

QUARTERLY ENVIRONMENTAL WATER REPORT MARCH TO MAY 2024

S2-FGJV-ENV-REP-0121

JUNE 2024


This Report has been prepared to satisfy the reporting requirements in the Main Works – Water Management Plan (WMP) and to meet Condition of Approval (CoA) 31(c)(d) of the Infrastructure Approval Schedule which requires publicly available reporting of the outcomes of the WMP. The Report provides commentary on the performance of the monitoring programs as part of the WMP.

Revision Record

A	23/06/2024	Issued for information	C. Pedraza		
Rev.	Date	Reason for Issue	Responsible	Accountable	Endorsed

Document Verification

RACIE Record

R responsible:	Name: Carolina Pedraza Job Title: Environmental Approvals Advisor Signed:  Date: 23/06/2024
A ccountable:	Name: Job Title: Signed: Date:
C onsulted:	See distribution list on Page 3.
I nformed:	See distribution list on Page 3.
E ndorsed:	Name: Massimo Franceschi Job Title: Project Director Signed: Date:

RACIE Terms

R	Responsible The person who actually produces the document.
A	Accountable The person who has the answer for success or failure of the quality and timeliness of the document.
C	Consulted Those who must be consulted before the document is published.
I	Informed Those who must be informed after the document is published.
E	Endorsed Those who must approve the document before publication.

**Document Distribution
 Consulted Distribution List**

Date	Format ⁽¹⁾	Addressee / Job Title	Company	Location ⁽²⁾
June 2024	EC	Chris Buscall	SHL	Cooma

Informed Distribution List

Date	Format ⁽¹⁾	Addressee / Job Title	Company	Location ⁽²⁾
June 2024	OHC	Central Archive	FGJV	Cooma

NOTE: (1) *OHC* – Original Hard Copy / *EC*–Electronic Copy / *HC* – Hard Copy / *Aconex* –Electronic Document Management System

Revision Tracking

Rev.	Date	Description of Revision
A	23/06/2024	Issued to SHL for inclusion of groundwater level assessment prior to external submission.

CONTENTS

ABBREVIATIONS AND DEFINITIONS	5
1. INTRODUCTION	6
2. PURPOSE	6
3. OVERVIEW	7
3.1. Reporting period	7
3.2. Construction progress	7
3.3. Regulatory actions.....	7
4. WEATHER CONDITIONS.....	8
5. SURFACE WATER MONITORING PROGRAM	9
5.1. Routine surface water quality monitoring	9
5.2. Event based monitoring.....	10
6. GROUNDWATER MONITORING PROGRAM.....	10
6.1. Groundwater quality	10
6.2. Groundwater levels.....	11
6.3. Groundwater inflows.....	11
7. TRENDS.....	12
8. CONCLUSION	15
Appendix A – Trend Analysis summary.....	16

TABLE OF TABLES

Table 2-1: Monitoring overview	6
Table 3-1: Key construction activities for March 2024 to May 2024.....	7
Table 4-1: Weather conditions for March 2024 to May 2024.	9
Table 5-1: Design rainfall depths (SWMP Section 5.1.1)	10
Table 6-1: Water access licence	11

TABLE OF FIGURES

No table of figures entries found.

ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
AWS	Automatic weather stations
BoM	Bureau of Meteorology
CoA	Condition of Approval
EPL	Environmental Protection Licence
Future Generation	Future Generation Joint Venture
MDB	Murray Darling Basin
NEM	National Electricity Market
Snowy Hydro	Snowy Hyrdo Limited
Snowy Scheme	Snowy Mountains Hydro-electric Scheme
SWMP	Surface Water Management Plan
TARP	Trigger Action Response Plan
WMP	Water Management Plan
WQO	Water Quality Objectives

1. INTRODUCTION

Snowy Hydro Limited (Snowy Hydro) is constructing a pumped hydro-electric expansion of the Snowy Mountains Hydro-electric Scheme (Snowy Scheme), called Snowy 2.0. Snowy 2.0 will be built by the delivery of two projects: Exploratory Works and Snowy 2.0 Main Works (which has commenced).

Snowy 2.0 is a pumped hydro-electric project that will link the existing Tantangara and Talbingo reservoirs through a series of new underground tunnels and a hydro-electric power station. Most of the project’s facilities will be built underground, with approximately 27 kilometres of concrete-lined tunnels constructed to link the two reservoirs and a further 20 kilometres of tunnels required to support the facility. Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs.

Snowy 2.0 will increase the generation capacity of the Snowy Scheme by an additional 2,200 MW, and at full capacity will provide approximately 350,000 MWh of large-scale energy storage to the National Electricity Market (NEM). This will be enough to ensure the stability and reliability of the NEM, even during prolonged periods of adverse weather conditions.

WeBuild, Clough and Lane have formed the Future Generation Joint Venture (Future Generation) and have been engaged to deliver both Stage 2 of Exploratory Works and Snowy 2.0 Main Works.

2. PURPOSE

This Environmental Water Report has been prepared to satisfy the reporting requirements in the Main Works – Water Management Plan (WMP) and to meet Infrastructure Approval CSSI 9687 (CoA) Schedule 3, Condition 31(c)(d) which requires publicly available reporting of the outcomes of the WMP. The Environmental Water Report is intended to provide commentary on the performance of the monitoring programs as part of the WMP (identified in Table 2-1).

Table 2-1: Monitoring overview

Aspect	Objective
Surface Water Monitoring Program	
Routine receiving surface water quality monitoring	<ul style="list-style-type: none"> inform and assess the performance of management processes/measures that seek to minimise the Project’s impact on surface water quality help determine source and extent of any water quality changes collect baseline data to characterise water quality and determine site specific values
Event based wet weather overtopping water quality monitoring	
Groundwater Monitoring Program	
Groundwater level monitoring	<ul style="list-style-type: none"> inform and assess the performance of management processes/measures that seek to minimise the Project’s impact on regional and local (including alluvial) aquifers and GDEs
Groundwater quality monitoring	
Water extraction monitoring	<ul style="list-style-type: none"> inform and assess water consumption, site water balance and compliance with water access licences

3. OVERVIEW

3.1. Reporting period

This Environmental Water Report covers the monitoring period from March 2024 to May 2024.

3.2. Construction progress

Table 3-1 summarises the key construction activities which have been undertaken during the reporting period.

Table 3-1: Key construction activities for March 2024 to May 2024

Location	Key construction activities
Lobs Hole Ravine Road	<ul style="list-style-type: none"> Irrigation via water carts. Ongoing maintenance.
Lobs Hole	<ul style="list-style-type: none"> Ravine Bay clearing and grubbing completed (Stage 1). Ravine Bay subsurface drainage works are completed for (Stage 1). Ravine Bay spoil emplacement commenced. Main Yard fill and spoil processing are ongoing from D&B tunnels to GF01. 350mm tunnel dewatering pipeline works along the mine trail road works are ongoing. Utilities cable pulling works are ongoing for the precast shed. ECVT IPS installation of rings for LSTT (Large Scale Trail Test) is ongoing. TBM 1 has installed 3 IPS test rings. Grouting in LST rings and other testing works are ongoing.
Marica	<ul style="list-style-type: none"> Marica HDD pad: BH2 drill and reaming are completed, casing installation is completed. BH3 surface hole pilot drilling is completed. Rimming is ongoing. Civil transitions between HDD substantially completed. Rectification of defects ongoing.
Plateau	<ul style="list-style-type: none"> Water Quality Monitoring ongoing. Bore hole 2 reaming completed. Bore hole 3 drilled up to CH + 700.
Rock Forest	<ul style="list-style-type: none"> NA – site under operational use as laydown area.
Talbingo	<ul style="list-style-type: none"> Stage 2 excavation works ongoing. Excavation and ground support works are ongoing on EL.533-EL529. Guard rails installation works are ongoing EL.535. Line drilling and drilling for blasting for zone-2 completed, EL.535 to 525. TBM2.2 Tunnel, has installed 155 rings during the last month. Temporary works in preparation for D&B.
Tatangara	<ul style="list-style-type: none"> Stage 2 excavation and ground support works completed up to elevation 1185. Stage 2 excavation diffuser side elevation 1185-1181.5 rock bolting and surface treatment are ongoing. Stage 2 excavation diffuser side excavation works are ongoing at elevation 1183 -1180.5. HRT transition C1 excavation of 24m was completed in May-24, a cumulative top heading length of 34.08m was completed.

3.3. Regulatory actions

A Clean-Up Notice was received in December 2023 relating to nutrients, and more specifically nitrogen and nitrate concentrations in ground water and surface water from the Project spoil emplacement areas exceeding the relevant WQOs, primarily at GF01. FGJV is actively addressing the ongoing high levels of nitrogen and nutrients, including:

- conducting spoil coring of emplacement areas including GF01, Main Yard, and Lick Hole Gully to identify hot spots;
- conducting additional water sampling with weekly in situ and comprehensive sampling in accordance with TARP 1;
- installation of additional groundwater bores;
- groundwater extraction with treatment of groundwater and leachate basin water at the construction water treatment plants;
- review of water and spoil by water experts and consultants; and
- investigation of options for improvements to the onsite treatment systems and processes.

The following actions are being carried out to manage, limit, and control the impacts in the area:

- The filter cake disposal and related materials at GF01 ceased on 1 December 2023.
- A Nitrogen Management Plan is under preparation in consultation with the EPA.
- Drill and blast activities are being assessed, and a quality procedure will be generated to improve the methodology.
- FGJV is conducting some trials to decrease spoil's nutrient load before placement.
- The water from the leachate basins is transported to the water treatment plants for treatment.

The surface water from EPL 55, downstream from GF01, is pumped to the leachate basin at GF01 when there is a flow and is transported to the water treatment plants for treatment.

4. WEATHER CONDITIONS

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

- “Lobs Hole” - which is an Automatic Weather Station managed by Future Generation in Lobs Hole construction site.
- “Cabramurra” - an Automatic Weather Station located near the lookout in the Cabramurra township managed by the Bureau of Meteorology
- “Tantangara” - an Automatic Weather Station managed by Future Generation in Tantangara construction site.

The Tantangara and Cabramurra gauges are in sub-alpine environments, with elevations of approximately 1220 m and 1475 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.

A summary of climate data for the ravine and plateau areas is provided in Table 4.1

Table 4-1: Weather conditions for March 2024 to May 2024.

Parameter	LobsHole ¹			Marica (Cabramurra)			Tantangara ²		
	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May
Temperature									
Mean maximum	32.9	29.3	20.7	30	26	19	32.8	25.2	19.5
Mean minimum	2.5	0.1	-3.3	-2	-5	-8	-0.2	-2.2	-5.2
Rainfall									
Monthly	21.8	47.4	32.6	27	46	35	14.6	30.8	34.2
Long Term Average	51.4	59.0	71.2	72.0	67.3	97.9	90.4	55.2	36.2

1. Lobs Hole long term average rainfall is taken from the Tumbarumba weather station
2. Tantangara long term average rainfall is taken from the Adaminaby Alpine Tourist Park weather station

The mean maximum temperature was generally high in 2024 than the same period in 2023, but the mean minimum temperatures were lower in 2024 than the same reporting period in 2023.

During the reported period, less rainfall was experienced in all locations that the same period in 2024. Marica received the most rain of the three sites during the reporting period, with a total of 108 mm (Sum of the three months).

The lower-than-average rainfalls, higher maximum temperatures, and lower minimum temperatures are congruent with the "El niño" event declared by the World Meteorological Organization. It was predicted to finished in April 2024. Despite the "El niño" event, some heavy rain events were experienced at each site.

5. SURFACE WATER MONITORING PROGRAM

5.1. Routine surface water quality monitoring

Routine surface water quality monitoring is undertaken in accordance with CoA31 and the Environment Protection Licence No. 21266 (EPL - 21266) to determine if the project is resulting in any impacts to receiving water quality against the Water Quality Objectives (WQO). The WQOs are specified in Table 2-2 of the Main Works – Surface Water Monitoring Program.

Publically available surface water quality monitoring results undertaken in accordance with EPL - 21266 can be accessed [here](#).

During the reporting period, concentrations exceeding WQOs for pH, turbidity, and EC were observed and were identified largely to correlate with recorded precipitation events. It was also observed that the results of metals were largely within the WQO, conversely to nutrients, specifically in April. The exceeding concentrations of nutrient are like due to the run off during rain events. These exceedances are also consistent according to the historical behaviors of these parameters across the Project.

Volumes of discharged treated water to reservoirs remained limited utilising beneficial reuse of water on site in other processes. This reduces the volume of water take from the reservoir and further minimises potential contamination of the reservoir where water may require further treatment.

The investigation regarding the elevated concentrations of nutrients in the vicinity of the spoil emplacement areas is ongoing. As has been demonstrated in the results of the previous reported period, the levels have decreased, reflecting the actions taken by FGJV are having a positive impact.

However, works will continue to control the levels and provide a root solution to the issue. It should be noted that high nutrient levels occur near spoil emplacement areas such as GF01 and Main Yard. The TARP1 protocol continues monitoring and obtaining as much data as possible. FGJV has continued to advance in different types of controls, such as improvements in Erosion and Sedimentation plans, water collection and treatment. These controls are monitored by way of weekly inspections, weekly water monitoring, and improvements in the water management and treatment on site.

5.2. Event based monitoring

Event based wet weather overtopping water quality monitoring is undertaken in accordance with the SWMP Trigger Action Response Plan (TARP 2) to monitor stormwater overtopping sediment basin discharges. Sediment basins for the Project have been designed to meet the design rainfalls depths identified in Table 5-1.

Table 5-1: Design rainfall depths (SWMP Section 5.1.1)

Catchment	Description	85 th percentile, 5-day rainfall (mm)	90 th percentile, 5-day rainfall (mm)	95 th percentile, 5-day rainfall (mm)
Yarrangobilly River	Surface works at Lobs Hole and Marica	28.1	35.6	49.0
Upper Eucumbene River	Surface works between Marica and the Snowy Mountain Highway	35.2	43.4	56.9
Tantangara construction compound	Surface works adjacent to the southern portion of Tantangara Reservoir	30.5	37.0	51.0
Goorudee Rivulet	Surface works at Rock Forest	20.0	25.7	36.1

During the reporting period, rainfall exceeded the design rainfall criteria two times, including:

- 6-10 April 2024 (46.6 mm at Lobshole)
- 30-31 May2024 (34.2 mm at Tantangara – 34 mm at Marica)

Across the sites, water quality results upstream and downstream were generally consistent following significant rainfall events, where turbidity, electrical conductivity, dissolved oxygen, and pH frequently exceeded the WQO. These exceedances are expected, as the Surface Water Management Plan identifies that after heavy rain events, the mentioned parameters will be affected. Water samples were collected for comprehensive water testing, and the EPA was notified of the releases in accordance with R4.1 of EPL 21266. Some exceedances in pH, EC and turbidity were observed. However, the majority of results were within the WQO.

6. GROUNDWATER MONITORING PROGRAM

6.1. Groundwater quality

Groundwater quality monitoring is undertaken in accordance with EPL - 21266 to determine if the project is resulting in any impacts to groundwater. Groundwater quality trigger levels for the Project are outlined in Table C-1 of the Main Works – Groundwater Monitoring Program.

Publically available groundwater quality monitoring results undertaken in accordance with EPL - 21266 can be accessed [here](#).

The frequency of water sampling remains increased during the Mar-May 2024 reporting period as the Nitrogen investigation is ongoing at Lobs Hole. This sampling is focused mainly on the spoil emplacement areas and also considers upstream and downstream EPL points that might be related to the case. Elevated nutrients are still observed. However, the trends from the last reported period showed a slight decrease. Groundwater extraction continued during this reporting period (EPL 56, 57, 58, 95, 92, 82, and 83 located in GF01 and Main Yard) as part of the actions taken by FGJV to minimise mobilisation of the contamination.

High levels of nutrients were observed, predominantly at EPL points 24, 52, 55, 58, 84, 85 and 86, which are currently under investigation and extraction while appropriate treatment options are implemented. The ongoing comprehensive weekly sampling, monitoring, and treatment of groundwater, and construction intervention, where required, demonstrate our commitment to identifying and addressing environmental issues.

Ravine Bay spoil emplacement area works commenced with clearing of trees, installation of drainage, and installation of a liner to minimise the potential for groundwater contamination. Monitoring of groundwater commenced prior to spoil emplacement to provide baseline data for the area.

EPL 1, 4 and 25 metals were primarily within the WQO, with a decrease is observed compared to the previously reported period. However, it is important to clarify that the excesses in metals are representative of natural conditions within the project area at these points.

6.2. Groundwater levels

Groundwater level monitoring is undertaken in accordance with the Groundwater monitoring program to determine groundwater drawdown as a result from the Project.

Site specific groundwater level triggers as outlined in Attachment B of the Main Works – Groundwater Monitoring Program have been established to monitor whether observed drawdown is greater than construction related predicted drawdown. This information is held by SHL.

For the second quarter of 2024, the boreholes sampled by FGJV responded to the weather in terms of rain and temperatures, however were relatively stable with the water level fluctuating by 1-m/

6.3. Groundwater inflows

Groundwater inflow into the tunnels is monitored during construction and compared to predicted inflows. This data is required to monitor the volume of extracted groundwater against water access licence limits (Table 6-1).

Table 6-1: Water access licence

Water Access Licence	Project	Water Source	Share (ML)
WAL42407 – Specific Purpose Access Licence	Exploratory Works	Upper Tumut water source	227
WAL42408 – Groundwater Licence	Exploratory Works	Lachlan Fold Belt MDB	0
WAL42960 – Groundwater Licence	Exploratory Works	Lachlan Fold Belt MDB	354
RO13-19-093 – via Controlled Allocation	Main Works	Lachlan Fold Belt MDB	3,375
RO1-19-092 – via Controlled Allocation	Main Works	Lachlan Fold Belt South Coast	1,722
Specific Purpose Access Licence	Main Works	Tantangara Water Source	532

The monthly inflows for the Construction Water Treatment Plant (CWTP) at the Main Access Tunnel (MAT) Portal are as follows:

- March 9.20 ML
- April 11.37 ML
- May 8.96 ML

The monthly inflows for the Construction Water Treatment Plant (CWTP) at Tintangara are as follows:

- March 19.52 ML
- April 11.42 ML
- May 16.12 ML

Groundwater inflows in March, April and May were higher than those in the previous quarter for Lobs Hole and Tintangara due to TBM increasing its activity, which has increased the inflow compared to the last quarter.

7. TRENDS

The Mann-Kendall statistical analysis test has been chosen to assess trends within surface water monitoring data. Mann-Kendall is a non-parametric test that assesses monotonic trends over time; identified as increasing, decreasing, or showing no significant trend. This test has been selected because it does not assume a specific distribution of the data and is robust against outliers, making it suitable for environmental datasets that may exhibit non-normal behaviour.

In instances where the Mann-Kendall analysis has been inconclusive due to insufficient data, a comparison of key general statistics has been undertaken, including an evaluation of mean, standard deviation, minimum, and maximum values. This comparative analysis has allowed for an assessment of construction monitoring data and whether it falls within the ranges identified in pre-project, baseline data. When calculating the mean value, non-detects have been considered as the detection limit value, rather than half the detection limit value, for a conservative output and thus the mean results in this Report are biased to a higher value.

Detailed Mann-Kendall trend analysis and metric summaries are provided in Appendix A. For each monitoring location, a summary of trends, mean, minimum, maximum and standard deviation is provided.

Surface water

- The following decreasing trends were identified:
- Aluminium – EPL 5, 6, 8, 9, 10, 11, 12, 14, 15, 16, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 40, 51, 52, 55
- Arsenic – EPL 8, 12, 14, 15, 16, 24, 41, 50, 51, 55
- Chromium III + IV – 8, 14, 16, 41, 52, 50, 51, 55
- Copper – EPL 8, 9, 12, 14, 15, 16, 24, 33, 38, 40, 41, 50, 51, 52,
- Iron – EPL 5, 8, 9, 10, 11, 12, 14, 15, 16, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 40, 50, 51, 52

- Manganese – EPL 5, 6, 8, 9, 10, 12, 14, 15, 16, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 52, 55,
- Nickel – EPL 8, 14, 24, 36, 37, 41, 50, 51, 52
- Lead – EPL 8, 12, 14, 16, 24, 41, 50, 51, 52
- Silver - EPL 8, 12, 14, 16, 24, 41, 50, 51, 52, 55
- Zinc – EPL 8, 14, 16, 24, 41, 50, 51, 52, 55,
- Ammonia – EPL 6, 8, 9, 10, 12, 14, 16, 24, 36, 37, 41, 52, 55,
- Cyanide – EPL 5, 6, 8, 9, 10, 11, 12, 14, 15, 16, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 50, 51, 52, 55
- Kjeldahl Nitrogen – EPL 8, 10, 14, 28, 29, 32, 38, 41, 52, 55
- Nitrate + Nitrite – EPL 5, 6, 8, 12, 14, 15, 16, 41, 46, 50, 51, 52, 55
- Nitrogen – EPL 8, 10, 14, 16, 26, 27, 28, 29, 32, 33, 38, 41, 50, 52, 55,
- Total Phosphorus – 8, 40, 51, 41, 54, 55,
- Reactive Phosphorus – EPL 5, 6, 8, 9, 10, 11, 12, 15, 24, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40
- Hardness – EPL 52
- Total suspended solids – EPL 5, 9, 10, 11, 12, 14, 15, 16, 30, 31
- Oil and Grease – EPL 5, 6, 8, 9, 11, 12, 14, 15, 16, 24, 26, 27, 30, 31, 33, 34, 35, 36, 37, 38, 40, 41, 50, 51, 55.

Groundwater

The following decreasing trends were identified:

- Aluminium – EPL 1, 56, 57, 58, 73
- Arsenic – EPL 56, 57, 58, 80, 81
- Chromium III + IV – EPL 56
- Copper – EPL 56, 57, 58, 80
- Iron – EPL 1, 56, 57, 58, 80
- Lead – EPL 56, 57, 58, 83
- Manganese – EPL 1, 2, 56, 57, 58, 72, 80, 83
- Nickel – EPL 4, 25, 56, 57, 58, 72, 80
- Silver – EPL 56, 57, 58, 83
- Zinc – EPL 56, 57, 58, 82
- Ammonia – EPL 56, 57, 58, 80, 81, 83
- Cyanide - EPL 56, 57, 58,
- Kjeldahl Nitrogen – EPL 56, 57, 58, 73, 83

- Nitrate + Nitrite – EPL 56, 57, 58, 80, 81, 83
- Nitrogen – EPL 1, 56, 57, 58, 73, 80, 83
- Total Phosphorus – EPL 56, 57, 58, 80
- Hardness – EPL 72
- Total Suspended solids – EPL 57, 78

The following increasing trends were identified:

Surface water

- Aluminium – EPL 46
- Iron – EPL 46
- Reactive Phosphorus – EPL 55
- Total Suspended solids – EPL 52

Groundwater

- Arsenic – EPL 1, 4, 25
- Chromium III + IV – EPL 1, 4, 25
- Ammonia – EPL 1, 4, 25
- Kjeldahl Nitrogen – EPL 1, 4, 25
- Nitrate + Nitrite - EPL 1, 4, 25
- Total Phosphorus - EPL 1, 2, 4, 25
- Reactive Phosphorus – EPL 69, 71, 72,
- Total Suspended solids – EPL 1

The results obtained from the trends show that the level of decreasing trends were higher than that of increase in both surface water and groundwater. During the reporting period, statistically significant decreases in trend are observed primarily in metals, some nutrients and oil & grease.

The work continues, demonstrating the effort taken by our team to maintain controls in place and mitigate and control the impacts generated. Regarding Groundwater, some decrease in metals and nutrients is observed, which is consistent with the previously reported period. The controls and monitoring carried out will continue, where sampling and inspections are the main sources of observations and early warnings if applicable. Generally, the nitrogen concentrations in groundwater and surface water had statistically significant decreasing trends.

A smaller number of increases are observed, especially in EPL 1, 4 and 25, where historically, at this time of year, this behavior has been observed and is related to the area's natural variation.

8. CONCLUSION

EPL monitoring results that exceeded the WQO are generally consistent with natural events such as rainfall and changes in seasonal weather, except for nutrients in the vicinity of spoil emplacement areas. The investigation relating to the Clean-up notice is ongoing through weekly and monthly sampling, and monitoring of the spoil emplacement areas. Laboratory results have been compiled and analyzed to create a baseline and monitor the behaviour of water with regard to direction and flow rate according to the seasons and periods of rain in each location. Further actions are being carried out to minimise ongoing contamination of the area and reduce the impacts mentioned above.

Some of the actions are ongoing, and the positive impact are demonstrated in the trends. Metals and nutrient levels decreased, mainly in GF01 and Main Yard EPL points (EPL 56, 57, 58, 80, 81, 83).

The reservoir discharge has been limited; the water is being treated and reused on-site when needed.

In general, the trend analysis shows that some exceedances in nutrients and metals are decreasing, and notably, the nitrogen concentrations in groundwater and surface water are generally decreasing across site. However, FGJV continues to take action and look for options to reduce these levels to meet background levels.

For example, the new spoil emplacement areas (Ravine Bay, Rock Forest and Tantangara) are being designed and built based on the lessons learned from GF01 and Main Yard, with on-site controls (such as liners) are being implemented. These actions are based on the results of the monitoring that has been carried out, the observations obtained and the input from different experts in the area to address the current issues and avoid any other impact from the spoil emplacement.



APPENDIX A – TREND ANALYSIS SUMMARY

Main data table with columns for Location, Site ID, and various chemical elements: Aluminum, Arsenic, Chromium, Copper, Iron, Manganese, Nickel, Lead, Silver, Zinc. Each element has sub-columns for Mean, Min, Max, and StdDev.

Summary data table with columns for Element, Trend, and various statistical metrics like Mean, Min, Max, and StdDev for each element across different sites.