanide Total	µg/L	4	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons																					
Oil and Grease	mg/L	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Metals																					
Aluminium (dissolved)	µg/L	5.0	27	6.0	<5	9.0	12.0	330	47.0	100	12.0	240	44.0	26.0	45.0	34.0	59.0	23.0	27.0	130	22.0
Arsenic (dissolved)	µg/L	1.0	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1.0	0.01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	1.0	1	<1	2.0	<1	2.0	2.0	3.0	<1	3.0	4.0	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	50.0	300	<50	<50	<50	<50	370	60.0	100	<50	220	<50	<50	<50	<50	<50	<50	<50	230	80.0
Lead (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	2.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5.0	1,200	<5	<5	<5	<5	77.0	<5	<5	<5	7.0	19.0	<5	<5	<5	<5	<5	<5	6.0	<5
Nickel (dissolved)	µg/L	1.0	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5.0	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5.0	2.4	<5	<5	<5	<5	<5	6.0	<5	<5	15.0	<5	<5	<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: 05 - 21 August 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate											
Inflow#	**ML/day**			-	-	1.7297	0.0509	0.1134	0.0585	0.5475	-
Outflow#	**ML/day**		4.32 (EPL 43 / 50)	-	0.3523	-	-	-	-	-	0.0036
Field											
pH	**pH Unit**	-	6.5-8.5	9.35	-	-	-	-	-	-	6.29
Electrical Conductivity	**µS/cm**	-	700 (EPL 41) / 200 (EPL 50)	657	-	-	-	-	-	-	6.6
Oxidation Reduction Potential	**mV**	-	No Water Quality Objective Value	215	-	-	-	-	-	-	277.5
Temperature	**°C**	-	15	18.51	-	-	-	-	-	-	10.4
Dissolved Oxygen	**% saturation**	-	No Water Quality Objective Value	113.4	-	-	-	-	-	-	61.1
Turbidity	**NTU**	-	<25	1.7	-	-	-	-	-	-	0.59
Laboratory analytes											
Total suspended solids	**mg/L**	5	5/10	5.8	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	**mg/L**	1	No Water Quality Objective Value	7.3	-	-	-	-	-	-	<5
Nutrients											
Ammonia as N	**mg/L**	5	0.2/2^	0.37	-	-	-	-	-	-	<0.005
Kjeldahl Nitrogen Total	**mg/L**	10	No Water Quality Objective Value	0.81	-	-	-	-	-	-	5
Nitrogen (Total)	**µg/L**	10	350	810	-	-	-	-	-	-	5000
Reactive Phosphorus	**µg/L**	1	No Water Quality Objective Value	22	-	-	-	-	-	-	2
Phosphorus (Total)	**mg/L**	5	0.1/0.3^	0.02	-	-	-	-	-	-	<0.005
Inorganics											
Cyanide Total	**µg/L**	4	No Water Quality Objective Value	5	-	-	-	-	-	-	<4
Hydrocarbons											
Oil and Grease	**mg/L**	5	2/5^	<5	-	-	-	-	-	-	<5
Metals											
Aluminium (dissolved)	**µg/L**	5	55	1500	-	-	-	-	-	-	<5
Arsenic (dissolved)	**µg/L**	0.2	13	<1	-	-	-	-	-	-	<1
Chromium (III+VI) (dissolved)	**µg/L**	0.2	1	100	-	-	-	-	-	-	<1
Copper (dissolved)	**µg/L**	0.5	14	3	-	-	-	-	-	-	<1
Iron (dissolved)	**µg/L**	2	300	60	-	-	-	-	-	-	<50
Lead (dissolved)	**µg/L**	0.1	3.4	<1	-	-	-	-	-	-	<1
Manganese (dissolved)	**µg/L**	0.5	1,900	<5	-	-	-	-	-	-	<5
Nickel (dissolved)	**µg/L**	0.5	11	<1	-	-	-	-	-	-	<1
Silver (dissolved)	**µg/L**	0.01	0.05	<5	-	-	-	-	-	-	<5
Zinc (dissolved)	**µg/L**	1	8	<5	-	-	-	-	-	-	<5
Biological											
Faecal Coliforms	**CFU/100mL**	1	10/100^	<1	-	-	-	-	-	-	<1
Biological Oxygen Demand	**mg/L**		5	<5	-	-	-	-	-	-	<10

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: 5 - 24 September 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, 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 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.

Sampling in Septmeber was undertaken following rainfall events when sampling for EPL 10 and 11.
Exceedances at Rock Forest, Lobs Hole, Marica and Tantangara are generally consistent upstream and downstream of the project with the exception of phosphorus, oil and grease and a number of sampling locations. No visible indicators of oil and grease were observed during sampling. Further investigation is being carried out to determine the source of these exceedances.

Due to a complication with the laboratory, BOD is unavailable for EPL 10, 11 and 41.

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 2.0 Main Works

Monthly EPL Sampling: 5 - 24 September 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
Field												
pH	pH Unit	-	6.5-8	7.6	7.9	6.05	6.37	6.12	6.98	6.14	6.01	6.27
Electrical Conductivity	µS/cm	-	20-30	53	72	11.7	10.4	10.2	11.5	9.6	10.9	10.3
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	194	178	300.3	271	279.5	282.5	192.6	278.6	265.5
Temperature	°C	-	No Water Quality Objective Value	12.31	12.57	7.8	7.8	7.8	7.7	7.2	7.2	7.7
Dissolved Oxygen	% saturation	-	90-110	79.4	90.6	84.6	82	91.3	83.9	90.6	86.6	85.1
Turbidity	NTU	-	1-20	0	2.2	4.2	3.4	2.95	3.18	9	4.27	3.34
Laboratory analytes												
Total suspended solids	mg/L	5	No Water Quality Objective Value	< 5	< 5	<5	<5	<5	<5	5.3	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	21.00	21.00	<5	<5	5	5.6	5	6.4	5.5
Nutrients												
Ammonia as N	µg/L	5	10	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	220	330	90	160	160	60	50	60	40
Nitrogen (Total)	µg/L	10	350	210	320	90	160	440	60	50	60.0	40
Reactive Phosphorus	µg/L	1	5	1.0	<1	<1	<1	<1	<1	7	<1	<1
Phosphorus (Total)	µg/L	5	10	<5	6.00	9.0	16.0	<5	100.0	15	<5	44
Inorganics												
Cyanide Total	µg/L	4	7	<4	<4	<4	<4	5.00	<4	<4	<4	4
Hydrocarbons												
Oil and Grease	mg/L	5	5	28	17	<5	51	60	<5	<5	<5	<5
Metals												
Aluminium (dissolved)	µg/L	5	55	6.00	8.0	14	15	17	60	21	40	50
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	0.2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	0.5	14	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	2	300	<50	<50	<50	<50	<50	70	80	70	60
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	10.0	10.0	<5	<5	<5	<5	<5	<5	6
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	<2	<1	<1	-	-	-	-	-	<1
Biochemical Oxygen Demand	mg/L	2	1/5^	-	-	<10	-	-	-	-	-	<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: 05 - 24 September 2022- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	7.6	8.03	8.03	7.73	7.86	7.9	7.92	7.7	7.6	7.3	7.8	6.5	6.5	7.0	6.4	6.5	6.7	6.4
Electrical Conductivity	µS/cm	-	30-350	65.0	83.0	83.0	75.0	67.0	78.0	70.0	75.0	62.0	17.7	19.3	14.2	13.5	10.1	9.1	8.2	25.2	22.0
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	152	170	170	-37	155	210	189	155.0	96.0	65.5	55.4	239.9	245.7	250.3	233.5	241.6	195.0	215.3
Temperature	°C	-	No Water Quality Objective Value	10.65	10.78	10.78	6.98	10.58	10.17	10.58	7.0	8.2	8.3	8.3	9.4	9.5	7.9	8.1	8.0	9.4	9.5
Dissolved Oxygen	% saturation	-	90-110	118.4	105.4	122.6	120.9	125.6	127.7	118.8	120.9	129.6	83.3	81.4	75.1	78.6	73.6	78.7	73.5	82.6	89.7
Turbidity	NTU	-	2-25	1.5	1.4	50	1.1	0.9	1.1	0.8	1.1	3.9	5.3	6.1	12.3	8.2	3.9	4.3	5.2	3.8	5.7
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	< 5	< 5	< 5	< 5	< 5	360	< 5	< 5	< 5	<5	<5	7.9	8.9	<5	<5	<5	<5	5.5
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	28	38	39	31	28	32	31	31	26.0	10	9.9	8.2	6.6	5.5	<5	<5	9.6	12
Nutrients																					
Ammonia as N	µg/L	5	13	20	21	35	11	24	13	<5	16	20	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	100	610	160	<10	420	170	390	270	170	70	60	<10	30.0	30	50.0	70.0	<10	460
Nitrogen (Total)	µg/L	10	250	3000	620	160	2200	430	170	400	270	170	70	60	70	30	30	50	110	440	550
Reactive Phosphorus	µg/L	1	15	<1	<1	4	3	3	5	3	3	9	<1	<1	<1	<1	<1	3	<1	<1	<1
Phosphorus (Total)	µg/L	5	20	15	13	10	19	15	16	14	12	25	<5	13	14	18	17	27	11	21	25
Inorganics																					
Cyanide Total	µg/L	4	4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	5.0	<4	<4	<4	<4	<4	<4
Hydrocarbons																					
Oil and Grease	mg/L	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Metals																					
Aluminium (dissolved)	µg/L	5.0	27	7.0	14.0	7.0	<5	8	26.0	9	6.0	8	15	<5	45	38	40	27	35	54	64
Arsenic (dissolved)	µg/L	1.0	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1.0	0.01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	1.0	1	<1	<1	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1
Iron (dissolved)	µg/L	50.0	300	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	80	60	60	70	80	280	260
Lead (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5.0	1,200	<5	<5	<5	24.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	13	14
Nickel (dissolved)	µg/L	1.0	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5.0	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5.0	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<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: 05 - 24 September 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate											
Inflow#	**ML/day**			-	-	0.2290	0.0650	0.1004	0.0571	0.0233	-
Outflow#	**ML/day**		4.32 (EPL 43 / 50)	-	0.5310	-	-	-	-	-	-
Field											
pH	**pH Unit**	-	6.5-8.5	9.05	-	-	-	-	-	-	7.2
Electrical Conductivity	**µS/cm**	-	700 (EPL 41) / 200 (EPL 50)	199	-	-	-	-	-	-	6
Oxidation Reduction Potential	**mV**	-	No Water Quality Objective Value	130	-	-	-	-	-	-	172.9
Temperature	**°C**	-	15	13.85	-	-	-	-	-	-	8.3
Dissolved Oxygen	**% saturation**	-	No Water Quality Objective Value	24.5	-	-	-	-	-	-	72.6
Turbidity	**NTU**	-	<25	21.6	-	-	-	-	-	-	0.3
Laboratory analytes											
Total suspended solids	**mg/L**	5	5/10	6.7	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	**mg/L**	1	No Water Quality Objective Value	13	-	-	-	-	-	-	<5
Nutrients											
Ammonia as N	**mg/L**	0.005	0.2/2^	<0.005	-	-	-	-	-	-	<0.005
Kjeldahl Nitrogen Total	**mg/L**	0.010	No Water Quality Objective Value	0.35	-	-	-	-	-	-	<0.010
Nitrogen (Total)	**mg/L**	0.010	350	0.31	-	-	-	-	-	-	0.25
Reactive Phosphorus	**mg/L**	0.001	No Water Quality Objective Value	0.024	-	-	-	-	-	-	<0.001
Phosphorus (Total)	**mg/L**	0.005	0.1/0.3^	0.066	-	-	-	-	-	-	<0.005
Inorganics											
Cyanide Total	**µg/L**	4	No Water Quality Objective Value	8	-	-	-	-	-	-	<4
Hydrocarbons											
Oil and Grease	**mg/L**	5	2/5^	15	-	-	-	-	-	-	<5
Metals											
Aluminium (dissolved)	**µg/L**	5	55	3900	-	-	-	-	-	-	<5
Arsenic (dissolved)	**µg/L**	0.2	13	5	-	-	-	-	-	-	<1
Chromium (III+VI) (dissolved)	**µg/L**	0.2	1	400	-	-	-	-	-	-	<1
Copper (dissolved)	**µg/L**	0.5	14	6	-	-	-	-	-	-	<1
Iron (dissolved)	**µg/L**	2	300	830	-	-	-	-	-	-	<50
Lead (dissolved)	**µg/L**	0.1	3.4	<1	-	-	-	-	-	-	<1
Manganese (dissolved)	**µg/L**	0.5	1,900	49	-	-	-	-	-	-	<5
Nickel (dissolved)	**µg/L**	0.5	11	<1	-	-	-	-	-	-	<1
Silver (dissolved)	**µg/L**	0.01	0.05	<5	-	-	-	-	-	-	<5
Zinc (dissolved)	**µg/L**	1	8	<5	-	-	-	-	-	-	<5
Biological											
Faecal Coliforms	**CFU/100mL**	1	10/100^	<1	-	-	-	-	-	-	<1
Biological Oxygen Demand	**mg/L**	2	1/5^	-	-	-	-	-	-	-	<5

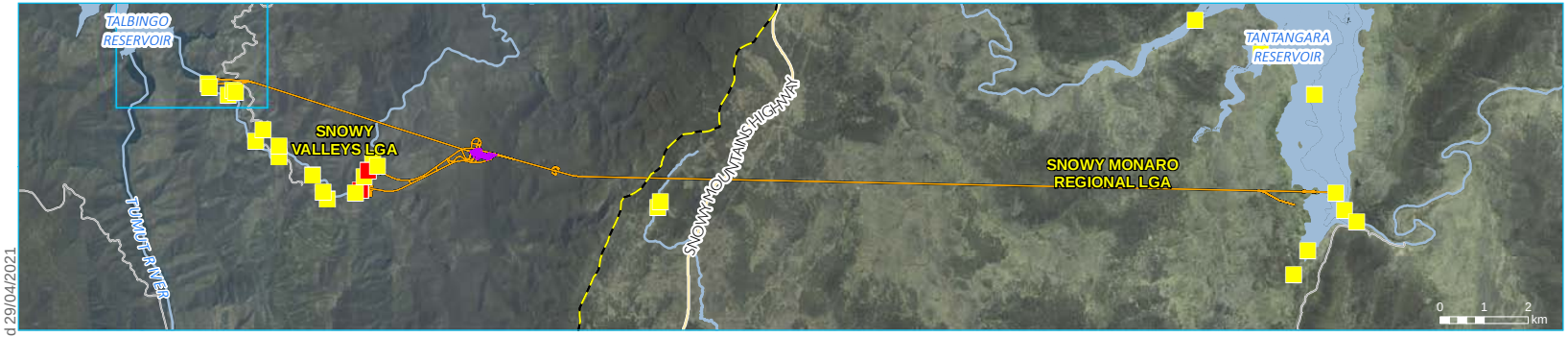
Note: Treated water was not being discharged at Talbingo and Tantangara Reservoirs at the time of EPL sampling

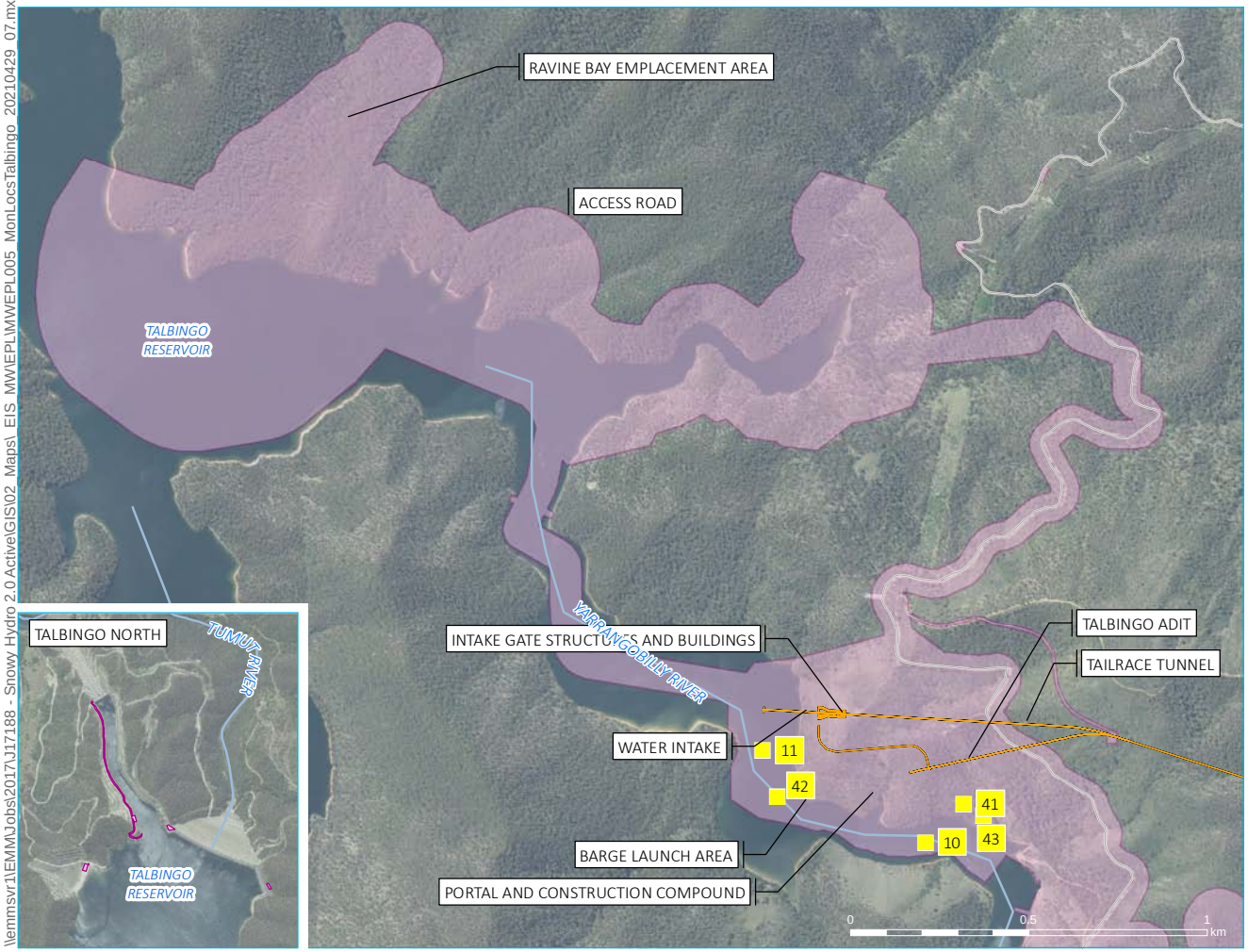
* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

\- 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





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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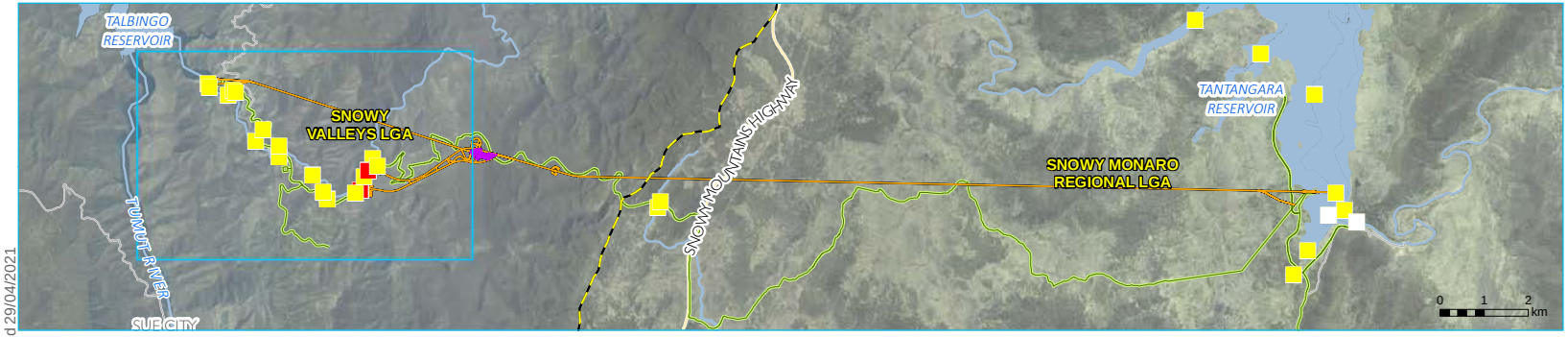

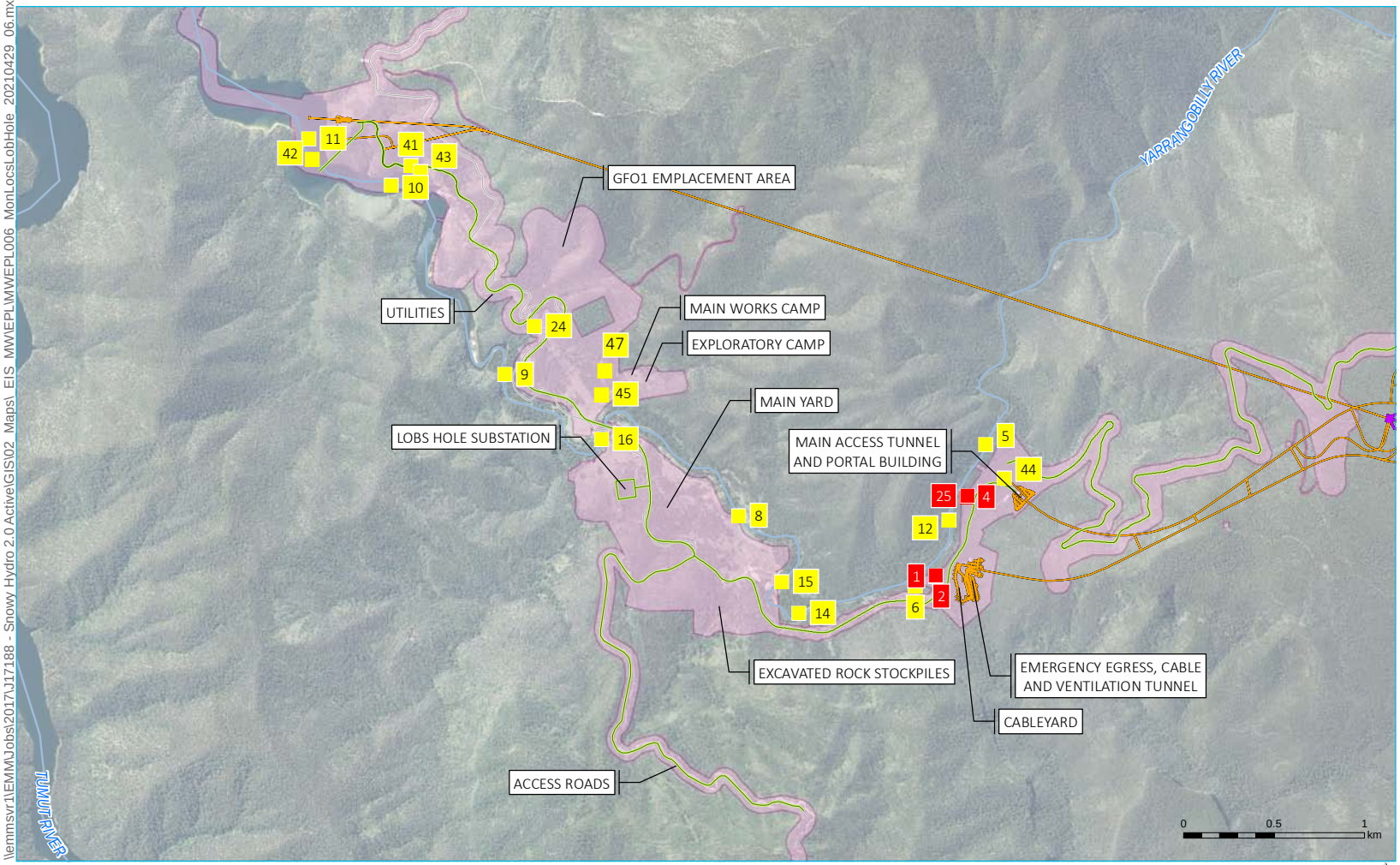

KEY

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 - Lobs Hole

Snowy 2.0
Main Works
Figure 2

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

GDA 1994 MGA Zone 55

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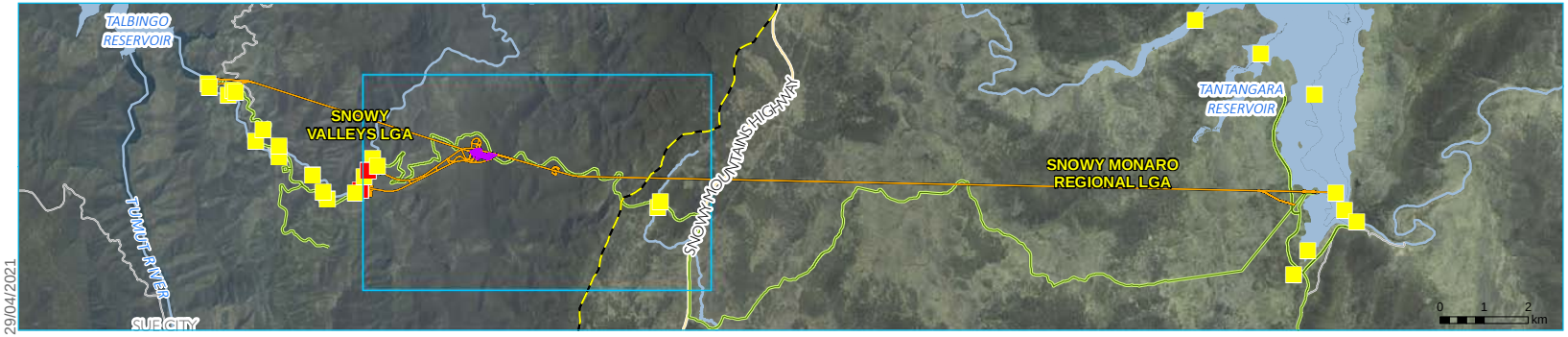

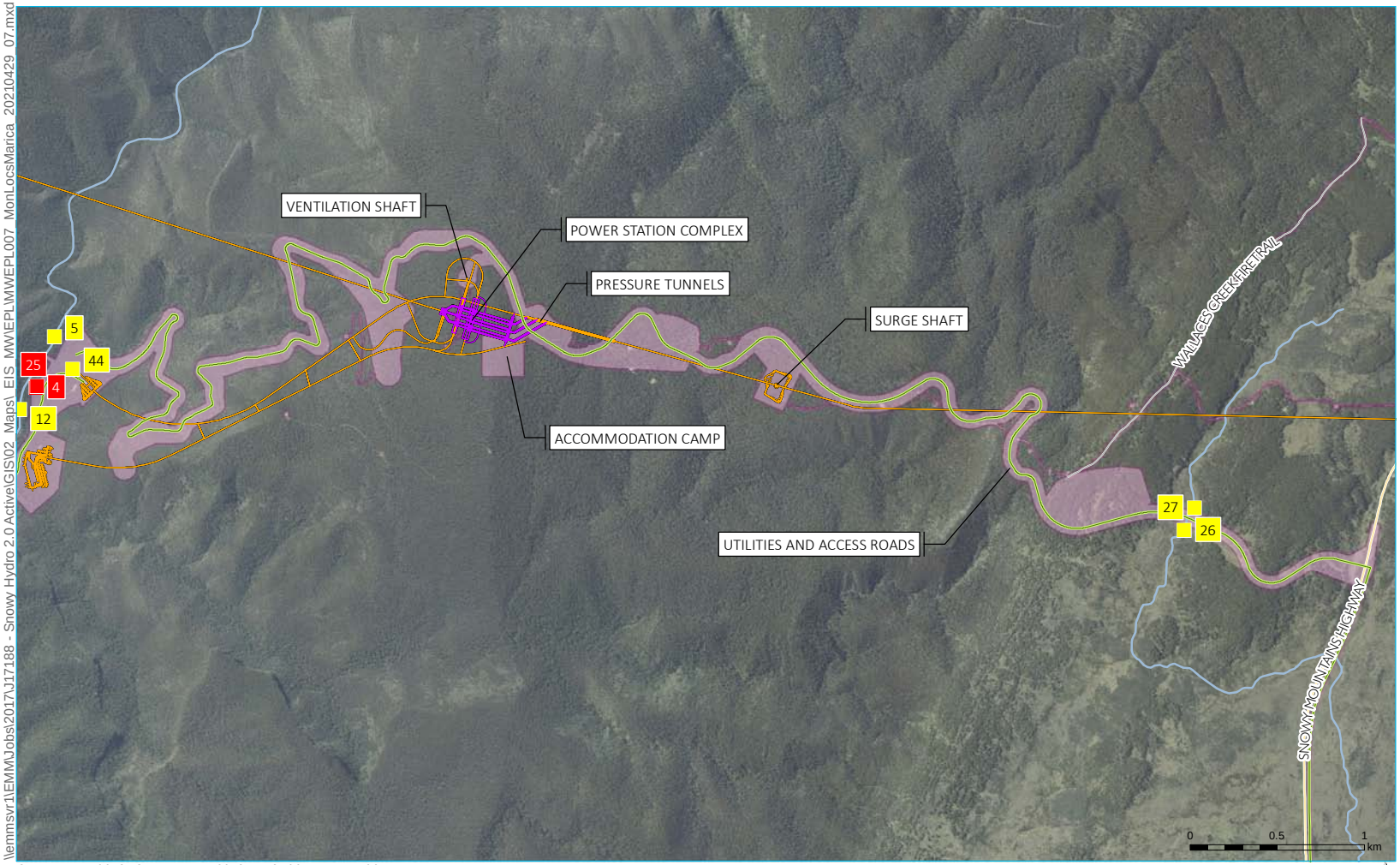

KEY

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 - Marica

Snowy 2.0
Main Works
Figure 3

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

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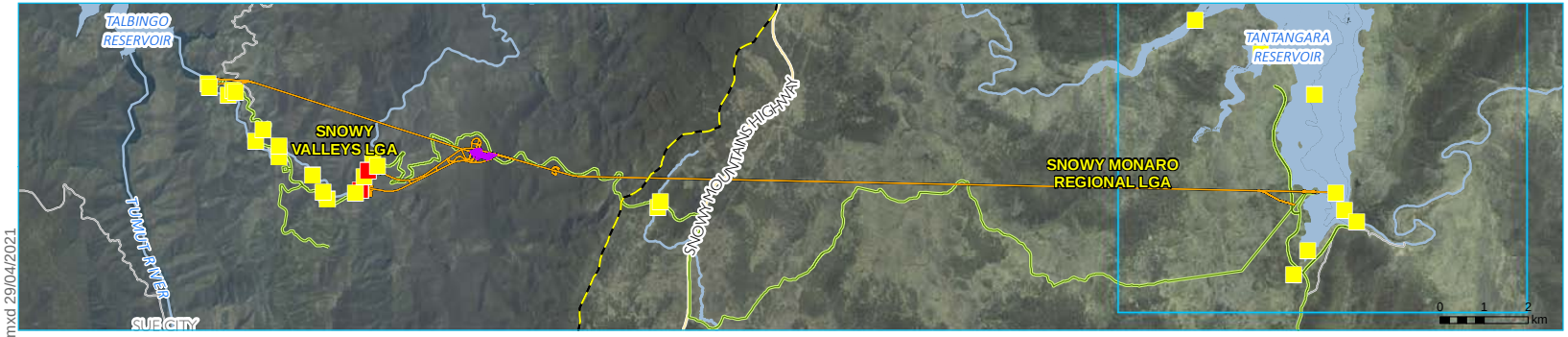

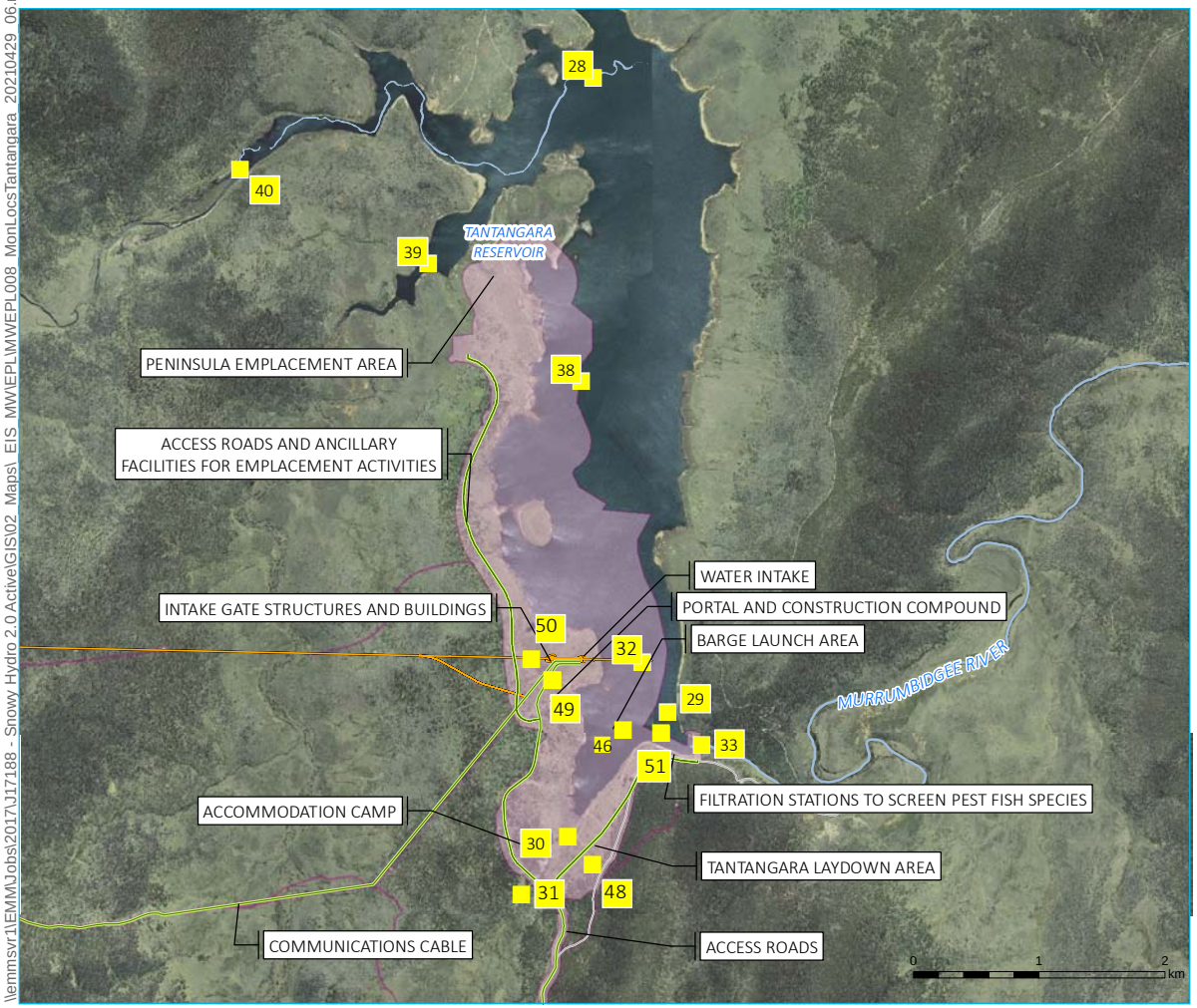

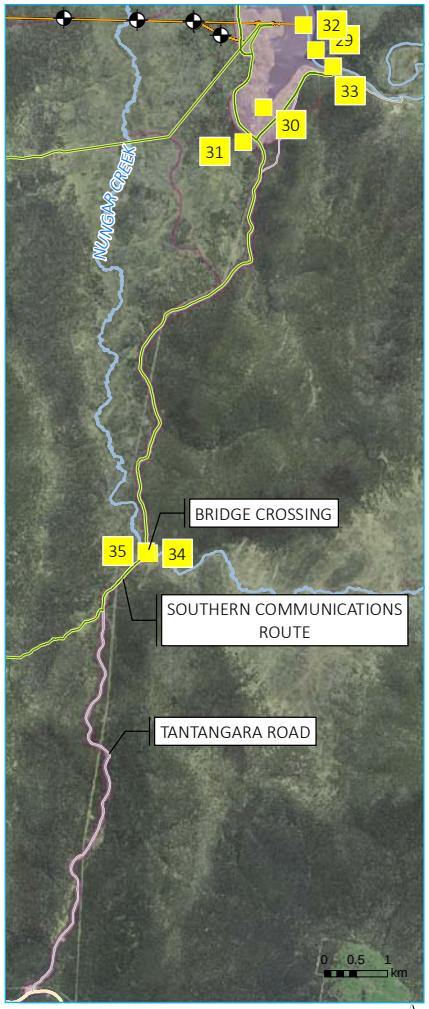

KEY

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

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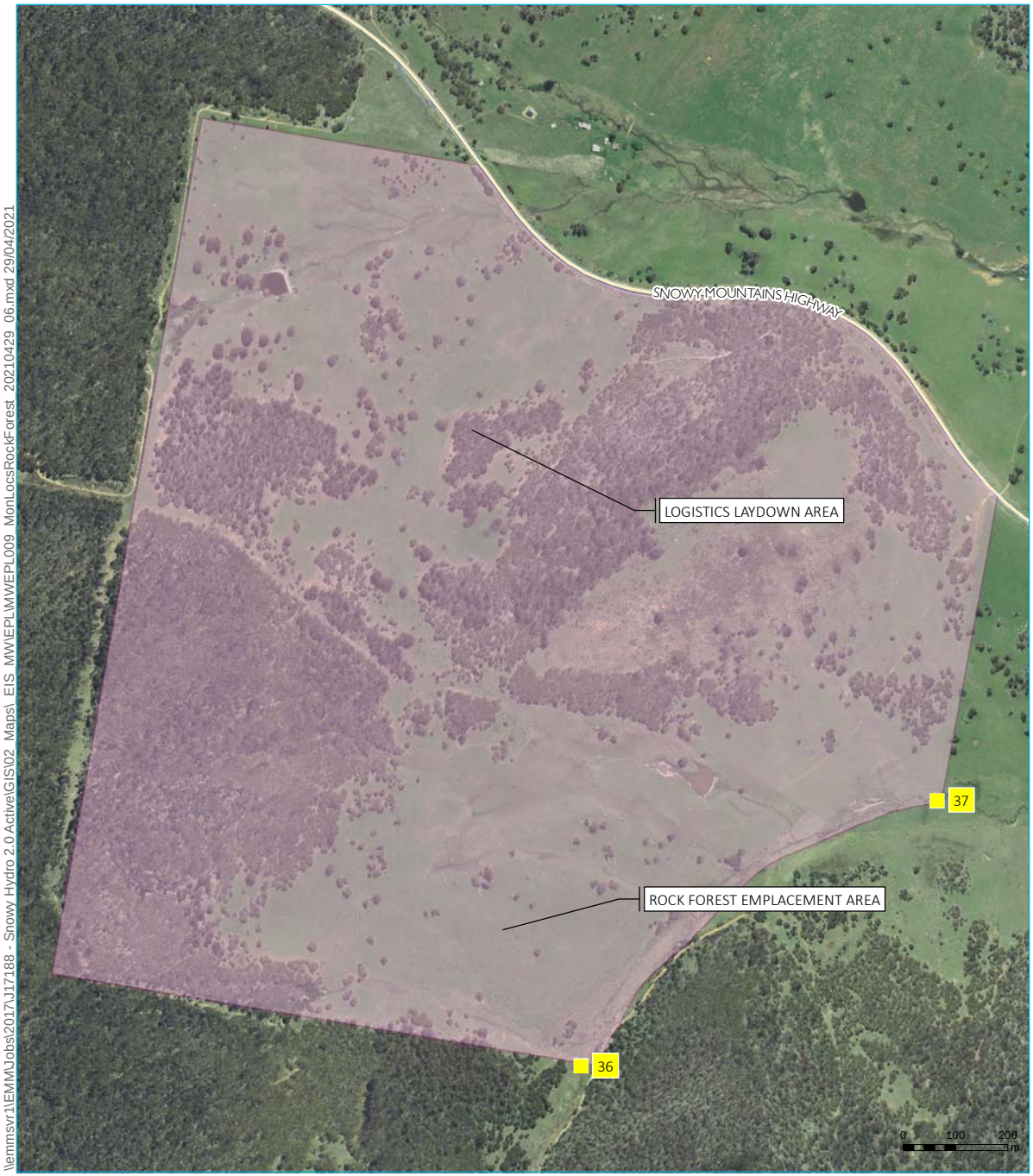

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KEY

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

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

GDA 1994 MGA Zone 55

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snowy 2.0

EMM creating opportunities

Snowy Hydro 2.0 Main Works EPL Sampling: 1 - 30 October 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, 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.

Exceedances at Rock Forest, Lobs Hole and Tantangara are generally consistent with baseline data with the exception of select analytes at a number of sampling locations. Surface water exceedances for metals (aluminium and copper) are consistent with baseline concentrations as identified in the SWMP. Oil & Grease concentrations at EPL 30 and EPL 34 only marginally exceeded the WQOs, with more significant exceedances at the two Rock Forest EPL locations (EP L36 and EPL 37). These exceedances are likely attributed to off-site agricultural activities as the upstream location (EPL 36) has no input from Rock Forest. The oil and grease exceedances that are consistent accross Tantangara and Talbingo Reserviors could pertain to error during the sampling process. Further investigation will be undertaken to determine the source of these exceedances. Phosphorous concentrations at EPL 16 and EPL 30 are marginally exceeding the WQO with EPL 14 and EPL 35 showing more significant exceedances. These could be a result of run-off derived from soil or plant materials. The EPL 9 total cyanide exceedance is likely a result of human error during the sampling process as it was the only exceedance accross the project EPL locations. Further investigation is being carried out to determine the source of this exceedance.

Dissolved oxygen (mg/L) and redox (mV) results are not available for EPL 10, EPL 11 and EPL 41 due to water quality meter error.
Due to issues with the laboratory and malfunction of the water monitoring equipment, Marica EPL sampling was not completed in October 2022 (EPL 26 and EPL 27).

No discharge of treated water to Tantangara or Talbingo Reservoirs was occuring at the time of sampling.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 1 - 30 October 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL51
Field												
pH	pH Unit	-	6.5-8	7.8	7.8	6.0	6.1	6.3	6.1	6.0	5.9	6.1
Electrical Conductivity	µS/cm	-	20-30	56.2	55.4	11.0	11.1	11.1	12.1	9.9	10.7	11.2
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value			216.4	261.7	253.9	269.5	237.5	227.9	261.4
Temperature	°C	-	No Water Quality Objective Value	17.6	17.2	9.5	9.3	9.5	9.3	8.8	8.3	9.4
Dissolved Oxygen	% saturation	-	90-110	108.7	107.1	110.9	92.3	92.7	93.5	91.0	96.5	92.4
Turbidity	NTU	-	1-20	2.7	2.8	3.8	3.1	3.2	3.0	2.6	2.6	3.8
Laboratory analytes												
Total suspended solids	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	19.0	26.0	<5	6.0	6.0	5.9	4.8	6.1	<5
Nutrients												
Ammonia as N	µg/L	5	10	<5	<5	<5	25.0	<5	<5	<5	25.0	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	100.0	50.0	100.0	130.0	100.0	90.0	100.0	80.0	120.0
Nitrogen (Total)	µg/L	10	350	100.0	50.0	100.0	130.0	100.0	90.0	100.0	80.0	160.0
Reactive Phosphorus	µg/L	1	5	20.0	2.0	1.0	2.0	3.0	2.0	3.0	3.0	<1
Phosphorus (Total)	µg/L	5	10	6.0	<5	19.0	20.0	91.0	15.0	14.0	37.0	11.0
Inorganics												
Cyanide Total	µg/L	4	7	<4	4.0	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons												
Oil and Grease	mg/L	5	5	25.0	53.0	12.0	11.0	11.0	15.0	8.6	11.0	9.7
Metals												
Aluminium (dissolved)	µg/L	5	55	17.0	14.0	53.0	47.0	62.0	46.0	59.0	21.0	45.0
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	0.2	1	1.0	<1	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	0.5	14	<1	3.0	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	2	300	<50	<50	70.0	60.0	80.0	60.0	70.0	<50	60.0
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	7.0	<5	<5	<5	<5	<5	<5	<5	<5
Biological												
Faecal Coliforms	CFU/100mL	1	10/100^	<1	<1	<1	-	-	-	-	-	<1
Biochemical Oxygen Demand	mg/L	2	1/5^	<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 October 2022- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	6.9	7.6	7.5	7.8	7.5	7.6	7.6	7.5	7.3	-	-	6.4	6.0	5.9	5.9	5.9	8.2	6.4
Electrical Conductivity	µS/cm	-	30-350	54.0	77.0	81.0	66.0	59.0	80.0	66.0	66.0	57.0	-	-	12.5	10.7	10.8	7.9	7.9	22.5	20.6
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	97	128	170	134	71	153	160	176.0	127.0	-	-	218.1	245.3	248.5	227.8	229.2	88.8	214.2
Temperature	°C	-	No Water Quality Objective Value	9.5	8.9	10.9	13.1	11.0	9.5	10.4	11.0	16.6	-	-	10.2	9.9	9.1	8.6	8.5	9.5	10.2
Dissolved Oxygen	% saturation	-	90-110	85.7	91.5	90.1	62.7	92.7	87.6	92.6	87.1	64.9	-	-	83.8	90.6	89.5	85.7	92.5	106.4	89.8
Turbidity	NTU	-	2-25	8	9	7	7	6	6	7.5	6.0	6.0	-	-	5.5	4.2	3.7	3.6	3.8	4.6	5.2
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<5	<5	<5	<5
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	27.0	38.0	39.0	36.0	30.0	42.0	33.0	34.0	27.0	-	-	6.4	6.0	6.1	4.2	4.2	12.0	12.0
Nutrients																					
Ammonia as N	µg/L	5	13	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	140.0	60.0	50.0	40.0	40.0	20.0	100.0	30.0	50.0	-	-	90.0	90.0	100.0	90.0	100.0	80.0	40.0
Nitrogen (Total)	µg/L	10	250	140.0	100.0	50.0	40.0	40.0	20.0	120.0	30.0	50.0	-	-	90.0	90.0	100.0	90.0	100.0	80.0	40.0
Reactive Phosphorus	µg/L	1	15	4.0	5.0	4.0	4.0	4.0	5.0	4.0	8.0	2.0	-	-	3.0	3.0	3.0	2.0	2.0	2.0	3.0
Phosphorus (Total)	µg/L	5	20	<5	<5	8.0	7.0	<5	190.0	<5	23.0	10.0	-	-	24.0	10.0	14.0	11.0	110.0	12.0	18.0
Inorganics																					
Cyanide Total	µg/L	4	4	<4	<4	<4	230.0	<4	<4	<4	<4	<4	-	-	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons																					
Oil and Grease	mg/L	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	5.5	<5	<5	6.1	<5	12.0	29.0
Metals																					
Aluminium (dissolved)	µg/L	5.0	27	44.0	19.0	36.0	36.0	26.0	23.0	26.0	32.0	38.0	-	-	23.0	17.0	44.0	39.0	21.0	35.0	30.0
Arsenic (dissolved)	µg/L	1.0	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1.0	0.01	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	<1	<1
Copper (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	1.0	<1	<1	<1
Iron (dissolved)	µg/L	50.0	300	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	<50	<50	<50	<50	<50	150.0	150.0
Lead (dissolved)	µg/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5.0	1,200	<5	<5	<5	<5	<5	<5	<5	<5	29.0	-	-	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	1.0	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5.0	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5.0	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<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 October 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate											
Inflow#	**ML/day**			-	-	0.8446	0.0422	0.0902	0.0591	0.0632	-
Outflow#	**ML/day**		4.32 (EPL 43 / 50)	-	0.5145	-	-	-	-	-	-
Field											
pH	**pH Unit**	-	6.5-8.5	8.1	-	-	-	-	-	-	6.5
Electrical Conductivity	**µS/cm**	-	700 (EPL 41) / 200 (EPL 50)	346.0	-	-	-	-	-	-	7.3
Oxidation Reduction Potential	**mV**	-	No Water Quality Objective Value	504.0	-	-	-	-	-	-	205.8
Temperature	**°C**	-	15	20.4	-	-	-	-	-	-	10.9
Dissolved Oxygen	**% saturation**	-	No Water Quality Objective Value	107.4	-	-	-	-	-	-	78.8
Turbidity	**NTU**	-	<25	30.2	-	-	-	-	-	-	1.7
Laboratory analytes											
Total suspended solids	**mg/L**	5	5/10	24.0	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	**mg/L**	1	No Water Quality Objective Value	<5	-	-	-	-	-	-	<5
Nutrients											
Ammonia as N	**mg/L**	5	0.2/2^	<5	-	-	-	-	-	-	44.0
Kjeldahl Nitrogen Total	**µg/L**	10	No Water Quality Objective Value	25000.0	-	-	-	-	-	-	130.0
Nitrogen (Total)	**µg/L**	10	350	24000.0	-	-	-	-	-	-	360.0
Reactive Phosphorus	**µg/L**	1	No Water Quality Objective Value	4.0	-	-	-	-	-	-	18.0
Phosphorus (Total)	**mg/L**	5	0.1/0.3^	0.0	-	-	-	-	-	-	0.0
Inorganics											
Cyanide Total	**µg/L**	4	No Water Quality Objective Value	<4	-	-	-	-	-	-	<4
Hydrocarbons											
Oil and Grease	**mg/L**	5	2/5^	13.0	-	-	-	-	-	-	<5
Metals											
Aluminium (dissolved)	**µg/L**	5	55	110.0	-	-	-	-	-	-	<5
Arsenic (dissolved)	**µg/L**	0.2	13	1.0	-	-	-	-	-	-	<1
Chromium (III+VI) (dissolved)	**µg/L**	0.2	1	48.0	-	-	-	-	-	-	<1
Copper (dissolved)	**µg/L**	0.5	14	4.0	-	-	-	-	-	-	<1
Iron (dissolved)	**µg/L**	2	300	50.0	-	-	-	-	-	-	<50
Lead (dissolved)	**µg/L**	0.1	3.4	1.0	-	-	-	-	-	-	<1
Manganese (dissolved)	**µg/L**	0.5	1,900	5.0	-	-	-	-	-	-	<5
Nickel (dissolved)	**µg/L**	0.5	11	1.0	-	-	-	-	-	-	<1
Silver (dissolved)	**µg/L**	0.01	0.05	5.0	-	-	-	-	-	-	<5
Zinc (dissolved)	**µg/L**	1	8	5.0	-	-	-	-	-	-	<5
Biological											
Faecal Coliforms	**CFU/100mL**	1	10/100^	<1	-	-	-	-	-	-	<1
Biological Oxygen Demand	**mg/L**		5	<5	-	-	-	-	-	-	<5

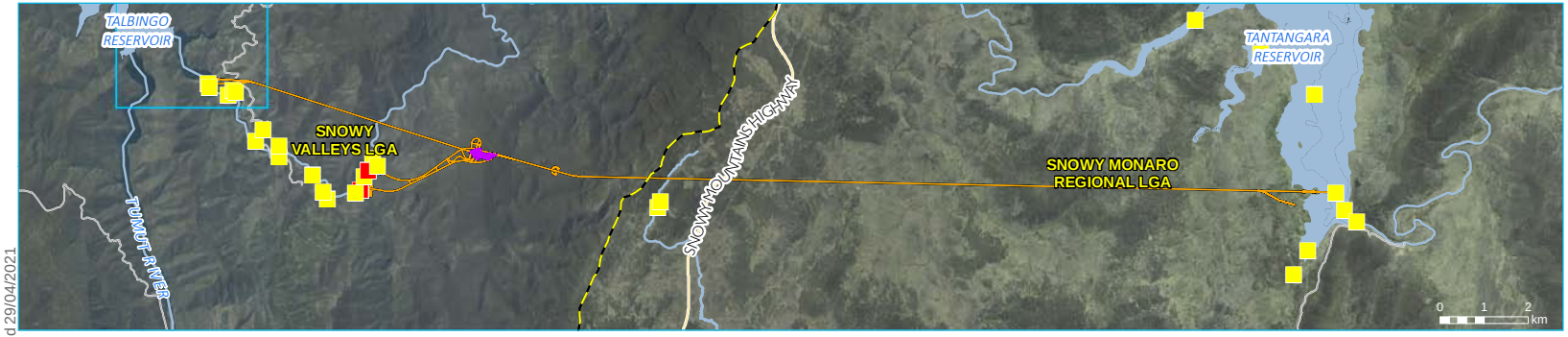
Note: Treated water was not being discharged at Talbingo and Tantangara Reservoirs at the time of EPL sampling

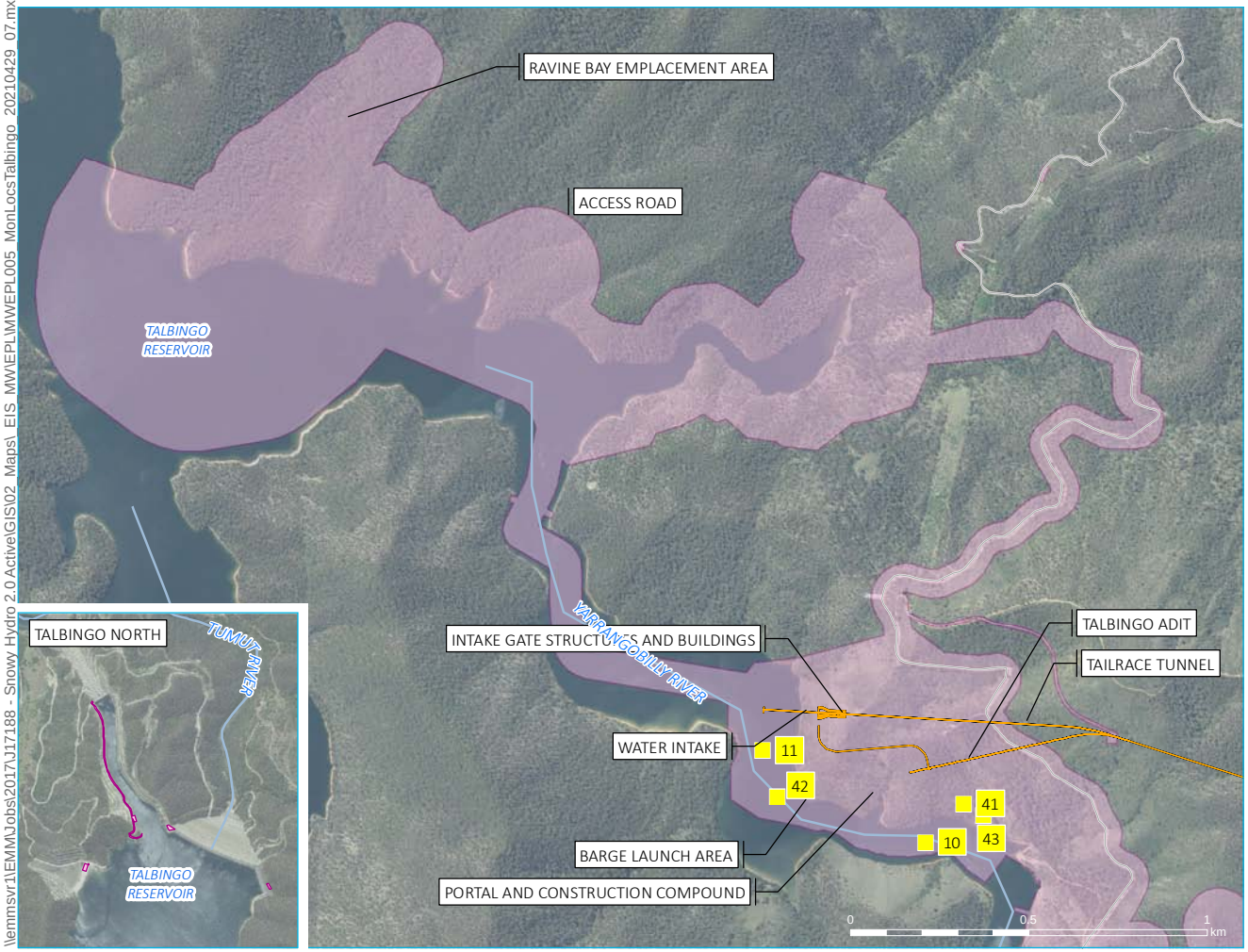
* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

\- 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





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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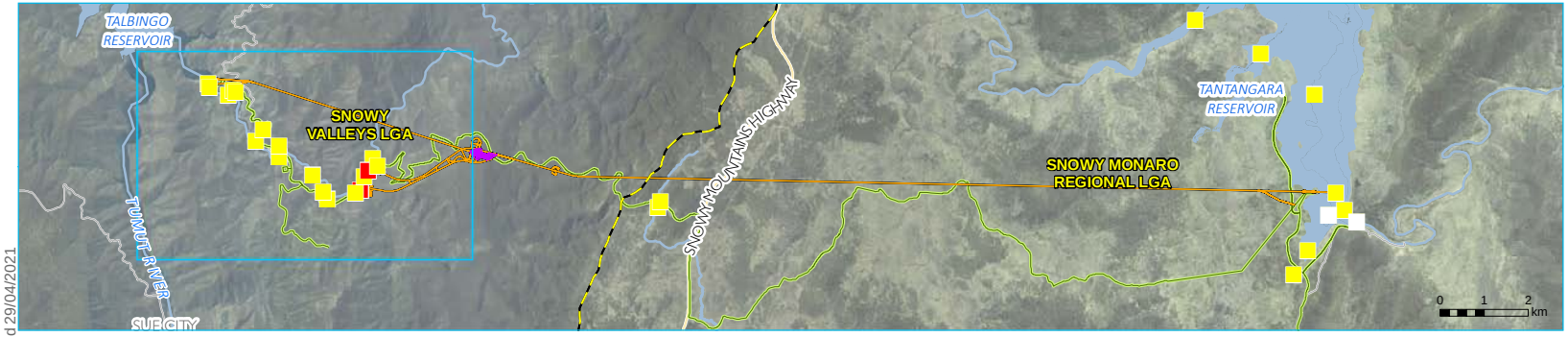

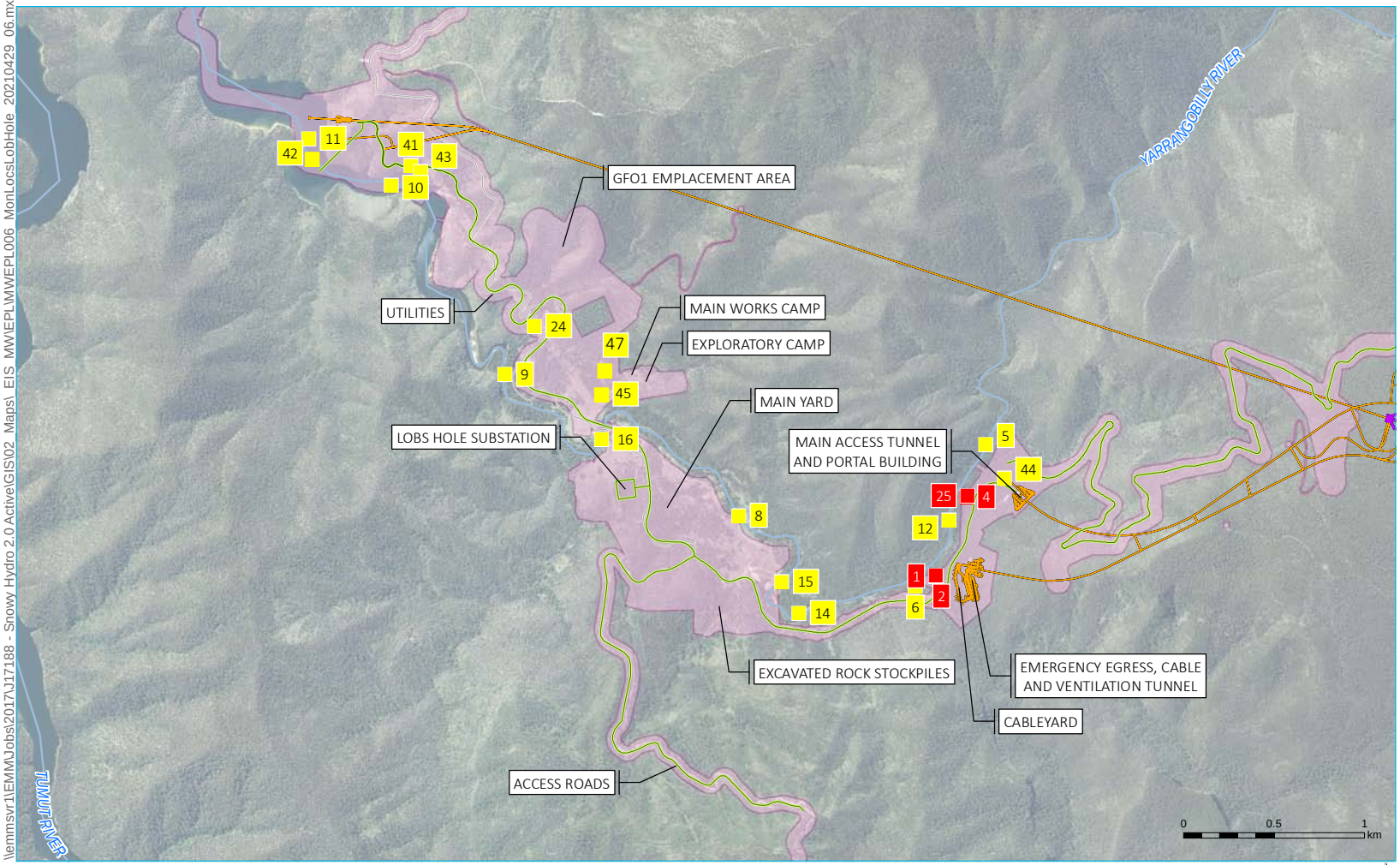

KEY

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 - Lobs Hole

Snowy 2.0
Main Works
Figure 2

\\emmsvr1\EMMJobs\2017\117188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MWEPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021

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

GDA 1994 MGA Zone 55

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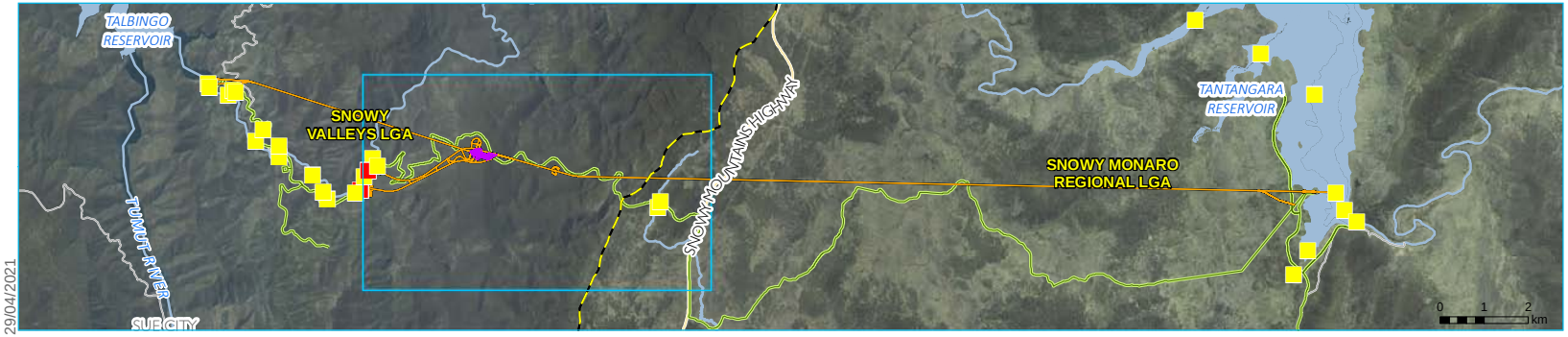

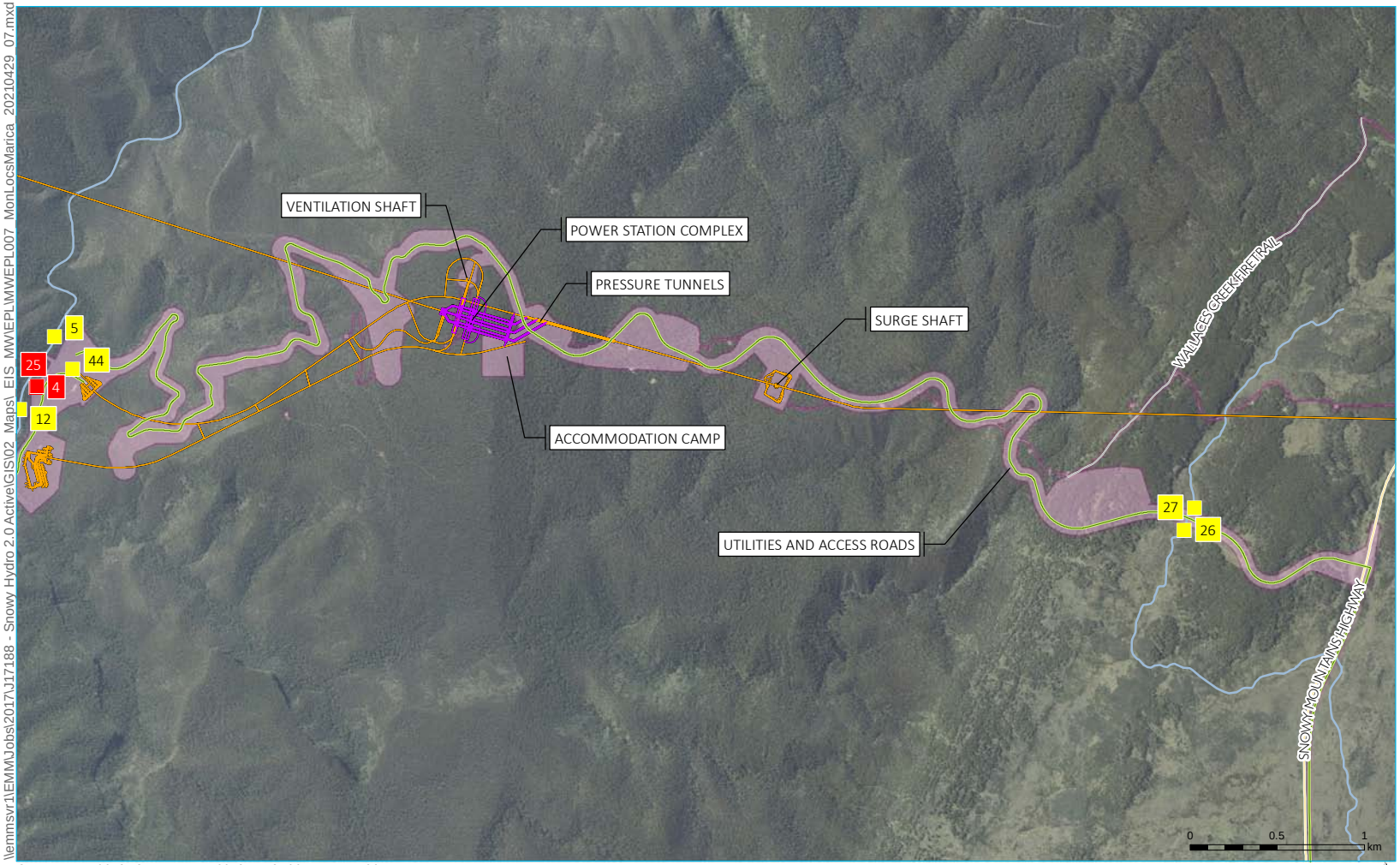

KEY

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 - Marica

Snowy 2.0
Main Works
Figure 3

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

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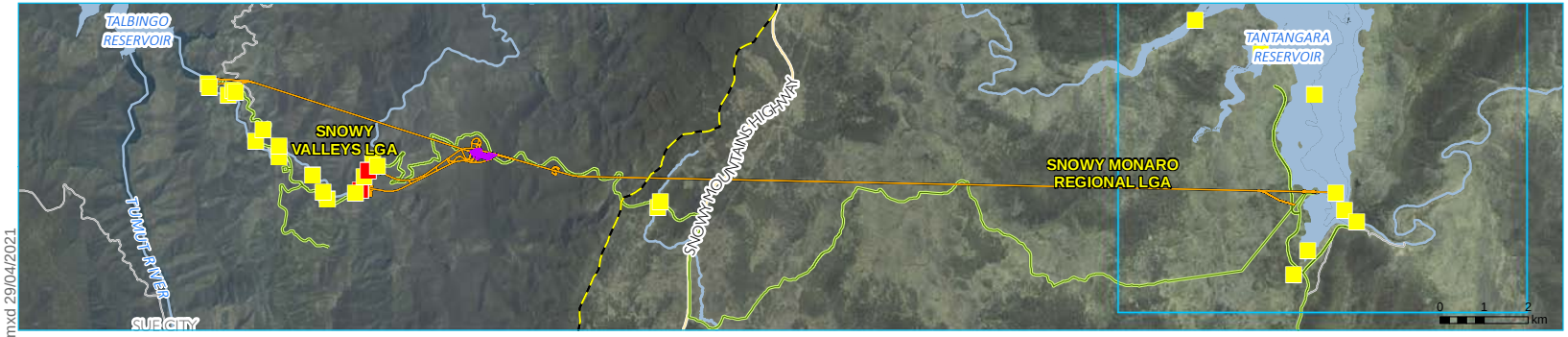

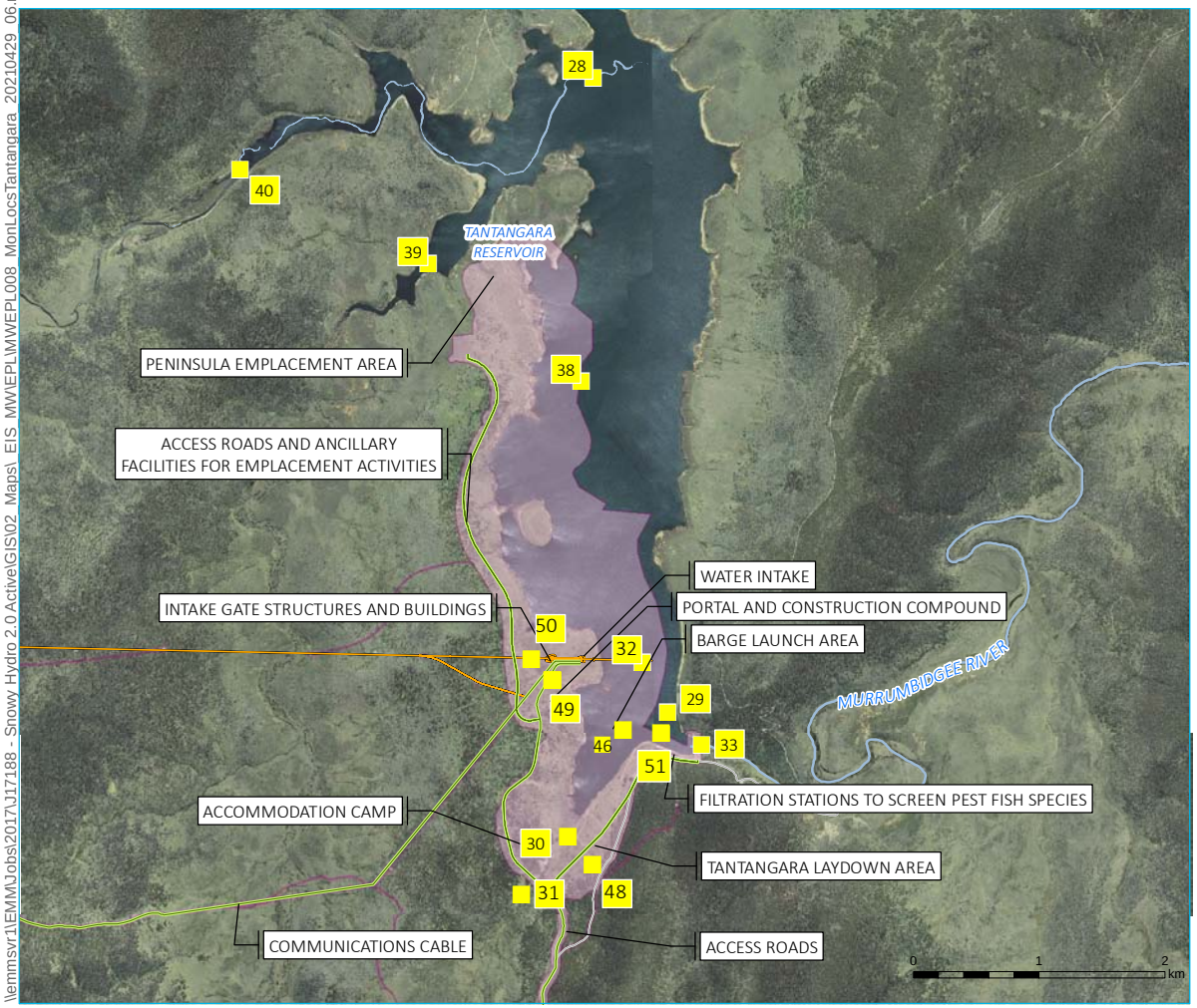

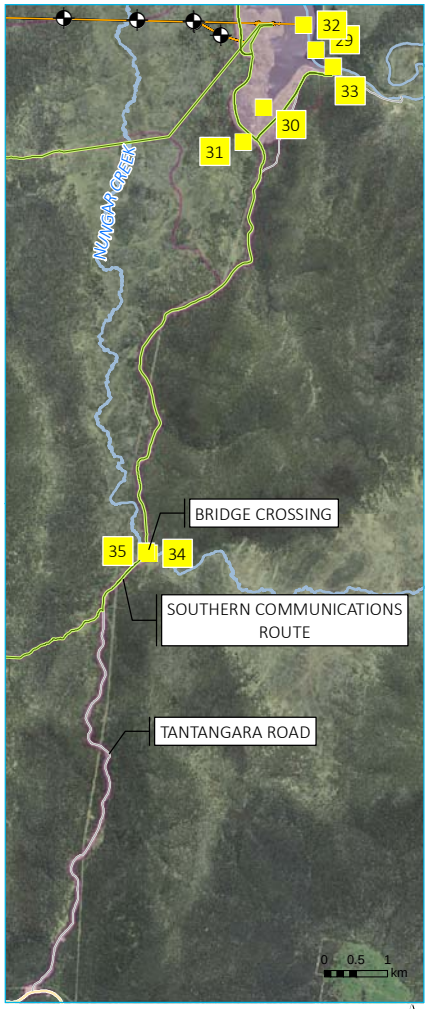

KEY

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

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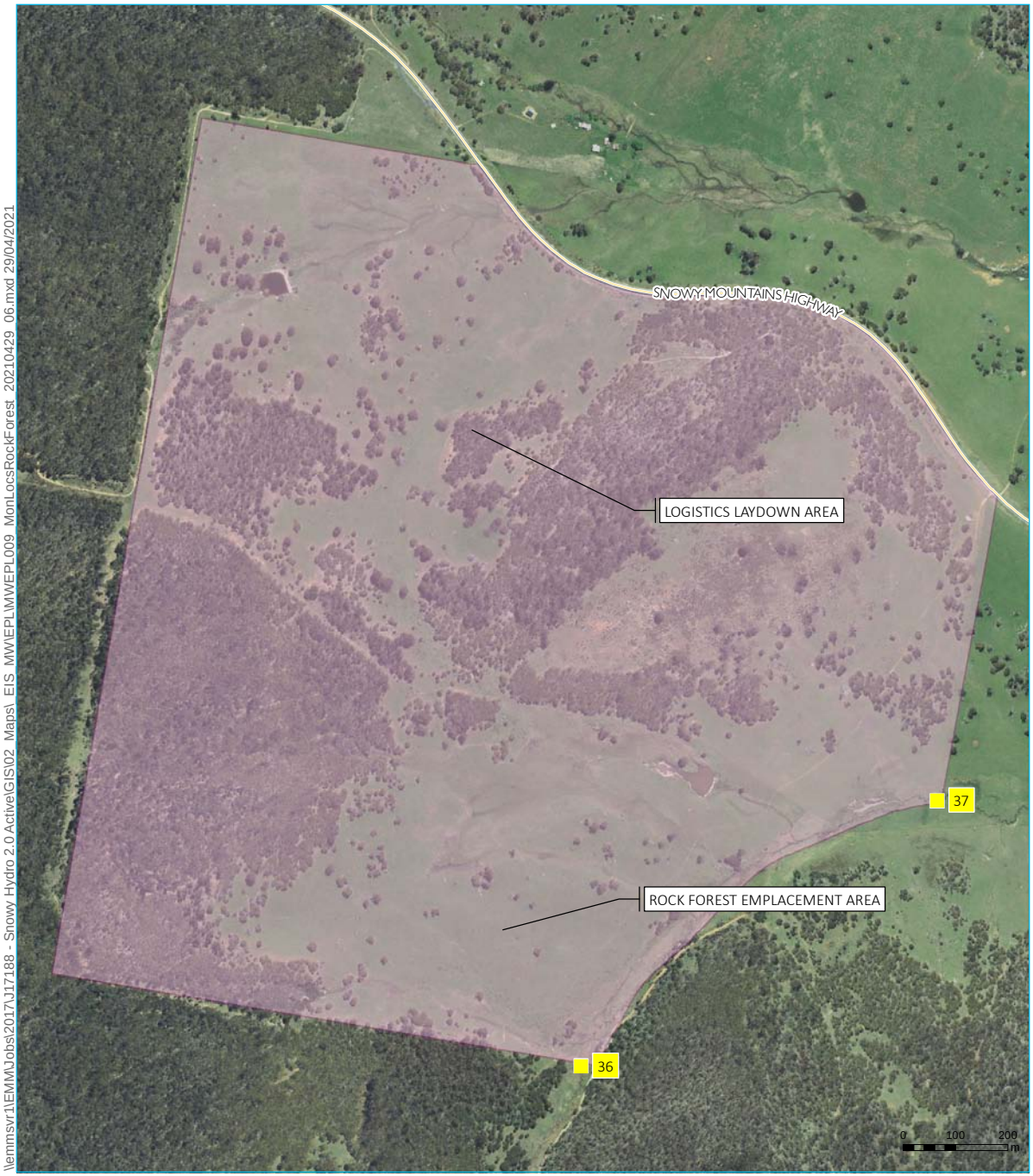

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KEY

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

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

GDA 1994 MGA Zone 55

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snowy 2.0

EMM creating opportunities

Snowy Hydro 2.0 Main Works EPL Sampling: 01 - 30 November 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, 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.

EPL sampling in Lobs Hole was completed on 5/11/2022 and 7/11/2022. EPL26 and EPL27 at Marica were sampled on 9/11/2022 and Tantangara EPL locations were sampled on 12/11/2022.

Exceedances at EPL sites are generally consistent with baseline data with an exception of select analyes at a number of sampling locations. Dissolved oxygen results that failed to reach the WQO occured at Marica and Tantangara only, water quality meter error is belived to be the issue. Oil and grease exceedances occured again at a number of sites in November 2022 and is being investigated further to determine the root cause. Sampling error or external laboratory issues are likely to have contributed to this rather than construction activities due to exceedances occuring accross most EPL locations. Nutrients, particularly ammonia and phosphorus, exceedances are likely attributed to runoff from naturally occuring soil or plant material. The reactive phosphorus exceedance at EPL27 is likey to be attributed to offsite activities as this site is upstream of Marica Road, hence before construction inputs. The exceedances reported at EPL41 (PWTP at Talbingo) are being investigated.

The PWTP was not discharging into Talbingo or Tantangara Resevoir during the time of sampling or from this point until treatment processes had been rectified and WQO achieved.

Groundwater results are generally consistent with previous monitoring rounds. The high iron levels alongside hydrogen sulphide odours could be indicative of the potential for acid mine drainage occurring. Nutrient concentrations that exceeded WQO are likely a result of natural influence.
Due to laboratory error, nitrogen and Kjeldahl is not available for a number of EPL samples.

Snowy Hydro 2.0 Main Works

Monthly EPL Sampling: 11 November 2022 Groundwater

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL1 (RMSB6)	EPL2 (RSMB7)	EPL4 (RSMB9)	EPL25 (RSMB8)
Physiochemical							
pH	**pH Unit**	-	6.5-8	7.72	7.79	7.52	6.64
Electrical Conductivity	**µS/cm**	-	30-350	965	177	999	394
Oxidation Reduction Potential	**mV**	-	No Water Quality Objective Value	-91	-67	-96	-3
Temperature	**°C**	-	No Water Quality Objective Value	19.58	21.97	17.0	18.7
Dissolved Oxygen	**% saturation**	-	No Water Quality Objective Value	19.8	24.5	8.9	20
Turbidity	**NTU**	-	No Water Quality Objective Value	302	621	278	1000
Nutrients							
Nitrogen (Total)	**µg/L**	10	250	1,100	300	600	500
Reactive Phosphorus	**µg/L**	1	15	50	<50	<50	<50
Metals							
Aluminium (dissolved)	**µg/L**	5	27	<5	<5	6	<5
Copper (dissolved)	**µg/L**	0.5	1	<1	<1	<1	<1
Iron (dissolved)	**µg/L**	2	300	310	2,600	740	6,100
Lead (dissolved)	**µg/L**	0.1	1	<1	<1	<1	<1
Manganese (dissolved)	**µg/L**	0.5	1,200	140	180	150	1,300
Nickel (dissolved)	**µg/L**	0.5	8	3	<1	1	13
Silver (dissolved)	**µg/L**	0.01	0.02	<5	<5	<5	<5
Zinc (dissolved)	**µg/L**	1	2.4	<5	<5	<5	21

* 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 November 2022 - Talbingo and Tantangara Reservoir

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL10	EPL11	EPL28	EPL29	EPL32	EPL38	EPL39	EPL40	EPL46	EPL51
Field													
pH	pH Unit	-	6.5-8	7.6	7.9	7.6	7.5	7.5	7.6	6.8	7.3	7.25	7.3
Electrical Conductivity	µS/cm	-	20-30	42	44	16.9	17.9	17.4	16.9	15.5	17.3	17.7	17.8
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	-60	-73	-50	-62.6	-82	-116.5	-6	-31.5	-87	-85.1
Temperature	°C	-	No Water Quality Objective Value	15.82	15.73	15.6	17.6	16.5	15.7	15.4	14.7	16.9	17.3
Dissolved Oxygen	% saturation	-	90-110	99.6	107.5	93.8	92.9	94.9	93.5	90.7	88.3	93.5	95.2
Turbidity	NTU	-	1-20	18.9	48	7	2.3	2	2	2.4	1.7	1.76	2
Laboratory analytes													
Total suspended solids	mg/L	5	No Water Quality Objective Value	9.1	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hardness as $CaCO_3$ (filtered)	mg/L	1	No Water Quality Objective Value	15	20	5.1	8.9	7.4	7.4	6.6	7.6	7.1	<5
Nutrients													
Ammonia as N	µg/L	5	10	11	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	-	-	100	100	100	100	100	100	100	200
Nitrogen (Total)	µg/L	10	350	-	-	100	100	100	100	100	100	100	200
Reactive Phosphorus	µg/L	1	5	<1	<1	16	3	4	<1	<1	<1	10	10
Phosphorus (Total)	µg/L	5	10	14	25	8	10	10	12	9	9	9	<5
Inorganics													
Cyanide Total	µg/L	4	7	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons													
Oil and Grease	mg/L	5	5	24	22	7.9	8.6	<5	<5	18	8	8.1	13
Metals													
Aluminium (dissolved)	µg/L	5	55	9	9	21	18	28	27	18	10	23	17
Arsenic (dissolved)	µg/L	0.2	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chromium (III+VI) (dissolved)	µg/L	0.2	1	<1	<1	2	2	1	<1	<1	<1	<1	1
Copper (dissolved)	µg/L	0.5	14	4	<1	<1	<1	<1	<1	<1	<1	<1	
Iron (dissolved)	µg/L	2	300	<50	<50	80	50	50	60	60	50	50	70
Lead (dissolved)	µg/L	0.1	3.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	0.5	1,900	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	0.5	11	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	0.01	0.05	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	1	8	7	<5	<5	<5	<5	<5	<5	<5	<5	<5
Biological													
Faecal Coliforms	CFU/100mL	1	10/100^	<1	<1	<1	-	-	-	-	-	-	<1
Biochemical Oxygen Demand	mg/L	2	1/5^	<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 November 2022- Surface Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL5	EPL6	EPL8	EPL9	EPL12	EPL14	EPL15	EPL16	EPL24	EPL26	EPL27	EPL30	EPL31	EPL33	EPL34	EPL35	EPL36	EPL37
Field																					
pH	-	-	6.5-8	6.9	6.96	7.65	7.21	6.88	7.56	7.56	7.4	7.0	6.0	6.1	7.4	7.2	6.1	6.6	6.9	6.2	6.5
Electrical Conductivity	µS/cm	-	30-350	48.0	60.0	62.0	57.0	50.0	72.0	54.0	54.0	57.0	14.5	14.6	19.6	16.8	18.5	10.8	11.9	26.4	32.5
Oxidation Reduction Potential	mV	-	No Water Quality Objective Value	177	-23	-60	144	-18	167	174	-44.0	77.0	207.4	183.3	-100.2	-93.3	245.2	60.7	137.2	204.1	173.4
Temperature	°C	-	No Water Quality Objective Value	12.15	13.95	11.24	10.43	12.23	10.11	10.18	13.3	11.3	7.2	7.3	13.1	12.8	16.2	12.3	13.1	12.4	14.2
Dissolved Oxygen	% saturation	-	90-110	91	94.4	94	103	92.3	100	94.3	94.9	96.8	67.3	68.5	51.9	78.9	69.9	80.4	72.4	64.1	66.4
Turbidity	NTU	-	2-25	16.7	24.5	23.6	18.1	13.7	17.3	18.1	26.2	16.5	4.7	10.2	17.6	7.8	7.6	2.5	2.5	2.6	3.0
Laboratory analytes																					
TSS	mg/L	5	No Water Quality Objective Value	<5	11	<5	24	7.2	<5	5.6	7.3	6.0	<5	18	15	12	<5	<5	<5	<5	<5
Hardness as CaCO3	mg/L	1	No Water Quality Objective Value	28	35	36	35	29	43	31	30	35.0	12	12	8.2	8.3	9.6	5.6	5.8	17	17
Nutrients																					
Ammonia as N	µg/L	5	13	<5	32	39	<5	24	<5	<5	47	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Kjeldahl Nitrogen Total	µg/L	10	No Water Quality Objective Value	<100	-	-	-	<100	-	<100	<100	-	<100	<100	100	200	-	-	100	200	200
Nitrogen (Total)	µg/L	10	250	<100	<100	-	-	<100	-	<100	<100	-	<100	<100	100	200	-	-	100	200	200
Reactive Phosphorus	µg/L	1	15	5	11	5	7	4	7	7	7	5	2	98	1	1	2	<1	6	8	<1
Phosphorus (Total)	µg/L	5	20	70	19	11	14	73	18	26	8	5	<5	31	40	17	9	5	6	<5	17
Inorganics																					
Cyanide Total	µg/L	4	4	4	<4	<4	<4	<4	<4	8	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hydrocarbons																					
Oil and Grease	mg/L	5	5	5	13	14	18	24	8.3	21	15	28	16	16	14	11	9.4	9.3	21	19	14
Metals																					
Aluminium (dissolved)	µg/L	5	27	19	10	5	16	30	9	41	27	35	<5	<5	21	31	<5	27	5	25	15
Arsenic (dissolved)	µg/L	1	0.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI) (dissolved)	µg/L	1	0.01	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	2	1	<1	1	<1	<1	1
Copper (dissolved)	µg/L	1	1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Iron (dissolved)	µg/L	50	300	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	70	70	90	70	70	140	140
Lead (dissolved)	µg/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese (dissolved)	µg/L	5	1,200	<5	<5	<5	<5	<5	<5	<5	<5	39	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nickel (dissolved)	µg/L	1	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (dissolved)	µg/L	5	0.02	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc (dissolved)	µg/L	5	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<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 - 30 November 2022 - Treated Water

Analyte	Unit	Limit of Reporting	Water Quality Objective Value*	EPL 41	EPL 43	EPL 44	EPL 45	EPL 47	EPL 48	EPL 49	EPL 50
Flow Rate											
Inflow#	**ML/day**			-	-	0.492	0.041	0.090	0.059	0.049	-
Outflow#	**ML/day**		4.32 (EPL 43 / 50)	-	0.167	-	-	-	-	-	-
Field											
pH	**pH Unit**	-	6.5-8.5	9.55	-	-	-	-	-	-	7.4
Electrical Conductivity	**µS/cm**	-	700 (EPL 41) / 200 (EPL 50)	95.8	-	-	-	-	-	-	9
Oxidation Reduction Potential	**mV**	-	No Water Quality Objective Value	161	-	-	-	-	-	-	-126.9
Temperature	**°C**	-	15	15.34	-	-	-	-	-	-	15.4
Dissolved Oxygen	**% saturation**	-	No Water Quality Objective Value	68.8	-	-	-	-	-	-	42.1
Turbidity	**NTU**	-	<25	1000	-	-	-	-	-	-	0
Laboratory analytes											
Total suspended solids	**mg/L**	5	5/10	320	-	-	-	-	-	-	<5
Hardness as $CaCO_3$ (filtered)	**mg/L**	1	No Water Quality Objective Value	9.6	-	-	-	-	-	-	<5
Nutrients											
Ammonia as N	**µg/L**	5	0.2/2^	330	-	-	-	-	-	-	<5
Kjeldahl Nitrogen Total	**µg/L**	10	No Water Quality Objective Value	1100	-	-	-	-	-	-	<100
Nitrogen (Total)	**µg/L**	10	350	1600	-	-	-	-	-	-	400
Reactive Phosphorus	**µg/L**	1	No Water Quality Objective Value	18	-	-	-	-	-	-	6
Phosphorus (Total)	**µg/L**	5	0.1/0.3^	430	-	-	-	-	-	-	20
Inorganics											
Cyanide Total	**µg/L**	4	No Water Quality Objective Value	6	-	-	-	-	-	-	<4
Hydrocarbons											
Oil and Grease	**mg/L**	5	2/5^	15	-	-	-	-	-	-	19
Metals											
Aluminium (dissolved)	**µg/L**	5	55	1600	-	-	-	-	-	-	<5
Arsenic (dissolved)	**µg/L**	0.2	13	11	-	-	-	-	-	-	<1
Chromium (III+VI) (dissolved)	**µg/L**	0.2	1	180	-	-	-	-	-	-	<1
Copper (dissolved)	**µg/L**	0.5	14	2	-	-	-	-	-	-	<1
Iron (dissolved)	**µg/L**	2	300	<50	-	-	-	-	-	-	<50
Lead (dissolved)	**µg/L**	0.1	3.4	<1	-	-	-	-	-	-	<1
Manganese (dissolved)	**µg/L**	0.5	1,900	<5	-	-	-	-	-	-	<5
Nickel (dissolved)	**µg/L**	0.5	11	<1	-	-	-	-	-	-	<1
Silver (dissolved)	**µg/L**	0.01	0.05	<5	-	-	-	-	-	-	<5
Zinc (dissolved)	**µg/L**	1	8	<5	-	-	-	-	-	-	<5
Biological											
Faecal Coliforms	**CFU/100mL**	1	10/100^	<1	-	-	-	-	-	-	<1
Biological Oxygen Demand	**mg/L**		5	<5	-	-	-	-	-	-	<5

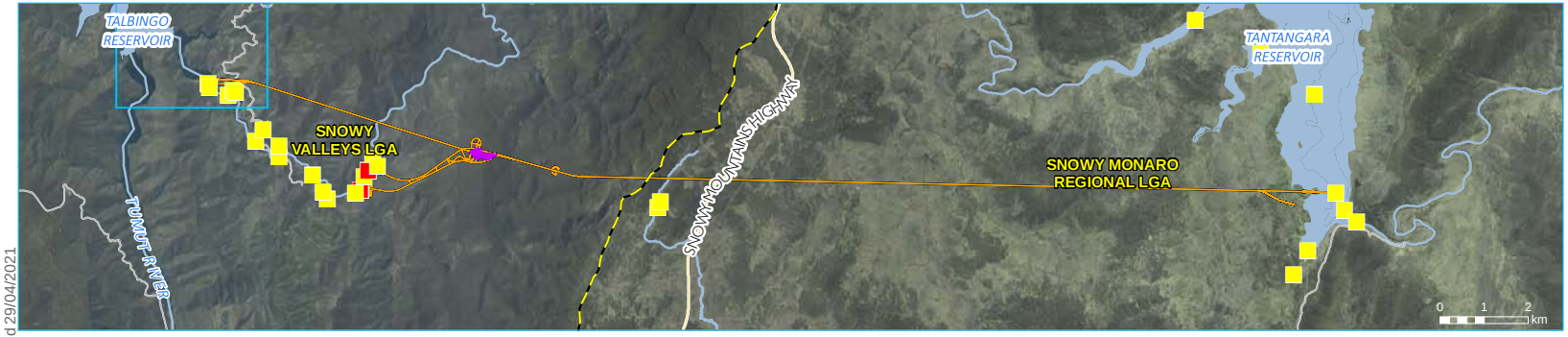
Note: Treated water was not being discharged at Talbingo and Tantangara Reservoirs at the time of EPL sampling

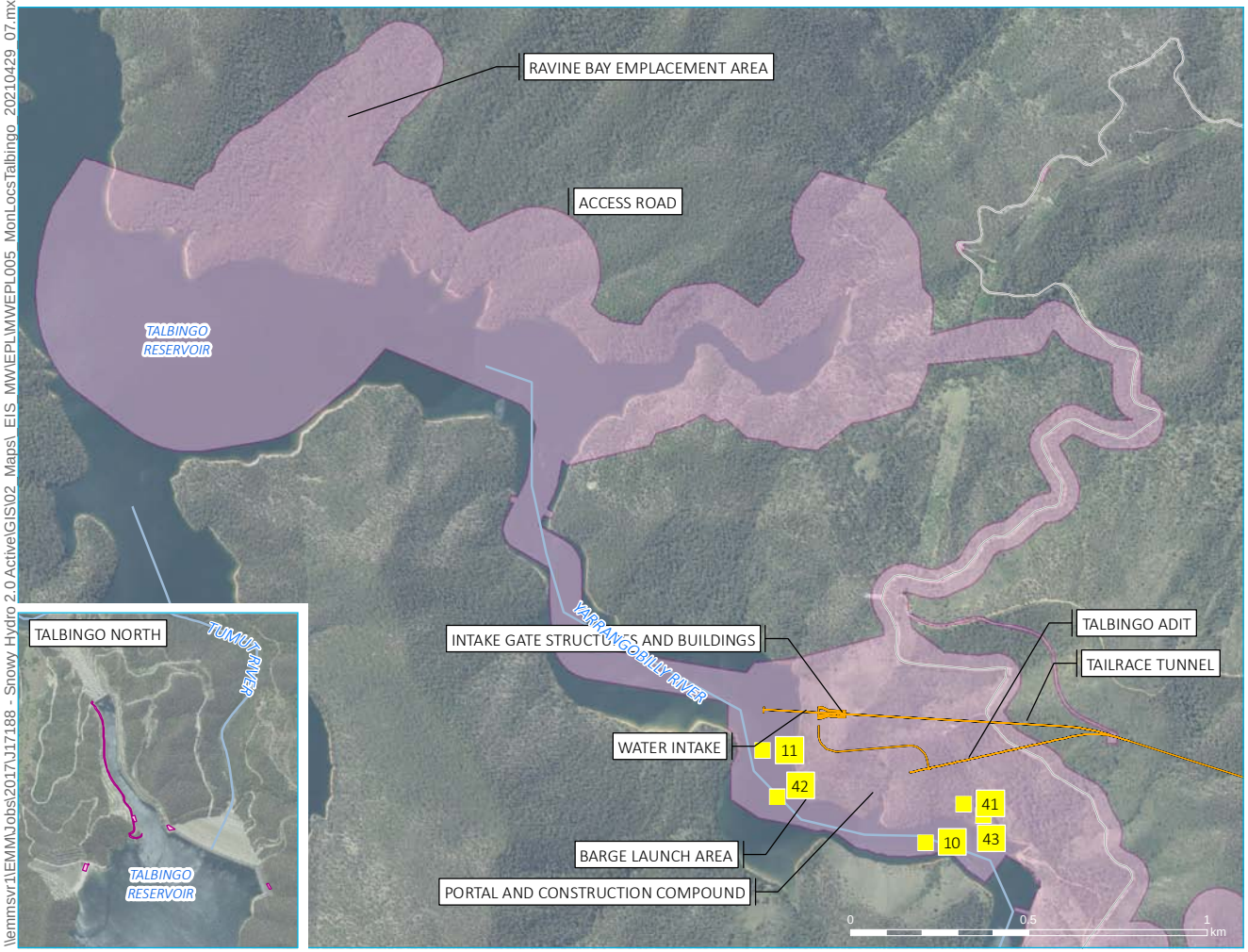
* Water Quality Objective values Treated Water reference the predicted values for physical and chemical stressors from the treatment plant as presented in the Main Works EIS.

\- 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





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

Snowy 2.0
Main Works
Figure 1

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

GDA 1994 MGA Zone 55

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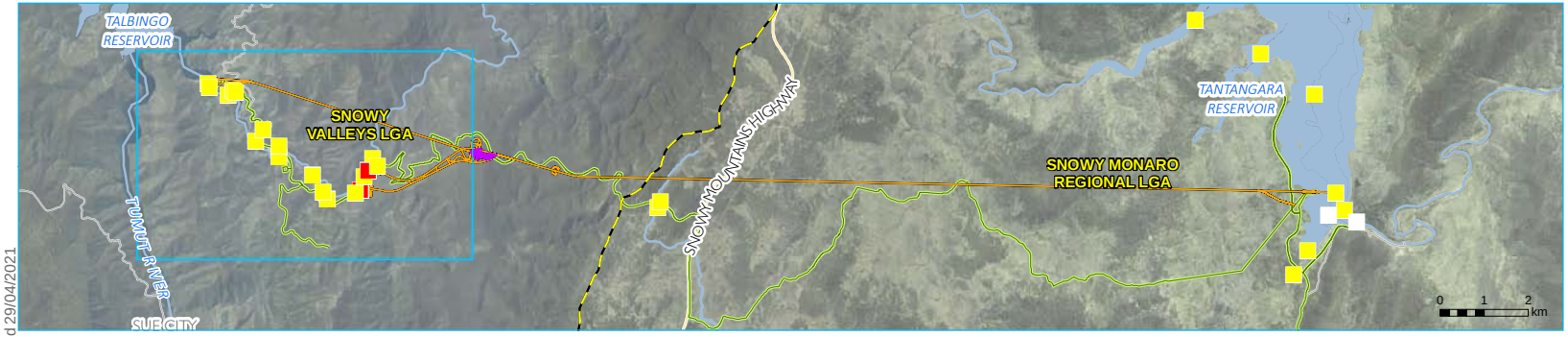

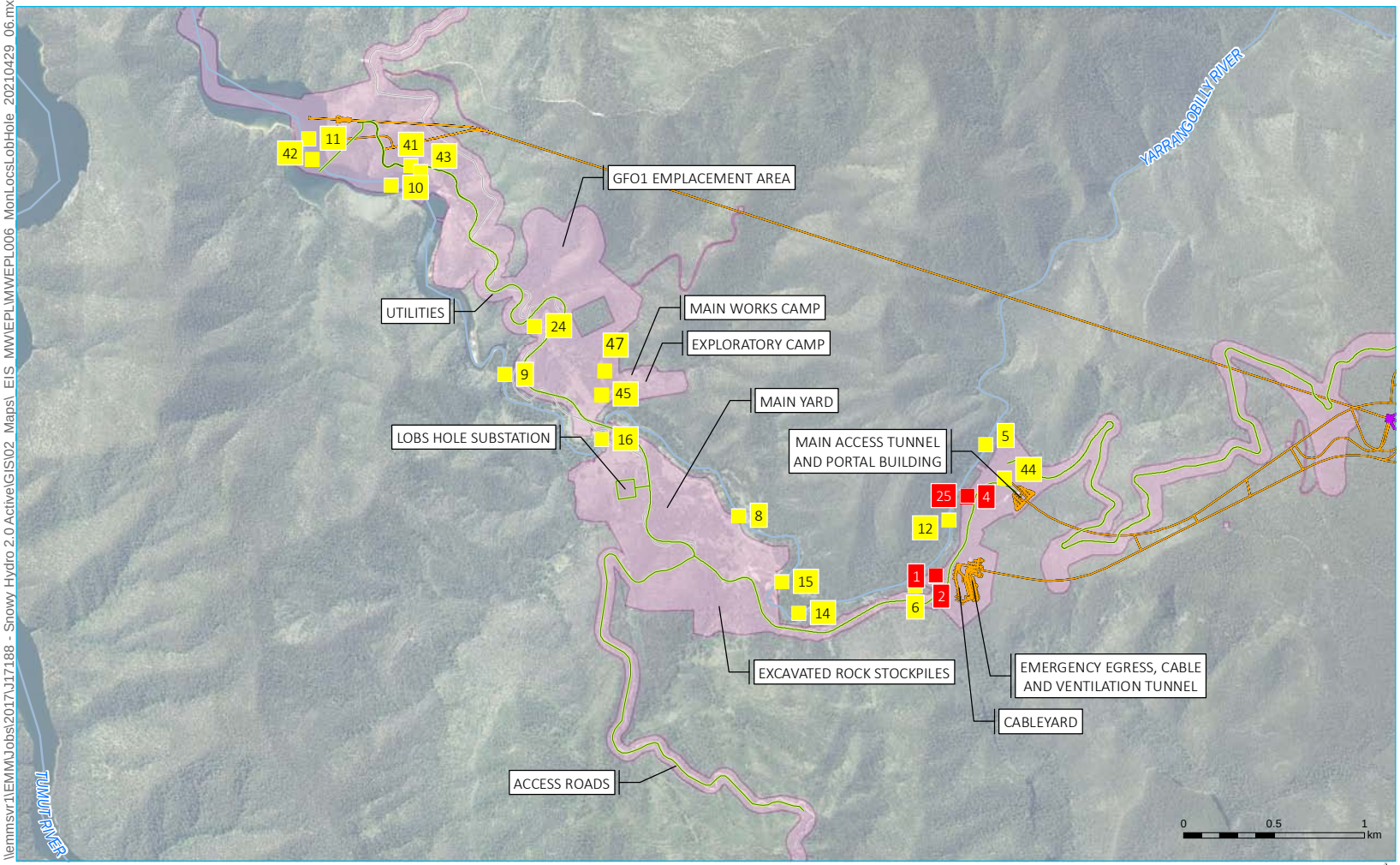

KEY

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

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EPL Premise and monitoring point maps - Lobs Hole

Snowy 2.0
Main Works
Figure 2

\\emmsvr1\EMMJobs\2017\117188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MWEPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021

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

GDA 1994 MGA Zone 55

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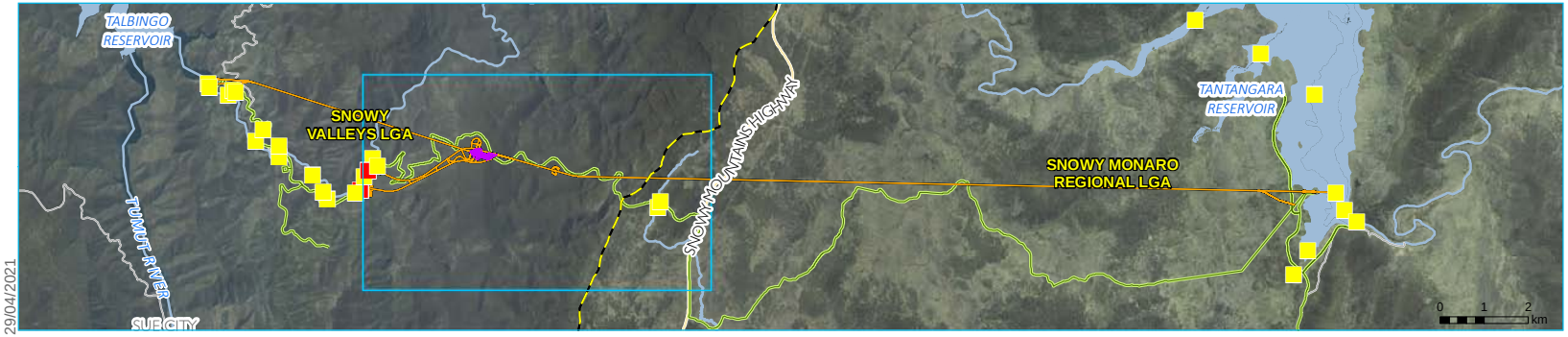

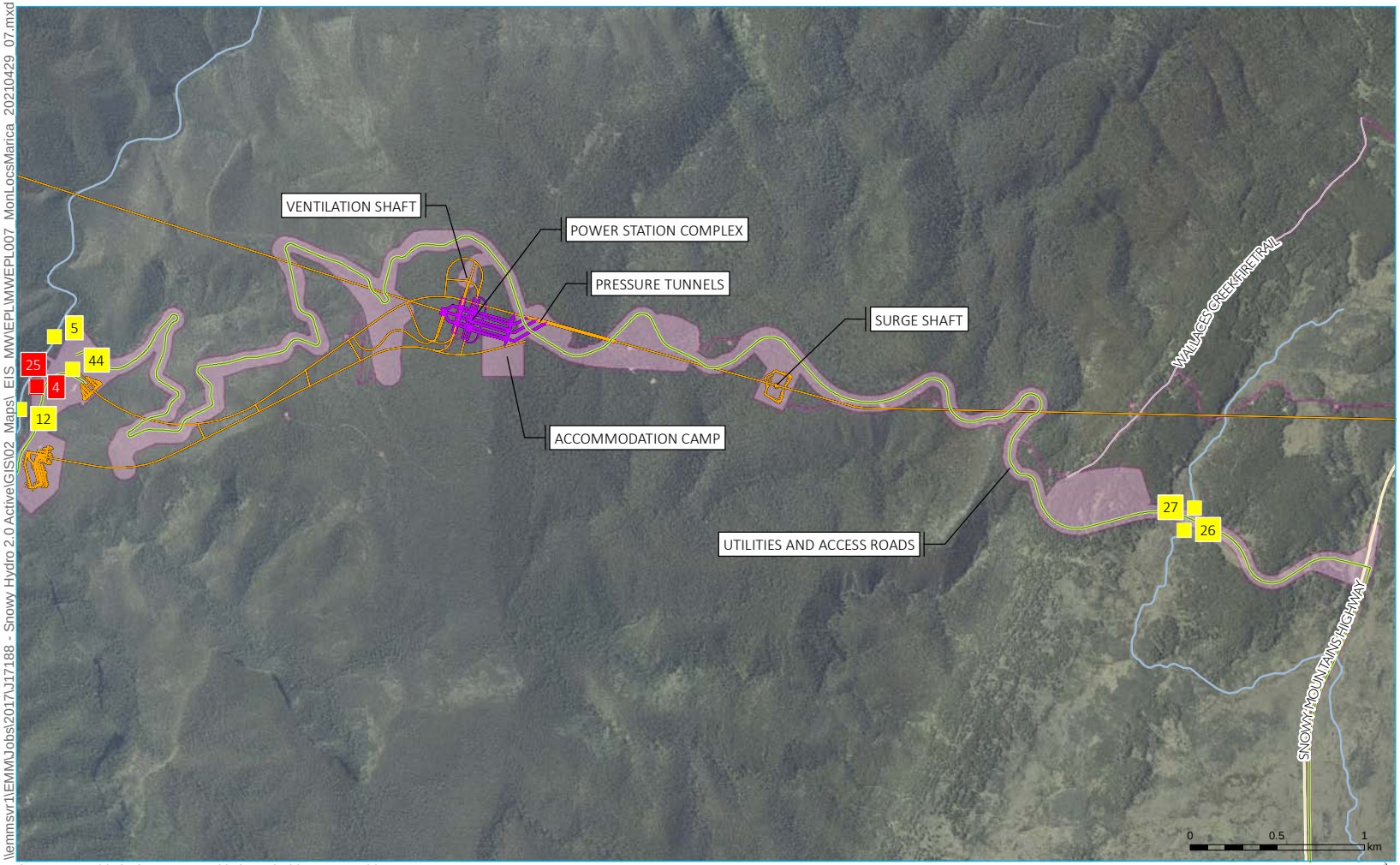

KEY

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

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EPL Premise and monitoring point maps - Marica

Snowy 2.0
Main Works
Figure 3

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

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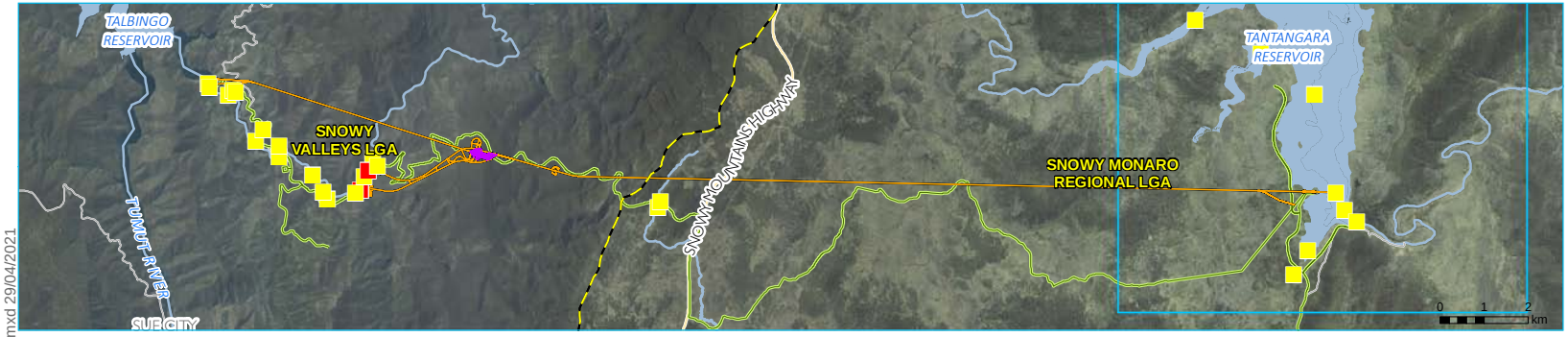

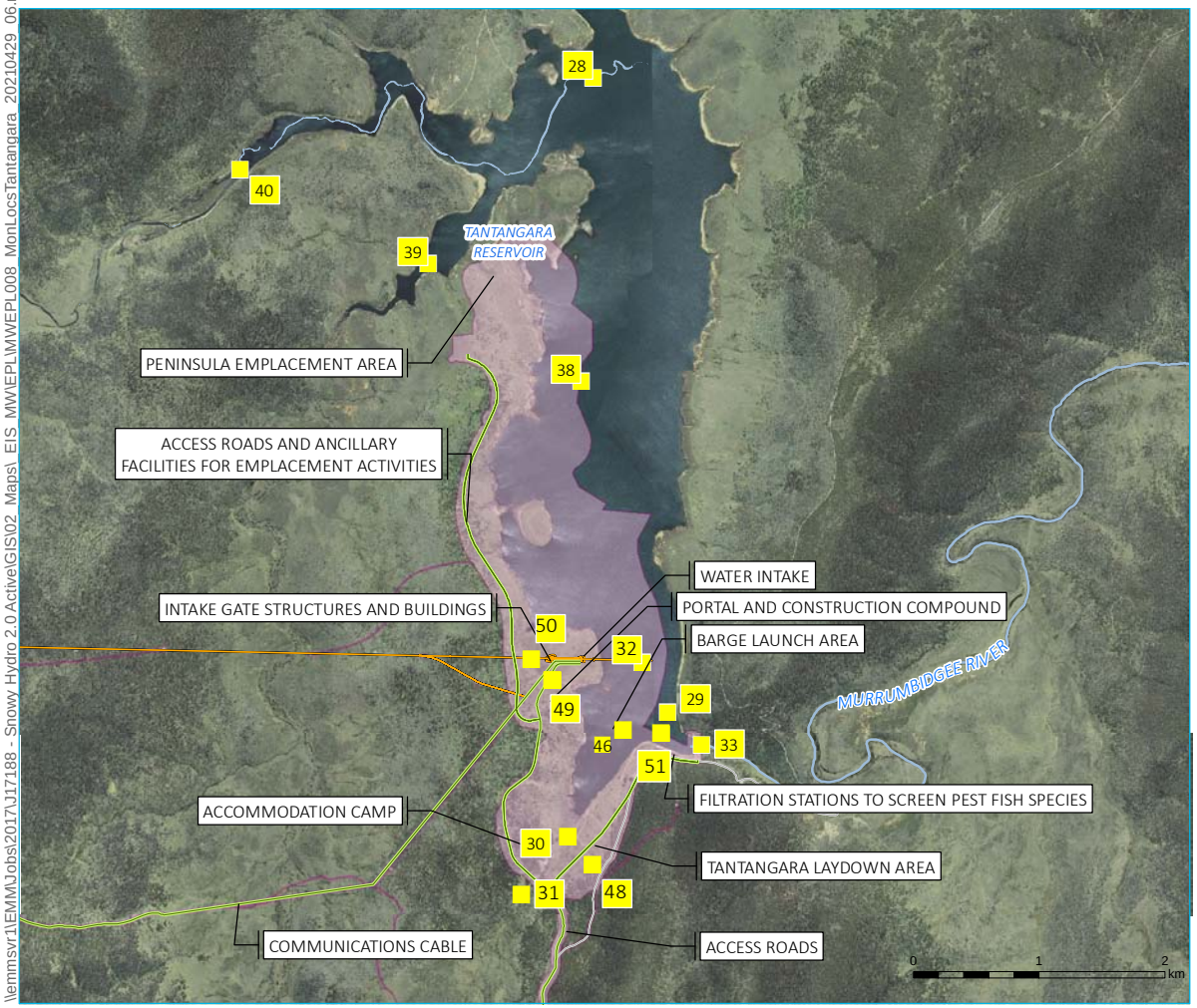

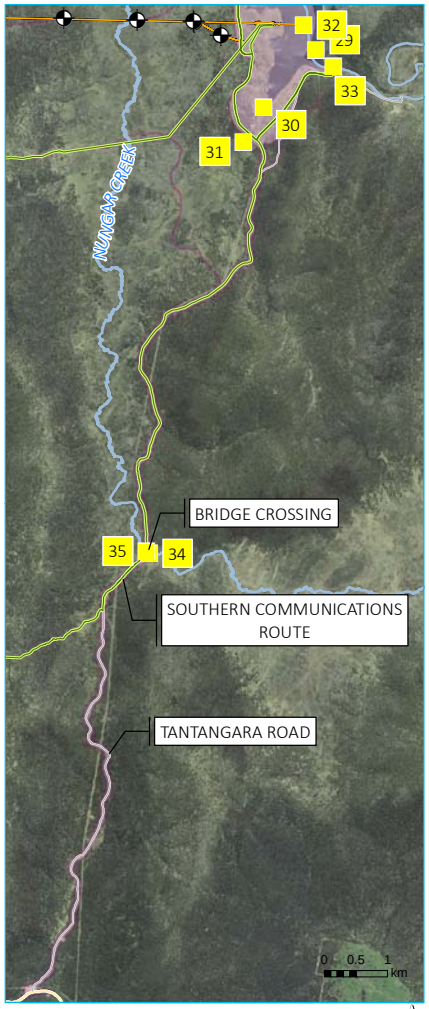

KEY

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

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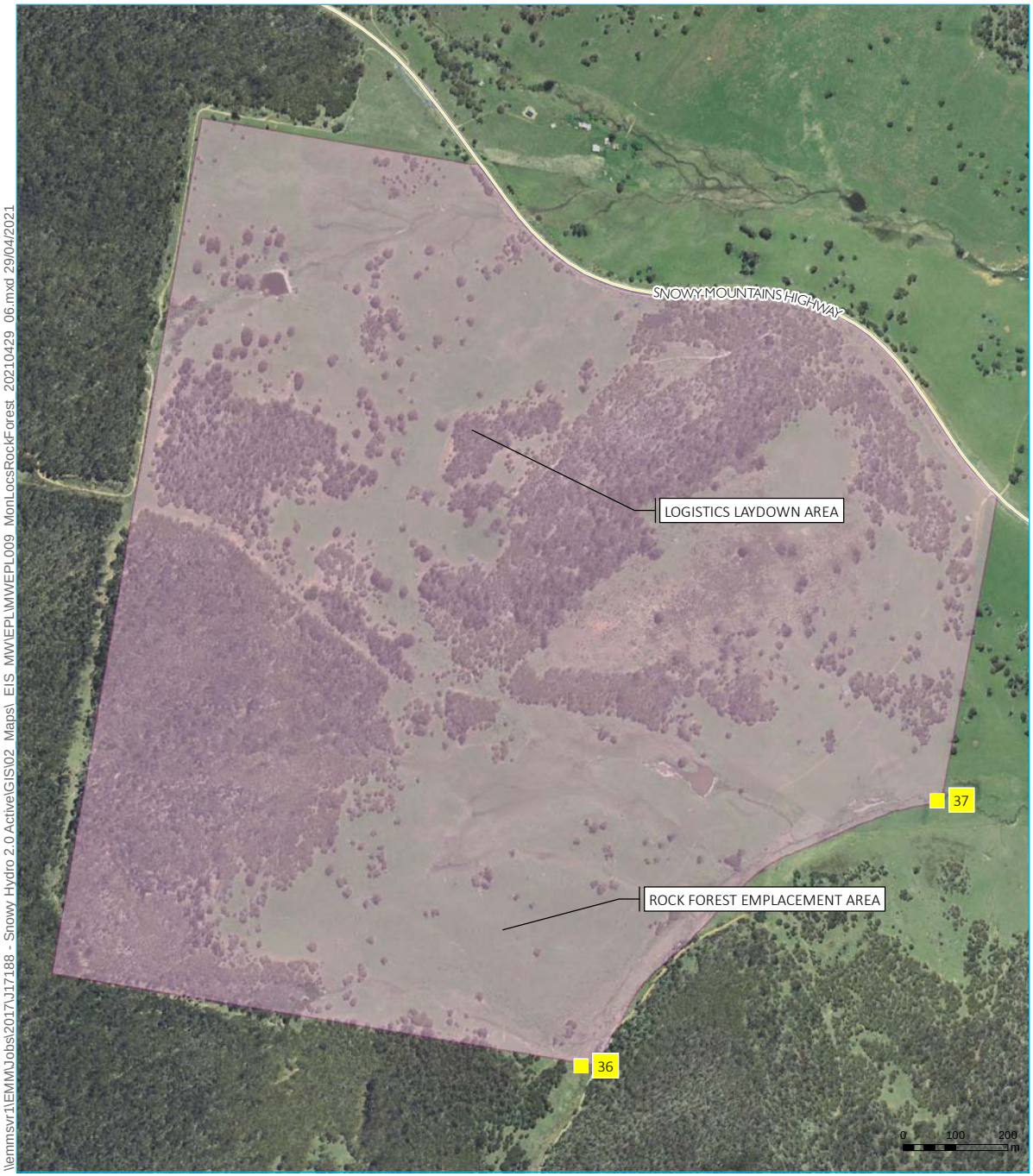

\\emmsvr1\EMMJobs\2017\J17188 - Snowy Hydro 2.0 Active\GIS\02_Maps_EIS_MW\EPL\MWEPL009_MonLocsRockForest_20210429_06.mxd 29/04/2021

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

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

GDA 1994 MGA Zone 55

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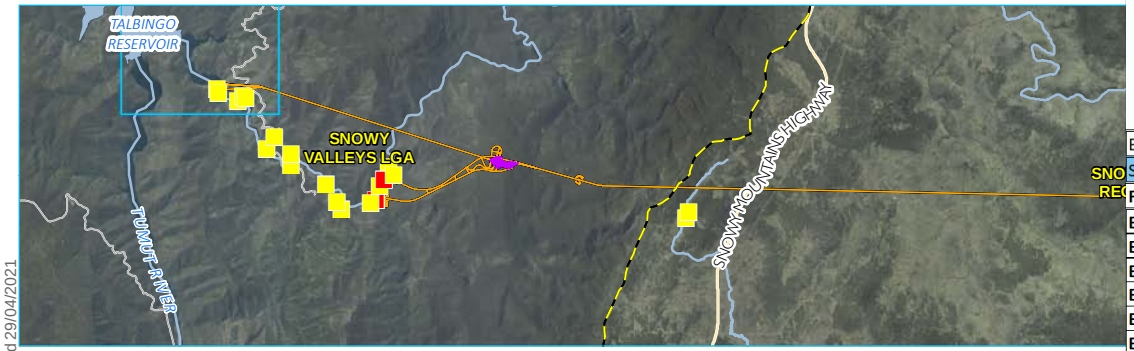
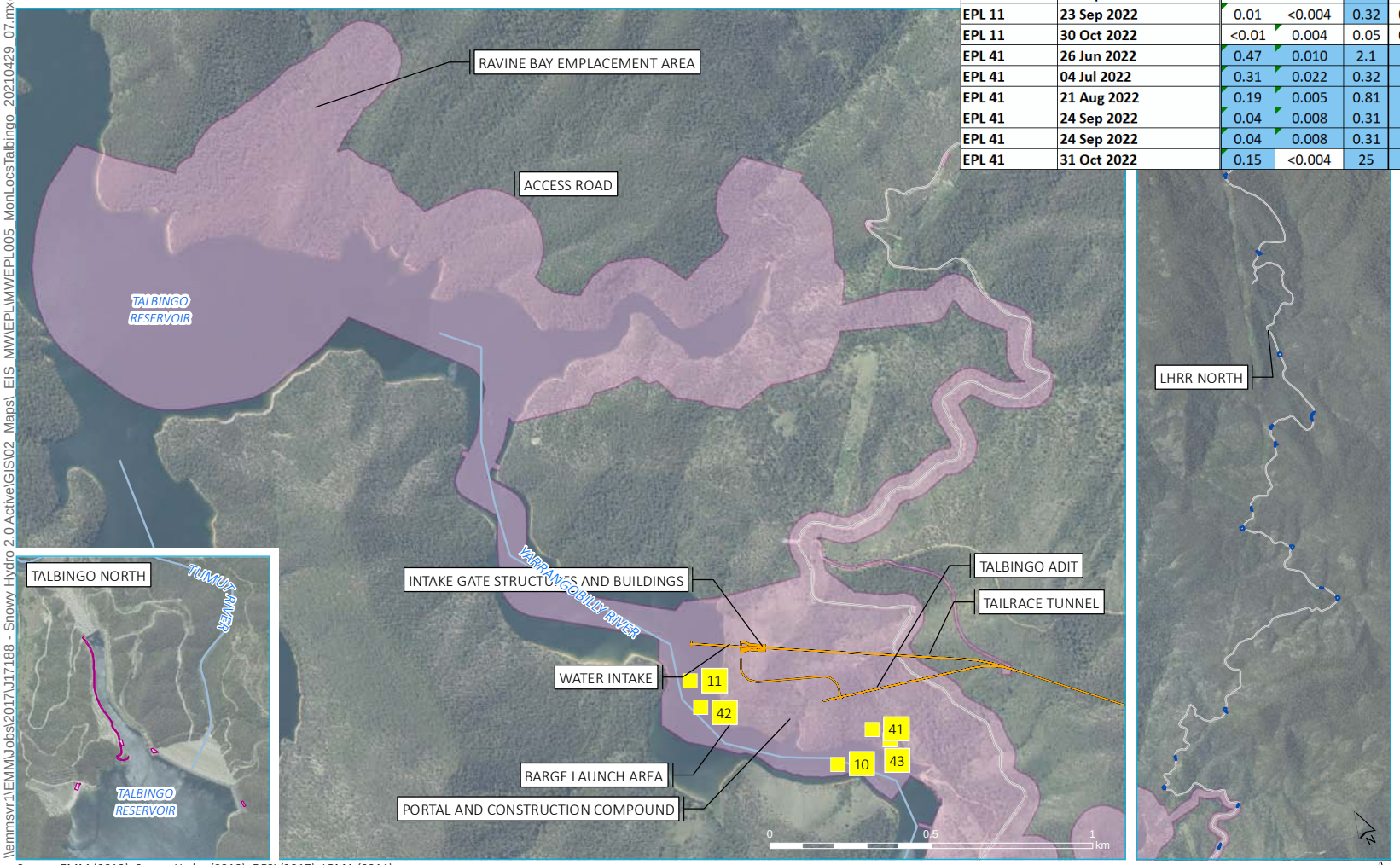
snowy 2.0

EMM creating opportunities

APPENDIX D – EXCEEDANCE MAP



		Nitrite + Nitrate as N	Cyanide Total	Nitrogen (Total)	Aluminium (filtered)	Arsenic (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Zinc (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.004	0.01	0.005	0.001	0.001	0.001	0.05	0.001	0.005
Snowy 2.0 - Surface Water Guidelines		0.02	0.004	0.25	0.027	0.0008	0.00001	0.001	0.3	0.001	0.0024
Field ID	**Date**										
EPL 10	03 Jul 2022	0.05	<0.004	0.06	<0.005	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005
EPL 10	21 Aug 2022	0.03	0.005	0.10	<0.005	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005
EPL 10	30 Oct 2022	<0.01	<0.004	0.10	0.017	<0.001	0.001	<0.001	<0.05	<0.001	0.007
EPL 11	03 Jul 2022	0.05	<0.004	0.08	0.006	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005
EPL 11	21 Aug 2022	0.02	<0.004	0.63	0.005	<0.001	<0.001	0.003	<0.05	<0.001	<0.005
EPL 11	23 Sep 2022	0.01	<0.004	0.32	0.008	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005
EPL 11	23 Sep 2022	0.01	<0.004	0.32	0.008	<0.001	<0.001	<0.001	<0.05	<0.001	<0.005
EPL 11	30 Oct 2022	<0.01	0.004	0.05	0.014	<0.001	<0.001	0.003	<0.05	<0.001	<0.005
EPL 41	26 Jun 2022	0.47	0.010	2.1	0.25	<0.001	0.073	0.010	<0.05	<0.001	0.039
EPL 41	04 Jul 2022	0.31	0.022	0.32	0.39	<0.001	0.28	0.076	<0.05	0.003	0.25
EPL 41	21 Aug 2022	0.19	0.005	0.81	1.5	<0.001	0.10	0.003	0.06	<0.001	<0.005
EPL 41	24 Sep 2022	0.04	0.008	0.31	3.9	0.005	0.40	0.006	0.83	<0.001	<0.005
EPL 41	24 Sep 2022	0.04	0.008	0.31	3.9	0.005	0.40	0.006	0.83	<0.001	<0.005
EPL 41	31 Oct 2022	0.15	<0.004	25	0.11	0.001	0.048	0.004	<0.05	<0.001	<0.005



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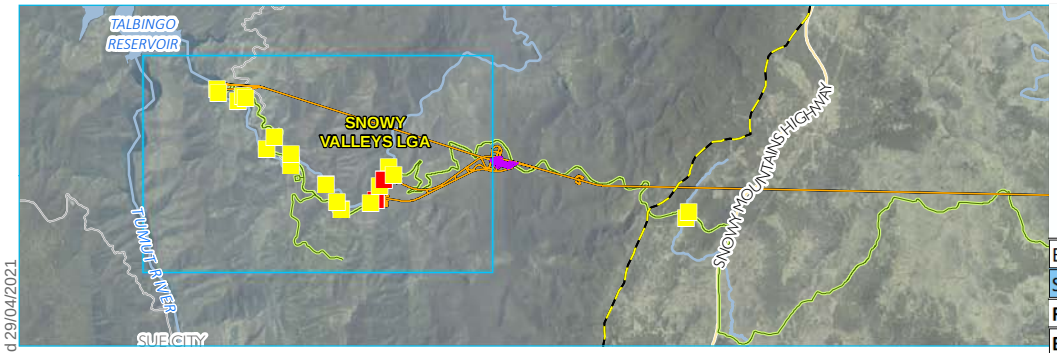
Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)

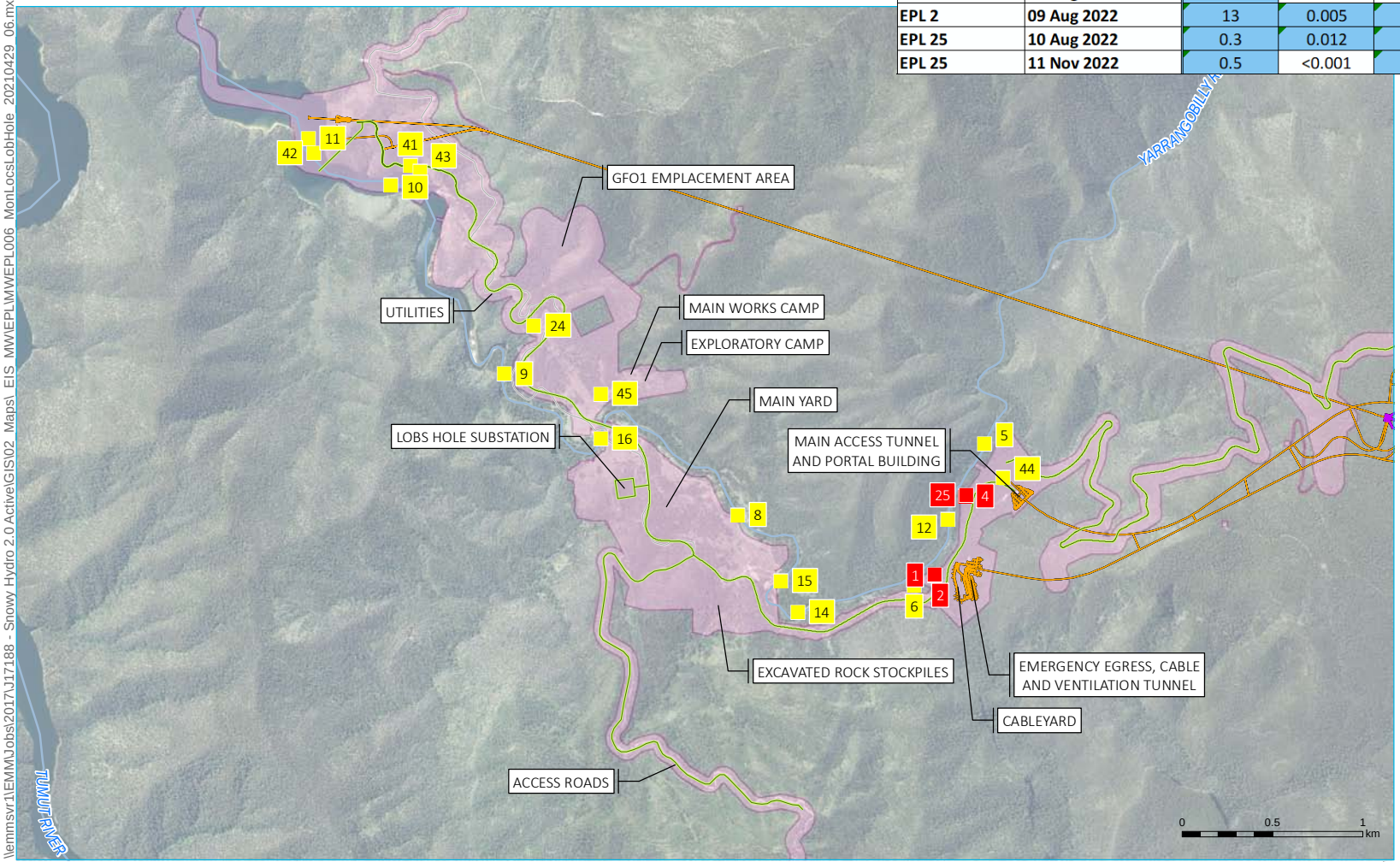
Figure 1 - EPL Exceedance Reservoir Water

snowy hydro

Future Generation
SALINI IMPREGILO · CLOUGH · LANE



		Nitrogen (Total)	Copper (filtered)	Iron (filtered)	Manganese (filtered)	Nickel (filtered)	Zinc (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.01	0.001	0.05	0.005	0.001	0.005
Snowy 2.0 - Surface Water Guidelines		0.25	0.001	0.3	1.2	0.008	0.0024
Field ID	**Date**						
EPL 1	**09 Aug 2022**	0.3	<0.001	<0.05	0.17	0.017	<0.005
EPL 2	**09 Aug 2022**	13	0.005	1.8	0.16	0.003	0.011
EPL 25	**10 Aug 2022**	0.3	0.012	0.88	1.2	0.013	0.027
EPL 25	**11 Nov 2022**	0.5	<0.001	6.1	1.3	0.013	0.021



\\emmsvr1\EMM\Jobs\2017\317188 - Snowy Hydro 2.0 Active\GIS\02 Maps\ EIS MW\EPL\MWEPL006 MonLocsLobHole 20210429 06.mxd 29/04/2021

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

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Figure 2 - EPL Exceedance - Groundwater

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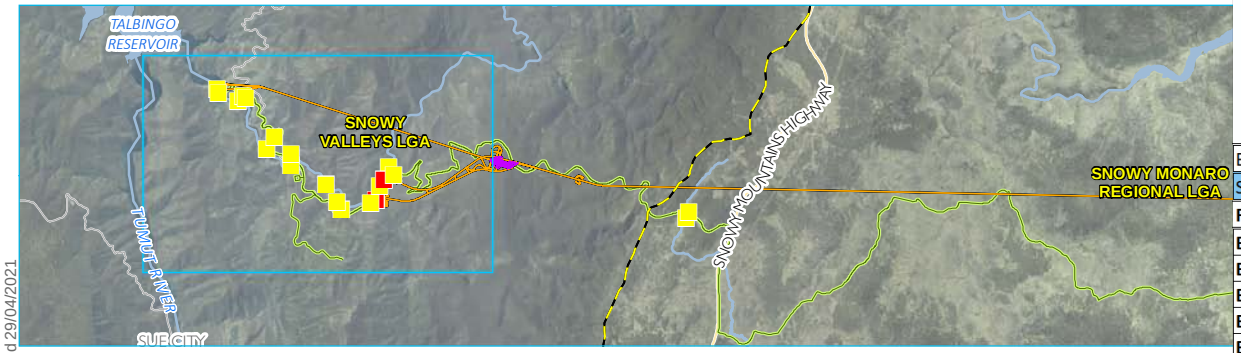

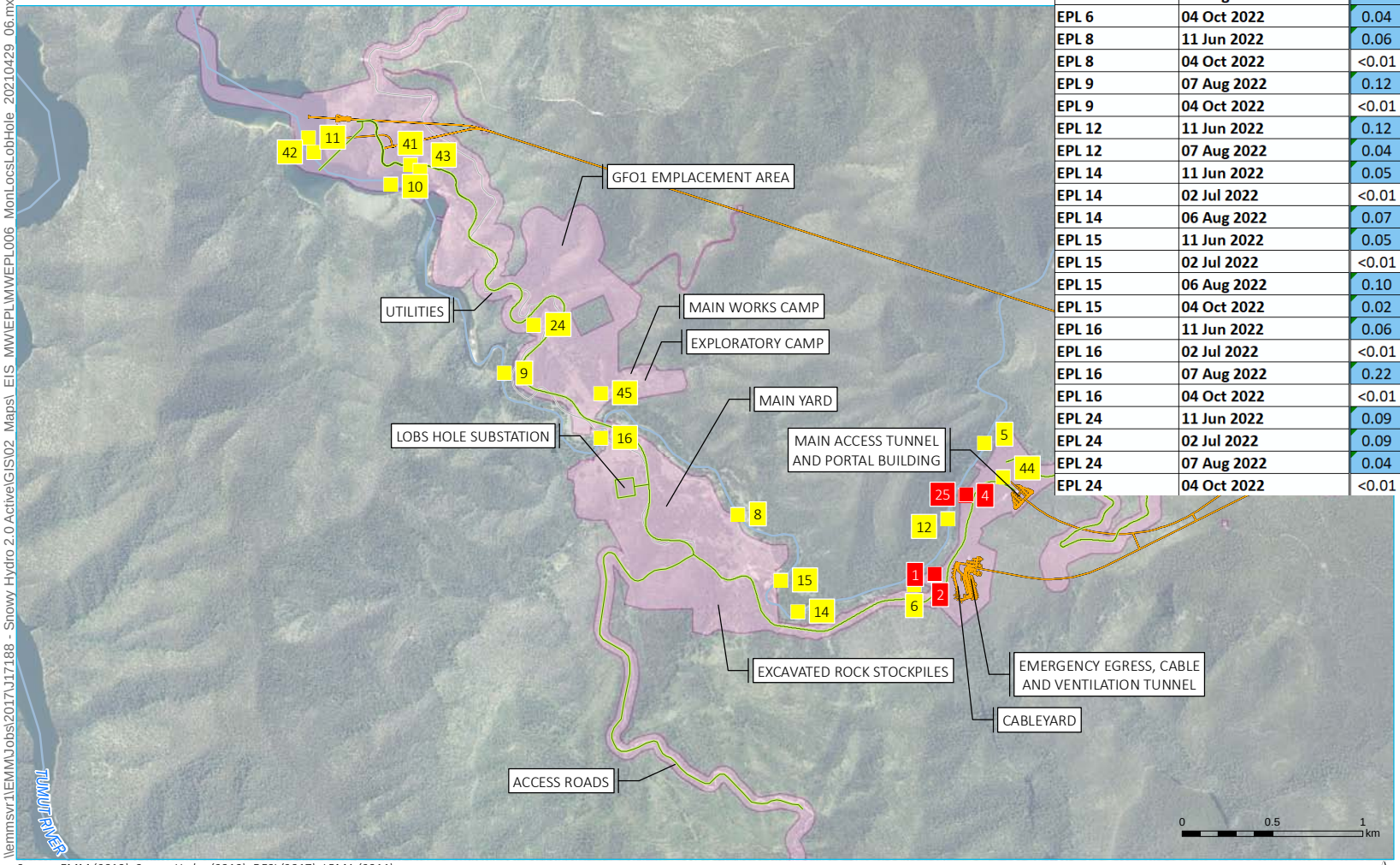

		Nitrite + Nitrate as N	Cyanide Total	Nitrogen (Total)	Aluminium (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Zinc (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.004	0.01	0.005	0.001	0.05	0.001	0.005
Snowy 2.0 - Surface Water Guidelines		0.015	0.004	0.25	0.027	0.001	0.3	0.001	0.0024
Field ID	**Date**								
EPL 5	**11 Jun 2022**	0.04	<0.004	0.46	0.058	<0.001	0.07	<0.001	<0.005
EPL 05	**02 Jul 2022**	<0.01	<0.004	0.01	0.041	<0.001	<0.05	<0.001	<0.005
EPL 5	**04 Oct 2022**	<0.01	<0.004	0.14	0.044	<0.001	<0.05	<0.001	<0.005
EPL 6	**11 Jun 2022**	0.02	<0.004	0.08	0.036	<0.001	<0.05	<0.001	<0.005
EPL 6	**07 Aug 2022**	0.15	<0.004	0.21	<0.005	0.002	<0.05	<0.001	<0.005
EPL 6	**04 Oct 2022**	0.04	<0.004	0.10	0.019	<0.001	<0.05	<0.001	<0.005
EPL 8	**11 Jun 2022**	0.06	<0.004	0.45	0.025	<0.001	0.05	<0.001	<0.005
EPL 8	**04 Oct 2022**	<0.01	<0.004	0.05	0.036	<0.001	<0.05	<0.001	<0.005
EPL 9	**07 Aug 2022**	0.12	<0.004	0.54	0.012	0.002	<0.05	<0.001	<0.005
EPL 9	**04 Oct 2022**	<0.01	0.23	0.04	0.036	<0.001	<0.05	<0.001	<0.005
EPL 12	**11 Jun 2022**	0.12	<0.004	0.22	0.11	0.012	0.10	<0.001	<0.005
EPL 12	**07 Aug 2022**	0.04	<0.004	0.35	0.33	0.002	0.37	0.002	<0.005
EPL 14	**11 Jun 2022**	0.05	0.004	0.63	0.028	<0.001	0.07	<0.001	<0.005
EPL 14	**02 Jul 2022**	<0.01	<0.004	0.02	0.029	<0.001	<0.05	<0.001	<0.005
EPL 14	**06 Aug 2022**	0.07	<0.004	0.27	0.047	0.003	0.06	<0.001	0.006
EPL 15	**11 Jun 2022**	0.05	<0.004	0.52	0.044	<0.001	0.06	<0.001	<0.005
EPL 15	**02 Jul 2022**	<0.01	<0.004	0.02	0.040	<0.001	<0.05	<0.001	<0.005
EPL 15	**06 Aug 2022**	0.10	<0.004	0.55	0.10	<0.001	0.10	<0.001	<0.005
EPL 15	**04 Oct 2022**	0.02	<0.004	0.12	0.026	<0.001	<0.05	<0.001	<0.005
EPL 16	**11 Jun 2022**	0.06	0.007	0.49	0.045	0.002	0.06	<0.001	<0.005
EPL 16	**02 Jul 2022**	<0.01	<0.004	<0.01	0.023	0.005	<0.05	<0.001	<0.005
EPL 16	**07 Aug 2022**	0.22	<0.004	0.59	0.012	0.003	<0.05	<0.001	<0.005
EPL 16	**04 Oct 2022**	<0.01	<0.004	0.03	0.032	<0.001	<0.05	<0.001	<0.005
EPL 24	**11 Jun 2022**	0.09	<0.004	0.46	0.057	<0.001	0.07	<0.001	<0.005
EPL 24	**02 Jul 2022**	0.09	<0.004	0.13	0.025	0.003	0.05	<0.001	<0.005
EPL 24	**07 Aug 2022**	0.04	<0.004	0.19	0.24	0.004	0.22	<0.001	0.015
EPL 24	**04 Oct 2022**	<0.01	<0.004	0.05	0.038	<0.001	<0.05	<0.001	<0.005

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

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Figure 3 - EPL Exceedance - Surface Water

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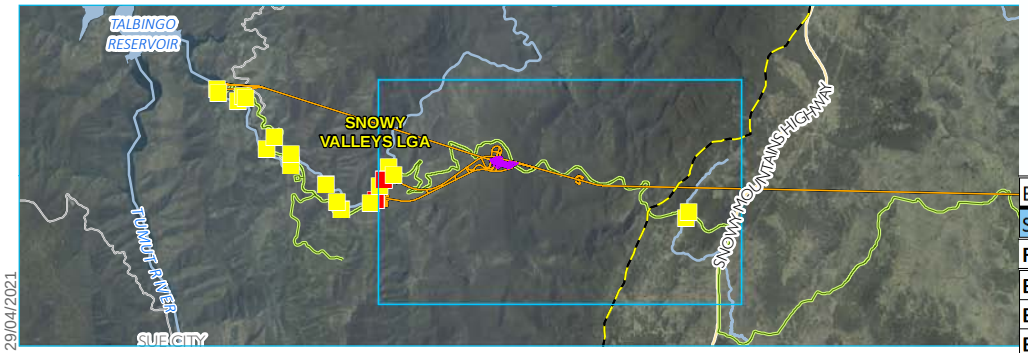
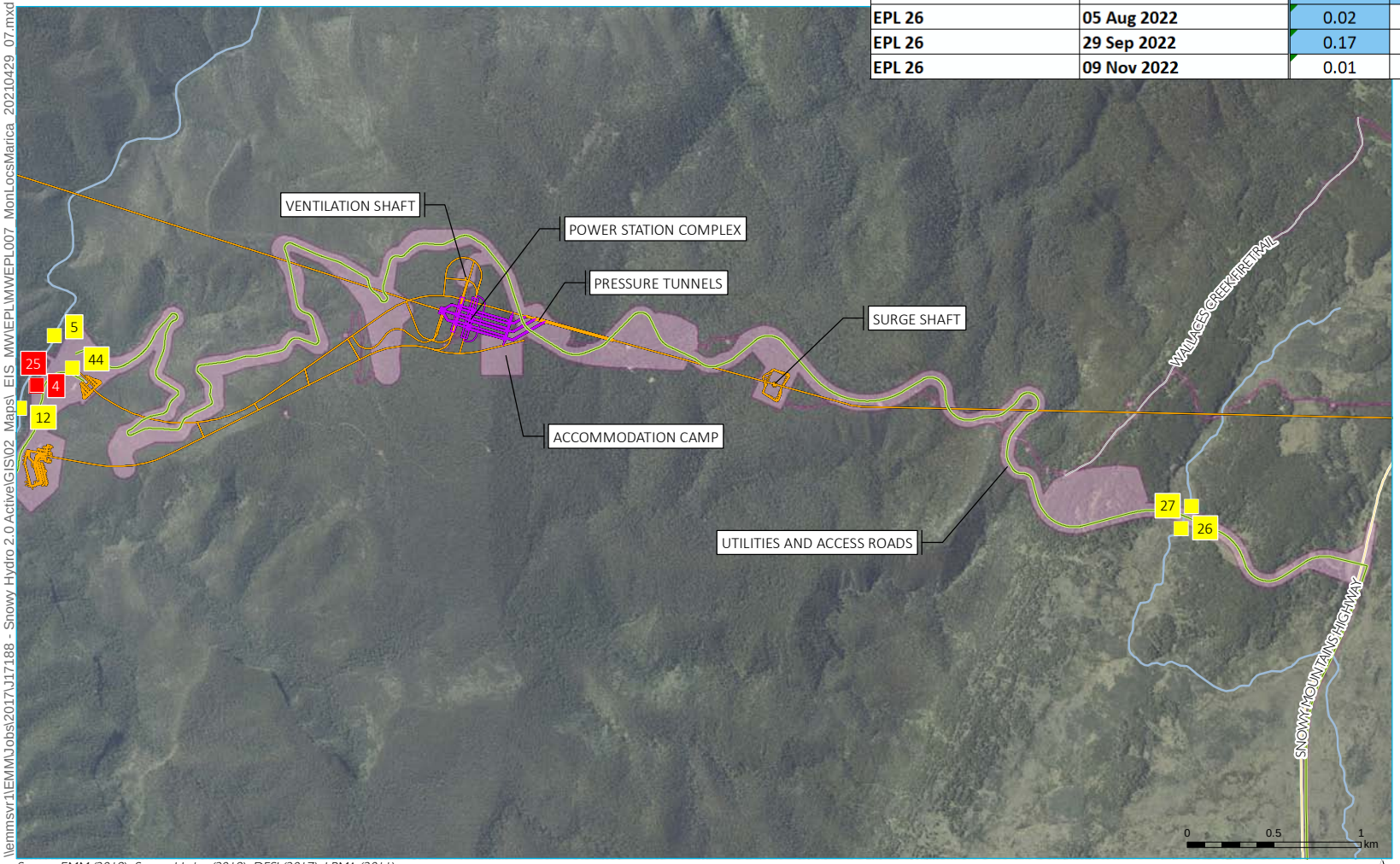
		Nitrite + Nitrate as N	Cyanide Total	Nitrogen (Total)	Aluminium (filtered)	Chromium (III+VI) (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.004	0.01	0.005	0.001
Snowy 2.0 - Surface Water Guidelines		0.015	0.004	0.25	0.027	0.00001
Field ID	**Date**					
EPL 26	**20 Jun 2022**	0.06	<0.004	0.06	0.025	<0.001
EPL 26	**03 Jul 2022**	0.02	<0.004	0.07	0.035	<0.001
EPL 27	**03 Jul 2022**	0.11	0.005	0.18	0.031	<0.001
EPL 26	**05 Aug 2022**	0.02	<0.004	0.22	0.044	<0.001
EPL 26	**29 Sep 2022**	0.17	<0.004	0.41	<0.005	<0.001
EPL 26	**09 Nov 2022**	0.01	<0.004	<0.1	<0.005	0.001





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

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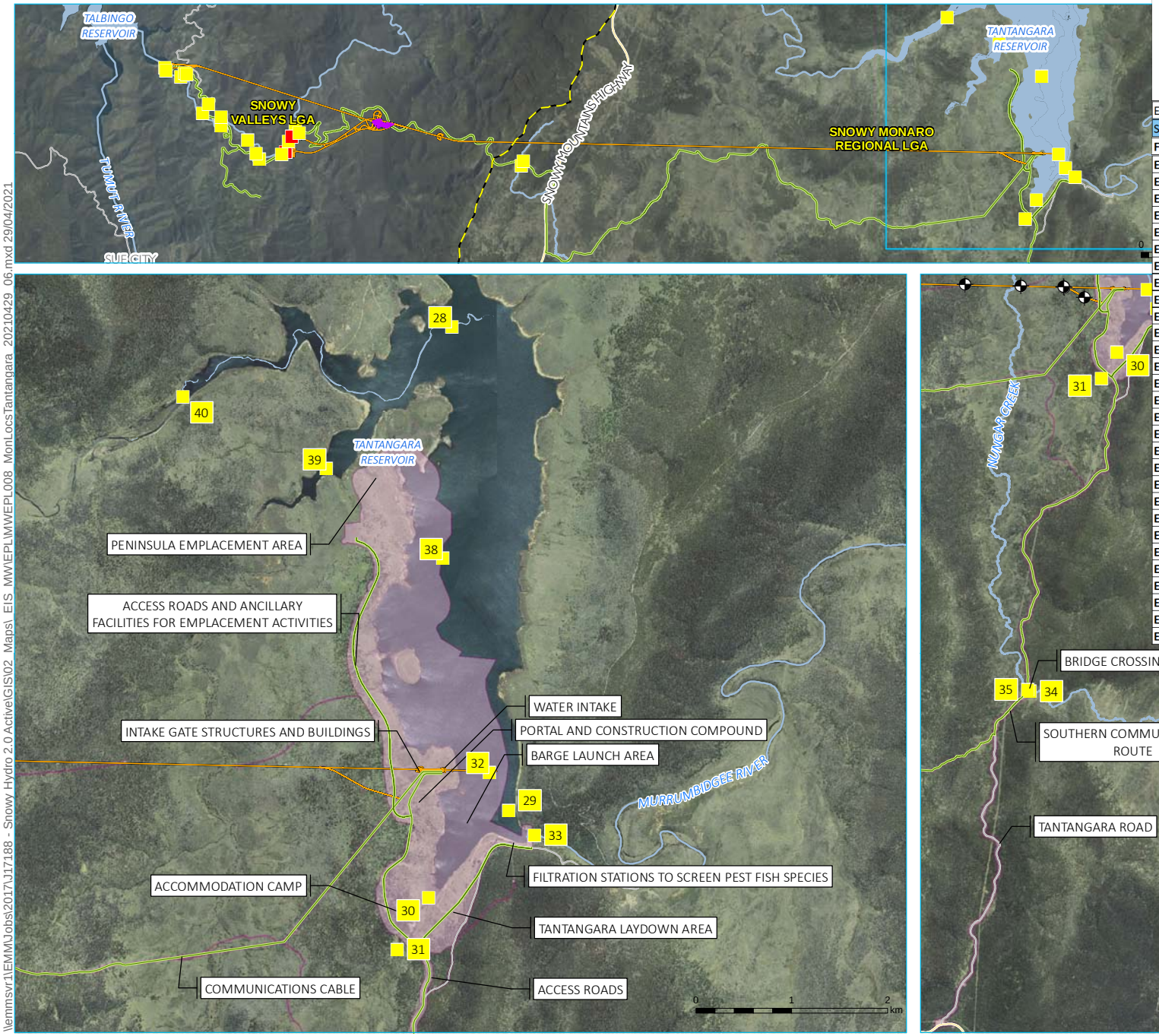
Figure 4 - EPL Exceedance - Surface Water



		Nitrite + Nitrate as N	Cyanide Total	Nitrogen (Total)	Aluminium (filtered)	Chromium (III+VI) (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.004	0.01	0.005	0.001
Snowy 2.0 - Surface Water Guidelines		0.015	0.004	0.25	0.027	0.00001
Field ID	**Date**					
EPL 28	**16 Jun 2022**	<0.01	0.005	0.13	0.027	<0.001
EPL 28	**08 Jul 2022**	0.02	<0.004	0.21	0.022	<0.001
EPL 28	**21 Aug 2022**	<0.01	<0.004	0.10	0.041	<0.001
EPL 28	**02 Oct 2022**	<0.01	<0.004	0.10	0.053	<0.001
EPL 28	**12 Nov 2022**	<0.01	<0.004	0.1	0.021	0.002
EPL 29	**16 Jun 2022**	0.02	0.004	0.16	0.022	<0.001
EPL 29	**08 Jul 2022**	0.05	<0.004	0.17	0.024	<0.001
EPL 29	**21 Aug 2022**	0.02	<0.004	0.13	0.11	<0.001
EPL 29	**02 Oct 2022**	<0.01	<0.004	0.13	0.047	<0.001
EPL 32	**16 Jun 2022**	0.02	0.005	0.14	0.025	<0.001
EPL 32	**08 Jul 2022**	0.07	<0.004	0.35	0.026	<0.001
EPL 32	**21 Aug 2022**	0.04	<0.004	0.15	0.089	0.002
EPL 32	**11 Sep 2022**	<0.01	0.005	0.44	0.017	<0.001
EPL 32	**02 Oct 2022**	<0.01	<0.004	0.10	0.062	<0.001
EPL 32	**12 Nov 2022**	<0.01	<0.004	0.1	0.028	0.001
EPL 33	**03 Jul 2022**	0.03	<0.004	0.11	0.11	<0.001
EPL 33	**19 Aug 2022**	0.02	<0.004	0.18	0.059	<0.001
EPL 33	**10 Sep 2022**	<0.01	<0.004	0.03	0.040	<0.001
EPL 33	**01 Oct 2022**	<0.01	<0.004	0.10	0.044	<0.001
EPL 33	**10 Nov 2022**	0.04	<0.004		<0.005	<0.001
EPL 38	**08 Jul 2022**	0.02	<0.004	0.17	0.024	<0.001
EPL 38	**21 Aug 2022**	0.01	<0.004	0.11	0.24	<0.001
EPL 38	**11 Sep 2022**	<0.01	<0.004	0.06	0.060	<0.001
EPL 38	**02 Oct 2022**	<0.01	<0.004	0.09	0.046	<0.001
EPL 39	**08 Jul 2022**	0.05	<0.004	0.49	0.010	<0.001
EPL 39	**21 Aug 2022**	<0.01	<0.004	0.05	0.11	<0.001
EPL 39	**02 Oct 2022**	<0.01	<0.004	0.10	0.059	<0.001
EPL 40	**08 Jul 2022**	0.31	<0.004	0.61	0.009	<0.001
EPL 40	**11 Sep 2022**	<0.01	<0.004	0.06	0.040	<0.001

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

Figure 5 - EPL Exceedance - Reservoir Water

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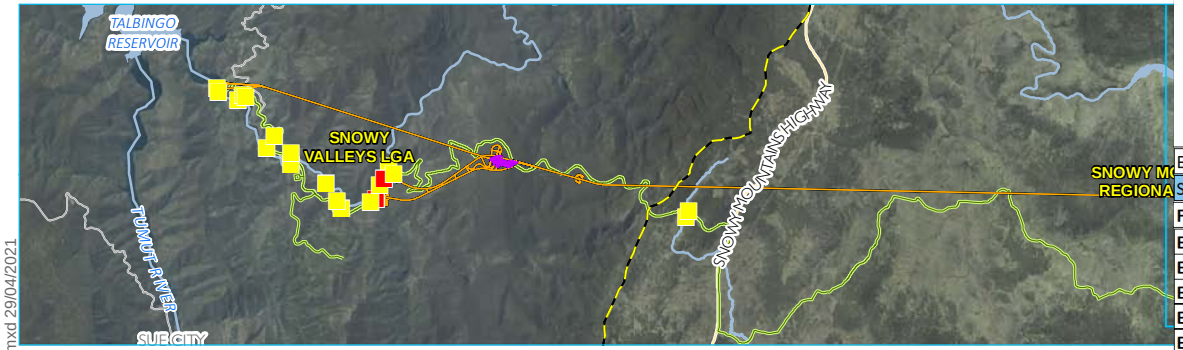

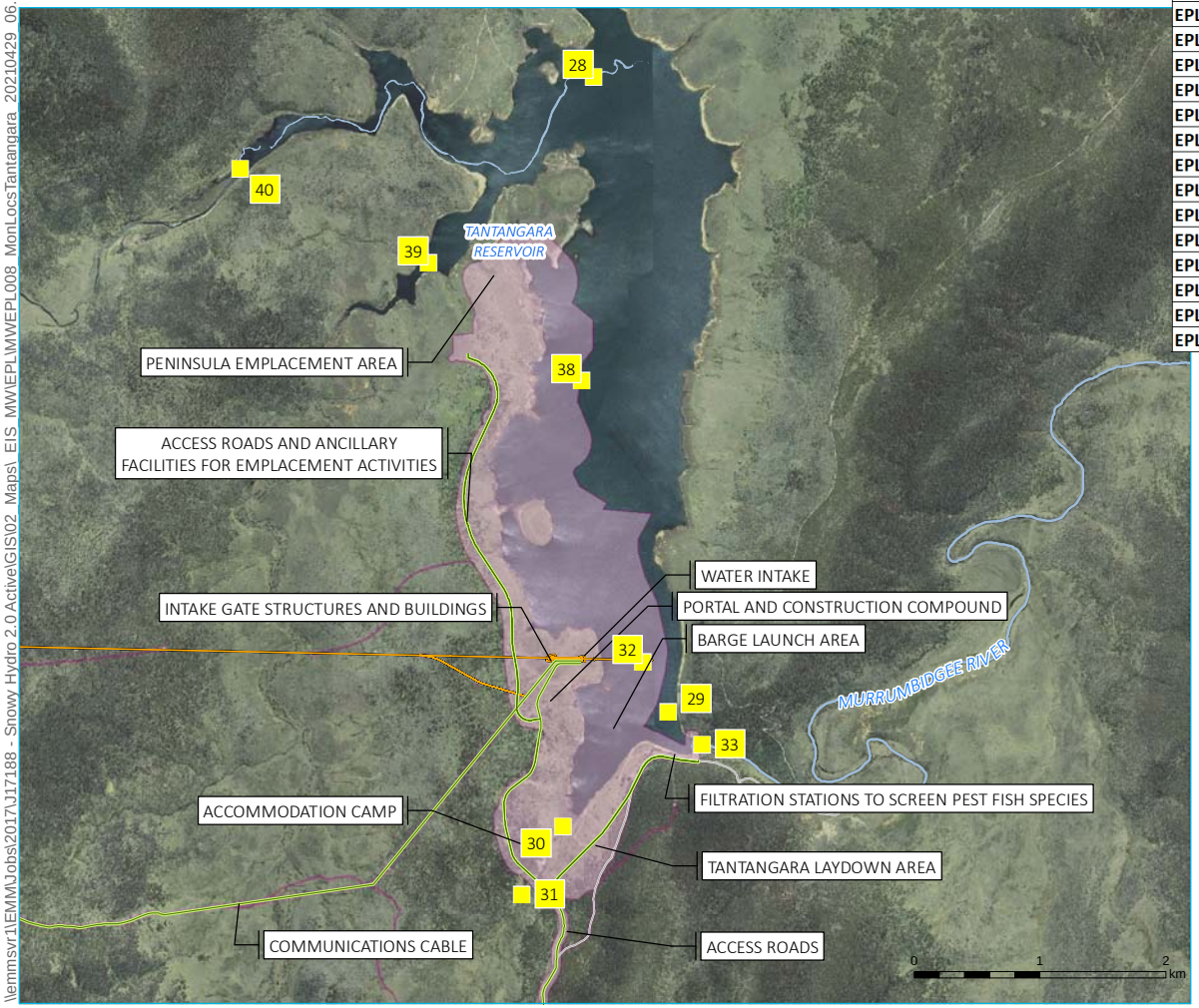

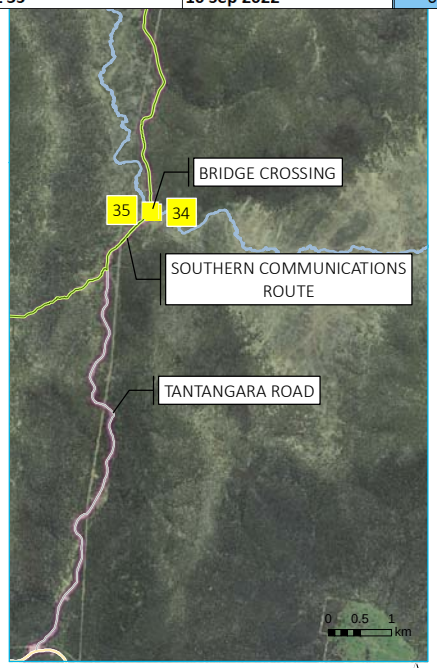

		Nitrite + Nitrate as N	Cyanide Total	Aluminium (filtered)	Chromium (III+VI) (filtered)	Zinc (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.004	0.005	0.001	0.005
Snowy 2.0 - Surface Water Guidelines		0.015	0.004	0.027	0.00001	0.0024
Field ID	**Date**					
EPL 30	**03 Jul 2022**	0.02	0.004	0.14	<0.001	<0.005
EPL 30	**19 Aug 2022**	<0.01	<0.004	0.045	<0.001	<0.005
EPL 30	**10 Sep 2022**	0.06	0.005	0.045	0.001	<0.005
EPL 30	**13 Nov 2022**	<0.01	<0.004	0.021	0.002	<0.005
EPL 31	**03 Jul 2022**	0.06	<0.004	0.15	<0.001	0.006
EPL 31	**19 Aug 2022**	<0.01	<0.004	0.034	<0.001	<0.005
EPL 31	**10 Sep 2022**	<0.01	0.004	0.038	0.002	<0.005
EPL 31	**13 Nov 2022**	<0.01	<0.004	0.031	0.001	<0.005
EPL 33	**03 Jul 2022**	0.03	<0.004	0.11	<0.001	<0.005
EPL 33	**19 Aug 2022**	0.02	<0.004	0.059	<0.001	<0.005
EPL 33	**10 Sep 2022**	<0.01	<0.004	0.040	<0.001	<0.005
EPL 33	**01 Oct 2022**	<0.01	<0.004	0.044	<0.001	<0.005
EPL 33	**10 Nov 2022**	0.04	<0.004	<0.005	<0.001	<0.005
EPL 34	**03 Jul 2022**	<0.01	0.004	0.12	<0.001	<0.005
EPL 34	**01 Oct 2022**	<0.01	<0.004	0.039	<0.001	<0.005
EPL 34	**10 Nov 2022**	<0.01	<0.004	0.027	0.001	<0.005
EPL 35	**03 Jul 2022**	<0.01	0.004	0.073	<0.001	<0.005
EPL 35	**19 Aug 2022**	0.85	<0.004	0.027	<0.001	<0.005
EPL 35	**10 Sep 2022**	0.04	<0.004	0.035	0.001	<0.005

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

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Figure 6 - EPL Exceedance - Surface Water

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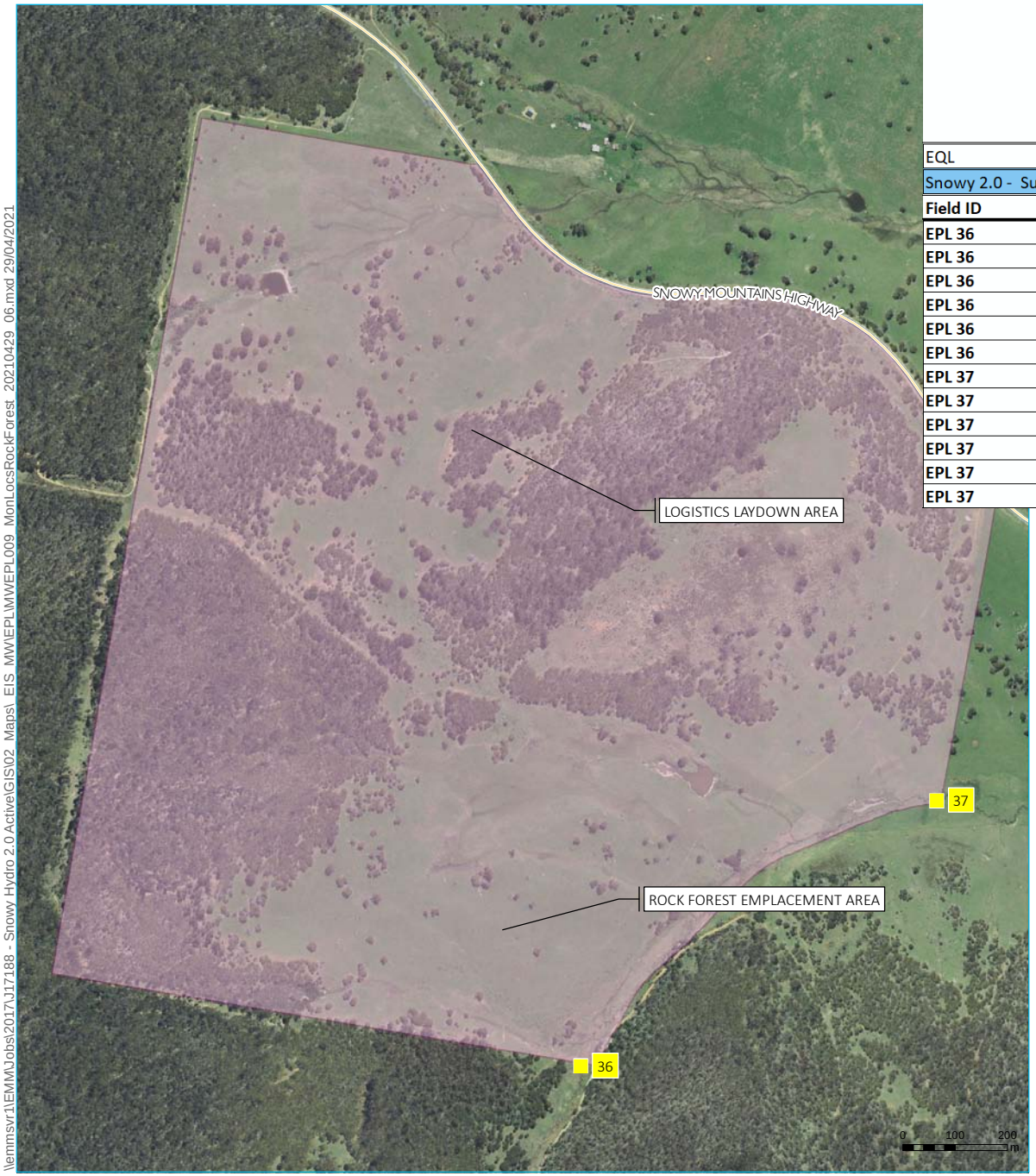
		Nitrite + Nitrate as N	Nitrogen (Total)	Aluminium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.002	0.01	0.005	0.001	0.001	0.05
Snowy 2.0 - Surface Water Guidelines		0.015	0.25	0.027	0.00001	0.001	0.3
Field ID	**Date**						
EPL 36	**16 Jun 2022**	0.04	0.17	0.032	<0.001	<0.001	0.16
EPL 36	**11 Jul 2022**	0.29	0.47	0.15	<0.001	<0.001	0.34
EPL 36	**20 Aug 2022**	<0.01	0.11	0.13	<0.001	<0.001	0.23
EPL 36	**09 Sep 2022**	0.48	0.44	0.054	<0.001	0.002	0.28
EPL 36	**01 Oct 2022**	<0.01	0.08	0.035	<0.001	<0.001	0.15
EPL 36	**09 Nov 2022**	<0.01	0.2	0.025	<0.001	<0.001	0.14
EPL 37	**16 Jun 2022**	0.03	0.21	0.032	<0.001	<0.001	0.16
EPL 37	**11 Jul 2022**	0.06	0.45	0.17	<0.001	<0.001	0.36
EPL 37	**20 Aug 2022**	<0.01	0.19	0.022	<0.001	<0.001	0.08
EPL 37	**09 Sep 2022**	8.7	0.55	0.064	<0.001	<0.001	0.26
EPL 37	**01 Oct 2022**	<0.01	0.04	0.030	<0.001	<0.001	0.15
EPL 37	**09 Nov 2022**	<0.01	0.2	0.015	0.001	<0.001	0.14



GDA 1994 MGA Zone 55

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

Figure 7 - EPL Exceedance - Surface Water

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Future Generation

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