Contents

1 Summary **4**

1.1 Introduction 4

1.2 Status as at FID 4

1.3 Scope and exclusions 5

1.4 Activities undertaken 5

1.5 Approvals 7

1.6 EIS process 8

1.7 Environmental values and impacts 8

1.8 Mitigation and management 9

1.9 Tenure 11

2 Activities undertaken **12**

2.1 Overview 12

2.2 Social impact assessment 13

2.3 Terrestrial and aquatic ecological survey and assessment 14

2.3.1 Requirements 14

2.3.2 Terrestrial 14

2.3.3 Aquatic 15

2.4 Water balance model and surface water assessment 15

2.5 Groundwater assessment 16

2.6 Cost-benefit and regional economic analysis 17

2.7 Traffic impact assessment 17

2.8 Soils capability and contamination assessment 17

2.9 Geodiversity assessment 18

2.10 Excavated rock management 19

2.11 Invasive fish assessments 19

2.12 Bushfire risk and hazard assessment 20

2.13 Heritage assessment 21

3 Approvals **22**

3.1 Overview 22

3.2 Preferred pathway 23
3.3 Statutory regime 23
3.3.1 Overview 23
3.3.2 SHC Act 24
3.3.3 NPW Act 25
3.3.4 POEO Act 25
3.3.5 Environmental Planning & Assessment Act 25
3.3.6 EPBC Act 26
3.3.7 Other approvals 27
3.4 Land access and tenure considerations 27
3.4.1 Background 28
3.4.2 Amended and Restated Snowy Regulatory Deed 28
3.4.3 Current Position 28
3.4.4 Proposed approach to lease and licences 29
3.4.7 Treatment of Transmission Assets 30
3.4.8 Access to Private Land 30
4 EIS Process 30
4.1 Overview 30
4.2 Timeline 30
4.3 Exploratory Works EIS 31
4.4 Summary approval status as at FID 32
5 Environmental values and impacts 32
5.1 Overview 32
5.2 Existing local values 33
5.2.1 Natural values 33
5.2.2 Cultural values 34
5.2.3 Social and economic values 34
5.3 Potential impacts on values 35
5.3.1 Recreational uses and amenity 35
5.3.2 Biodiversity 36

5.3.3 Geodiversity 37
5.3.4 Geology and soils 38
5.3.5 Water (surface and groundwater) 38
5.3.6 Local infrastructure and services 39
5.3.7 Traffic 40
5.3.8 Bushfire 40
5.3.9 Contamination and erosion 40
5.3.10 Noise and vibration 41
5.3.11 Excavated rock and waste disposal 41
5.3.12 Transport of undesirable aquatic species 42
6 Mitigation and management 42
6.1 Overview 42
6.2 Contractors' obligations 43
6.3 Recreational uses and amenity 45
6.4 Biodiversity 45
6.4.1 Terrestrial 45
6.4.2 Aquatic 46
6.4.3 Offsets 46
6.5 Geodiversity 47
6.6 Soil and land 47
6.7 Cultural heritage 47
6.8 Water 48
6.9 Local infrastructure and services 48
6.10 Geochemical risk 48
6.11 Bushfire 49
6.12 Contamination and erosion 49
6.13 Noise and vibration 49
6.14 Excavated rock and waste disposal 49
6.15 Transport of undesirable aquatic species 50
7 Supporting information 50

8 Definitions and abbreviations **50**

Tables

Table 1: Legislation
Table 2: EIS key dates

1 Summary

This chapter describes work undertaken to date to progress the planning and environmental approvals required to construct and operate the Project under NSW and Commonwealth laws, key tenure considerations and key environmental values, expected impacts, management and mitigation.

1.1 Introduction

As at Final Investment Decision (***FID***), a number of State and Commonwealth referrals have been formally initiated and are in progress, with approvals expected progressively through 2018, 2019 and 2020 and enabling legislation achieved on 21 November 2018. The Environmental Impact Statement (***EIS***) process is central to the approvals process, with the Exploratory Works EIS lodged in 2018, and the Main Works EIS planned to be lodged in early-2019.

1.2 Status as at FID

The approvals status as at FID is as follows:

1. The Exploratory Works EIS, including piloting excavated rock disposal in Talbingo Reservoir, was lodged in July 2018. It followed the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) *(**EPBC Act**)* referral, which was submitted in June 2018 and determined not a controlled action in July 2018. Exploratory Works are expected to be approved by NSW Planning shortly after FID with acceptable conditions;
2. Legislation granting Snowy Hydro tenure to the land required for the Project was passed by the NSW Parliament on 21 November 2018;
3. The conditions of planning approval for the Exploratory Works have been taken into account in the budget, scope and program for the Main Works (with contingencies for the outcome of the more detailed assessment);
4. The Main Works planning process has formally commenced, with the Main Works Scoping Report lodged in October 2018 and Secretary's Environmental Assessment Requirements (***SEARs***) are expected to be received from NSW Planning shortly after FID;
5. The EPBC referral for Main Works was lodged in October 2018 and assessment requirements are expected to be incorporated into the SEARs;
6. The Project team and its advisors confirm that lodgement of the Main Works EIS by the end of March 2019 is achievable;

7. Agreements to Lease for construction and operations leases are expected to be achieved with Office of Environment and Heritage (***OEH***) by mid December 2018; and
8. Shallow transmission and construction power planning approval processes are well advanced by TransGrid and consistent with the Project schedule.

1.3 Scope and exclusions

The scope of this chapter is to describe work undertaken to date, the planning and environmental approvals required to construct and operate the Project under NSW and Commonwealth laws, key tenure considerations and key environmental values, expected impacts and management.

As at FID, the Project comprises:

1. Exploratory works, eg construction of an exploratory adit, exploratory shaft and associated civils (***Exploratory Works***) as further described in *Supporting Chapter Thirteen - Early and exploratory works*; and
2. Construction and operation of the main Pumped Hydro Energy Storage (***PHES***) Project (***Main Works***) as further described in *Supporting Chapter Twelve - Facilities*.

As at FID, the environmental assessments undertaken for both the Exploratory Works and Main Works have been based on the Reference Design undertaken by SMEC. The assessments for the Exploratory Works have been undertaken to the level required to support a full EIS, but those assessments are necessarily at a higher level for the Main Works. A preliminary assessment of the tender designs undertaken by the Civil Contractors has been undertaken. Further detailed assessments will continue after FID as further clarifications and design work are undertaken with the successful Contractor.

This chapter does not include details of all other non-environment and planning legal approvals that are required to carry out the Project. See also *Supporting Chapters Nineteen - Operations readiness,* and *Sixteen - Transmission* (construction supplies and shallow connection works).

Note that separate to the Project, approvals will also need to be obtained to carry out network connection and transmission augmentation works (see *Chapter Sixteen - Transmission* for further details). These works will be carried out by a Transmission Network Service Provider (***TNSP***) in NSW and Victoria and so the TNSP will be responsible for obtaining the approvals to construct and operate. Details of the required approvals and environmental impact assessment for the network connection and transmission augmentation works are therefore not discussed in this submission. Snowy Hydro will collaborate closely with both the TNSP and NSW, Victorian and Commonwealth approval authorities throughout this process.

1.4 Activities undertaken

Snowy Hydro undertook a broad program of work prior to FID:

1. Developed an approval strategy:
    a. Met with key stakeholders and approval bodies including State and Federal Government departments, prominent local community groups and associations, to discuss the needs of the Project and required approvals;
    b. Identified and assessed the options for a planning approval pathway at both State and Federal levels with reference to relevant laws, including the *Environmental Planning and Assessment Act 1979* (NSW) (***EP&A***) and EPBC Act, and strategic needs of Snowy Hydro;
    c. Reviewed the *Snowy Hydro Corporatisation Act 1997* (NSW) (***SHC***), *National Parks and Wildlife Act 1974* (NSW) (***NPW***) and Snowy Water Licence for any required amendments to facilitate construction and operation of the Project;
    d. Developed and lodged a joint request with TransGrid to the NSW Minister for Planning to declare the Project Critical State Significant Infrastructure (***CSSI***). For more details regarding transmission, see *Chapter Sixteen - Transmission*.
2. Reviewed the existing environmental values and risks of the Project area in the context of its location inside Kosciuszko National Park (***KNP***);
3. Prepared preliminary environmental assessments to identify high-level environmental aspects, impacts and mitigation strategies for the Exploratory Works and Main Project EIS;
4. Conducted field work to obtain baseline environmental data including cultural heritage and biodiversity data in the KNP, which will feed into future EIS for the Project;
5. Undertook investigations and research activities to inform assessment and approvals as identified in the Feasibility Study.
6. Undertook regular consultation activities with stakeholders in the Project area (for more details regarding community consultation, see *Chapter Twenty-One - Stakeholder strategy and engagement*); and
7. Prepared two EPBC referrals for the purposes of assessing whether the Exploratory Works and Main Project were Controlled Actions under the legislation;
8. Prepared the EIS for Exploratory Works and commenced drafting of EIS for the Main Works;
9. Prepared and submitted the Response to Submissions (***RTS***) report following Public Exhibition of the Exploratory Works EIS (available as supporting information to this chapter);
10. Provided inputs to procurement processes and tender documentation (Employer's Requirements);
11. Prepared a draft Construction Environmental Management Plan (***CEMP***) and subplans for the Exploratory Works; and
12. Evaluated tender documents for Electrical/Mechanical (***E&M***) and Exploratory Works - Roads (***EWR***) tenders.

EMM Consulting Pty Ltd (***EMM***) has been involved with the Project from the outset, providing environment and planning consulting services. They were responsible for delivery of a Preliminary Environmental Assessment (***PEA***) (or equivalent) and the Exploratory Works EIS. They will continue to be engaged with

the Project following FID, to prepare the Main Works EIS and undertake other approvals-related studies and activities.

The Feasibility Study and subsequent consultation with the various regulators identified a number of studies and investigations necessary to the EIS and approvals process. These included:

1. **Social impact assessment** - impacts to recreational uses and amenity from construction activities;
2. **Terrestrial and aquatic ecological survey** - presence of threatened and endangered species at specific locations, existing biodiversity and existing environment, constraints, mitigation and compensatory measures, aquatic habitat and species present, fish diversity and presence of invasive fish species;
3. **Water balance model** - surface water assessment and site water balance;
4. **Groundwater assessment** - groundwater monitoring network, a groundwater model;
5. **Cost-benefit and regional economic analysis** - local and regional impacts of the Project during construction;
6. **Traffic impact assessment** - traffic impacts associated with construction;
7. **Soils capability and contamination assessment** - character and sensitivity of soil and land resources, potential areas and contaminants of concern;
8. **Geodiversity assessment** - significant geodiversity features of KNP and potential risks to them;
9. **Excavated rock management** - impacts of excavated rock management and placement on biodiversity, surface water, traffic, soil and contamination and visual amenity;
10. **Invasive fish assessments** - assessment of the potential for the spread of invasive species through the proposed main Project alignment;
11. **Bushfire risk and hazard risk** - response to the SEARs requirement to assess public safety, including an assessment of the risks to public safety;
12. **Heritage assessment** - assessment of potential for impacts on Aboriginal artefacts and places, and places of historic heritage;
13. **Surface water assessment**;
14. **Noise and vibration assessment** - identification, modelling and assessment of construction noise impacts; and
15. **Air quality assessment** - air quality and greenhouse gas assessment.

These studies were undertaken by EMM, its subconsultants, and other consultants engaged directly by Snowy Hydro.

1.5 Approvals

The Project requires approvals at both State and Commonwealth levels. The existing Scheme is governed by special-purpose NSW, VIC and Commonwealth legislation and operating instruments, some of which require amendment. The Project also requires approval under Commonwealth environmental protection acts. The interplay of the various acts means that there were a number of

possible pathways that could be followed to obtain full approval to construct and operate the Project.

The preferred and selected approval pathway involves:

1. Seeking CSSI status under the EP&A Act;
2. Requesting that the responsible Minister make minimal amendments to the *SHC Act 1997 (*NSW); and
3. Referring the Project for Commonwealth approval under the EPBC Act.

The Project was declared State Significant Infrastructure (***SSI***) and CSSI in March 2018. Snowy Hydro requested SEARs for the Exploratory Works in March 2018 and received them in May 2018, and a revision in June 2018.

The EIS for Exploratory Works was submitted to the NSW Department of Planning and Environment (***DPE***) in July 2018 and exhibited in July and August 2018. The RTS report was submitted in October 2018.

Snowy Hydro requested SEARs for the Main Works in October 2018, and expects to receive this shortly after FID**.**

Approval for the Exploratory Works EIS is expected to be received/advised by DPE that this would be provided shortly following FID. The Main Works EIS is being prepared for submission by March 2019.

A referral for Exploratory Works under the EPBC Act was lodged with the Federal Department of Environment and Energy (***DoEE***) in May 2018. The DoEE found the Exploratory Works to be 'not a controlled action' under the EPBC Act in July 2018. A referral for Construction of the Project was made with DoEE in October 2018.

1.6 EIS process

Certainty around planning approvals is a key factor influencing the Project's viability, and the EIS process is central to the key approvals. Various alternatives were considered for EIS lodgement. The selected plan includes two EISs - one for Exploratory Works and one for the Main Works. In parallel with the Snowy Hydro EIS processes, TransGrid is running a separate transmission-related EIS processes as proponent (see *Supporting Chapter Sixteen*).

1.7 Environmental values and impacts

Environmental and cultural values were initially considered when determining the construction and operation impacts of the Project during the Feasibility Study. Further investigation of these values has been undertaken as part of the environmental impact assessment process, and key environmental aspects and impacts requiring priority investigation were identified for the EIS which will accompany any application for planning approval. These include:

1. Recreational use - and amenity of conservation areas (KNP);
2. Biodiversity - terrestrial and aquatic, including transfer of undesirable aquatic species;
3. Heritage - Aboriginal cultural heritage and historic heritage;

4. Water - surface and groundwater;
5. Soils and contamination;
6. excavated rock - excavated rock and waste management, including subaqueous disposal of excavated rock;
7. Transport and access;
8. Noise, vibration and blasting impacts;
9. Air quality;
10. Social and economic impacts, including local infrastructure and services; and
11. Other risks including climate, bushfire and public safety.

There are a number of significant natural, cultural and socio-economic values present in the Project area. Snowy Hydro has assessed the potential impacts on those values from both construction and operation phases of the Project.

As construction methods are developed and environmental impact assessment processes proceed, the values, impacts and mitigation measures will become better understood. This in turn means they can be communicated effectively, so that timely Project approval is achieved and social licence to operate is maintained in the long term.

Some specific social, cultural and economic values are likely to be impacted, including recreational uses and amenity, Aboriginal cultural heritage values and local infrastructure and services. There is significant potential to mitigate the impacts of these such as through strategies to provide alternate access and facilities, spreading of the workforce (in time and place), investment in infrastructure and services where the link to the Project is clear/quantified, and by locating activities so as to avoid significant Aboriginal cultural heritage.

Some specific natural values are also likely to be impacted, including biodiversity and water. There is potential to avoid location of activities in high value areas, minimise the impacts where they are located in sensitive areas and to offset these impacts where they are unavoidable.

1.8 Mitigation and management

The Project has been designed to avoid and minimise adverse impact on KNP where possible. All works will be carried out by the appointed contractors under the conditions of the Environment Protection Licence (***EPL***), and in accordance with the existing SMP EMP. A detailed CEMP and several CEMP sub-plans have been prepared by EMM for submission to DPE. These have been prepared in parallel with the tender process to allow construction works to commence as soon as possible after the Exploratory Works planning approval is received. Contractors will be required to operate under these detailed CEMPs. Specific mitigations and offsets will be implemented as required.

Snowy Hydro proposes to enter into a heads of agreement with National Parks and Wildlife Services (***NPWS***) which will form the basis of a voluntary planning agreement (***VPA***) or similar between the two parties. This will broadly set out the measures proposed to mitigate impacts to recreational users of KNP and

nominate the monetary contributions required to fund the mitigation and management measures.

A hierarchy of avoidance, mitigation and management, and offsetting is proposed to manage impacts to terrestrial and aquatic biodiversity.

Road designs for the EWR have been designed to minimise impact on areas of geodiversity, particularly fossiliferous beds and rock streams.

Erosion and sediment control plans (***ESCPs***) will be developed specifically for the construction works.

The formal consultation process with the Aboriginal community has commenced in accordance with the requirements of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. Further site-specific mitigation measures will be developed during the preparation of the Main Works EIS. Specifically, Snowy Hydro (in conjunction with the contractors) will prepare separate Cultural Heritage Management Plans (***CHMP***) to manage Aboriginal and historical heritage values.

Site-specific water impact mitigation measures will be developed during the preparation of the Main Works EIS. Appropriate process water and wastewater treatment facilities will be constructed for both the Exploratory Works and Main Works to ensure any water discharged to reservoirs, natural water courses or ground will meet required discharge specifications. Run-off from construction areas will be treated before discharge. Sedimentation dams and basins of the appropriate type will be constructed where necessary.

A social impact assessment will be undertaken during preparation of the EIS to assess social impacts of the Project on the local community and KNP park users.

To avoid the uncontrolled placement of Potentially Acid-Forming (***PAF***) rock, excavated material will be geochemically characterised prior to placement, with sequestration and treatment of PAF material.

Standard construction mitigation measures will be applied and be able to mitigate identified potential bushfire impacts.

A contaminated land management plan and a site-specific asbestos management plan will address risks posed by contaminated material.

Noise management will involve noise monitoring during initial stages of construction to determine if noise levels are within acceptable levels. Safe working distances will be applied to manage vibration impacts within acceptable levels. A blasting management procedure or plan will outline measures to minimise public safety risks.

Site-specific excavated rock and waste mitigation measures will be developed during the preparation of the Main Works EIS.

The feasibility of all fish protection options will need to be considered in relation to their capability of preventing or minimising the movement of all life stages of pest species during the Main Works EIS stage. Current mitigation options to be

evaluated include deterrent technologies, barriers and screens and offsetting measures including targeted species protection and supplementary stocking for recreational fishing. These mitigation measures will be focussed on taking a risk-based approach to minimising transfer and spread of pest species within and beyond Tantangara Reservoir.

The final decommissioning and rehabilitation outcomes for the Works are yet to be determined and are subject to ongoing consultation with NPWS. The final landform and rehabilitation outcomes to be achieved following the Works will be designed to meet the land-use goals of NPWS and the KNP Plan of Management.

1.9 Tenure

The Feasibility Study identified that the Project would primarily be located within the KNP, but outside Snowy Hydro's existing Snowy Park Lease areas. For this reason, the study foreshadowed that minor legislative amendments would be required to the *Snowy Corporatisation Act 1997* to authorise Snowy Hydro's existing lease arrangement over the KNP to be expanded for Snowy 2.0.

The *Snowy Hydro Corporatisation Amendment (Snowy 2.0) Act 2018* (the ***Snowy 2.0 Act***) was passed by the NSW State Parliament on 21 November 2018 and received assent on 28 November 2018.

Under the Snowy 2.0 Act, the Minister (for the Environment) has been authorised to grant leases, licences, easements and rights of way to facilitate Snowy 2.0. The Office of Environment and Heritage (***OEH***), as representatives of the Minister, are currently working with Snowy Hydro on the grant of leases.

Agreement with OEH has been reached on the following approach to the grant of leases and licences, and draft documents are in negotiation:

1. An agreement for lease (***AfL***) will be entered into by mid-December 2018;
2. The AfL will provide for the grant of construction lease(s), licence(s) (or other relevant tenures) as well as the long-term operational lease for the purposes of Snowy 2.0. Note that the long-term operational lease will be on substantially the same terms as the existing Snowy Park Lease and must expire at the same time as the existing Snowy Park lease;
3. The AfL will set out high-level agreement in relation to:
    a. Approach to rent for construction lease and long-term operational lease (broadly based on the current cost recovery approach);
    b. Conditions Precedent to the construction and operating leases being granted (will include planning approval for each project element);
    c. Commencement dates and terms for construction and operating leases which will need to be integrated as construction areas become operational; and
    d. Others are currently the subject of discussions with OEH.

4. It is proposed that there will be one construction lease and works access licence for Exploratory Works and one construction lease and work access licence for Main Works, but there will be provision for further staging if required. The lease and licence process for exploratory works will be triggered as soon as practicable after planning approval is granted.
5. The construction leases will allow for construction of the Project in accordance with the CSSI planning approval and the Construction Environment Management Plan (**CEMP**) developed in accordance with that approval.

---

2 Activities undertaken

2.1 Overview

EMM Consulting Pty Ltd (***EMM***) was engaged from the outset to provide the environment and planning consulting services required to complete a PEA (or equivalent) and one or more EIS. The objectives for the PEA and EIS were for them to be deemed adequate by the DPE and the DoEE for the purposes of accompanying applications for approval of the Project under the Commonwealth EPBC Act and the NSW EP&A Act (see below for further details of the PEA and EIS). This included advice on a community consultation program for the Project (see *Chapter Twenty-One*).

Their scope included:

1. Strategic advice with respect to planning and approvals to comply with both NSW and Commonwealth statutory requirements;
2. Field assessments;
3. Scoping and compilation of technical studies and reports; and
4. Preparation, completion and submission of applications for development approval.

The Feasibility Study identified several studies and investigations necessary to the EIS and approvals process. These included:

1. Social impact assessment;
2. Terrestrial and aquatic ecological survey;
3. Water balance model;
4. Groundwater assessment;
5. Cost-benefit and regional economic analysis;
6. Traffic impact assessment;
7. Soils capability and contamination assessment;
8. Geodiversity review;
9. Excavated rock management;
10. Invasive fish assessments;
11. Bushfire risk and hazard risk; and
12. Heritage survey.

Additional studies necessary to the EIS and approvals process were identified through consultation with DPE and the issue of SEARs for Exploratory Works. These studies included:

1. Surface water assessment;
2. Noise and vibration assessment; and
3. Air quality assessment

The findings of these studies to date have informed the EIS process and the Employer's Requirements. A number of these studies were completed in July 2018 in respect of the Exploratory Works only, and were made public as part of the Exploratory Works EIS.[1] Their scopes and objectives are summarised briefly below. Findings of the assessments are documented in the EIS.

Given the limited geographic scope and scale of the Exploratory Works assessments, they cannot be considered definitive for the Main Works. However, while limited in scope, the methodology is repeatable and the assessments provide valuable insight into the likely issues to be addressed for the balance of the Project. The likely issues and the methodology for assessment of these issues were refined as part of the Scoping Report for Main Works submitted to DPE in October 2018. Subject to approval at FID, these assessments are expected to be completed to support the lodgement of the EIS for the full Project in 2019.

2.2 Social impact assessment

The Feasibility Study identified impacts to recreational uses and amenity from construction activities as key matters requiring further investigation. A social impact assessment was to be undertaken during preparation of the EIS to assess the social impacts of the Project on the local community and KNP park users. This was to be completed in conjunction with the Project's stakeholder engagement strategies.

A social assessment for the Exploratory Works was prepared by EMM in July 2018. The objectives of the social assessment were to:

1. Understand how and where Exploratory Works will be undertaken;
2. Understand the demographic profile of areas potentially impacted by the Exploratory Works;
3. Engage with stakeholders to identify community values, opportunities, issues and concerns associated with the Exploratory Works;
4. Predict and analyse the potential impacts of the Exploratory Works including impacts on access to, and demand for, local services and infrastructure;
5. Consider the outcomes and key findings of technical investigations for noise, air quality, surface water and traffic to identify potential amenity impacts; and
6. Develop appropriate mitigation and enhancement strategies.

The assessment was undertaken in four phases:

[1] See *Chapter Thirteen - Early and exploratory works* for details of scope.

1. Understand the issues;
2. Predict, analyse and assess the likely impacts;
3. Develop and implement strategies; and
4. Design and implement monitoring programs.

2.3 Terrestrial and aquatic ecological survey and assessment

2.3.1 Requirements

The Project's location within KNP and its inherent conservation and ecological values mean that ecological-related impacts are a key matter to be considered in ongoing assessments.

The Feasibility Study identified that while there is scope to avoid impacts on NSW and Commonwealth-listed species and communities as part of the design process for construction, further assessments were required.

2.3.2 Terrestrial

Further assessment included undertaking ecological survey work to determine the presence of threatened and endangered species at specific locations. This was to be undertaken as part of the EIS for Exploratory Works and in accordance with the relevant NSW and Commonwealth guidelines, including revised vegetation mapping and assessment of threatened ecological communities, followed by collection of detailed vegetation integrity data and targeted surveys for threatened species.

To support the referral of the Exploratory Works under the EPBC Act, a Matters of National Environmental Significance (***MNES***) Report was prepared by EMM in May 2018. The purpose of the report was to identify Commonwealth species and communities that may be impacted by the Exploratory Works, and demonstrate how impacts have been avoided and minimised to ensure Exploratory Works would not be a controlled action under the EPBC Act.

A Biodiversity Development Assessment Report (***BDAR***) for the Exploratory Works was prepared by EMM in July 2018.[2] The objectives of the BDAR were to:

1. Describe the existing biodiversity values and existing environment;
2. Identify and assess potential for the presence of biodiversity values including threatened species and communities under relevant legislation including the NSW Biodiversity Conservation Act 2017 (BC Act) and EPBC Act;
3. Identify ecological constraints within and impacts arising from the Exploratory Works;
4. Provide mitigation measures to reduce the impacts from the proposal on biodiversity wherever possible; and

[2] *Biodiversity Development Assessment Report - Exploratory Works for Snowy 2.0 (EMM)* (BDAR). Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_2_App_F_Biodiversity_assessment.pdf.

5. Where impacts are unavoidable, consider compensatory measures that are appropriate for the Exploratory Works.

2.3.3 Aquatic

Aquatic ecology

The Feasibility Study noted that further aquatic ecology assessments would be undertaken as part of the EIS. This was to include targeted surveys for threatened species (including investigating the technology of DNA sampling of the reservoirs to assist with the identification of species of interest).

Cardno (NSW/ACT) Pty Ltd (***Cardno***) prepared an aquatic ecology assessment for the Exploratory Works as a subconsultant to EMM in July 2018.[3] The scope of the assessment was to:

1. Review relevant legislation, policies and guidelines pertaining to aquatic ecology;
2. Review existing information on aquatic ecology which may be affected by Exploratory Works;
3. Undertake field survey of watercourses which may be affected by Exploratory Works to identify aquatic habitat, macrophytes and fish;
4. Identify aquatic flora and fauna following review of existing information and field surveys which would be expected to occur;
5. Assess the potential direct and indirect impacts on aquatic ecology during Exploratory Works, including potential impacts on listed threatened and protected species, endangered populations, aquatic vegetation and habitat, general ecological processes, and any potential cumulative impacts in a local and regional context; and
6. Recommend measures to avoid, mitigate and/or minimise potential impacts on aquatic ecology.

DNA species monitoring

Enviro DNA Pty Ltd was engaged in late 2017 to provide environmental DNA species monitoring services. Their scope included:

1. DNA analysis to assess the presence/absence of Epizootic Haematopoietic Necrosis Virus (***EHNV***) in Talbingo Reservoir using previously-collected water samples;
2. Determine fish and decapod biodiversity in the Snowy Hydro 2.0 study area using environmental DNA; and
3. Determine the presence of EHNV in Redfin and trout caught in the Talbingo and Tantangara reservoirs.

2.4 Water balance model and surface water assessment

The Feasibility Study noted that a comprehensive water balance model for the Project would be obtained to assist with preparing further impact assessments

[3] *59918111 - Aquatic Ecology Assessment (Cardno).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_2_App_G_Aquatic_ecology_assessment.pdf.

on the operation of the Project. The development of the EIS would consider issues such as the impacts of changed operating regimes on water quality, waterlogging and erosion of foreshores and potential for health issues.

A surface water assessment for Exploratory Works was prepared by EMM in July 2018. The scope of the surface water assessment was to:

1. Assess impacts of the Project on the quantity and quality of the region's surface water features;
2. Assess potential flooding risks of the Project; and
3. Provide a detailed site water balance for the Project.

2.5 Groundwater assessment

The Feasibility Study noted that during the EIS a comprehensive groundwater assessment was to be undertaken including:

1. Development of a combined surface and groundwater monitoring plan (detailing proposed sites, sampling frequency, listing of water quality analyses), tailored to provide data to meet EIS requirements for groundwater;
2. Construction of a groundwater monitoring network (using suitable water bore drilling techniques and hydrogeological supervision during drilling and installation); and
3. Development of a groundwater model to predict inflow volumes, associated water source contributions and depressurisation of selected geological layers and water table drawdown, and potential connectivity and changes to overlying rivers and creeks (ie changes to baseflow).

EMM prepared a Groundwater assessment for Exploratory Works in July 2018.[4] The objectives of the assessment were to document the groundwater assessment methods and results, the initiatives built into the project design to avoid and minimise associated impacts to groundwater, and the mitigation and management measures proposed to address residual impacts not able to be avoided. The assessment included:

1. Implementation of a dedicated groundwater monitoring network (also covers the broader Project area);
2. Development of a numerical groundwater model;
3. Installation of groundwater monitoring bores;
4. Hydraulic testing;
5. Groundwater level and quality monitoring; and
6. Landholder bore review.

The outcomes of this assessment are described in more detail in *Chapter Eighteen - Hydrology*.

[4] *Groundwater assessment - Exploratory Works for Snowy 2.0 (EMM)*. Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_4_App_N_Groundwater_Assessment.pdf.

2.6 Cost-benefit and regional economic analysis

The Feasibility Study identified local and regional impacts of the Project during construction as priority areas for further investigation of economic impacts from the Project. A Cost-Benefit Analysis (***CBA***) and regional economic analysis of the Project was to be undertaken as part of the EIS preparation.

Gillespie Economics prepared an economic assessment of Exploratory Works as a subconsultant to EMM in July 2018.[5] The assessment provided:

1. A CBA; and
2. An assessment of the economic effects in the locality, using input-output analysis.

2.7 Traffic impact assessment

The Feasibility Study noted a relatively low risk of traffic impacts associated with the construction of the Project. The main traffic impacts of the Project are expected to arise from:

1. Haulage of excavated rock from the multiple extraction points to the final excavated rock placement location(s); and
2. Increased traffic volumes on the local road network generated during the construction of the Project.

A traffic impact assessment was to be conducted during preparation of the EIS in order to assess the impacts of the Project on existing traffic and the local road network.

SCT Consulting Pty Ltd (***SCT***) prepared a traffic and transport report for Exploratory Works as a subconsultant to EMM in July 2018.[6] SCT undertook a number of traffic surveys in the area between January and March 2018. These surveys were evaluated against relevant AUSTROADS guidelines for performance assessment. Forecast Project vehicle movements were then applied to assess the impact of the additional traffic volumes.

2.8 Soils capability and contamination assessment

The Feasibility Study identified that construction activities during the Project may result in contamination of soils and/or groundwater due to spills and leaks of fuel, oils and other hazardous materials from maintenance works. These impacts are anticipated to be readily manageable through standard environmental management measures already in place for the existing Scheme.

[5] *Snowy 2.0 Exploratory Works Economic Assessment (Gillespie Economics).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_6_App_S_Economic_Assessment.pdf.

[6] *Snowy Hydro 2.0 Traffic and Transport Report (SCT).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_6_App_Q_Traffic_and_Transport_Assessment.pdf.

A soils capability and contamination assessment was to be undertaken as part of the EIS.

A soil and land assessment for Exploratory Works was prepared by EMM in July 2018.[7] It documents the assessment methods and results, the initiatives built into the project design to avoid and minimise associated impacts to soil and land resources, and the mitigation and management measures proposed to address any residual impacts not able to be avoided. The objectives of the assessment were to:

1. Address requirements relating to soil and land resources;
2. Describe, classify and map the soils within the assessment area;
3. Assess the suitability of soil units for recovery and use as topsoil/growth media in rehabilitation;
4. Identify any potentially problematic soil, eg highly sodic, acidic or saline;
5. Assess impacts of the Exploratory Works on soil resources and land and soil capability; and
6. Identify appropriate soil management measures.

A phase 1 contamination assessment for Exploratory Works was prepared by EMM in July 2018.[8] The objectives of the assessment were to:

1. Identify potential areas and contaminants of concern within the Exploratory Works footprint, which comprises the location of all infrastructure and areas where construction activities would occur;
2. Provide a preliminary qualitative assessment, and desktop review of available data, in relation to contamination risk posed during Exploratory Works; and
3. Assess where further investigation should be undertaken or appropriate management
procedures should be implemented for Exploratory Works.

2.9 Geodiversity assessment

Geodiversity refers to the natural diversity of rocks, minerals, fossils, sediments and soils, and the processes that have shaped these features over time. EMM undertook a literature review and preliminary assessment in July 2018 to:[9]

1. Identify significant geodiversity features of KNP within the area of Exploratory Works; and
2. Identify and evaluate the risks that Exploratory Works posed to identified geodiversity features.

[7] *Soil and land assessment - Exploratory Works for Snowy 2.0 (EMM).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_3_App_H_Soil_and_land_assessment.pdf.

[8] *Phase 1 contamination assessment - Exploratory Works for Snowy 2.0 (EMM).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_3_App_J_Phase_1_contamination.pdf.

[9] *Appendix I - Geodiversity Review - Exploratory Works for Snowy 2.0 (EMM).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_3_App_I_Geodiversity_review.pdf.

The assessment involved a literature review of relevant and available documentation, as well as geographic information system analysis and a visual site inspection to confirm the location and condition of geodiversity features relevant to Exploratory Works.

Additional assessments of significance were completed by Dr Ian Percival (with respect to fossil outcrops) and Dr Bradley Opdyke (with respect to periglacial rock streams) to supplement the EIS and matters raised by NPWS.

2.10 Excavated rock management

It was noted in the Feasibility Study that the Project's excavated rock management will be subject to further detailed design and assessment to determine final excavated rock placement. The impacts of excavated rock management and placement on biodiversity, surface water, traffic, soil and contamination and visual amenity were to be comprehensively investigated through the preparation of the EIS.

Haskoning Australia was engaged in early 2018 to provide assistance, analysis and advice, including assistance with the preparation of an excavated rock disposal and management plan.

Their scope included:

1. An initial scoping study identifying and determining the engineering, data collection and modelling activities required to produce options and ascertain excavated rock management and excavated rock handling solutions for the Project, including a recommended solution that will meet Snowy Hydro's operating needs and be within all applicable legislative parameters;
2. Management of CSIRO under subcontract. CSIRO to provide material testing services;
3. Attendance at meetings and workshops;
4. Developing a concept design for barge access facilities at the northern and southern ends of the Talbingo Reservoir;
5. Providing computer modelling to determine the potential effects of excavated rock disposal on the Talbingo and Tantangara reservoirs; and
6. Conducting an investigation on reservoir bed condition and sediment in the reservoirs.

SGM Environmental Pty Ltd (***SGME***) was engaged as a subcontractor to EMM to prepare an evaluation of environmental risk and conceptual design for two excavated rock emplacement areas (the conceptual design) at Lobs Hole.[10]

2.11 Invasive fish assessments

It was noted in the Feasibility Study that further aquatic ecology assessments would be undertaken as part of the EIS. This was planned to include assessment

[10] *Snowy 2.0 Exploratory Works - Technical Report - Excavated Rock Emplacement Areas Assessment (SGME).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_3_App_K_Excavated_rock_emplacement.pdf.

of the potential for the spread of invasive species through the proposed main Project alignment.

Presently there are concerns that Redfin perch (*Perca fluviatilis*), an invasive species present in Talbingo Reservoir, may be transferred to Tantangara Reservoir where they are currently absent. Following further survey work, it has also been established that other undesirable fish species including Eastern Gambusia (*Gambusia holbrooki*) and Climbing Galaxias (*Galaxias brevipinnis*) are also present in Talbingo Reservoir but not Tantangara.

Charles Sturt University (***CSU***) was engaged in 2017 to provide environmental and ecological advice regarding existing fish communities in the region, and a desktop study to provide an assessment of the potential for a new pipeline between Talbingo and Tantangara reservoirs to lead to the establishment of a viable population of Redfin perch in Tantangara Reservoir.

In early 2018, CSU were engaged again to undertake an experimental study to test the likelihood of survival of all life stages of Redfin through the proposed development assuming no screens or deterrents were installed. The project included collecting and rearing adult and juvenile Redfin plus the collection of eggs and larvae and undertaking the following tasks:

1. Designing and constructing experimental apparatus that can simulate the expected pressure and simulate pressure changes through the proposed power station.
2. Perform shear flume experiments to simulate the expected shear stress fish will be subjected to during transport.
3. Performing probabilistic blade-strike mortality modelling based on Computational Fluid Dynamics (***CFD***) modelling of the proposed turbine geometry.

This project was subsequently amended to include the testing of adult Gambusia. Time and resources did not permit the testing of other life stages or Climbing Galaxias.

Enviro DNA Pty Ltd were engaged in late 2017 to provide environmental DNA species monitoring services. Their scope included water sampling services and DNA analysis to assess the presence/absence of Redfin in Talbingo and Tantangara reservoirs.

2.12 Bushfire risk and hazard assessment

A bushfire risk and hazard assessment for Exploratory Works was prepared by EMM in July 2018.[11] The assessment responded to the SEARs requirement to assess public safety, including an assessment of the risks to public safety, paying particular attention to bushfire risks, emergency egress and evacuation, and the handling of dangerous goods.

[11] *Bushfire Risk and Hazard Assessment - Exploratory Works for Snowy 2.0 (EMM).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_6_App_V_Bushfire_and_Hazard_Risk_Assessment.pdf.

2.13 Heritage assessment

The Feasibility Study identified the potential for impacts on Aboriginal artefacts and places and noted that the extent and intensity of potential impacts had yet to be determined.

The Feasibility Study noted scope to avoid identified known Aboriginal artefacts, sites and places through the design process, and that where this was not possible and these items might be harmed, consultation, mitigation and the necessary approvals would be obtained.

It was stated that further Aboriginal cultural heritage assessments including archaeological surveys would be undertaken as part of the EIS, to ensure that Aboriginal cultural heritage values were properly identified and considered.

New South Wales Archaeology Pty Ltd (***NSW Archaeology***) were engaged in mid-2017 to provide ongoing archaeology advice with respect to both Aboriginal cultural heritage and historic heritage. Their scope included:

1. Support for the Aboriginal consultation process;
2. Support for approvals for geotechnical investigation;
3. Field supervision and assessment services for geotechnical investigation; and
4. Heritage assessment, including ground surveys, heritage documentation review, draft heritage reports, approvals documentation and consultation with heritage groups.

NSW Archaeology prepared an Aboriginal Cultural Heritage Assessment Report (***ACHAR***) and a Historic Cultural Heritage Assessment Report (***HCHAR***) in July 2018.[12] The documents describe the respective heritage assessment methods and results, the initiatives built into the project design to avoid and minimise associated impacts, and the mitigation and management measures proposed to address any residual impacts not able to be avoided.

2.14 Noise and vibration assessment

A noise and vibration assessment for Exploratory Works was prepared by EMM in July 2018.[13] Their scope included:

1. Identification of the key noise sensitive receptors;
2. Modelling and assessment of construction noise impacts against identified criteria and noise management levels in line with the relevant guidelines; and
3. Assessment of blasting and vibration impacts from activities including tunnelling.

[12] *Snowy 2.0 Exploratory Works - Historic Cultural Heritage Assessment Report (NSW Archaeology).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_5_App_P_Historic_Cultural_Heritage_Assessment.pdf.

[13] *Snowy 2.0 Exploratory Works - Noise and vibration assessment (EMM).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_6_App_T_Noise_and_Vibration_Assessment.pdf.

2.15 Air quality assessment

An air quality and greenhouse gas assessment for Exploratory Works was prepared by Jacobs as a subconsultant to EMM in July 2018.[14] The scope included:

1. Identification of the key air quality issues, based on a review of the project methods and activities;
2. Preparing air emission inventories for all key source locations associated with construction;
3. Dispersion modelling of emissions to predict the contribution of the project to local and regional air quality; and
4. Assessment of model predictions against Environment Protection Authority (***EPA***) air quality assessment criteria.

3 Approvals

3.1 Overview

The Project requires approvals at both State and Commonwealth levels. The existing Scheme is governed by special-purpose NSW, Vic and Commonwealth legislation and operating instruments, some of which require amendment. The Project also requires approval under various Commonwealth environmental protection acts. The interplay of the various acts means that there were a number of possible pathways that could be followed to obtain full approval to construct and operate the Project.

The preferred and selected approval pathway involves:

1. Seeking CSSI status under the EP&A Act 1979 (NSW);
2. Requesting that the responsible Minister make minimal amendments to the SHC Act; and
3. Referring the Project for Commonwealth approval under the EPBC Act.

The Project was declared SSI and CSSI in March 2018. Snowy Hydro requested SEARs for the Exploratory Works in March 2018 and was received in May 2018. Supplementary SEARs to include consideration of pilot excavated rock disposal within Talbingo Reservoir were requested and received in June 2018.

The EIS for Exploratory Works was submitted to the NSW DPE in July 2018 and exhibited in July and August 2018. The RTS was submitted in October 2018.

Snowy Hydro requested SEARs for the Main Works in October 2018, with SEARs expected to be received shortly after FID.

As at FID, approval for the Exploratory Works EIS is pending, and the Main Works EIS is being prepared for submission.

[14] *Snowy 2.0 Exploratory Works - Air Quality and Greenhouse Gas Assessment (Jacobs).* Available at https://s3-ap-southeast-2.amazonaws.com/spatial-media-video/portal-files/snowy/eis/ew/technical/Vol_6_App_T_Noise_and_Vibration_Assessment.pdf.

A referral for Exploratory Works under the EPBC Act was lodged with the DoEE in May 2018. The DoEE found the Exploratory Works to be 'not a controlled action' under the EPBC Act in July 2018. A referral for construction and operation of the Project was made with DoEE in October 2018.

3.2 Preferred pathway

The approval pathway recommended and chosen for the Project provides for a transparent and rigorous environmental assessment process and involves:

1. Making a submission to the NSW Minister for Planning to request the Project be declared CSSI under the EP&A Act 1979 (NSW). This submission was lodged on 26 October 2017. The Project was declared SSI and CSSI on 7 March 2018;
2. Requesting that the Minister responsible for administering the SHC Act make minimal amendments to that Act. These amendments have been made in November 2018 and provide Snowy Hydro with tenure and authority to operate inside KNP; and
3. Referring the Project for Commonwealth approval under the EPBC Act.

Other second-tier approvals will be required to construct and/or operate the Project, including:

1. A new EPL for construction of the Project, as required under the *Protection of the Environment Operations Act 1997* (NSW) (***POEO***);
2. Amendment to Snowy Hydro's existing Scheme-wide EPL No. 10515 on commencement of operation of the Project;[15] and
3. Licenses that may be required for groundwater monitoring and use in accordance with the *Water Management Act 2000* (NSW) and *Water Act 1912* (NSW).

3.3 Statutory regime

3.3.1 Overview

Construction and operation of the Project will require approvals at both State and Commonwealth levels of government. The relevant Acts and operating instruments are listed in Table 1 below.

Jurisdiction	Legislation	Action / instrument
NSW	*SHC Act 1997*	Amendment
	Environmental Planning and Assessment Act 1979	CSSI declaration Planning approval
	Water Management Act 2000	Groundwater licences
	Water Act 1912	Groundwater licences
	Biodiversity Conservation Act 2016	Habitat/species offsets

[15] See Environment Protection Authority - NSW, 2013. Environmental Protection Licence - 10515. , pp.1–17. Available at: http://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=32431&SYSUID=1&LICID=10515 [Accessed November 30, 2017].

	Fisheries Management Act 1994	Habitat/species offsets
	POEO Act 1997	New EPL (for construction) Amendment to existing EPL for operation
	NPW Act 1974	
Vic	*SHC Act 1997*	
Commonwealth	*SHC Act 1997*	
	EPBC Act 1999	Environmental approval Biodiversity offsets

Table 1: Legislation

The interplay of the various acts means that there were a number of possible pathways that could be followed to obtain full approval to construct and operate the Project. Approval pathway options for the Project were assessed with reference to the following key criteria and are detailed against the relevant acts below:

1. **Maintain credibility and social licence** - credible, transparent and rigorous environmental assessment;
2. **Keep it simple** - aim for a simple approval process and minimise new legislation;
3. **Flexibility** - a regime that is suitable for the Project that is of national significance by providing flexibility and can be staged; and
4. **Include the Project within the existing Scheme** - ongoing operation of the Project must be integrated into the existing fit-for-purpose regulatory regime.

3.3.2 SHC Act

The Scheme was originally constructed and operated by the Commonwealth Snowy Mountains Hydro-electric Authority (***SMHEA***) in accordance with special-purpose Commonwealth legislation. In 2002, this Commonwealth authority was corporatised to form the present-day Snowy Hydro. This was enabled by three pieces of legislation in NSW, Vic and the Commonwealth, each called the *Snowy Hydro Corporatisation Act 1997*.

The SHC Act entitles Snowy Hydro to a number of key operating instruments to enable the continued operation of the Scheme. Relevantly, this includes entitlement to the grant of the Snowy Park Lease and that the Scheme, as it existed as at the date of corporatisation, is deemed to have been granted all relevant planning approvals in accordance with the EP&A Act and other relevant NSW laws. This fit-for-purpose regime is well understood and has been successful, both for Snowy Hydro and its government stakeholders (particularly NPWS) in managing the operations of the Scheme.

The SHC Act has now been amended by the Snowy 2.0 Act to enable the granting of leases for the development and operation of the Project (see *Section 3.4.3* below).

3.3.3 NPW Act

Amendments to the SHC Act following from the CSSI declaration will have the effect of consequential minor amendments to the NPW Act to allow the Project to be constructed within KNP and to dovetail ongoing operation of the Project into the existing regime. There are precedents where this has been used such as the Sydney Olympics and Sydney's Northside Storage Tunnel.

3.3.4 POEO Act

A new EPL was required for construction of the Project to undertake 'scheduled development works', such as extractive works and helicopter-related activities, as required under Part 3 of the POEO Act. This EPL was obtained in late 2017.

Amendment to Snowy Hydro's existing Scheme-wide EPL No. 10515 will be required on commencement of operation of the Project, to include the new electricity generating activities under Part 3 of the POEO Act.

3.3.5 Environmental Planning & Assessment Act

The Project will be a major augmentation to the existing Scheme. Although the SHC Act, NPW Act and the KNP Plan of Management (***KNP PoM***) all recognise and authorise the existence and continuance of the existing Scheme development, the scale of the Project's augmentation means such works would likely be considered beyond the scope of the existing regime for environmental assessment of Snowy Hydro operations within KNP and as authorised by the SHC Act.

As such, the construction and operation of the Project is a new development that requires approval under the EP&A Act. This planning approval must be obtained prior to commencing any works and in accordance with the assessment requirements of the EP&A Act. These activities must also comply, or be taken to comply with, the requirements of the NPW Act given the Project is located inside KNP.

Based on the scope and key criteria, a strategic decision was made to proceed with an existing planning approval process and request that the Project be declared CSSI under the EP&A Act.

Given the inter-dependencies of the Project and necessary transmission upgrades, Snowy Hydro and TransGrid decided to make a joint submission to the Minister requesting the CSSI declaration cover both generation and transmission. It is envisaged that the generation and transmission works will be carried out by the separate entities, with separate EIS and project approvals. This joint submission was lodged with the Minister for Planning on 26 October 2017 and approved by the Minister on 9 March 2018.

The main reasons for choosing this pathway were:

1. **Credibility and social licence -** the application and assessment process will involve rigorous environmental assessment and public participation

procedures specified in the EP&A Act;
2. **Keep it simple -** this is an established and transparent process under the EP&A Act. This pathway is also an accredited assessment process under the EPBC Act;
3. **Flexibility -** the Project can be staged under the EP&A Act, with separate applications for the Exploratory Works and Construction if needed.

The CSSI declaration was made in March 2018. With the Minister declaring the Project CSSI, Snowy Hydro expects to achieve Exploratory Works approval at the end of 2018 and full Project approval in 2019. This is dependent on successful completion of a range of Project deliverables including the Geotechnical Investigation Program (***GIP***) and detailed design.[16]

Following the CSSI declaration, Snowy Hydro then requested SEARs for the Exploratory Works in March 2018. These SEARs set the parameters for the Exploratory Works EIS. They were developed by the NSW DPE in consultation with key stakeholders including the DoEE, NPWS, NSW OEH, NSW RMS and NSW DPI (Water) among others.

The EIS for Exploratory Works was submitted by Snowy Hydro to the NSW DPE in July 2018 and publicly exhibited by the DPE in accordance with the EP&A Act between 23 July and 20 August 2018. Additionally, a digital EIS portal (https://v2.communityanalytics.com.au/snowy/eis) was established to provide the community with information on key findings through video and digital media forums.

A total of 51 submissions were received during the public exhibition period, including four from special interest groups and 47 individual community submissions. Of the 51 submissions, 19 (or 37%) were in support of the Exploratory Works, 15 (or 29%) objected to the works, and the remaining 17 provided comments. In addition, 11 submissions were received from State government agencies and councils.

Snowy Hydro prepared a RTS document which was submitted to the NSW DPE on 3 October 2018. The RTS provided a comprehensive response to all submissions made on the EIS.

Snowy Hydro requested SEARs for the Main Works in October 2018, with a response expected in calendar 2018.

3.3.6 EPBC Act

The EPBC Act requires any person (including corporations) who proposes to conduct an activity that will or may have a 'significant impact' on MNES to refer the matter to the Commonwealth Minister for Environment. If the Minister decides the action is a 'controlled action' the activities are then assessed and approved or denied. Relevant to Snowy Hydro, MNES include places listed on the National Heritage Register, Ramsar wetlands of international significance,

[16] See *Chapter Ten - Site and ground conditions* for further discussion of the GIP.

threatened flora and fauna species and ecological communities, and migratory species.[17]

A referral for Exploratory Works was lodged with the DoEE on 28 May 2018. The referral was subsequently publicly notified from 2 June to 20 June 2018, where comments from the community and special interest groups could be prepared and lodged with DoEE.

As part of the referral assessments of potential impacts of Exploratory Works on MNES were submitted to DoEE. This included the following reports which were submitted as part of the EPBC referral:

1. MNES Report – Species and Communities; and
2. Assessment of Impacts on National Heritage Places.

The Exploratory Works EPBC referral concluded that overall there is a low risk of direct or indirect impacts to threatened species listed under the EPBC Act and Exploratory Works are unlikely to result in a significant impact to these species. The referral also stated that the proposed action will not have a significant impact on National Heritage Places. The DoEE provided their decision on the referral for Exploratory Works on 12 July 2018, finding the Exploratory Works to be 'not a controlled action' under the EPBC Act.

In addition to the NSW planning approval process, referral to the DoEE is required for construction and operation of the Project as the works are likely to have a significant impact on MNES. A referral for Construction of the Project was made with DoEE in October 2018.

Once a referral is made, no works can commence until the Commonwealth Minister for the Environment has made its determination. CSSI is an accredited assessment process for the purposes of the EPBC Act, meaning that the same EIS (see the EIS pathway below) can be used to support assessment and approval processes under the EP&A Act and EPBC Act. The timeframe for a determination under an accredited assessment process is 30 business days from the date of receipt of an assessment report.

3.3.7 Other approvals

Other second-tier approvals that may be required for the Project include licenses that may be required for groundwater monitoring and use in accordance with the *Water Management Act 2000* (NSW) and *Water Act 1912* (NSW).

3.4 Land access and tenure considerations

Snowy Hydro requires certainty of property tenure to commence works in each phase of the Project.

[17] See Australian Government - Department of the Environment and Energy, 2017. What is protected under the EPBC Act? - Matters of national environmental significance. Available at: http://www.environment.gov.au/epbc/what-is-protected [Accessed December 1, 2017].

3.4.1 Background

The Feasibility Study identified that the Project will primarily be located within the KNP, but outside Snowy Hydro's existing Snowy Park Lease areas.[18] For this reason the study foreshadowed that minor legislative amendments would be required to the SHC Act to authorise Snowy Hydro's existing lease arrangement over the KNP to be expanded for Snowy 2.0. The Feasibility Study also identified that additional areas outside the KNP may also be required for staff, warehouse facilities and excavated rock locations and advised that necessary property rights would be secured through either lease or purchase from existing landowners.

3.4.2 Amended and Restated Snowy Regulatory Deed

As part of the sale of the NSW and Victorian shares in Snowy Hydro to the Commonwealth, the governments entered into the 'Amended and Restated Snowy Regulatory Deed' on 21 March 2018. Under this Deed, the NSW government undertook to:

1. Provide all reasonable assistance to Snowy Hydro in relation to the current operations and planning and environment approvals required for the Snowy 2.0 Development; and
2. Use all reasonable endeavours to ensure that:
    a. Snowy 2.0 enabling legislation is introduced and progressed through each house of the NSW Parliament if legislation is required to facilitate the grant of the Snowy 2.0 Lease; and
    b. the Snowy 2.0 lease is able to be granted to Snowy Hydro by the responsible Minister as expeditiously as practicable.

The Snowy 2.0 lease referred to in the agreement is a lease on terms that are substantially the same as the terms of the Snowy Park Lease.

3.4.3 Current Position

Snowy Hydro Corporatisation Amendment (Snowy 2.0) Act 2018 (NSW) (the ***Snowy 2.0 Act***) was passed by the NSW State Parliament on 21 November 2018 and received assent on 28 November 2018.

The Snowy 2.0 Act addresses each of the matters required to authorise a lease for Snowy 2.0 in KNP. The key provisions are:

1. **Snowy 2.0 Lease** - The Act authorises and entitles Snowy Hydro to the grant of lease, license, easement or right of way for the purpose of and in connection with Snowy 2.0, which is defined as the development described in the CSSI declaration and which has received planning approval. The Snowy 2.0 lease must expire on 30 May 2077, at the same time as the current Snowy Park Lease;
2. **TransGrid lease** - authorises and entitles the current NSW Transmission Operator (TransGrid) to receive a lease, license, easement or right of way for the purpose of the Snowy 2.0 transmission system. (TransGrid's lease

[18] Snowy 2.0 Study Report - Chapter Fourteen at pages 5 and 6.

term may be the same as TransGrid's existing lease/licence/ easement but is not required to be);

3. **Access to stored waters** - the Snowy 2.0 lease must provide for the same public access to stored waters as had been previously made available. This is consistent with the current Snowy Park Lease;
4. **Native Title** - The Act provides for regulations to be made to put in place an indemnity scheme which will provide that if compensation is payable by the State to Native Title holders as a result of the legislation or a lease granted under it or the grant of planning approvals or amendments to plans of management, then Snowy Hydro and TransGrid (or the relevant holder of the TNSP licence) must contribute to or indemnify the State against that compensation. The Land and Environment Court will be given jurisdiction to resolve disputes which may arise with respect to compensation. The implications of this are discussed further below in the *Native Title* section.

3.4.4 Proposed approach to lease and licences

As indicated above, the Minister (for the Environment) has been authorised to grant leases, licences, easements and rights of way to facilitate Snowy 2.0. The Office of Environment and Heritage (***OEH***), as representatives of the Minister, are currently working with Snowy Hydro on the grant of leases.

Agreement with OEH has been reached on the following approach to the grant of leases and licences, and draft documents are in negotiation:

1. An AfL will be entered into by mid-December 2018;
2. The AfL will provide for the grant of construction lease/s licence/s (or other relevant tenures) as well as the long-term operational lease for the purposes of Snowy 2.0. Noting that the long term operational lease will be on substantially the same terms as the existing Snowy Park Lease and must expire at the same time as the existing Snowy Park lease;
3. The AfL will set out high level agreement in relation to:
    a. Approach to rent for construction lease and long term operational lease (broadly based on the current cost recovery approach);
    b. Conditions Precedent to the construction and operating leases being granted (will include planning approval for each project element);
    c. Commencement dates and terms for construction and operating leases which will need to be integrated as construction areas become operational; and
    d. Others are currently the subject of discussions with OEH.
4. It is proposed that there will be one Construction lease and works access licence for Exploratory Works and one construction lease and work access licence for Main Works, but there will be provision for further staging if required. The lease and licence process for exploratory works will triggered as soon as practicable after planning approval is granted; and

5. The construction leases will allow for construction of the Project in accordance with the CSSI planning approval and the CEMP developed in accordance with that approval.

3.4.7 Treatment of Transmission Assets

Shallow Transmission Works

To facilitate the connection of Snowy 2.0 power station to the existing TransGrid transmission network, a new (shallow) connection will be required. This will involve the construction of a point of connection at Lobs Hole and 10 km of new 330 kV line to connect into TransGrid's existing 550 kV Line 64 to provide a point of entry and exit for output from the new Snowy 2.0 power station. It has been agreed with TransGrid that it will build, own and operate the connection assets and new line as part of its transmission system, with Snowy Hydro meeting the costs of construction. See *Supporting Chapter Sixteen - Transmission*.

Some of this line and the related switchyards will be located within KNP. TransGrid will require a construction lease or licence to support the construction and easements and leases to support the occupation of the line and switchyard. The Snowy 2.0 legislation provides for, authorises and entitles TransGrid to receive a lease, license, easement or right of way for the purpose of the Snowy 2.0 transmission system. This supplements existing provisions of the *National Parks and Wildlife Act* which provide for the grant of easements for transmission lines, TransGrid will negotiate with OEH to obtain the necessary tenures.

3.4.8 Access to Private Land

As at FID, no private land had been identified as being required.

4 EIS Process

4.1 Overview

Certainty around planning approvals is an important factor influencing the Project's viability, and the EIS process is central to the key approvals. Various alternatives were considered for EIS lodgement. The plan adopted includes two EIS processes: Exploratory Works and a single EIS for the Main Works, which includes construction and operation of the Project. In parallel with the Snowy Hydro EIS processes, Transgrid is running a separate transmission-related EIS process as proponent (see *Supporting Chapter Sixteen*).

4.2 Timeline

Key dates for the EIS process are shown in Table 2 below.

Event	Timeframe
Lodge Exploratory Works EIS	July 2018 (Lodged)
Lodge PEA (Scoping Report) for Main Works EIS	Oct 2018 (Lodged)
Receive SEARs for Main Works EIS	Dec 2018
Exploratory Works EIS Determination	Dec 2018
Lodge Main Works EIS	Mar 2019
Display Main Works EIS	Apr 2019
Main Works EIS Determination[19]	Dec 2019
EPBC Approval for Main Works	Feb 2020

Table 2: EIS key dates

Progress on the transmission approvals by TransGrid is central to confirmed transmission capability and thus integral to the Project's viability. Therefore, Snowy Hydro is equally concerned to ensure transmission approvals pathways are secure (see *Supporting Chapter Sixteen*).

4.3 Exploratory Works EIS

The Exploratory Works EIS was submitted to DPE in July 2018 and publicly exhibited by DPE in accordance with the EP&A Act between 23 July and 20 August 2018.

A total of 51 submissions was received during the public exhibition period, including four from special interest groups and 47 individual community submissions. Of the 51 submissions, 19 (37%) were in support, 15 (29%) objected, and the remaining 17 provided comments. In addition, 11 submissions were received from State government agencies and local councils.[20]

A Response to Submissions (***RTS***) report was lodged in October 2018 in accordance with the relevant legislation and guidance. Matters raised in submissions in support predominantly related to the social, economic and recreational impacts of the Project. Supporting submissions also frequently referred to stakeholder engagement, transport and the approval process. Additional matters raised included support for Snowy 2.0, the proposed mitigation measures, impacts to water and other matters including noise, public safety and waste.

Matters raised in submissions in objection predominantly related to social, economic and recreational impacts and the approval process. Additional matters raised frequently in objecting submissions included biodiversity, project elements, stakeholder engagement, heritage, project justification, KNP, land, transport, water and other matters including noise, public safety and waste. One

[19] EISs will also be required for the transmission Shallow Works and Deep Works. As at FID, it is assumed that these will be the responsibility of TransGrid.
[20] *Response to Submissions - Exploratory Works for Snowy 2.0 - October 2018 (EMM).*

objecting submission raised matters relating to the proposed mitigation measures.

4.4 Summary approval status as at FID

The Exploratory Works EIS, including piloting excavated rock disposal in Talbingo Reservoir, was lodged in July 2018 and as at the time of writing, is expected to be approved shortly after FID with acceptable conditions.

Legislation granting Snowy Hydro tenure to the land required for Snowy 2.0, was passed by the NSW Parliament on 21 November 2018.

The conditions of planning approval for Exploratory Works have been taken into account in the budget, scope and program for Main Works (with contingencies for the outcome of the more detailed assessment).

The Main Works planning process has formally commenced and SEARs were sought from DPE in Nov 2018.

The EPBC referral was lodged in October 2018 and assessment requirements incorporated into the SEARs.

Based on stakeholder discussion to date, the terms of the Main Works SEARs are expected to be acceptable and capable of being fully addressed in the Main Works EIS.

As at FID, Main Works tenders are being reviewed, with ongoing discussions to be held over the forthcoming period to March 2019 (see *Supporting Chapter Two* for detailed procurement status). Lodgement of the Main Works EIS is on track to be submitted in line with the timeline above. Transmission and construction power planning approval processes are well advanced by TransGrid and consistent with the Project schedule.

5 Environmental values and impacts

5.1 Overview

There are a number of significant natural, cultural and socio-economic values present in the Project area. Snowy Hydro has assessed the potential impacts on those values from both construction and operation phases of the Project.

As construction methods are developed and environmental impact assessment processes proceed, the values, impacts and mitigation measures will become better understood. This, in turn, means they can be communicated effectively so that timely Project approval is achieved and social licence to operate is maintained in the long term.

Some specific social, cultural and economic values are likely to be impacted, including recreational uses and amenity, Aboriginal cultural heritage values and local infrastructure and services. There is significant potential to mitigate the impacts of these such as through strategies to provide alternate access and

facilities, spreading of the workforce (in time and place), investment in infrastructure and services where the link to the Project is clear/quantified, and by locating activities so as to avoid significant Aboriginal cultural heritage.

Some specific natural values are also likely to be impacted, including biodiversity and water. There is potential to avoid location of activities in high-value areas, minimise the impacts where they are located in sensitive areas and to offset these impacts where they are unavoidable.

5.2 Existing local values

The existing values that would be potentially impacted by the Project are summarised below.

5.2.1 Natural values

The Project area contains significant natural features, including species and communities of flora and fauna (biodiversity), watercourses and impoundments, and rocks and landforms (geodiversity). These features are recognised in the *Kosciuszko National Park Plan of Management 2006* (KNP PoM). The seasonal presence of snow, more than anything else, sets the Australian Alps and Project area apart from most other places on mainland Australia. Beyond this, the Alps contain unusual assemblages of plants and animals, many of which are endemic to the mountains.[21]

Significant features of the vegetation include the upper slope and inverted treelines, the subalpine treeless flats and valleys and Alpine Sphagnum Bogs and Associated Fens. Several threatened flora and fauna species have been identified in the KNP and Project area. The fauna of the KNP is also significant due to its diversity in relation to reptiles at high altitudes, and the number of cold-climate species of the alpine and subalpine areas. The Project area includes key fish habitat and potentially 'sensitive' aquatic habitat, known to support (or provide suitable habitat for) a number of threatened species.

The alpine rivers of the KNP are significant even though they form only a small percentage of all running waters in the country. The headwaters of the Murrumbidgee, Tumut, and Eucumbene are all in proximity to the Project. Kellys Plain Creek and its tributaries empty into Tantangara Reservoir from the south. Tantangara, Nungar and Gooandra creeks, as well as numerous unnamed creeks and drainage lines, empty into Tantangara Reservoir from the west within the EIS study area. Aside from their operational functions, Talbingo and Tantangara reservoirs provide suitable habitat for threatened and native fish species.

KNP contains geodiversity values, including periglacial deposits (known as rock streams), and fossiliferous limestone deposits, which are present in the Project area.

[21] NSW Government - Department of Environment and Conservation, 2006. 2006 Plan of Management - Kosciuszko National Park, pp.1–348. Available at: http://www.environment.nsw.gov.au/resources/nature/KNPPOM.pdf [Accessed November 30, 2017], p.1.

5.2.2 Cultural values

Aboriginal people have lived in the Southern alpine regions for at least 21,000 years, with occupation dated from the Late Pleistocene.[22] The Australian Alps bioregion was the traditional home of two Aboriginal groups: the Walgal people occupied the northern part of the bioregion near Kiandra, while the Ngarigo people lived in the region around the highlands. Surviving traces of Aboriginal occupation in KNP include 'the remains of campsites, ceremonial grounds, stone arrangements, burial sites, rock art, scarred trees and grinding grooves.'.[23] The region holds outstanding values due to the importance of Aboriginal food sourcing and ceremonial gatherings.

In regards to historic heritage, the alpine region and high country have a rich history extending from the early explorer-settlers in the 1820s, the establishment of pastoralism in the 1830s, the gold rush at Kiandra in 1859-60 and early scientific exploration. Throughout the twentieth century, the Scheme was built, scientific research developed further and tourism and recreation was promoted. Other important activities include timber harvesting, milling and mining. A wide range of historical items and places are distributed throughout the mountains, including stockman's huts, fences and mine sites. A historic cultural heritage assessment was completed in 2018 by NSW Archaeology as part of the EIS relating to Exploratory Works. Six historical complexes were identified across the project area relating to themes of mining, pastoralism, transport, towns/settlement, and industry, and a total of 127 historic heritage items were identified by the assessment.

The Scheme and KNP are listed as 'Places' on the National Heritage List under the EPBC Act. There are locally significant listed heritage items within the broader area, including Kiandra, Currango homestead, Irwins Hut, Lobs Hole, DMR sites and unnamed mountain huts.

5.2.3 Social and economic values

The nationally-significant tourism and recreational values of KNP are based upon the diverse range of natural and cultural settings within which people can undertake a range of activities. These activities include (but are not limited to): bushwalking, fishing, boating and water skiing, camping, horse riding, gold-panning, downhill skiing and cross-country skiing. Recreational use areas around Talbingo Reservoir, Lobs Hole Ravine, Tantangara and Bullocks Hill/Gooandra are within the immediate Project area.

The closest social and economic centres are Adaminaby, Talbingo and Cabramurra townships, which were originally built for the Scheme workers and their families. They have developed into popular bases for KNP recreational users. Larger towns like Tumut and Cooma continue to develop as service centres for pastoral, tourism, forestry and other uses, as well as being significant bases for Snowy Hydro business and worker accommodation.

[22] Ibid, p.81.
[23] Ibid, p.83.

Other places with high environmental, cultural, social and economic value outside the Project area include the Yarrangobilly Caves and Kiandra, which has special significance as the first place in Australia where recreational skiing was undertaken and as old gold rush town. There are a number of tourist operations nearby the Project, including Selwyn Snowfields and accommodation facilities on Lake Eucumbene at Providence Portal, Anglers Reach and Adaminaby.

5.3 Potential impacts on values

The following specific values have been identified to date as (a) having relatively higher local significance, and (b) being more susceptible to impacts:

1. Recreational use and amenity;
2. Biodiversity (terrestrial and aquatic);
3. Aboriginal cultural heritage;
4. Water (surface and groundwater); and
5. Local infrastructure and services.

As noted above, detailed environmental risk assessment as at FID has been largely confined to the footprint of the Exploratory Works. Further understanding of impacted values has been obtained from public submissions to the Exploratory Works EIS.

Environmental risk assessment undertaken within the broader Project area can be considered only as preliminary as at FID. However, a detailed program of further investigation is in development in support of the Main Works EIS to be lodged in March 2019.

More detailed assessment of the values, impacts and design of controls to manage them will occur through the approval and assessment process.

Each of the matters identified below requiring further assessment will be addressed through ongoing consultation with key stakeholders during the development of the Main Works SEARs, the Main Works EIS, through public submissions to the EIS and Snowy Hydro's response, and finally, any conditions of approval that may be granted.

Snowy Hydro notes that indirect impacts to the community, such as induced population growth in some communities and the need for suitable accommodation, can be expected. These indirect impacts can have positive and negative consequences. Consultation with local Councils, NSW Department of Premier and Cabinet and other NSW Agencies has commenced to understand the potential effects of these impacts and what can practically be done to address this.

5.3.1 Recreational uses and amenity

During both construction and operation of the Project, impacts on recreational uses and amenity will occur at Tantangara Reservoir, Talbingo Reservoir and certain access locations around the Bullocks Hill/Gooandra area. Impacts beyond and between these areas will be related to the movement of traffic for

logistical requirements, between Project work sites and accommodation and excavated rock locations.[24]

The amenity values of the landscape are core to the recreational uses of KNP. During construction works in particular, the amenity of the immediate Project area is expected to be affected through increased traffic, noise and visual impacts from construction sites, as well as restricted access due to construction-related road closures. There will also be visual impacts associated with the surface infrastructure and connection of the Project to the transmission network, including overhead power lines and cableyard that will continue into the operational period.

It is expected that many users, like bushwalkers, riders, campers, skiers, 4WD enthusiasts and even fishers and boat users, will be able to avoid or move around the broader Project area without being impacted unreasonably. Users of specific areas such as Lobs Hole Ravine camping area, Bullocks Hill and some of the western foreshore of Tantangara will be more impacted.

5.3.2 Biodiversity

Overview

During construction, there is potential for activities to impact on both terrestrial and aquatic flora and fauna, including threatened and protected species, populations and communities listed under both NSW and Commonwealth legislation.

The extent and intensity of potential impacts will require further information regarding the construction methodology, location and layout of infrastructure and ancillary services and placement of excavated rock.

Terrestrial

Background research undertaken to support the Exploratory Works EIS identified 19 species of threatened fauna as having potential to occur within the Exploratory Works project area. Ten threatened fauna species were recorded during targeted surveys within or adjacent to the Exploratory Works project area; five ecosystem credit species and five species credit species (as defined under the Biodiversity Assessment Method (***BAM***)). The five ecosystem credit species included Smoky Mouse and Booroolong Frog.

It can be reasonably expected through construction that impacts from vegetation clearance for road access and site establishment (including the establishment of construction camps, equipment laydown sites, inlet/outlet construction sites, surge shaft sites, main tunnel sites, electricity supply works for construction activities and transmission infrastructure for connection to the transmission network) will result in direct impacts and habitat loss.

[24] See *Supporting Chapter Fifteen - Contractors' execution approach* for further discussion of traffic and logistics.

There will also be noise, vibration and other indirect impacts on fauna as a result of blasting and tunnelling activities. There will be potential for the introduction and/or spread of weeds and other invasive species into the existing environment.

Aquatic

During construction of Exploratory Works and Main Works, there is potential for impacts on aquatic habitat which may affect native fish and decapods, through discharge of wastewater to watercourses, construction/upgrade of roads and waterway crossings, subaqueous emplacement of excavated material in Talbingo and Tantangara reservoirs, construction of intakes and associated dredging works, and reductions to baseflow in watercourses during tunnelling.

One threatened species, Murray Crayfish, was identified during surveys in Talbingo Reservoir and the Yarrangobilly River relating to Exploratory Works. While potential habitat will be modified during Exploratory Works, suitable mitigation measures have been agreed with regulatory authorities.

Further baseline surveying is required for Main Works to inform the impact assessment of aquatic habitat and species. Once operational, Snowy 2.0 will result in changes to the hydrological regime and physical and chemical properties of water in Talbingo and Tantangara reservoirs due to the transfer of water between the reservoirs. This may have associated impacts to aquatic habitat and biota, including impacts downstream. There is potential for entrainment and subsequent loss of native fish and other aquatic biota during transfer of water between Talbingo and Tantangara reservoirs, Pest species (flora and fauna) and diseases (such as EHNV) could also be transferred between the reservoirs. If these survive, this may result in impacts to native biota within the reservoirs and connected waterways.

Groundwater-Dependent Ecosystems (***GDE***) or stygofauna are an important component of the KNP ecosystem, but assessment of their presence in the Project area and vulnerability to date has been limited. An assessment of stygofauna will be completed as part of the Main Works EIS. For other water-quality-related impacts, see *Water (surface and groundwater)* below.

5.3.3 Geodiversity

While not considered in detail during Feasibility, studies undertaken for the Exploratory Works EIS identified areas of geodiversity value within the Project area, including periglacial deposits (known as rock streams), and fossiliferous limestone deposits. Mitigation measures have been incorporated as part of Exploratory Works to minimise impacts to geodiversity values. Geodiversity values within KNP that may be affected by Main Works will be identified as part of the EIS, and proactively managed to avoid impacts where possible, and where impacts cannot be avoided, mitigation measures implemented to minimise impacts.

5.3.4 Geology and soils

The geology within the Project area comprises granites that have formed faulted and stepped ranges (NPWS 2003). More recent volcanic activity produced basalts and, in the Pleistocene, the cold-climate superimposed glacial features on the landscape. The South Eastern Highlands are part of the Lachlan fold belt that runs through the eastern states as a complex series of metamorphosed Ordovician to Devonian sandstones, shales, volcanic rocks and granite body intrusions. Overlying these older units, a regionally extensive weathered zone is assumed to exist.

This complex geology, in association with topography, has resulted in a diverse soil landscape. Soils vary significantly across the bioregions in relation to altitude, temperature and rainfall. The alpine soils support unique flora and fauna.

5.3.5 Cultural heritage

The Project has the potential to impact Aboriginal heritage during construction. The clearance of vegetation, construction of infrastructure and any earthworks would cause direct impacts and certain indirect impacts caused by acerbated erosional processes. The results of Aboriginal Heritage Information System searches, field survey and test excavation relating to Exploratory Works identified a relatively high density of Aboriginal artefact distribution in certain favourable landforms such as flats and gentle gradient crests within or near the Lobs Hole area which suggests that it is likely to have been used regularly and reasonably intensively by Aboriginal people.

The Project has the potential to impact historic heritage during construction. The clearance of vegetation, construction of infrastructure and any earthworks could cause direct impacts and certain indirect impacts to historic items.

The extent and intensity of potential impacts due to the Main Works have yet to be determined. A comprehensive assessment will be conducted as part of the Main Works EIS, including initiatives to avoid and minimise impacts. Mitigation and management measures would be designed to address any residual impacts which are not able to be avoided.

5.3.5 Water (surface and groundwater)

Overview

Surface water and groundwater impacts are mainly associated with underground activities (groundwater) and activities associated with access, construction of inlet/outlet structures and site works for tunnel portal and surge shaft (surface water).

Surface

Reservoirs

Potential impacts during construction at Tantangara and Talbingo reservoirs include increased sedimentation and nutrient loads from run-off and from discharge of treated water and wastewater from construction camps, resulting in

accelerated productivity (weed and algal growth) and restriction of sunlight filtration. Sediment may impact aquatic fauna and smother flora and habitat. Historic water quality issues are present in Tantangara Reservoir which will require further investigation.

The potential for localised increased turbidity, sediment run-off, accidental release of hydrocarbons, and minor loss of soft sediment habitat was noted in the Exploratory Works EIS.

Potential impacts during operations at Tantangara and Talbingo reservoirs include the disturbance of existing bed sediments (typically silts) near the intakes/discharges and creation of sediment plumes.

Natural watercourses

There is also potential for surface water quality impacts on nearby watercourses due to run-off from construction activities resulting in sedimentation to waterways, as well as due to the discharge of treated water into watercourses.

Groundwater

The impacts on the groundwater values (both volume and quality parameters) are expected to be minimal, and can be managed and mitigated through construction design of the Project. There are potential GDE in the vicinity of the project. However, impacts on these as a result of groundwater inflow to the tunnel (or other Project-related changes) are not expected.

Reservoir levels

Although there will be changes to the existing operational regimes at Tantangara and Talbingo reservoirs, the Project will operate within the existing Scheme operational obligations. Therefore alterations to reservoir levels and corresponding impacts will be managed by existing operational management plans and procedures.

5.3.6 Local infrastructure and services

The location, scale and intensity of impacts to local infrastructure and services will depend on the final construction design and methodology and will vary according to the point in time within the Project schedule. There is potential for some localised impacts to be significant and once identified and quantified, carefully managed.

For instance, any impacts on water supply, waste services and wastewater infrastructure will depend on the location of the workforce accommodation and the extent to which the services are provided on-site by the Contractor. The Contractor's workforce planning will set out where Project-related personnel will be located and the time at which they will arrive and leave (see *Supporting Chapter Fifteen*). This is expected to build up from the first year to a height in the peak construction year and then decline again.

The impacts on road infrastructure will also depend on the location of workforce accommodation, as well as location and method of excavated rock disposal, and

the location and method of major construction material inputs (e.g., in situ concrete lining, on-site or off-site fabrication of precast segmental lining). It can be expected that excavated material will be used and located in a number of places, and some road infrastructure may be avoided altogether.

The impacts of the Project on services such as health care will depend on the services provided by the Contractor to the workforce as part of the employment package and provided on-site and in the accommodation. It is expected that given the location of the accommodation (remote from Tumut and Cooma) a high level of health care (in particular emergency and acute) will be provided.

Indirect impacts on the community such as Project-induced population growth in some communities and the need to accommodate in suitable housing can be expected. This can have positive and negative impacts. The positive impacts are related to the increased economic activity associated with the additional people, in hospitality and retail sectors. The negative impacts relate to the potential undersupply of particular types of accommodation. Consultation with local Councils, NSW Department of Premier and Cabinet and other NSW Agencies has commenced to understand the potential effects of these impacts and what can practically be done to address this.

5.3.7 Traffic

Traffic surveys conducted for the Exploratory Works EIS identified minimal impacts arising from project traffic. However given the increase in excavated rock haulage and other traffic generating construction activities, further assessment is required to determine likely impacts arising from the Main Works.

5.3.8 Bushfire

Protection from bushfire attack and prevention of ignition from construction activities must be a primary consideration of the design, construction execution and ongoing operation. Constraints on access/egress during bushfire situations make appropriate on-site refuge critical.

Potential bushfire impacts during construction of the Project may include:

1. Exposure to bushfire attack due to poor siting of construction works;
2. Vulnerability to bushfire attack due to inadequate asset protection and/or inappropriate construction materials; and
3. Increased likelihood of ignition from Project-related activities (hot work, vehicle movement, smoking).

5.3.9 Contamination and erosion

Construction of the Project will expose the natural ground surface and subsurface through the removal of vegetation and the excavation of soil for surface infrastructure works, establishment of construction camps, auxiliary works, and equipment laydown areas.

Potential soil capability and contamination impacts during construction may include:

1. Potential for exposed soils and other materials (such as excavated rock and other aggregates) to be transported from the construction sites into surrounding waterways;
2. Disturbance of contaminated land. There are known areas of contamination at Lobs Hole Ravine from historical copper mining activities;
3. Contamination of land due to spills and leaks from construction equipment, vehicles and fuel storage areas; and
4. Contamination of groundwater due to spills and leaks from construction equipment and vehicles.

Lobs Hole Ravine is likely to be subject to ground disturbance works during construction of the Project.

5.3.10 Noise and vibration

The construction methods likely to be implemented for the Project will be Tunnel-boring Machines (***TBM***), drill and blast (***D&B***) or a combination of the two. Blasting will likely be undertaken at the initial sections of all tunnels and fault zones, with the remaining excavation taking place using TBM. The Machine Hall and Transformer Hall would be excavated through D&B.

Some features in the surrounding environment may be sensitive to ground vibration including karst and heritage rock structures. The nearest potentially sensitive structure (Yarrangobilly Caves) is approximately 6.1 km from any likely D&B activity.

Likely ground vibration levels are shown to be well below damage thresholds.

The EIS will include further detailed information on potential impacts from blasting, including management measures where required.

5.3.11 Excavated rock and waste disposal

The Project construction will generate construction waste streams including excavated rock, building materials and rubbish. The waste predicted to have the greatest impact will be the excavated material generated during tunnelling. There are currently three excavated rock placement options under consideration. They include within the reservoirs, to land inside KNP or to land outside KNP or a combination of all three.

Potential waste and excavated rock management impacts during construction may include:

1. Impacts associated with the management of waste streams from construction activities including concrete batching plant waste, sewage, construction materials, rubbish and wastewater;
2. Surface water impacts including erosion and sediment control associated with excavated rock placement and stockpiling;

3. Traffic impacts of excavated rock haulage from tunnelling location to final placement; and
4. Visual impacts of excavated rock placement and stockpiling.

5.3.12 Transport of undesirable aquatic species

An environmental risks for the operation of the Facilities (once the Project is completed) is the potential transfer of undesirable aquatic species such as Redfin perch (*Perca fluviatilis*) through the proposed tunnel from Talbingo Reservoir to Tantangara Reservoir. Surveys undertaken to date for the Project have confirmed that Redfin are relatively abundant in Talbingo Reservoir, and do not appear to be present in Tantangara Reservoir.

If Redfin were introduced to Tantangara Reservoir, potential impacts to native (including threatened) fish species and recreational fisheries within and downstream of Tantangara Reservoir may occur.

The CSU study will indicate whether Redfin have the capacity to survive transport through the proposed power station.

6 Mitigation and management

6.1 Overview

The Project has been designed to avoid and minimise adverse impacts on KNP where possible. Both the Exploratory Works and Main Works (the ***Works***) will include short-term and temporary impacts to KNP, in addition to residual impacts that need to be considered as part of a longer-term management strategy. Management of impacts within KNP will be aligned to the land-use objectives identified in the KNP PoM administered by NPWS. Snowy Hydro has been working with NPWS to ensure opportunities for contributory measures are identified where needed.

The final decommissioning and rehabilitation outcomes for the Works are yet to be determined and are subject to ongoing consultation with NPWS. The final landform and rehabilitation outcomes to be achieved following the Works will be designed to meet the land-use goals of NPWS and the KNP PoM.

Snowy Hydro, as the owner and proponent of the Works, will be responsible for overseeing the construction of the Works to ensure they are delivered in line with the conditions of approval, if granted. The cost of any environmental mitigation for the Works has been taken into account in the capital works budget for the Project (see *Supporting Chapter Four - Schedule, cost estimate and contingency*). The expected community benefits of the Project are discussed in *Supporting Chapter Twenty-One*.

Public authorities that will be involved in monitoring the environmental performance of the Works following approval include DPE with jurisdiction over the conditions of approval, the EPA with responsibility for the EPL, and NPWS

with responsibility for monitoring compliance with the management plan for KNP (SMP EMP).

Snowy Hydro will appoint construction contractor(s) to carry out the Works in compliance with the EIS(s) and the conditions of approval, if granted. This includes the implementation of a CEMP and all other activities relevant to managing construction impacts. All mitigation measures identified in the EIS will be captured by the CEMP and associated sub-plans, as well as in standalone strategies associated with long-term management commitments.

Snowy Hydro will be responsible for obtaining and implementing the requirements of the EPL, including relevant monitoring requirements and auditing of contractor(s) activities. Following the construction of the Works, all ongoing maintenance and management of permanent infrastructure will be the responsibility of Snowy Hydro and will be incorporated into relevant operating management procedures where required. The conditions of consent will include requirements for environmental performance monitoring and regular reporting, as well as independent environmental auditing.

As well as the requirements set out in the EIS and the conditions of approval, Snowy Hydro will also need to manage the Works in accordance with their existing obligations within KNP. Snowy Hydro currently manages around 6,400 ha of land within KNP. As part of Snowy Hydro's occupation of KNP, all work is carried out in accordance with a management plan. The environmental management framework proposed for the Works will complement the existing SMP EMP and ensure existing objectives continue to be met.

6.2 Contractors' obligations

The primary impacting activities will be undertaken by contractors, both for Exploratory Works and for Main Works. Therefore the setting of clear expectations and the monitoring of performance by the contractors is paramount.

The Principal Contractors (the Exploratory Works contractor and the Civil Contractor) will be required to prepare, submit for approval and operate under detailed CEMPs. These CEMPs must meet Snowy Hydro's requirements and any conditions of the Approvals. The requirement for CEMPs is documented in the scope of services for Exploratory Works and the Employer's Requirements for Main Works.

The contractors will provide CEMPs consistent with best industry practice and the conditions of the approvals, including the Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2004) and the Environmental Management Plan Guidelines (Department of the Environment, 2014).

The CEMPs will include the following requirements:

1. A description of activities to be undertaken (including the scheduling of the Works);
2. Details of environmental policies, guidelines and principles to be followed;

3. A schedule for compliance auditing;
4. A program for ongoing analysis of the key environmental risks arising from the approved activities, including an initial risk assessment undertaken before the commencement of the Works;
5. An inspection program detailing the activities to be inspected and frequency of inspections;
6. A protocol for managing and reporting incidents and non-compliances;
7. Procedures for rectifying any non-compliance with the approvals identified during compliance auditing, incident management or at any time during Works;
8. An outline of the training and induction for employees, including contractors and sub-contractors, in relation to environmental and compliance obligations under the approvals; and
9. The process for periodic review and update of the CEMP and all associated plans and programs.
10. In addition, as a sub-set to the CEMP, the contractors will produce the following management plans:
    a. Biodiversity Management Plan;
    b. Heritage Management Plan;
    c. Noise, Vibration and Blasting Management Plan;
    d. Excavated Rock and Disposal Management Plan;
    e. Soil Management Plan;
    f. Geodiversity Management Plan;
    g. Contaminated Land Management Plan;
    h. Waste Management Plan;
    i. Surface Water and Groundwater Management Plan;
    j. Public Safety Management Plan;
    k. Community Consultation and Complaints Management Plan; and
    l. Decommissioning and Site Rehabilitation Management Plan.
11. The contractors will provide an Environmental Management Strategy for each phase of the Project that is consistent with best industry practice and the conditions of the approvals. This strategy will include:
    a. The strategic framework for environmental management of the Project;
    b. Identification of the statutory approvals that apply to the Project;
    c. Describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Project;
    d. Describe the procedures that would be implemented to:
        1. Keep the local community and relevant agencies informed about the operation and environmental performance of the Project;
        2. Receive, handle, respond to, and record complaints;
        3. Resolve any disputes that may arise;
        4. Respond to any non-compliance;
        5. Respond to emergencies; and
    e. Include a clear plan depicting all the monitoring to be carried out in relation to the Project.

Environmental requirements have also been embedded in the Employer's Requirements for the Main Works contracts (See *Supporting Chapter Twelve* for technical and *Supporting Chapter Fifteen* for execution and construction requirements).

6.3 Recreational uses and amenity

Snowy Hydro proposes to enter into a heads of agreement with NPWS which will form the basis of a Voluntary Planning Agreement (***VPA***), or similar, between the two parties. This will broadly set out the measures proposed to mitigate impacts to recreational users of KNP and nominate the monetary contributions required to fund the mitigation and management measures.

Mitigation and management measures committed to by Snowy Hydro for Exploratory Works include:

1. Master planning for areas affected by displacement of Lobs Hole Ravine recreational users; and
2. Providing additional recreational facilities to mitigate the impacts of the closure of public access to the Talbingo spillway and boat ramp.

Additional site-specific mitigation measures will be developed during the preparation of the Main Works EIS and may include:

1. Distributing impacts (such as traffic) across time and location;
2. Provision of alternative access (e.g. boat launching and hut access) where these may be restricted by the Project;
3. Design of inlet/outlets so that water inflows and outflows minimise impact on recreational users and other environmental values;
4. Design of hydro assets (in particular headrace and tailrace) and associated water collection and delivery infrastructure to mitigate the potential for native fish entrainment and transport through barrier and deterrence technologies; and
5. Alternative access arrangements to most areas where suitable options exist.

Additional recreational areas outside the footprint of the Project site will be developed to offset any loss of amenity due to closure of facilities such as camping areas at Tantangara foreshore.

6.4 Biodiversity

A hierarchy of avoidance, mitigation and management, and offsetting is proposed to manage impacts to terrestrial and aquatic biodiversity.

6.4.1 Terrestrial

The mitigation and management framework for terrestrial biodiversity during Exploratory Works (and expanded for Main Works) is as follows:

1. Avoidance - Locating infrastructure and assets like access roads and tunnel portals away from known sensitive areas and limiting works to disturbed areas as much as possible. Consideration of laydown and material placement locations in regards to existing terrestrial ecological features;
2. Mitigation and management - Implementing a Biodiversity Management sub-plan as part of the CEMP that includes:
    a. Pre-clearing surveys to determine if threatened species are present;
    b. Protocols for weed, pest and pathogen prevention
    c. Limiting access to areas of retained vegetation; and
    d. Rehabilitation; and
3. Offsetting - Providing offsets and funding to protect and improve the conservation values of KNP.

6.4.2 Aquatic

Suitable mitigation and management measures for reducing impacts to Murray Crayfish in Talbingo Reservoir will be adopted in the biodiversity management plan for dredging and excavated rock placement activities. To date, no other threatened species have been identified in either of the reservoirs.

Measures for reducing or preventing movement of fish between the two reservoirs will be addressed in the Main Works EIS and are discussed further in the *Transport of undesirable aquatic species* section below.

6.4.3 Offsets

Offsetting involves management activities that deliver gains in a high-value location, where unavoidable impacts have resulted in loss of natural value elsewhere. It can also take the form of a contribution to research, or on-ground works where there is agreement on the objectives and long-term funding.

Given the location of the Project in KNP and within the Scheme water catchment area, the requirement to offset unavoidable impacts as a consequence of the Project will be likely. Specific offsets have been identified through the Exploratory Works EIS.

Consistent with the requirements of Biodiversity Conservation Act 2016 (NSW) and the EPBC Act, a range of potential offset and contribution options will be discussed with NPWS and other key stakeholders. An objective will be to identify opportunities for habitat improvement/catchment health works with a direct, positive benefit to the Project area's biodiversity and ecological processes.

As at FID, a Biodiversity Offset Strategy for Exploratory Works has been provided to OEH and NPWS for review.[25] A comparable strategy for Main Works will be developed in the course of the Main Works EIS.

Provision will be made in the Project capital and ongoing operational budget for required offsets and for an ongoing monitoring program to assess performance.

[25] See the *Response to Submissions* for detail.

6.5 Geodiversity

Road designs for the EWR have been designed to minimise impact on areas of geodiversity, particularly fossiliferous beds and rock streams. It is proposed that fossiliferous material excavated during the Works be preserved off-site so that palaeontologists (from various research organisations) can look through the fresh material and collect fossil specimens for scientific research and curation in their respective collections.

6.6 Soil and land

ESCPs will be developed specifically for the construction works and these will address areas of increased erosion potential such as around drainage lines, roads and soils of increased erosion potential, as well as all areas of disturbance.

6.7 Cultural heritage

The formal consultation process with the Aboriginal community has commenced in accordance with the requirements of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.[26] This provides the opportunity for people with knowledge about the significance of Aboriginal cultural heritage in the Project area to inform decisions during the refinement of Project designs and options, as well as the ongoing management of construction and operation sites.

It is anticipated that for the Main Works there will be further opportunities to avoid and minimise impacts to Aboriginal cultural heritage through the design and construction planning process. Further site-specific mitigation measures will be developed during the preparation of the Main Works EIS.

Specifically, Snowy Hydro (in conjunction with the contractors) will prepare separate CHMPs to manage Aboriginal and historical heritage values. These will be prepared prior to commencement of construction to allow for appropriate management of heritage values prior to and during all works.

For Aboriginal heritage, the CHMP would set out:

1. Procedures to manage impacts, avoidance of impacts and impact mitigation;
2. Procedures relating to the conduct of additional archaeological assessment, if required, and the management of any further Aboriginal cultural heritage values which may be identified;
3. Guidelines for ongoing consultation and opportunities for cultural values assessment; and
4. An unexpected finds protocol for Aboriginal objects and sites and human skeletal material.

[26] Department of Environment Climate Change and Water, 2010. Aboriginal cultural heritage consultation requirements for proponents. Available at: http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf [Accessed November 30, 2017].

For historic heritage the CHMP would set out:

1. Procedures to manage impacts, avoidance of impacts and mitigation;
2. An unexpected finds protocol and the procedure to be followed for unrecorded heritage when preliminary clearance of vegetation is made;
3. A protocol for the management of potential unmarked graves and other human skeletal material in the project areas;
4. Guidelines for the management of moveable heritage in or near the project areas, to ensure that it is not inadvertently impacted or removed.

6.8 Water

Site-specific water impact mitigation measures will be developed during the preparation of the Main Works EIS. For construction these are likely to include:

1. Use of physical barriers to prevent sediment from entering water;
2. Establishment of clear water diversions upstream of the site to prevent water moving through the site;
3. Implementation of Water Quality Control Plans with defined parameters for ceasing work;
4. Regular monitoring of controls (especially after rainfall events) and manage during works; and
5. For operation, mitigation measures will include operating instructions and protocols.

Appropriate process water and wastewater treatment facilities will be constructed for both the Exploratory Works and Main Works to ensure any water discharged to reservoirs, natural water courses or ground will meet required discharge specifications. Run-off from construction areas will be treated before discharge. Sedimentation dams and basins of the appropriate type will be constructed where necessary.

6.9 Local infrastructure and services

Mitigation options

A social impact assessment will be undertaken during preparation of the Main Works EIS to assess social impacts of the Project on the local community and KNP park users. This will be completed in conjunction with the Project's Stakeholder Engagement Program (see *Supporting Chapter Twenty-One*).

It can be reasonably expected that with quantification of the impacts and identification of where the infrastructure and services impacts are found to exist, targeted contributions and investments can be made to address them with the appropriate agency or government body.

6.10 Geochemical risk

As noted above, some excavated material may be PAF, or have excess acid neutralising capacity (***ANC***) and thus acid consuming (***AC***) potential. To avoid the uncontrolled placement of PAF rock, excavated material will be geochemically

characterised prior to placement, with sequestration and treatment of PAF material.

6.11 Bushfire

Standard construction mitigation measures will be applied and be able to mitigate identified potential bushfire impacts. These mitigation measures will be supplemented by site-specific mitigation measures and these will be developed during the preparation of the Main Works EIS and may include:

1. Establishing appropriate asset protection zones around all proposed surface facilities, construction camps and construction compounds;
2. Incorporating the consideration of fire-resistant materials and design into the works (see *Supporting Chapter Twelve*;
3. Application of ignition prevention strategies;
4. Establishing evacuation plans for all construction areas and camps (see *Supporting Chapter Fifteen*); and
5. Liaising with NSW Rural Fire Service (***RFS***) with regards to the design of proposed surface facilities, construction camps and construction compounds.

6.12 Contamination and erosion

A contaminated land management plan and a site-specific asbestos management plan will address risks posed by contaminated material. Site-specific mitigation measures for this area, in particular, will be required during the preparation of the Main Works EIS.

6.13 Noise and vibration

The main objective of the noise and vibration mitigation would be to manage construction activities to meet the required noise management levels and applicable vibration criteria across the Project, in particular, where noise and vibration impacts are predicted at sensitive receptors.

Noise management will involve noise monitoring during the initial stages of construction to determine if noise levels are within acceptable levels. Safe working distances will be applied to manage vibration impacts within acceptable levels. A blasting management procedure or plan will outline measures to minimise public safety risks.

6.14 Excavated rock and waste disposal

Site-specific excavated rock and waste mitigation measures will be developed during the preparation of the Main Works EIS and may include:

1. Establishing dedicated waste receptacles at the construction camps and construction locations;

2. Temporarily stockpiling excavated material to provide for the ability to transport it to the final placement location over an extended period of time;
3. Selection of excavated rock placement locations away from sensitive receptors such as recreational areas; and
4. Selection of multiple excavated rock placement locations.

6.15 Transport of undesirable aquatic species

The feasibility of all fish protection options will need to be considered in relation to their capability of preventing or minimising the movement of all life stages of pest species during the Main Works EIS stage. Current mitigation options to be evaluated include deterrent technologies, barriers and screens and offsetting measures including targeted species protection and supplementary stocking for recreational fishing. These mitigation measures will be focused on taking a risk-based approach to minimising transfer and spread of pest species within and beyond Tantangara Reservoir.

7 Supporting information

All supporting documents referenced in this chapter are publicly available as appendices to the Exploratory Works EIS published online in July 2018. While links to the individual reports are given above, the main report and all appendices are available from https://v2.communityanalytics.com.au/snowy/ew/downloads.

8 Definitions and abbreviations

AC	Acid consuming
ACHAR	Aboriginal Cultural Heritage Assessment Report
AfL	Agreement for lease
ANC	Acid neutralising capacity
BDAR	Biodiversity Development Assessment Report
CBA	Cost-Benefit Analysis
CEMP	Construction Environmental Management Plan
CFD	Computational Fluid Dynamics
CHMP	Cultural Heritage Management Plans
CSSI	Critical State Significant Infrastructure
CSU	Charles Sturt University
D&B	Drill and blast
DoEE	Department of Environment and Energy
DPE	Department of Planning and Environment
E&M	Electrical/Mechanical
EHNV	Epizootic Haematopoietic Necrosis Virus
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environment Protection Licence
ESCP	Erosion and sediment control plans

EWR	Exploratory Works - Roads
FID	Final Investment Decision
GDE	Groundwater-Dependent Ecosystems
GIP	Geotechnical Investigation Program
HCHAR	Historic Cultural Heritage Assessment Report
KNP	Kosciuszko National Park
MNES	Matters of National Environmental Significance
NPWS	National Parks and Wildlife Services
OEH	Office of Environment and Heritage
PAF	Potentially Acid-Forming
PEA	Preliminary Environmental Assessment
PHES	Pumped Hydro Energy Storage
POEO	Protection of the Environment Operations
RFS	Rural Fire Service
RTS	Response to Submissions
SEAR	Secretary's Environmental Assessment Requirements
SMHEA	Snowy Mountains Hydro-electric Authority
SSI	State Significant Infrastructure
TBM	Tunnel-boring Machines
TNSP	Transmission Network Service Provider
VPA	Voluntary planning agreement

10 Bibliography

1. Australian Government - Department of the Environment and Energy, Wetlands of international importance (Ramsar wetlands). Available at: http://www.environment.gov.au/epbc/what-is-protected/wetlands [Accessed November 30, 2017].
2. Australian Government - Department of the Environment and Energy, 2017. What is protected under the EPBC Act? - Matters of national environmental significance. Available at: http://www.environment.gov.au/epbc/what-is-protected [Accessed December 1, 2017].
3. Department of Environment Climate Change and Water, 2010. Aboriginal cultural heritage consultation requirements for proponents. Available at: http://www.environment.nsw.gov.au/resources/cultureheritage/commconsultation/09781ACHconsultreq.pdf [Accessed November 30, 2017].
4. Environment Protection Authority - NSW, 2013. Environment Protection Licence - 10515. , pp.1–17. Available at: http://app.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=32431&SYSUID=1&LICID=10515 [Accessed November 30, 2017].
5. NSW Government - Department of Environment and Conservation, 2006. 2006 Plan of Management - Kosciuszko National Park. , pp.1–348. Available at: http://www.environment.nsw.gov.au/resources/nature/KNPPOM.pdf [Accessed November 30, 2017].
6. NSW Office of Water, 2017. Snowy Hydro Limited - Snowy Water Licence. Available at:

http://www.water.nsw.gov.au/water-licensing/corporate-licences/snowy-hydro#licence [Accessed November 30, 2017].