



Snowy 2.0 Main Works Modification 1

Main Access Tunnel to Marica Services Connection
State Significant Infrastructure Modification Assessment
(SSI-9687-Mod-1)



Published by the NSW Department of Planning and Environment

dpie.nsw.gov.au

Title: Snowy 2.0 Main Works Modification 1

Subtitle: Main Access Tunnel to Marica Services Connection — State Significant Infrastructure Modification Assessment (SSI-9687-Mod-1)

Cover image: Artist impression of the example drill site layout (source: FGJV) Source: Modification Report

© State of New South Wales through Department of Planning and Environment 2022. You may copy, distribute, display, download and otherwise freely deal with this publication for any purpose, provided that you attribute the Department of Planning and Environment as the owner. However, you must obtain permission if you wish to charge others for access to the publication (other than at cost); include the publication in advertising or a product for sale; modify the publication; or republish the publication on a website. You may freely link to the publication on a departmental website.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (January 2022) and may not be accurate, current or complete. The State of New South Wales (including the NSW Department of Planning and Environment), the author and the publisher take no responsibility, and will accept no liability, for the accuracy, currency, reliability or correctness of any information included in the document (including material provided by third parties). Readers should make their own inquiries and rely on their own advice when making decisions related to material contained in this publication.

Executive Summary

Snowy Hydro Limited (Snowy Hydro) has approval to develop Snowy 2.0 Main Works (the project), comprising an expansion to the existing Snowy Mountains Hydro-electric Scheme and a new underground power station in the Kosciuszko National Park. The project is under construction.

Proposed Modification

The modification application seeks to allow for the undergrounding of cabling and services between the Main Access Tunnel (MAT) portal site and the Marica construction compound site by horizontal directional drilling. This modification would require establishment of boreholes at Marica and the MAT portal, and establishment, use and decommissioning of associated construction sites (drill pads) at each location.

Engagement

The Department publicly exhibited the modification report on its website from 26 October 2021 to 8 November 2021 and referred the modification request to relevant government agencies for comment. Two public submissions were received in support of the proposal, two submissions objected to the proposal and one submission provided comments. The Department also received advice from ten Government agencies.

Issues raised in submissions and agency advice included groundwater and surface water impacts associated with drilling, site access arrangements, biodiversity offsetting, and heritage impacts.

Assessment

In assessing the merits of the proposed modification, the Department has considered the merits of the proposal in accordance with the relevant matters for consideration under the *Environmental Planning and Assessment Act 1979*.

Snowy Hydro prepared a Submissions Report outlining clarifications to the proposal, including confirming the proposed size of the eastern drill pad and length of underground drilling, committing to use of only water-based substances for drilling, and further outlining its approach to groundwater, heritage and biodiversity impacts of the modification. Following these clarifications and proposed modifications to conditions of approval, the agencies raised no issues with the proposed modification.

The Department is satisfied that the modification would not result in any significant impacts, subject to the implementation of the existing conditions of approval and minor additional condition relating to access.

Summary

The Department's assessment has concluded that the modification should be approved to allow the undergrounding of cabling and services between the Main Access Tunnel (MAT) portal site and the Marica construction compound site, which would reduce the disturbance footprint of the project. Consequently, it is in the public interest and should be approved.

Glossary

Abbreviation	Definition
BCS	Biodiversity Conservation Section, DPIE
Crown Lands	Crown Lands, DPIE
Department	Department of Planning and Environment
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
Heritage NSW	Heritage NSW, Department of Premier and Cabinet
LEP	Local Environmental Plan
Minister	Minister for Planning
NPWS	National Parks & Wildlife Service, DPIE
NRAR	Natural Resources Access Regulator, DPIE
SEARs	Planning Secretary's Environmental Assessment Requirements
Secretary	Planning Secretary of the Department of Planning and Environment
SSI	State Significant Infrastructure

Contents

Executive Summary	iii
Glossary	iv
1 Introduction	1
1.1 Approval history	1
2 Proposed modification	3
2.1 Horizontal directional drilling	3
3 Statutory context	5
3.1 Scope of modifications	5
3.2 Delegated authority	5
3.3 Minister’s delegate as determining authority	5
3.4 Biodiversity Conservation Act 2016	5
4 Engagement	6
4.1 Department’s engagement	6
4.2 Summary of submissions	6
4.3 Key Issues — Community and Interest Groups	6
4.4 Key Issues — Government Agencies	7
4.5 Response to submissions	7
5 Assessment	8
5.1 Groundwater and surface water	8
5.2 Access	9
5.3 Other issues	10
6 Evaluation	12
7 Recommendation	13
8 Determination	14
Appendices	15
Appendix A – Modification Report	15
Appendix B – Submissions Report	15
Appendix C – Submissions	15
Appendix D – Notice of Modification	15
Appendix E – Consolidated Approval	15

1 Introduction

Snowy Hydro Limited (Snowy Hydro) has approval to construct and operate the Snowy 2.0 project, comprising an expansion to the existing Snowy Mountains Hydro-electric Scheme and a new underground power station in the Kosciuszko National Park. The project connects the Talbingo and Tantangara reservoirs to the new power station via a series of underground tunnels and is capable of generating up to 2,000 megawatts (MW) of electricity and providing up to 350 gigawatt hours (GWh) of energy storage for the National Electricity Market (NEM). The project is shown in Figure 1.

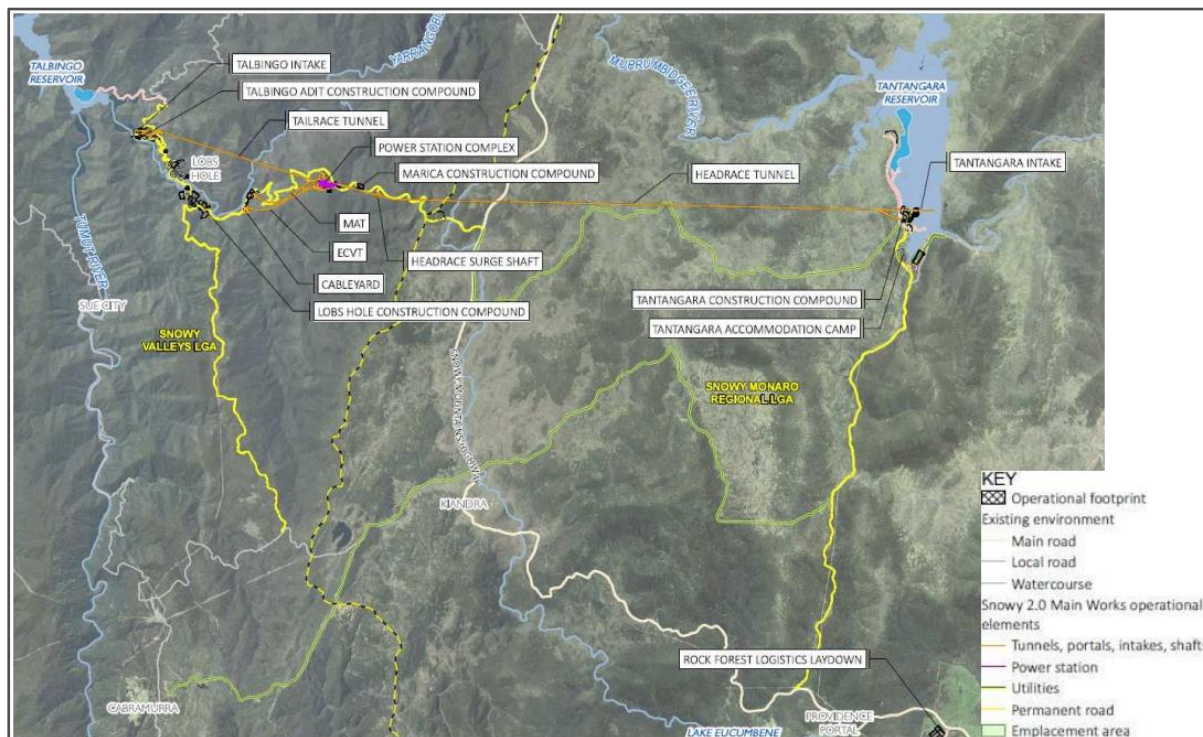


Figure 1 | Location of Snowy 2.0 Main Works Components

Source: Snowy 2.0 Main Works — Critical State Significant Infrastructure Assessment (SSI 9687) (DPIE 2020)

1.1 Approval history

Development of the Snowy 2.0 project and associated transmission connection is declared to be critical State Significant Infrastructure (CSSI), and is subject of a series of separate CSSI approvals. A summary of CSSI approvals, modifications and active applications and modifications for the broader Snowy 2.0 project is provided at Table 1.

Table 1 | Summary of Snowy 2.0 approvals and modifications

Application	Development	Approval Date	Status
Exploratory Works	Geotechnical works to investigate the ground conditions at the Snowy 2.0 project site.	7 February 2019	Exploratory Works commenced in early 2019.
Exploratory Works Modification 1	Approval for additional borehole drilling and geophysical surveys, establishment of a construction power connection to Transgrid 330kV line 2 at Lobs Hole; and changes to project boundary for constructability and additional infrastructure.	2 December 2019	
Exploratory Works Modification 2	Approval for change of exploratory tunnelling methodology from drill and blast to predominantly tunnel boring machine, reduction in use of barging, increasing the Lobs Hole accommodation camp capacity to 250) and establishing an alternate emergency access point at Lobs Hole Ravine Road – North subject to upgrades and restrictions on its use to emergencies and limited light vehicle use.	27 March 2020	
Segment Factory	Construction and use of the segment factory, a construction support facility for the manufacture of tunnel segment linings for the Main Works project.	31 March 2020	Construction and use of the Segment Factory commenced in 2020.
Main Works	Construction and operation of the pumped hydro-electric power station and tunnels connecting the Talbingo and Tantangara reservoirs.	20 May 2020	Construction of the Main Works project commenced in 2020, and is progressing towards construction completion scheduled for 2026.
Transmission Connection	Construction and operation of a transmission connection between the proposed Snowy 2.0 pumped hydro and generation project to the existing high voltage transmission network	Under assessment	The EIS for the project was exhibited and the proponent is currently preparing a Submissions Report.

2 Proposed modification

Snowy Hydro is seeking to modify the infrastructure approval to allow for the undergrounding of cabling and services between the Main Access Tunnel (MAT) portal site and the Marica construction compound site by horizontal directional drilling. These services would provide power, water and communications for construction works, tunnel boring machines for tunnelling, geotechnical, earthworks and stockpiling activities, construction workshops and offices, and worker accommodation.

The proposed modification is described below, and in further detail in the Modification Report and Submissions Report (see **Appendices A and B**).

2.1 Horizontal directional drilling

Snowy Hydro proposes to install underground cabling and services using horizontal directional drilling, rather than via overhead lines or trenching within an approved access route, the Marica West Trail, to link the MAT portal and Marica sites.

As part of detailed design for the project, Snowy Hydro has identified an option to install services using horizontal directional drilling. The drilling would replace the need for approximately 5 km of trenching between the two sites, and avoid earthworks across steeply rising terrain.

This modification would require establishment of boreholes at Marica and the MAT portal, and comprise the following works:

- temporary drill pad at the eastern receival pad (Marica) (100 m x 100 m) site;
- temporary drill pad at the western launch pad (MAT portal) site (40 m x 100 m), including providing temporary HDPE pipe connections for water supply to the western launch pad site;
- drilling seven services holes (4 x 450 mm diameter for power and 3 x 350 mm for water and communications), up to approximately 2.28 km between the two sites, and casing the holes with steel or fibreglass with no chemicals would be used in the drilling process;
- installation of services;
- spoil removal, temporary stockpiling, and disposal; and
- decommissioning.

The proposed alignment of the services is shown in **Figure 2**, and the indicative drill pad site layout is provided in **Figure 3**.

The drill pads are located within the construction envelope defined in the SSI approval, except for part of the eastern drill pad located outside the disturbance area shown in the SSI approval.

The drilling process would take approximately 6 months, including site establishment and an approximately 100 day horizontal directional drilling period. The activity would take place across the approved 24/7 project construction hours.

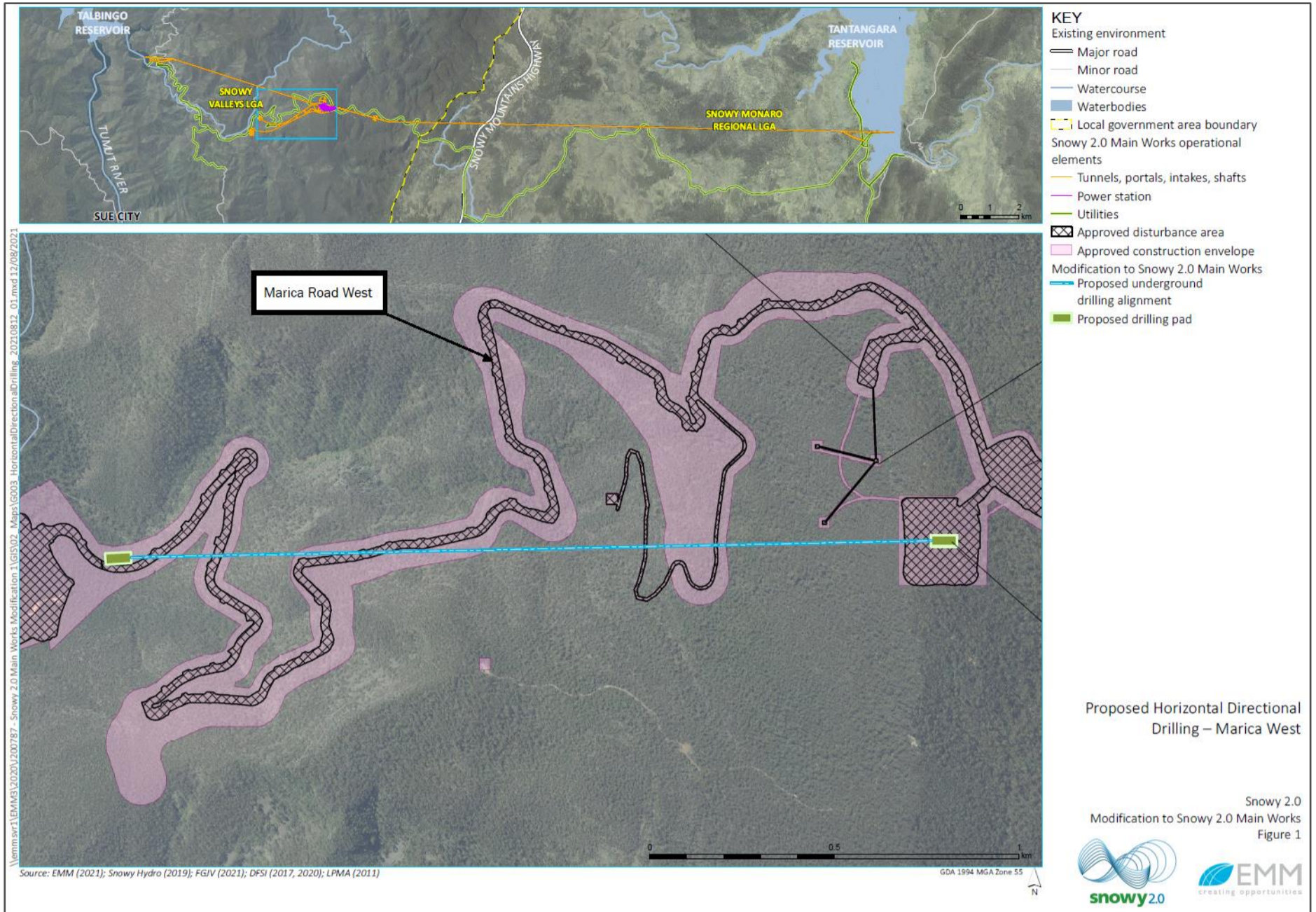


Figure 2 | Proposed alignment of services (Source: Modification Report)

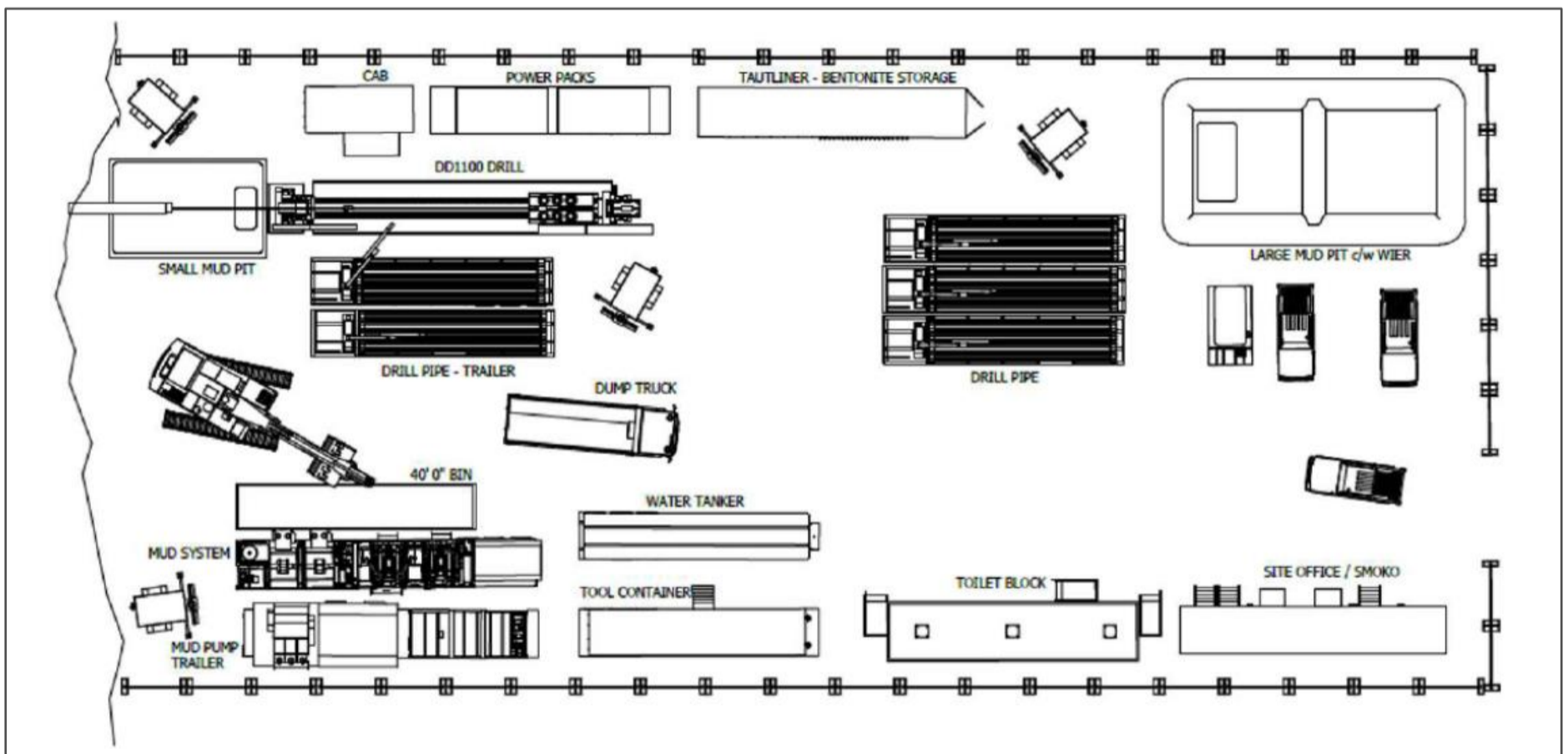


Figure 3 | Drill pad site layout (Source: Modification Report)

3 Statutory context

3.1 Scope of modifications

In accordance with section 5.25 of the EP&A Act, a proponent may request the Minister to modify the approval for State significant infrastructure. The Minister's approval for a modification is not required if the infrastructure as modified will be consistent with the existing approval. The proposal involves changes to the construction methodology and physical infrastructure for the project, and is not considered consistent with the existing approval. Consequently, modification of the Minister's approval under Section 5.25 of the EP&A Act is required.

3.2 Delegated authority

The Minister will be the approval authority under section 5.25 of the EP&A Act unless the Minister has delegated his determination functions to the Department.

3.3 Minister's delegate as determining authority

Under the Instrument of Delegation dated 26 April 2021, the functions and powers of the Minister for Planning under section 5.25 of the EP&A Act to determine a modification of the Minister's approval may be delegated to the Director, Energy Assessments where:

- the relevant local council has not made an objection;
- a political disclosure statement has not been made; and
- there are less than 15 public submissions in the nature of objections.

The proposed modification meets the terms of this delegation. As such, the Director, Energy Assessments, is the delegated authority to determine the modification request.

3.4 Biodiversity Conservation Act 2016

Under section 7.17(2)(c) of the *Biodiversity Conservation Act 2016*, an application to modify a SSI approval must be accompanied by a biodiversity development assessment report, unless the person determining the application is satisfied the modification will not increase the impact on biodiversity values.

The Department's assessment of biodiversity matters is provided in **Section 5.3**. Because the proposed clearing is within the construction envelope and clearing limits established by the existing approval, and management and offsetting of clearing would be conducted within the framework established by the conditions, Snowy Hydro considered a biodiversity development assessment report was not required. The Department and BCS support this approach and the Department recommends that the Director, Energy Assessments forms the opinion that the modification will not increase the impact on biodiversity values.

4 Engagement

4.1 Department's engagement

The Department publicly exhibited the modification report on its website from 26 October 2021 to 8 November 2021 and referred the modification request to relevant government agencies for comment.

The modification request was also notified to previous submitters on the Snowy 2.0 Main Works SSI application by post and email.

4.2 Summary of submissions

During the exhibition period, the Department received a total of 5 unique public submissions on the proposal. Of the submissions received, 4 were from members of the community and one was from an interest group, the National Parks Association of NSW. Two submissions were in support of the proposal, two submissions objected to the proposal and one submission provided comments only. A summary of the submissions is provided in **Section 4.3** below.

The Department also received advice from ten Government agencies, which are summarised further in **Section 4.4** below.

A link to the full copy of the submissions and Government agency advice is provided in **Appendix C**.

4.3 Key Issues — Community and Interest Groups

The key issues raised in public submissions objecting to the modification included:

- objection to the overall project
- concern with retaining the proposal to erect overhead power lines associated with the project.

The key issues raised in public submissions supporting the modification included:

- avoidance of ground disturbance, erosion and biodiversity impacts associated with trenching
- reduced time and cost associated with horizontal directional drilling compared to overhead or trenched services

The **National Parks Association** noted that, while it continues to object to the overall project, it offered 'conditional support' for horizontal directional drilling of services as an alternate to erecting overhead lines, but requested Snowy Hydro provide additional information about the costs of the proposed change. The submission also requested that Snowy Hydro place other services required for the project, but not subject of this modification, underground.

While the Department acknowledges concerns raised in public submissions about the construction of overhead power lines for the project, these matters are outside the scope of this modification and will instead be considered in the assessment of those proposals.

4.4 Key Issues — Government Agencies

The Department's **Water Group** and the **Natural Resource Access Regulator (NRAR)** provided a joint submission, requesting further information about water access licence requirements for water needed for drilling, and the potential annual quantity of groundwater take. Water Group and NRAR recommended Snowy Hydro update its Groundwater Management Plan and Surface Water Management Plan to include measures to monitor, meter and report on groundwater and surface water take, and manage impacts to water sources. This issue is discussed further in **section 5.1**.

EPA considered that the primary risk for the modification was potential discharge of drilling liquids to surface waters, via 'frac-out', particularly noting the Modification Report specified the drilling fluid would be a mixture of water and bentonite. EPA recommended Snowy Hydro conduct appropriate risk assessments of all of additives that are proposed for the activity, and implement appropriate procedures to manage the drilling process, spills and spoil handling and emplacement. This issue is discussed further in **Section 5.1**.

National Parks and Wildlife Service (NPWS) and the Department's **Biodiversity Conservation Section (BCS)** provided a joint submission in relation to the modification, and raised issues regarding potential changes to site access.

NPWS and BCS advised that any proposal not to use the Marica West Trail as the primary emergency access point would potentially reduce the ability of emergency services to enter and exit Lobs Hole in the event that Ravine Road South was inaccessible. NPWS and BCS also requested further information about the potential use of Lobs Hole Ravine Road North, particularly noting that the upgrade of that road, as required by the conditions of the Exploratory Works approval, is not yet complete. This issue is discussed further in **Section 5.2**.

Heritage NSW supported the continued application of the Heritage Management Plan to the drilling works, but requested Snowy Hydro be satisfied there would be no unnecessary impacts will occur to Aboriginal objects or cultural values from the modification. Heritage NSW also advised that it was unlikely the modification would cause additional impacts to archaeological relics.

Crown Lands noted the proposal would not impact on Crown Land.

DPI Agriculture, Resource Regulator and **Transgrid** had no comment on the modification.

4.5 Response to submissions

On 6 December 2021, Snowy Hydro submitted a Submissions Report, providing a response to the issues raised in submissions, and outlining clarifications to the proposal including:

- increasing the footprint of the eastern receival pad (Marica) site to 100 m x 100 m (from 100 m x 40 m).
- stating the proposal would use only water-based substances for drilling fluid.
- confirming the length of drilling to be 2.28 km (increased from 2.2 km).

The Department assessment of the proposal and Snowy Hydro's responses to the issues raised in submissions is detailed in **Section 5** of this report.

5 Assessment

The Department has assessed the modification application and supporting information in accordance with the relevant requirements of the EP&A Act, having regard to the existing conditions of approval, the modification request, Modification Report, the issues raised in agency advice and submissions from members of the public, and the Submissions Report. A list of key documents that informed the Department's assessment is provided in **Appendices A to E**.

The Department considers that the key assessment issues are surface and groundwater impacts (**Section 5.1**), and emergency access (**Section 5.2**). The Department's assessment of other matters is provided in **Section 5.3**.

5.1 Groundwater and surface water

The modification has the potential to impact groundwater and surface water through interception of groundwater, use of water for drilling and generation of wastewater.

Groundwater

The modification proposes to build seven 2.28 km tunnels that would intercept the Lachlan Fold Belt MDB Fractured Rock Groundwater Source, and intercept up to 14 ML of groundwater during construction. The drilling process would require approximately 189,000 kL of water for use as drilling fluid, which would be pumped to the western launch pad from the MAT Portal water supply. Snowy Hydro estimates 75% of this water could be recycled, . Approximately 900 kL wastewater would be generated by the drilling process per day, with cuttings and clay filtered at the western launch pad, and excess water and the remainder treated in the project water treatment plant and disposed in accordance with the approved Surface Water Management Plan.

In response to the joint Water Group/NRAR advice, Snowy Hydro reviewed its construction water requirements and groundwater take against availability of water under its existing specific purpose access licence (SPAL) and groundwater licences respectively. In summary, Snowy Hydro notes:

- 2 ML surface water would be required for the works, comprising less than 1% of its existing SPAL entitlements.
- In line with recent practice onsite, it is likely a substantial proportion of this requirement would be sourced from runoff and intercepted groundwater in lieu of water sourced from Talbingo Reservoir under the SPAL.
- The project holds sufficient groundwater licence allocations to accommodate the groundwater take for drilling, as groundwater requirements for the project are anticipated to ramp up throughout construction and Snowy Hydro would have sufficient remaining unit shares within its licences to accommodate the proposed additional take prior to completion of the main tunnels.
- Surface and groundwater use would be metered in accordance with the approved Snowy 2.0 Water Management Plan.
- Groundwater take would cease following casing of the tunnels.

DPIE Water reviewed the Submissions Report and was satisfied that the response addressed the matters raised in its submission.

The Department considers that the groundwater impacts of the proposal would be minimal and could be managed in accordance with its existing conditions of approval and licencing arrangements.

Surface water

Parallel to the assessment of this modification, and in light of EPA's concerns regarding potential surface water quality impacts in the event of discharge of drill fluid, Snowy Hydro reviewed its proposed drill fluid and determined that no chemicals will be used in the horizontal directional drilling, with only water-based substances to be used. As a consequence, Snowy Hydro considers that the risk of loss of containment of drilling fluid would be reduced. Notwithstanding this, Snowy Hydro also committed to developing and implementing a frac-out contingency plan and incident response procedures. The EPA advised that it was satisfied with this approach.

The Department considers that the water quality risk associated with the modification could be managed effectively in accordance with the updated commitments set out in the Submissions Report.

5.2 Access

While the proposal does not propose to amend access to and within the site during construction or operation, the Department acknowledges that the modification would change the scope and extent of construction works within the Marica West Trail alignment and may have implications for construction and use of that route.

The Department acknowledges NPWS and BCS's concern that emergency access to the site and the overall Emergency Management Plan for the project would need to be revisited if the Marica West Trail is not completed. As identified in the joint NPWS/BCS advice, the Marica West Trail is approved as a primary access/egress route during emergency events. While an alternate route, Lobs Hole Ravine Road North, is available as secondary emergency route, its overall use is restricted by the conditions of the SSI approval. As such, delivery of Marica West Trail forms part of the Emergency Management Plan required by the SSI approval.

While the modification application does not propose to amend the access arrangements, the Department has considered that emergency access and notes that, in its Submissions Report, Snowy Hydro has committed to review and update its approved Emergency Access Plan in consultation with NPWS in the event that any changes to the project emergency access and egress are identified. As such, the Department has recommended conditions to require Snowy Hydro to review the Emergency Management Plan in consultation with NSW Rural Fire Service and State Emergency Service, to the satisfaction of NPWS, if any changes to approved access arrangements are proposed.

5.3 Other issues

Issue	Findings	Recommendations
Biodiversity	<p>Establishment of the drill pad sites would change the indicative disturbance footprint of the project, but this would remain within existing clearing limits.</p> <p>The Main Works SSI approval sets out an overall approved construction envelope, and sets a maximum clearing area for the project of 425 ha. The CSSI approval also shows an indicative disturbance area for the project, which Snowy Hydro can refine within the construction envelope so long as total clearing for the project remains less than 425 ha.</p> <p>The Department notes that each of the proposed drill sites are located within the approved construction envelope. While part of the eastern drill pad site would be outside the previously identified disturbance area, the SSI approval allows Snowy Hydro to make changes to the precise indicative area, so long as it stays within approved construction envelope and, when fixed based on the final design, is subsequently offset.</p> <p>The Department is satisfied that the change in the disturbance area at the eastern drill pad site is permissible, so long as Snowy Hydro continues to comply with the relevant conditions of approval.</p> <p>The Department notes the approval requires Snowy Hydro to review each of the relevant management plans within 3 months should this modification be approved, including the Biodiversity Management Plan, which should ensure that the relevant mitigation measures are reviewed and updated where required.</p>	<p>No additional conditions recommended.</p>

Issue	Findings	Recommendations
<p>Spoil management</p>	<p>Overall, drilling of the tunnels would generate approximately 2,500 m³ of spoil which would need to be stockpiled and disposed of, including movement of spoil from the western pad site to the Main Yard of GF01 emplacement areas.</p> <p>As part of the Modification Report, Snowy Hydro committed to active management of stockpiles and disposal in line with existing spoil management requirements for the project.</p> <p>The Department considers that the volume of spoil to be generated can be readily managed in accordance with the existing spoil management requirements of the SSI approval.</p>	<p>No additional conditions recommended.</p>
<p>Heritage</p>	<p>Heritage NSW raised concerns that the drilling works may impact on Aboriginal objects or cultural values, particularly within the survey unit MSU9 identified in the EIS, which was not previously subject of impact from works.</p> <p>In its Submissions Report, Snowy Hydro noted that MSU9 would continue to be unaffected, as drilling works would be at depths of up to 50-100 m underground in that location and unlikely to impact on Aboriginal heritage. Further, all surface works would be located in areas surveyed and identified for clearance as part of the approved project.</p> <p>Notwithstanding the low potential for impact, Snowy Hydro noted that it would continue to implement the approved Heritage Management Plan for the project, which provides for management of unexpected finds.</p> <p>The Department considers that the potential for impacts is low and can be managed in accordance with the Heritage Management Plan.</p>	<p>No additional conditions recommended.</p>

6 Evaluation

The Department has assessed the modification application and supporting information in accordance with the relevant requirements of the EP&A Act.

Snowy Hydro proposes to install underground cabling and services using horizontal directional drilling, rather than via overhead lines or trenching within an approved access route, the Marica West Trail, to link the MAT portal and Marica sites.

The Department considered key issues raised by DPIE Water and NRAR, EPA, Heritage NSW and NPWS and BCS, including surface and groundwater impacts, heritage impacts and access arrangements, and Snow Hydro's response to the issues raised in agency and public submissions. The Department considers that the issues raised could be managed, subject to conditions.

The Department considers the proposed modification would result in an overall reduction in the impacts associated with establishing services connection between the two sites, and could be managed effectively under the conditions of consent (as proposed to be modified).

Consequently, the Department considers that the modified project is in the public interest, and should be approved, subject to the recommended revised conditions of approval.

7 Recommendation

It is recommended that the Director, Energy Assessments, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **determines** that the application Snowy 2.0 Main Works Modification 1 (SSI-9687-Mod-1) falls within the scope of section 5.25 of the EP&A Act;
- **forms the opinion** under section 7.17(2)(c) of the *Biodiversity Conservation Act 2016* that a biodiversity development assessment report is not required to be submitted in relation to this application as the modification will not increase the impact on biodiversity values;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the modification;
- **modify** the approval SSI-9687; and
- **signs** the attached Notice of Modification (see **Appendix D**).

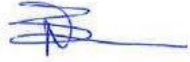
Recommended by:



Dominic Crinnion
Team Leader
Energy Assessments

8 Determination

The recommendation is **Adopted / ~~Not adopted~~** by:



27/1/22

Nicole Brewer

Director

Energy Assessments

as delegate of the Minister for Planning

Appendices

Appendix A – Modification Report

<https://www.planningportal.nsw.gov.au/major-projects/project/42911>

Appendix B – Submissions Report

<https://www.planningportal.nsw.gov.au/major-projects/project/42911>

Appendix C – Submissions

<https://www.planningportal.nsw.gov.au/major-projects/project/42911>

Appendix D – Notice of Modification

<https://www.planningportal.nsw.gov.au/major-projects/project/42911>

Appendix E – Consolidated Approval

<https://www.planningportal.nsw.gov.au/major-projects/project/42911>