Mole River Dam Project

Scoping Report

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Prepared by	Approved by
	
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Executive Summary

ES1 Overview

New South Wales (NSW) is currently facing critical water supply issues and the government response is to fast track a portfolio of drought relief and water security projects. This includes the proposed new Mole River Dam in the Border Rivers region of NSW (the project).

The NSW *Water Supply (Critical Needs) Act 2019* has declared the Mole River Dam project (the project) as Critical State Significant Infrastructure (CSSI) under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The CSSI declaration acknowledges that the dam is critical to the State for environmental, economic and social reasons.

As CSSI, the project will require approval from the NSW Minister for Planning and Public Spaces and will require the preparation of an Environmental Impact Statement (EIS) to accompany the application for the project. The purpose of this Scoping Report is to request and inform the content of the environmental assessment requirements to be issued by the Secretary of the NSW Department of Planning, Industry and Environment (DPIE); referred to as SEARs. The SEARs will specify the requirements to be addressed by the EIS.

WaterNSW is responsible for dam operations, water security and managing water stored in 42 water storages across the State. WaterNSW is the proponent for the project.

ES2 What is the project?

The project includes construction of a rockfill dam and associated spillway and other infrastructure to provide nominally 100 gigalitres (GL) of storage capacity. The project will contribute to a step improvement in water security, drought security and flood management capacity in the Border Rivers region.

Key project elements include:

- construction of a dam wall and associated embankment to provide nominally 100 GL of storage;
- construction of a spillway, including approach channel, ogee spillway and downstream chute and terminal structure;
- construction of intake tower and associated access bridge;
- installation of appropriate fish passage;
- upgrade or construction of new access roads suitable for construction and ongoing maintenance requirements;
- installation of construction compounds and laydown areas as required;
- establishing a construction camp and associated services as required; and
- installation of ancillary facilities, including utilities and services, or relocation of existing infrastructure and services as required.

While the key components of the project are largely fixed, the final design solution and operation will be based on an iterative design and assessment process that will be carried out as part of the EIS.

ES3 Why is the project needed?

The Borders Rivers Valley is a large catchment and its water supply is serviced by three relatively small dams and large on-farm storages. A significant portion of water stored in the on-farm storages evaporates during periods when it is needed most. Inadequacy of local water supply infrastructure and unreliable water supply within the Borders River Valley has led to financial uncertainty and anxiety for farmers and their communities. These factors are a major constraint on on-farm investment and their long-term financial security, impacting farmers, their employees, local businesses and communities.

The inadequacy of current water infrastructure in the Borders River Valley, coupled with the risk of increasing likelihood of droughts and floods and the lead time for the development of the scale of infrastructure response required, means that delivery of solutions should be commenced as soon as possible.

The project is aligned with the NSW Government's 20-year infrastructure investment plan set out in the State Infrastructure Strategy 2018-2038, and WaterNSW's 20-year Infrastructure Options Study 2012. Following investigations into possible solutions in the Borders River Valley, it was concluded that the development of a new dam forms part of a recommended scheme that provides the greatest improvement in drought security, flood management and water reliability (Jacobs 2017).

ES4 What are the key issues and likely impacts?

Preliminary environmental investigations have been carried out to identify the relevant matters to be addressed in the EIS for the project and the required level of assessment. This process was guided by the draft guidelines prepared by DPIE (2019), government, community and stakeholder views obtained during previous consultation for the project and informed by desktop assessment and limited field survey undertaken by WaterNSW and the project team.

Key issues to be assessed during the EIS include:

- water – the project may have potential impacts on surface water hydrology, water quality, cold water pollution and flooding. Consequently, considerations of water (surface and groundwater) users and downstream infrastructure and properties adjacent to the downstream watercourse will be required;
- biodiversity – the project will impact native vegetation, threatened species habitat and waterways due to clearing works during construction and resulting from inundation of the upstream environment. Indirect impacts are also possible to the downstream aquatic habitat and species if there are changes to flow regimes;
- heritage – the project has the potential to impact known and potential Aboriginal heritage sites during construction as a result of clearing and earthworks as well as during operation as result of inundation. Although no sites or places of historic heritage significance have been identified, the project footprint has potential for a range of early European relics, structures and landscape that (if present) may prove to be significant;
- land – erosion and sedimentation is a key consideration for the project's construction and operation. The project has the potential to impact on existing land uses including agricultural land, existing road and other services/infrastructure situated within the inundation area;

- hazard and risks (including contamination) – dam safety management is paramount to protect life, property and the environment from dam failure and therefore detailed assessment of the design against dam safety requirements is needed. Legacy contamination associated with derelict mine sites is a potential issue and will require further investigation and assessment to determine risks associated with the construction and operation of the project; and

- social and economic – the project will impact private residences and outbuildings within the inundation area. The project will also contribute to an influx of workers to the region. which will provide a range of economic benefits. Further assessment is needed to better understand the social and economic impacts and benefits of the project on the local community as well as regionally.

Other issues such as potential impacts on public infrastructure, transport and access, air quality, amenity (including noise and visual impacts) and hazards and risks (such as bushfire and waste) will also be assessed in the EIS. However, likely impacts are not expected to be significant and detailed assessments are not anticipated to be required.

ES5 How will the project be assessed?

As CSSI, the project may be carried out without obtaining development consent under Part 4 of the EP&A Act. However, the project is subject to Division 5.2 of the EP&A Act that requires preparation of an EIS and approval from the Minister for Planning and Public Spaces.

With respect to the provisions of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), further detailed survey work is needed to determine potential impacts of the project on matters of national environmental significance (MNES) and the environment generally. Therefore, WaterNSW will submit a referral under the EPBC Act nominating the project has the potential to result in a significant impact and consider the project is likely to be a controlled action and require approval by the Commonwealth Minister for the Environment.

WaterNSW will seek an accredited process, where the Commonwealth accredits the NSW assessment process under Division 5.2 of the EP&A Act and enable DPIE to manage the assessment process, including the issuing of SEARs and the assessment of the EIS.

Accordingly, it has been assumed that a single EIS will be required for the project, and that the EIS will address the requirements of all State and Commonwealth agencies. The EIS will be supported by comprehensive technical reports attached as appendices to the main report and prepared in accordance with relevant NSW and Commonwealth legislation and guidelines.

The community will have the opportunity to view the EIS and provide comment. WaterNSW will continue to engage with government agencies, local Councils, key stakeholder groups and the community throughout the EIS process.

Table of Contents

Appendices

Tables

Figures

1 Introduction

1.1 Critical water infrastructure

New South Wales (NSW) is currently facing critical water supply issues and the government response is to fast track a portfolio of drought relief and water security projects. A fundamental part of the solution is the planning and development of three new or augmented dams in NSW. This includes the Mole River Dam, being a new dam on the upper reaches of the Mole River, in the northern New England region of NSW ('the project').

Mole River is one of the major tributaries of the Dumaresq River and part of the Border Rivers catchment, which is one of the northern-most catchments in the Murray-Darling Basin. The Border Rivers system is a highly regulated catchment that services both domestic and agricultural users in NSW and QLD. The Border Rivers' income is heavily dependent on agriculture, specifically from dryland and irrigated cereals, dryland livestock and irrigated cotton. The current water supply in the Border Rivers has low reliability and poor security of supply, which undermines agricultural productivity and reduces certainty thereby acting as a major constraint to agricultural investment and financial security for farmers and local communities.

Key benefits of the project include:

- provision of 100 gigalitres (GL) of storage capacity in the upper reaches of the catchment;
- improved water security and reliability for domestic supply and agriculture, supporting improved agricultural productivity, financial security and investment; and
- flood mitigation.

The NSW *Water Supply (Critical Needs) Act 2019* declared the Mole River Dam (the project) as critical State significant infrastructure (CSSI) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The CSSI declaration states that the dam is critical to the State for environmental, economic or social reasons.

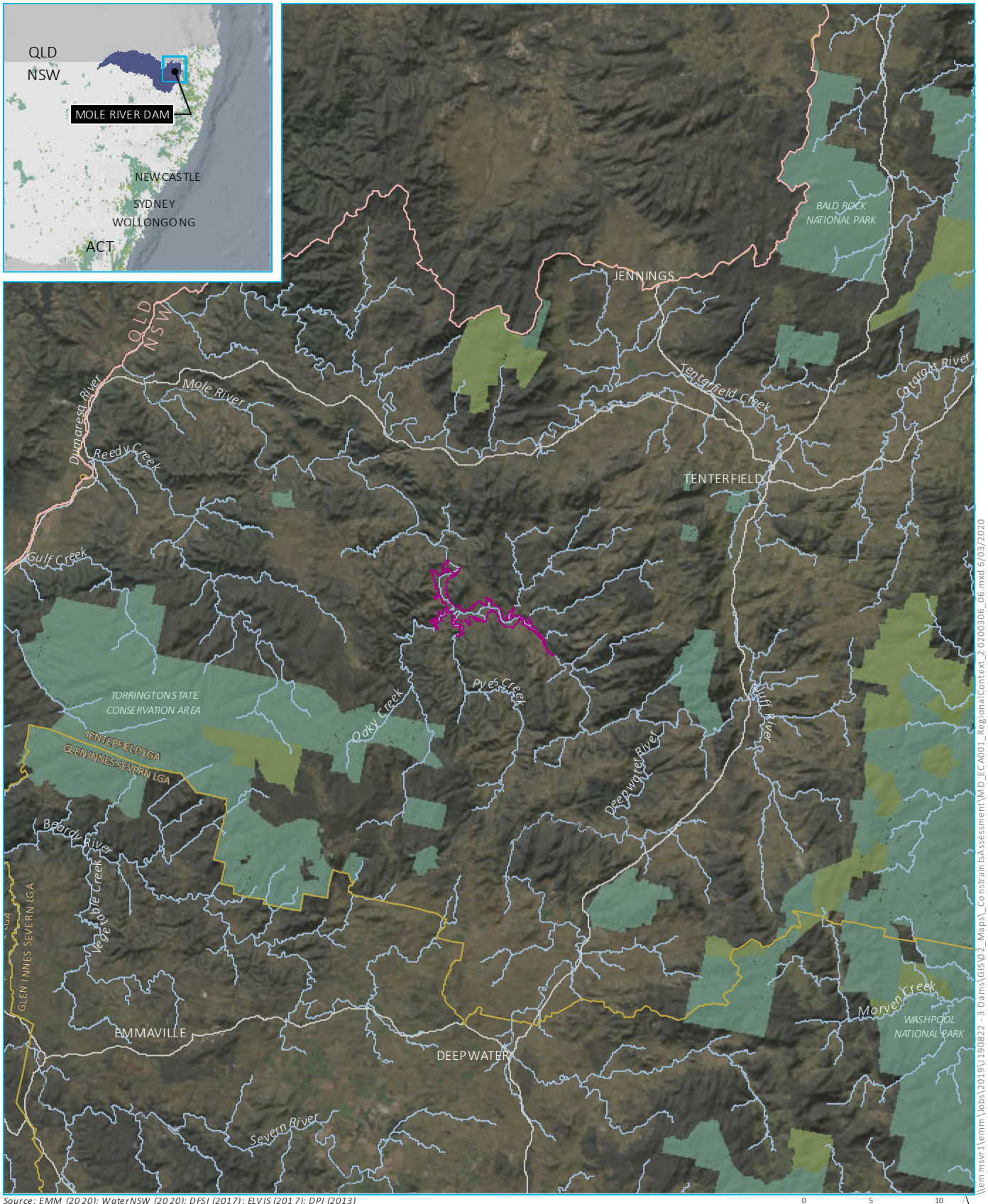
As CSSI, the project is subject to Division 5.2 of the EP&A Act, which requires the preparation of an environmental impact statement (EIS) and the approval of the NSW Minister for Planning and Public Spaces.

1.2 Purpose of this scoping report

This scoping report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of WaterNSW (the proponent) to provide an overview of the project, to consider the potential environmental issues associated with its construction and operation and to identify likely impacts for further investigation and assessment.

The report accompanies the application of the project to the Planning Secretary under section 5.15 of the EP&A Act to carry out State significant infrastructure.

An EIS for State significant infrastructure must be prepared in accordance with the Secretary's environmental assessment requirements (SEARs). The Scoping Report is to inform the content of the SEARs for the project. The SEARs will specify the requirements for the EIS that will be prepared to accompany the application for the project.



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Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2017); DPI (2013)

*Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.

KEY

- Project footprint
- Major road
- Named watercourse
- Named waterbody
- Local government area
- NPWS reserve
- State forest
- Border Rivers catchment (inset)

Regional context

Mole River Dam Project
Scoping report
Figure 1.1

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2 The project

2.1 Overview

Mole River Dam is in the Border Rivers catchment, approximately 20 km south-west of Tenterfield in northern NSW. Its proposed 100 GL of storage capacity would improve water security and reliability for users within the catchment, in particular, supporting improved productivity, financial security and investment for agriculture; and provide flood mitigation.

An outline of the key phases of the project has been developed with the key milestones and indicative timing as shown in Figure 2.1.

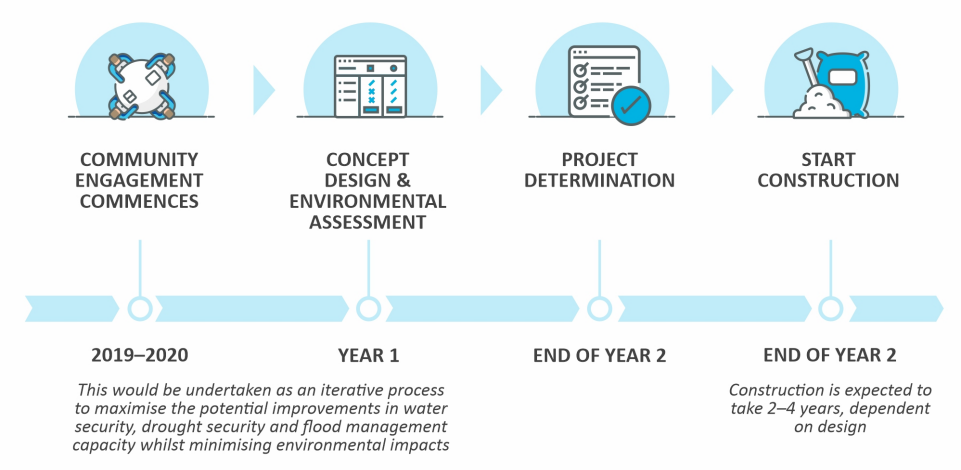


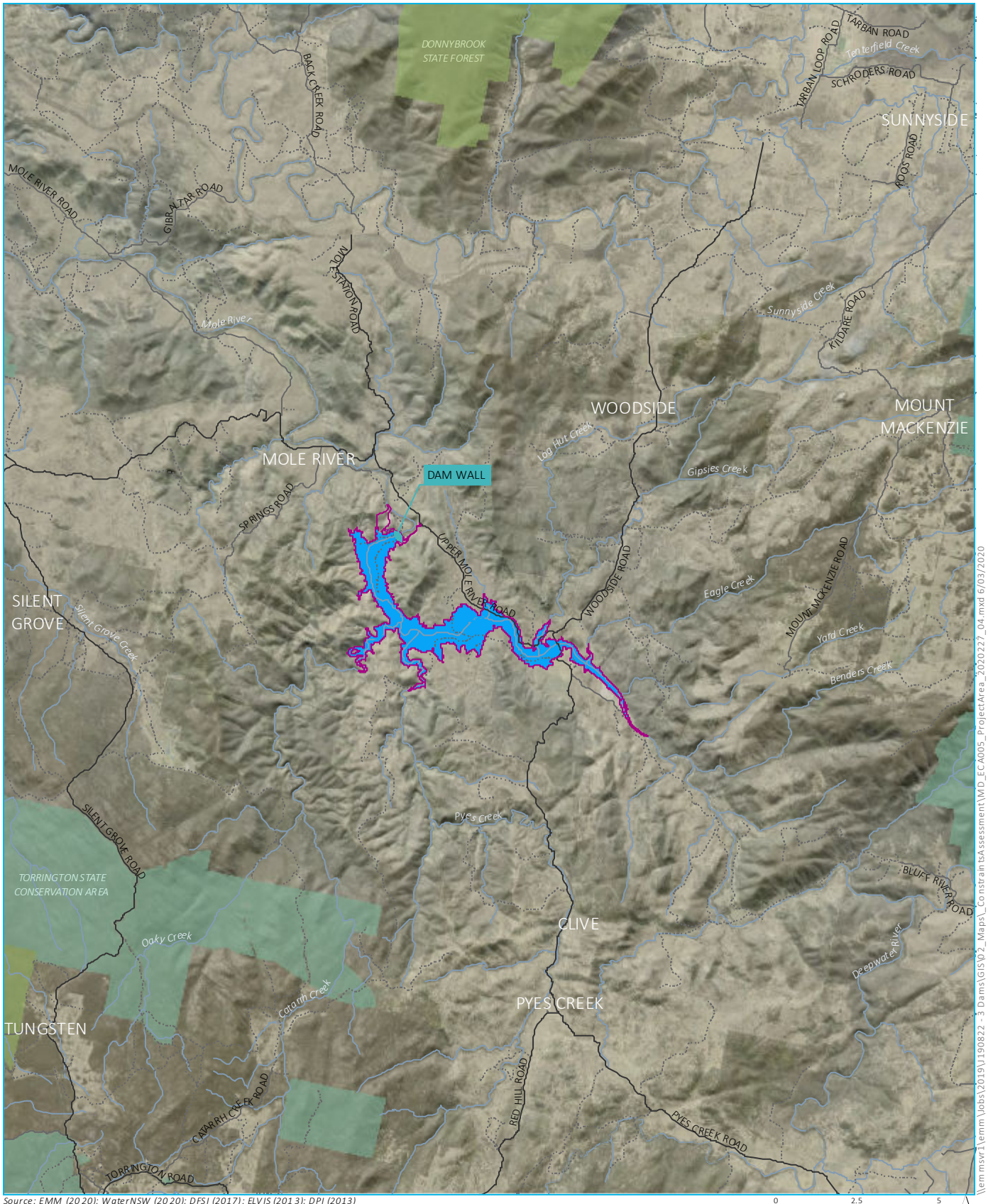
Figure 2.1 Indicative project timing

2.2 Project areas

In outlining the project, three key areas have been described to facilitate the assessment of both direct and indirect impacts during construction and operation. The project areas to be considered include:

- Inundation area: This is the area defined by the proposed full supply level (FSL) for the project. This area would be inundated at full supply and as such forms the key area of impact during operation of the project.
- Project footprint: In addition to the area of inundation, direct impacts may be experienced within the footprint of both construction and operational areas.
- Project area: A broader project area has also been defined to allow for assessment of potential indirect impacts. This has been defined as a 10 km area around the project footprint.

Figure 2.2 shows the key project areas, including the inundation area, project footprint and project area.



Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2013); DPI (2013)

*Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.

0 2.5 5 km

GDA 1994 NSW Lambert

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KEY

- Project footprint
- Inundation area*
- Dam wall
- Main road
- Local road
- Track
- Named watercourse
- Waterbody
- NPWS reserve
- State forest

Project areas

Mole River Dam Project
Scoping report
Figure 2.2

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2.3 Project design and layout

The project design provided in this section is an indicative preliminary design. The project design will be further developed to take into consideration environmental and technical investigations.

While the key components of the project are largely fixed, the final design solution and operation will be based on:

- the outcomes of further community and stakeholder engagement;
- results of geotechnical and other structural analysis and design investigations;
- flood and dam break modelling;
- ability for the design to meet dam safety requirements; and
- outcomes of environmental impact studies to ensure the design balances water storage benefits with potential social and environmental impacts.

2.3.1 Key components of the project

Table 2.1 provides a summary of the key components of the project identified by the preliminary design. An indicative layout for the project is show in Figure 2.3.

Table 2.1 Summary of key components of project

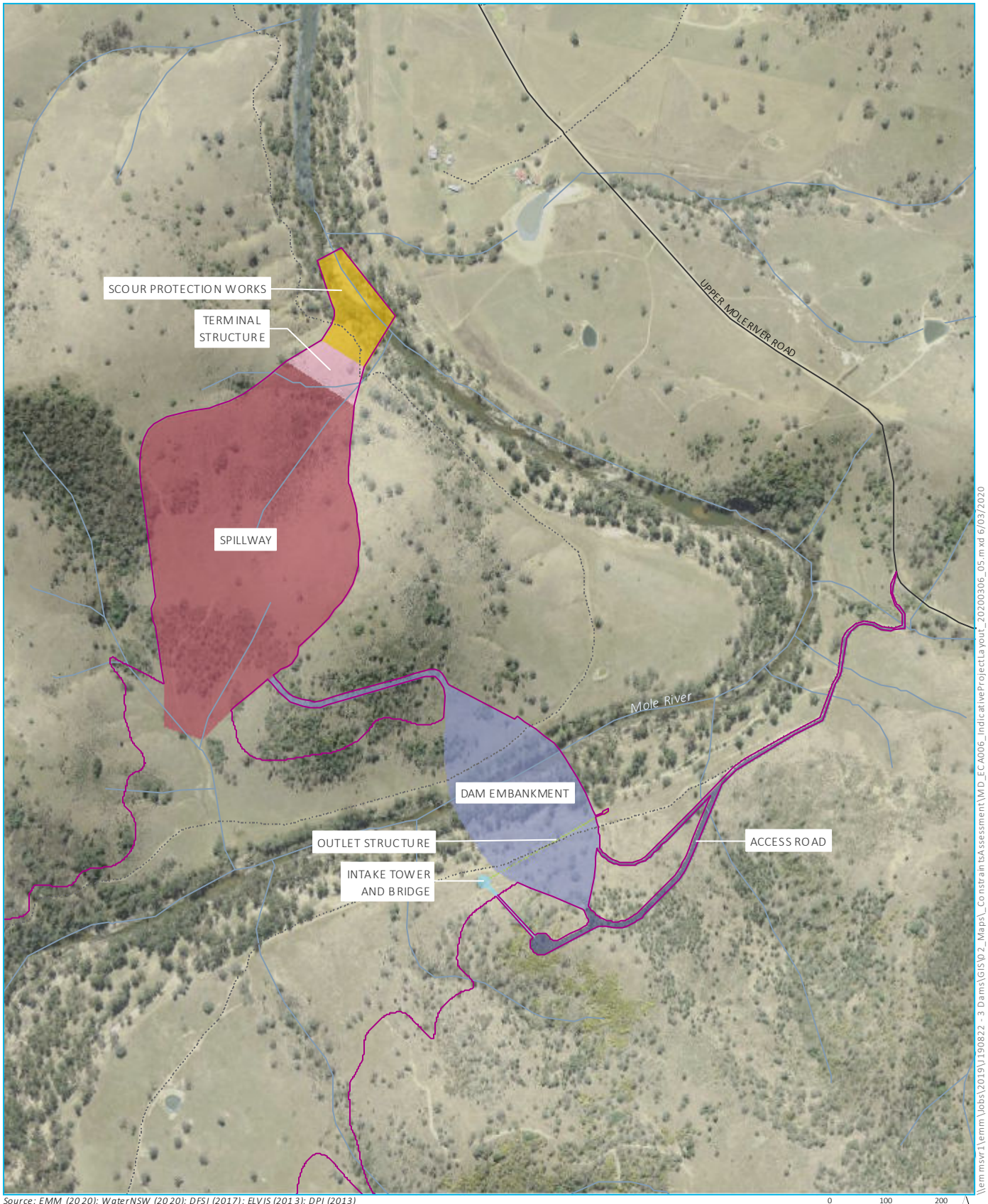
Component	Description
Dam wall	Preliminary investigations have identified that a number of dam types may be suitable for the new dam wall, including a zoned rockfill or roller compacted concrete dam. A concrete faced rockfill dam may also be a viable option. The type of dam to be constructed will be determined following detailed site investigations, including determining availability of construction materials, and detail design.
Spillway	The preliminary spillway design comprises an approach channel, ogee spillway crest, chute and terminal structure. The ogee crest is proposed to be cut into the saddle next to the left abutment of the proposed dam. Positioning of the spillway within the saddle rather than immediately adjacent to the left abutment was identified as likely preferred in consideration of geological conditions, which indicate more suitable underlying rock (less deeply weathered) is likely to occur within the saddle. Notwithstanding, it is anticipated that the spillway would require extensive lining. Preliminary design works identified a number of potential spillway length, crest height and freeboard options. For the feasibility study, a nominal 59 m spillway length was assumed, however the preferred configuration will be identified following detailed geological investigation and optimisation. The preliminary design identified the length of upstream approach channel and downstream chute of the order of 200 m and 300 m respectively. Final design for both elements will be subject to detailed site investigation, with the objective to reduce excavation volumes as much as possible, whilst achieving required hydrological conditions. The spillway structure would terminate with a flip bucket and plunge pool to provide energy dissipation. The invert level of the downstream end of the pool would rise back to meet river level at the outlet point. The extent of scour in an extreme flood, along with the suitability of a plunge pool, will be determined during detailed design.
Intake tower	The preliminary design identified an inlet tower structure, the location and design of which will be confirmed during detailed design. In order to mitigate potential cold water pollution and dissolved oxygen impacts, it is anticipated that a multi-level off-take would be included, with final offtake intervals to be confirmed during detailed design.
Access bridge	The preliminary design identified an access bridge to the intake tower, design of which will be confirmed during detailed design.

Table 2.1 Summary of key components of project

Component	Description
Fish passage	Fish passage requirements, design and location will be investigated during detailed design and EIS phases.
Access roads	Suitable road access would be required to the dam site to facilitate access and ongoing operation and maintenance activities. The preliminary design identified an existing access track off Upper Mole River Road along the southern side of Mole River to provide access to the dam embankment and outlet structure. Requirements for construction of new or upgrade of existing local roads from the site access to the broader regional road network to accommodate anticipated construction and maintenance traffic will be investigated and confirmed during detailed design and EIS preparation.
Construction compounds	The project is likely to require the establishment of one or more construction compounds to facilitate construction of the proposed dam. Smaller construction laydown areas may also be required to allow for construction of specific elements of the project. Siting criteria for the selection of a preferred compound location are provided in Section 2.5.1.
Construction camp	A construction camp may also need to be established to provide accommodation and associated services during the construction phase of the project. The need for and location of such a camp will be identified during preparation of the EIS.
Services/ structures	Existing infrastructure and services may require relocation as part of the project, for example if identified within areas subject to proposed inundation or within the development footprint. Existing infrastructure that may be impacted by the project will be identified during detailed investigations and suitable mitigation measures incorporated in the EIS and detailed design.

2.3.2 Design integration and assessment approach

The preliminary design considered in this scoping report was developed in accordance with WaterNSW's objective to improve water security for the Border Rivers region. Further design work is underway to develop the concept design to inform the environmental assessment and feed into the detailed design. The process of design development during the EIS will involve an iterative design integration and assessment process where findings of environmental investigation of the concept will input to ongoing design refinement and solutions. This process will allow the design to avoid or minimise environmental and social impacts where possible without compromising dam safety requirements.



Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2013); DPI (2013)

*Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.

0 100 200 m

GDA 1994 NSW Lambert

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KEY

- Project footprint
- Main road
- Track
- Watercourse
- Waterbody

Indicative infrastructure

- Access road
- Dam embankment
- Intake tower and bridge

- Outlet structure
- Scour protection works
- Spillway
- Terminal structure

Indicative project layout

Mole River Dam Project
Scoping report
Figure 2.3

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2.4 Construction

The key steps to constructing the new dam include:

- construction of the embankment and spillway;
- construction of associated intake towers, bridges and other associated facilities;
- construction of an access road to the dam site, and upgrading existing roads along the identified haulage route(s) required for construction and ongoing operation of the facility; and
- relocating services and structures affected by the full supply level (FSL).

Following completion of construction work, the dam would undergo a period of commissioning and filling before commencing routine operation. This stage of the project will be guided by development and implementation of an operational strategy. The Mole River Dam operating strategy will be developed in consideration of potential impacts on existing water users, environmental outcomes and flood mitigation.

Construction activities for the project would generally be undertaken within the project footprint (Figure 2.2). As the iterative process of design and environmental assessment progresses, key components of the design will be confirmed, and a more detailed construction program will be developed.

Some components of construction of the project may be delivered as separate but coordinated construction contract packages. A more detailed staging and construction coordination plan will be presented in the EIS.

There may be additional preliminary works that may be required, which would be further refined during the design process for the project, and be considered either exempt development or subject to the relevant separate environmental impact assessment requirements under the EP&A Act.

2.5 Alternatives being considered

A number of dam storage capacities were considered as part of the Mole River Dam Feasibility Study (Jacobs 2017), including 100 GL, 200 GL and 300 GL for their ability to deliver improved reliability of water supply to the Border Rivers catchment users, and specifically the following objective targets:

- improving average annual reliability of water supply to Border Rivers irrigators;
- reducing the likelihood of zero general security allocations in any given year; and
- reducing reliance on supplementary water, and thereby shifting more of the water shares to general security which can be allocated more reliably, conveniently and with reduced water losses.

A 100 GL storage capacity rockfill dam was identified as preferred on the basis of preliminary hydrological modelling, design and cost analysis.

An iterative process of environmental investigation and impact assessment and concept design will be undertaken to refine the preliminary design. The design will be optimised to maximise the potential improvements in water security, drought security and flood management capacity whilst minimising environmental impacts.

Some key considerations during development of the concept design include:

- Dam wall: The feasibility study indicated that a rockfill dam would be suitable for the proposed site, however noted that an alternate roller-compacted concrete dam (RCC) may also be suitable. A concrete faced rockfill dam was not discussed, however may also be a viable option. The study highlighted that based on current available geological information, material won from site excavations are unlikely to be suitable for use in a rockfill embankment, however further site investigation is required to confirm the site's geological conditions. The final dam design therefore needs to be informed by site investigations and consider the suitability and availability of local material sources and potential for significant associated material haulage costs if material must be sourced from more distant location(s). It is noted that geological information indicates that a granite intrusion located approximately 1 km from the dam site may be a suitable source of fill material, which requires further investigation as part of subsequent work stages.
- Dam wall and spillway: The preliminary design indicated the preferred location for the spillway within a saddle next to the left abutment of the dam, where it is understood less deeply weathered rock is located (compared to the hill immediately adjacent to the abutment) and fresh rock is approximately 3 m deep. The ogee spillway design incorporated in the preliminary design was selected largely to minimise the quantity of excavation required in consideration of associated excavation costs. However, in consideration of the above issue regarding availability of suitable embankment material, further investigation and design may be able to identify suitable alternate spillway design options that optimise the materials obtained from the spillway site versus rockfill required for the dam wall construction.
- Intake towers: The preliminary design did not consider design options for this component, which requires further consideration during detailed design.
- Fish passage: The preliminary design did not consider design options for this component, which requires further consideration during detailed design.

2.5.1 Criteria for determination of construction compound site locality

Potential locations for construction compounds will be identified during detailed design and EIS preparation. As the iterative process of concept design and environmental assessment progresses, preferred locations for construction compounds will be identified. The following provides a summary of key criteria that would be considered when selecting a preferred location:

- land ownership / lease arrangements;
- site topography, drainage and soil conditions: The preference should be a large open area with a reasonably flat site. A slight slope is permissible for stormwater runoff;
- proximity to the construction site of the dam wall – preferably downstream of the dam to be constructed;
- a site that avoids or minimises potential impacts to threatened vegetation and Aboriginal cultural heritage;
- a site that avoids or minimises potential impacts on sensitive receivers including noise and air quality impacts;
- a site that has large enough area to accommodate key facilities, including concrete batch plants, heavy construction machinery, construction site offices, storage and laydown areas;
- access and availability of potable water and electricity;
- access and availability of communications;
- accessibility by emergency services;
- accessibility by road for delivery of construction materials and removal of waste;
- potential impact from flooding; and
- safety and security – inner and outer perimeter security including safety for pedestrian and vehicular movements.

3 Strategic context

3.1 Water security for the future

WaterNSW is responsible for dam operations, water security and managing water stored in all its 42 water storages. Each valley has different water storage and supply issues. In the coming decades, the most important environmental change with significant implications for infrastructure is a reduction in water availability.

3.1.1 Drought and climate trends

Natural rainfall variability in NSW is large and the State has a history of drought and flooding events. The most severe drought events include the Federation Drought (1896 to 1902) and the more recent Millenium Drought (1996 to mid-2010). Severe flooding events across NSW followed during 2010 and 2011, which provided the wettest two-year period on record and broke the long-term drought across the State (BoM 2012).

While natural variability is expected to provide rainfall during cooler months and in the short-medium term, in the longer term, large year to year rainfall variability is expected against a background state which is expected to further change through time. Longer, drier periods and less frequent but more intense rainfall events are expected.

NSW is currently experiencing one of the most severe droughts on record, with the Central West, Far West and North West regions the worst affected to date. WaterNSW is already delivering a range of emergency drought relief projects to extend water supplies for critical human needs in towns and valleys where rainfall, inflows and storage levels are low. The current experience further highlights the critical need for planning for future droughts and ensuring water security during these periods.

3.1.2 Government support, plans and policy

The State Infrastructure Strategy (SIS) was first delivered in October 2012 and is a 20-year infrastructure investment plan for the NSW Government that places strategic fit and economic merit at the centre of investment decisions. The strategy assesses infrastructure problems and solutions, and provides recommendations to best grow the State's economy, enhance productivity and improve living standards for NSW community. The SIS was reviewed in 2014 and updated in 2018 to the current *Building Momentum State Infrastructure Strategy 2018-2038*.

The NSW Government identified in its 'State Infrastructure Strategy 2014 Review' (SIS Review) a new Mole River Dam as a possible solution to key issues identified for the Border Rivers catchment. The SIS Review also recommended Water NSW should develop a best practice 20 year capital plan to provide the evidence base required for pricing applications going forward.

In support of the SIS:

- WaterNSW developed a 20 year Infrastructure Options Study (2018). This Options Study details the state's existing rural bulk water supply systems and provides a strategic level assessment of infrastructure solutions to mitigate or improve long-term level of service issues in the regulated valleys. A new dam on the Mole River was one of many options considered to improve water availability in the Border Rivers catchment;
- WaterNSW commissioned a feasibility study for a new Mole River dam. The study identified a number of water security options and the Upper Mole River Dam was carried forward as the preferred option; and
- a regional water security and supply fund was committed to by the NSW and Commonwealth governments.

The $1 billion water infrastructure package for rural and regional communities in NSW was announced in October 2019 by the Premier and Commonwealth governments. Part of this funding is committed to the planning and development of the Mole River Dam project.

3.2 Border Rivers catchment

In NSW, 82.5 per cent of the land area and 11.6 per cent of the population is located west of the Great Dividing Range. The main water demands in this area are agriculture and mining and supporting regional towns.

The Border Rivers system supplies water for irrigation, stock and domestic, town water supply and industrial purposes. Land use is predominately for cattle and sheep grazing. Dryland cropping mostly occurs on the slopes. Small-scale crops such as grapes, stone fruit, vegetables and apples are grown in the upland areas. On the western plains, 75 per cent of irrigated crops are cotton.

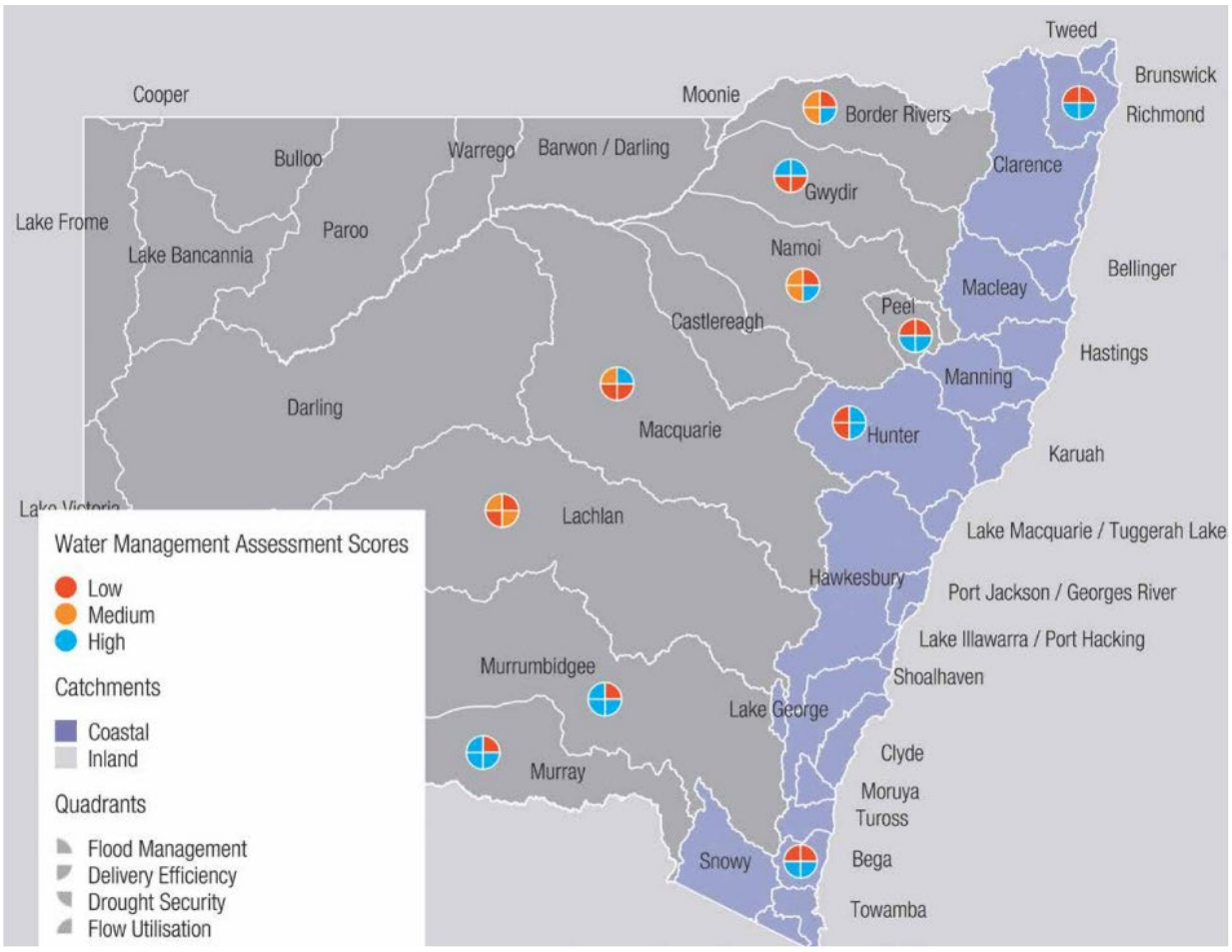
The Border Rivers regulated system is located in Queensland and NSW. The NSW-Queensland Border Rivers Agreement 1946 (the Agreement), as ratified by the New South Wales-Queensland Border Rivers Act (QLD 1946, NSW 1947) (the Act), contains water sharing arrangements for the Border Rivers, and provisions for the construction and operation of certain storages.

3.2.1 Current challenges and opportunities

The Border Rivers is a large catchment and its water supply is serviced by three relatively small dams and large on-farm storages that rely on access to unregulated flows (supplementary water access). A significant proportion of water taken for these on-farm storages evaporates during periods when it is needed most.

Hydrological data received from DoI Water for the Border Rivers indicates that under the current arrangements, General Security licence holders receive low reliability of supply. The relative capability of the Border Rivers water system is reflected in the SIS Review, which rated regional valleys according to four attributes (as shown in Figure 3.1). The Border Rivers scored low and medium scores across three of the four key areas.

In considering potential solutions, WaterNSW developed and assessed a long list of asset and non-asset options. Only two options were considered to provide feasible or satisfactory solutions, a new dam on the Upper Mole River (the project) and a new dam on the Lower Mole River. The Upper Mole River was adopted as the preferred option as it provided superior hydrological flexibility and more manageable environmental conditions compared with the Lower Mole River site.



Source: Infrastructure NSW (2014)

Figure 3.1 Water management assessment scores for NSW catchments

3.2.2 Natural and built features that could be impacted by the project

The project area is very sparsely populated, however there are a number of residences upstream of the proposed dam, either within or adjacent to the inundation area. The two closest villages are Woodside and Silent Grove, located approximately 5 km north and 11 km south-west of the inundation area respectively. The surrounding land uses are primarily rural and agricultural.

Key features identified within the catchment that could be impacted by the project are:

- biodiversity values including terrestrial and aquatic threatened ecological communities and species;
- Aboriginal cultural heritage sites and intrinsic values of the area;
- land and associated infrastructure currently used for rural and agricultural purposes;
- properties requiring full or partial acquisition as they would be inundated by the new full supply level. Some properties may also be impacted by maximum flood levels and may necessitate relocation of structures;
- utilities and infrastructure requiring relocation as they would be inundated by the new full supply level or within future maximum flood levels; and
- derelict mines with potential contamination issues.

These features and further consideration on how they may be impacted by the project are described in Chapter 6.

3.3 Critical need for the project

Unreliable water supply has led to financial uncertainty and anxiety for farmers and their communities. Farmers have taken active measures to invest in on-farm storages to help improve the reliability of unregulated supplies. However, high water losses through evaporation (potentially as high as 40% losses) limits the effectiveness of on-farm dams as a long-term solution.

Low water availability and security is a major constraint on on-farm investment and their long-term financial security. This lack of security prevents farmers from converting to higher value land use comprised of permanent tree crops (such as almonds) and create a barrier to long-term financial security for farmers, their employees, supporting businesses and the local communities. This puts pressure on the local population, drives increased unemployment and makes it harder for farmers and other industries to attract high skilled workers to the region.

Border Rivers needs better water infrastructure to:

- improve long term water availability and reliability of water supply to Border Rivers irrigators;
- reduce the likelihood of zero general security allocations in any given year; and
- reduce reliance on supplementary water.

A new dam would have the potential to secure more water in flood sequences so that in drier times more water would be available to communities, agriculture, and the environment. The intended benefits to be realised from the Mole River Dam project include the following:

- Improved on-farm productivity. The primary and most direct intended benefit would be improvement of on-farm productivity as a result of more reliable and secure water supply to existing licence holders. Irrigators would be able to grow more of their existing crops and to use a portion of their land to grow higher value crops;
- More stable and resilient local communities. Being able to smooth out irrigators' production from year to year would help secure existing jobs and create new employment opportunities in nearby towns. This would sustain and grow the local population and economy. It would also attract a higher skilled workforce that can further improve the comparative advantage of the regional economy; and
- Environmental benefits for the downstream Barwon-Darling system through increased flow reliability and associated environmental health outcomes.

Reflecting the relative urgency, the project is critical water infrastructure needed in the next decade to achieve greater water security, reliability and availability. The project is wholly consistent with the State's infrastructure priorities in ensuring water security for regional communities.

4 Statutory context

4.1 Critical State significant infrastructure

Section 5.12 of the EP&A Act provides for the declaration of SSI, and section 5.13 enables the NSW Minister for Planning and Public Spaces to declare SSI to be CSSI if 'it is of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons'.

On 21 November 2019, the NSW *Water Supply (Critical Needs) Act 2019* (WSCN Act) was enacted. The object of the act is to facilitate the delivery of water supplies to certain towns and localities to meet critical human water needs, and to declare certain activities to be CSSI for the purposes of the Part 5 of the EP&A Act.

Schedule 3 of the WSCN Act provides that certain activities described in the schedule is taken to be CSSI. It currently includes four activities, including the project.

Accordingly, the project is declared to be SSI and CSSI. As such, the project requires assessment and approval from the NSW Minister for Planning and Public Spaces under Division 5.2 of Part 5 of the EP&A Act.

4.2 Planning and assessment process

Division 5.2 of Part 5 of the EP&A Act sets out the assessment and approval framework for SSI and CSSI. This process is shown in Figure 4.1.

As previously stated, applications for SSI and CSSI must be accompanied by an EIS. The requirements of an EIS are stipulated in Schedule 2 of the EP&A Regulation 2000. This states, among other things, that an EIS must address the Secretary of DPIE's environmental assessment requirements (SEARs) and include:

(a) a summary of the EIS,

(b) a statement of the objectives of the development, activity or infrastructure,

(c) an analysis of feasible alternatives to the carrying out the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure,

(d) an analysis of the development, activity or infrastructure, including:

  (i) a full description of the development, activity or infrastructure, and

  (ii) a general description of the environment likely to be affected by the development, activity or infrastructure, and

  (iii) the likely impact on the environment of the development, activity or infrastructure, and

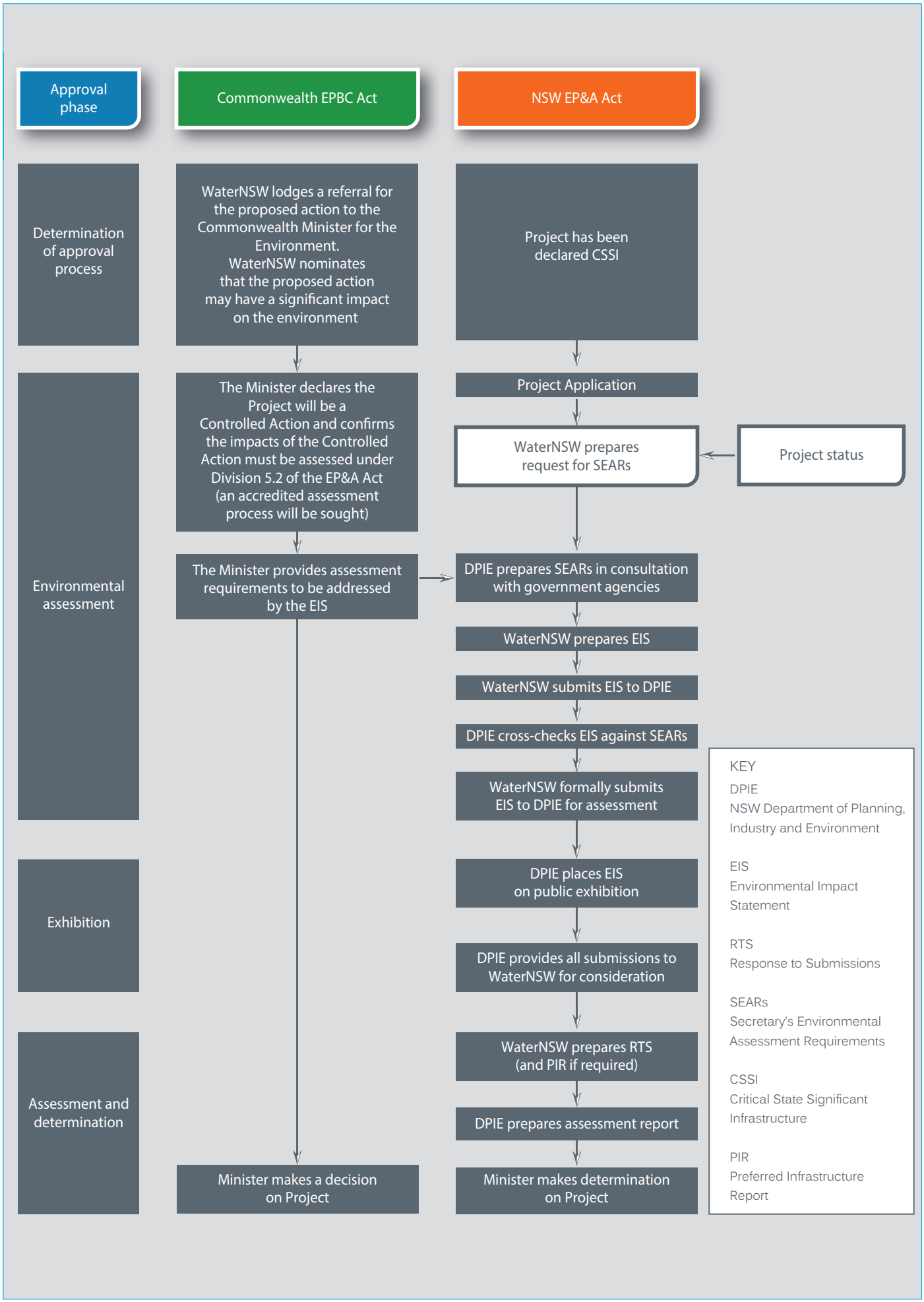
  (iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure, and

  (v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out,

(e) a compilation (in a single section of the EIS) of the measures referred to in item (d)(iv),

(f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development.

The EIS for the project would be undertaken to address the SEARs and include the above requirements.



WaterNSW EMM creating opportunities

Approvals process
Mole River Project
Scoping Report
Figure 4.1

4.2.1 Application of other provisions of EP&A Act

By virtue of section 5.22 of the EP&A Act, a number of parts and divisions of parts of the EP&A Act do not apply to SSI and CSSI. This includes local environmental plans (LEPs) and state environmental planning policies (SEPPs) (except where they apply to the declaration of infrastructure as SSI and CSSI) and Part 4 of the EP&A Act.

4.2.2 Other State approvals and licences

Under sections 5.23 and 5.24 of the EP&A Act, certain separate environmental approvals under other NSW legislation would not be required for the project or would be required to be issued consistent with an approval (if granted) for the project. Each of these separate environmental approvals is considered in Table 4.1.

Further environmental and other approvals may be required in addition to those referred to under section 5.23 and 5.24 of the EP&A Act, and these would be considered and outlined where relevant to the assessment of the project as part of the EIS.

Table 4.1 Other State approvals and licenses

Approval	Relevance to project	Comment
Approvals not required under section 5.23		
A permit under section 201, 205 or 219 of the NSW *Fisheries Management Act 1994* (FM Act)	Relevant but not required	Consistent with clause 5.23 of the EP&A Act, these approvals are not required for SSI and CSSI or any investigative or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements in connection with an application for approval.
An approval under Part 4 or an excavation permit under section 139 of the NSW *Heritage Act 1977*	Relevant but not required	
An Aboriginal heritage impact permit under section 90 of the NSW *National Parks and Wildlife Act 1974*	Relevant but not required	
A bushfire safety authority under section 100B of the NSW *Rural Fires Act 1997*	Relevant but not required	
A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than a groundwater interference approval) under section 91 of the NSW *Water Management Act 2000*	Relevant but not required	
Approvals required to be issued consistently under section 5.24		
An aquaculture permit under section 114 of the NSW *Fisheries Management Act 1994*	No	The project does not involve aquaculture.
Approval under section 15 of the NSW *Mine Subsidence Compensation Act 1961*	No	The project is not within a mine subsidence district.
A mining lease under the NSW *Mining Act 1992*	No	The project does not involve mining.
A production lease under the NSW *Petroleum (Onshore) Act 1991*	No	The project does not involve petroleum production.
An environment protection licence (EPL) under Chapter 3 of the NSW *Protection of the Environment Operations Act 1997*	Yes	It is likely that an EPL will be required for the applicable scheduled activities.

Table 4.1 Other State approvals and licenses

Approval	Relevance to project	Comment
		Under section 5.24(1) of the EP&A Act, an EPL cannot be refused if it is necessary for carrying out approved SSI and CSSI and is to be substantially consistent with the EP&A Act approval.
A consent under section 138 of the NSW *Roads Act 1993* (Roads Act)	Yes	The project involves interaction and works within public road reserves. Under section 5.24(1) of the EP&A Act, consent under section 130 of the Roads Act cannot be refused if it is necessary for carrying out approved SSI and CSSI and is to be substantially consistent with the EP&A Act approval.
A licence under the NSW *Pipelines Act 1967* (Pipelines Act)	No	The project does not involve the construction and operation of water pipelines.

4.3 Commonwealth approval framework

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of national environmental significance (MNES) including:

- world heritage properties;
- national heritage places;
- Ramsar wetlands of international importance;
- nationally threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

If an action will, or is likely to, have a significant impact on any MNES, it is deemed to be a 'controlled action' and requires approval from the Commonwealth Minister for the Environment or the Minister's delegate. To determine whether a proposed action will or is likely to be a controlled action, a Referral of Proposed Action is submitted to the Commonwealth Department of the Agriculture, Water and the Environment (DAWE) for assessment.

As stated in 6.2.1, regional vegetation mapping identified that the much of the native vegetation within the study area is likely to be part threatened ecological community, commonly known as Box Gum Woodland which is listed as critically endangered under the EPBC Act. This community is also known to provide habitat for threatened flora and fauna species listed under the EPBC Act.

Accordingly, WaterNSW, on a precautionary basis, will refer the project to DAWE and nominate that it has the potential to have a significant impact on MNES. This will allow potential impacts to relevant MNES to be considered in the EIS being prepared for the project.

The approval process under the EPBC Act will be determined with DAWE. A Proposed Action can be assessed using one of the following assessment approaches:

- accredited assessment (where there is no bilateral agreement in place the Commonwealth Minister for the Environment can accredit use of state legislation, such as the EP&A Act, for the assessment);
- assessment on referral information;
- assessment on preliminary documentation;
- assessment by EIS or public environment report; or
- assessment by public inquiry.

It is the preference of WaterNSW that the project be assessed using an accredited process under section 87(4) of the EPBC Act, where the Commonwealth accredits the assessment process under Division 5.2 of Part 5 of the EP&A Act.

The approval process under the EPBC Act using an accredited process can be seen in Figure 4.1.

The use of an accredited assessment process does not alleviate the approval requirements of the Commonwealth Minister for the Environment under the EPBC Act. While the NSW Minister for Planning and Public Spaces is the determining authority for the project under the EP&A Act, the Commonwealth Minister for the Environment remains the person who must decide whether or not to approve the controlled action under the EPBC Act.

5 Considerations during scoping

5.1 Engagement with community and stakeholders

The project is one of the first major dam projects in NSW in four decades and comes in response to the effects of a severe drought, which has highlighted the importance and priority of water security for communities and users of river systems and water storages.

WaterNSW commenced introductory discussions for the project in late 2019 and early 2020 with local government and key stakeholder groups. These preliminary meetings provided initial views on issues and concerns, perceived benefits and preferred methods of interaction and communication and discussed the principles and practices around WaterNSW future engagement.

The primary concerns highlighted by this consultation were:

- the extent and impacts of inundation;
- the impacts on public infrastructure such as roads, bridges, drainage;
- the impacts on property and the need for land acquisitions;
- concern the project may not proceed;
- the need to consider other measures for drought proofing;
- the risks for water quality and catchment health;
- issues relating to water security for existing licence holders; and
- opportunities for local business participation in the project.

Communication with the broader community has also commenced through:

- media releases including public announcement by the NSW Minister for Water, Property and Housing;
- updates via the WaterNSW website including a dedicated project page providing a description of the project and access to the supporting feasibility and investigative studies; and
- initial identification and engagement of Aboriginal community members.

Preliminary consultation was also carried out as part of the feasibility study prepared for the project (Jacobs 2017), which obtained the views of stakeholders such as irrigators and water users. WaterNSW has been in contact and had discussions with members from this 2017 reference group on the project.

WaterNSW has committed to guiding principles for engagement on the project and will implement a comprehensive consultation and engagement strategy to inform the project throughout subsequent stages, as detailed in Chapter 7. This will include an Aboriginal engagement communication strategy that will provide a foundation for close engagement with the Aboriginal community.

5.2 Identification of key issues

5.2.1 Scoping process

Preliminary environmental investigations have been carried out to identify the relevant matters to be addressed in the EIS for the project and the required level of assessment. This process was informed by desktop assessment and limited field survey undertaken by WaterNSW and the project team. This process included:

- consultation with DPIE and key stakeholders;
- undertaking a process of identifying and characterising relevant matters for assessment, involving an appraisal of likely environmental and social impacts; and
- reporting the outcomes of that assessment in this Scoping Report.

A checklist of matters was provided (DPIE 2019) and a preliminary impact and mitigation assessment was carried out. The full list of matters considered in the scoping assessment is provided in the Scoping Worksheet provided at Appendix A. Those matters relevant to the construction and operation of the project have been identified and allocated to one of the following categories:

- key matters or issues – these have been defined as requiring detailed assessment, ie. will require detailed field surveys and/or quantified modelling techniques to fully understand the impacts and identify project-specific mitigation and/or alternatives. It is assumed at this stage of assessment that each of the listed key issues will require separate technical responses and will be separately attached to the EIS;
- other matters or issues – characterised as matters where the assessment approach and measures to manage impacts are well understood and routinely used on similar projects and will be subject to a standard assessment. Each of these issues will need to be addressed through the EIS process and require investigation, but which may or may not require a technical study; and
- scoping only issues or matters that require no further assessment in the EIS – matters in this group have been considered in this initial scoping assessment and justification provided as to why it is proposed that they not be investigated further.

The outcomes of the scoping investigations are provided in this report and the completed Scoping Worksheet at Appendix A.

5.2.2 Issues requiring assessment

Based on the findings of the scoping assessment (Appendix A), the environmental investigations that have been carried out to date and feedback received on the project, key assessment issues for the project have been identified as:

- biodiversity;
- hazards & Risks (dam and flood; contamination);
- heritage;
- land;
- social; and
- water.

Table 5.1 presents key issues or matters to be considered for the EIS and are detailed further in Chapter 6.

Table 5.1 Identification of key and other issues requiring assessment

Issue	Scoping assessment	Key or Other issue
Access	Standard – inundation as a result of the project has potential to impact access to property and some local roads. Construction and operational access impacts will require consideration.	Other issue (Section 6.7.1)
Air	Standard – impacts to air is likely to be limited during construction and operation, however should be considered further as the design develops.	Other issue (Section 6.7.2)
Amenity (inc Noise)	Standard – Noise and vibration impacts may be experienced during construction. Visual impacts as a result of the raised dam wall and inundation will also require assessment.	Other issue (Section 6.7.3)
Biodiversity	Detailed - the project will have direct impacts arising from the construction of the project and inundation. Potential direct impacts include impact on native vegetation, including threatened, impact on threatened species habitat; and disturbance/inundation of aquatic habitats.	Key issue (Section 6.2)
Built Environment	Standard - inundation as a result of the dam has potential to impact private property and public infrastructure.	Other issue (Section 6.4)
Economic	Standard – partial or complete inundation of land and infrastructure may impact the livelihood of some community members and may also impact access to natural resources.	Other issue (Section 6.6)
Hazards & Risks (dam and flood; contamination)	Detailed – construction of the dam wall requires detailed consideration of dam safety and flood risks. Contamination risks associated with potential interactions with historical mining activities requires consideration.	Key issue (Section 6.5)
Hazards & Risks (other)	Standard – other hazards and risks such as bushfire and waste will require consideration but are considered unlikely to present a significant risk.	Other issue (Section 6.7.4)
Heritage	Detailed - the project has the potential to impact Aboriginal heritage arising from the construction of the project and inundation.	Key issue (Section 6.3)
Land	Detailed - partial or complete inundation of land and infrastructure may impact land capability and should be considered in conjunction with social and economic impacts. Consideration of soils within the construction and inundation areas also require assessment.	Key issue (Section 6.4)
Social	Detailed – there are a range of potential direct and indirect impacts (positive and negative) of the project. Consideration of the social consequences resulting from the findings of other technical investigations such as investigations into noise, air quality, surface water and access will also be required.	Key issue (Section 6.6)
Water	Detailed – A range of issues including water quality, cold water pollution, changes to flow regimes and flooding require detailed consideration.	Key issue (Section 6.1)

5.2.3 Matters requiring no further assessment in the EIS

As part of the scoping process a range of issue were identified that are considered to not require further investigation. Table 5.2 identifies these issues and provides a brief justification for no further consideration in the project EIS.

Table 5.2 Matters requiring no further assessment

Issue	Justification
Access (port/airport facilities)	No ports or airports are located in proximity to the project and as such there will not be any direct or indirect impacts.
Hazards & Risks (coastal hazards)	Mole River Dam is in the Border Rivers catchment, approximately 20 km south-west of Tenterfield in northern NSW and as such does not require assessment of coastal hazards.
Hazards & Risks (hazardous / offensive development)	Construction of Mole River Dam and associated ancillary development is not considered to be hazardous / offensive development.

6 Proposed assessment

Preliminary environmental investigations have been carried out to identify the relevant matters to be addressed in the EIS for the project and the required level of assessment. Based on these findings, issues have been defined as either key or other issues requiring a detailed or standard level of assessment. The proposed assessment for key issues are outlined in Section 6.1 to Section 6.6, and for other issues in Section 6.7.

6.1 Water

6.1.1 Existing environment

i Surface water resources and users

The Mole River is a tributary of the Dumaresq River within the broader Border Rivers catchment, which includes the Dumaresq, Severn, Macintyre and Barwon Rivers. The Dumaresq River, Macintyre River and a section of the Barwon River, downstream of the Weir River, form the state boundary between NSW and QLD.

The Border Rivers system is a highly regulated catchment, subject to water sharing arrangements that services both NSW and QLD users. Its water supply is serviced by three existing catchment dams and large on-farm storages. A new dam will have the potential to secure more water in flood sequences so that in drier times more water would be available to communities, agriculture, and the environment.

The Border Rivers system is currently regulated by the following three dams:

- Pindari Dam - water stored in Pindari Dam (312 GL capacity) is shared amongst NSW users only;
- Glenlyon Dam - water stored in Glenlyon Dam (254 GL capacity) is shared between NSW (up to 57%) and QLD water users (up to 43%); and
- Coolmunda Dam - water stored in Coolmunda Dam (69 GL capacity) is exclusive for QLD users.

The Mole River waters are currently subject to the provisions of the Water Sharing Plan for the NSW Boarder Rivers Unregulated and Alluvial Water Sources 2012. However, future water management will likely be subject to a revised Water Sharing Plan for the NSW Border Rivers Regulated River Water Source 2009.

The water resources are also subject to interstate water sharing arrangements. The Intergovernmental Border Rivers Agreement 2008 between NSW and QLD, established by the Border Catchments Ministerial Forum contains water sharing arrangements for the Border Rivers, and provisions for the construction and operation of certain storages.

ii Hydrogeological setting

The local flow system is a fractured rock groundwater aquifer contained within the Bondonga beds. The fractured rock is a limited groundwater resource due to the very low primary porosity with groundwater flow occurring within secondary porosity features such as fractures or along contact boundaries between different rock lithologies. The hydraulic conductivity and groundwater storage within these secondary porosity features is typically very low, making it an ideal surrounding rock for water impoundment.

Recharge areas to the fractured rock aquifers are generally considered to be via rainfall on the upper slopes, ridgelines and hilltops of the landscapes where the rock sub-crops or outcrops. Discharge points are likely to comprise of natural locations such springs, spring fed dams, lower slopes and the relatively lower lying areas.

iii Groundwater management and users

The dam site is within the New England Fold Belt Murray Darling Basin Groundwater source managed by the Murray Darling Basin Groundwater Water Sharing Plan (WSP).

6.1.2 Issues for consideration

i Surface water

The project may have potential impacts on surface water hydrology, water quality, cold water pollution and flooding. These impacts could extend beyond the project boundary and may, without appropriate mitigation measures, be significant. The project could adversely impact water users, aquatic and terrestrial ecology, downstream infrastructure and properties adjacent to the downstream watercourse. Improved flow reliability may also provide benefits to downstream water users and environmental flow benefits. The potential impacts of the project with reference to the above matters of consideration will need to be assessed in the EIS. However, there is insufficient information currently available to adequately assess the impacts. Therefore, additional baseline data (flow and water quality) will need to be compiled and detailed flood modelling will be required to quantify and assess the potential impacts.

ii Groundwater

The main issues for consideration of groundwater impacts is a potential reduction of frequency of flooding and reduction in the volume of surface water runoff with potential loss of groundwater baseflow contributing to river flow; and potential for contamination of groundwater if the project interacts with potential contamination sources associated with historical mining areas (refer Section 6.5.2). This could impact downstream groundwater users that abstract groundwater and groundwater dependent environments. Depending on the nature and scale of identified impacts, they may be able to be managed by controlling environmental flows from the dam to the downstream river environment, which should be considered during the EIS and development of management plans.

6.1.3 Approach to assessment in EIS

i Surface water

Operating rules are a key driver in understanding potential water related impacts. The EIS will identify Interim Operating Rules prepared as part of the iterative design and assessment process.

A water assessment will be completed for the EIS. The assessment will characterise baseline conditions through review of available water quality data, supplemented with the collection of additional field data during the EIS. The assessment will identify and provide management measures for:

- potential impacts on ambient water quality parameters, as defined by the baseline data;
- potential geomorphological impacts including potential erosion and sedimentation within the storage, banks of the storage, and downstream impacts to the receiving environment; and
- cold water pollution relative to the downstream ambient water temperature.

Detailed flood modelling will be conducted to identify potentially impacted properties and quantify any potential environmental impacts associated with the project, and to develop suitable mitigation strategies if required. Dam break modelling will be required as part of the spillway design and this will also be reported in the EIS as it pertains to downstream impacts and public safety.

Water balance modelling will be conducted to confirm yield and security of supply and will consider any requirements of the Water Sharing Plan and Sustainable Diversion Limits (such as cumulative impacts associated with water extraction/allocation), which have been developed in accordance with the Murray-Darling Basin Plan.

ii Groundwater

The objective of the Groundwater Impact Assessment (GIA) is to assess the impact to the groundwater regime from the project. The key NSW policy that the project will need to address is the NSW Aquifer Interference Policy (AIP). The AIP sets out the minimal impact considerations that are essentially a series of threshold levels for groundwater level drawdown and quality changes. The study will need to directly address the potential for the project to impact upon these thresholds.

6.2 Biodiversity

A preliminary assessment of terrestrial and aquatic ecology has been prepared. The assessment is provided in Appendix B and can be referred to for further detail on existing biodiversity values and considerations for detailed assessments to be carried out for the EIS.

6.2.1 Existing environment

i Terrestrial ecology

The Mole River Dam project is located in the Nandewar Interim Biogeographic Regionalisation of Australia (IBRA) region and Nandewar Northern Complex IBRA subregion and Mole Valley, Ashford Mole Valleys and Inverell Plateau Granites BioNet NSW Landscape (formerly Mitchell landscapes).

The Mole River is in the Border Rivers catchment. The study area includes 18 major waterways (3rd or higher stream order), which feed into the catchment of the proposed dam. No important wetlands, coastal wetlands, Ramsar wetlands or local wetlands are located within or immediately adjacent to the project footprint.

Regional vegetation mapping predicts that seven native plant community types (PCT's) and one potential PCT occur within the project footprint (refer Figure 6.1). One Plant Community Type (PCT; PCT 599) may be equivalent to *White Box Yellow Box Blakely's Red Gum Woodland*, listed as endangered under the *Biodiversity Conservation Act 2016* (BC Act), and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Box Gum Woodland).

Approximately fifteen hectares of potential Box Gum Woodland occur in the project footprint. Only very limited access has been available for preliminary survey and more detailed field surveys will be required to confirm if the vegetation within the terrestrial study area aligns with regional mapping. Impacts on threatened ecological communities will be a key consideration for assessment.

A total of 41 threatened native flora species and 35 threatened native fauna species listed as species credit species have potential to occur within the project area. A preliminary assessment of the likelihood of these species occurring, with a precautionary approach utilised if there was uncertainty as to whether habitat or the species may occur on site, identified a total of 24 threatened flora species, and 27 threatened fauna species as likely to occur and require further assessment.

A total of six migratory species listed under the EPBC Act have a moderate to high likelihood of occurrence within or adjacent to the project area.

ii Aquatic species and habitats

One threatened ecological aquatic community has been identified downstream of Mole River Dam which may be affected: Lowland Darling River aquatic ecological community, listed as an Endangered Ecological Community (EEC) under the *Fisheries Management Act 1994* (FM Act). This EEC commences approximately 50 km downstream of the proposed Mole River Dam at the confluence with the Dumaresq River, and then flows into the Macintyre River.

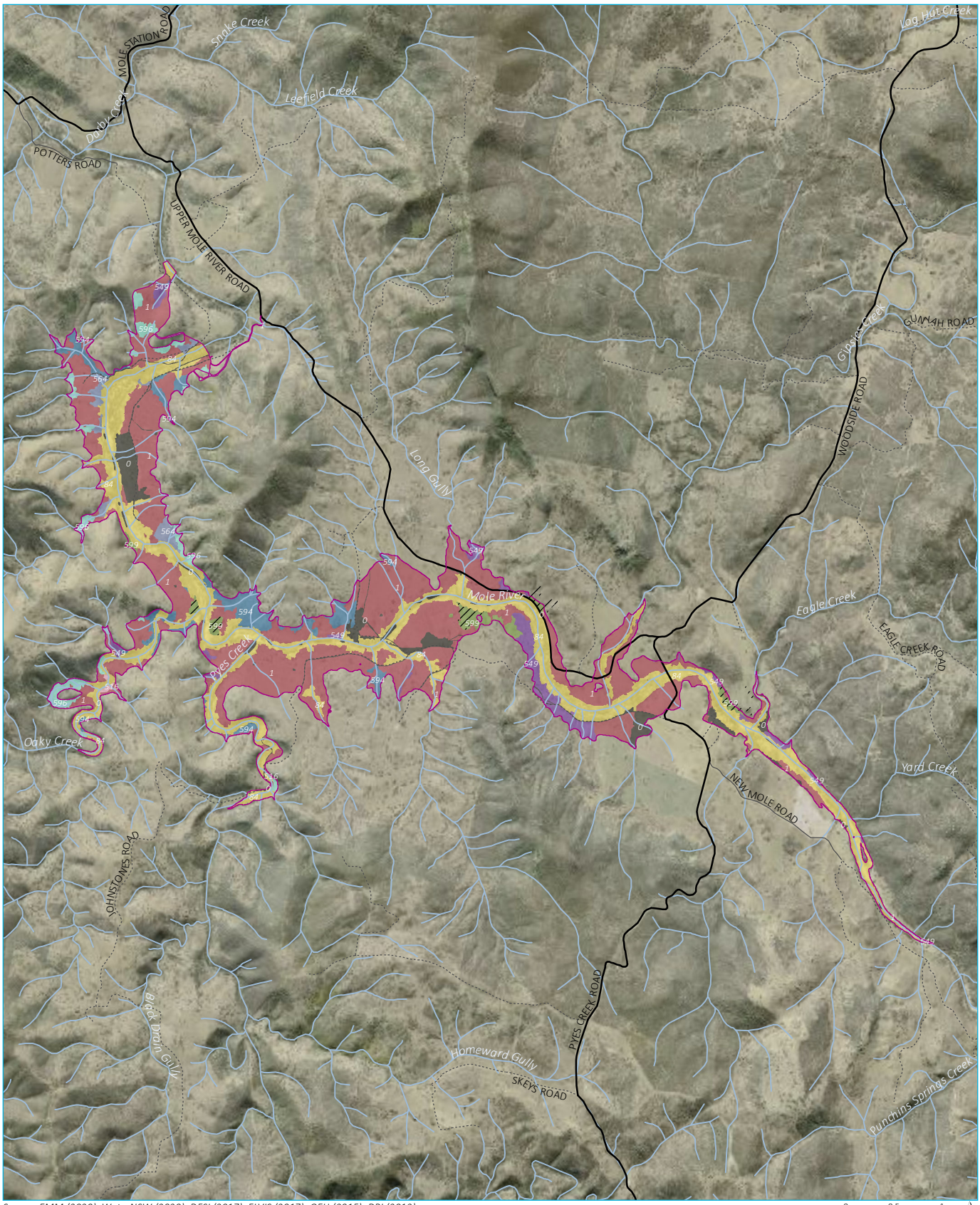
A total of six threatened aquatic species listed under the FM Act and/or the EPBC Act were identified through background research, with two assessed as being of low potential to occur; and four considered to be moderate to high potential to occur (refer Figure 6.2 - note that one of these four species, the Murray Cod, currently has limited publicly available data on its distribution, therefore is not represented on this figure).

iii Groundwater-dependent ecosystems (GDEs)

The Groundwater Dependent Ecosystems Atlas predicted that three PCTs may be present in the downstream aquatic study area that could represent terrestrial GDEs. Of the predicted terrestrial GDEs, PCT 1307 may represent Box Gum Woodland. One aquatic GDE, the Border Rivers, was predicted.

No databases are available in NSW which catalogue the presence of subterranean fauna; however, based on a brief literature review, it is possible that stygofauna may occur within the aquatic study area, with a number of stygobitic groups recorded from six sub-catchments of the Border Rivers catchment and from varying geologies and salinities.

Further assessment of groundwater availability and changes to groundwater following construction will need to be undertaken to inform a more detailed GDE assessment. Further assessment of whether the aquatic study area supports aquatic and/or subterranean GDEs will also be required as part of the EIS stage.



Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2017); OEH (2015); DPI (2013)

*Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.

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KEY

- Project footprint
- Main road
- Local road
- Vehicular track
- Watercourse/drainage line
- Potential threatened ecological community
- PCT | Not Native
- PCT1 | Candidate Native Grasslands
- PCT516 | Grey Box grassy woodland or open forest of the Nandewar Bioregion and New England Tableland Bioregion
- PCT549 | Silver-leaved Ironbark - Black Cypress Pine +/- White Box shrubby open forest mainly in the northern Nandewar Bioregion
- PCT564 | White Cypress Pine - Silver-leaved Ironbark - Caley's Ironbark open forest of the central Nandewar Bioregion and western New England Tableland Bioregion
- PCT594 | Silver-leaved Ironbark - White Cypress Pine shrubby open forest of Brigalow Belt South Bioregion and Nandewar
- PCT596 | Tumbledown Red Gum - White Cypress Pine - Silver-leaved Ironbark shrubby woodland mainly in the northern Nandewar Bioregion
- PCT599 | Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion
- PCT84 | River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South and Nandewar Bioregions

Plant community type mapping

Mole River Dam Project
Scoping report
Figure 6.1

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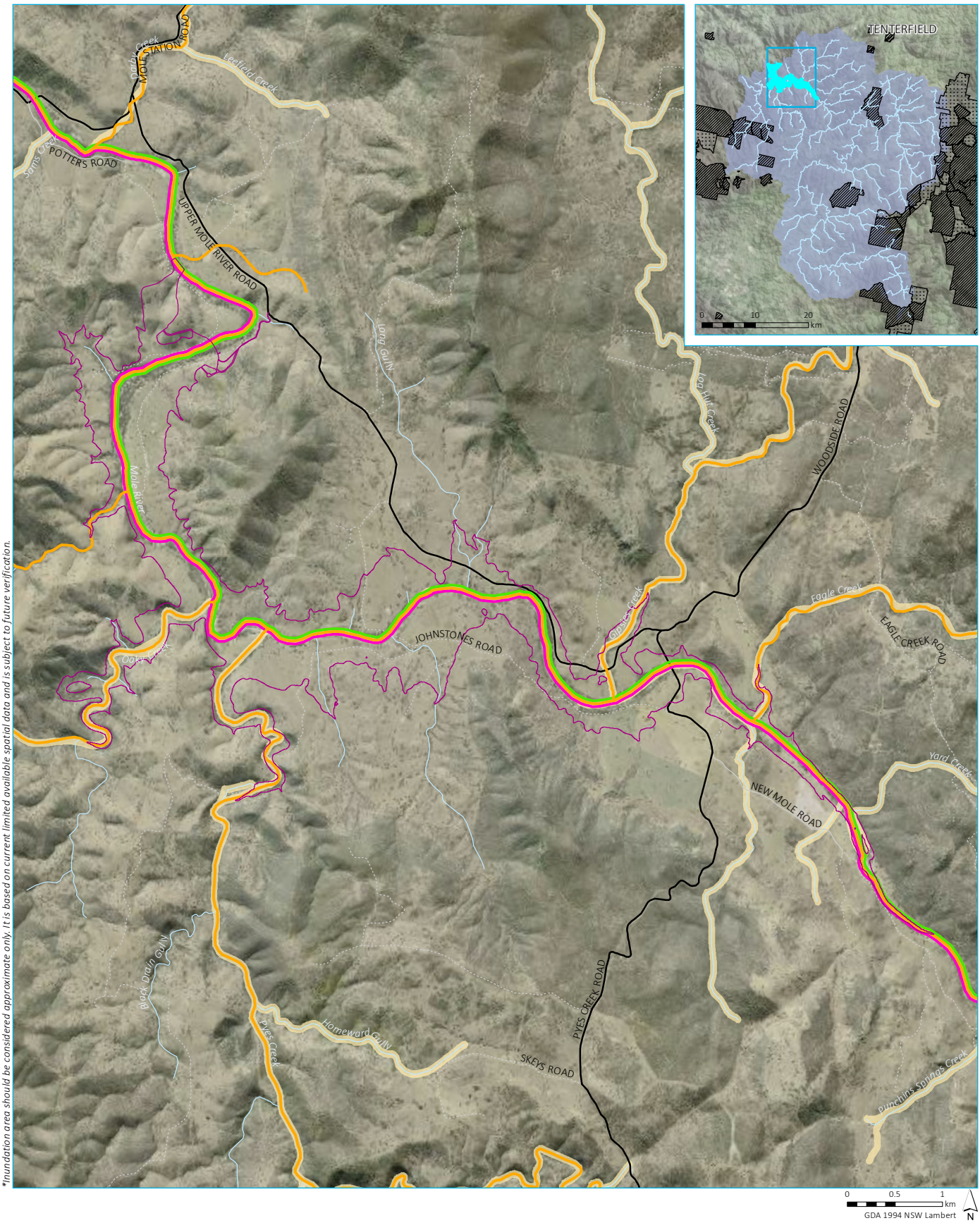

Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2013); DPI (2009, 2013); BoM (2011)

**Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.*

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KEY

- Project footprint
- Main road
- Local road
- Vehicular track
- Watercourse (Strahler stream order 3 and above)
- State forest (refer to inset)
- NPWS reserve (refer to inset)
- Mole River Dam catchment (refer to inset)
- Key fish habitat

Aquatic species

- Eel Tailed Catfish
- Macquarie Perch
- Purple Spotted Gudgeon

Aquatic habitat and species

Mole River Dam Project
Scoping report
Figure 6.2

EMM
creating opportunities

6.2.2 Issues for consideration

The main impacts of the Mole River Dam project will be associated with direct impacts arising from the clearing works for construction of the project, including inundation of the upstream environment up to the proposed FSL. Potential direct impacts rising from the project include:

- impact on native vegetation, including TECs;
- impact on threatened species habitat; and
- disturbance/inundation of waterways.

In addition to the direct impacts arising from the project, a number of indirect, prescribed and uncertain impacts, as described in the BAM (OEH 2017), may also result. Indirect impacts include disturbance of fauna species due to increased noise, vibration and dust, lighting impacts, increase in weeds, pathogens and pest and predatory animals, impediments to fish passage and changes in downstream flow regimes that may impact aquatic ecosystems, species and habitats.

Measures to avoid, minimise and mitigate impacts will need to be considered during design and further environmental assessment undertaken as a part of the EIS. Any residual impacts would need to be offset.

6.2.3 Approach to assessment in EIS

An assessment of the biodiversity values and the likely biodiversity impacts of the project will be undertaken in accordance with the BC Act, FM Act and EPBC Act. Terrestrial ecology will be assessed in accordance with the Biodiversity Assessment Method (BAM) and be documented in a Biodiversity Development Assessment Report (BDAR). Aquatic ecology will be assessed in accordance with the FM Act and documented in an aquatic ecology assessment.

Further assessment of groundwater availability and changes to groundwater following construction will need to be undertaken to inform a more detailed GDE assessment. Further assessment of whether the aquatic study area that supports aquatic and/or subterranean GDEs will also be required as part of the EIS stage.

The assessment of biodiversity would be undertaken in accordance with relevant NSW and Commonwealth legislation and guidelines, including:

- *Commonwealth EPBC 1.1 Significant Impact Guidelines – Matters of National Environmental Significance* (Commonwealth of Australia 2013);
- *Commonwealth Department of the Environment – survey guidelines for nationally threatened species* (various);
- *Biodiversity Assessment Method* (OEH 2017);
- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004);
- *Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians* (DECC 2009);
- *Policy and guidelines for fish habitat conservation and management* (DPI 2013);
- *NSW Biodiversity Offsets Policy for Major Projects. Fact Sheet: Aquatic biodiversity* (DPI 2014);
- *Survey guidelines for Australia's threatened fish* (DSEWPC 2011); and
- *NSW Guide to Surveying Threatened Plants* (OEH 2016).

The BAM stipulates when surveys are required for native species. Surveys for the project would be undertaken within seasonal timeframes where possible and presence will be assumed for species where surveys cannot be undertaken.

6.3 Heritage

A preliminary assessment of Aboriginal cultural heritage and historic heritage has been prepared. The assessment is provided in Appendix C and can be referred to for further detail on existing heritage values and considerations for detailed assessments to be carried out for the EIS.

6.3.1 Existing environment

The project footprint is characterised by a steep sided valley centred upon Mole River. Notably, most valley floor landform elements (river flood plains, rises and spurs and foot slopes) of the project footprint are on the northern side of Mole River. Whereas, with some exceptions, the southern side of Mole River within the project footprint abuts steep rocky scarp and scree slopes.

The project footprint is characterised by thickly grassed paddocks interspersed with predominately native regrowth trees focussed on riparian corridors and steep scree slopes, and occasional mature or dead native trees. Accordingly, ground surface visibility conditions for archaeological material is very low.

Outcropping of granitic geology occurs frequently across the project footprint and wider project area. Prominent crests and spurs are characterised by outcropping granite ranging from most commonly small angular boulders to occasional tors with monolithic appearance. Cliff lines and large cliff-side boulders occur on steep to precipitous slopes, but no obvious overhangs have been identified.

i Aboriginal cultural heritage

Ethnographic records indicate that occupation of the project footprint was most likely associated with closely related groups the *Ngarabal* people in the west and south and the *Jukambal* people towards the east and north. The Aboriginal community in Tenterfield LGA has two main language groups: the *Kamilaroi* (*Gamilaraay* and *Gamilaroi*) people and the *Bundjalung* (*Bunjalung, Badjalang* and *Bandjalang*) people and falls within the jurisdiction of the Moombahlene Local Aboriginal Land Council (LALC) (TSC 2020).

In 1991, Rich and Rosen completed a survey of the project footprint as part of a preliminary constraints assessment for two previously proposed dam options. The assessment concluded that the Mole River Valley was a focus for Aboriginal occupation. Sites identified as part of the study were predominantly along the eroding banks of tributary streams and on spurs above the confluences of streams. Close to Mole River, sites were also found on rises and hills above the flood plain.

One previously recorded stone artefact scatter (AHIMS 12-1-0013) and one open camp site (AHIMS 12-1-0014) have been recorded within the project footprint, and a further six occur within 500 m. These sites were identified as part of the survey performed by Rich and Rosen (1991). No Aboriginal objects were identified as part of a site inspection of publicly accessible locations as part of scoping phase investigation for the project. It is considered unlikely that the results of the site inspection reflect an absence of Aboriginal objects, as the survey was only completed for a limited portion of the project footprint.

Landscape observations indicate that Aboriginal sites such as rock shelters, grinding grooves and Aboriginal scar trees have limited potential to occur within the project footprint.

ii Historic heritage

European occupation of the New England Tablelands began in the 1830s with squatters and pastoralists moving into the region, reaching the Tenterfield area by 1839 (Commonwealth of Australia 1924, p. 172).

Selector's and squatter's huts, a tin mining site, agricultural equipment, and *Alister* homestead have been identified within the inundation zone of the proposed Mole River dam. These sites and items are from all phases of the historical occupation of Mole Station and the Mole River Holding and represent the evolution of land use in the Mole Valley from c.1847 to the present day.

6.3.2 Issues for consideration

i Aboriginal cultural heritage

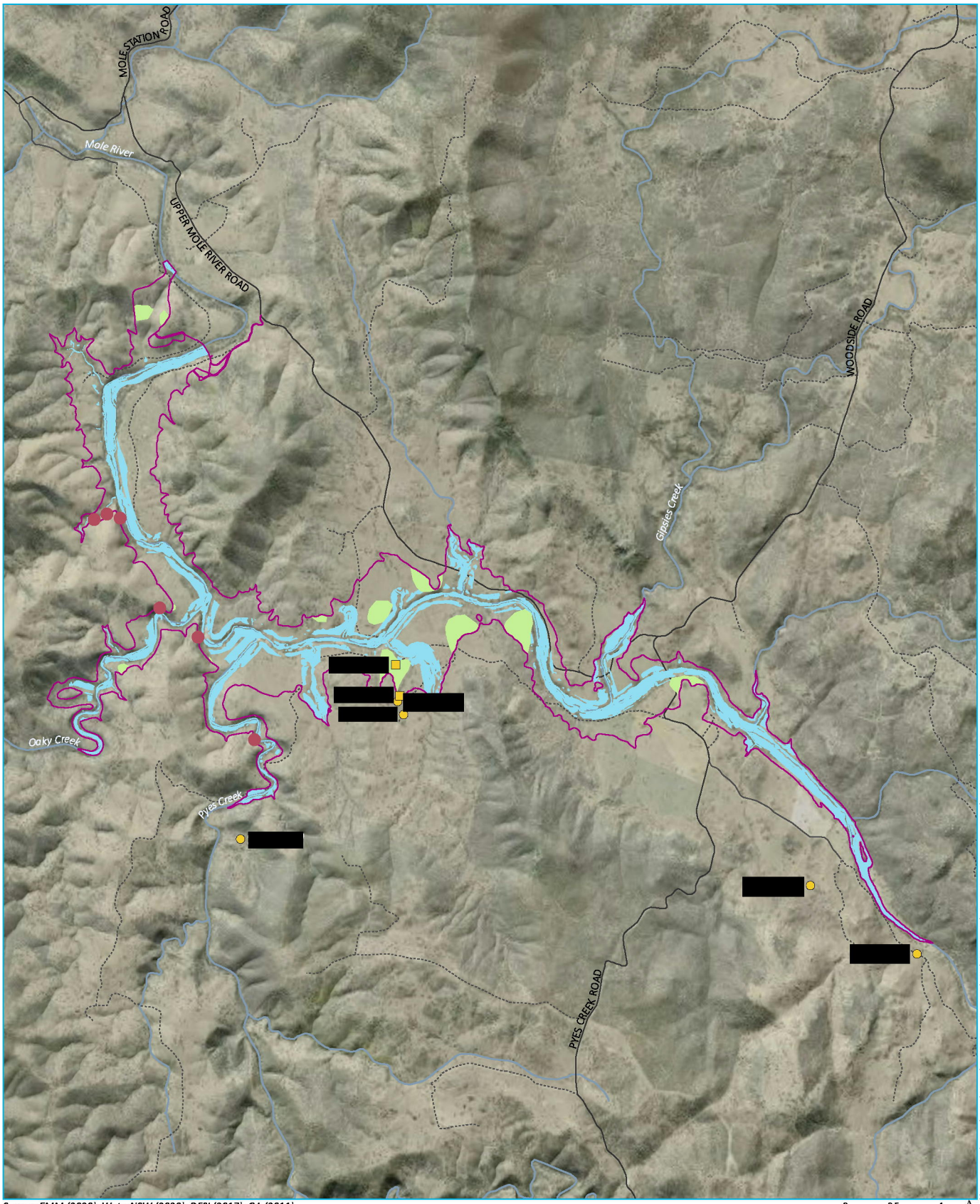
The project has the potential to impact Aboriginal heritage during construction as a result of clearing and earthworks and other construction activities as well as during operation as a result of inundation.

It is anticipated that the project will affect primarily stone artefact sites associated with transient or longer-term open camp activities. As the project footprint is centred on a primary watercourse in the region, it is likely to have accommodated Aboriginal occupation and provided abundant food and material resources. Depending on the nature of soils present on particular landforms, stone artefacts may be present in both surface and sub-surface contexts on elevated landforms adjacent to watercourses.

Given the low ground surface visibility across the project footprint, it is unlikely that substantive archaeological material will be visible in future systematic surveys and would be best characterised through archaeological excavation.

ii Historic heritage

Although no specific sites or places of historic heritage significance have been identified, the project footprint has potential for a range of early European relics, structures and landscapes that (if present) may prove to be significant. The identification and characterisation of these relics and sites is essential to reduce the potential for impacts to early historic properties, cultural landscapes and/or relics within the project footprint.



Source: EMM (2020); WaterNSW (2020); DFSI (2017); GA (2011)

**Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.*

0 0.5 1 km
GDA 1994 NSW Lambert
N

KEY

- Project footprint
- Main road
- Local road
- Track
- Named watercourse

AHIMS site type

- Within project footprint
- Outside project footprint
- Undefined artefactual site

Area of archaeological potential

- Crest landform
- Level to gently inclined landforms within 100 m of primary watercourse
- Very steep to precipitous terrain

AHIMS sites and areas of archaeological sensitivity

Mole River Dam Project
Scoping report
Figure 6.3

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6.3.3 Approach to assessment in EIS

i Aboriginal cultural heritage

An Aboriginal cultural heritage assessment (ACHA) would be conducted for the EIS. The ACHA will investigate, characterise and assess the significance of cultural material and values within the project footprint and provide guidance on its management and mitigation prior to, during and following construction. The ACHA will be developed in consultation with DPIE and Aboriginal stakeholders, with consideration to:

- consultation requirements set out in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a); and
- assessment, survey and reporting requirements set out in the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).

ii Historic heritage

A heritage assessment and statement of heritage impact (SoHI) will be prepared as part of the EIS and will investigate significance and assess impacts arising from the project. The assessment would include a review and synthesis of the historical context of the area based on primary and secondary sources, including historical maps and various published and unpublished sources (eg academic theses and consultant reports).

The assessment of historic heritage would be undertaken in accordance with the principles of the A*ustralia ICOMOS Burra Charter* (Australia ICOMOS 2013a) and its relevant Practice Notes (Australia ICOMOS 2013b, 2013c, 2017). It would also comply with the *NSW Heritage Manual* (1996) and its various updates and other guidelines published by the NSW Heritage Office (1996, 2001, 2009).

6.4 Land

6.4.1 Existing environment

The project area is on the boundary of two bioregions, being the New England Tablelands bioregion to the east and the Nandewar bioregion to the west. Towards the eastern portion of the project area and associated with the New England Tablelands bioregion, the geology consists of primary Tertiary (65 to 2.5 million years ago) basalt flows. These flows have since eroded to reveal mostly Carboniferous (358 to 298 million years ago) and Permian (298 to 251 million years ago) aged sedimentary rock which form the New England fold belt. The Nandewar bioregion is located on the western edge of the New England fold belt and consists of mostly Palaeozoic sedimentary rocks.

The shallow geology of the project area consists of the Permian aged Clive Adamellite formation, including mostly granitoid course-grained igneous rock, which is visible as sporadic outcropping across the project area. As a result, the soil of the project area consists of harsh texture contrast soils with yellow clay subsoils mixed with the gritty and shallow profile of the granite rock.

High level soil mapping of the project area identifies multiple soil types present, including mostly lithosols, yellow podzolic soils and earthy sands and smaller amounts of yellow earths and solodic soils. It should be noted that the soil landscape of the project area is not identified on eSPADE (DPIE 2018).

The topography immediately surrounding Mole River is flat valley floor, which has historically been used for agricultural purposes.

Existing land uses in and around the inundation area include:

- a number of sparsely located residences upstream of the proposed dam;
- pastureland currently or previously used for livestock grazing;
- rural landholdings and structures associated with past agricultural activities;
- a number of existing local roads, including Pyes Creek Road, Johnstones Road, Woodside Road, and Upper Mole River Road; and
- potentially other local roads and other services/infrastructure.

Land that would be impacted within the project footprint is predominantly free hold.

6.4.2 Issues for consideration

The project footprint spans across a number of soil types including yellow earths, yellow podzolic soils, lithosols and earthy sands are present. Generally, the subsoil of these soil types are highly dispersive, weak and erodible during and after rainfall events.

The erosion hazard will vary across these soil types, and during rainfall events, rill, gully or sheet erosion may occur. Considering the soil may be disturbed due to construction works and during operation due to inundation, this may result in sediment contaminating surface water and ultimately nearby waterways.

A search of the Australian Soils Resource Information System (CSIRO 2014) indicated that majority of the project footprint is located on lands within acid sulfate soil class B4, meaning there is a low probability or very low confidence of acid sulfate soils. The south-eastern corner of the project footprint is located on lands within acid sulfate soil class C4, meaning there is extremely low probability or low confidence of acid sulfate soils. Therefore, there is a low risk of implications associated with acid sulfate soils occurring during construction and operation of the project.

The project also has the potential to impact on existing land uses. Partial or complete inundation of agricultural land may impact the viability of some land holdings and there is potential for impacts to existing road and other services/infrastructure in the inundation area.

6.4.3 Approach to assessment in EIS

Field investigations will be undertaken as part of the EIS to inform the assessment of potential risk to the environment. A Soil and Water Management Plan would be prepared in accordance with *Managing Urban Stormwater: Soils and construction, 4th Edition* (Landcom, 2004) (The Blue Book).

Partial or complete inundation of agricultural land may impact the viability of some land holdings and as such the assessment of impacts to land use will be undertaken in combination with the social impact assessment and include consideration of potential economic impacts.

6.5 Hazards and risks

6.5.1 Dam safety

i Existing Environment

The proposed location for the dam wall is located immediately upstream of a number of private residences. Further downstream beyond the private residence is agricultural land, private properties and residences, as well as public infrastructure such as roads and bridges and the township of Mingoola.

ii Issues for consideration

Dam safety management is paramount to protect life, property and the environment from dam failure. Dam failure can cause extensive damage to properties and loss of life. Dam failure can occur during probable maximum flood events due to overtopping or inadequate spillway design, as the function of the spillway is to prevent the dam from failure due to overtopping. Protection of downstream properties and infrastructure is a key consideration. Environmental considerations are also a factor as the downstream environment includes an aquatic EEC.

The project will require construction of a new dam wall and spillway. The design and construction of the dam and spillway will need to meet Dam Safety regulatory requirements and will need to demonstrate:

- the proposed dam will not lead to dam failure;
- that flood risks during construction and operation will not be increased; and
- that public safety risks downstream of the dam have been identified and mitigated through design and dam management.

In addition, constructing the dam will necessitate changes to Water Sharing Rules and operating licences once completed, as well as development and implementation of a Dam Safety Management System, plans and flood operational rules.

iii Approach to assessment in EIS

The EIS will assess dam safety to ensure public safety risks have been identified and mitigated through design and dam management. The assessment will be undertaken with reference to ANCOLD (2003) Guidelines on Risk Assessment and Dams Safety NSW regulations and guidelines and be informed by:

- development of operation rules to cover normal operation, flood operation and environmental flows;
- confirmation of probable maximum flood events;
- dam break modelling – to simulate and predict dam break scenarios; and
- failure mode analysis – to consider all potential failure modes so all contingencies can be accounted for in the design.

6.5.2 Contamination

i Existing environment

The NSW EPA Contaminated Sites Register lists both former and current contaminated sites which have had regulatory involvement. A search of the register did not identify any sites within the project footprint. Further, under the POEO Act a register of current and surrendered licences is also maintained by EPA. The search of the register did not identify any sites within a 500 m buffer of the project footprint.

No evidence of historic landfills has been identified within the project footprint. Notwithstanding, rural property owners may have buried, burned or disposed waste materials on private land with the project footprint.

Several derelict mines and/or quarries have been identified in proximity to the project footprint (Figure 6.4):

- Pyes Creek deposit (underground mine);
- Alister and Nagles deposit (pits);
- Reynolds and Browns deposit (pits);
- Britz deposit (underground mine); and
- Waylins prospect (underground mine).

A number of reports relating to the mining and processing of ore in general proximity to the project footprint have been identified. The reports primarily focus on legacy contamination issues associated with the historical mining of arsenopyrite at the Mole River arsenic mine in the 1920s and 1930s. It is noted the Mole River mine is located several kilometres downstream of the project footprint near the junction with Sam's Creek. Given the Mole River mine is located downstream of the project footprint, direct impacts to the project appear unlikely.

ii Issues for consideration

No land uses have been identified in close proximity to the inundation area that are likely to have caused considerable or widespread soil, surface water or groundwater contamination.

Contamination-related implications for the project are related to potentially localised point sources/areas of contamination associated with derelict mine sites and localised waste burial on private land.

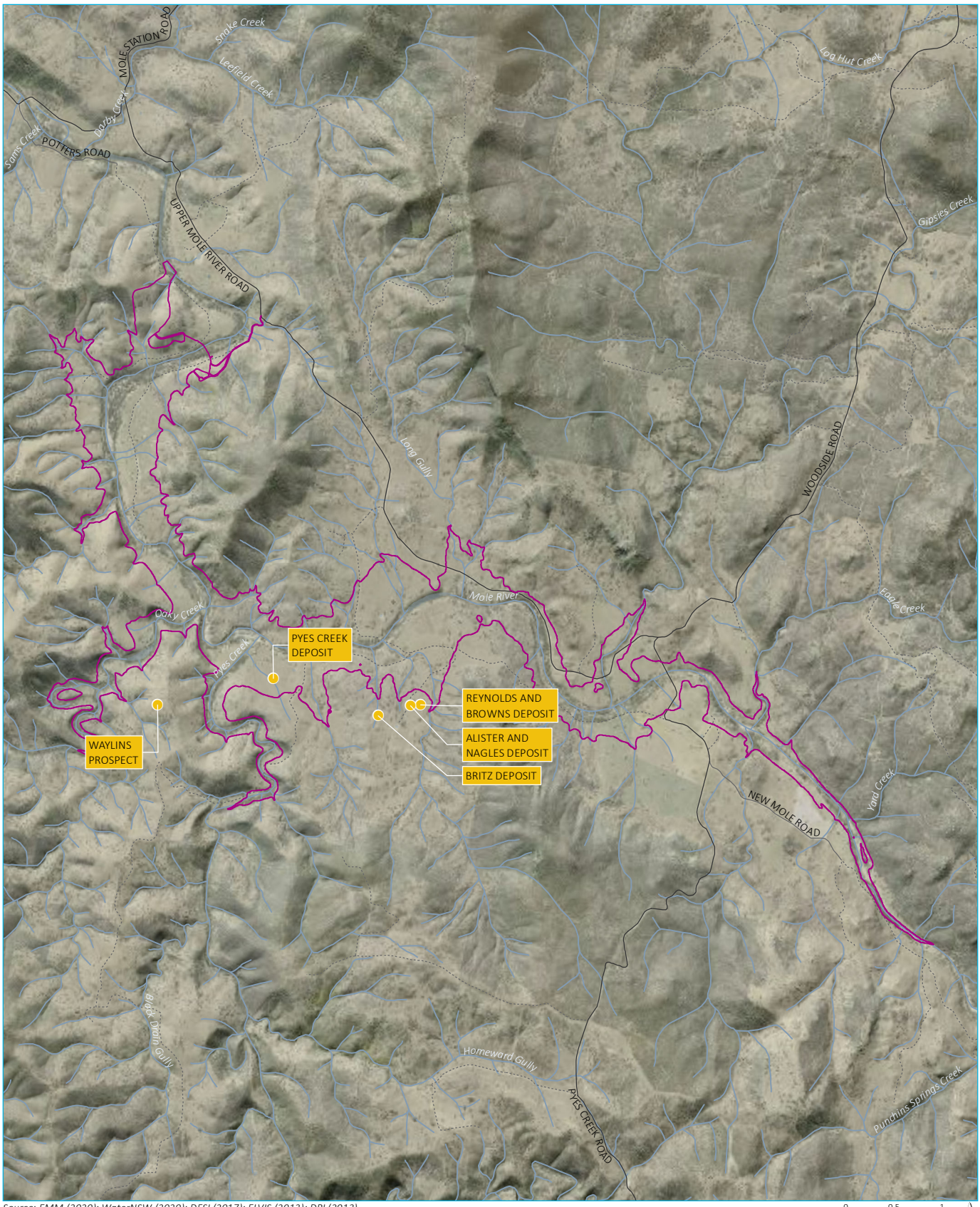
Legacy contamination associated with derelict mine sites will require further investigation and assessment, remediation and/or management to mitigate risks to human health and/or ecological risks associated with the construction and operation of the project. Further, historical waste disposal activities on private land may present a risk to water quality within the impoundment, if not remediated.

iii Approach to assessment in EIS

A contamination assessment of the project footprint will be completed as part of the EIS. The preliminary site investigation will include consideration of the existing environment and a review of the site history, identification of current or historical contaminating activities and potential receptors (including landholdings likely to be inundated as a result of the project). The assessment will provide key measures for managing soils during construction, operations and decommissioning.

The following government guidelines will be considered where relevant during the preparation of the EIS:

- *Acid Sulfate Soils Assessment Guidelines* (Department of Planning 2008);
- *Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning 1998);
- *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage 2000);
- *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom 2004);
- *Managing Urban Stormwater: Soils and Construction Volume 2* (Department of Environment and Climate Change 2009a);
- *Guidelines on the Duty to Report Contamination under the CLM Act* (Department of Environment and Climate Change 2008); and
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ 2000).



Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2013); DPI (2013)

**Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.*

0 0.5 1 km

GDA 1994 NSW Lambert

N

KEY

- Project footprint
- Derelict mines and quarries
- Main road
- Local road
- Track
- Watercourse
- Waterbody

Historic mine/quarry sites

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Scoping report
Figure 6.4

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6.6 Social and economic

6.6.1 Existing environment

The largest town within proximity of the project is Tenterfield, approximately 23 km north-east of the dam wall, with the suburbs of Mole River, Woodside and Silent Grove also within the project's social area of influence. The majority of project infrastructure and potential for impacts to private landholdings and existing structures and services are adjacent to, or within approximately 700 m of, the existing alignment of Mole River.

A large number of businesses in the surrounding area are associated with agriculture; the sector which provides the largest contribution of gross regional product and employment for the region (RDANI 2016). Other important contributors to the region are retail, construction, health care, accommodation and food services and manufacturing. The region experiences greater than average unemployment rates.

6.6.2 Issues for consideration

An influx of workers to the region and locality would be expected during construction, which would increase demand for accommodation, community services and other social infrastructure and facilities. These potential impacts could be both positive and negative. With positive impacts associated with economic benefits provided by local and regional business opportunities and contribution and negative impacts associated with local disruption to some parts of the community.

Construction activities at the dam wall and surrounds will result in amenity (noise and visual) impacts. These impacts, while temporary, could occur over several years. This prolonged period may affect the health and wellbeing of residents within proximity of the dam wall and social cohesion more broadly.

Based on a review of aerial imagery, it is anticipated that a number of private residences and outbuildings will be inundated by the FSL, resulting in displacement of these residents. The displacement of members of the local community from their homes and properties and removal/relocation of existing services and structures (including a number of different access roads) have potential to adversely affect the local community fabric.

6.6.3 Approach to assessment in EIS

An economic assessment will be undertaken to demonstrate the regional and local economic benefits of the project during construction. The assessment will also consider changes to the regional economy during operation due to the permanent loss of property uses upstream as a result of inundation as well as the benefits of improved water security for users.

A social impact assessment (SIA) will be undertaken to define the project's area of social influence and identify the potential social impacts. The SIA will recommend mitigation, management and monitoring measures where required. The assessment will be undertaken generally in accordance with the principles of the NSW Government's (2017) *Social Impact Assessment Guideline for State Significant Mining, Petroleum Production and Extractive Industry Development*. The key objectives of the SIA will be to:

- understand the area of social influence through development of a social profile and collection of qualitative and quantitative data;
- predict and analyse the potential direct and indirect impacts (positive and negative) of the project including impacts on access to, and demand for, local social services and infrastructure including on-site and off-site housing requirements (primarily for construction staff);

- consider the social consequences resulting from the findings of other technical investigations such as investigations into noise, air quality, surface water and traffic to identify potential amenity impacts as well as the outcomes of the economic assessment; and
- develop appropriate mitigation and enhancement strategies.

The establishment of the area of social influence will be undertaken as the first phase of the SIA.

6.7 Other issues

6.7.1 Transport and access

i Existing environment

The project footprint is accessible from the north via the Bruxner Highway and Upper Mole River Road from the north-west or Woodside Road from north-east, or from the south via the New England Highway and Pyes Creek Road or Bluff River Road and New Mole Road.

The local and regional road network is shown on Figure 6.5. There are no State roads within the immediate vicinity of the inundation area. The Bruxner Highway is the closest state road and is approximately 8 km north of the inundation area. The New England Highway is approximately 13 km east of the inundation area. Both the Bruxner Highway and New England Highway are approved B-double routes for up to 25-26 m.

All local roads are owned by Tenterfield Shire Council, including Pyes Creek Road, Johnstons Road, Woodside Road, Bluff River Road, New Mole Road and Upper Mole River Road.

Given the low population density within the project area, existing traffic levels in the area are low and generally limited to local residents and tourists.

ii Issues for consideration

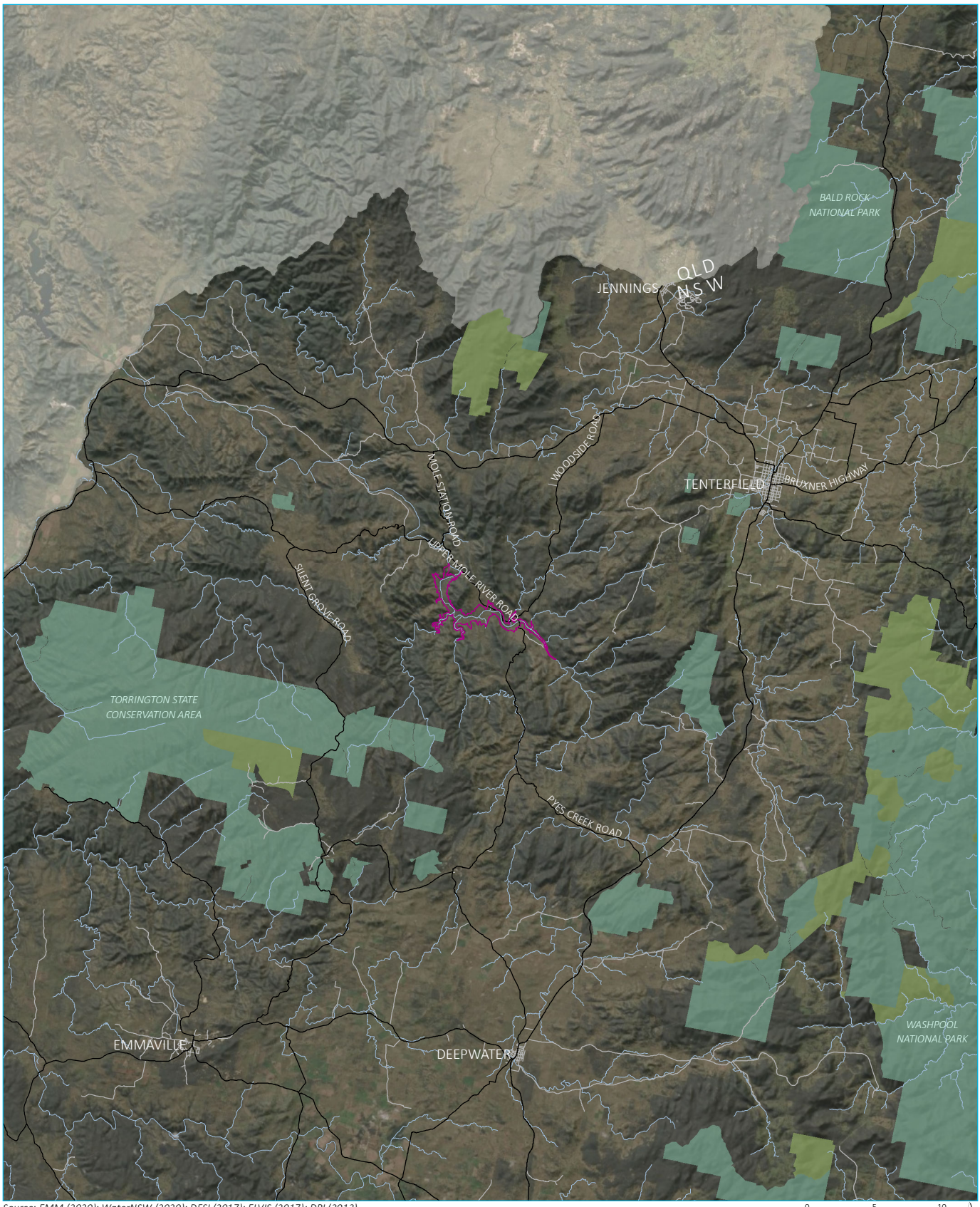
The project will result in an increase in light and heavy vehicle traffic volumes on the local road network, primarily within the vicinity of the proposed dam wall. Heavy vehicles will transport construction materials to site and will also be used to transport waste materials away from site.

Impacts on the local road network will be temporary and largely restricted to construction. At this stage, it is likely that the major transportation routes during construction will include the road network closer to Tenterfield, including Woodside Road and Bruxner Highway. However, other route options may also be explored and will be known once the source of construction materials has been determined.

Once operational, no significant traffic or access impacts are anticipated.

iii Approach to assessment in EIS

Direct impacts within the project area will be due to inundation of some local roads. Consultation with Tenterfield Shire Council will be required to determine any relocation or upgrade requirements. Inundation will also impact on access roads for some rural land holders. An assessment of impacts on existing road infrastructure and road users and determination of access requirements during construction and operations will be undertaken as part of the EIS.



Source: EMM (2020); WaterNSW (2020); DFSI (2017); ELVIS (2017); DPI (2013)

*Inundation area should be considered approximate only. It is based on current limited available spatial data and is subject to future verification.

0 5 10 km

GDA 1994 NSW Lambert

N

KEY

- Project footprint
- Main road
- Local road
- Named watercourse
- NPWS reserve
- State forest

Local road network

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Scoping report
Figure 6.5

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6.7.2 Air

i Existing environment

The area surrounding the inundation area is sparsely populated. The closest receptor to the project footprint appears to be a rural property approximately 340 m north-east of the proposed scour protection works. A number of residences appear to be located upstream of the proposed dam, either within or adjacent to the inundation area.

The project is located in an area typical of a rural environment and air quality is generally considered to be good. A few air pollutants are likely to be emitted from the surrounding residential and rural land holdings. Recent bushfires along the eastern coast of Australia have caused poor air quality in many parts of NSW.

ii Issues for consideration

Temporary air quality impacts are expected within and surrounding the inundation area. Site establishment and construction of the project will result in disturbance of soil and generation of dust due to vehicles driving on unsealed roads and directly from construction activities. Dust, or particulate matter, is expected to be the primary air quality impact. Construction plant and equipment, including vehicles required to transport staff and materials to the site will also contribute to combustion-related pollutants.

Air quality impacts during operations will be limited and will include minor and occasional vehicle movements and potential plant emissions associated with maintenance and inspection of project infrastructure.

iii Approach to assessment in EIS

An air quality impact assessment will be undertaken as part of the preparation of the EIS and will assess the potential impacts of dust emissions during construction on sensitive receivers. The assessment will identify potential air quality impacts associated with the project in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2016), which lists the statutory methods for modelling and assessing emissions of air pollutants from stationary sources in NSW. No assessment of potential air quality impacts during operations is proposed.

While likely to be minor, annual greenhouse gas emissions for both construction and operations will be considered using the National Greenhouse Accounts Factors (DoEE 2018).

6.7.3 Amenity

i Existing environment

Based on a review of available aerial imagery, the inundation area is broadly characterised as a landform pattern of hills centred around the valley formed by Mole River. The inundation area boundaries are typically defined by steep, rocky hill slopes and crests, whereas the landscape closer to the channel of Mole River features more gentle slopes, spurs, foot slopes and valley flats.

The project footprint has been extensively cleared of native vegetation to accommodate grazing. The landscape within and adjacent to the project footprint is not densely populated and no significant tourist vantage points or conservation areas have been identified.

The ambient noise environment in the vicinity of the project is likely to be predominantly characterised by natural elements with occasional human influences associated with general agricultural activities.

A number of residences have been identified in the landscape surrounding the project footprint. The closest receptor to the project footprint appears to be a rural property approximately 340 m north-east of the proposed scour protection works.

ii Issues for consideration

During construction, the landscape within the project footprint will undergo a number of physical changes, namely through the installation of project infrastructure, including the dam embankment and intake tower/bridges. The project infrastructure will add new features to the visual landscape at this location, which will result in a high degree of contrast to the surrounding rural setting.

The preliminary design identifies the dam embankment and intake tower/bridges will be substantially elevated compared to the surrounding existing surface levels, along with a large spillway that will extend through a saddle in the existing topography. The introduction of this new infrastructure will modify the existing environment and result in a permanent change to the visual landscape for nearby receptors, potentially including the nearest residences and local road users.

The topography of the local area heavily influences the potential impacts to visual amenity as a result of the project; however, it is noted that the area of inundation is not in a visually prominent location.

The primary noise impacts will occur during construction as a result of construction plant and equipment, construction activities and increased vehicle movements. Noise impacts may also be experienced during the relocation of services and structures likely to be affected by the project.

It is currently not known if any blasting would be required during dam construction, which will require confirmation during subsequent work stages.

iii Approach to assessment in EIS

A landscape and visual impact assessment will be prepared as part of the EIS. The assessment will consider potential changes to landscape character and visual impacts (including lighting impacts) resulting from the construction and operation of the project, in relation to identified sensitive receptors.

All construction activities are proposed during standard daytime construction hours in accordance with the *Interim Construction Noise Guideline* (ICNG) (DECC 2009b). There are not likely to be noise impacts associated with the ongoing operation of the project. As such, a construction only quantitative noise assessment will be carried out in accordance with the ICNG. If blasting is to be undertaken during construction, potential blasting and vibration impacts would require assessment as part of the construction noise assessment. Operational impacts will be considered qualitatively in the EIS.

6.7.4 Hazards and risks

i Bushfire

The project is located within the Northern Tablelands Bush Fire Management Zone. The bush fire season within proximity of the project footprint generally runs from August to March each year. The main sources of ignition reported in the Northern Tablelands Bush Fire Management Zone are lightning strikes and escaped private burns.

Construction of the project has the potential to result in unplanned fires, creating a risk to project staff as well as to members of the public. Key considerations include potential sources of ignition (eg machinery and equipment) and ensuring adequate construction standards and asset protection zones.

The potential for bushfire hazard and risk impacts will be investigated further through the EIS with consideration of the relevant guidelines and standards, including the NSW RFS (2006) *Planning for Bush Fire Protection* and the *Northern Tablelands Bush Fire Risk Management Plan* (Northern Tablelands BFMC 2018).

ii Waste

It is anticipated that the project will produce a number of waste streams during construction. Minor quantities of waste will also continue to be generated by the day-to-day operation of the project.

Waste will also be generated as part of decommissioning at the end of the project's operational life and the relocation of services and structures affected by the FSL.

Waste streams likely to be generated during the construction and ongoing operation of the project will include:

- rock excavated as part of the spillway construction that can't be beneficially reused;
- cardboard packaging, plastic wrapping, plastic ties, wood pallets and other timber offcuts for project infrastructure components;
- general waste from the construction compound, operations and management buildings;
- comingled recycling;
- oily rags, filters and drums (primarily during construction);
- waste batteries; and
- confidential documents.

In addition, consideration of the temporary and/or permanent storage of excavated material generated during construction of the additional embankment is required. Potential impacts from poor management of waste include contamination of land and water, and human and animal health impacts.

7 Proposed community engagement during the EIS

7.1 Overview of approach

WaterNSW is implementing a tailored framework for stakeholder engagement and communication for the project. A broad engagement framework and schedule has been mapped to support delivery of the project as shown in Figure 7.1.

A staged approach was developed by WaterNSW as part of the early consultation program (Phase 1 and 2) to allow response to initial community interest to the project following the government announcements made earlier in October 2019. The focus of EIS engagement will be during Phase 3 and Phase 4, with ongoing community engagement anticipated throughout the project's construction.

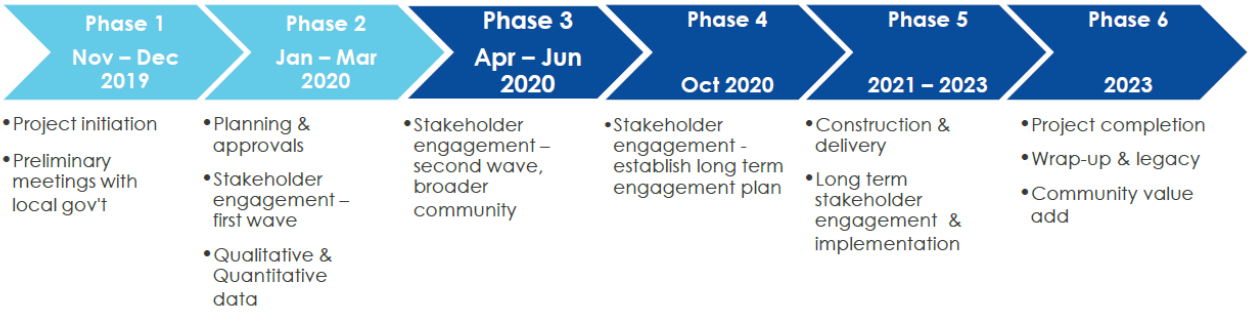

Figure 7.1 WaterNSW's phased community and stakeholder approach

The proposed approach is designed to progressively build the quality and depth of WaterNSW's conversation with stakeholders, set a basis for future engagement and support the project program. WaterNSW principles around stakeholder engagement are that it would be two-way, genuine communication and interaction with clear and accurate information, be timely, accessible, inclusive and sustainable, with stakeholders encouraged to become long-term partners.

7.1.1 Identified stakeholder groups

Early consultation has identified a number of key stakeholder groups. The broad stakeholder groups identified are:

- land holders;
- Aboriginal groups, including Moombahlene Local Aboriginal Land Council;
- industry and interest groups, including business, tourism, recreation, utilities and other interests;
- government, including local, state and Commonwealth Members of Parliament and regulatory authorities;
- general public; and
- media.

Future consultation and engagement activities will further identify and map individual community and stakeholders with an interest in or likely to be impacted by the project.

7.1.2 WaterNSW guiding principles

As part of initial planning, WaterNSW has developed a series of guiding principles to deliver the project. Given the projects are critical in ensuring water security, the project timeframes are aggressive and require a tailored approach for specific stakeholder groups to ensure a depth of engagement is achieved to support the overall delivery of the project. The guiding principles are described below.

The WaterNSW Way guiding principles

- Stakeholder and community engagement must, above all, be genuine and respectful, and tailored to the specific needs of stakeholders to avoid generic low-value activity
- Local community benefits will be maximised with capabilities in local regions identified and utilised where possible
- A 'no surprises' approach will be undertaken to ensure key stakeholders are briefed according to a set of agreed engagement, communication and media protocols
- Issues will be considered not just from WaterNSW perspective but also from a stakeholder view – a 'walk in their shoes' approach
- WaterNSW will listen, will be fact based in its communication and engagement, and will aim to have a comprehensive understanding of stakeholder issues
- WaterNSW will ensure internal conversations are held regularly and coordination achieved to avoid stakeholders being exposed to siloed thinking and 'corporate speak'
- Baseline community (quantitative) and stakeholder (qualitative) sentiment will be established, followed up with ongoing regular research and monitoring to ensure the performance of the WaterNSW engagement, and to provide the ability to continue to tailor the engagement plan to meet emerging issues
- WaterNSW will be committed to the requirements of the plan, to stay the course for the long term and to be an active partner with stakeholders.

7.2 Engagement during the EIS

WaterNSW has developed a specific engagement action plan for Mole River Dam that will outline the specific methods and timing for its implementation.

Engagement targeted specifically for the Mole River Dam project leading up to the EIS exhibition will comprise:

- community briefings to be held in key local communities;
- discussions with affected and potentially affected land holders;
- engagement with Aboriginal stakeholders, groups, and organisations around mobilisation for opportunities associated with the project EIS (in line with the Aboriginal engagement communication strategy, see below);
- intergovernmental meetings with key representatives from DAWE, DPIE and other government agencies; and
- media briefings.

A broader Aboriginal engagement communication strategy is currently being implemented and aims to ensure early and close engagement with the Aboriginal community and provide a framework for ongoing consultation. The strategy involves:

- identifying key Aboriginal stakeholder for each region and establish points of contact;
- documenting any key issues or areas of concern raised during initial discussions;
- identifying key community areas or projects that may provide opportunity for integration into the project; and
- identifying interests and ideas raised by stakeholders about future involvement in the assessment process, and subsequent stages of the project (such as construction).

A comprehensive schedule of community participation and engagement will be developed. The following opportunities for when and how the community can be involved in the planning, design and environmental assessment phases of the project are likely to include:

- Attendance at community information sessions – to be announced;
- Participation in community sentiment analysis via qualitative and quantitative research;
- Community Reference Group meetings;
- Aboriginal Reference Group meetings;
- Cohort of key opinion leader meetings;
- Interest group round table meetings;
- Location engagement such as site tours / walkthrough Q&A opportunities, event tie-ins;
- Environmental Impact Statement (EIS) consultation during the exhibition of the documentation; and
- Via DPIE through making a submission on the project during the EIS public exhibition.

Project information will be provided to the local community and targeted stakeholders via the following:

- Directly with the local community through face-to-face meetings or community events;
- Directly with Aboriginal groups (identified through Aboriginal engagement communication strategy) through face-to-face meetings;
- Mail and/or email to local community and key stakeholders registering an interest;
- Mail and/or email to WaterNSW customers;
- Mole River Dam pages on the WaterNSW website (www.waternsw.com.au);
- Social media including WaterNSW Facebook page; and

A project email address to directly respond to concerns and enquiries (MoleRiverDam@waternsw.com.au as well as projects@waternsw.com.au).

8 References

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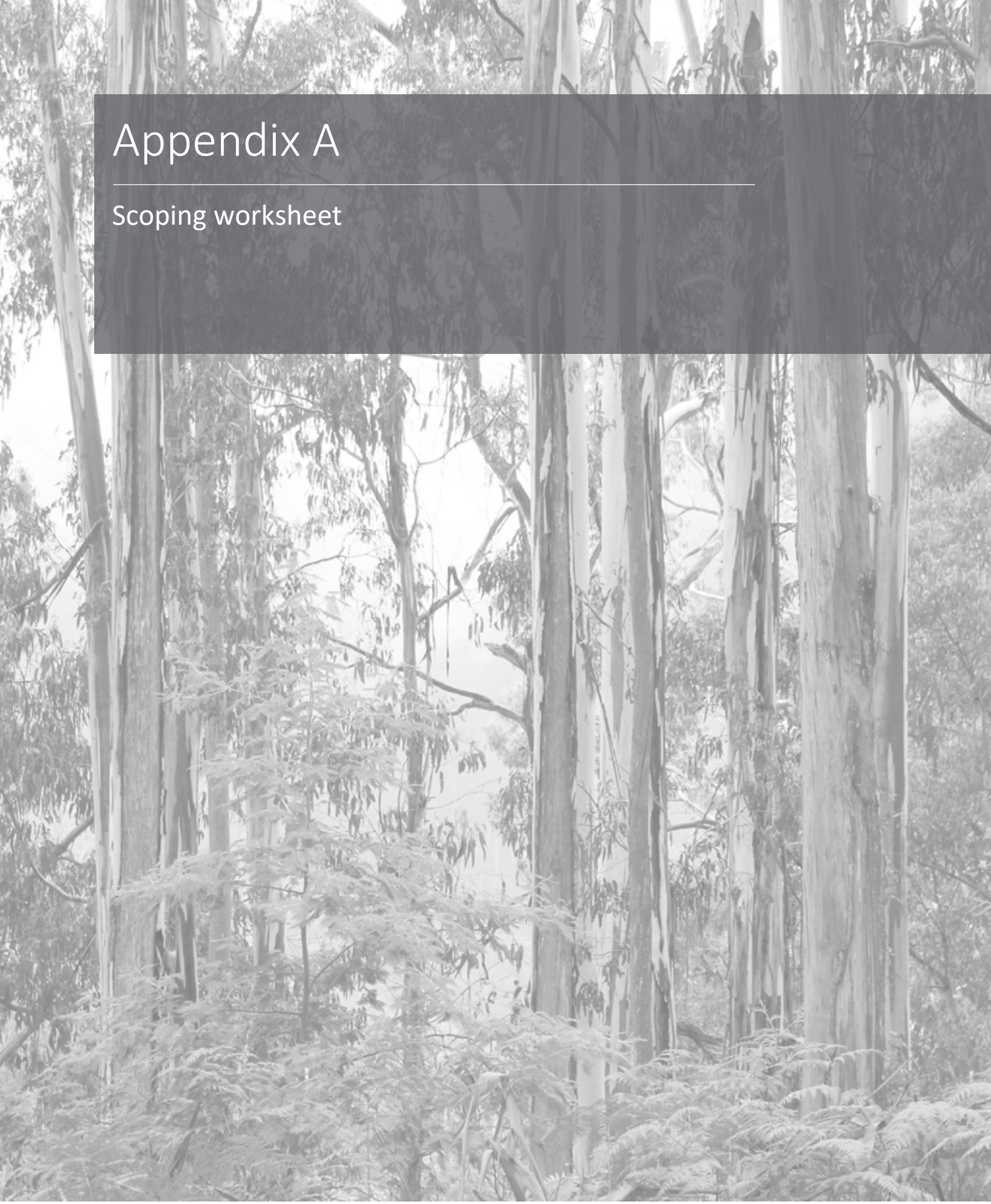

Appendix A

Scoping worksheet

Project : J190822 **Scoping Report Mole River Dam: Appendix A Scoping worksheet**

MATTERS		IMPACTS		ASSESSMENT LEVEL	CUMULATIVE IMPACTS	COMMUNITY ISSUES	ASSESSMENT APPROACH	SCOPING REPORT
Potential matters that could be affected by the project		Is the project (without mitigation) likely to cause an impact?	Are the impacts (without mitigation) likely to be significant based on the magnitude of the impacts and/or sensitivity of receivers?	What level of assessment is required to assess impacts and determine mitigation measures?	Will cumulative assessment be required?	Did the community raise any concerns about the impacts?	Indicative approach to assessment in EIS	Where was this addressed in the Scoping Report?
Group	**Specific**	**Impact?**	**Significant Impact?**	**Assessment Level**	**Cumulative**	**Concerns?**	**Category**	**Section**
ACCESS	access to property	Yes	Unknown			Yes	Scoping Report with focussed engagement	Section 2.3, Section 6.7.1
	parking	No				No	None (include short explanation in Scoping Report)	N/A
	port / airport facilities	No				No	None (include short explanation in Scoping Report)	Section 5.2.3
	road / rail network	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.7.1
	other - please specify	N/A					None (include short explanation in Scoping Report)	
AIR	atmospheric emissions	Unknown	Unlikely			No	Scoping Report	Section 6.7.2
	gases	Unknown	Unlikely			No	Scoping Report	Section 6.7.2
	particulate matter	Unknown	Likely	Standard	No	No	Standard Assessment	Section 6.7.2
	other - please specify	N/A					None (include short explanation in Scoping Report)	
AMENITY	noise	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.7.3
	odour	No				No	None (include short explanation in Scoping Report)	N/A
	vibration	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.7.3
	visual	Yes	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.7.3
	other - please specify	N/A					None (include short explanation in Scoping Report)	
BIODIVERSITY	conservation areas	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.7.3
	native vegetation	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.2
	native fauna	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.2
	other - please specify	N/A					None (include short explanation in Scoping Report)	
BUILT ENVIRONMENT	private property	Yes	Likely	Standard	No	No	Standard Assessment	Section 3.2.2
	public domain	Yes	Unknown	Standard	No	No	Standard Assessment	Section 3.2.2
	public infrastructure	Yes	Unknown	Standard	No	No	Standard Assessment	Section 3.2.2, Section 6.4, Section 6.7.1
	other - please specify	N/A					None (include short explanation in Scoping Report)	
ECONOMIC	livelihood	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	natural resource use	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	opportunity cost	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	other - please specify	N/A					None (include short explanation in Scoping Report)	
HAZARDS & RISKS	biosecurity	Unknown	Unlikely			No	Scoping Report	N/A
	bush fire	Yes	Unknown	Standard		No	Scoping Report	Section 6.7.4
	coastal hazards	No				No	None (include short explanation in Scoping Report)	Section 5.2.3
	dams	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.5.1
	dangerous goods	Unknown	Unknown	Standard		No	Scoping Report	Section 4.1.6
	environmental hazards	Unknown	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.5, Section 6.7.4
	floods	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.1
	groundwater contamination	Unknown	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.5.2, Section 6.1, Section 6.7.4
	hazardous / offensive development	No				No	None (include short explanation in Scoping Report)	Section 5.2.3
	land contamination	Unknown	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.5.2, Section 6.7.4
	land movement	Unknown	Unknown	Standard	No	No	Standard Assessment	Section 6.4.2
	waste	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.7.4, Section 6.5.2
	other - please specify	N/A					None (include short explanation in Scoping Report)	
HERITAGE	Aboriginal cultural	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.3
	historic	Yes	Unknown	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.3
	natural	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.3
	other - please specify	N/A					None (include short explanation in Scoping Report)	
LAND	land capability	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.4
	soil chemistry	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.4
	stability / structure	Yes	Unknown	Standard	No	No	Standard Assessment	Section 6.4
	topography	Unknown	Unknown	Standard	No	No	Standard Assessment	Section 6.4
	other - please specify	N/A					None (include short explanation in Scoping Report)	
SOCIAL	community services / facilities	Unknown	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	health	Unknown	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	housing availability	Unknown	Unknown	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6.6
	safety	Unknown	Unknown	Standard	No	No	Standard Assessment	Section 6.6
	social cohesion	Yes	Likely	Detailed	No	Yes	Detailed Assessment with focussed engagement	Section 6.6
	other - please specify	N/A					None (include short explanation in Scoping Report)	
WATER	ground water quality	Yes	Unknown	Detailed	No	No	Detailed Assessment	Section 6.1
	hydrological flows (including flooding)	Yes	Likely	Detailed	No	No	Detailed Assessment	Section 6.1
	surface water quality	Yes	Likely	Detailed	No	No	Detailed Assessment	Section 6.1
	water availability	Yes	Likely	Detailed	No	No	Detailed Assessment	Section 3.1, Section 3.3 Section 6.1, Section 6.2.1
	other - please specify	N/A					None (include short explanation in Scoping Report)	