



S2-FGJV-ENV-PLN-0039

SNOWY 2.0 EXPLORATORY WORKS – WORKER RECREATIONAL MANAGEMENT PLAN

Approval Record			
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Document Revision Table		
Rev.	Date	Description of modifications / revisions
-	09.04.19	FIRST DRAFT
A	17.04.19	FOR REVIEW AND CONSULTATION
B	27.05.19	UPDATED FROM SNOWY HYDRO COMMENTS
C	28.06.19	FOR REVIEW AND CONSULTATION
D	02.08.19	UPDATED FROM OEH COMMENTS
0	27.08.19	UPDATED FROM DPIE COMMENTS
1	14.01.20	UPDATED TO INCORPORATE MODIFICATION 1 AND MODIFICATION 2
2	10.03.19	UPDATED BASED ON SNOWY HYDRO COMMENTS
3	03.04.20	FOR CONSULTATION
4	23.04.2020	UPDATED FOLLOWING MODIFICATION 2 CONSOLIDATED APPROVAL

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ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
ACHA	Aboriginal Cultural Heritage Assessment
AFL	Agreement for Lease
Approval	Infrastructure Approval (SSI 9208)
APZ	Asset Protection Zone
CoA	Conditions of Approval for the Snowy 2.0 Exploratory Works project
DPIE	NSW Department of Planning, Industry and Environment
DPI	NSW Department of Industry
EMMP	Excavated Material Management Plan
EMS	Environmental Management Strategy
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPA	NSW Environment Protection Authority
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
Exploratory Works EIS	<i>Snowy 2.0 Exploratory Works - Environmental Impact Statement</i>
Future Generation	Future Generation Joint Venture
Future Generation-PMS	Project Management System
GDE	Ground Dependent Ecosystem
KNP	Kosciuszko National Park
KNP PoM	Kosciuszko National Park Plan of Management 2006
NOA	Naturally occurring asbestos
NPWS	NSW National Parks and Wildlife Service
NPW Act	<i>National Parks and Wildlife Act 1974</i>
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
PEP	Project Execution Plan
PIRMP	Pollution Incident Response Management Plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Project, the	Snowy 2.0, Exploratory Works Stage 2
QMP	Quality Management Plan
REMM	Revised environmental management measures
RTS	<i>Response to Submissions Exploratory Works for Snowy 2.0</i>
SEMP	Subaqueous Emplacement Management Plan
Snowy Hydro	Snowy Hydro Limited

Acronym	Definition
Submissions Report or RTS	<i>Response to Submissions Exploratory Works for Snowy 2.0</i>
TARP	Trigger Action Response Plan
TBM	Tunnel Boring Machine
TEC	Threatened Ecological Community
WRMP	Worker Recreational Management Plan

1. INTRODUCTION

Salini Impregilo, Clough and Lane have formed the Future Generation Joint Venture (Future Generation) to provide the Civil Works Package for Snowy Hydro Limited (Snowy Hydro) on the Snowy 2.0 Project (the Project).

The Project is a pumped hydro project that will increase the generation capacity of the Snowy Mountains Scheme by up to 2,000mW and at full capacity will provide approximately 350,000MW/h of energy storage. The project includes all activities associated with the civil works requirements for the Snowy 2.0 Pumped Hydro-electric Scheme.

Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs, which are in the Kosciusko National Park (KNP) in southern NSW. Approximately 27km of concrete-lined tunnels will be constructed to link the two reservoirs and a further 20km of tunnels will be required to support the facility. The power station complex will be located almost one-kilometre underground.

The project will deliver one of the largest pumped hydro schemes in the world and underscores the importance of the Snowy Scheme's role in the National Electricity Market.

Future Generation was conceived to deliver an integrated engineering, procurement and construction management service for the project. The joint venture is backed by the combined experience of Salini Impregilo, Clough and Lane, through their experience in the infrastructure, mineral and oil and gas sectors throughout Australia and the world.

1.1. Purpose

The Worker Recreational Management Plan (WRMP or Plan) forms part of the Environmental Management Strategy (EMS) for Snowy 2.0 – Exploratory Works – Stage 2 (Exploratory Works – Stage 2). The Exploratory Works is the first phase of Snowy 2.0, a pumped hydro-electric storage and generation project which will increase the hydro-electric capacity within the existing Snowy Mountains Hydro-electric Scheme. The Main Works or second phase, will be subject to a separate Environmental Impact Statement (EIS) in 2019.

This WRMP has been prepared to address the requirements of:

- the Infrastructure Approval (SSI 9208) issued for Snowy 2.0 Exploratory Works on the 7 February 2019 and modified on 2 December 2019 and 27 March 2020;
- the *Environmental Impact Statement Exploratory Works for Snowy Hydro 2.0* (Exploratory Works EIS);
- the revised environmental management measures (REMMs) within the *Response to Submissions Exploratory Works for Snowy 2.0* (Submissions Report or RTS);
- the *Modification 1 Assessment Report - Exploratory Works for Snowy 2.0* (Modification 1);
- the REMMs within the *Response to Submissions - Exploratory Works Modification 1* (Submissions Report for Modification 1);
- the *Modification 2 Assessment Report - Exploratory Works for Snowy 2.0* (Modification 2); and
- the REMMs within the *Response to Submissions - Exploratory Works Modification 2* (Submissions Report for Modification 2).

The Exploratory Works for Snowy 2.0 includes, but is not limited to:

- an exploratory tunnel to the site of the underground power station for Snowy 2.0;
- horizontal and test drilling;
- a portal construction pad;

- an accommodation camp;
- road works and upgrades providing access and haulage routes;
- barge access infrastructure and dredge works*;
- excavated rock management, including subaqueous placement* within Talbingo reservoir;
- services infrastructure; and
- post-construction revegetation and rehabilitation.

****Note: these activities will not proceed unless the relevant management plans are approved by Department of Planning, Industry and Environment (DPIE).***

Exploratory Works will be delivered in three distinct stages and these stages will be completed by two different contractors. Leed Engineering (Leed) is the contractor who will be carrying out the Snowy 2.0 Stage 1 work on behalf of Snowy Hydro. Future Generation is the contractor who will be delivering the Snowy 2.0 Stage 2 works on behalf of Snowy Hydro.

Works to be completed by Leed on behalf of Snowy Hydro:

- **Stage 1a – Pre-construction Minor Works** – Stage 1a has been approved and commenced in the first quarter of 2019. The scope of pre-construction minor works includes dilapidation studies, survey work, borehole installation, site office establishment, minor access roads, installation of monitoring equipment, installation of erosion and sediment controls, and minor clearing.
- **Stage 1b - Exploratory Works Access Roads (EWAR)** – Stage 1b has been approved and commenced in the second quarter of 2019. The scope includes roadworks and upgrades to enable access and haulage routes during Exploratory Works. This includes upgrades to 26 km of existing roads and creating about 2 km of new roads, two new bridge crossings and two temporary waterway crossings.

Works to be completed by Future Generation on behalf of Snowy Hydro:

- **Stage 2 – Exploratory Works** – Stage 2 has been approved and works commenced in October of 2019. The scope for Stage 2 Exploratory Works includes:
 - pre-construction minor activities including dilapidation studies, survey, investigations, access etc; and
 - construction works including exploratory tunnel, portal construction pad, accommodation camp, dredging, barge access infrastructure, excavated rock management and additional geotechnical investigation. This includes subaqueous emplacement within Talbingo Reservoir.

Further detail on construction activities and staging is presented in Section 1.7 and Figure 1-1.

This Plan identifies the Project's environmental management measures in relation to worker recreational management for the Exploratory Works – Stage 2.

Exploratory Works	2019				2020				2021			
Stage 1 – Access Roads												
Stage 2 – Exploratory Works												

Figure 1-1: Timing of Exploratory Works stages

Stage 2 management plans have been revised from the corresponding Stage 1 management plan, as demonstrated in the document revision section of each Stage 2 plan. The intent of this arrangement is to ensure a consistent approach to managing environmental risk and regulatory requirements for the Exploratory Works project. In the event that both Exploratory Works Stages are undertaken concurrently, and / or in overlapping locations, the Stage 1 management plan will apply to the Stage 1 works, and the Stage 2 management plans will apply to the Stage 2 works. This arrangement would not affect management standards as all relevant measures from each management plan would continue to apply. As the proponent, Snowy Hydro will oversee both Stages of the Exploratory Works project.

The timing of the preparation, consultation, submission and approval of this Plan, along with other management plans required by the Conditions of Approval (CoA), is shown within Table 4.4 and Figure 4.4 of the EMS.

Ongoing revisions to this Plan will occur in accordance with Section 1.6 of the EMS, and as required by condition 4 of schedule 4 of the Infrastructure Approval. Circumstances requiring a review, and if necessary, revision of this Plan include submission of incident reports or audit reports, approval of modifications to the CoA and directions of the Planning Secretary under condition 4 of schedule 2.

Specific on-site management measures identified in this Plan will be incorporated into site documents. These site-specific documents will be prepared for construction activities and will detail the management measures which are to be implemented on the ground. Construction personnel will be required to undertake works in accordance with the mitigation measures identified in the site-specific documents.

1.2. Background

Snowy Hydro is the proponent of the Project which is a pumped hydro-electric storage and generation project proposed to address increasing demands for renewable energy supplies. Snowy 2.0 involves linking Talbingo and Tantangara reservoirs within the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme) and building an underground power station between the two reservoirs.

Future Generation proposes to carry out the Exploratory Works – Stage 2 prior to the main construction works for the Project, to inform the detailed design and to reduce project risk. Exploratory Works are required to obtain detailed geological data for the location of the underground power station. An exploratory tunnel is to be constructed to gain this information. The Exploratory Works – Stage 2 will predominantly be in the Lobs Hole area of KNP. If the Exploratory Works are not undertaken, risks to the design and construct elements of the power station cavern are significantly increased.

The Exploratory Works EIS was prepared to assess the impact of these works on the environment, including an assessment of social impacts within Chapters 5.7 and Appendix R.

The Exploratory Works EIS identified that there is potential for a small number (approximately 24 of the estimate 200 workers, during peak construction) of workers to stay within the local region and take advantage of the recreational opportunities it provides, including camping within the KNP during their off-swing period. The Exploratory Works EIS concluded that, even if all workers off-

swing recreate within the KNP, this level of demand will have a negligible impact. It is estimated that there are 2.2 million annual visitors to KNP.

The RTS included REMMs within Chapter 8. There were no management measures from that report associated with worker – recreational management.

1.2.1. Modification 1

In accordance with section 5.25 of the EP&A Act, the Infrastructure Approval issued for Exploratory Works was modified to:

- provide additional geotechnical information for the detailed design of the Snowy 2.0 power station and power waterway;
- provide a reliable long-term source of construction power for the duration of Exploratory Works and will reduce the reliance on diesel generation and associated on-site storage and emissions;
- improve the efficiency of the Exploratory Works construction power;
- optimise the detailed design of construction areas and access roads; and
- improve worker safety during construction.

The Modification 1 Assessment Report was submitted to Department of Planning, Industry and Environment (DPIE) in June 2019, and was publicly exhibited between 26 June 2019 and 9 July 2019. A total of nine submissions were received, and following consideration, approval was granted by the Minister for Planning and Public Spaces on 2 December 2019.

Though Modification 1 included several changes, only the geotechnical investigations are relevant to the Stage 2 works and Future Generation's activities for the Exploratory Works project.

1.2.2. Modification 2

In accordance with section 5.25 of the EP&A Act, the Infrastructure Approval issued for Exploratory Works was modified to:

- revise the tunnelling method from drill and blast to predominantly tunnel boring machine (TBM);
- provide for road upgrades required to enable the transport and delivery of TBM equipment and materials required for tunnelling;
- include vegetation trimming, and selective tree lopping/removal on Lobs Hole Ravine Road (south) to provide adequate clearance for transport of the TBMs;
- improve access and egress to Lobs Hole via Lobs Hole Ravine Road (north);
- relocate the Middle Bay Barge ramp;
- increase the capacity of the Lobs Hole accommodation camp from 152 personnel to up to 250;
- provide for additional diesel storage capacity for the TBM until the Lobs Hole substation construction power is available;
- provide for the additional diesel generators required to provide power supply to the TBM prior to Lobs Hole substation commissioning; and
- revise the transport strategy to reduce the use of barging for delivery of materials to site.

The Modification 2 Assessment Report was submitted to Department of Planning, Industry and Environment (DPIE) in October 2019, and was publicly exhibited between 5 November 2019 and 21 November 2019. A total of twenty-five submissions were received, and following consideration, approval was granted by the Minister for Planning and Public Spaces.

1.3. Environmental Management System

The overall environmental management system for the Project is described in the Environmental Management Strategy (EMS). This Worker Recreation Management Plan (WRMP or plan) forms part of Future Generation's environmental management framework as described in the EMS.

This plan aims to transfer the relevant requirements of the approval documents into a management plan which can be practically applied on the project site.

1.4. Relationship to Project Management System and other Project Plans

It is a requirement of Volume 4 Employer's Requirements – Project Execution to develop and implement a number of project plans for the project. These plans are defined as deliverables. The WRMP is required to support the deliverable plans.

The Environmental Management Strategy (EMS) will form part of the Project Management System (Future Generation-PMS) and will include any requirements specified in the contract documents, where appropriate. All Future Generation-PMS procedures will support, interface or directly relate to the development and execution of the plan.

The Project Execution Plan (PEP) is the overarching document that outlines the minimum requirements for project management on the project. The PEP is not a standalone document and has been prepared with consideration to other project plan requirements. The PEP will also detail the interfaces between other project plans and provide information on the responsibility and management of the interfaces and project works.

All project plans are reviewed by the Quality Manager and/or Systems Manager to ensure consistency with the Quality Management Plan (QMP) and Future Generation-PMS.

1.5. Purpose and objectives

The purpose of this plan is to describe how the Project proposes to minimise and manage impacts of worker recreation on the KNP's natural assets and existing infrastructure during construction of the Project.

The key objective of the WRMP is to describe the management measures that are to be implemented to ensure that worker recreational impacts to the values of KNP are minimised within the scope permitted by the Project Conditions of Approval (CoA). To achieve this objective, Snowy Hydro and Future Generation will:

- ensure appropriate measures are implemented to address the relevant CoA and the REMMs listed within the Submissions Reports for Modification 1 and Modification 2 as detailed within Section 2.2 of this Plan;
- ensure appropriate measures are implemented during construction to avoid or minimise worker recreational impacts to the values of KNP and potential adverse impact;
- establish a monitoring program to assess the effectiveness of the worker recreational management controls and to monitor worker recreational impacts outside the approved disturbance area; and
- establish a plan to respond if the values of KNP are adversely affected by worker recreational activities.

1.6. Consultation

In accordance with condition 2 of Schedule 3 of the Approval, the WRMP has been prepared in consultation with Snowy Hydro and National Park and Wildlife Services (NPWS).

On 20 May 2019 and 28 June 2019, the Plan was issued to relevant stakeholders for review and comment. Comments from consultation have been incorporated into this Plan where appropriate. Response to the comments have been provided back to the Stakeholder Agencies.

An agency briefing meeting was conducted with EPA, OEH, NPWS, DPI Fisheries and Snowy Hydro on 4 June 2019. The comments from this briefing were incorporated into the plan and the plans were resubmitted to DPIE and Snowy Hydro on 5 July 2019.

Consultation is summarised in Table 1-1. A separate document (Agency Consultation Evidence Report) has been prepared detailing the consultation process.

Table 1-1: Consultation undertaken for this plan

Date	Consultation	Outcomes
17 April 2019	Issued WRMP to Snowy Hydro.	Comments accepted and plans revised to address comments
27 May 2019	Issued WRMP to OEH.	Comments accepted and plans revised to address comments
4 June 2019	Agency briefing meeting with EPA, OEH, NPWS, DoI Fisheries and Snowy Hydro	Comments received from NPWS during briefing. WRMP revised to include comments
4 July 2019	Incorporated agencies' comments and updated plan. Updated plan submitted to Snowy Hydro and DPIE on 5 July 2019	Comments accepted and plans revised to address comments

Revision 3 of the WRMP (prepared in response to Modification 2 consolidated approval conditions and incorporating Modification 1 information) was issued to NPWS for consultation on 6 April 2020. No comments were provided, specific to the WRMP.

1.7. Construction Activities

This Plan relates to Stage 2 works. Stage 2 includes the following:

- pre-construction minor works (not construction activities) including:
 - building/road dilapidation studies;
 - survey works;
 - installing groundwater bores in the Ravine beds on site for water supply;
 - establishing a temporary site office;
 - minor access roads to facilitate the pre-construction minor works;
 - installation of environmental impact mitigation measures, including the installation of monitoring equipment, erosion and sediment controls, and fencing; and
 - minor clearing or translocation of native vegetation within the approved disturbance footprint for the pre-construction minor works.
- the exploratory tunnel which is approximately 3.1 km long and will lead to the site of the underground power station. Excavation of the tunnel will occur through a method of both drill and blast and TBM;
- road upgrades for transport and delivery of the TBM and TBM equipment (undertaken by Snowy Hydro);
- a turnaround area on Link Road (undertaken by Snowy Hydro) for transportation of the TBM equipment and materials to the construction areas at Lobs Hole and to facilitate set down and turn-back of oversize and overmass (OSOM) deliveries;

- horizontal and other test drilling, investigations and analysis in situ at the proposed cavern location and associated areas, and around the portal construction pad, access roads and excavated rock management areas all within the disturbance footprint;
- borehole drilling and geophysical surveys for further geotechnical investigation of the Snowy 2.0 power station and power waterway at Marica, Talbingo and Tantangara;
- ongoing groundwater monitoring using existing boreholes and access tracks within KNP;
- ongoing maintenance and rehabilitation of existing access tracks required for groundwater monitoring and geotechnical investigations within KNP;
- additional geotechnical drilling is proposed to enable investigation and detailed design of critical bridge works (Nungar Creek bridge) on Tantangara Road;
- additional laydown areas at Talbingo north for the transfer of plant and materials are proposed within Modification 1 to improve constructability; a portal construction pad for the exploratory tunnel. This will provide the entrance structure to the tunnel and an area for infrastructure and equipment needed to support tunnelling activities;
- an accommodation camp for the Exploratory Works construction workforce;
- barge access infrastructure including one new barge ramp at Middle Bay near Lobs Hole at the southern part of Talbingo Reservoir;
- excavated rock management, including subaqueous placement within Talbingo Reservoir*. Up to 750,000 m³ of excavated rock will need to be tested for its geochemical properties (i.e. whether the rock is reactive or non-reactive) before being managed by a combination of the following options:
 - re-use – suitable material can be used as construction materials for roads or similar. Some materials will be provided to NPWS for use in road maintenance and upgrades in other areas of KNP;
 - on land placement – material will be placed in one of two on land emplacement areas. The eastern emplacement area has been designed to safely treat reactive material during temporary storage. The western emplacement area will be used for temporary storage of materials for re-use or offsite disposal (*Note: no material is to remain at any emplacement area and must be either sub-aqueously placed at Talbingo Reservoir or removed to a suitable place outside of KNP within three years of completion of the exploratory works (should Snowy 2.0 main Works not proceed)*);
 - subaqueous placement within Talbingo Reservoir* - suitable material will be placed at a suitable location within Talbingo Reservoir, subject to a number of water quality controls and monitoring;
- services infrastructure such as diesel-generated power, water and communication; and
- post-construction revegetation and rehabilitation, management and monitoring.

1.7.1. Works approved through Modification 1

The Exploratory Works - Modification 1 works scope is included in Table 1-2. For clarity this has been divided between Stage 1 and Stage 2 works.

The revised project boundary (disturbance footprint) for the project, as approved through Modification 1 of the Infrastructure Approval, has been included in Appendix A.

Table 1-2: Exploratory Works - Modification 1 works scope (Stage 1 and Stage 2)

Modification 1 – Stage 1	
Activity	Description
Lobs Hole Substation	<p>Additional disturbance area required for the construction power connection to an existing transmission line (Line 2) at Lobs Hole for power supply to the Exploratory Works accommodation camp and construction areas. This will provide a reliable and long-term source of construction power and will reduce the reliance on diesel generation and associated on-site storage requirements and emissions. Works in this area will include establishing a substation, connection infrastructure, access roads and ancillary construction areas. Works in this area will include establishing a substation, connection infrastructure, access roads and ancillary construction areas.</p> <p>This will include:</p> <ul style="list-style-type: none"> • construction of a 330/33 kV substation within Kosciuszko National Park and adjacent to Line 2, which forms a 330-kV connection between Upper Tumut Switching Station and Yass Substation; • geotechnical investigation works to inform the detailed design of the construction power substation; • replacement of one transmission support structure (Structure 54) within the existing transmission easement. This will involve removal of the existing structure and establishment of one new steel lattice tower, approximately 50 m in height; • short overhead 330 kV transmission line connections (approximately 100 m in length) between the substation and the new Structure 54; • 33 kV feeder connection between the substation and the Exploratory Works construction power network. This will be either overhead lines or underground cables; • establishment and upgrade of access tracks and roads to the new substation and transmission line structures; • installation of a fibre optic communication link into the new substation from the approved communication network; and • ancillary activities, including brake and winch sites, crane pads, site compounds and equipment laydown areas. <p>(Illustrated in Appendix A Figure 1i).</p>
Camps Bridge and Wallaces Creek	<p>Additional disturbance area around Camp Bridge and Wallaces Creek Bridge required for improved constructability of the crossings. Works within these areas will include vegetation clearing, levelling earthwork, erection of falsework, sediment controls, laydown, parking and movement of equipment.</p> <p>(Illustrated in Appendix A Figures 1h and 1i).</p>
Lobs Hill Ravine Road and Construction Boundary Changes	<p>Minor changes to the project boundary identified through detailed design including:</p> <ul style="list-style-type: none"> • revised road upgrade for Lobs Hole/Ravine Road to improve access, drainage and safety; • minor additions to construction areas for design optimisation. • removal of dangerous trees on Lobs Hole Ravine Road. This will involve either complete or partial removal of up to 91 trees that have been identified to pose a safety risk to road users on Lobs Hole Ravine Road and Mine Trail Road. <p>(Illustrated in Appendix A Figures 1d, 1e, 1f and 1i).</p>
Operating Hours	<p>Modify operating hours for the use of Upper Lobs Hole Ravine Road from 7 am to 6pm to sunrise to sunset.</p>
Miscellaneous	<p>Continued use of existing communications towers within KNP that were previously approved by the NPWS under a separate review of environmental factors (REF R – Wallaces Creek Geotechnical drilling) environmental impact assessment carried out under the NSW <i>National Parks and Wildlife Act 1974</i> (NPW Act) and its regulation for the geotechnical investigation program; and</p> <p>Increase in peak traffic volumes. Additional vehicles will be required to access the site to facilitate construction of Exploratory Works, however no change in impacts to the road network are expected.</p> <p>(The location of the communications towers illustrated in Appendix A Figures 1a, 1f,1i).</p>

Modification 1 – Stage 2	
Activity	Description
Borehole drilling and geophysical surveys	<p>This includes:</p> <ul style="list-style-type: none"> borehole drilling and geophysical surveys for further geotechnical investigation of the Snowy 2.0 power station and power waterway at Marica, Talbingo and Tantangara; clearing of up to 2.79 hectares (ha) of additional vegetation for access tracks and drilling pads. About 1.33 ha within Smokey Mouse potential habitat; trimming of overhanging dangerous branches on adjacent trees (these trees will not require removal); mulching of trees and vegetation; establishment of an additional 1 km of access tracks (4 m wide), including minor earthworks; placement of geofabric (as required) and import of stabilised material; establishment of eight drilling pads and boreholes at top of the cavern area, with an area of 900 m² per pad, including minor earthworks, placement of geofabric (as required) and import of stabilised material (as required); undertaking geophysical surveys near Talbingo and Tantangara reservoirs; establishment of two drilling pads and boreholes at both Tantangara and Talbingo with an area of 900 m² per pad, including approximately 400 m of additional access tracks and minor earthworks (as required); establishment of in-reservoir boreholes including one in Talbingo Reservoir and two in Tantangara Reservoir; drilling of additional nested vertical boreholes at each of the drilling pads up to a depth of 1,100 m; conversion of the investigation boreholes into monitoring bores; undertaking geophysical surveys; rehabilitation of the drilling pads and access tracks following completion of works; ongoing maintenance of existing access tracks required for geotechnical investigations within KNP. <p>(Illustrated in Appendix A Figure 1j, 1k, 1l, 1m and 1n)</p>
Talbingo Laydown	<p>Outside of KNP, Snowy Hydro is proposing to add four laydown locations to facilitate the construction of the communications cable linking Lobs Hole with the Tumut 3 Power Station.</p> <p>These are proposed on existing hardstand areas along the northern foreshore of Talbingo Reservoir within Snowy Hydro owned land. Additional widening of Spillway Road for accessibility is required.</p> <p>(Illustrated in Appendix A Figure 1o)</p>
Tantangara Access	<p>Two additional geotechnical boreholes are required to facilitate the detailed design of cuttings, bridge foundations, retaining wall foundations, and drainage structures near Nungar Creek.</p> <p>(Illustrated in Appendix A Figure 1m and 1n)</p>
Operating Hours	<p>Modify operating hours for the use of Upper Lobs Hole Ravine Road from 7 am to 6pm to sunrise to sunset.</p>

1.7.2. Works approved through Modification 2

The Exploratory Works - Modification 2 scope for Stage 2 works is included in Table 1-3.

The revised project boundary (disturbance footprint) for the project, as approved through Modification 2 of the Infrastructure Approval, has been included in Appendix A.

Table 1-3: Exploratory Works - Modification 2 works scope (Stage 2)

Modification 2 - Stage 2 works	
Activity	Description
Tunnelling	<p>The tunnelling methodology has been revised and include the following:</p> <ul style="list-style-type: none"> • TBM method will used to excavate the exploratory tunnel. The TBMs will be fully equipped to perform the excavation, ventilation, lining, and removal of excavated material; • the TBMs will be engineered to facilitate dismantling operations. This will avoid the need to excavate a preliminary dismantling chamber and allow the TBMs to be retrieved from the tunnel, thereby reducing the amount of excavated rock material; • the TBM will be equipped with devices to perform the following surveys: <ul style="list-style-type: none"> – geophysical seismic reflection surveys; – geoelectrical surveys; and – systematic probe core retrieval ahead of the advancing tunnel face; • the probing results will also be used to determine the presence of potentially acid forming (PAF) and naturally occurring asbestos (NOA) material; • the TBMs will be equipped with drilling machines to drill drainage holes with pipes to relieve groundwater pressures. If required, pre-excavation grouting will also be used to seal-off groundwater inflow and to improve the stability of the excavation face; • post-excavation grouting from the segmental lining may also be used to further consolidate the surrounding rock and/or prevent water ingress if required. <p>(Illustrated in Appendix A)</p>
Design	<p>Detailed design and geotechnical investigations have been optimised. The project optimisation is expected to reduce the exploratory tunnel length by approximately 600 m and reduce the volume of excavated material by approximately 65,000 m³.</p> <p>(Illustrated in Appendix A)</p>
Road upgrades (undertaken by Future Generation and Snowy Hydro or their contractors)	<p>Minor road upgrade works will be undertaken to enable transport of TBM equipment and materials required for tunnelling.</p> <p>The road upgrades have been designed to avoid additionally impacting any areas of geodiversity significance including the boulder streams, karst and fossil features on Lobs Hole Ravine Road.</p> <p>(Illustrated in Appendix A)</p>
Vegetation Clearing (undertaken by Future Generation and Snowy Hydro or their contractors)	<p>The additional clearing will include approximately 2.78 ha of vegetation to establish road upgrades on Lobs Hole Ravine Road (south), Lobs Hole Ravine Road (north) and Link Road.</p> <p>(Illustrated in Appendix A)</p>
Transport Strategy	<p>Modification 2 proposes to revise the transport strategy so that materials and equipment required for Exploratory Works will be delivered using Lobs Hole Ravine Road (south) as the primary access road.</p>
Link Road Turnaround Area (undertaken by Snowy Hydro or their contractors)	<p>A turnaround area will be established on Link Road for safe transportation of the TBM equipment and materials to the construction areas at Lobs Hole. The turnaround area will facilitate set down and turn-back of oversize and overmass deliveries.</p> <p>(Illustrated in Appendix A)</p>
Lobs Hole Ravine Road (south)	<p>Minor upgrade works will be undertaken on sections Lobs Hole Ravine Road (south) to enable the transport of the TBM equipment.</p> <p>(Illustrated in Appendix A)</p>

Modification 2 - Stage 2 works	
Activity	Description
Lobs Hole Ravine Road (north)	Roadworks will be conducted at Lobs Hole Ravine Road (North) to provide improved access and egress to Lobs Hole. Road works will include road upgrade and widening in several sections suitable for passing bays as well as regular maintenance of the existing roadway. (Illustrated in Appendix A)
Middle Bay Barge Ramp	The location of the Middle Bay barge ramp was revised as part of further refinement to the construction methodology. An alternative location for the Middle Bay barge ramp was identified to the west of the approved barge ramp location. A key benefit of the new barge ramp location is that it minimises the requirement for dredging as part of the barge ramp construction. (Illustrated in Appendix A)
Accommodation Camp	Lobs Hole accommodation camp will increase capacity to provide beds for up to 250 personnel. The additional accommodation will be created through an additional storey to the Lobs Hole accommodation camp using modular and stackable accommodation units that will allow the expansion to be entirely within the existing disturbance footprint.
Power Supply	Additional power supply capacity is required to enable TBM tunnelling for Exploratory Works. The Lobs Hole substation proposed under Modification 1 is scheduled to be online from approximately October 2020 and will provide the power supply required for operation of the TBM. It is currently planned to commence tunnelling with the TBM from August 2020. In the period prior to the Lobs Hole substation commissioning the additional power supply required for TBM tunnelling will be provided by additional diesel generator sets. Diesel generator sets with a total capacity of 20 MVA as well as an additional three 65 kL diesel storage tanks will be installed at the portal construction pad. (Illustrated in Appendix A)

2. ENVIRONMENTAL REQUIREMENTS

2.1. Legislation

Legislation relevant to worker recreational management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation); and
- *National Parks and Wildlife Act 1974* (NPWS Act).

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the EMS.

2.2. Conditions of Approval

The Infrastructure Approval includes conditions relevant to worker recreation within Schedule 3. The relevant conditions are presented in Table 2-1.

Table 2-1: Conditions of approval relevant to worker recreation

Condition	Requirement	Where addressed
Schedule 3 Condition 2	<p>Prior carrying out any construction, unless the Planning Secretary agrees otherwise, the Proponent must prepare a Worker – Recreational Management Plan to the satisfaction of the Planning Secretary.</p> <p>This plan must:</p> <ul style="list-style-type: none"> • be prepared in consultation with the NPWS; • identify the measures that would be implemented to minimise the impacts of workers on the values of the Kosciuszko National Park outside the approved disturbance area for the project, particularly the recreational activities of workers staying in the accommodation camp on site; • include a program to monitor the impacts of the development outside the approved disturbance area; • include a trigger action and response plan that would be implemented if monitoring shows the values of the Kosciuszko National Park are being adversely affected by the development. 	<p>This Plan</p> <p>Section 1.6</p> <p>Table 5-1</p> <p>Section 6.1</p> <p>Section 6.2</p>
Schedule 3 Condition 3	The Proponent must implement the approved Worker Recreational Management Plan.	Section 1.4

2.3. Revised Environmental Management Measures

There are no REMMs of relevance to this plan.

2.4. Licenses and Permits

There are no licences and permits applicable to this WRMP.

Future Generation are required to establish an Agreement for Lease (AFL) with NPWS, with an accompanying Works Access Licence in order to carry out the relevant Stage 2 Exploratory Works in accordance with the Exploratory Works EIS, CSSI 9208 and the approved Management Plans.

2.5. Guidelines

The guidelines considered in the completion of this plan include:

- Kosciuszko National Park Plan of Management 2006 (KNP PoM).

3. EXISTING ENVIRONMENT

3.1. Kosciuszko National Park

KNP is unique in Australia as it contains Australia's highest mountains, unique glacial landscapes and unusual assemblages of plants and animals. It has a rich Aboriginal and European history. The existence of older homesteads, farming and mining activity within KNP as well as current debates about conservation and heritage activities within the park are testimony to the importance of these values to local communities and our definition of national identity.

However, to many people the primary attractions of KNP are the snowfields and the opportunities provided by the existence of a series of alpine resorts that make KNP Australia's pre-eminent skiing destination.

The Exploratory Works are mostly located in the Ravine region, with additional barge facilities proposed at the northern end of Talbingo Reservoir, near Tumut 3 power station and outside the KNP boundary.

The Ravine region is relatively isolated at the north-western extremity of the KNP. The location is accessed from the Snowy Mountains Highway that links Tumut and Cooma. However, once off the

highway, the area is serviced by minor roads and tracks that have no through road or network function.

As for the values and importance of the Ravine region to the KNP, the Ravine area has not been included in a Wilderness Area within the KNP PoM, neither has it been recognised as possessing places and values of exceptional significance (NPWS 2006).

There are three areas identified in the KNP PoM that contain significant natural and cultural values but that are considered highly vulnerable to human-induced disturbance and require specific management measures to ensure their protection. These are:

- the alpine landscapes of the Main Range –around the concentration of alpine resorts near Mount Kosciuszko;
- the Yarrangobilly karst catchment – about 30 km by road north east of the project area; and
- the Cooleman Plain karst catchment – about 70 km north east of the project area.

There are an additional four management units identified as significant for their recreational values. These are the alpine skiing areas of:

- Charlotte Pass – within the Main Range Management Unit, in the southern part of KNP;
- Thredbo - within the Main Range Management Unit, about 2 hours and 40 minutes' drive (152 km) by road south east of the project area;
- Selwyn – on the south side of Kings Cross Road, about 40 minutes' drive (22 km) from Lobs Hole; and
- Perisher Range –within the Main Range Management Unit, about 3 hours 30 minutes (210 km) by road, south of the project area.

The KNP PoM also contains Schedules (at Part C of the KNP PoM) that address more site-specific matters, including features and items that may be potentially directly or indirectly affected by Exploratory Works. Those features and items relevant to Exploratory Works are included in Table 3-1.

Table 3-1: Significant natural and cultural features within KNP

Significant natural and cultural feature	KNP PoM Reference	Summary
Yarrangobilly Caves and the karst formations	Schedule 1 Table S1:10 Karst	These features are about 8 km north east of the project area, where the significance of the karstic limestone and the importance of the caves as a key tourist feature are recognised; the limestone unit is stratigraphically interpreted to be at the base of the Ravine Beds and is unlikely to be intercepted by Exploratory Works.
Yarrangobilly River	Table S1:12 Rivers, lakes and wetlands	Surface water features relevant to Exploratory Works are the Yarrangobilly River and Talbingo Reservoir including tributaries such as Wallaces and Stable creeks.
Communities and species of flora and fauna	Table S1:1 Mammal Species, Table S1.2 Amphibian species, Table S1.3 Reptile species, Table S1.4 Fish species, Table S1.5 Bird species, Table S1.6 Invertebrate species, Table 1.7 Plant species, Table S1.8 Plant communities	The Exploratory Works EIS aquatic ecology assessment identified ecological values within the Yarrangobilly River and Wallaces Creek as well as within Talbingo Reservoir which included aquatic habitat, and in particular extensive areas of wood debris (primarily submerged dead trees) and the non-native aquatic macrophyte <i>Elodea canadensis</i> (Canadian Pondweed) along shallow edges and embayment's. Canadian Pondweed is known to potentially alter dissolved oxygen levels reducing the water quality, restrict recreational activities on waterways and pose a drowning hazard for recreational swimmers. 5 threatened aquatic species were identified with the potential to occur within that part of the reservoir that may be impacted by Exploratory Works. The project area is made up of 9 Plant Community Types (PCTs), none of which have been identified

Significant natural and cultural feature	KNP PoM Reference	Summary
	and Table S1.14 Other	as Threatened Ecological Communities (TECs), 3 Ground Dependent Ecosystems (GDEs) and 4 species of threatened flora and 19 species of threatened fauna with potential to occur within the project area. 12 species of threatened fauna, including 2 aquatic species, were identified within the project area.
Aboriginal heritage places and objects	Table S1.13	The Aboriginal Cultural Heritage Assessment (ACHA) detailed the history of the Wolgalu people who inhabited the area, along with information of the existing material evidence, outcomes of the predictive model and results of the field assessments. (Exploratory Works EIS Appendix O (Aboriginal Cultural Heritage)).
Mining sites and remnants of earlier European activity	Table S1.13	The historic heritage assessment detailed the alpine region and high country's rich history from the early explorer-settlers in the 1820s, the establishment of pastoralism and summer grazing in the 1830s and the gold rush at Kiandra in 1859-60 and early scientific exploration. The assessment includes details of the copper mine in the Lobs Hole area established in the late nineteenth century through to 1916, the remains of both surface and below ground works from the mine and the settlement of Ravine associated with the mining boom.
Rocks and landforms	Table S1.9	A geodiversity review identified the glacial and peri-glacial features of KNP within proximity to the project area. These included scree slopes and block streams and boulder fields along Lower Lobs Hole Ravine Road. Exploratory Works EIS Appendix I (Geodiversity Review).

4. ENVIRONMENTAL ASPECTS AND IMPACTS

4.1. Construction Activities

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental Management Systems). The relationship of aspects and impacts is one of cause and effect.

Key aspects of the Project that could result in environmental impacts are identified in Table 4-1. The extent of these impacts will depend on the nature, extent and magnitude of construction activities and their interaction with the natural environment (Column 2). This is further exacerbated by environmental factors (Column 3).

Table 4-1: Project aspects and impacts relevant to this Plan

Environmental Aspects (Activities likely to cause impacts)	Environmental Impacts	Environmental Factors (Conditions)
<ul style="list-style-type: none"> Worker recreational activities during off-swing periods Worker recreational activities during breaks and rest hours General worker behaviour and attitude towards KNP values 	<ul style="list-style-type: none"> Damage and theft of historic heritage and aboriginal heritage items Disturbance to flora and fauna outside of the approved disturbance footprint Incidental spread of weeds, bacteria and pathogens Damage to karst features Littering 	<ul style="list-style-type: none"> Proximity – location of KNP areas of significance relevant to the Project.

4.2. Worker Recreation Impacts

The potential for impacts of Worker Recreation will depend on a number of factors. Primarily impacts will depend on the volume of workers and their interaction with the natural environment and other users of the KNP. Potential impacts attributable to workers on the Project may include:

- damage and theft of historic heritage and aboriginal heritage items;
- disturbance to flora and fauna outside of the approved disturbance footprint;
- incidental spread of weeds, bacteria and pathogens;
- damage to karst features; and
- littering.

4.3. Environmental Risk Assessment

The environmental aspects and impacts for the Project are further considered within Appendix A3 of the EMS. This includes a risk assessment process. The risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred. The risk assessment considers the impacts of increased users of the national park (i.e. workers) and increased pressures on the natural environment of the park and park infrastructure. Safety risks such as those associated with water recreation are covered in a safety risk assessment.

5. WORKER RECREATION MANAGEMENT MEASURES

A range of environmental requirements and control measures are identified in the EIS, RTS and the conditions of the Approval. Safeguards and management measures will be implemented to avoid, minimise or manage impacts to KNP outside of the disturbance footprint from worker recreational activities.

Specific safeguards and management measures to address the impacts to the surrounding environment from worker recreation are outlined in Table 5-1.

Table 5-1: Worker recreational management measures

ID	Measure / Requirement	Stage	When to implement	Responsibility	Source document
WR01	Training will be provided to all project personnel, including relevant sub-contractors on the importance of preserving the values of KNP and the requirements from this plan through inductions, toolbox talks and targeted training. The training will inform workers of the acceptable recreational activities within KNP and behaviors expected of personnel during construction.	Stage 1 Stage 2	Pre-construction and Construction	Contractor	Schedule 3 Condition 2
WR02	Recreational activities by workers during on shift times will be limited to areas within the approved Exploratory Works EIS disturbance footprint.	Stage 2	Construction	Contractor	Schedule 3 Condition 2
WR03	Additional clearing will be avoided by aligning the running track within the existing, approved clearing extent for the construction facilities required.	Stage 2	Pre-construction and Construction	Contractor	Schedule 3 Condition 2
WR04	Appropriate erosion and sediment controls will be planned and installed to minimise potential erosion and sediment impacts peripheral to the recreational areas attributed to the construction or use of the areas.	Stage 2	Pre-construction and Construction	Contractor	Schedule 3 Condition 2
WR05	Appropriate lighting will be installed for the running track in a manner that minimises the potential for light spill onto adjacent vegetation. All lighting will incorporate cut-off shields and be directed downwards towards the track, away from the night sky and away from known locations of sensitive habitat.	Stage 2	Construction	Contractor	Schedule 3 Condition 2
WR06	Recreational areas will be delineated with visual items such as fencing, para-webbing, or signage, to minimise users from encroaching outside of the approved recreational areas extents.	Stage 2	Construction	Contractor	Schedule 3 Condition 2
WR07	Information signage will be erected at all recreational areas to advise users of the environmental sensitivities within the project area and environmental management requirements.	Stage 2	Construction	Contractor	Schedule 3 Condition 2
WR08	Measures to prevent the introduction and/or spread of pests, weeds and pathogens will be implemented in accordance with the Weed and Feral Animal Management Plan.	Stage 2	Construction	Contractor	Schedule 3 Condition 2

5.1. Proposed Worker Recreational Activities

Future Generation considers the health and wellbeing of project personnel as an important aspect of project success. The long hours, shift structure and arduous nature (mental or physical) of the work performed can expose workers to fitness-for-work issues. The design, available facilities, and management of Future Generation's provided accommodation can assist in combatting some of the issues associated with:

- fatigue;
- shift structure and working hours; and
- mental health and wellbeing.

Future Generation's accommodation sites (camps) provide limited indoor exercise facilities other than a well-equipped gymnasium. As much of the construction works can be repetitive and mentally demanding, Future Generation considers outdoor recreational activities and regular exercise as beneficial, to help to maintain physical and mental fitness. Future Generation has designed its exercise activities and facilities to ensure an exercise regime that covers both aerobic and musculoskeletal fitness.

Future Generation proposes the following additional infrastructure within the current EIS footprint:

- running track within the asset protection zone (APZ) of the worker camp (see Figure 5-1). The APZ is a 20-50m wide cleared area required around the camp location. The track will be located as near as practical to the tree line around all camps.

The track will be delineated with 'no-go' zone fencing to ensure project personnel do not impact on the natural and cultural features outside of the approved project area.

This is not expected to increase light impacts as the perimeter of the camp will already need to have lights installed. Lighting will be installed at the running track to facilitate its use in early morning and late afternoon and evening when natural light is poor. Lighting from the accommodation camp was considered in Section 5.3.1 of the EIS Main Report. All lighting installed at the accommodation camp will be compliant with Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting and the Dark Sky Planning Guideline, (DPE 2016).

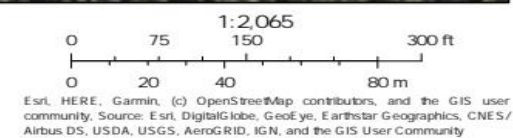
Future Generation will not permit other recreational activities including fishing, swimming or water sports within Talbingo Reservoir or the Yarrangobilly River.

It is important to note that the accommodation camp will be constructed during exploratory works, however 150 workers will not be mobilised to site to construct the camp. It is expected that approximately 30 workers will be required to construct the camp. During construction of the camp workers will be accommodated either offsite (outside of the KNP) or at a small temporary fly camp at the site of the exploratory camp. Workers will not be permitted to undertake recreational activities in the KNP during camp construction and alternative arrangements will be made. Construction and commissioning of the gym at Exploratory Works camp will be expedited to provide some recreation facilities for workers constructing the camp.



5/24/2019, 10:21:26 AM

- FGJV Design- Surface works - 20190405 Exploratory Works RTS boundary (20190122)
- Project labels
- Running track alignment
- EW disturbance area (20180515)
- EW avoidance area (20180515)



FGJV
EMM Consulting (2017)

Figure 5-1: Proposed Accommodation Camp worker recreation facilities

6. COMPLIANCE MANAGEMENT

6.1. Monitoring and Inspection

Weekly environmental inspections of the project will occur in accordance with Section 8 of the EMS.

All proposed recreational areas are within the current approved Exploratory Works EIS boundary and therefore the impact on the values of the KNP outside the approved Exploratory Works EIS disturbance area are intrinsically minimised.

Monitoring of the potential impacts to the values of the KNP at the periphery of the recreational areas, including the retained vegetation immediately adjacent to the accommodation camp running track will be undertaken as part of the weekly environmental inspections.

Monitoring will be targeted to the following environmental elements:

- visual evidence of users running adjacent to but outside of the designated running track, potentially damaging vegetation or fauna habitat;
- visual evidence of erosion and sedimentation cause by the construction and operation of the running track, potentially damaging vegetation or nearby waterways;
- visual evidence of light spill on vegetation from any installed safety lighting along the running track, potentially impacting on nocturnal fauna; and
- visual evidence of an increase in weed occurrence within the identified recreational areas.

6.2. Trigger Action Response Plan

6.2.1. Purpose

The purpose of the Trigger Action Response Plan (TARP) is to detail a standardised, response procedure in the event that the environmental monitoring elements detailed in Section 6.1 are shown to be occurring and causing degradation.

The TARP applies to all identified recreational areas detailed in this plan.

6.2.2. Objective

The objectives of the TARP are as follows:

- undertake preliminary visual inspection monitoring to try and determine the extent of potential impact;
- identify the potential catalyst of the impact;
- identify and implement potential mitigation measures to minimise continuation of the impact; if possible, and
- meet CoA and REMMs requirements for trigger response.

6.2.3. Response Process

Where degradation against the environmental monitoring elements are identified to be occurring for more than three consecutive monitoring events the following TARP process will be implemented:

- evaluate the cause of the impact;
- assess potential mitigation measures that can be applied to avoid or minimise the identified cause;
- implement the identified mitigation measures and monitor on an increased frequency until it can be ascertained that the impact has been avoided or managed to minimise further degradation;
- items to raise awareness of the impact will be communicated to construction personnel and users to attempt to reduce the likelihood of impact reoccurrence;
- if on-going monitoring shows that the implemented measures are ineffective then a higher order of reasonable measures must be evaluated and implemented;
- items to raise awareness of the impact will be communicated to construction personnel and users to attempt to reduce the likelihood of impact reoccurrence; and
- once it is evident that the impact is being managed with the implemented measures, monitoring will revert to the normal monitoring regime.

This TARP will also be considered to be implemented, in conjunction with other EMS Sub-plan TARPs, in the event that monitoring of biodiversity, aquatic habitat or surface water quality in the vicinity of the nominated recreational areas are showing on-going degradation.

Response to incidents will be undertaken as described in Section 7 of the EMS and in accordance with the Pollution Incident Response Management Plan (PIRMP) required by the Environment Protection Licence (EPL) 21266. The notification requirements consistent with the Infrastructure Approval (SSI 9208).

6.3. Auditing

Audits will be undertaken to assess the effectiveness of these management measures, compliance with this plan, the conditions of the Infrastructure Approval, Exploratory Works EIS, Submissions Reports and other relevant approvals, licences and guidelines. Audit requirements are detailed in Section 8 of the EMS.

6.4. Reporting

Reporting will include monthly internal project reports and six-monthly compliance reports as required by the CoA. The six-monthly reports will track compliance against the CoA and the REMMs.

APPENDIX A – EXPLORATORY WORKS – PROJECT BOUNDARY FIGURES

APPENDIX 2 – SITE LAYOUT

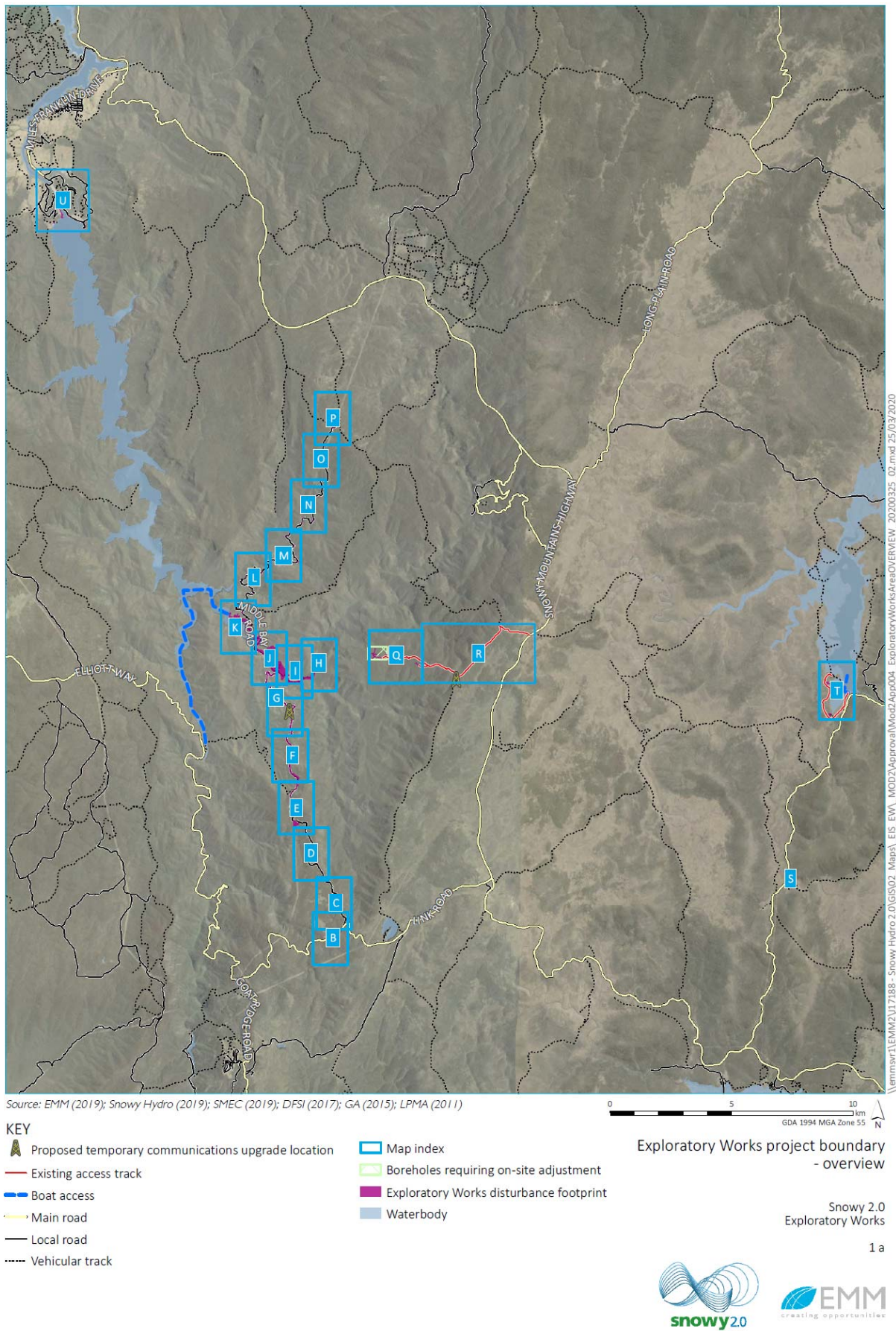
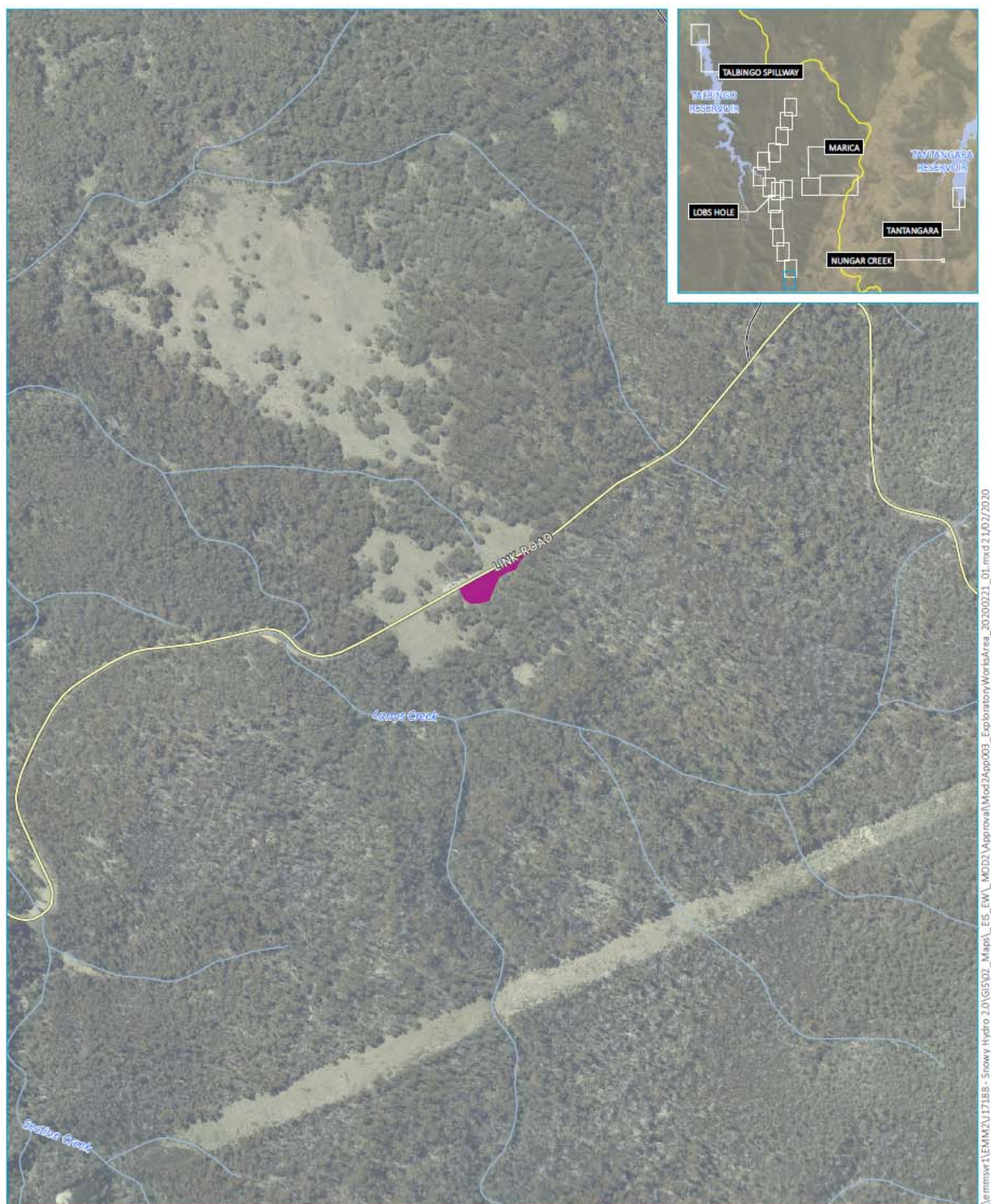


Figure 2-1: Project Boundary – Overview



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Dangerous tree
- Main road
- Local road
- Watercourse/drainage line
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

Exploratory Works project boundary
- Link Road turnaround area

Snowy 2.0
Exploratory Works

1 b



Figure 2-2: Project Boundary – Link Road turnaround area

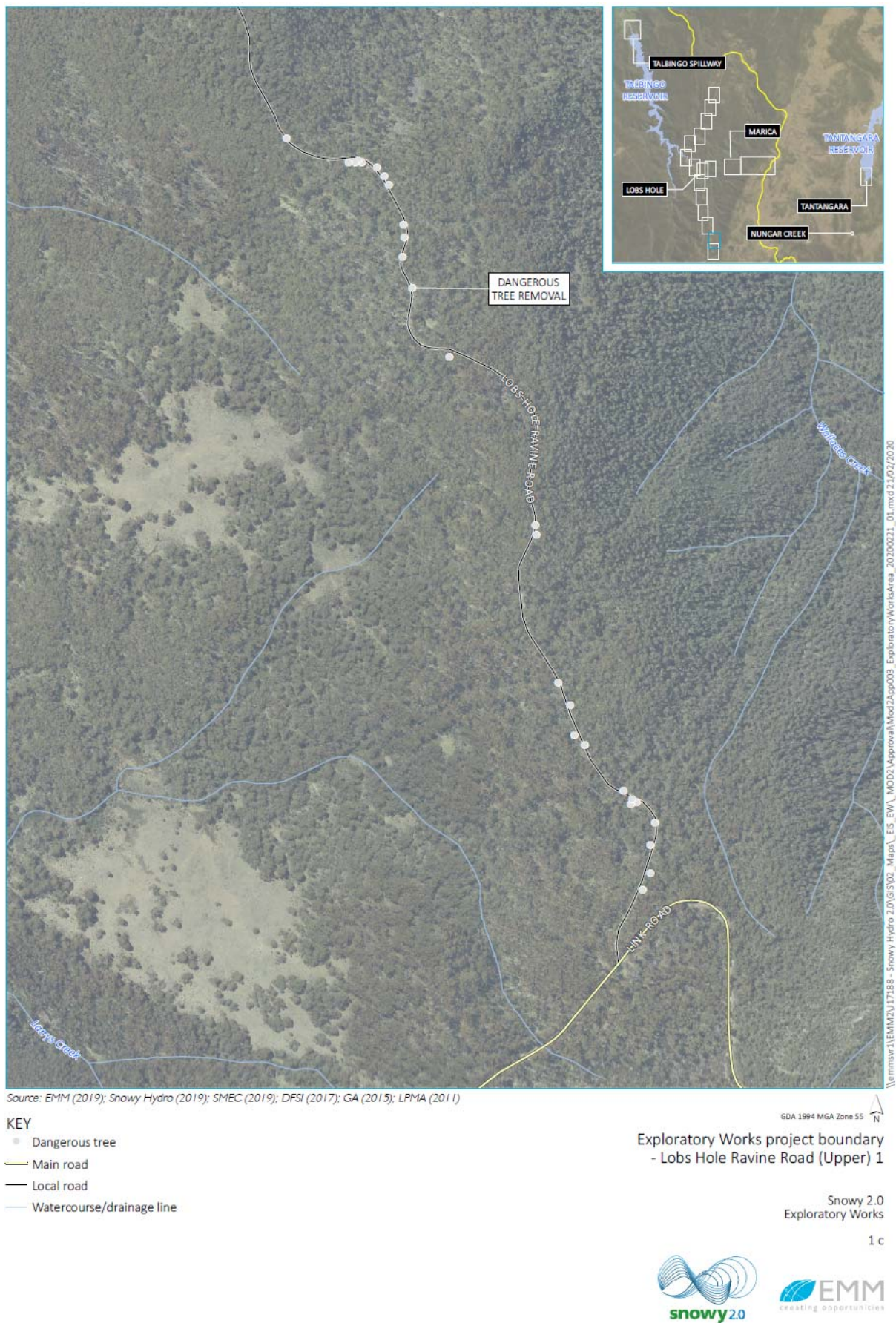


Figure 2-3: Project Boundary – Lobs Hole Ravine Road (Upper) 1

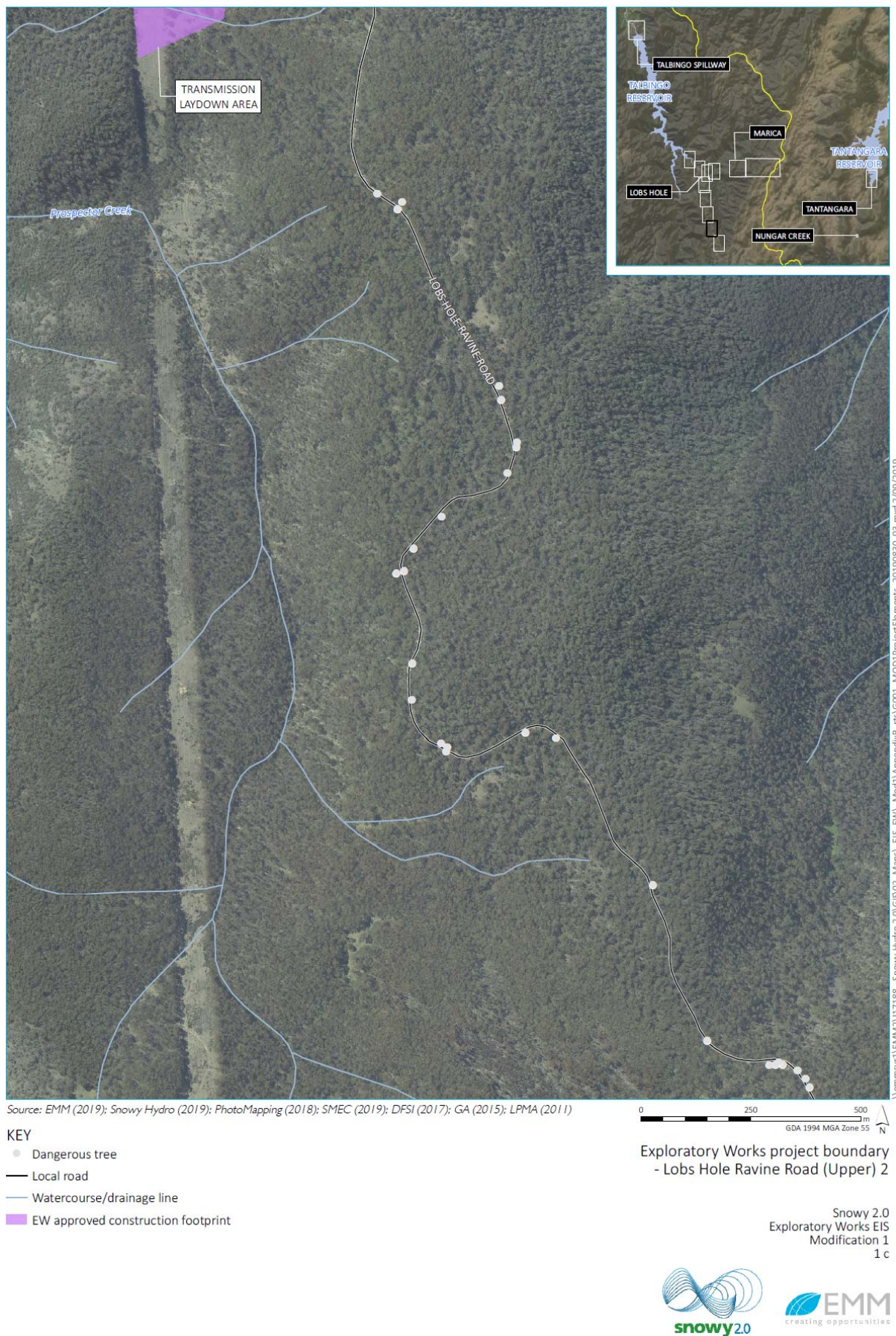
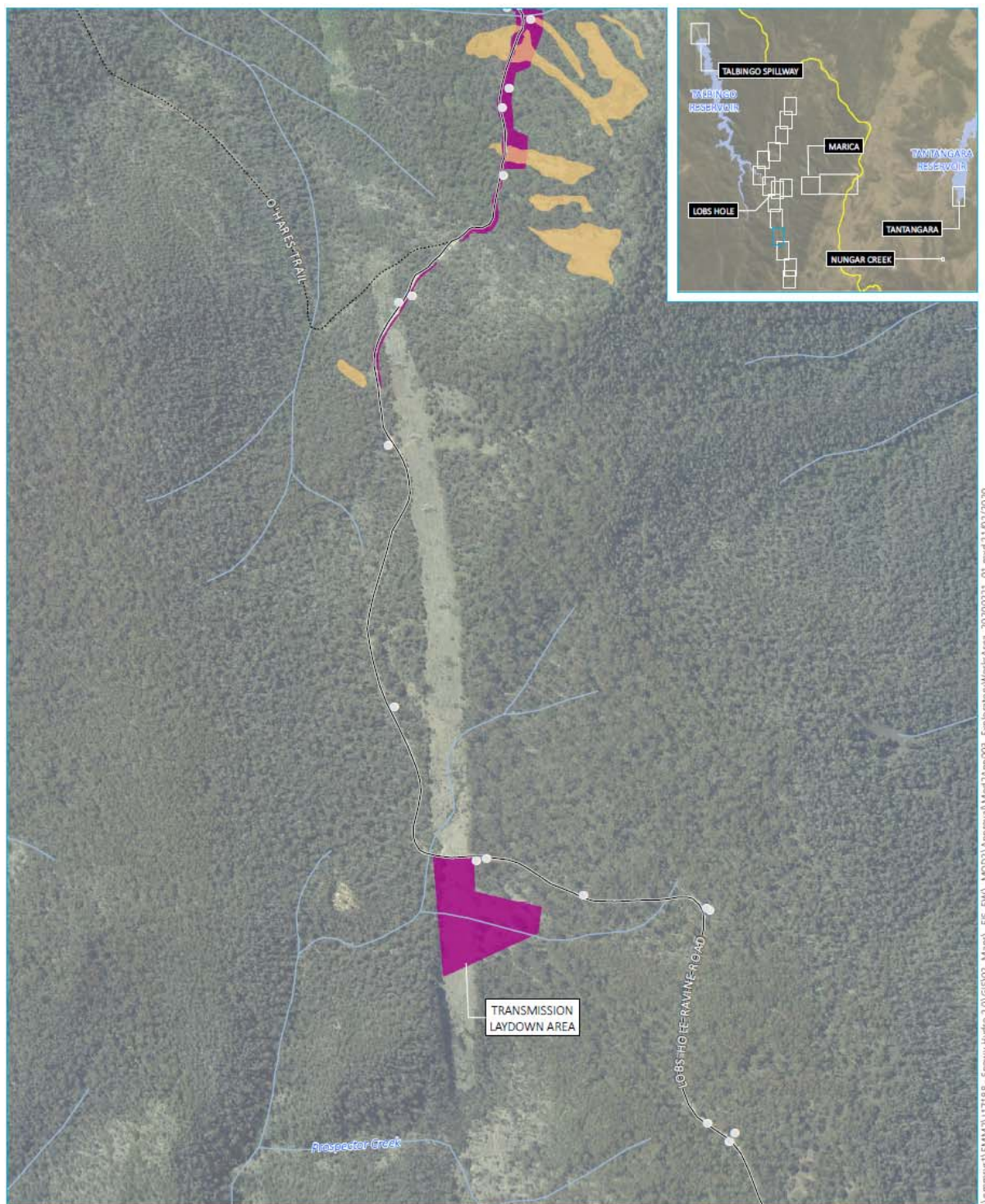


Figure 2-4: Project Boundary – Lobs Hole Ravine Road (Upper) 2



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Dangerous tree
- Local road
- Vehicular track
- Watercourse/drainage line
- Boulder stream
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

Exploratory Works project boundary
- Lobs Hole Ravine Road (Upper) 3

Snowy 2.0
Exploratory Works

1 e



Figure 2-6: Project Boundary – Lobs Hole Ravine Road (Upper) 3

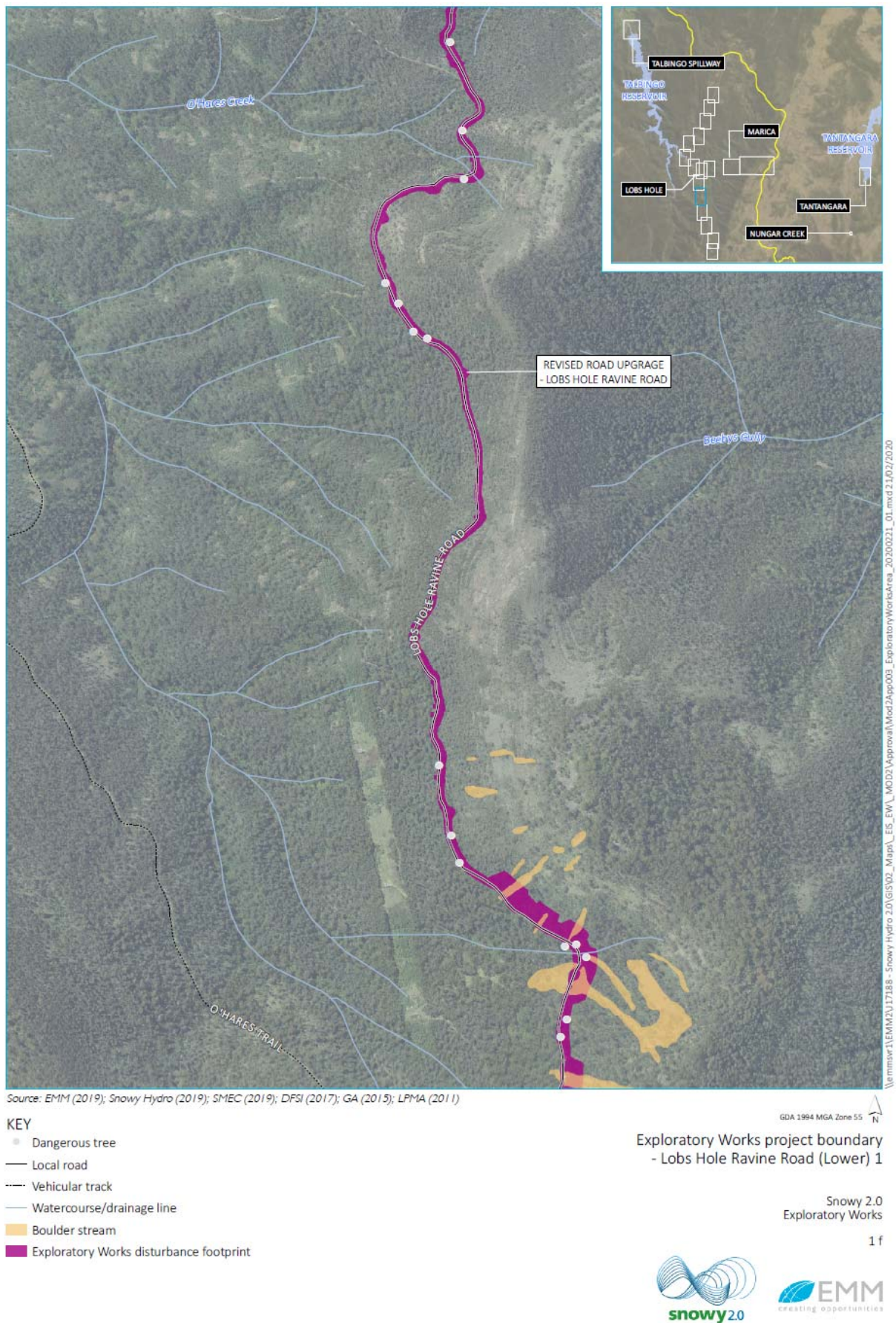
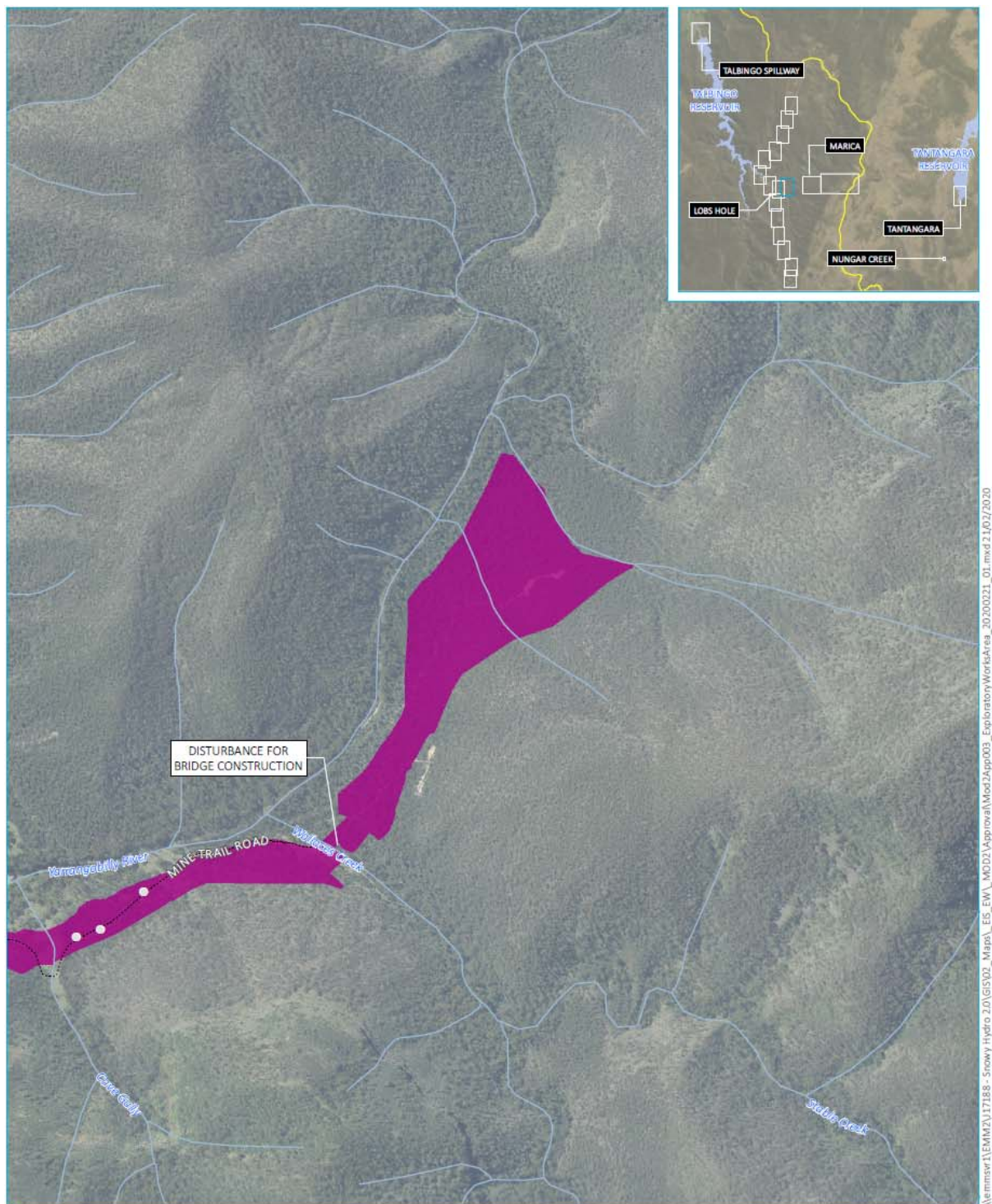


Figure 2-7: Project Boundary – Lobs Hole Ravine Road (Lower) 1



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Dangerous tree
- Vehicular track
- Watercourse/drainage line
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

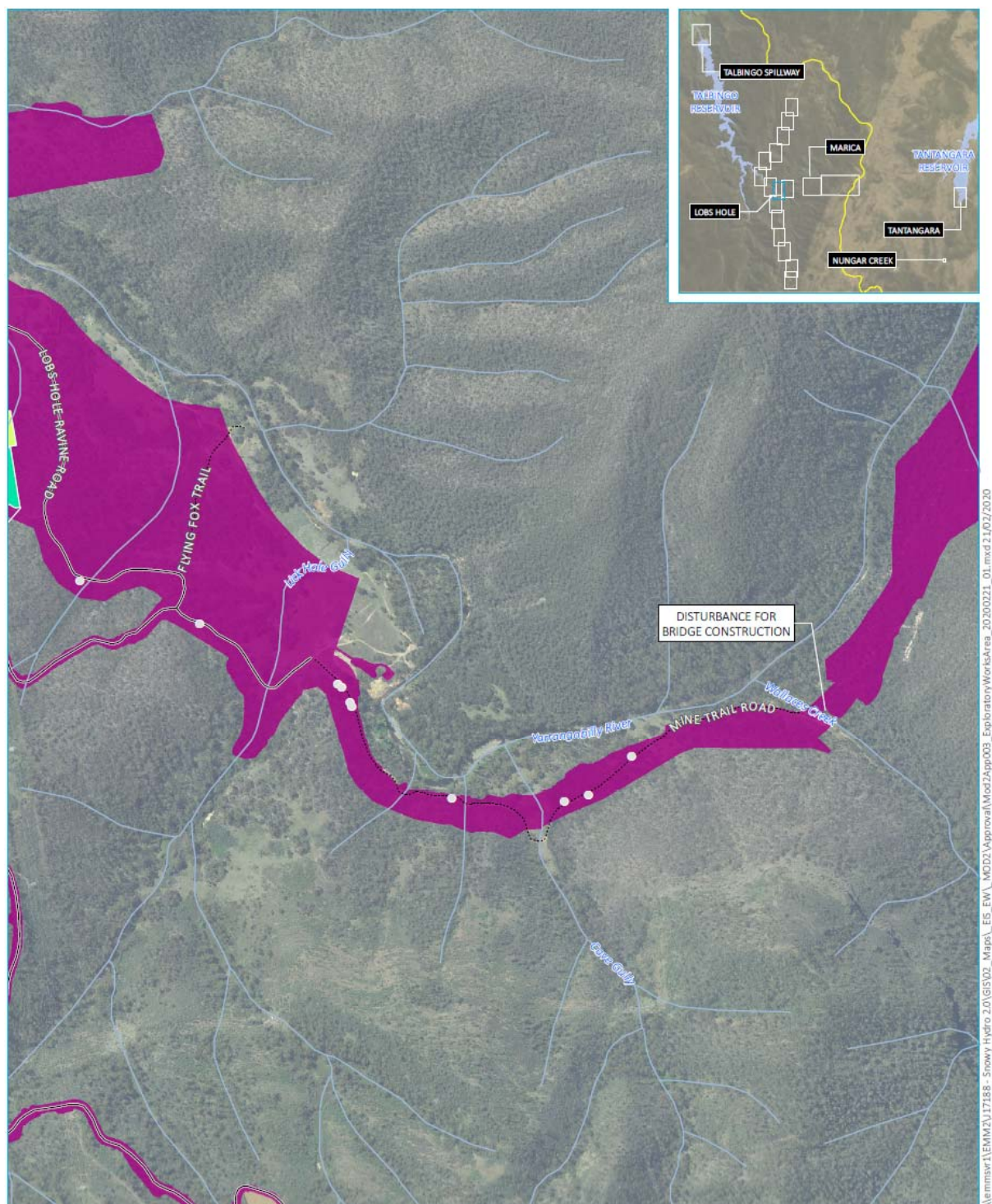
Exploratory Works project boundary
- Mine Trail Road 1

Snowy 2.0
Exploratory Works

1 h



Figure 2-9: Project Boundary – Mine Trail Road 1



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Dangerous tree
- Local road
- Vehicular track
- Watercourse/drainage line
- Indicative laydown area
- Proposed substation
- Fossil area
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

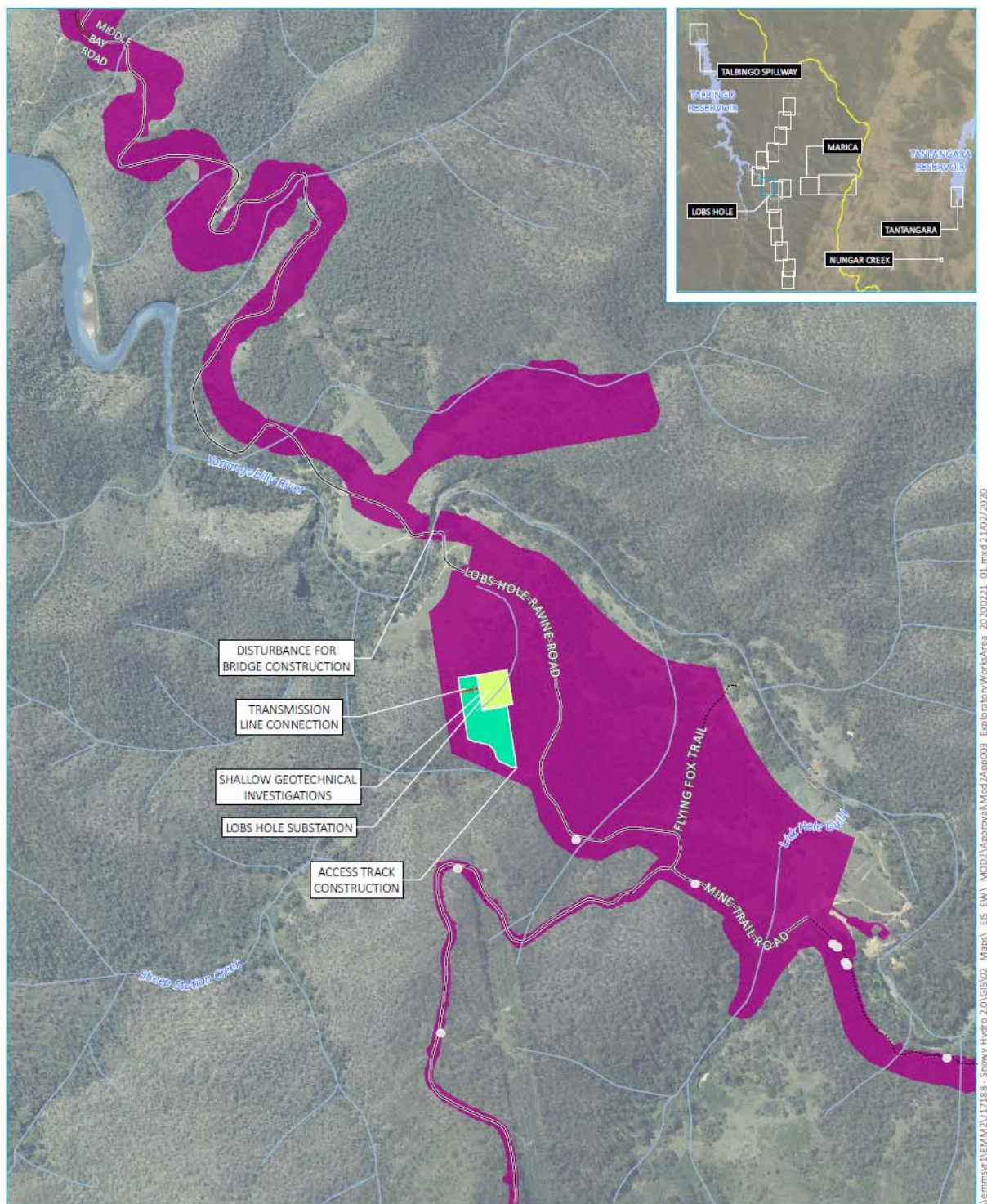
Exploratory Works project boundary
- Mine Trail Road 2

Snowy 2.0
Exploratory Works

1 i



Figure 2-10: Project Boundary – Mine Trail Road 2



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Dangerous tree
- Approved EW access
- Transmission line connection
- Local road
- Vehicular track
- Watercourse/drainage line
- Indicative laydown area
- Proposed substation
- Exploratory Works disturbance footprint
- Waterbody

GDA 1994 MGA Zone 55



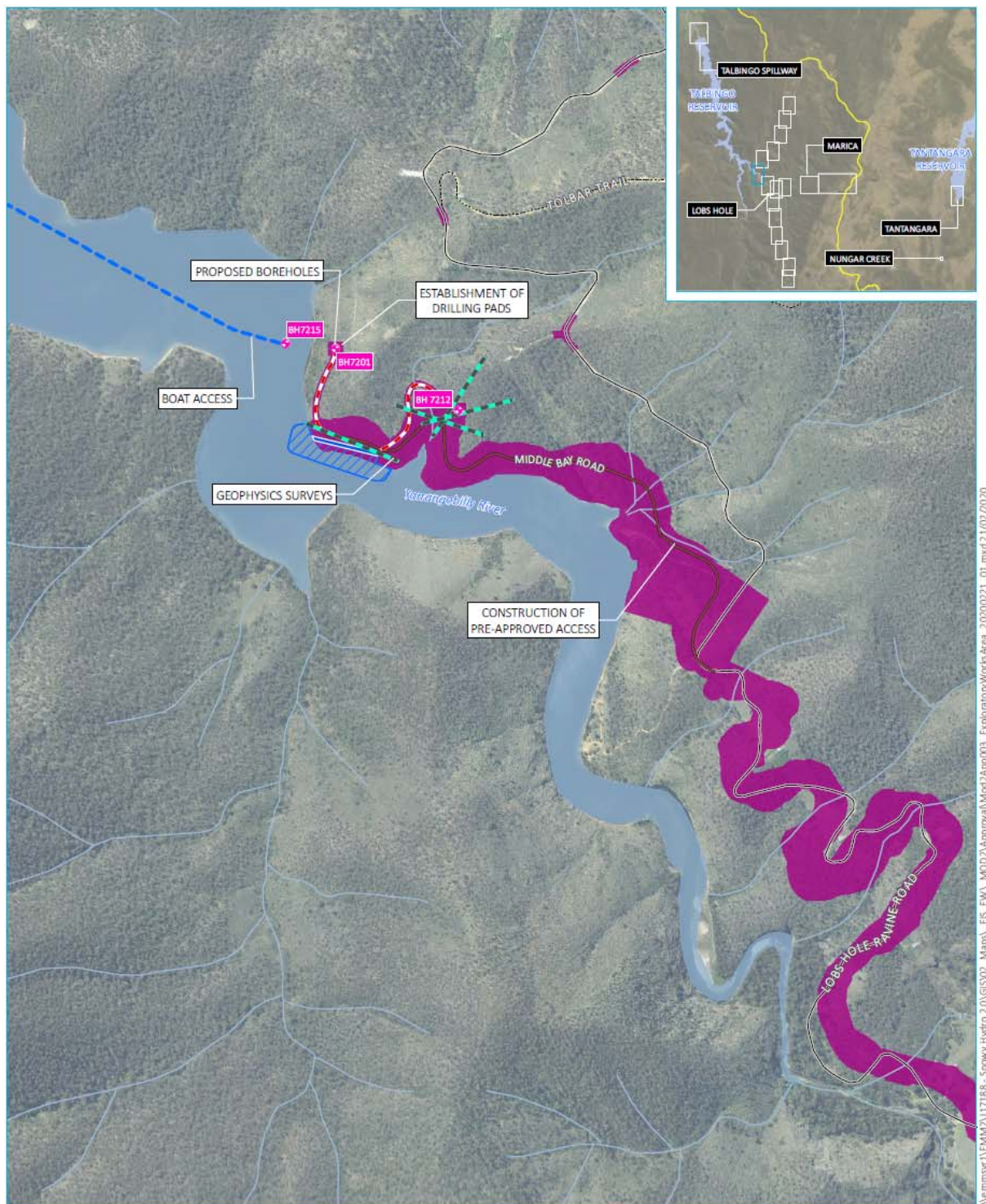
Exploratory Works project boundary
- Lobs Hole

Snowy 2.0
Exploratory Works

1 j



Figure 2-11: Project Boundary – Lobs Hole



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- ◆ Proposed borehole
- Proposed geophysics
- Proposed access track
- Approved EW access
- Boat access
- Local road
- Vehicular track
- Watercourse/drainage line
- Proposed barge ramp relocation
- ▨ Proposed disturbance area - barge infrastructure
- Exploratory Works disturbance footprint
- Waterbody

GDA 1994 MGA Zone 55

Exploratory Works project boundary
- Lobs Hole Ravine Road

Snowy 2.0
Exploratory Works

1 k



Figure 2-12: Project boundary – Lobs Hole Ravine Road

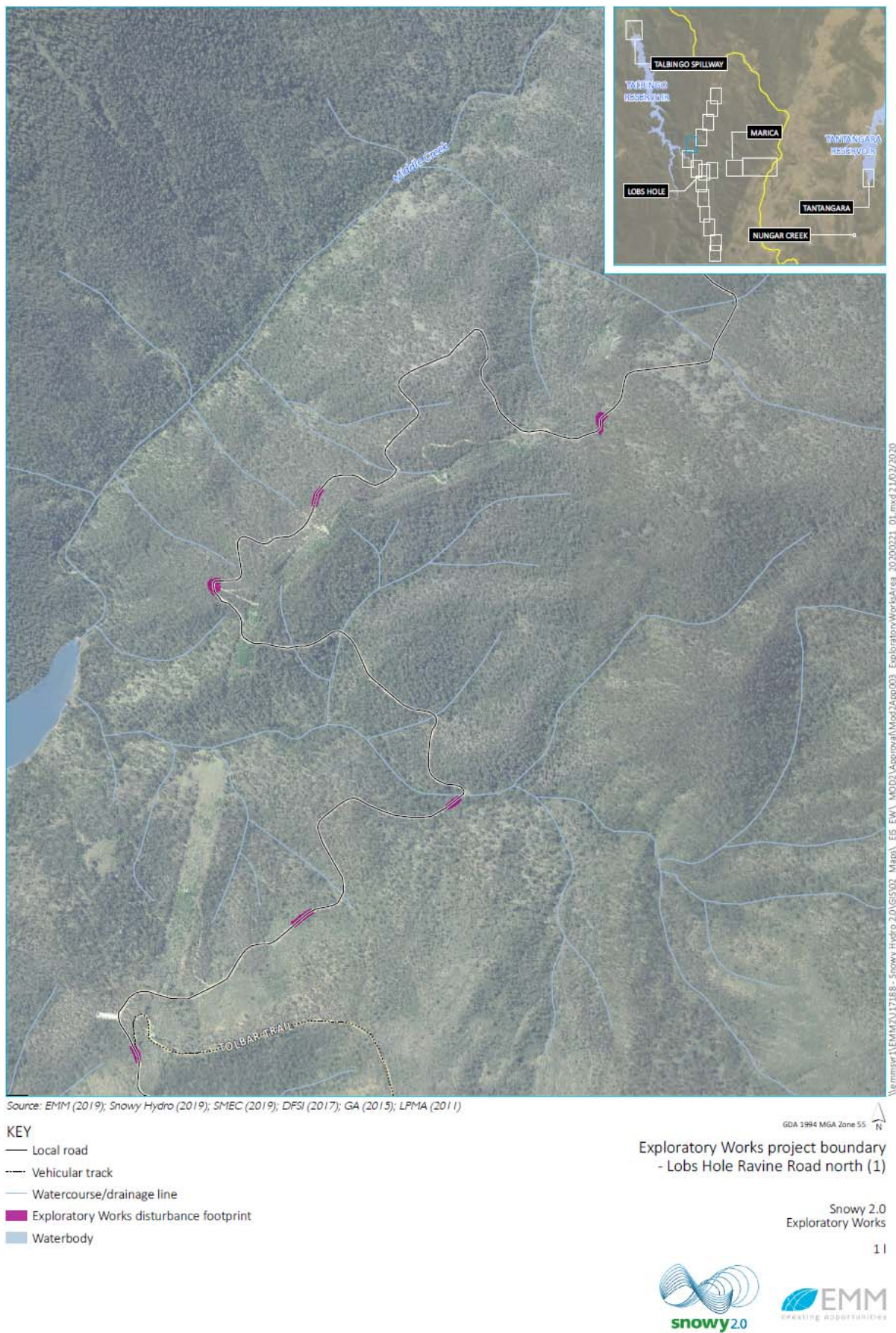
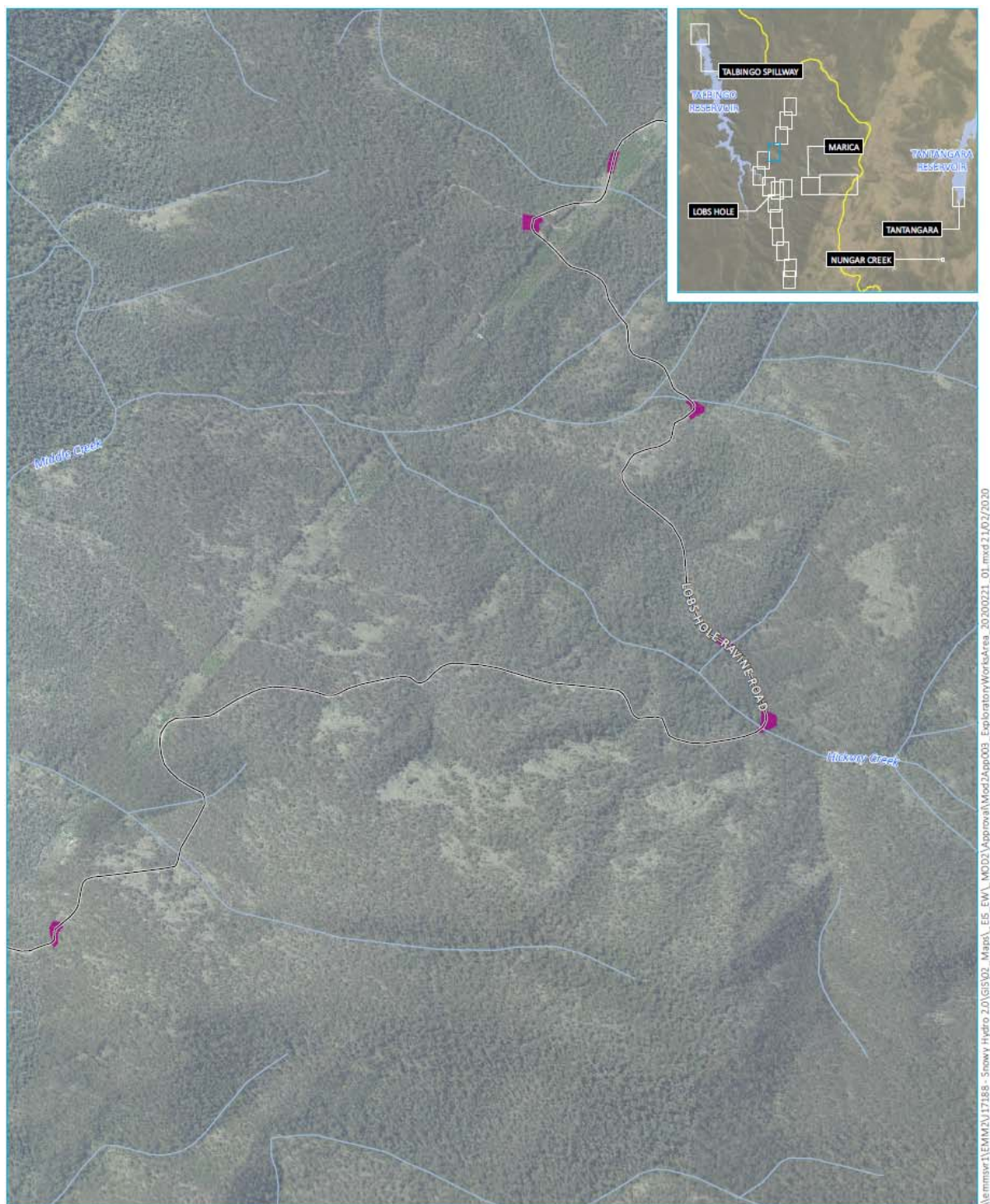


Figure 2-13: Project boundary – Lobs Hole Ravine Road north (1)



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Local road
- Watercourse/drainage line
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

Exploratory Works project boundary
- Lobs Hole Ravine Road north (2)

Snowy 2.0
Exploratory Works

1 m



Figure 2-14: Project boundary – Lobs Hole Ravine Road north (2)



Figure 2-15: Project boundary – Lobs Hole Ravine Road north (3)

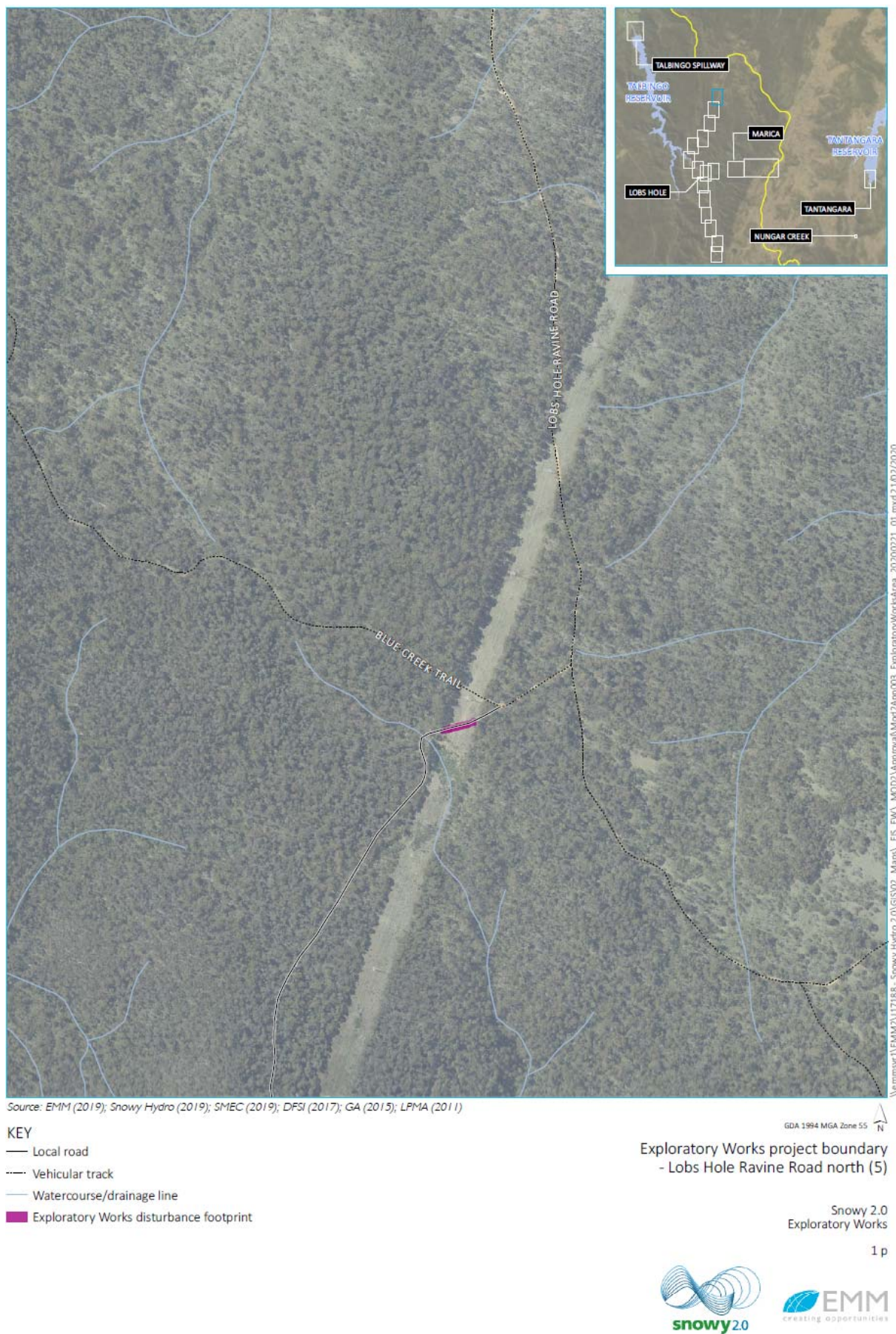
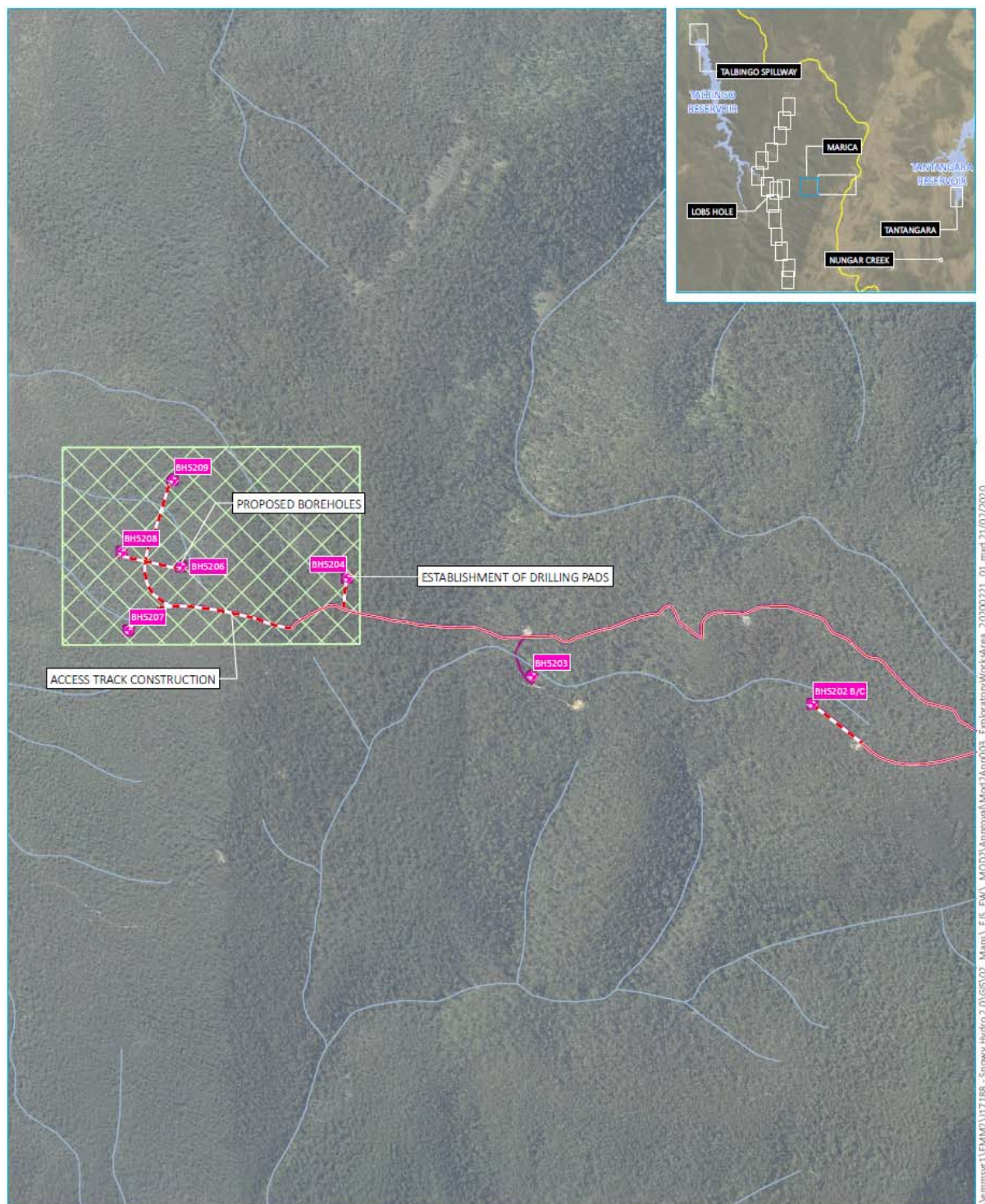


Figure 2-17: Project boundary – Lobs Hole Ravine Road north (5)



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Proposed borehole
- Existing access track
- Proposed access track
- Watercourse/drainage line
- Boreholes requiring on-site adjustment
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

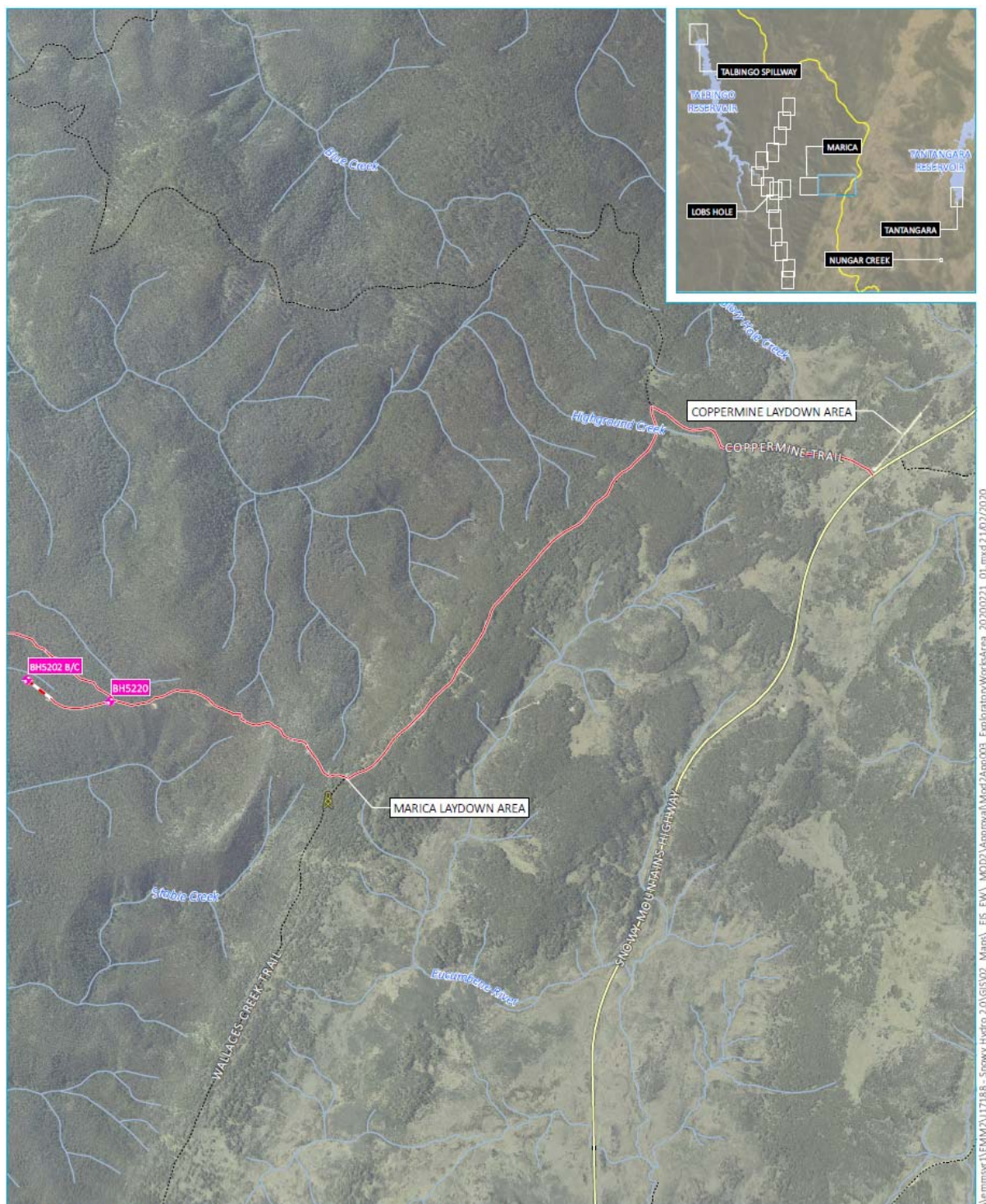
Exploratory Works project boundary
- Marica 1

Snowy 2.0
Exploratory Works

1 q



Figure 2-18: Project boundary – Marica 1



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Proposed borehole
- Existing temporary communications
- Existing access track
- Proposed access track
- Main road
- Vehicular track
- Watercourse/drainage line
- Exploratory Works disturbance footprint

GDA 1994 MGA Zone 55

Exploratory Works project boundary
- Marica 2

Snowy 2.0
Exploratory Works

1 r



Figure 2-19: Project boundary – Marica 2



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- ◆ Proposed borehole
- Main road
- Watercourse/drainage line
- Exploratory Works disturbance footprint
- Proposed work area

GDA 1994 MGA Zone 55

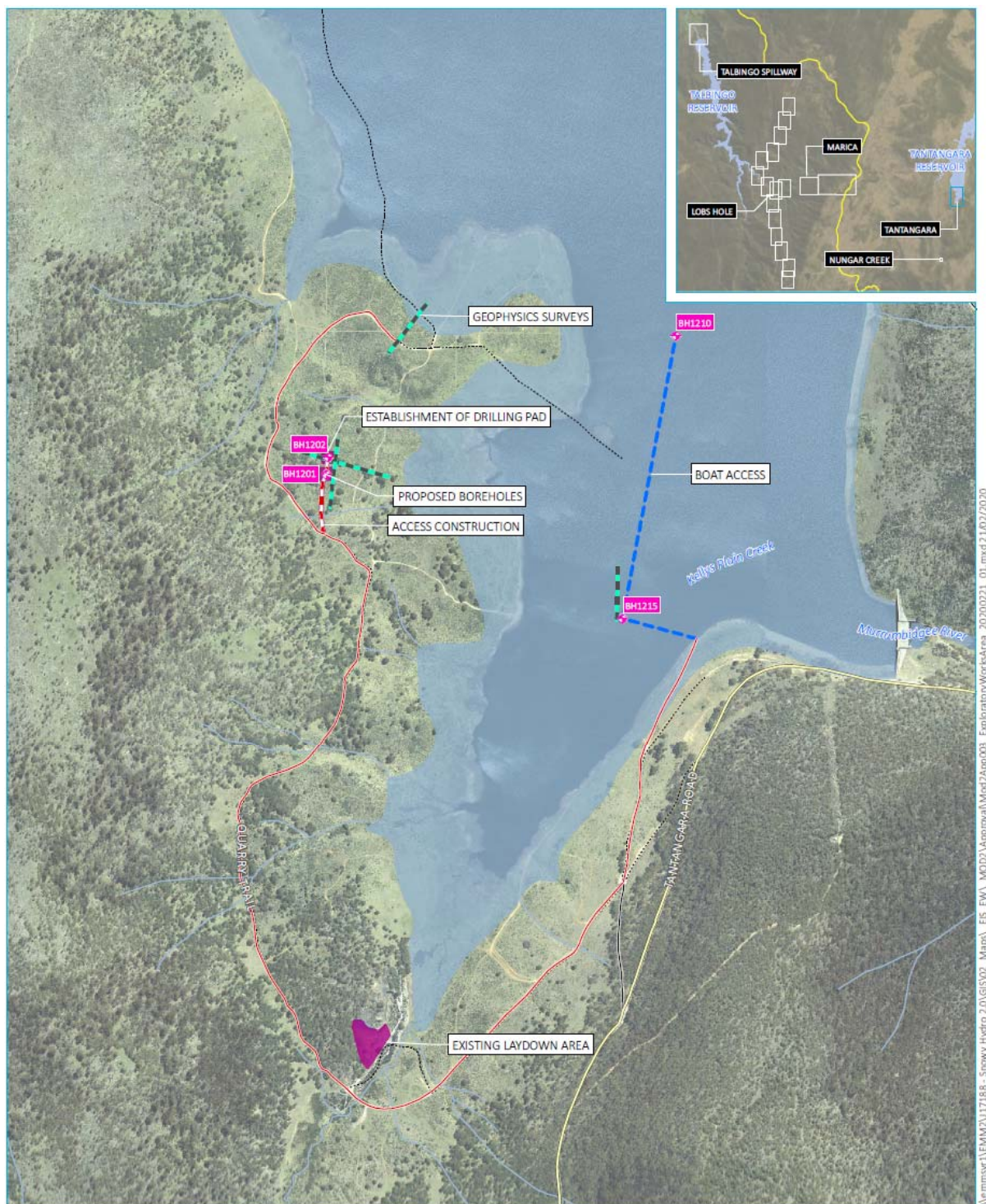
Exploratory Works project boundary
- Nungar Creek

Snowy 2.0
Exploratory Works

1 s



Figure 2-20: Project boundary – Nungar Creek



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

- KEY**
- Proposed borehole
 - Proposed geophysics
 - Existing access track
 - Proposed access track
 - Boat access
 - Main road
 - Local road
 - Vehicular track
 - Watercourse/drainage line
 - Exploratory Works disturbance footprint
 - Waterbody

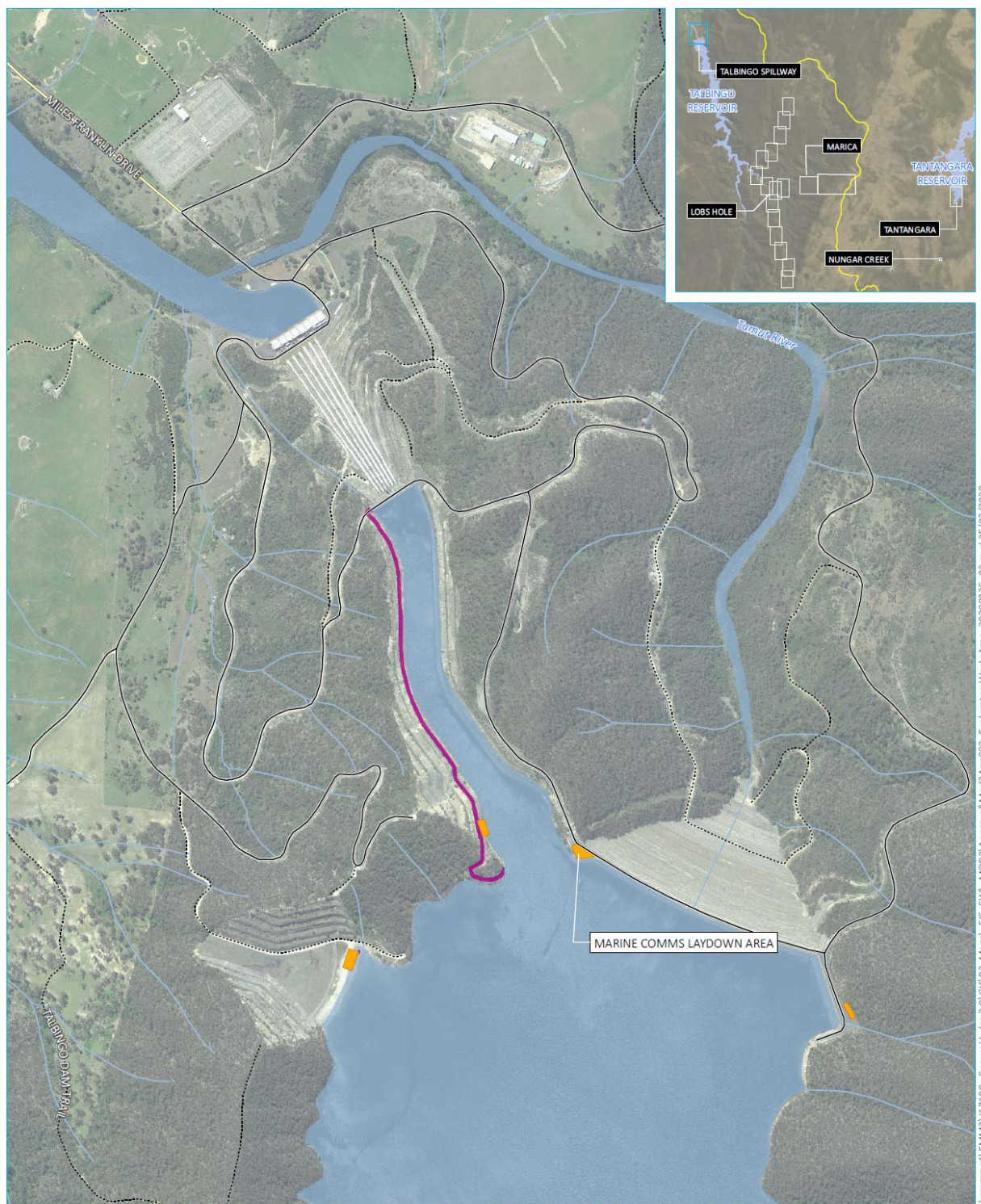
Exploratory Works project boundary
- Tantangara Reservoir

Snowy 2.0
Exploratory Works

1 t



Figure 2-21: Project boundary – Tantangara Reservoir



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

KEY

- Main road
- Local road
- Vehicular track
- Watercourse/drainage line
- Marine comms laydown (proposed)
- Exploratory Works disturbance footprint
- Waterbody

GDA 1994 MGA Zone 55

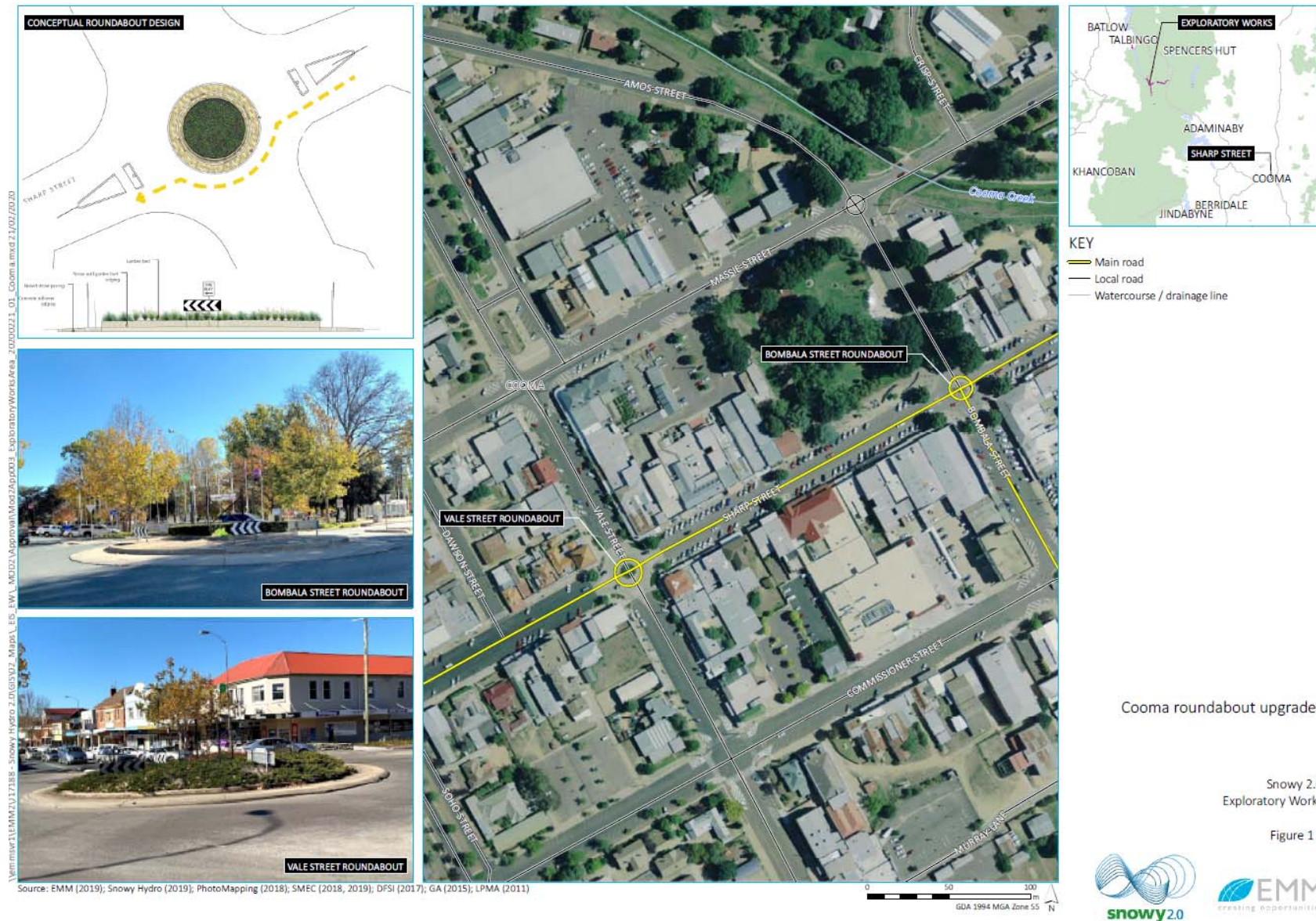
Exploratory Works project boundary
- Talbingo spillway

Snowy 2.0
Exploratory Works

1 u



Figure 2-22: Project boundary – Talbingo spillway



2-24: Road Upgrades Sharp Street/Bombala Street and Sharp Street/Vale Street Roundabouts