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REPORT

**BI-ANNUAL SPOIL REPORT
FEBRUARY 2025 – JULY 2025**

S2-ENV-RP-GEN-REP-FGJV0133

REV C

APRIL, 2026

ABSTRACT

This report provides an overview of the spoil management during the nominated reporting period in accordance with Schedule 3 Condition 7 (f).

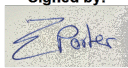
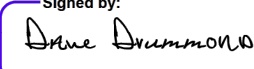
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1 Introduction

1.1 Background

Snowy Hydro Limited (SHL) 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 commenced in October 2020).

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 2,000 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 (FGJV) and were engaged to deliver Stage 2 of Exploratory Works and Snowy 2.0 Main Works.

1.2 Purpose and Scope

This Biannual Spoil Monitoring Report (the Report) has been prepared to satisfy the reporting requirements for:

- Schedule 3, Condition 7 of the Infrastructure Approval; and
- Section 9.5 of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).

Table 1-1 details the relevant conditions of the Infrastructure Approval as well as the sections of the Report where the conditions have been addressed.

The scope of this report covers the period from 1st February 2025 to 31st July 2025.

Table 1-1 Summary of Approval Requirements Covered in this Report

Condition	Report Section
Spoil Management Plan – Section 9.5 – Table 9-4	
Report on:	
a) Volume of spoil excavated from tunnelling	Section 2.1
b) Volume placed at each emplacement area: i. Ravine Bay; ii. GFO1; iii. Lobs Hole; iv. Tantangara; or v. Rock Forest.	Section 2.1
c) Volume disposed of off-site (if any).	Section 2.2
d) Volume reused elsewhere in Kosciuszko National Park (KNP) (if any).	Section 2.3

Condition	Report Section
e) Volume of Acid and Metalliferous Drainage (AMD) material treated (if any).	Section 2.4
f) Volume of Naturally Occurring Asbestos (NOA) excavated and placed in encapsulation (if any).	Section 2.5
Infrastructure Approval - Schedule 3 - Condition 7 (f)	
Include a program to monitor and publicly report on:	
a) the management of spoil on site;	Section 3
b) the implementation of each of the detailed plans, including the effectiveness of the proposed mitigation and contingency measures; and	Section 3
c) progress against the detailed completion criteria and performance indicators of each permanent spoil emplacement area.	Section 4.2

1.3 Terminology

Terminology used when reporting spoil volumes are provided in Table 1-2.

Table 1-2 Terminology Used to Describe Spoil Volumes

Terminology	Volume Terminology	Description	Conversion Factor (Relative to unbulked)
Unbulked	Bank Cubic Meters (BCM)	Refers to the volume of spoil prior to excavation. Also commonly referred to as bank volume	1.0
Bulked	Loose Cubic Meters (LCM)	Refers to the volume of spoil stockpiled after excavation	1.25
Placed	Compacted Cubic Meters (CCM)	Refers to the volume of spoil placed in a PSE and accounts for compaction that is undertaken during placement to offset bulking and minimise long term consolidation	1.15

2 SPOIL VOLUME

2.1 Volume of Emplaced Spoil

During the reporting period 1,046,048 m³ of spoil was moved:

- 780,627 m³ of spoil was excavated
- 264,421 m³ of spoil moved within the site, predominantly from the GF01 to RRN PSE.
- 1,000 m³ of spoil was transported to Yarrangobilly Campground Works for NPWS in March – April 2025.

Table 2-1 Summary of Spoil Volumes (LCM) between 1 February 2025 and 31 July 2025

Source Area												
				LOB			MAR			TAN		
				MAT / ECVT	TBM2	GF01	USS	Adit	TSE	TBM3	D&B	TSE
Disposal Area	LOB	RRN	134,060	133,639	224,188	-	-	-	-	-	-	-
		GF01	355	6,263	-	-	-	-	-	-	-	-
		MYD	529	9,420	-	-	-	-	-	-	-	-
	TAN	TSE	-	-	-	-	-	2,206	56,070	3,643	-	-
		PSE	-	-	-	-	-	1,596	132,906	32	36,431	
	ROC	PSE	-	-	-	-	-	-	-	-	-	-
		MAR	TSE	-	-	-	13,710	290,000	-	-	-	-
	OTH	OTH¹	-	-	-	-	-	-	1,000	-	-	-
		Total	134,944	149,322	224,188	13,710	290,000	3,802	189,976	3,675	36,431	

Notes to Table

1) Yarrangobilly Campground Works for NPWS

2.2 Offsite Disposal

A summary of the offsite disposal of soil and rock materials is presented in Table 2-2.

Table 2-2 Summary of Offsite Disposal

Project Area	Waste Classification Certificate Number	Volume m ³	Classification	Description
Lobs Hole - MAT Portal	754-SYDGE230005D-L53	1,726	General Solid Waste - Non putrescible	Filter Cake
Lobs Hole - Talbingo	754-SYDGE230005D-L53	1,280	General Solid Waste - Non putrescible	Filter Cake
Tantangara - Surface	754-SYDGE230005D-L53	464	General Solid Waste - Non putrescible	Filter Cake
All Sites – Filter Cake Hook Bins	754-SYDGE230005D-L90	2,014	General Solid Waste - Non putrescible	Filter Cake
Tantangara STP: Bays 2 & 3	754-SYDGE230005D-L104	5,971	General Solid Waste - Non putrescible	Filter Cake
Pad G (MY07 Material)	754-SYDGE230005D-L99	2,000	General Solid Waste - Non putrescible	Sediment
Lobs Hole - MYD -Soil Hook Bins	754-SYDGE230005D-L100	11	General Solid Waste - Non putrescible	Contaminated Soil
Tantangara - Q2 Laydown - Soil Hook Bins	754-SYDGE230005D-L102	16	General Solid Waste - Non putrescible	Contaminated Soil
Marica – M4 Laydown and Zone 10	754-SYDGE230005D-L111	56	General Solid Waste - Non putrescible	Contaminated Soil
Marica – M4 Laydown	754-SYDGE230005D-L113	6	Hazardous Solid Waste	Contaminated Soil
Marica – M4 Laydown	754-SYDGE230005D-L115	7	General Solid Waste - Non putrescible	Contaminated Soil
Tantangara – Adjacent Spoil Rd Crib	754-SYDGE230005D-L119	9	Restricted Solid Waste – Non putrescible	Contaminated Soil
Tantangara – Q3 Laydown	754-SYDGE230005D-L122	13	Restricted Solid Waste – Non putrescible	Contaminated Soil
Total	-	13,573	-	-

Disposal sites which have been used during this period are presented in Table 2-3.

Table 2-3 Summary of Disposal Locations

Tipping Location	Address	EPA Licence Number
ACT Recycling	Mugga Lane Resource Management Facility, Mugga Lane Symonston, ACT 2609	L0005
Bellettes	10 Killarney Road, Gilmore, NSW, 2720	20596
Cleanaway Kemps Creek	1725 Elizabeth Drive, Kemps Creek, NSW 2178	4068
Hi-Quality - Minda Landfill - Windellama	Oallen Ford Road, Windellama, NSW 2580	10398

2.3 Volumes Reused

Approximate volumes of spoil material reused within the Project are outlined below:

- 4,305 m³ of spoil was reused at Marica Adit.
- Small quantities of Virgin Excavated Natural Material (VENM) were used for Pad and road maintenance throughout the Project, as required.

2.4 PAF Treatment and Validation

In accordance with the Spoil Management Plan, material identified as PAF requires treatment and validation prior to incorporating spoil into the emplacement area. Treatment methods are dependent on the testing results and availability of suitable site won material with acid neutralising capacity.

During the reporting period, reactive material was identified as per Table 2-4. This reactive material, in addition to reactive material identified within the previous reporting period and excavated during this current period, was treated and subsequently validated by either having achieved an NPR >3 or by consultation provided by a suitably qualified contractor. Records of PAF treatment are provided in Table 2-4, while further supporting information was provided by the WSP Memo PS204364-WSP-PER-MNG-MEM-041.

2.5 NOA Encapsulation

No NOA was encountered during this reporting period.

Table 2-4 PAF treatment and validation details between 1 August 2024 and 31 Jan 2025

Type	PAF Source Location	PAF Specific Source	PAF Spoil – Volume (m3)	NAF with ANC – Spoil Location	NAF Specific Source	NAF with ANC – Volume (m3)	Blending Ratio (PAF:NAF with ANC)	NPR Following Neutralisation
D&B	MAT02-A	CH553.4-560.4	640	Material from previous chainage	MAT-02	1,280	1:2	31.69
TBM	HRT01-02	R1156-1170 R1176-1190 R1196-1205 R1216-1220	8,000	HRT01-02	R921-956 R1211-1225	8,000	1:1	5.32
TBM	HRT01-02	R1271-1275	1,000	HRT01-02	R1266-1270 R1276-1280	2,000	1:2	17.36
TBM	HRT01-02	R1266-1325	10,000	HRT01-02	R1266-1325	10,000	1:1	4.80
TBM	HRT01-02	R1326-1335	2,000	HRT01-02	R1336-1345	2,000	1:1	4.60
TBM	HRT01-02	R1351-1370	4,000	HRT01-02	R1346-1350 R1370-1385	4,000	1:1	4.60
TBM	HRT01-02	R1386-1390 R1396-1400	2,000	HRT01-02	R1391-1395 R1401-1405	2,000	1:1	4.60
TBM	HRT01-02	R1431-1435	1,000	HRT01-02	R1446-1450	1,000	1:1	4.60
Total	-	-	28,640	-	-	30,280	-	-

3 SPOIL MANAGEMENT

3.1 Introduction

Spoil is currently managed under the spoil management plan, with mitigation and control measures provided in Appendix A.

3.2 Additional Nitrate Controls

Additional controls have been implemented on the project to mitigate potential nitrate contamination. These include:

- The Nitrogen Management Plan (S2-FGJV-PLN-0367) has been issued for final review, to provide information and guidance on relevant works:
 - a) Controls listed in the Nitrogen Management Plan are being applied on the Project and further works are being developed in line with Nitrogen controls.
 - b) Development of a Nitrogen-specific, interactive training module by an external provider has been completed and is being rolled out to capture new, existing and future employees.
- Groundwater extraction has been undertaken from several wells during the reporting period, as reported on a fortnightly basis to the NSW EPA.
- Comprehensive Nitrogen datasets continue to be compiled for works across the Project and are used to direct ongoing sampling for Nitrogen concentrations in soil and water.
- Sampling of spoil material for Nitrogen continues at D&B work fronts following blasting and at Emplacement Areas following emplacement.
- The construction of Project PSE areas has continued, with spoil being placed in lined areas with leachate collection system, where applicable.
- Previously implemented controls at Marica remain in place as D&B works continue for the Upstream Surge Shaft, including:
 - c) lined temporary spoil emplacement area in line with design, to hold spoil while stored temporarily on site.
 - d) Ion exchange unit at the Marica water treatment plant to further remove nitrates and nitrates from construction water.
 - e) Relining of leachate collection ponds downstream of the spoil emplacement area.
 - f) Works are currently being supervised by the spoil manager and / or spoil advisors.

4 CONCLUSIONS

4.1 Spoil Summary

During the reporting period, spoil characterisation was carried out in accordance with the Spoil Management Plan.

- A total of 780,627 m³ of ex-situ spoil materials was generated during this period:
 - g) 28,640 m³ of PAF was identified and treated during this reporting period.
 - h) No NOA was encountered during this reporting period.
 - i) Sludge and Filter Cake materials are currently being disposed of offsite.
- The following spoil emplacement areas were active during this reporting period:
 - j) Ravine Bay PSE
 - k) GF01 PSE
 - l) Main Yard TSE
 - m) Marica TSE
 - n) Tantangara TSE
 - o) Tantangara PSE
- Additional measures have been implemented to further mitigate the potential risk of nitrate contamination resulting from blasting activities.

4.2 Assessment Against Completion Criteria

During this reporting period, no spoil emplacement areas were finalised and as such completion criteria listed in Section 7 of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019) have yet to be assessed.

APPENDIX A. SPOIL MANAGEMENT MEASURES

A.1. Spoil Mitigation Measures

Measure / Requirement	Implementation	Effectiveness
Training will be provided to all project personnel, including relevant sub-contractors on spoil management practices and the requirements from this plan through inductions, toolboxes and targeted training.	Training has been and continues to be provided to all relevant project personnel involved in spoil works. Nitrogen-specific interactive training module has been developed to cover broad aspects of nitrogen-impacted spoil management and provide context on related issues. Training is currently being rolled out to new and existing employees.	Training programs including Nitrogen Management Plan modules achieved 95% compliance until reporting period. Additionally, there is no recorded result of any Nitrogen related incidence, as all the spoils are placed at the monitored and tracked if placed in a correct location.
Management measures from this plan will be included in relevant site environmental documents including for example, Work Packs and/or Site Environmental Plans (SEPs).	Management measures from the spoil management plan are currently being implemented and have been correlated to site work packs such as the Inspection and Test Plan (ITP) for spoil. Some of the management measures include pre-characterisation of Spoil, PAF treatment (if any), load sheets, surveys and emplacement validation testing. All the test results are uploaded on internal QA/QC portal GLAASS. The current revision of the spoil reuse procedure (S2-FGJV-ENV-PRO-0056) is being finalised and will cover all aspects of spoil characterisation for emplacement, on-site reuse, off-site reuse and off-site disposal. The document is aimed to maximize the reuse of spoil across the site with appropriate environmental compliance.	Implementation has been effective, as confirmed by the successful correlation of the Spoil Management Plan to active Site Work Packs and ITPs. The use of the GLAASS QA/QC portal has ensured that 100% of test results (including PAF treatment and validation) are traceable and compliant with regulatory reporting requirements. The reduction in off-site transport volumes during this period serves as physical evidence that the site's internal reuse procedures are functioning as intended to meet environmental objectives. Refer to Table 2-4 PAF treatment and validation details between 1 August 2024 and 31 Jan 2025 for all the PAF successfully treated on site as per the revised ITP.
The spoil characterisation program in Appendix A of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019) will be implemented. The program will enable adequate assessment of contaminated materials, NOA, Acid Metalliferous Drainage (AMD) / Neutral Metalliferous Drainage (NMD) / Saline Drainage (SD) material and reduce the risk of material being misclassified as 'benign' and being managed inappropriately.	Spoil characterisation and spoil leachate sampling and assessment is ongoing across the project. In accordance with Appendix A of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019), adequate assessment of materials is facilitated through high sampling frequency, QA/QC testing and validation testing. Nutrients continue to be screened for in D&B and emplacement validation works, where they are deemed to be a CoPC.	Refer to Table 2-4 PAF treatment and validation details between 1 August 2024 and 31 Jan 2025 for all the PAF successfully treated on site as per the revised ITP. All the test results are uploaded on internal QA/QC portal GLAASS and are also submitted to the clients (SHL) during monthly progress reporting.

Measure / Requirement	Implementation	Effectiveness
Targeted investigations will be undertaken prior to construction along the surface disturbance areas using a risk-based approach. The results of these targeted investigations will determine the level of management to be implemented.	Samples are currently being taken from in-situ spoil materials where contamination is expected prior to excavation based on sampling densities prescribed in the Spoil Management Plan (S2-FGJV-ENV-PLN-0019). Sampling densities are based on geological formation of the rocks, preliminary site investigation showing areas with likelihood of COPCs. Moreover, sampling densities are revised when COPCs show uniform conditions and low risks.	Targeted borehole sampling at the Tantangara Intake Stage 3 footprint confirmed the presence/absence of additional CoPCs in topsoil and subsoil prior to disturbance. This proactive investigation ensured that excavation and stockpiling strategies were tailored to actual site conditions, effectively eliminating the risk of cross-contamination during construction.
Material which has been assessed as not suitable for reuse on land or for subaqueous disposal or cannot be reused will be classified in accordance with the Waste Classification Guidelines (NSW EPA 2014).	Where material has not been suitable for reuse, it has been classified in accordance with the Waste Classification Guidelines (NSW EPA 2014) and disposed offsite at an appropriately licenced facility, material typically includes spoil which has been impacted by spills. In addition to the Waste Classification Guidelines (NSW EPA 2014) material may be characterised in accordance with an applicable Resource Recovery Order (RRO) where appropriate. Refer to Table 2-2 for Summary for off-site disposal of materials sent off-site as per the guidelines.	100% of material unsuitable for onsite reuse was classified per NSW EPA 2014 Guidelines prior to removal. The effectiveness is verified by the reconciliation of waste dockets against Table 2-2 confirming all off-site disposal occurred at appropriately licensed facilities in full compliance with the project's conditions.
Prior to the importation of any VENM during construction, the VENM source(s) will be identified and assessed against the definition of VENM in the Waste Classification Guidelines (NSW EPA, 2014) and the POEO Act. The VENM source(s) will be assessed by an appropriately qualified contaminated land consultant.	During the reporting period, no VENM was imported to the project. The project currently has a surplus of VENM and as such significant import is not expected.	Refer Table 2-1 for material placed and reused across the site. No VENM importation was required during the reporting period due to the project's successful surplus management. The verification framework (including consultant assessment) remains in place to ensure any future imports meet POEO Act definitions, thereby preventing the introduction of external contaminants to the KNP.
Spoil generation will be minimised through design optimisation and beneficial reuse as set out in Section 6.2 of the Spoil Management Plan.	The design has been optimised to minimise spoil generation and maximise beneficial reuse. Discussion is ongoing around the incorporation of spoil materials into the final landform of the site where possible.	Refer Table 2-1 for material placed and reused across the site. monitoring and tracking of the material across the site have been effective via multiple sources such as, load sheets, progress reports, and weekly surveys.
Spoil is to be only re-used, placed, or disposed of in accordance with its classification as set out in Section 6.1 of the Spoil Management Plan.	Excavated spoil material has been reused where possible and all suitable site-won spoil has been retained within the project area. Any PAF identified on the project is appropriately ameliorated before placement into one of the PSE areas.	Materials are classified as PAF or NAF prior to excavation, based on which its placement or treatment is advised. Refer Table 2-1 for material placed and reused across the site and

Measure / Requirement	Implementation	Effectiveness
		Table 2-4 for all the PAF managed on site during reporting period. Hence, PAF management measures has been implemented successfully across the site.
Apart from the spoil that is provided to the NPWS for use in other parts of the Kosciuszko National Park, sent off-site, used to construct temporary or permanent infrastructure for the development or used to rehabilitate the site, the Proponent must ensure that all the spoil generated by the development is disposed of in the following emplacement areas: • Ravine Bay; • GFO1; • Lobs Hole; • Tantangara; or • Rock Forest	All spoil not reused or disposed off-site within the reporting period has been placed within the spoil emplacement areas listed here except for approximately 1,000 m ³ of material which was sent to NPWS, this material was classified as VENM.	Refer Table 2-1 for material placed at different PSEs across the site during reporting period.
TBM spoil must not be placed in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary.	During the reporting period, TBM spoil was not placed in the active storages or below the fully supply level of Talbingo or Tantangara Reservoir.	N/A
Spoil from dredging, channel excavation or underwater blasting must not be placed in the eastern and western emplacement areas, or in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary.	During the reporting period, no spoil was generated from dredging, channel excavation, or underwater blasting. Materials are monitored and tracked on daily basis via daily reports and load sheets across the site.	All the spoil generated from each work front, along with the placement location is provided in Table 2-1. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.
The beneficial reuse of non-reactive spoil on the project will be maximised where possible.	Spoil reuse has been maximised through utilisation in roads and other temporary infrastructure. It should be noted that the amount of spoil generated on the project greatly exceeds the amount of spoil which is required for project works.	Refer Table 2-1 for material reused during reporting period. Maximizing the reuse of material has successfully minimized waste generation on site.
The beneficial reuse of non-reactive spoil elsewhere in the KNP will be maximised where possible (as requested and approved by NPWS).	During this reporting period, approximately 1,000 m ³ of material was sent to NPWS for works at the Yarrangobilly Campground Works, this material was classified as VENM. no spoil has been reused elsewhere in the KNP.	Refer Table 2-1 for material reused off-site. Maximizing the reuse of material has successfully minimized waste generation on site.

Measure / Requirement	Implementation	Effectiveness
Off-site disposal of spoil will be minimised where possible. Surplus spoil will be directed to the permanent spoil emplacement areas as a priority over off-site disposal.	Where the material does not pose an adverse risk to human health or the environment it is reused within the project. It should be noted that during this reporting period filter cake and sludge materials are currently being taken offsite as per EPA directive.	Refer to the Table 2-2 for Summary for off-site disposal of materials sent off-site as per EPA directive. Hence, any potential adverse risk was successfully mitigated via off-site disposal.
Spoil left at Lobs Hole, Marica and Tantangara for incorporation into the final landform should be minimised.	Presently the majority of spoil is placed within the PSE areas rather than stockpiled within the temporary spoil emplacement areas for final rehabilitation. During this reporting period Ravine Bay, GF01 and Tantangara PSE areas received spoil materials. For Marica, works have commenced to build Rock Forest PSE.	Refer to the Table 2-1 for material placed at various PSEs and temporary spoil pad successfully. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.
The Exploratory Works western emplacement area must only receive non-reactive spoil, which has a low geochemical risk and is suitable for reuse. Reactive spoil must not be directed to the Exploratory Works western emplacement area.	The Exploratory Works western emplacement area has not received any reactive material for this reporting period and is not anticipated to receive any further spoil.	Any material not suitable for placement or re-use was taken off-site. Refer to Table 2-2 for summary for off-site disposal of materials successfully sent off-site as per EPA directive. Also, to the refer Table 2-1 for material placed at various PSEs and temporary spoil pad successfully.
The Contaminated Land Management Plan (S2-FGJV-ENV-PLN-0049) will be implemented to ensure appropriate management of contaminated material on site.	Spoil has been managed in accordance with the Contaminated Land Management Plan (S2-FGJV-ENV-PLN-0049). Potentially contaminated areas within the project such as former mine tailing sites were not excavated or remediated during this period. Some spoil including filter cake and sludge material was disposed offsite during the reporting period as per EPA directive. Overall, the amount of material transported offsite was a small percentage of total spoil.	Any material not suitable for placement or re-use was taken off-site. Refer to Table 2-2 for Summary for off-site disposal of materials sent off-site as per EPA directive. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.
An unexpected finds procedure is included in the Contaminated Land Management Plan (S2-FGJV-ENV-PLN-0049). Workers will be trained to identify potential contamination that may be encountered during construction.	Training has been provided to all relevant project personnel involved in spoil works. Nitrogen Management training is now being rolled out to new and existing employees.	List of all the attendees has been successfully recorded by FGJV Training department. Approximately 2100 employees have attended the training till reporting period. No incident related to elevated nitrogen has been identified

Measure / Requirement	Implementation	Effectiveness
		during reporting period. Training will be ongoing for all the new employees.
The Naturally Occurring Asbestos Management Plan (Appendix D of this Plan) will be implemented to ensure appropriate management of Naturally Occurring Asbestos encountered during works.	Naturally Occurring Asbestos has been identified along the headrace tunnel at 7.5 km. During the reporting period, excavation did not occur along the 7.5 km alignment.	No asbestos identified during the reporting period.
The Acid and Metalliferous Drainage Management Plan (Appendix E of the Spoil Management Plan) will be implemented to ensure appropriate management of AMD material encountered during works.	During the reporting period, the AMD Management Plan was implemented, including ongoing characterisation testing for AMD material at all underground work fronts and Emplacement Validation testing in all active PSE areas.	Potential Acid Forming rocks were identified and treated successfully treat as shown in Table 2-4 PAF treatment and validation details between 1 August 2024 and 31 Jan 2025 as per the ITP.
The Waste Management Plan (S2-FGJV-ENV-PLN-0048) will be implemented to ensure appropriate classification, use and disposal of waste from the project.	All spoil which is not suitable for onsite reuse is categorised for offsite reuse or offsite disposal in accordance with the NSW/EPA waste classification guidance.	Any material not suitable for placement or reuse was taken off-site. Refer to Table 2-2 for Summary for off-site disposal of materials sent off-site as per EPA directive. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.
Material which is not suitable for reuse or placement or on onsite remediation, will be transported to a facility that is lawfully permitted to receive that material.	All spoil which is not suitable for onsite reuse is categorised for offsite reuse or offsite disposal in accordance with the NSW/EPA waste classification guidance All filter cake and sludge materials were disposed offsite during this reporting period under EPA directive.	Refer to Table 2-2 for Summary for off-site disposal of materials sent off-site as per EPA directive. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.
The Stockpile Procedure (Appendix C of the Spoil Management Plan) will be developed to ensure temporary stockpiling is appropriately managed and that any adverse impacts are controlled and rectified.	Stockpiling of material has been carried out in accordance with the Stockpiling Procedure including, but not limited to, the location of stockpiling, erosion and sediment controls, stockpile heights, and management.	All the spoil volume as per Table 2-1 has been successfully stockpiled at different PSEs and TSEs across the site as per the procedure. Monitoring and tracking of the materials via load sheets, progress reports and weekly surveys has effectively prevented any breach of compliance during reporting period.

Measure / Requirement	Implementation	Effectiveness
The Surface Water Management Plan (S2-FGJV-ENV-PLN-0011) will be implemented to ensure impacts on surface waters, because of spoil handling and placement, are minimised.	Impacts on surface water have been minimised in accordance with the measures outlined in the Surface Water Management Plan (S2-FGJV-ENV-PLN-0011) including the diversion or clean water and the management of storm water and leachate water. The Ravine Bay, Tantangara and Rock Forest PSE designs include leachate collection systems with associated emergency water storages to ensure that there is sufficient capacity for leachate collection.	Water sampling and testing is carried out on routinely basis by Environmental and Water Specialist. Any trigger in values was notified, and necessary action were taken by environmental team as per the management plan. All the result summaries and incidences are recorded in Bi-annual EPL Water Monitoring reports every 6-months.
Site-based Erosion and Sediment Control Plans (ESCPs) will be prepared by a suitably qualified erosion and sediment control specialist.	All ESCPs have been prepared by SEEC, a qualified erosion and sediment control specialist.	All the management measures are tailored to site-specific risk. Therefore, all the measures were successfully implemented on site as per the ESCP prepared by SEEC. Hence, site-based risk assessment is fit for purpose, it reflects the site conditions and align with Blue Book to have minimum environmental impact.
An Asbestos Management Plan (S2-FGJV-HAS-PLN-0010) has been developed and will be implemented to manage Asbestos Containing Materials ACM (ACM), or areas are suspected of containing ACM (such as historical buildings). The AMP addresses unexpected finds of ACM. Specifically, protocols will be stipulated for separation, monitoring, validation and clearance of asbestos.	The Asbestos Management Plan has been followed. During the reporting period, no asbestos was identified within the site. During this period no excavations were undertaken within an area of known asbestos.	No asbestos identified during the reporting period.
An Occupational Hygienist (Hygienist) will be on-site for the duration of the excavation works where ACM has been identified from pre-construction or where unexpected finds of ACM are encountered.	During the reporting period, no ACM was identified on site. Occupational hygienists are currently being mobilised for anticipated asbestos works which are schedule to commence in March 2026.	No asbestos identified during the reporting period.
The process Water Treatment Plants will receive all tunnel drainage, including tunnel drainage containing AMD components for excavations in Possible, Likely and Confirmed AMD hazard areas. The water will be reused in the tunnelling process following treatment. Any discharge to the environment will only occur where the water is treated, so as to comply with the criteria in EPL 21266.	During the reporting period all treated process water was either reused in accordance with WMP e.g. for tunnelling and dust suppression or discharged at the nominated EPL discharge point in Talbingo or Tantangara Reservoir. The Ravine Bay, Tantangara and Rock Forest PSE designs include leachate collection systems with associated emergency water storages to ensure that there is sufficient capacity for leachate collection.	As per the treatment plants productivity data, approximately 50% of the water get reused on site and remaining get discharged if it meets the discharge criteria. This minimizes the potential impact of untreated water on site. All the data regarding treated water and discharged water is successfully recorded in CWT Plants Productivity and Consumption Sheet.

Measure / Requirement	Implementation	Effectiveness
The Topsoil Strategy (Appendix B of the Spoil Management Plan S2-FGJV-ENV-PLN-0019) will be implemented to ensure the surface of the emplacement areas will be suitable to sustain the target PCTs in the long term.	Measures have been implemented in accordance with the topsoil strategy, including, but not limited to: - Stockpiled, signposted and separated from other materials - Height will not exceed 2.5m to minimise the risk of compaction and to maintain the viability of the soil - Stockpiles monitored and managed for weeds	As per the strategy Topsoil is stockpiled separately from rest of the spoil at Ravine Bay PSE, Around Tantangara PSE and Marica HDD PAD with appropriate management measures in place. All the topsoil survey pickup volumes are uploaded on internal QA/QC portal GLAASS and tracked effectively on routinely basis.
A hold point process will be established and implemented requiring approval by the FGJV Environment Manager or Construction Manager prior to the placement of material generated from dredging, channel excavation or underwater blasting. This hold point process will note that this material cannot be placed in the Exploratory Works eastern and western emplacement areas without the approval of the Planning Secretary.	During the reporting period, no spoil was generated from dredging, channel excavation or underwater blasting.	Not relevant for the reporting period
The western emplacement area will be used to store cuttings and other material that has a low geochemical risk. This landform will be built in a manner that limits compaction and will be top-soiled and vegetated to stabilise the landform. To note, the Exploratory Works western emplacement area will be filled during Main Works for the purposes of constructing the Main Yard. Nevertheless, only non-reactive spoil will be placed at this location.	The western emplacement area has not received any reactive material for this reporting period. It is not expected that this PSE area will receive spoil going forward.	Not relevant for the reporting period
Any remnant mine workings located within the eastern and western rock and soil emplacement areas will be rehabilitated (if necessary).	During the reporting period, no works were required on the remanent mine workings.	Not relevant for the reporting period

Measure / Requirement	Implementation	Effectiveness
The eastern emplacement area will be used to store any material generated during Exploratory Works that has higher geochemical risk. Excavated material will be geochemically characterised prior to placement. If any potentially acid forming material is encountered, it will be placed in a select area of the emplacement. The potential for acid rock drainage will be treated by placing and compacting layers of limestone (or other suitable ANC material) between each rock and sediment layer as required. The volume of limestone (or other suitable ANC material) in each layer will be determined stoichiometrically so that the maximum potential acidity from the overlying layer of rock and sediment is treated. This approach will neutralise AMD within the stockpile. Once design levels are reached, the landform will be top-soiled and vegetated. To note, the Exploratory Works eastern emplacement area will be filled during Main Works for the purposes of constructing the Main Yard. PAF material will be managed as set out in Appendix E of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).	During the reporting period, spoil characterisation was carried out in accordance with Appendix A of the Spoil Management Plan. PAF material was encountered within the Powerhouse Complex (various work fronts) and the Tantangara HRT tunnel, which was treated using spoil with adequate ANC. During the reporting period the majority of PAF was treated at the excavation are and subsequently transported to the Tantangara or Ravine Bay PSE area.	Potential Acid Forming rocks were identified and treated successfully as shown in Table 2-4 PAF treatment and validation details between 1 August 2024 and 31 Jan 2025 as per the ITP requirement. The process has been effective as NPR >3 was achieved for all the neutralization process.
Runoff from Lick Hole Gully during Exploratory Works will be diverted around or through the eastern emplacement area. The diversion works will comprise a dam upstream of the diversion inlet and either a gravity or pump assisted diversion system. The diversion works will have a 1% AEP capacity. The dam upstream of the diversion inlet will be designed as a detention basin and will not permanently hold water. To note, the Exploratory Works eastern emplacement area will be filled during Main Works for the purposes of constructing the Main Yard and the final Lobs Hole emplacement area. Final design of the Lobs Hole emplacement area will be addressed in accordance with the staging specified in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010). Operational controls that require ongoing management following completion of construction would be of no impost the NPWS.	The Lick Hole Gully clean water diversion drain has been designed with a 1% AEP capacity.	The Construction Method Statement (CMS) (S2-LEED-CON-CMS-0001) was prepared and implemented for Lick Hole Gully Clean Water Diversion. As per the requirement, ERSED controls were implemented with appropriate control measures. The underground deviation is installed using twin 1200 diameter RCP as per the design S2-CIV-CF-MYA-DRG-8301_C to meet the requirement.

Measure / Requirement	Implementation	Effectiveness
A high-flow diversion drain will be established to convey runoff from Lick Hole Gully around the emplacement area in a controlled manner, avoiding uncontrolled overflows through the emplacement area. This diversion drain will only be engaged if a flood greater than a 1% AEP event occurs. To note, the Exploratory Works eastern emplacement area will be filled during Main Works for the purposes of constructing the Main Yard and the final Lobs Hole emplacement area. Final design of the Lobs Hole emplacement area will be addressed in accordance with the staging specified in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010). Operational controls that require ongoing management following completion of construction would be of no impact to the NPWS.	A clean water diversion drain was constructed to convey Lick Hole Gully around the emplacement area. Lobs Hole Main Yard emplacement area has been approved under a staged approach and final design of Lobs Hole Main Yard emplacement will be prepared at a later date but prior to land forming and rehabilitation.	The Construction Method Statement (CMS) (S2-LEED-CON-CMS-0001) was prepared and implemented for Lick Hole Gully Clean Water Diversion.
Seepage from the eastern emplacement area will be collected in a water management dam. Collected water will either be irrigated to the emplacement (to promote evaporation) or treated in the process water treatment plant. Discharge of seepage water to the Yarrangobilly River will be avoided. To note, the Exploratory Works eastern emplacement area will be filled during Main Works for the purposes of constructing the Main Yard and the final Lobs Hole emplacement area. Final design of the Lobs Hole emplacement area will be addressed in accordance with the staging specified in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010).	A water management basin was constructed at the base of the eastern emplacement area. Water from the basin is being taken to the water treatment plant in accordance with the Water Management Plan.	Final design of Lobs Hole Main Yard emplacement will be prepared prior to final land forming and rehabilitation.
The western emplacement will be designed to prevent the risk of emplacement material being entrained in flood waters during a 1 in 5000-year flood event. To note, the Exploratory Works eastern emplacement area will be filled during Main Works for the purposes of constructing the Main Yard and the final Lobs Hole emplacement area. Final design of the Lobs Hole emplacement area will be addressed in accordance with the staging in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010).	Lobs Hole Main Yard emplacement area has been approved under a staged approach and final design of Lobs Hole Main Yard emplacement will be prepared at a later date but prior to land forming and rehabilitation.	Final design of Lobs Hole Main Yard emplacement will be prepared prior to final land forming and rehabilitation.

Measure / Requirement	Implementation	Effectiveness
The monitoring in Section 9 of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019) will be implemented to identify and track the performance of: • the management of spoil on site; • the implementation of each of the detailed plans, including the effectiveness of the proposed mitigation and contingency measures; and • progress against the detailed completion criteria and performance indicators of each permanent spoil emplacement area.	This report in general addresses this item.	This report in general addresses this item.
Monitoring measures to be included as part of the Surface and Groundwater Monitoring Program, to monitor potential impacts from the placement of spoil.	Monitoring and mitigation measures relating to spoil management are included in the Surface Water Management Plan (S2-FGJV-ENV-PLN-0011) and Groundwater Management Plan (S2-FGJV-ENV-PLN-0012).	No spoil impacts were identified in groundwater during this reporting period.
The permanent spoil emplacement areas will be designed to comply with the design objectives in Table 2 (of the COA entitled Design Objectives for Permanent Spoil Emplacement Areas).	The Lobs Hole Main Yard design is currently for the temporary phase of works. Design of the Lobs Hole permanent emplacement area (final design) will be developed at a later stage so as to comply with Design Objectives in schedule 3 condition 6 of the Infrastructure Approval. GF01 and Ravine Bay spoil emplacement is being constructed in accordance with the current design and will be land formed once placement is complete to meet the approved criteria. The permanent spoil emplacement design for Tantangara is currently being finalised during this reporting period. However, Stage 1 has already been finalised, and construction works are underway, with Stage 1 already receiving spoil excavated from Tantangara work fronts; spoil is either emplaced at the permanent emplacement area or is temporarily stockpiled at S1 Laydown dependent on available space and site conditions.	Assessment of the PSE areas against the design objects are provided in the corresponding appendix of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019). Additionally, design objectives are fully integrated to engineering design, and ongoing control measures in ERSED plans ensures the objectives are achieved to minimize potential environmental impact over the long term.

Measure / Requirement	Implementation	Effectiveness
New landforms will: be safe, stable and non-polluting; maximise surface drainage to the natural environment.	Ravine Bay spoil emplacement area continues to be constructed during this period and is generally in accordance with the NSW EPA solid waste landfill guidelines. GF01 PSE area has been constructed in accordance with the design; however, some elevated nutrient concentrations have been observed in water in the locality of the emplacement area. Water is being removed and treated at the site water treatment facilities while an appropriate remediation option is determined. Water quality downstream is being closely monitored with limited impacts observed to date. During this reporting period a 3rd party consultant was engaged to provide guidance on potential nitrogen issued within the GF01 PSE. Tantangara Permanent Spoil Emplacement design is currently being finalised during this reporting period. In general, for all PSE areas, surface drainage has been installed that directs any surface water run-off away from the slope area and into a controlled drainage system. Surfaces of placed material have been sloped to provide drainage towards basins /collection points. The Ravine Bay, Tantangara and Rock Forest PSE designs include leachate collection systems with associated emergency water storages to ensure that there is sufficient capacity for leachate collection.	All the Emplacements area has been designed as per the requirement. Additionally, the ERSED plan of all the Emplacement areas include detailed control measures, which has been effective to control any run-off and direct it to the leachate basins.
Detailed plans for each of the permanent spoil emplacement areas that have been prepared using both analogue and erosional-based methods will be developed for approval prior to commencement of construction of the applicable placement area. The plans will: - describe how the development of each emplacement area would be co-ordinated with the rehabilitation of the site in accordance with the approved Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010). - describe the measures that would be implemented to comply with the spoil management requirements in condition 4 and the design objectives in Table 2 of the COA.	This measure / requirement is addressed in the corresponding appendix of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.

Measure / Requirement	Implementation	Effectiveness
- include a topsoil strategy outlining measures the measures that would be implemented to ensure the surface of the emplacement areas will be suitable to sustain the target PCTs in the long term, having regard to the approved strategy in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010). - identify the key risks for the successful completion of each emplacement area and the contingency measures that would be implemented to address these risks; and - include detailed completion criteria and performance indicators for each emplacement area, including criteria for triggering remedial action (if necessary)		
The Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) will be implemented for the new landforms at Tantangara Reservoir, Lobs Hole and Talbingo Reservoir.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.	Not relevant for the reporting period.
Mitigations will be included in the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) to minimise impacts to Alpine humus soils and peat bogs/fens.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.	Not relevant for the reporting period.
The Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) (refer to REHAB01) will be implemented and will include measures to minimise: - loss of soil; - loss of organic matter and nutrient decline; - soil structural decline; and - compaction.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.	Not relevant for the reporting period.
Regular rehabilitation monitoring will be undertaken to identify any defects, such as slumping, erosion or poor vegetation establishment. Identified defects will be rectified.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.	Not relevant for the reporting period.

A.2. Contingency Measures – Lobs Hole (Main Yard)

Risk	Contingency	Implementation
The timing of construction stages prevents adequate spoil volume or spoil quality being available for development of the final landform	The Main Yard, Ravine Bay and Tantangara PSE areas are expected to be used to accommodate spoil which will be used in the final rehabilitation of the site. These PSE areas will be gradually brought down to allow for use in the final rehabilitation of the site.	The main yard PSE currently contains spoil which may be used for rehabilitation of the site. The Ravine Bay PSE has been designed to temporarily accommodate spoil above the final surface which may be used in the rehabilitation of the site.
The timing of construction stages results in excess spoil needing to be retained at the Lobs Hole emplacement areas, contrary to the requirement of schedule 3, condition 6 of the Infrastructure Approval	The Main Yard will be progressively decommissioned as areas within the facility are no longer required to support construction. Material can be drawn down progressively and diverted to GF01 or Ravine Bay (or both). Ravine Bay and Tantangara PSE areas may be temporarily exceeded to accommodate spoil for rehabilitation works.	Spoil placement at Ravine Bay PSE is ongoing. Ravine Bay and Tantangara PSE retains spare capacity in the unlikely circumstance there is excess spoil.
Contamination caused by development or operation of Main Yard construction pads	Respond to incidents and execute remediation where required. Retain records to demonstrate either: – no residual risk from contamination; or – residual risk from contamination is not unacceptable.	Only minor spills have occurred within the Main Yard construction pads. All spills cleaned up removing any potential source of contamination. Impacted spoil is disposed of appropriately offsite after classification. No groundwater impacts have been observed downstream of the Main Yard PSE area.
Temporary foreign or unsuitable objects prevent effective filling and / or compaction	Upon completion of use of area for purposes of supporting construction remove all foreign / unsuitable objects that are not proposed to form part of the Lobs Hole emplacement area final design. Undertake inspection of each area within the Main Yard facility that is being decommissioned. Retain records.	Spoil placement at Main Yard PSE was undertaken within this reporting period. All foreign materials are removed where possible prior to placement. Given the spoil placed within this area is natural soil and rock materials there have not been any significant issues with foreign materials.
Soil and water impact during removal of controls supporting Main Yard as a construction compound and development of the site for emplacement	Develop and maintain specific erosion and sediment control plans based on risk for each transition (e.g.: removal of hardstand, removal of basins, regrading). Implement and maintain the controls as specified by the erosion and sediment control plans.	Specific ERSED plans have been prepared for spoil placement. Spoil placement occurred within main yard during this reporting period. Prior to commencing decommissioning of the construction pads, the ERSED plans will be updated to address specific risks for each transition stage.

Risk	Contingency	Implementation
The Main Yard temporary works design and execution are unable to be modified upon completion and result in risk for landform's future intended use.	Include check of Main Yard temporary works against criteria and objectives in the design for final emplacement area, the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010), and the Recreation Management Plan. Ensure work with potential to undermine the proposed outcomes from the final works are avoided.	An update will be provided regarding updated ERSED plans and decommissioning works at a later stage. The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses.

A.3. Contingency Measures – Lobs Hole (GF01)

Risk	Contingency	Implementation
The works deviate from the design criteria specified.	The design criteria form the Basis of Design (BoD) and these will be used to ensure the achievement of the objectives. Measurement tools are in place to ensure the construction does not deviate from these design criteria. This will be managed through the FGJV technical team design review process. Where concept design changes or deviation from the design criteria is expected, agencies will be consulted.	For the Ravine Bay, Tantangara and Rock Forest PSE areas a 3 rd party QA/QC consultant has been engaged to ensure that there is compliance with the design. GF01 PSE has been completed with no significant variations from the proposed design. No significant deviations from the current design were recorded during the reporting period, all minor deviations were addressed through Requests for Information (RFI) from the designer.
The timing of construction stages results in insufficient or excessive spoil volume being available for development of the final landform.	GF01 is to be utilised for on-land material placement before there is access to the other emplacement areas. Should less material be placed into GF01 than expected, the landform can be constructed to a lower level or with flatter slopes.	Placement of spoil in GF01 largely ceased during the reporting period and the landform is currently at final design with sufficient spoil placed.
Material placed into GF01 contains contamination (other than PAF and NOA material).	Respond to incidents as per the Unexpected Finds Protocol and Section 6.6 of the Spoil Management Plan.	Excess nitrogen compounds were identified within groundwater adjacent to GF01. The source of the nitrates was found to be residual nitrates from drill and blast activities. Water is being removed and treated at the site water treatment facilities while an appropriate remediation option is determined. A Nitrogen Management Plan and associated training module have been prepared which detail various requirements, controls and responsibilities pertaining to nitrogen pollution.
Temporary foreign or unsuitable objects prevent effective filling and / or compaction	Ensure only spoil is placed in the area. Undertake inspections of spoil being laid and compacted. Retain records. These are considered "business as usual" controls.	Only mechanically excavated, TBM and D&B spoil is placed in GF01. Regular inspections are undertaken of the emplacement area and material not suitable for placement will be disposed offsite at a suitable facility. During this reporting period material that was taken off site included filter cake and sludge as per EPA directives.

Risk	Contingency	Implementation
Soil and water impact(s) during construction	Develop and maintain specific erosion and sediment control plans throughout construction based on risk for each of the spoil layers. Implement and maintain the controls as specified by the erosion and sediment control plans.	Specific ERSED plans have been prepared and implemented for the spoil emplacement area. Water is being removed and treated at the site water treatment facilities while an appropriate remediation option is determined.
GF01 design is modified, and this results in changes to the landform's future intended use, or approved form.	Check any changes to the GF01 design against criteria and objectives in the design for the final emplacement area, the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) and the Recreation Management Plan. Any changes required need to align with the currently proposed outcomes.	No deviations from the design were recorded in the reporting period. During the reporting period GF01 was shaped to the final design and is currently awaiting rehabilitation.
Rehabilitation is inadequate and does not achieve the required outcomes	Ensure that the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) is followed, including requirements for topsoil placement and surface finishing prior to rehabilitation, ensuring a successful handover.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses. The plan includes management measures to minimise loss of soil, organic matter, nutrient decline, soil structural decline and compaction. The plan will be implemented once approved.
Volumes of topsoil are inadequate	Topsoil volume requirements will be calculated and if there is not enough topsoil within the site that can be reused, topsoil and other required materials may be ordered from an external source to meet the demand.	Topsoil was removed from GF01 prior to spoil emplacement and has been appropriately stockpiled in a location recorded in a register. This topsoil will be used during rehabilitation. If there is an insufficient quantity of topsoil in accordance with the Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010), further topsoil will be sourced.
Material placed has a higher risk of erosion than expected.	The GF01 PSE area is to be designed to be erosion resistant by minimising steep angles where possible.	The GF01 PSE is periodically surveyed to assess erosion, no significant erosion or loss of volume in the PSE was identified during the reporting period.
PAF presence	To be treated as per characterisation program (Appendix A of the SMP) and the Lobs Hole Material Characterisation Procedure outlined in Attachment A of this plan. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective	During the reporting period, spoil characterisation was carried out in accordance with Appendix A of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019) and PAF materials were treated as per the PAF neutralisation procedure.

Risk	Contingency	Implementation
	site management and will be monitored under the Project EPL.	
Rock drainage lines not constructed correctly or rock too small and experiences erosion.	Ensure robust rock sizing for drainage lines, use of suitable rock with the correct grading, and proper construction controls. Implement and maintain the controls as specified by the erosion and sediment control plans.	Drainage lines installed for construction purposes have been constructed from suitable sized rock to minimise erosion. Drainage lines are monitored regularly.
Soil and water impact(s) during removal of controls	A basin is installed at the base of the GF01 PSE, the basin can remain in place until rehabilitation is completed, and an acceptable water quality achieved. The GF01 basin includes emergency water storages to ensure that there is sufficient capacity for leachate collection.	The basin has been constructed and will remain in place until rehabilitation is complete or the water quality is acceptable.
Long term stability not demonstrated	Undertake LEM to confirm long term stability and address any areas of higher erosion risk.	Surveys indicate that there is no significant loss of material in the GF01 PSE. Monitoring will continue to be undertaken to ensure that the landform is stable.

A.4. Contingency Measures – Ravine Bay

Risk	Contingency	Implementation
The works deviate from the design criteria specified.	The design criteria form the Basis of Design (BoD) and these will be used to ensure the achievement of the objectives. Measurement tools are in place to ensure the construction does not deviate from these design criteria. This will be managed through the FGJV technical team design review process. Where concept design changes or deviation from the design criteria is expected, agencies will be consulted.	The Ravine Bay spoil emplacement area has been designed with additional controls to mitigate potential nitrate contamination from blasting. The Ravine Bay spoil emplacement areas has been designed generally in accordance with the NSW EPA solid waste landfill guidelines. The spoil emplacement area has been developed in consultation with the NSW EPA with an independent third party providing a quality control assessment.
The timing of construction stages results in insufficient or excessive spoil volume being available for development of the final landform.	Ravine Bay PSE will be filled to the design level. Should excess spoil material be required for the final rehabilitation this may be temporarily stockpiled at the Ravine Bay PSE.	Placement of spoil in Ravine Bay commenced during the previous reporting period. The design of the emplacement area includes capacity of 1.4 million cubic meters. It is expected that more than 1.4 million cubic meters will have to be stockpiled temporarily at Ravine Bay PSE. The designer has approved temporary stockpiling in excess of 1.4 million cubic meters.
Material placed into Ravine Bay contains contamination (other than PAF).	Respond to incidents as per the Unexpected Finds Protocol and Section 6.6 of the Spoil Management Plan. Design to include contamination mitigation measures such as leachate collection systems and liners to ensure there is no pathway between potential contamination within the PSE and sensitive receptors.	Elevated nitrogen values have been observed within the Ravine Bay leachate basin suggesting that any contamination from D&B residues have been captured and that the controls to mitigate contamination have been effective.
Temporary foreign or unsuitable objects prevent effective filling and / or compaction	Ensure only spoil is placed in the area. Undertake inspections of spoil being laid and compacted. Retain records. These are considered "business as usual" controls.	All foreign materials are removed where possible prior to placement. Given the spoil placed within this area is natural soil and rock materials there have not been any significant issues with foreign materials. During the reporting period, filter cake and sludge is currently being transported offsite as per NSW EPA directives.

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Risk	Contingency	Implementation
Soil and water impact(s) during construction	Develop and maintain specific erosion and sediment control plans throughout construction based on risk for each of the spoil layers. Implement and maintain the controls as specified by the erosion and sediment control plans.	Specific ERSED plans have been prepared and implemented for the spoil emplacement area.
Ravine Bay design is modified, and this results in changes to the landform's future intended use, or approved form.	Check any changes to the Ravine Bay design against criteria and objectives in the design for the final emplacement area, the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) and the Recreation Management Plan. Any changes required need to align with the currently proposed outcomes.	The Ravine Bay PSE design is currently being evaluated by a 3 rd party consultant to ensure compliance with the design, there have been no significant deviations from the proposed design.
Rehabilitation is inadequate and does not achieve the required outcomes	Ensure that the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) is followed, including requirements for topsoil placement and surface finishing prior to rehabilitation, ensuring a successful handover.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses. The plan includes management measures to minimise loss of soil, organic matter, nutrient decline, soil structural decline and compaction. The plan will be implemented once approved.
Volumes of topsoil are inadequate	Topsoil volume requirements will be calculated and if there is not enough topsoil within the site that can be reused, topsoil and other required materials may be ordered from an external source to meet the demand.	Topsoil was removed from Ravine Bay prior to spoil emplacement and has been appropriately stockpiled in a location recorded in a register. This topsoil will be used during rehabilitation. Further a significant quantity of topsoil has been sourced from transmission line works which can be used to supplement topsoil sourced from the Ravine Bay PSE area, as such a topsoil deficit is not expected.
Material placed has a higher risk of erosion than expected.	Although an outer topsoil layer will be placed over the excavated tunnel material, there is the risk that the TBM material will be highly erodible due to the possible percentage of silt sized particles. It may be necessary to place a layer of coarser D&B material over the final surface before topsoiling. The surface will then be ripped to increase infiltration and form a coarser final surface.	The Ravine Bay PSE has been designed to mitigate erosion including limiting steep slopes and appropriately sized rockfill in drainage lines. A significant amount of spoil which will need to be placed over several months before the composition and erodibility of the final layer will need to be assessed.

Risk	Contingency	Implementation
PAF presence	To be treated in accordance with the Spoil Management Plan (S2-FGJV-ENV-PLN-0019). Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	All PAF material was adequately ameliorated with validation samples confirming that the amelioration was sufficient.
Rock drainage lines not constructed correctly or rock too small and experiences erosion.	Ensure robust rock sizing for drainage lines, use of suitable rock with the correct grading, and proper construction controls. Implement and maintain the controls as specified by the erosion and sediment control plans.	Drainage lines installed for construction purposes have been constructed from suitable sized rock to minimise erosion. The design of Ravine Bay including drainage lines has been undertaken in consultation with the NSW EPA as well as technical experts.
Soil and water impact(s) during removal of controls	Develop and maintain specific erosion and sediment control plans throughout construction based on risk for each of the spoil layers. Ravine Bay PSE design to include contamination mitigation measures such as leachate collection systems and liner.	Specific erosion and sediment control plans has been prepared prior to placement of spoil. The initial construction of the Ravine Bay PSE has involved leachate collection systems and liner.
Long term stability not demonstrated	Undertake LEM to confirm long term stability and address any areas of higher erosion risk.	The Ravine Bay emplacement area was designed with a highly compacted low hydraulic conductivity base. Spoil placed within the emplacement area is currently subject to a proof roll test to ensure sufficient compaction. Once the area is completed it will be assessed for stability.

A.5. Contingency Measures - Tintangara

Risk	Contingency	Implementation
Clearing and grubbing outside approved area.	Disturbance boundaries are set out on site with no-go areas demarcated.	The Disturbance boundaries are to be installed prior to carrying out clearing and grubbing works.
The works deviate from the design criteria specified.	The design criteria form the Basis of Design (BoD) and these will be used to ensure the achievement of the objectives. Measurement tools are in place to ensure the construction does not deviate from these design criteria. This will be managed through the FGJV technical team design review process. Where concept design changes or deviation from the design criteria is expected, agencies will be consulted.	The design for Stage 2 of Tintangara PSE is currently being finalised. Stage 1 was partially constructed during this reporting period under the supervision of a 3 rd party consultant, no significant deviations from the design were observed.
The timing of construction stages results in insufficient or excessive spoil volume being available for development of the final landform.	Excess spoil may be placed at the Tintangara PSE for use in the final rehabilitation of the site. Should there be insufficient spoil for the development of the Tintangara PSE then the design can be modified and the landform flattened while maintaining a natural shape.	It is expected that some excess spoil may have to be temporarily accommodated at the Tintangara PSE which will subsequently be used in the rehabilitation of the site. Following the acceptance of the final design of the Tintangara PSE the designer will be consulted to ensure that any excess spoil placed at the Tintangara PSE will be safe and stable.
Material placed into Tintangara contains contamination (other than the PAF and NOA material).	Respond to incidents as per the Unexpected Finds Protocol the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).	Spoil from Tintangara Adit, Gate Shaft and Intake has been placed at either Tintangara TSE or Tintangara PSE. The unexpected finds protocol is being followed for placement of materials at both locations.
Temporary foreign or unsuitable objects prevent effective filling and / or compaction	Ensure only spoil is placed in the area. Undertake inspections of spoil being laid and compacted. Retain records. These are considered "business as usual" controls.	Spoil from Tintangara Adit, Gate Shaft and Intake has been placed at either Tintangara TSE or Tintangara PSE. The unexpected finds protocol is being followed for placement of materials at both locations. If foreign materials are found within spoil materials, they are typically classified for offsite disposal or offsite reuse. Foreign materials are generally not encountered given the spoil is from a natural source.

Risk	Contingency	Implementation
Soil and water impact(s) during construction	Develop and maintain specific erosion and sediment control plans throughout construction based on risk for each of the spoil layers. Tantangara PSE design to include contamination mitigation measures such as leachate collection systems and liner.	Spoil from Tantangara Adit, Gate Shaft and Intake has been placed at either Tantangara TSE or Tantangara PSE. Specific erosion and sediment control plans has been prepared prior to placement of spoil. The initial construction of the Tantangara PSE has involved leachate collection systems and liner.
Tantangara design is modified, and this results in changes to the landform's future intended use, or approved form.	Check any changes to the Tantangara design against criteria and objectives in the design for the final emplacement area, the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010), and the Recreation Management Plan. Any changes required need to align with the currently proposed outcomes.	Stage 2 of the Tantangara PSE design is currently being finalised. Construction of Stage 1 of the Tantangara PSE is ongoing under the supervision of a 3 rd party consultant. No significant deviations from the design have been observed thus far.
Rehabilitation is inadequate and does not achieve the required outcomes	Ensure that the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) is followed, including requirements for topsoil placement and surface finishing prior to rehabilitation, ensuring a successful handover.	This section will be updated once the design is complete and placement of spoil and rehabilitation works have commenced.
Volumes of topsoil are inadequate	Topsoil volumes requirements will be calculated and if there is not enough topsoil within the site that can be reused, topsoil and other required materials may be ordered from an external source to meet the demand.	Topsoil which has been generated during the stage 1 works have been appropriately stockpiled for later rehabilitation works. There will be a significant amount of topsoil generated during the Stage 3 of the Tantangara Intake and as such a deficit is not expected.
Material placed has a higher risk of erosion than expected.	Although an outer topsoil layer will be placed over the excavated tunnel material, there is the risk that the TBM material will be highly erodible due to the possible percentage of silt sized particles. It may be necessary to place a layer of coarser D&B material over the final surface before topsoiling. The surface will then be ripped to increase infiltration and form a coarser final surface.	The Tantangara PSE has been designed to mitigate erosion including limiting steep slopes and appropriately sized rockfill in drainage lines. A significant amount of spoil which will need to be placed over several months before the composition and erodibility of the final layer will need to be assessed.
PAF presence to be managed	To be treated and placed in accordance with the Spoil Management Plan (S2-FGJV-ENV-PLN-0019). Site specific controls including compaction rates, water	Spoil from Tantangara Adit, Gate Shaft and Intake has been tested in accordance with the spoil characterisation procedure.

Risk	Contingency	Implementation
	quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	During this reporting period PAF was identified in the HRT01-02 tunnel and have been blended with NAF spoil identified to contain suitable ANC. All blending works were validated following completion.
NOA presence to be managed	To be treated and placed in accordance with Appendices A and D of the SMP and the Tantangara Material Characterisation Procedure outlined in Attachment A of this plan.	Excavations were not undertaken through areas of NOA during this reporting period.
Rock drainage lines not constructed correctly or rock too small and experiences erosion.	Ensure robust rock sizing for drainage lines, use of suitable rock with the correct grading, and proper construction controls. Implement and maintain the controls as specified by the erosion and sediment control plans.	The final design for Stage 2 of Tantangara PSE is currently being finalised. The Stage 1 design has considered rock sizing in drainage lines to minimise erosion. This section will be updated further once the design is complete, and potential risks of erosion beyond the design are identified.
Soil and water impact(s) during removal of controls	The basins can remain in place until rehabilitation is completed, and an acceptable water quality achieved.	The basin has been constructed and will remain in place until rehabilitation is complete or the water quality is suitable.
Long term stability not demonstrated	Undertake LEM to confirm long term stability and address any areas of higher erosion risk.	Placement of spoil at the Tantangara PSE has commenced and is ongoing. Following the cessation of spoiling activities long term stability monitoring will be undertaken.
Final dozing occurs towards water	Final dozing will be undertaken either when water levels are suitably low to limit the risk of entering water, or a bench will be left between the water level and the area to be dozed to ensure the equipment cannot enter the water.	The current Tantangara PSE design which is in draft contains a bund which prevents spoil material being pushed into the Tantangara Reservoir.
Post construction recreational use changes or is not achieved	The landform has been sloped to meet targets that are similar to natural slopes in the general area and should allow easy access. Rock has also been limited to ensure that passage on to the surface is easily achieved, although subject to confirmation by the wave action modelling.	The design for Stage 2 of Tantangara PSE is currently being finalised. This section will be updated once the design is complete although the Tantangara PSE will be designed to align with surrounding landforms.
The varying water level causes scour through wave action	Modelling of the wave action and erosion risk will be included in the detailed design. The use of	The design for Stage 2 of Tantangara PSE is currently being finalised although this design is proposed all above Fully Supply Level (FSL) of the Tantangara

Risk	Contingency	Implementation
	appropriate vegetation in this zone and / or some rock if required will be considered as part of the design. Appropriate sediment controls will be implemented during periods of low reservoir levels to limit placement of D&B material directly into water and reduce sediment loading during placement. D&B benches below FSL will be dozed down as placed to ensure a low gradient is achieved.	Reservoir and as such will have limited interaction with the reservoir.
Water rising (flooding) the area	Basins and surface water will be monitored regularly during routine site inspections, particularly prior to any shutdowns.	Leachate basins are being monitored regularly and leachate water is managed in accordance with the water management plan.
Public risks associated with the reservoir	Ensure appropriate exclusion zones and notifications to the community have been undertaken appropriately.	Placement of spoil is currently all on land above FSL within the project boundary and worksite, this area is clearly marked and not accessible by the public.
Climate change changing the occurrence of extreme events	Design, including rock armouring, accounts for the 1% Annual Exceedance Probability (AEP) risk, or a 1 in 100-year Average Recurrence Interval (ARI) storm event. Gradients have been flattened to 1V:7H and 1V:8H below Full Supply Level (FSL) and rock drainage included to manage erosion risks.	The design for Stage 2 of Tantangara PSE is currently being finalised. This section will be updated once the design is complete.
Leachate from the spoil emplacement	A spoil characterisation program has been prepared involving NAG suite analysis, pH and EC screening and validation testing by a NATA accredited laboratory (Appendix A of the SMP) to ensure material is neutralised prior to placement. A leachate basin will be constructed on site and tested for potential contamination prior to reuse on the stockpile. Attachment A – Tantangara Material characterisation program outlines the steps to ensure material neutralisation and actions in the circumstance contamination is detected. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	Material excavated from Tantangara Intake, Gate Shaft and Adit has been tested in accordance with the spoil characterisation procedure. All material is either temporarily stockpiled at Tantangara TSE or placed at Tantangara PSE. The design for Tantangara PSE is currently being finalised, however leachate controls have been implemented for areas already receiving spoil and leachate is being monitored. For the Tantangara TSE, leachate detection monitoring is undertaken in accordance with the Tantangara Leachate Detection Plan (S2-FGJV-ENV-PRO-0057).

Risk	Contingency	Implementation
Neutral mine drainage	Kinetic testing has been carried out to understand the reactivity of the excavated rock. The outcomes will be used to better understand the reactivity of sulphides in excavated rocks, the release rates of contaminants, and the water quality evolution in response to long-term oxidation and weathering that may affect the design of the final landforms and the quality of surface and groundwater. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	The summary of the Kinetic testing on AMD classification for various geological units across the site showed low potential of neutral mine drainage. Placement of spoil at Tantangara PSE has commenced with adequate water quality control and erosion control measures, along with the emplacement validation sampling for AMD testing to ensure effective management of the excavated materials. Furthermore, visual inspection of permanent spoil emplacement areas has commenced where ARD, NMD and / or SD are deemed likely to be present i.e. where known PAF has been blended and subsequently emplaced. Visual inspections include but are not limited to presence of visual indicators such as ARD plumes in basins, ferric hydroxide sludge and salt encrustations.

A.6. Contingency Measures – Marica and Rock Forest

Risk	Contingency	Implementation
The works deviate from the design criteria specified.	The design criteria form the Basis of Design (BoD) and these will be used to ensure the achievement of the objectives. Measurement tools are in place to ensure the construction does not deviate from these design criteria. This will be managed through the FGJV technical team design review process. Where concept design changes or deviation from the design criteria is expected, SHL will be consulted.	D&B spoil from Upstream Surge Shaft and mechanically excavated spoil from Marica Adit are currently being placed at the Marica temporary laydown. D&B spoil from Upstream Surge Shaft is also being backloaded in trucks to Tantangara PSE and stockpiled for PAF neutralisation purposes. For the reporting period most spoil placed in the Marica TSE area has been from USS D&B excavation works. The design of the Marica TSE area, which has and will continued to receive D&B spoil, has been amended to include a clay liner as an additional leachate control.
Material placed into Marica contains contamination (other than PAF and NOA material).	Respond to incidents as per the Unexpected Finds Protocol and Section 6.6 of the Spoil Management Plan.	No unexpected finds have been made to date.
Temporary foreign or unsuitable objects prevent effective filling and / or compaction	Ensure only spoil is placed in the area. Undertake inspections of spoil being laid and compacted.	Only natural soil and rock material from Upstream Surge Shaft is placed at temporary spoil pad. Foreign materials are stored in containers and transported offsite.
Soil and water impact(s) during construction	Develop and maintain specific erosion and sediment control plans throughout construction based on risk for each of the spoil layers. Implement and maintain the controls as specified by the erosion and sediment control plans.	Specific erosion and sediment control plans are in place to and are monitored. No soil and water impacts were observed during the reporting period.
Marica design is modified, and this results in changes to the landform's future intended use, or approved form.	Check any changes to the Marica design against criteria and objectives in the design for the final emplacement area, the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) and the Recreation Management Plan. Any changes required need to align with the currently proposed outcomes.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses. The design will be reviewed against the required criteria and changes made where required.

Risk	Contingency	Implementation
Rehabilitation is inadequate and does not achieve the required outcomes	Ensure that the Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) is followed, including requirements for topsoil placement and surface finishing prior to rehabilitation, ensuring a successful handover.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses. This section will be updated in subsequent reports requirements for topsoil and surface finish have been determined.
Volumes of topsoil are inadequate	Topsoil volume requirements will be calculated and if there is not enough topsoil within the site that can be reused, topsoil and other required materials may be ordered from an external source to meet the demand.	The Main Works Rehabilitation Management Plan (S2-SHL-ENV-PLN-0010) has been approved and will be implemented as the rehabilitation progresses. This section will be updated in subsequent reports once the quantity of topsoil required has been determined.
PAF presence	To be treated as per characterisation program (Appendix A of the SMP) and the Material Characterisation Procedure outlined in Attachment A of this plan. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed to ensure effective site management and will be monitored.	Material excavated from USS has been tested in accordance with spoil characterisation procedure. No PAF was identified within spoil from the USS during this reporting period.
Laboratory Turn Around Time (TAT) does not meet rate of excavation and placement	Material will be stockpiled at the temporary spoil area until laboratory results are received	During the reporting period spoil was characterised from material from down hole probing and stored in an appropriate location until results confirmed whether treatment was required.
Rock drainage lines not constructed correctly or rock too small and experiences erosion.	Ensure robust rock sizing for drainage lines, use of suitable rock with the correct grading, and proper construction controls. Implement and maintain the controls as specified by the erosion and sediment control plans.	Final design of Rock Forest PSE has not yet been completed. This section will be updated once the final design has been completed.
Soil and water impact(s) during removal of controls	The basin can remain in place until rehabilitation is completed, and an acceptable water quality achieved.	Final design of Rock Forest PSE has not yet been completed. This section will be updated once the final design has been completed. There are several basins adjacent to the temporary spoil emplacement area which were relined during the previous reporting period.

Risk	Contingency	Implementation
Long term stability not demonstrated	Undertake risk assessment based on the Einstein-Brown equation computed in Geographic Information Systems (GIS) to confirm long term stability and address any areas of higher erosion risk.	Final design of Rock Forest PSE has not yet been completed. This section will be updated once the final design has been completed.
Climate change changing the occurrence of extreme events	Design, accounts for the 1% Annual Exceedance Probability (AEP) risk, or a 1 in 100-year Average Recurrence Interval (ARI) storm event.	Final design of Rock Forest PSE has not yet been completed. This section will be updated once the final design has been completed.
Leachate from the spoil emplacement	A spoil characterisation program has been prepared involving NAG suite analysis, pH and EC screening and validation testing by a NATA accredited laboratory (Appendix A of the SMP) to ensure material is neutralised prior to placement. A leachate basin will be constructed on site and tested for potential contamination prior to reuse on the stockpile. Attachment A – Tantangara Material characterisation program outlines the steps to ensure material neutralisation and actions in the circumstance contamination is detected. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	Monitoring was undertaken in accordance with the Marica Leachate Detection Plan. Additionally, conditional infrastructure auditing is undertaken once a week.
Neutral mine drainage	Kinetic testing has been carried out to understand the reactivity of the excavated rock. The outcomes will be used to better understand the reactivity of sulphides in excavated rocks, the release rates of contaminants, and the water quality evolution in response to long-term oxidation and weathering that may affect the design of the final landforms and the quality of surface and groundwater. Site specific controls including compaction rates, water quality controls and erosion and sediment controls will be developed and workshopped with the NSW EPA to ensure effective site management and will be monitored under the Project EPL.	The summary of the Kinetic testing on AMD classification for various geological units across the site showed low potential of neutral mine drainage. Placement of spoil at Rock Forest PSE has not commenced and no PAF was identified at Marica during the reporting period.