CONTENTS

TABLES

FIGURES

7. LAND USE AND INFRASTRUCTURE

This Chapter addresses Section 3.2.4.1 of the ToR identifying the land use, land tenure (including mining and petroleum and gas tenements), areas covered by applications for Native Title claims and infrastructure within the Project area.

The Chapter also identifies the existing State, regional and local planning frameworks. Section 7.1 provides an in depth profile of the existing land use, land tenure and infrastructure within the Project area, while Section 7.2 identifies the potential impacts of the Project on these aspects and recommends appropriate mitigation measures.

7.1. Description of environmental values

7.1.1. Methodology

The description of land use, tenure, infrastructure and planning frameworks is based on a desktop assessment of the following:

- existing land uses and existing infrastructure (including site inspection);
- land tenure including mining tenements; and
- relevant legislation and State, regional and local planning frameworks.

7.1.1.1. Land use

The Australian Land Use and Management (ALUM) system (2006) is used to describe land uses in this section. The ALUM system is nationally recognised and is used for collecting and presenting land use information and identifies 32 land use categories with sub-categories. The ALUM data used to create mapping within this section was dated 1999-2005, and therefore changes to land uses may have occurred since that time. Observations from the site inspection have been used to confirm and update this data.

7.1.1.2. Land tenure

Land tenure is described in this section using the Digital Cadastral Data Base (DCDB) Tenure Codes held by DERM. This database identifies property tenure which in Queensland includes two tenure types of freehold, and non-freehold. In general terms, freehold land refers to land purchased from the State and affords the titleholder the highest level of independence in terms of land uses and possession. Non-freehold land is controlled by the State and may be subject to a lease, licence or reserved for a particular purpose such as a community use or road. Non-freehold land may also have no tenure.

Mining tenures are identified in this Chapter and include exploration permits, mineral development licences, mining leases, authority to prospect (ATP), potential commercial areas (PCA) and petroleum leases. Exploration permits, mineral development licences and mining leases are granted as an environmental authority (mining activities) under the *Mineral Resources Act 1989*, while ATPs, PCAs and petroleum leases are granted as petroleum authorities under the *Petroleum and Gas (Production and Safety) Act 2004*. It is important to note that because mining activities and petroleum and gas tenements are controlled under different Acts, these tenures can overlap and thus affect potential land use.

7.1.2. Dam and surrounds

This section provides a description of the dam and surrounds in regard to the planning frameworks, existing land uses, tenure and infrastructure.

7.1.2.1. State planning framework

The *Sustainable Planning Act 2009* (SP Act), under Section 766, has transitional provisions which allow the continuation of State planning regulatory provisions in force under the repealed *Integrated Planning Act 1997* (IPA). The provisions of the SP Act enable the State Government to prepare and adopt State Planning Policies (SPPs). The SPPs are statutory instruments and have effect throughout the State, except where specified, and establish the State Government's position in regard to planning and development matters of State significance.

Generally, SPPs are applicable in assessing development applications, the designation of community infrastructure and making and amending planning schemes. Some elements of the Project may require a development application under the SP Act and the nature of the works involved in these applications may trigger the consideration of one or more SPPs.

The SPPs potentially relevant to the Project are:

- SPP 1/92: Development and Conservation of Agricultural Land (SPP 1/92);
- SPP 1/03: Mitigation and Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03); and
- each of these SPPs outlined above are supported by a guideline that provides advice and information on interpreting and implementing the SPP.

SPP 1/92 Development and Conservation of Agricultural Land

SPP1/92 is potentially relevant to the Project as the predominant land uses within the Project area are agriculture and grazing. The key objective of SPP 1/92 is the protection of Good Quality Agricultural Land (GQAL). GQAL is land which is capable of sustainable agricultural use (i.e. crops and animal production, excluding intensive animal uses and plant nurseries) without causing degradation of land or other natural resources.

'Guideline 1 for SPP 1/92: The Identification of GQAL' describes the four tier classification system used to identify those areas considered to be GQAL. A large proportion of the dam and surrounds is not classified as GQAL. However, the upper areas towards Taroom contain Class A GQAL, while areas on the north and south bank surrounding the existing Glebe Weir contain both Class A and Class C GQAL, Figure 6-5. Further discussion of GQAL and potential impacts are provided in Chapter 6.

SPP1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

This SPP aims to mitigate the adverse impacts of flood, bushfire and landslide when making decisions about development. It is supported by 'Guidelines for SPP 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide', which provides advice on interpreting and implementing SPP 1/03 in development assessment and when making and amending planning schemes.

The SPP applies to development in the bushfire, flood hazard and landslide natural hazard management areas identified under the SPP or a natural hazard area under a local government planning scheme. The purpose of the SPP is to protect life and property from these hazards. Further information regarding bushfire risks, flooding and landslide is provided in Chapter 3, Chapter 14 and Chapter 26 respectively.

The Project has been considered against the applicable outcomes of the SPP, with comments provided in Table 7-1.

Table 7-1 SPP1/03 Outcomes

State Planning Policy Outcome	Comment
Outcome 1: Within the natural hazard management areas, development to which this SPP applies is compatible with the nature of the natural hazard, except where: ■ the development proposal is a development commitment; or ■ there is an overriding need for the development in the public interest and no other site is suitable and reasonably available for the proposal.	In relation to the dam and surrounds, the Project involves the construction and operation of a dam, whereas this SPP seeks to manage developments which may introduce people and property into a hazard area. Water from the dam will be provided to primarily service coal mines and power stations (and associated urban communities) in the Surat Basin, extending to Dalby. Water will also be released downstream to mines in the Southern Bowen Basin, to customers in the Dawson Valley Water Supply Scheme, and as required to meet critical urban supply needs in the lower Fitzroy and other parts of Queensland in line with the government's objective to establish a state water grid. In addition, the Project has been granted significant project status under the *State Development and Public Works Organisation Act 1971* and the Project is defined as community infrastructure under the SP Act.
Outcome 2: Development that is not compatible with the nature of the natural hazard but is otherwise consistent with Outcome 1 is minimised as far as practicable from adverse impacts from natural hazards, and does not result in an unacceptable risk to people or property.	The Project's susceptibility to natural hazards is addressed in **Chapters 3** and **26**. The Project is designed and will be operated to ensure that the surrounding and downstream communities are not exposed to additional risk of natural hazards.
Outcome 3: Wherever practicable, community infrastructure to which this applies is located and designed to function effectively during and immediately after natural hazard events commensurate with a specified level of risk.	As set out in **Chapter 2,** for the purpose of preliminary design, it has been assumed that the dam and surrounds will be assessed as an Extreme Hazard category dam in accordance with Queensland Dam Safety Management Guidelines (QDSMG) and the definitions given by Australian National Committee on Large Dams (ANCOLD). Accordingly the preliminary design allows sufficient flood discharge to safely pass the Probable Maximum Flood (PMF). The operation phases of the Project will adopt measures to account for climate variability and weather or weather-related extremes. These measures include: ■ design the spillway to pass probable maximum flood for the site; ■ provide for rapid draw-down of the storage in the event of a dam safety emergency; ■ prepare flood management plans for operation; ■ prepare storm management plans; ■ prepare fire management plans for operation; and ■ brief all personnel on safety during extreme weather events and fires.

- Strategic Cropping Land Policy Framework

The Strategic Cropping Land Policy Framework (SCLPF) was released in August 2010 and includes plans to introduce new legislation in 2011. It will require proposed development that may impact on Queensland's best cropping land to be assessed to ensure it does not cause permanent damage. Developments such as coal seam gas, underground coal gasification, mining and urban uses would all be assessed under this new legislation. The legislation will include:

- a new Act specifically for strategic cropping land resources;
- a new State Planning Policy under the SP Act; and
- amendments to existing resources legislation.

Draft Strategic Cropping Land maps have been released under the SCLPF as part of the policy framework and will be finalised with the release of new legislation in 2011. It has been identified that much of the Project is located within Strategic Cropping Land (Figure 6-11 to Figure 6-13)..

7.1.2.2. Regional planning framework

As stated above, the SP Act has transitional provisions which allow the continuation of regional planning instruments in force under the repealed IPA. The SP Act provides for the development of regional plans by the State to provide region-wide guidance for planning schemes and development.

The Central Queensland Regional Growth Management Framework (RGMF) is a non-statutory document that was released in 2002 and covers the section of the Project within the Banana Shire Council area. It also covers Central Highlands Regional Council area, Gladstone Regional Council area (excluding the former Miriam Vale Shire Council local government area), Rockhampton Regional Council area and Woorabinda Aboriginal Community area. At the time of writing this EIS, there are currently no proposals for a new or revised plan for the Central Queensland region.

The RGMF was prepared as an advisory document to establish a strategic framework that provides an integrated approach to managing the future growth and development of the Central Queensland region to the year 2020. The primary goals of the RGMF are to:

- provide an integrated whole of region approach to planning and governance;
- stem the leakage of human and financial capital from this region; and
- position the region in order to maximise the competitive advantage and sustainability of its future.

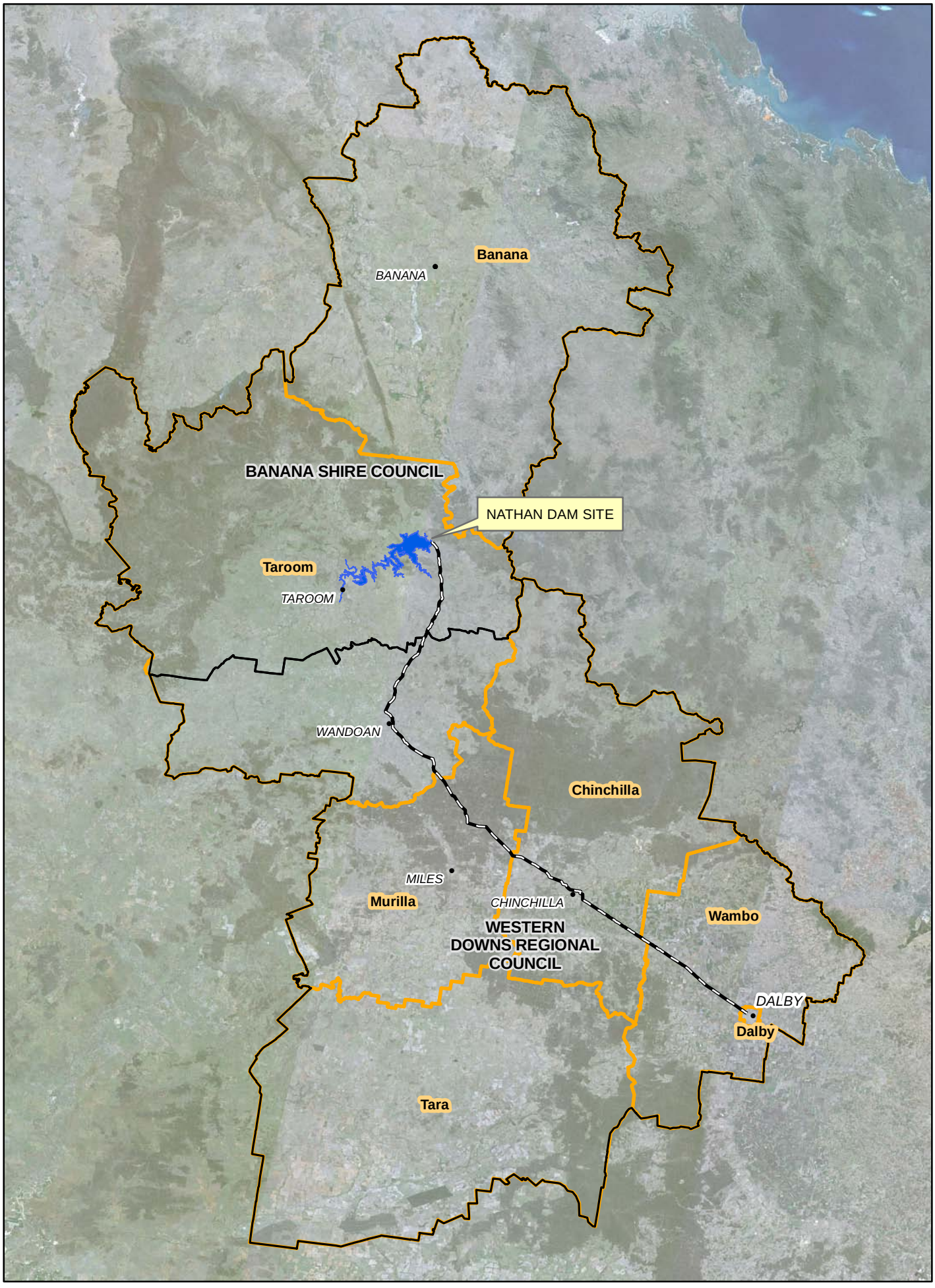
The Banana Shire Council and Western Downs Regional Council local government areas, within which the Project is located, are covered by the RGMF.

Figure 7-1 shows the Project area in the context of the current local government area boundaries and the former local government area boundaries of Taroom, Murilla, Chinchilla, Wambo and Dalby.

Regional Policies

As outlined previously, the regional policies of the RGMF are non-statutory, however, they provide a planning framework through which intended outcomes of the Central Queensland region can be achieved. The following regional policies are of particular relevance to the Project:

- Resource Use, Conservation and Management;
- Economic Development;
- Infrastructure; and
- Social and Cultural Development.



LEGEND

- Towns of Interest
- Proposed Pipeline
- Full Supply Level (183.5m AHD)
- Regional Council Boundary
- Former Local Government Areas

Projection: GDA94 Zone 56

Figure 7-1

0 10 20 40
Kilometres

N

Scale 1:2,000,000 (at A4)

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NATHAN DAM AND PIPELINES EIS

Regional and local government boundaries

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Each of the regional policies of the RGMF is measured through various outcomes. Table 7-2 identifies and provides comments on the relevant regional outcomes in regard to the Project.

Table 7-2 RGMF regional policies and outcomes

Regional Policy	Outcome	Comment
Resource Use, Conservation and Management	The promotion of, and adherence to, best practice land management for sustainable and profitable land use.	This section identifies land uses within the Project area and identifies the potential impacts to land use and mitigation measures. Assessment of GQAL is provided in **Chapter 6**.
	The economic prosperity, competitive advantage and biodiversity of the region are protected from introduced and endemic pests and diseases.	Pest species within the Project area are identified in **Chapters 10**, **11** and **12**. Potential impacts of weed outbreaks during construction are identified in **Chapters 10**, **11** and **12** and mitigation strategies are provided.
	The promotion of, and adherence to, sustainable use of water resources while maintaining and enhancing environmental values.	The proposed dam and water storage aims to foster use of water resources. The ecological values of the area are addressed in **Chapters 9** to **13**. The hydrological values of the area are addressed in **Chapter 14**.
	Socio-economic and environmentally sustainable waste management practices are adopted within the region.	**Chapter 20** identifies the waste that will be generated by the Project and provides strategies for the sustainable management of the generated waste.
	Air quality is maintained at levels which ensure sustainable regional communities, protection of the natural environment and opportunities for continuing economic growth.	**Chapter 17** provides an assessment of the existing air quality within the Project area and identifies the potential impacts of the Project.
	Development takes place with a focus on efficiency to achieve economic progress with minimisation of greenhouse emissions and with an understanding of the potential impact of climatic conditions.	**Chapter 18** provides an assessment of greenhouse gases associated with the Project and identifies mitigation strategies for potential impacts.
	Fisheries resources and fish habitats are managed for sustainable economic and recreational use and conservation of biodiversity.	The water storage area will provide fish habitat and recreation facilities. **Chapter 12** and **13** addresses the values and impacts of the Project on aquatic flora and fauna.
	Biodiversity in terrestrial, freshwater, marine and estuarine ecosystems is maintained, with native species and communities conserved and linked by viable networks of wildlife habitat across the landscape.	The ecological values of the area and impacts of the Project are addressed in **Chapters 9** to **13**. The hydrological values of the area are addressed in **Chapter 14**.
Economic Development	The region supports existing and emerging industries and encourages diversification ensuring growth and a viable and ecologically sustainable economy in the region.	The region consists of a number of land uses including mining operations, farming and grazing operations that support the local economy. The Project will support the mining industry in the area by the provision of a dedicated water supply. Water supply security to existing irrigators will be compliant with legislated requirements (**Chapter 14**). Water may also be supplied to urban areas. Benefits and impacts of the Project on the local and regional economies are discussed in **Chapter 25**.

Regional Policy	Outcome	Comment
	Sustainable and robust forestry based on the conservation of native forests, the development and best practice management of state owned and private plantations, the protection of resources, and the development and maintenance of infrastructure to enable long term use and value-adding to timber produced in Central Queensland.	No part of the Project is located within or traverses State owned or private forestry plantations.
	Sustainable use of fisheries resources and the maintenance of a sustainable and viable aquaculture industry.	**Chapters 12** and **13** address the values and impacts of the Project on aquatic flora and fauna.
	The existence of mineral processing/metal manufacturing activities that build on the extensive mineral and resource deposits in the region that meet existing and emerging markets. The existence of chemical processing industries supported by mining and mineral processing.	The region consists of mining operations that support the local economy. The Project will support the mining industry in the area by the provision of a dedicated water supply. Economic benefits and impacts on the local and regional economy are discussed in **Chapter 25**.
	Continued sustainable growth of the region's tourism experience that contributes to the region's growth and prosperity.	Recreational opportunities have been proposed as part of the Project. These are outlined in **Chapters 2** and **24**.
Infrastructure	Transport infrastructure in the region is adequate to support sustainable regional development with particular reference to settlement patterns, passengers, freight, public safety and environmental impact.	**Chapter 21** provides an assessment of the existing transport modes and routes within the region and identifies potential impacts of the Project and mitigation measures. The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
	Local, regional and state road transport infrastructure throughout the region meets the needs of local communities and industries and supports regional economic development.	**Chapter 21** provides an assessment of the existing transport modes and routes within the region and identifies potential impacts of the Project and mitigation measures for these impacts. The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
	Central Queensland has an efficient rail network that meets the current and future needs of rail customers.	The dam and surrounds is not in the vicinity of rail infrastructure, however, the pipeline route follows the railway easement at various locations. **Chapter 21** outlines the Project's impact on the rail network and provides mitigation measures to ensure the rail network is not adversely affected by the Project.
	Development of water storage and distribution infrastructure within the region's ecologically sustainable limits.	The Project provides for water storage with the need for the Project being outlined in **Chapter 1**. The Project is considered essential for the sustainable growth of the region.

Regional Policy	Outcome	Comment
Social and Cultural Development	Responsive and sustainable social infrastructure and social planning processes that support community needs and development.	**Chapter 24** addresses the social benefits and impacts of the Project. The provision of the water supply will provide employment and recreational opportunities.
	Arts, culture and heritage is visible throughout the region because of the community's emphasis upon identification, utilisation, enhancement, protection and management of the diverse cultural and heritage resources.	Cultural heritage values within the Project area are identified and addressed in **Chapter 22**. Mitigation strategies are provided to protect and manage cultural and heritage resources affected by the Project.

7.1.2.3. Local planning framework

The local government amalgamation process which occurred across Queensland in 2008 resulted in the amalgamation of a number of local government areas into larger regional local government areas. The Project is located within the newly formed Banana Shire Council and Western Downs Regional Council areas.

Banana Shire Council comprises a merger of the former Banana Shire Council and part of the former Taroom Shire Council. The newly formed Western Downs Regional Council comprises a merger of the former local government areas of Chinchilla, Murilla, Taroom (part), Dalby, and Wambo.

Figure 7-1 shows the Banana Shire Council and Western Downs Regional Council areas and the former local government areas.

The SP Act requires local governments to prepare planning schemes (statutory instruments). Given the recent timing of the local government amalgamations, the local planning framework is still based on the planning schemes for the former local government areas. These planning schemes were prepared under the IPA and remain in force under the transitional provisions of the SP Act.

Planning schemes establish a framework for managing growth and development in a local government area. Desired Environmental Outcomes (DEOs) establish the foundation of a planning scheme, expressing the purpose and what the scheme is intended to achieve. Planning schemes cover a broad range of issues including community need, economic activity and nature conservation. The detailed planning requirements and standards included in planning schemes support the achievement of the DEOs and development must not compromise their achievement.

The preferred land use pattern within local government areas are controlled through the inclusion of land in zones and associated development controls, including levels of assessment for particular uses. Importantly, zones and actual land use occurring within them can differ from the particular uses envisaged by a zone.

The dam and surrounds is located wholly within the former Taroom local government area.

- Former Taroom Shire Council

The Taroom Shire Planning Scheme took effect on 22 December 2006 and relates only to the former local government area. This section identifies the relevant DEOs and zones of the Taroom Shire Planning Scheme.

Desired Environmental Outcomes

The Taroom Shire Planning Scheme aims to achieve its DEOs to the extent practicable having regard to each of the other DEOs. Broad sustainable outcomes are reflected in the DEOs, which are grouped under topics reflecting the three strands of ecological sustainability, originally meeting the IPA requirements and SP Act transitional provisions. The DEO categories are:

- The Environment;
- Economic Development; and
- Community and Services.

The DEOs relevant to the Project are listed in Table 7-3.

Under the DEO for Economic Development, productive rural land (GQAL) is required to be protected from incompatible development to reflect and enhance its continued economic potential and viability. GQAL mapping is provided in the Taroom Shire Planning Scheme and identifies that GQAL is prevalent in the eastern and western areas of the dam and surrounds. GQAL is assessed further in Chapter 6.

Table 7-3 Taroom Shire Planning Scheme – desired environmental outcomes

Desired Environmental Outcome	Comment
Development is managed to minimise any adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas, ridgelines and escarpments.	The impacts of the Project on the identified matters are assessed in **Chapters 6** and **9** to **13**. **Chapter 17** assesses the impacts of the Project on air quality. **Chapters 9** to **13** discuss the flora and fauna of the Project area and assess the impacts of the Project.
Protected areas (including Expedition National Park, Isla Gorge National Park, Precipice National Park, Lake Murphy Conservation Park, Carraba Conservation Park, Glen Leigh Environmental Reserve, Expedition Resources Reserve, Stones Country Resources Reserve, Palm Tree Creek – important wetland and Robinson Creek – important wetland) and areas, local items and places of cultural significance (including areas along water courses) are identified to ensure their environmental, landscape values and historic significance are protected and enhanced through compatible development.	Protected areas are identified in this section, while further detail and assessment is provided in **Chapter 9** where the impacts of the Project are assessed.
The Planning Scheme reinforces the roles of Taroom and Wandoan as the principal places for administrative services, business, industry and commerce within the Shire.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The local service role of the small town of Guluguba is protected and enhanced.	The water storage area is approximately 70 km north of Guluguba at its closest point and is not expected to have an impact on the town's service role.

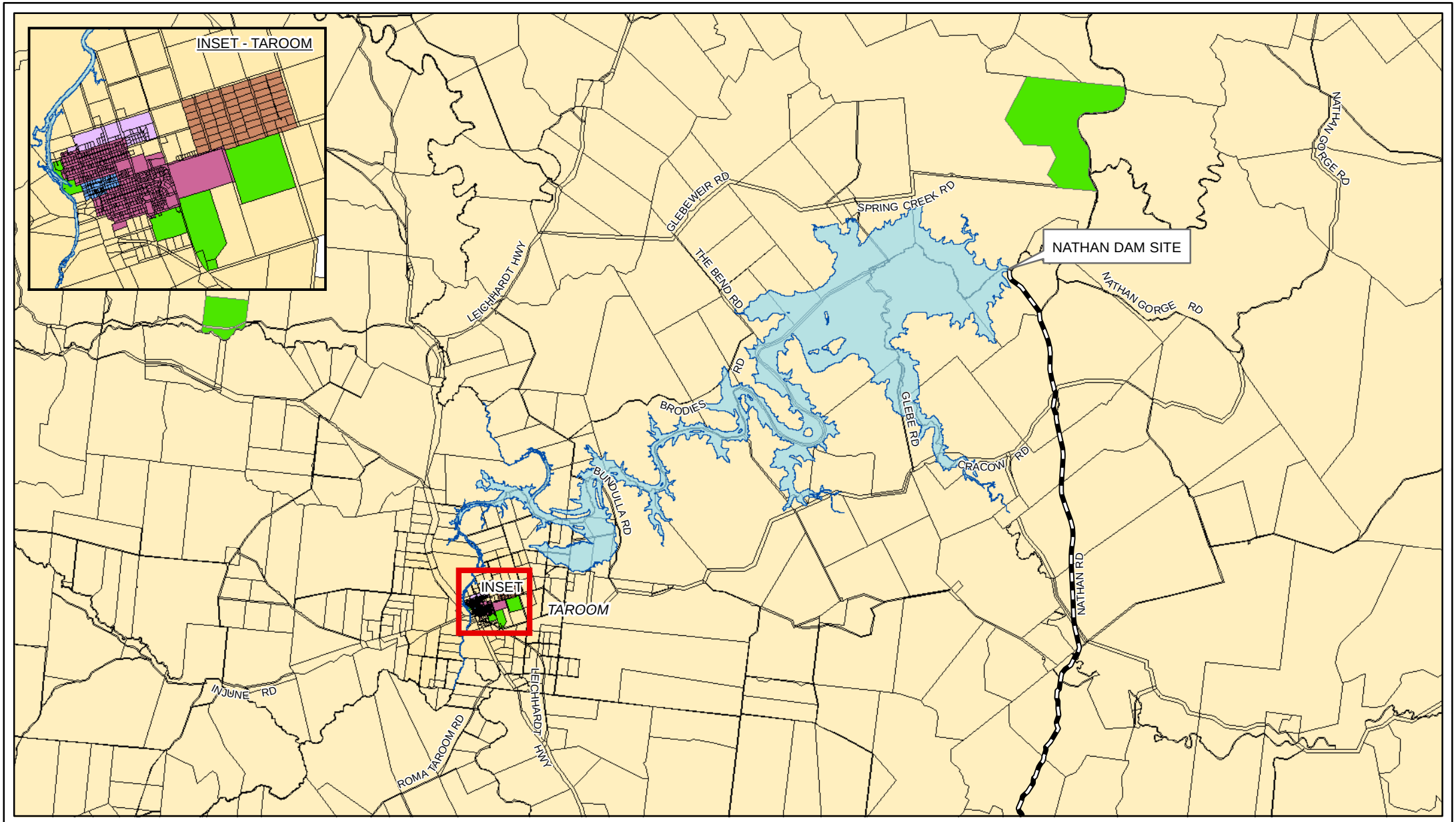
Desired Environmental Outcome	Comment
Productive rural land, rural industries and natural features (including mineral and extractive resources and tourist resources such as National Parks, Reserves, Conservation Parks and Wetlands) are protected to reflect and enhance their continued economic potential and viability.	Assessment of the impacts of the Project considers the loss of GQAL and activities contributing to the local economy. Assessment of GQAL is provided in **Chapter 6**, while **Chapter 25** includes an assessment of the impacts of the Project on the local economy. Strategies are provided to mitigate disruption to the local economy during construction and operation.
The Shire's industrial areas in Taroom and Wandoan are consolidated and protected to ensure their roles as the key areas for industrial activity are reinforced.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The settlement pattern is logical and sequenced and the built environment contributes to the overall rural amenity and character of Taroom Shire.	The settlement pattern of the Taroom Shire will not be influenced by the Project. Nonetheless, **Chapter 5** identifies the potential visual impacts of the Project. **Chapter 24** also addresses potential amenity issues.
People are connected to public spaces (including recreational areas) and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centres of Taroom and Wandoan, and small town of Guluguba.	The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.	This chapter identifies housing types in the Project area through the descriptions of land uses and zones. **Chapter 2** outlines the overall benefits of the Project, while **Chapter 24** provides an assessment of how the Project will affect the social values of the local environment.
Infrastructure (including water, sewerage and roads) reflects community expectations and needs, meets engineering and environmental standards and is provided in an orderly and logical sequence to ensure cost effectiveness.	**Chapter 1** outlines the need for the Project and the socio-economic cost and benefits. **Chapter 2** describes the design and construction of the Project (dam, pipeline and associated infrastructure including roads) to required standards.

Zones

The area for water storage is included predominantly within the Rural 'Zone'. Land immediately adjacent the Dawson River bordered by North Street and Short Street is included within the Open Space and Recreation 'Zone'. The relevant zones are shown in Figure 7-2 for the dam and surrounds. The planning scheme outlines the purpose for each zone and these are provided in Table 7-4. The Rural 'Zone' also incorporates development controls for Protected Areas identified in the planning scheme under Schedule 2, Division 8: Artesian Springs, Section 8.1.

Table 7-4 Taroom Shire Planning Scheme – zones

Zone	Purpose
Rural	Consistent uses include primary production through grazing and farming, while allowable uses included tourist related uses (bed and breakfast premises and visitor accommodation) and intensive animal industries and extractive industries. Industrial uses are supported only where it can be demonstrated that those uses are associated with rural production and cannot reasonably be established in the Industrial Zone. Uses that may have detrimental impacts on existing intensive animal industries, extractive industries or GQAL are not supported.
Open Space and Recreation	Allows for the provision of recreational facilities that protect and enhance the local amenity, and the continued conservation of protected areas. Development in protected areas zoned under the planning scheme as Open Space and Recreation results in minimal impacts on the natural environment and maintains conservation, biodiversity and habitat values.



LEGEND

- Proposed Pipeline
- Full Supply Level (183.5m AHD)
- Cadastre

Zoning

- Commercial
- Industrial
- Open Space and Recreation
- Rural
- Rural Residential
- Urban

Projection: GDA94 Zone 56

Figure 7-2

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

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Zoning - dam and surrounds

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7.1.2.4. Existing land use

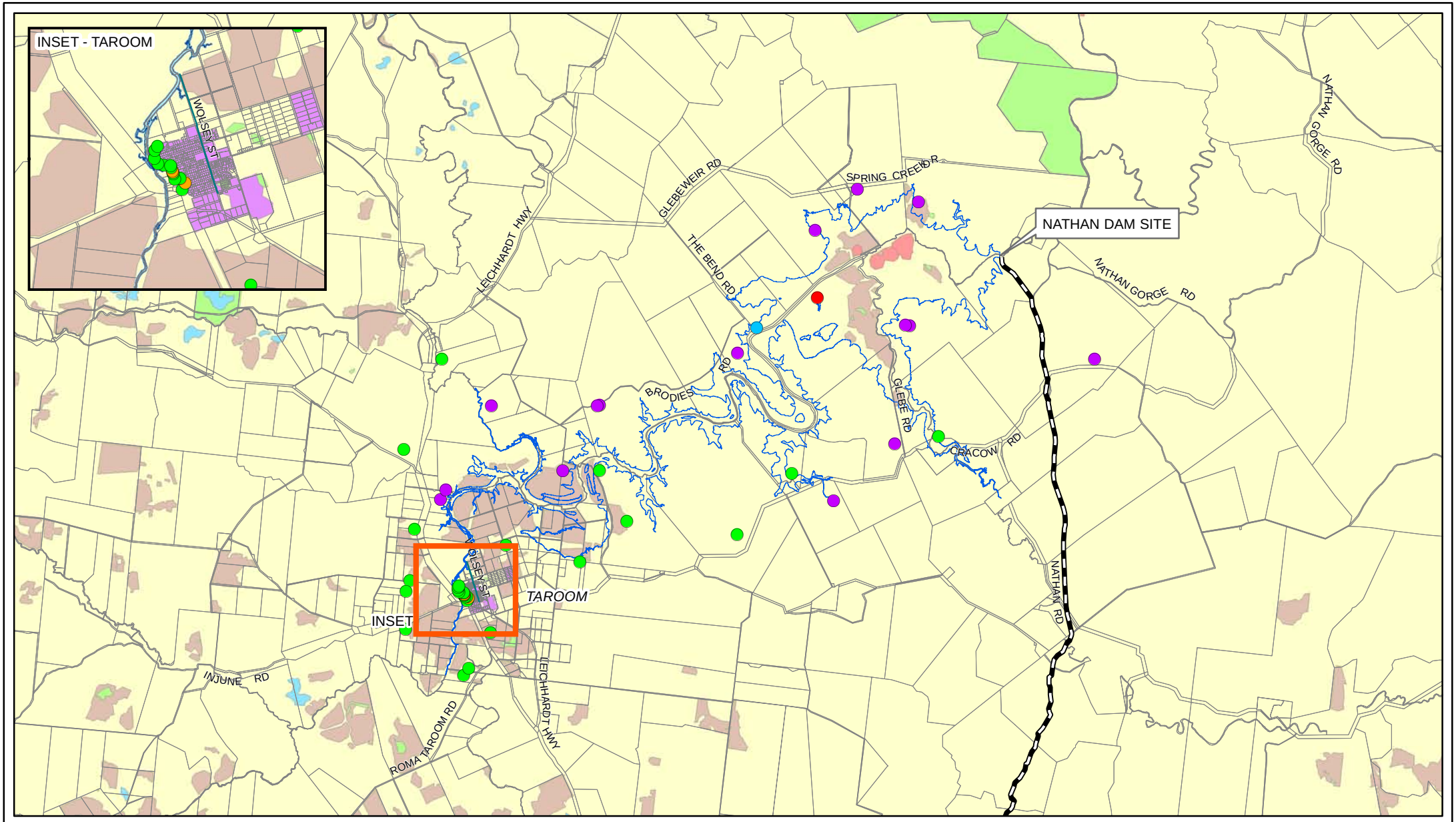
Existing land use within the dam and surrounds are shown in Figure 7-3. Land use within the dam and surrounds is predominantly beef cattle grazing, while land uses on the north and south banks of the Dawson River in the vicinity of the existing Glebe Weir comprise a mixture of irrigated and dryland agriculture (Figure 7-4). Some areas of dryland agriculture and crops occur south of the Dawson River along the western bank of Cockatoo Creek and north-east from Taroom along Bundulla Road.

Land adjacent to the dam wall on the northern bank of the Dawson River has not been cleared or developed and comprises sparse native pastures. Land on the southern bank adjacent to the proposed dam wall has been cleared and comprises a mixture of native and naturalised grasses. Land use downstream of the proposed dam wall is predominantly grazing, however, there are some areas of irrigated agriculture on the banks of the Dawson River north of Spring Creek near Precipice Creek and Dukes Plains Road.

The locality of Cracow with a population of around 120 people is the nearest residential area to the water storage, approximately 23 km north east of the proposed dam wall. The town of Taroom with a population of approximately 630 people is 38 km south-west of the proposed dam wall. Taroom is adjacent to the Dawson River at the water storage upstream limit.

A reserve for recreation and camping activities is located adjacent to Glebe Weir on the northern bank of the Dawson River. Access to this area is via Glebe Weir Road. Other reserves located at Taroom include a dedicated recreation area and walking track on the southern bank of the Dawson River and a larger 'town common' on the northern bank (Figure 7-5).

The water storage impinges upon 74 land parcels of varying sizes, some of which contain residences, sheds and cattle yards. A list of these affected land parcels and areas are provided in Appendix 2A, while impacts to these properties are discussed in Section 7.2.1.2. Two residences are located within the water storage, one of which is abandoned, and four residences will be located between FSL and the Q100 flood level (flood buffer). These residences are shown in Figure 7-3.



LEGEND

- Proposed Pipeline
- Full Supply Level (183.5m AHD)
- Cadastre

Land Use Classification

- Class 1: Conservation and natural environments
- Class 2: Production from relatively natural environments
- Class 3: Production from dryland agriculture and plantations
- Class 4: Production from irrigated agriculture and plantations
- Class 5: Intensive uses
- Class 6: Water

Affected Residences

- Residence below FSL
- Residence below FSL (abandoned)
- Residence between FSL and Q100 Flood
- Residence above Q100 flood on property impacted by FSL
- Residence above Q100 flood on property impacted by Q100 flood

Projection: GDA94 Zone 56

Figure 7-3

0 1 2 4 6
Kilometres

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Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land use dam and surrounds

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Figure 7-4 Irrigated agriculture in the vicinity of Glebe Weir

Figure 7-5 Recreation areas at Taroom

7.1.2.5. Land tenure

Land tenure within the proposed dam and surrounds is shown in Figure 7-6 and is largely freehold (75.6%). However, there are a number of leasehold land parcels on the southern side of the Dawson River fronting Taroom Cracow Road and to the north of Taroom on the northern side of the Dawson River. A small parcel of State land (Lot 15 on LE230) reserved by DERM for Community or Public Purposes is located on the northern bank of the Dawson River on the eastern side of Glebe Weir. This parcel of land is heavily vegetated and does not currently facilitate any land uses.

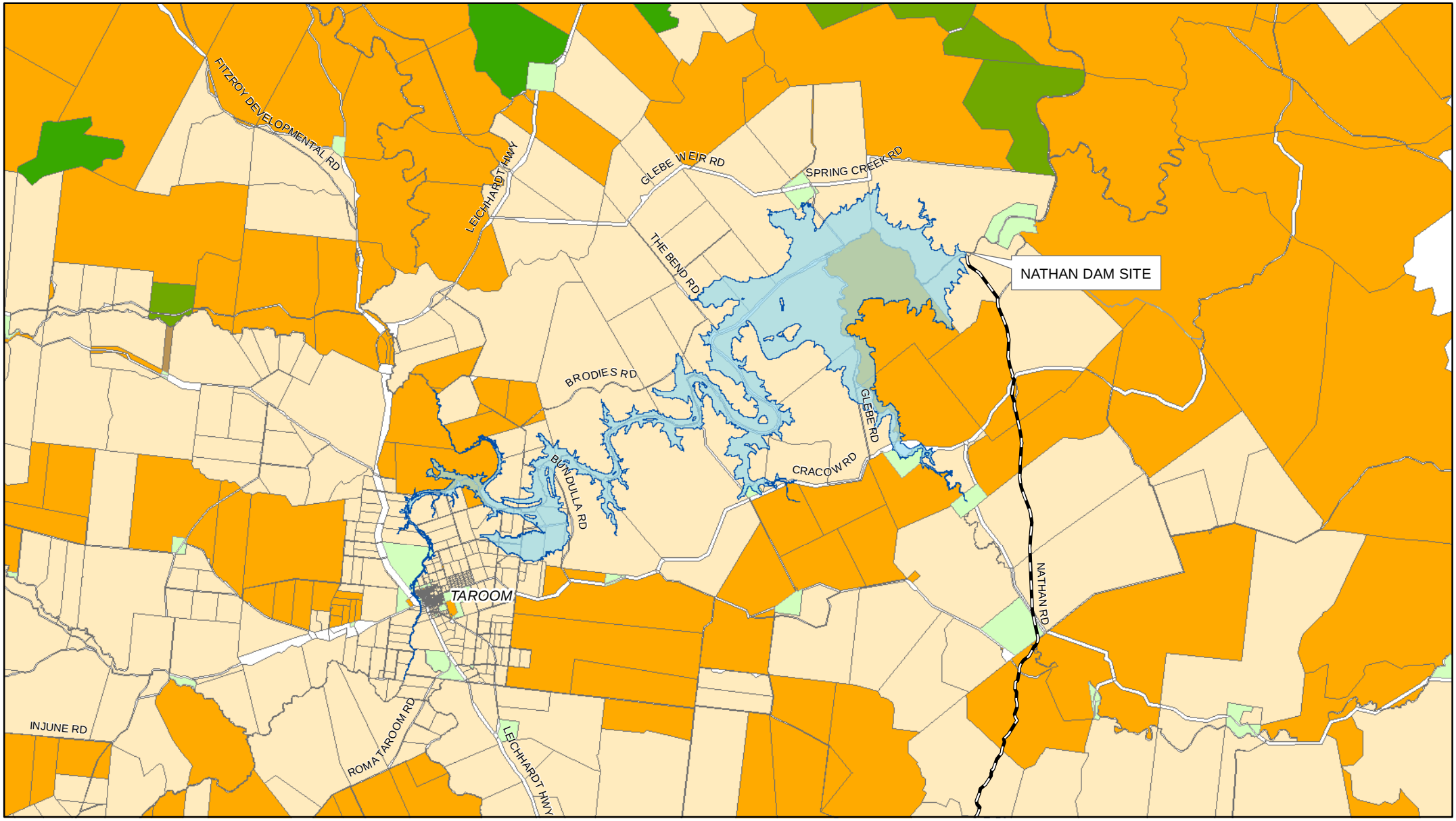
The land parcels affected by the water storage at FSL (both wholly and partially) are listed in a table in Appendix 2A. This table provides information on Real Property Descriptions, overall area of each lot and the area of impact of the FSL on each lot. Table 7-5 identifies the reserves affected at FSL and their current purpose.

Table 7-5 Reserves affected by the dam

Description	Purpose	Responsibility
Lot 14 on LE230	Recreation and camping activities	Banana Shire Council
Lot 15 on LE230	Community or Public Purposes	DERM
Lot 26 on FT5	Park and recreation	DERM
Lot 27 on FT627	Park and recreation	DERM
Lot 25 on F4037	Park and recreation	DERM
Lot 20 on LE 232	Nature refuge	Banana Shire Council
Lot 221 on T5012	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council
Lot 53 on FT699	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council
Lot 144 on SP173872	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council
Lot 164 on FT136	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council
Lot 7 on RP219771	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council
Lot 54 on FT570	Recreation area and walking track – 'Taroom River Walk', 'Old Stony Crossing' and 'Taroom Caravan Park'	Banana Shire Council

Stock routes in the vicinity of the water storage radiate from Taroom and are predominantly located in road reserves. There are a number of stock routes which are located near to the water storage, including along the:

- Taroom – Cracow Road;
- Leichhardt Highway to the north of Taroom;
- Taroom – Injune Road; and
- Taroom – Roma Road.



LEGEND

- Proposed Pipeline
- Full Supply Level (183.5m AHD)

Tenure

- Covenant
- Easement
- Freehold
- Housing Land
- Lands Lease
- Marine Park
- Main Road
- National Park
- Reserve
- State Forest
- State Land
- No Tenure

Projection: GDA94 Zone 56

Figure 7-6

0 1.5 3 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land tenure dam and surrounds

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Native Title

At the time of writing this EIS:

- SunWater had undertaken an assessment of the native title extinguishment status of the lands the subject of the Dam and Surrounds; and
- SunWater was undertaking an assessment of the appropriate native title future act compliance measures where applicable.

The relevant Native Title Representative Body for the Dam and Surrounds is Queensland South Native Title Services.

As of 30 June 2011, the following native title claims were registered within the Dam and Surrounds area (Figure 22-1):

Wulli Wulli People Federal Court file number QUD6006/00, Native Title Tribunal file number QC00/7; and

the Iman People #2 Federal Court file number QUD6162/98, Native Title Tribunal file number QC97/55;

There are no registered native title claims within the balance of the Dam and Surrounds Area.

It is SunWater's understanding that native title http://www.nntt.gov.au/Pages/default.aspx has been extinguished over all lots within the dam area except for 11 reserves (14LE230, 144SP173872, 15LE230, 164FT136, 18LE279, 221T5012, 25F4037, 26FT5, 27FT627, 53FT699, 54FT570) and sections of boundary watercourse along the Dawson River, Cockatoo Creek, Palm Tree Creek and Bentley Creek.

The Glebe Weir is wholly within the Dam and Surrounds Area, at the time of writing this EIS SunWater is undertaking research to determine whether native title has been extinguished along this section of the Dawson River.

SunWater intends to negotiate an indigenous land use agreement (ILUA) for the extinguishment of native title over the above listed properties.

Mining and exploration tenures and extractive resources

Figure 7-7 and Figure 7-8 show the mining, petroleum and gas tenements within the dam, water storage area and surrounds.

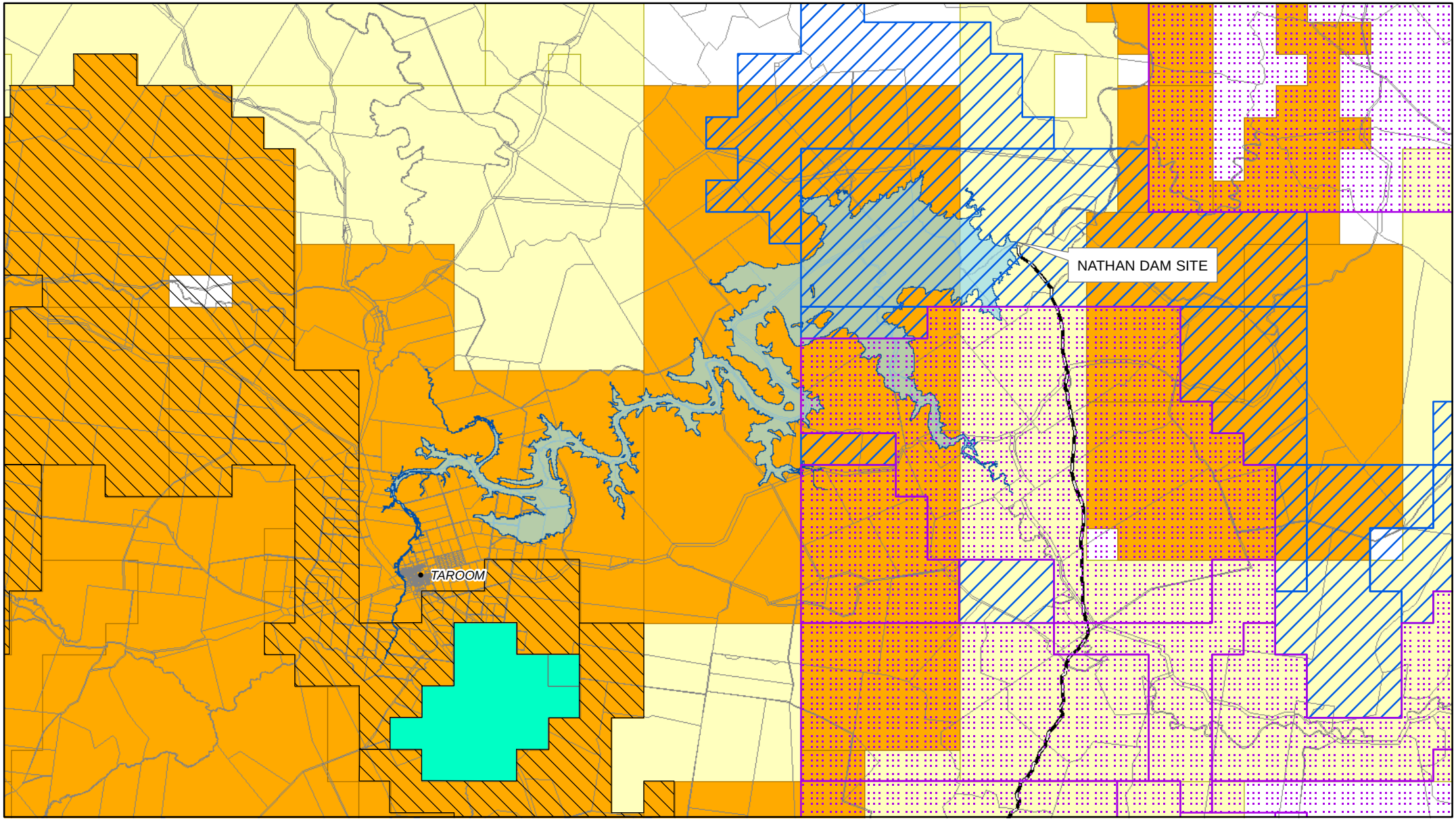
Mining

The dam and surrounds is covered by applications for coal exploration permits except for an area at the upstream limit of water storage in Juandah Creek near Taroom (Figure 7-7). A mineral exploration permit covers parts of Cockatoo Creek, while applications for mineral exploration permits also cover parts of the main water storage area. Applications for mineral development licences include areas surrounding Taroom at the upstream limit of water storage.

There are no mining leases in the vicinity, however, the water storage is covered by mineral exploration permits or mineral exploration permit applications.

- Petroleum and gas

Petroleum exploration permits include the eastern and southern sections of the water storage (Figure 7-8), while both gas and petroleum exploration or appraisal wells have been drilled to the east of Cockatoo Creek outside of the FSL on Lot 12 on FT7 and Lot 5 on FT847. There are no gas or petroleum pipelines in the vicinity of the dam and surrounds.



LEGEND

- Proposed Pipeline
- Full Supply Level (183.5m AHD)
- Cadastre

Mineral Development Licence

- Application
- Granted

Exploration Permit Coal

- Application
- Granted

Exploration Permit Minerals

- Application
- Granted

Projection: GDA94

Figure 7-7

0 1.5 3 6
Kilometres

N

Scale 1:300,000 (at A4)

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NATHAN DAM AND PIPELINES EIS

Mining tenements dam and surrounds

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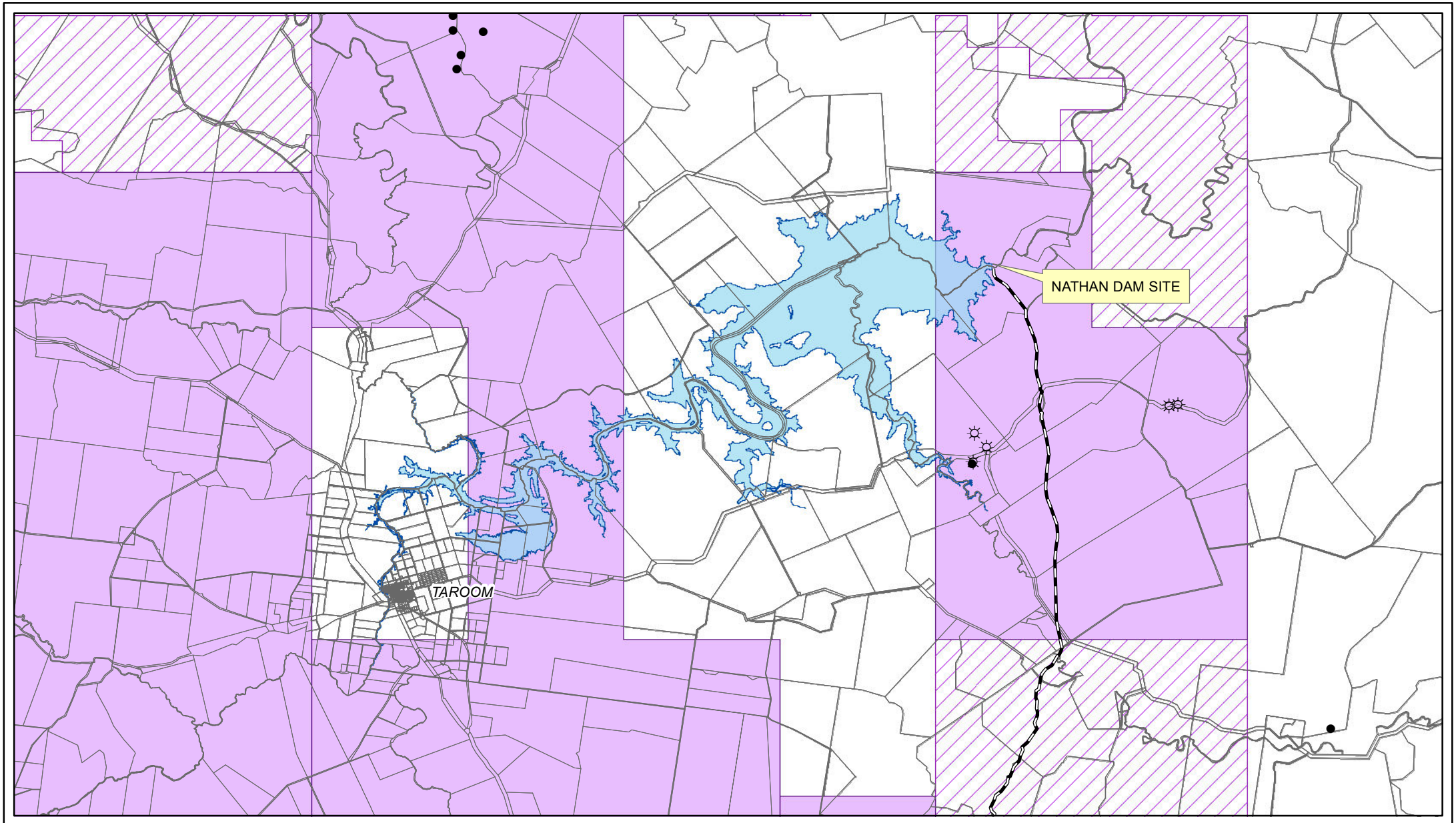

LEGEND

- Coal Seam Gas Exploration Well
- Petroleum Exploration Well
- Proposed Pipeline
- Cadastre
- Full Supply Level (183.5m AHD)

Exploration Permit Petroleum

- Application
- Granted
- Petroleum Pipeline Licence

Projection: GDA94

Figure 7-8

0 1.5 3 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Petroleum and gas tenements - dam and surrounds

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- Extractive resources

There are no operating or licenced resource extraction sites within or surrounding the water storage. The gravel pit at 'Balcarris' on Lot 14 on FT1 has produced material for road base in the past, however, it is not currently in use.

7.1.2.6. Protected areas

Protected areas under Commonwealth and State legislation in the Project area are shown in Figure 7-9 and include:

- Boggomoss Area Numbers 1 and 2 are listed on the Register of the National Estate (DEWHA, 2010)
- 'The Glebe' homestead is listed on the Queensland Heritage Register (DERM, 2009); and
- a nature reserve controlled by DERM.

Boggomoss Area Number 1 is located on Lot 2 on LE284 and comprises approximately 800 ha in the vicinity of Boggomoss Creek, Spring Gully, and an un-named left bank tributary that joins the Dawson River at approximately 325.5 km AMTD. Boggomoss Area Number 2 is located on the upstream banks of Cockatoo Creek on Lot 26 on FT5, currently a reserve managed by DERM. Further assessment of Boggomoss Area Number 1 and Boggomoss Area Number 2 is provided in Chapters 9 and 10.

'The Glebe' homestead is situated on Lot 15 on FT2, on a rise approximately 0.5 km from the Dawson River at 330 km AMTD. The listing includes mention of the homestead and associated buildings, yards and gardens. Further assessment of 'The Glebe' homestead is provided in Chapter 23.

The nature refuge (Lot 20 on LE232) comprises an area of approximately 207 ha on Boggomoss Creek where it is crossed by Glebe Weir Road. A nature refuge is:

> *a voluntary agreement between a landholder and the Queensland Government that acknowledges a commitment to manage and preserve land with significant conservation values while allowing compatible and sustainable land uses to continue* (DERM, 2010).

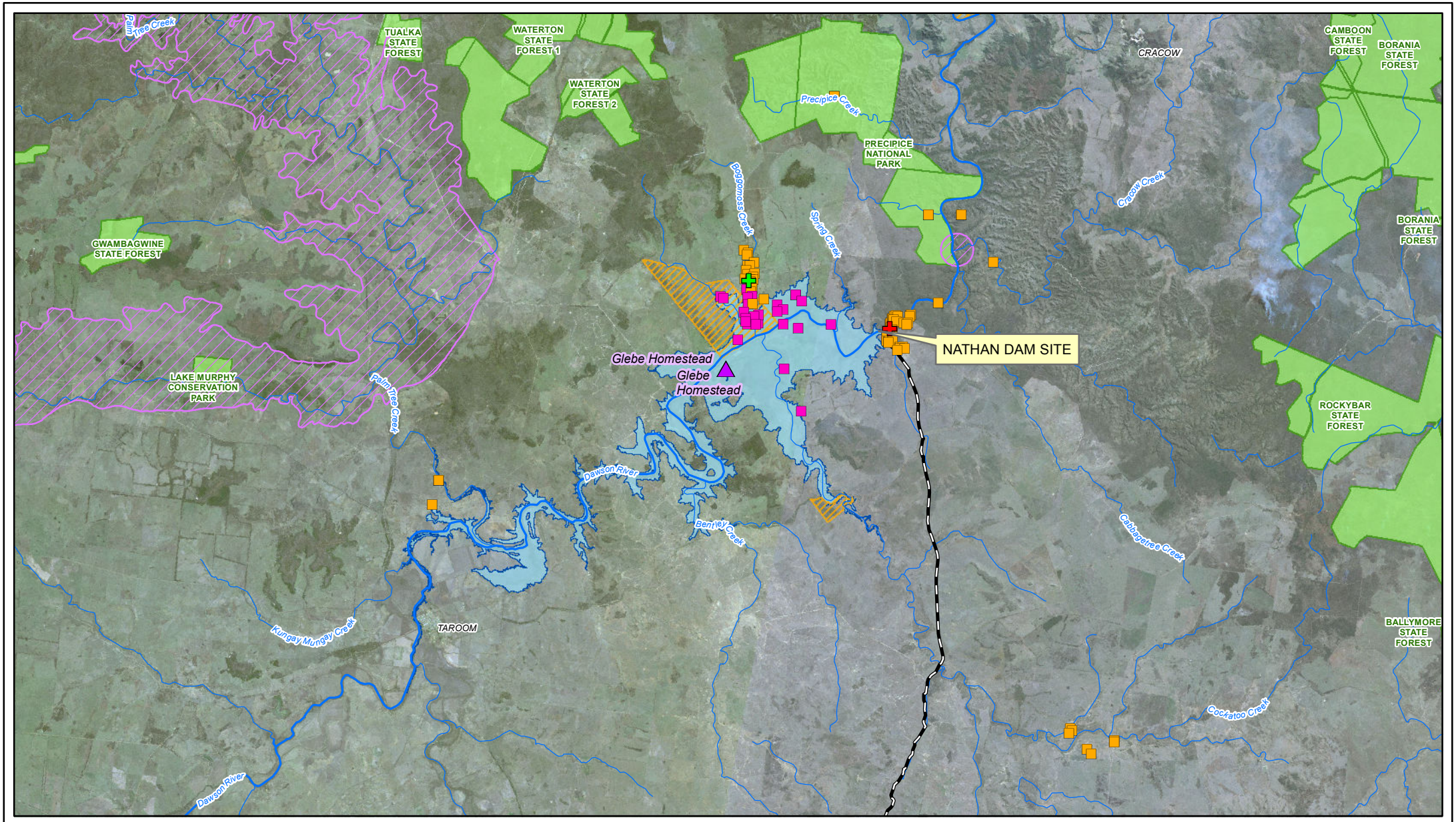
Part of this nature refuge lies within Boggomoss Area Number 1. In addition to the Commonwealth and State protected areas, the Taroom Shire Planning Scheme identifies the protected areas in the vicinity of the water storage in which development controls apply (as outlined in Section 7.1.2.3). These protected areas are shown in Figure 7-9 and include:

- a number of artesian springs in and along the Dawson River immediately downstream of the water storage, in and around Boggomoss Creek and Spring Gully and in and along Price Creek, a south bank tributary downstream of the water storage;
- Boggomoss Springs is listed as an 'Important Wetland' in Nathan Gorge commencing approximately 8.5 km downstream of the water storage – this appears to be the headwaters of Gyranda Weir; and
- the Precipice National Park on the left bank of the Dawson River commencing approximately 8.5 km downstream of the water storage.

Many of the artesian springs listed above are within Boggomoss Areas 1 and 2 as shown in Figure 7-9. More information on the protected areas including boggomosses and artesian springs is provided in Chapter 9 including details on Figure 9-1 and Figure 9-2. The Taroom Shire Planning Scheme also identifies a number of areas of Biodiversity Planning Assessment (BPA) significance and more information on these is provided in Chapter 9.

The Great Barrier Reef World Heritage Area (GBRWHA) has been identified by SEWPaC as a Matter of National Environmental Significance that may be impacted by the Project (Section 1.8). The Fitzroy River Basin discharges into the GBRWHA at Keppel Bay, south-east of Rockhampton, about 620 km river distance downstream of the Project. The GBRWHA is also listed as a National Heritage Place on the National Heritage List. The National Heritage List has been established to list places of outstanding heritage significance to Australia. A more detailed analysis of the GBRWHA in relation to the Project is provided in Chapter 28.

The Shoalwater and Corio Bays Area as Wetlands of International Importance (RAMSAR wetland) has been identified by SEWPaC as being potentially impacted by the Project. The Shoalwater and Corio Bays Area is located in the Rockhampton Regional Council area with the southern boundary approximately 50 km north of Rockhampton. The Project lies within the catchment of the Fitzroy River, which discharges at Keppel Bay 100 km to the south of the Shoalwater and Corio Bays Area. Further analysis of the Shoalwater and Corio Bays Area in relation to the Project is provided in Chapter 28.



LEGEND

- Glebe Homestead
- Dawson River
- Watercourse
- Proposed Pipeline
- Full Supply Level (183.5m AHD)
- Boggomoss Areas
- Directory of Important Wetlands
- Protected Areas of Queensland

National Estate Site

- Boggomoss Area 1
- Boggomoss Area 2

GAB Spring Sites

- Inside FSL
- Outside FSL

Projection: GDA94 Zone 56

Figure 7-9

0 2 4 8 Kilometres

N

Scale 1:350,000 (at A4)

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NATHAN DAM AND PIPELINES EIS

Protected areas - dam and surrounds

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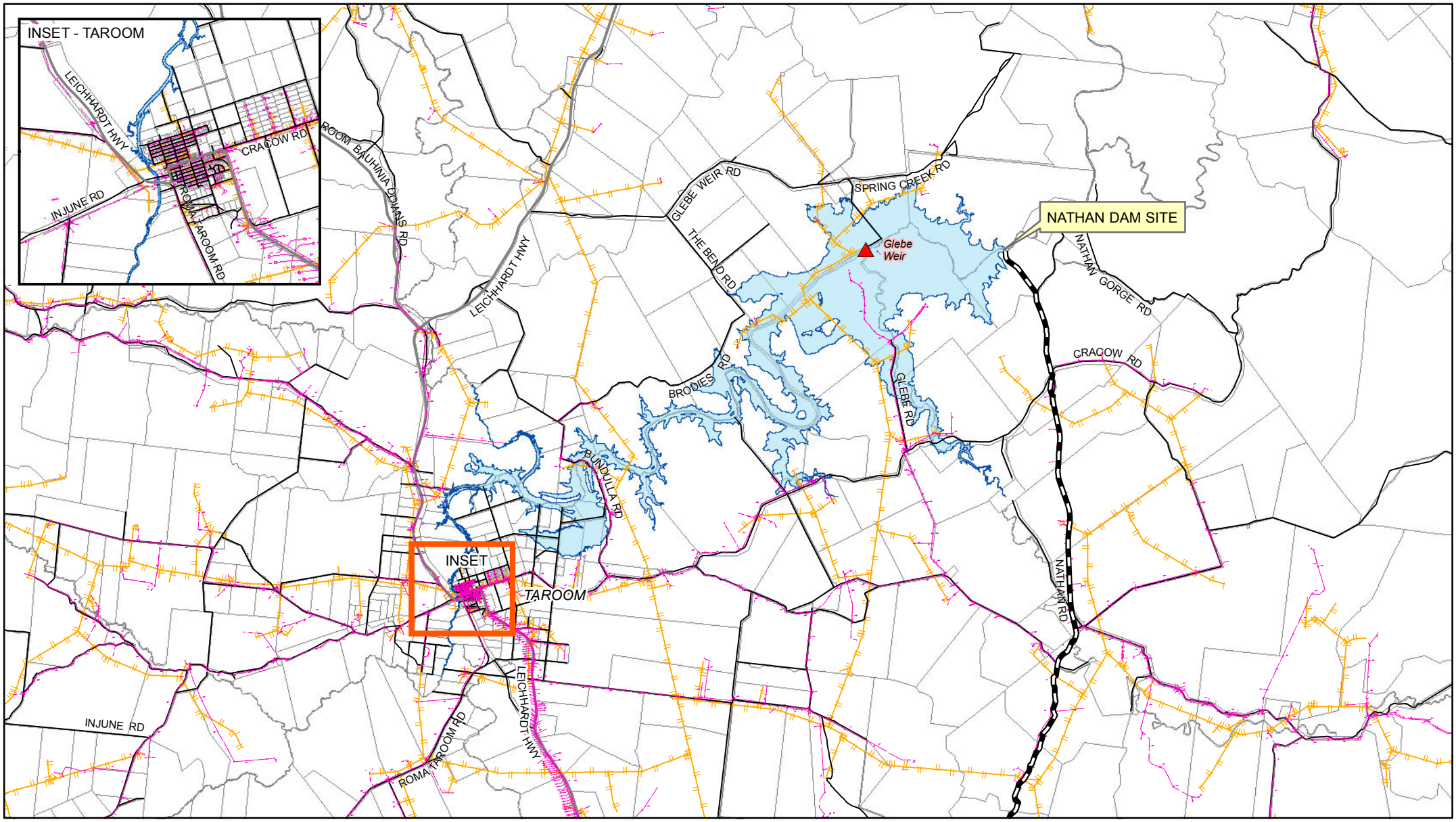
7.1.2.7. Infrastructure

Existing infrastructure located throughout the proposed dam and surrounds is shown in Figure 7-11. Glebe Weir (Figure 7-10) is a sheet pile and mass concrete structure in the Dawson River at 326.2 km AMTD (a proposal to raise FSL to 172.9 m AHD as part of the Wandoan Coal JV has been recommended by the Coordinator General for approval at State level and has been approved at Commonwealth level). As mentioned in Section 7.1.2.4 and Section 7.1.2.5, a camping and recreation area is located on the northern bank of Dawson River adjacent to Glebe Weir with a boat launching ramp and toilet block (Figure 7-12). Other recreation facilities in the vicinity of the proposed water storage are located adjacent the bank of the Dawson River at Taroom.

Existing Ergon powerlines and Telstra telecommunications infrastructure (Figure 7-13) are located throughout the proposed dam and surrounds, servicing the existing dwellings. These are shown in Figure 7-11. Water pipelines within the water storage include on-property irrigation mains, such as those on Lot 14 on FT1 and Lot 2 on LE284, and stock water distribution pipelines, such as those associated with the artesian bore on Lot 14 FT1. There are no gas or petroleum pipelines in the vicinity of the proposed dam and surrounds.

The road network consists of a number of sealed and unsealed local access roads and road names are provided in Section 7.1.2.7. No railway corridors are in the vicinity of the dam and surrounds.

Figure 7-10 Glebe Weir



LEGEND

- Glebe Weir
- Proposed Pipeline
- Telstra Infrastructure
- Ergon Infrastructure
- State Controlled Roads
- Local Roads
- Full Supply Level (183.5m AHD)
- Cadastre

Projection: GDA94 Zone 56

Figure 7-11

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Infrastructure - dam and surrounds

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Figure 7-12 Glebe Weir Camping Reserve

Figure 7-13 Existing telecommunications infrastructure

Other in-stream or near-stream infrastructure along the Dawson River and its tributaries identified within the water storage includes:

- stream gauging stations at:
  - Dawson River – Glebe Weir tailwater;
  - Dawson River – Glebe Weir headwater;
  - Dawson River – Taroom; and
  - Palm Tree Creek – Palm Lea, close to the proposed upstream limit of storage;
- a gravel vehicle crossing or ford through the Dawson River at the south west end of North Street, Taroom;
- a footbridge over the low flow channel over the Dawson River at approximately 382 km AMTD;
- a portable pump and stock water tank and trough on the right bank of the Dawson River at approximately 362 km AMTD;
- a permanent electric pump on the right bank of the Dawson River at approximately 383.5 km AMTD;
- trailer mounted diesel irrigation pumps on Boggomoss and Cockatoo Creeks near their junctions with the Dawson River just upstream of Glebe Weir;
- cattle yards in poor repair on Lot 9 on LE68;
- cattle yards on Lot 7 on LE19;
- a centre pivot irrigation system, shed and cattle yards on Lot 2 on LE284;
- an artesian bore, a set of cattle yards and a centre pivot irrigation system on Lot 14 on FT1;
- a machinery shed and cattle yards on Lot 15 on FT2;
- an irrigation system (unused for some time) on Lot 15 on LE2;
- a stock water supply pump and a set of cattle yards on Lot 3 on F4037; and
- boundary and internal subdivision fencing at numerous locations.

Roads

There are no State-controlled roads in the vicinity of the water storage. There are a number of road reserves in the vicinity of the water storage but not all are maintained or have been developed. Local council controlled roads located within the water storage area and in its vicinity are shown in Figure 7-11 and include:

- Glebe Weir Road (north bank);
- Spring Creek Road (north bank);
- The Bend Road (north bank);
- Brodies Road (north bank);
- Glebe Road (south bank);

- Taroom Cracow Road (south bank);
- Nathan Road;
- Bundulla Road (south bank); and
- Wolsley Street, Taroom – north-north-west end only, outside town area (south bank).

Within the water storage, Bundulla Road and Brodies Road are linked by a low-level causeway over the Dawson River and there are a number of culverts and creek crossings on other Council-controlled roads. A number of private roads within the water storage provide primary access to residences and properties. Transport issues are addressed in Chapter 21.

7.1.3. Pipeline

7.1.3.1. State planning framework

The state planning framework is discussed in Section 7.1.2.1.

7.1.3.2. Regional planning framework

The regional planning framework is discussed in Section 7.1.2.2.

7.1.3.3. Local planning framework

The pipeline route is situated within the former local government areas of Taroom, Murilla, Chinchilla, Dalby and Wambo. Though the pipeline route lies within the current Banana Shire Council and Western Downs Regional Council areas, planning schemes for the former local authorities still apply. The relevant pipeline components include the same attributes of the planning scheme for the former Taroom Shire Council as described in Section 7.1.2.3. This section describes the planning schemes which are currently in effect for the Banana Shire Council and Western Downs Regional Council local government areas.

- Former Taroom Shire Council
- Desired environmental outcomes

The DEOs for the Taroom Shire Planning Scheme have been identified in Section 7.1.2.3 and their relevance to the pipeline is discussed in Table 7-6.

As outlined in Section 7.1.2.3, GQAL mapping is provided in the Taroom Shire Planning Scheme and identifies that GQAL is prevalent in the vicinity of the pipeline. GQAL is assessed further in Chapter 6.

Table 7-6 Taroom Shire Planning Scheme – desired environmental outcomes

Desired Environmental Outcome	Comment
Development is managed to minimise any adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas, ridgelines and escarpments.	The impacts of the pipeline on the identified matters are assessed in **Chapters 6** and **9** to **13**. **Chapter 17** assesses the impacts of the Project on air quality. **Chapters 9** to **13** discuss the flora and fauna of the Project area and assess the impacts of the Project.
Protected areas (including Expedition National Park, Isla Gorge National Park, Precipice National Park, Lake Murphy Conservation Park, Carraba Conservation Park, Glen Leigh Environmental Reserve, Expedition Resources Reserve, Stones Country Resources Reserve, Palm Tree Creek – important wetland and Robinson Creek – important wetland) and areas, local items and places of cultural significance (including areas along water courses) are identified to ensure their environmental, landscape values and historic significance are protected and enhanced through compatible development.	Protected areas are identified in this section, while further detail and assessment is provided in **Chapter 9** where the impacts of the Project are assessed.
The Planning Scheme reinforces the roles of Taroom and Wandoan as the principal places for administrative services, business, industry and commerce within the Shire.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The local service role of the small town of Guluguba is protected and enhanced.	The Project is approximately 4 km north east from Guluguba at its closest point. The Project is not expected to have a negative impact on the town. Opportunities will be provided for stock and domestic use for affected landholders, however, the Project will not facilitate agricultural expansion.
Productive rural land, rural industries and natural features (including mineral and extractive resources and tourist resources such as National Parks, Reserves, Conservation Parks and Wetlands) are protected to reflect and enhance their continued economic potential and viability.	Assessment of the impacts of the Project considers the loss of GQAL and activities contributing to the local economy. Assessment of GQAL is provided in **Chapter 6**, while **Chapter 25** includes an assessment of the impacts of the Project on the local economy. Strategies are provided to mitigate disruption to the local economy during construction and operation.
The Shire's industrial areas in Taroom and Wandoan are consolidated and protected to ensure their roles as the key areas for industrial activity are reinforced.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The settlement pattern is logical and sequenced and the built environment contributes to the overall rural amenity and character of Taroom Shire.	The settlement pattern of the Taroom Shire will not be influenced by the Project. Nonetheless, **Chapter 5** identifies the potential visual and amenity impacts of the Project. **Chapter 24** also addresses potential amenity issues.
People are connected to public spaces (including recreational areas) and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centres of Taroom and Wandoan, and small town of Guluguba.	The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.	The Project will be designed appropriately to ensure the safety of the community is not jeopardised. **Chapter 26** identifies the potential hazard and risk associated with the Project and details appropriate mitigation measures. Furthermore, **Chapter 2** outlines the overall benefits of the Project, while **Chapter 24** provides an assessment of how the Project will affect the social values of the local environment.

Desired Environmental Outcome	Comment
Infrastructure (including water, sewerage and roads) reflects community expectations and needs, meets engineering and environmental standards and is provided in an orderly and logical sequence to ensure cost effectiveness.	**Chapter 1** outlines the need for the Project and the socio-economic cost and benefits. **Chapter 2** describes the design and construction of the Project (dam, water storage and associated infrastructure, including roads) to required standards.

Zones

Under the Taroom Shire Planning Scheme, the pipeline is included wholly within the Rural 'Zone' as indicated in Figure 7-14.

The code purpose for the Rural 'Zone' is provided in Table 7-4.

Former Murilla Shire

The Murilla Shire Planning Scheme took effect on 30 June 2006 and relates only to the former local government area. This section identifies the relevant DEOs and zones of the Murilla Shire Planning Scheme.

Desired environmental outcomes

The DEO categories are:

- The Environment;
- Economic Development; and
- Community and Services.

The DEOs relevant to the Project are listed in Table 7-7.

Under the DEO for Economic Development, productive rural land (GQAL) is required to be protected from incompatible development to reflect and enhance continued economic potential and viability. GQAL mapping is provided in the Murilla Shire Planning Scheme and identifies that the majority of the pipeline is not subject to GQAL. The only areas of GQAL in the vicinity of the pipeline is a Class B area to the north of Hookswood Road along Pelham Road and a Class A area on the southern side of Hookswood Road on either side of Boort Koi Road. GQAL is assessed further in Chapter 6.

Table 7-7 Murilla Shire Planning Scheme – DEOs

Desired Environmental Outcome	Comment
Development is managed to minimise the adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas.	The impacts of the Project on the identified matters are assessed in **Chapters 6, 9, 10, 11, 12** and **13**. **Chapter 17** assesses the impacts of the Project on air quality. **Chapters 9** to **13** discuss the flora and fauna of the Project area and assess the impacts of the Project.
Protected areas (including the Wildflower Area) and areas, items and places of cultural significance (including areas along water courses) are identified to ensure their environmental, landscape values and historic significance are protected and enhanced through compatible development.	Protected areas are identified in this section, while further detail and assessment is provided in **Chapter 9** where the impacts of the Project are assessed.

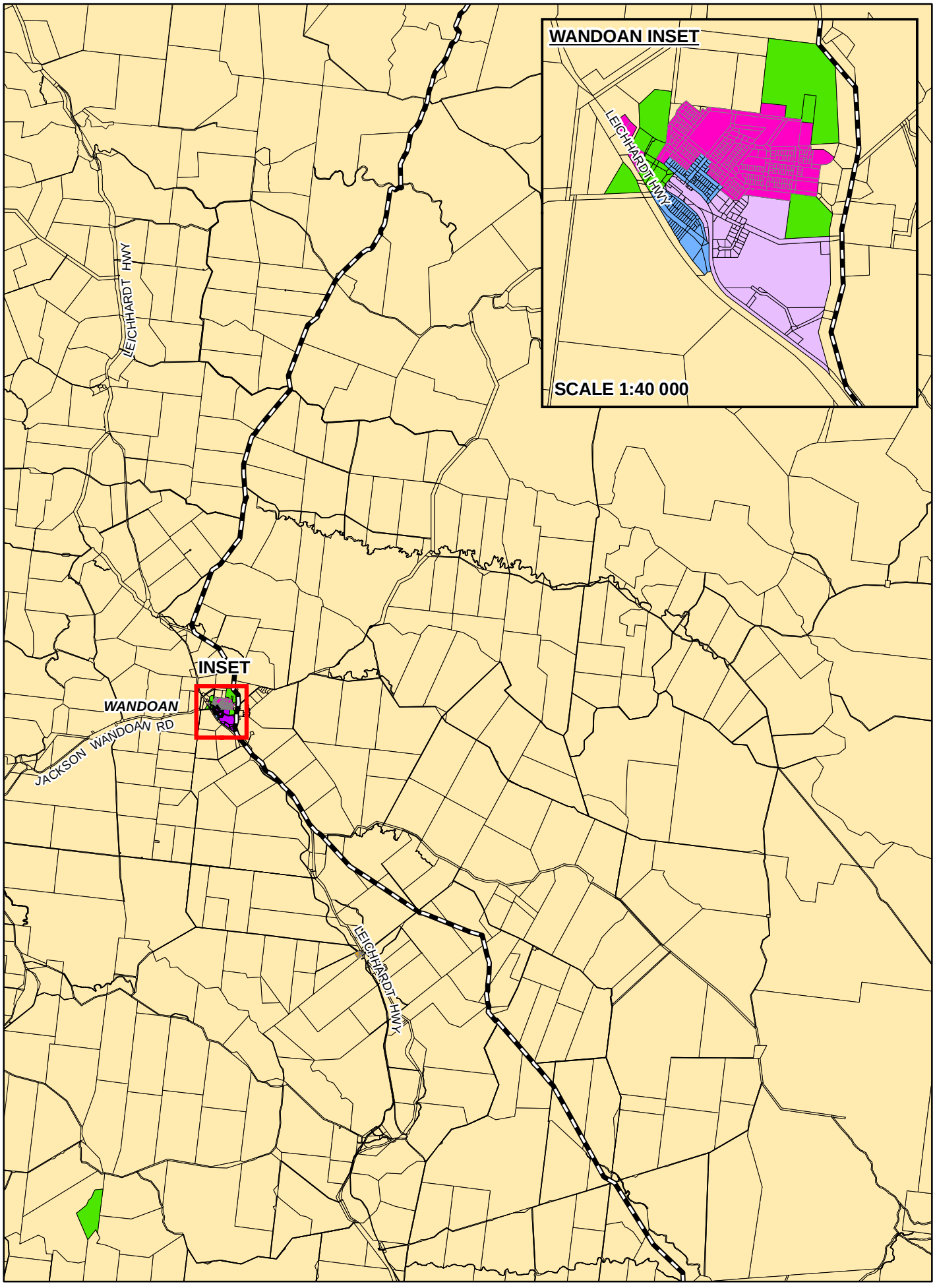
Desired Environmental Outcome	Comment
The Planning Scheme reinforces and consolidates the role of Miles as the principal place for business, industry and commerce within the Shire.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the pipeline.
The local service roles of the small towns of Condamine, Drillham and Dulacca are protected and enhanced.	The Project is not located near the towns of Condamine, Drillham or Dulacca and as such, no adverse impacts are expected.
Productive rural land, rural industries and natural features (including mineral and extractive resources and tourist resources such as the Wildflower Area) are protected to reflect and enhance their continued economic potential and viability.	Assessment of the impacts of the Project considers the loss of GQAL and activities contributing to the Shire's economy. Assessment of GQAL is provided in **Chapter 6**, while **Chapter 25** includes an assessment of the impacts of the Project on the local economy. Strategies are provided to mitigate disruption to the local economy during construction and operation.
The Shire's industrial areas in Miles are consolidated and protected to ensure their roles as the key areas for industrial activity are reinforced.	The Project does not pass through Miles. Nonetheless, **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The settlement pattern is logical and sequenced and the built environment contributes to the overall rural amenity and character of Murilla Shire.	The settlement pattern of Murilla Shire will not be influenced by the Project. Nonetheless, **Chapter 5** identifies the potential visual and amenity impacts of the Project. **Chapter 24** also addresses potential amenity issues.
People are connected to public spaces (including recreational areas) and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centre and small towns of the Shire.	The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.	This chapter identifies housing types in the Project area through the descriptions of land uses and zones. **Chapter 2** outlines the overall benefits of the Project, while **Chapter 24** provides an assessment of how the Project will affect the social values of the local environment.
Infrastructure (including water, sewerage and roads) reflects community expectations and needs, meets engineering and environmental standards and is provided in an orderly and logical sequence to ensure cost effectiveness.	**Chapter 1** outlines the need for the Project and the socio-economic cost and benefits. **Chapter 2** describes the design and construction of the Project (dam, water storage and associated infrastructure, including roads) to required standards.

Zones

Under the Murilla Shire Planning Scheme, the pipeline is included wholly within the Rural 'Zone' as shown in Figure 7-14 . The planning scheme outlines the purpose of the Rural 'Zone' and is provided in Table 7-8.

Table 7-8 Murilla Shire Planning Scheme – zones

Zone	Purpose
Rural	Consistent uses include primary production through grazing and farming, while allowable uses included tourist related uses (bed and breakfast premises and visitor accommodation) and intensive animal industries and extractive industries. Industrial uses are supported only where it can be demonstrated that those uses are associated with rural production and cannot reasonably be established in the Industrial Zone. Uses that may have detrimental impacts on existing intensive animal industries, extractive industries or GQAL are not supported.



LEGEND

Proposed Pipeline

Zoning

- Commercial
- Industrial
- Mixed Use
- Open Space and Recreation
- Rural
- Rural Residential
- Small Town
- Urban

Projection: GDA94 Zone 56

Figure 7-14A

0 1 2 4 6
Kilometres

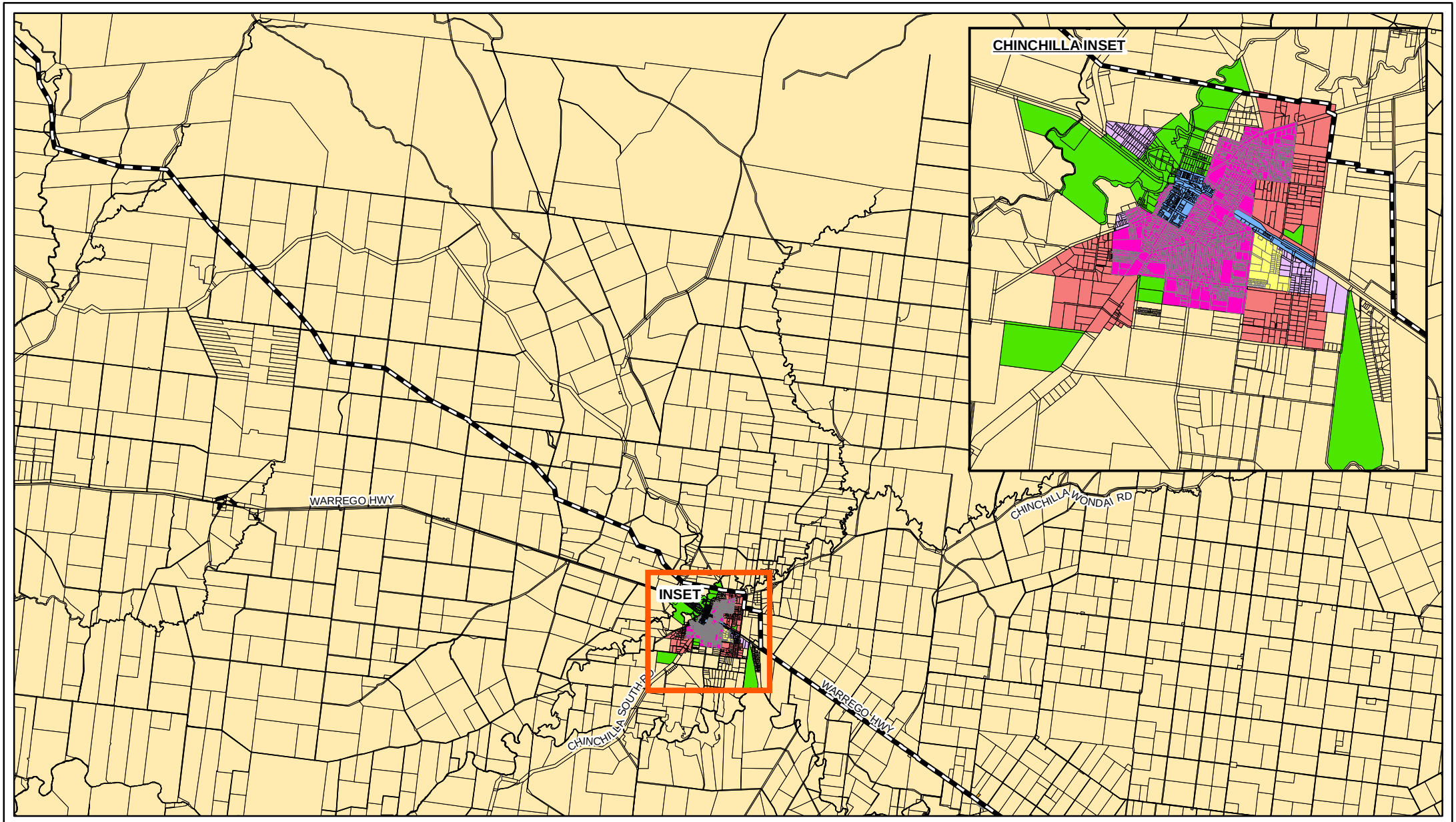
N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Zoning - pipeline



LEGEND

Proposed Pipeline

Zoning

- Commercial
- Industrial
- Mixed Use
- Open Space and Recreation
- Rural
- Rural Residential
- Small Town
- Urban

Projection: GDA94 Zone 56

Figure 7-14B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Zoning - pipeline

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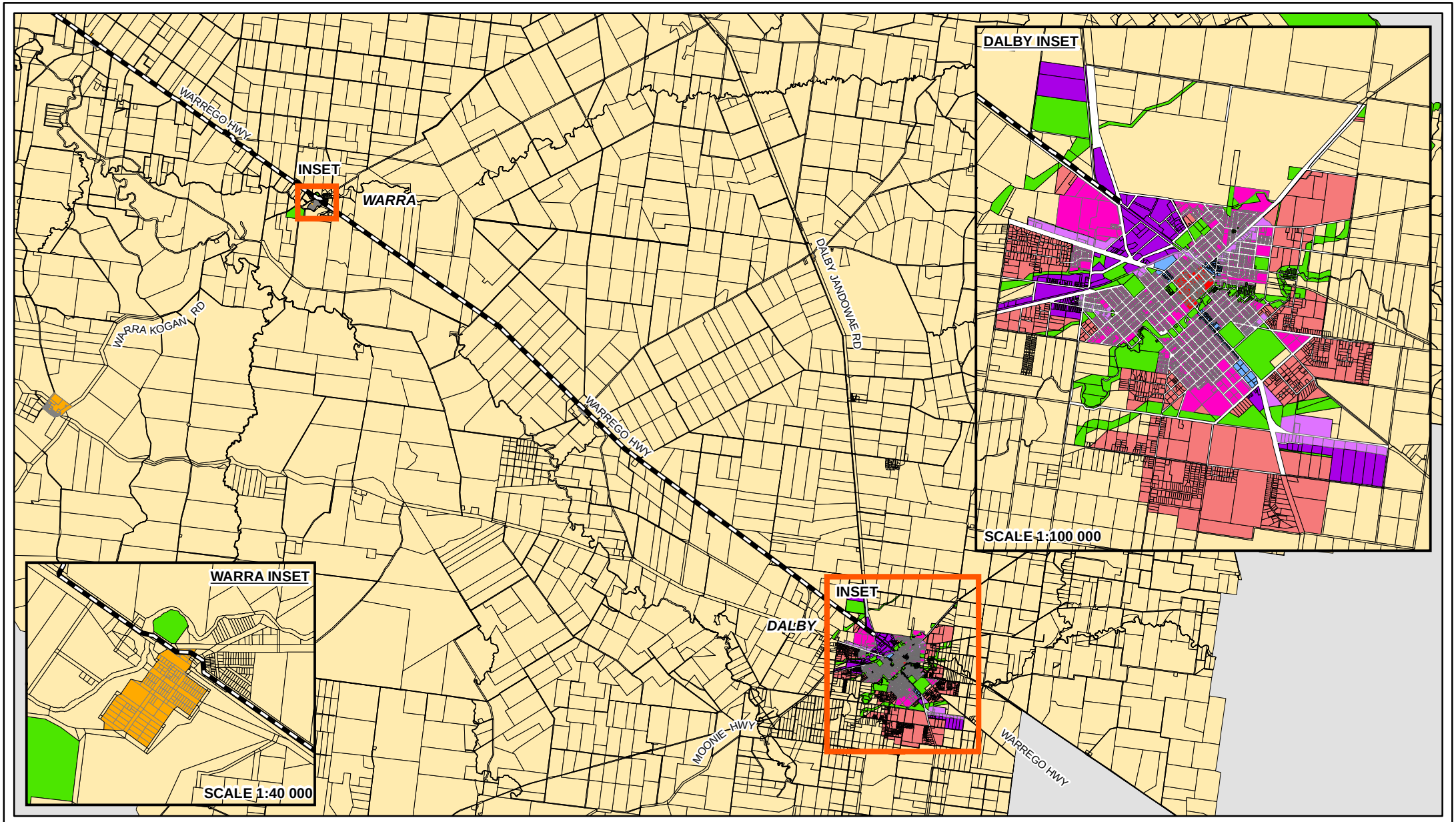

LEGEND

Proposed Pipeline

Zoning

- Commercial
- Industrial
- Light Industry
- Mixed Use
- Open Space and Recreation
- Rural
- Rural Residential
- Residential
- Small Town
- Town Centre

Projection: GDA94 Zone 56

Figure 7-14C

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Zoning - pipeline

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Former Chinchilla Shire

The Chinchilla Shire Planning Scheme took effect on 30 June 2006. This section identifies the relevant DEOs and zones of the Chinchilla Shire Planning Scheme.

Desired Environmental Outcomes

The DEO categories are:

- The Environment;
- Economic Development; and
- Community and Services.

The DEOs relevant to the Project are listed in Table 7-9.

Under the DEO for Economic Development, productive rural land (GQAL) is required to be protected from incompatible development to reflect and enhance continued economic potential and viability. GQAL mapping is provided in the Chinchilla Shire Planning Scheme and identifies that both Class A and Class B GQAL is common within the vicinity of the pipeline. Class B GQAL is common to the west of Chinchilla, while Class A GQAL is common on either side of the railway and Warrego Highway easements in which the pipeline will follow. GQAL is assessed further in Chapter 6.

Table 7-9 Chinchilla Shire Planning Scheme – DEOs

Desired Environmental Outcome	Comment
Development is managed to minimise the adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas.	The impacts of the Project on the identified matters are assessed in **Chapters 6** and **9** to **13**. **Chapter 17** assesses the impacts of the Project on air quality. **Chapters 9** to **13** discuss the flora and fauna of the Project area and assess the impacts of the Project.
Significant areas (including the Condamine River) and areas and items of cultural significance (including areas along water courses) are identified to ensure their environmental and landscape values and historic significance are protected and enhanced through compatible development.	Protected areas are identified in this section, while further detail and assessment is provided in **Chapter 9** where the impacts of the Project are assessed.
The Planning Scheme reinforces and consolidates the role of Chinchilla as the principal place for business, industry and commerce within the Shire.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The local service roles of the towns of Brigalow and Kogan are protected and enhanced.	The pipeline passes through the town of Brigalow, but is approximately 19 km from Kogan. **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
Productive rural land (such as the Condamine floodplain), rural industries and natural features (including mineral and extractive resources) are protected to reflect and enhance their continued economic potential and viability.	Within the jurisdiction of the Chinchilla Shire Planning Scheme, much of the land surrounding the pipeline route is considered to be productive rural land. Assessment of the impacts of the Project considers the loss of GQAL and activities contributing to the local economy. Assessment of GQAL is provided in **Chapter 6**, while **Chapter 25** includes an assessment of the impacts of the Project on the local economy. Strategies are provided to mitigate disruption to the local economy

Desired Environmental Outcome	Comment
	during construction and operation.
The industrial areas in Chinchilla are consolidated and protected to ensure their role as the key areas for industrial activity is reinforced.	The pipeline does not pass through any industrial areas in Chinchilla. Nonetheless, **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The settlement pattern is logical and sequenced and the built environment contributes to the overall rural amenity and character of Chinchilla Shire.	The settlement pattern of the Chinchilla Shire will not be influenced by the Project. Nonetheless, **Chapter 5** identifies the potential visual and amenity impacts of the Project. **Chapter 24** addresses the potential amenity issues.
People are connected to public spaces (including recreational areas) and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centre and small towns of the Shire.	The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.
Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.	This chapter identifies housing types in the Project area through the descriptions of land uses and zones. **Chapter 2** outlines the overall benefits of the Project, while **Chapter 24** provides an assessment of how the Project will affect the social values of the local environment.
Infrastructure (including water, sewerage and roads) reflects community expectations and needs, achieves engineering and environmental standards and is provided in an orderly and logical sequence to ensure cost effectiveness.	**Chapter 1** outlines the need for the Project and the socio-economic cost and benefits. **Chapter 2** describes the design and construction of the Project (dam, water storage and associated infrastructure, including roads) to required standards.

Zones

Under the Chinchilla Shire Planning Scheme, the pipeline is included predominantly within the Rural 'Zone'. As the pipeline passes through the township of Brigalow following the railway easement and Warrego Highway, the pipeline crosses land included in the Small Town 'Zone'. The pipeline also passes through land included in the Rural Residential 'Zone' and the Open Space and Recreation 'Zone' as it travels through the northern area of Chinchilla, as shown in Figure 7-14. The planning scheme outlines the purpose for each zone and these are provided in Table 7-10.

Table 7-10 Chinchilla Shire Planning Scheme – zones

Zone	Purpose
Rural	Consistent uses include primary production through grazing and farming, while allowable uses included tourist related uses (bed and breakfast premises and visitor accommodation) and intensive animal industries and extractive industries. Industrial uses are supported only where it can be demonstrated that those uses are associated with rural production and cannot reasonably be established in the Industrial Zone. Uses that may have detrimental impacts on existing intensive animal industries, extractive industries or GQAL are not supported.
Rural Residential	Consistent uses include low density detached houses in rural settings. Allowable uses include tourist related uses (bed and breakfast and visitor accommodation) and home businesses where they are of small scale and are compatible with surrounding uses. Development that may have detrimental impacts on the low density rural residential scale, intensity, form and character of the zone or causes degradation of GQAL is not supported.
Open Space and Recreation	Allows for the provision of recreational facilities that protect and enhance the local amenity, and the continued conservation of protected areas. Development in

Zone	Purpose
	protected areas zoned under the planning scheme as Open Space and Recreation results in minimal impacts on the natural environment and maintains conservation, biodiversity and habitat values.
Small Town	Suitable uses include a range of residential and other small scale, low intensity, non-residential uses, necessary to service the town and its surrounding rural area. Uses must ensure residential amenity is protected.

Former Dalby Shire

The Dalby Town Planning Scheme took effect on 1 September 2007 and relates only to the former local government area. The aim of the planning scheme is to manage land use and development, infrastructure and valuable features to meet its needs for present and future generations. This section identifies the relevant DEOs, zones and precincts within the Dalby Town Planning Scheme.

Desired environmental outcomes

The Dalby Town Planning Scheme aims to achieve its DEOs to the extent practicable having regard to each other DEO. The DEO categories are:

- Social;
- Environmental; and
- Economic.

The DEOs relevant to the Project are listed and discussed in Table 7-11.

Table 7-11 Dalby Town Planning Scheme – DEOs

Desired Environmental Outcome	Comment
Future development in the Town of Dalby will be consistent with its safe and relaxed lifestyle, attractive setting exhibiting a distinctive character and sense of place.	**Chapter 24** provides an assessment of how the Project will affect the social values of the Shire.
There will be effective conservation of historic architecture and places of cultural heritage significance. New development will respect existing character and ensure streetscapes are cohesive with a compatible mix of land uses, activities and building forms with effective buffering where required.	Cultural heritage values within the Project area are identified and addressed in **Chapter 22** and **Chapter 23**. Mitigation strategies are provided to protect and manage places of cultural heritage significance affected by the Project.
The Town will maximise access for all inhabitants with transport corridors and facilities including the aerodrome, which provide for the safe and efficient movement of people and goods through the district. A network of local roads and mix of land uses will exist, which provides for maximum accessibility for pedestrians, cyclists and public transport.	**Chapter 21** provides an assessment of the existing transport methods and routes within the region and identifies potential impacts of the Project and mitigation measures for these impacts. The Project will be designed appropriately and where infrastructure is affected, limiting connectivity to public spaces, it will be replaced and/or relocated as required.
To maximise community health and safety and implement strategies to mitigate impacts of natural hazards in accordance with the Natural Disaster Mitigation Plan for Dalby Town.	**Chapter 26** provides a hazard and risk assessment of the Project.
The biodiversity and health of ecological systems will be maintained or improved in the Town of Dalby by protecting	**Chapters 9** to **13** provide an assessment of sensitive environmental areas, terrestrial flora and fauna and

Desired Environmental Outcome	Comment
areas with significant nature conservation values and providing for revegetation where appropriate.	aquatic flora and fauna within the Project area. Where potential impacts on ecological systems have been identified, mitigation measures have been provided.
Controls on water supply, stormwater and effluent will avoid risk to the environment and maintain high standards of water and air quality, and acceptable noise levels.	**Chapter 16** provides an assessment of surface water quality in relation to the Project, while **Chapter 17** assesses the impacts of the Project on air quality. Noise and vibration associated with the Project is assessed in **Chapter 19**.
Development will integrate the natural environment into the urban and rural fabric and ensure minimisation of adverse environmental impacts.	The aim of this EIS is to identify the potential impacts of the Project and provide mitigation strategies to minimise environmental impacts.
The Town of Dalby will continue its proud heritage as a prosperous and productive economy that reinforces the district's strengths in agriculture and related industries, Commercial/government services, educational and health facilities and transport infrastructure with its location advantages servicing western Queensland and South East Queensland.	As the pipeline reaches Dalby, it passes through land uses for a range of agricultural purposes. Impacts on land used for these purposes are examined in this chapter and mitigation measures are recommended to prevent or minimise impacts on activities that contribute to the economic wellbeing of the area. **Chapter 1** outlines the need and justification for the Project which reinforces the requirement for additional water infrastructure to service the region's mining water supply needs. **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
Future economic activity will build on existing industries and the district's agricultural resources whilst diversifying this base in a manner consistent with the area's character and the sustainable use of resources. There will be an enhanced tourism industry, which is based on, but does not compromise the district's natural assets, its cultural heritage and its Rural town character.	The Project will support future economic activity through the provision of a dedicated water supply that will support and enhance the large number of mining and agricultural operations in the region. Economic benefits and impacts are discussed in **Chapter 25**.
Dalby will have a strengthened role as the major community and economic centre for the Western Darling Downs with integrated road, rail and air transport and information systems, educational infrastructure that is fully integrated with the community to meet the needs of the rural, manufacturing and service industries with community and Commercial groups to research and contribute to the continual development of innovation and community creativity.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project. **Chapter 21** provides an assessment of the existing transport methods and routes within the region and identifies potential impacts of the Project and mitigation measures for these impacts. The Project will be designed appropriately and where infrastructure is affected, limiting connectivity within the community, it will be replaced and/or relocated as required.
Higher order retail, professional and commercial services and government facilities will be provided within the central town area and a range of employment opportunities will be available in identified Industrial land within and near the city. The Town will become both economically stronger and a more attractive place to live, work and conduct business. Use of the Town's economic resources, especially good quality agricultural land, will not have been compromised by other forms of land use or development.	**Chapter 24** addresses the social benefits and impacts of the Project. The provision of the water supply will provide employment and recreational opportunities. **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project. Potential impacts of the Project on GQAL are assessed in **Chapter 6**.

Zones and precincts

The town of Dalby is divided into two zones, 'The Town Zone' and 'The Rural Zone'. The pipeline is included in both these zones under the Dalby Town Plan. Within these zones, however, there are further divisions referred to as 'Precincts' which spatially identify distinct land use localities to assist in achieving the DEOs and provide the basis for regulating development. The Precinct Maps indicate the intended pattern of land uses within the town and describe the intent for, and character of each locality to clearly achieve a desired land use distribution.

The pipeline is located within the 'Rural Precinct' as it follows the railway easement into Dalby, ending within the 'Industry Precinct' at Dalby Jandowae Road. The pipeline also passes through the 'Open Space Precinct' and these relevant precincts are shown in Figure 7-14. The planning scheme outlines outcomes for each of the Precincts and these are described in Table 7-12.

Table 7-12 Dalby Town Planning Scheme – precincts

Precinct	Outcomes
Rural	The following describes the outcomes for the Rural Precinct: ■ Continue the ongoing Rural use of areas where they are considered good quality agricultural land; ■ Ensure that any Residential uses in the Rural area are associated with the Rural activity on site; ■ Restrict the expansion of any non Rural uses into the Rural area due to the limited ability to extend infrastructure networks into these areas; ■ GQAL is protected from fragmentation, alienation or encroachment of incompatible land uses in accordance with SPP 1/92 – Development and Conservation of Agricultural Land; ■ Development is appropriately located within the Rural Zone and existing future Rural Activities are not prejudiced by inappropriate development; and ■ Maintains the environment, including soil, air and water, compatible with healthy natural systems and ensure public health and safety.
Industry	The Industry Precinct is characterised by existing and future industries and associated services supporting economic activities in the district, as well as sites for diversified enterprises. Development in the Industry Precinct is predominantly industrial in nature and ensures that the use of land in the precinct for industrial purposes is protected.
Open Space	The Open Space Precinct includes land possessing significant environmental values and/or constraints to development including low lying lands, remnant vegetation, proximity to noxious activities and areas of special recreation values requiring careful management. Development in the Open Space Precinct is managed to protect the purpose of the designation for flood storage, environmental and/or recreation.

Former Wambo Shire

The Wambo Shire Planning Scheme took effect on 30 June 2006 and relates only to the former local government area. This section identifies the relevant DEOs and zones of the Wambo Shire Planning Scheme.

Desired environmental outcomes

The DEO categories are:

- The Environment;
- Economic Development; and

- Community and Services.

The DEOs relevant to the Project are listed in Table 7-13.

Under the DEO for Economic Development, productive rural land (GQAL) is required to be protected from incompatible development to reflect and enhance continued economic potential and viability. GQAL is shown on a map within the Wambo Shire Planning Scheme and the mapping identifies that GQAL is located on both the northern and southern side of the railway and Warrego Highway easements in which the pipeline is situated. Class A GQAL is the most predominant, while small areas of Class B GQAL are located on the southern side of the Warrego Highway to the north west of Warra and on both sides of the railway and Warrego Highway easements to the south east of Macalister. GQAL is assessed further in Chapter 6.

Table 7-13 Wambo Shire Planning Scheme – DEOs

Desired Environmental Outcome	Comment
Development is managed to minimise the adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas.	The impacts of the Project on the identified matters are assessed in **Chapters 6** and **9** to **13**. **Chapter 17** assesses the impacts of the Project on air quality. **Chapters 9** to **13** discuss the flora and fauna of the Project area and assess the impacts of the Project.
Protected areas (including Bunya Mountains and Lake Broadwater) and areas and items of cultural significance (including areas along water courses) are identified to ensure their environmental and landscape values and historic significance are protected and enhanced through compatible development.	Protected areas are identified in this section, while further detail and assessment is provided in **Chapter 9** where the impacts of the Project are assessed.
The Planning Scheme reinforces and consolidates the role of Jandowae as the principal place for business, industry and commerce within the Shire.	**Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
The local service roles of the towns of Macalister, Warra, Jimbour, Bell and Kaimkillenbun are protected and enhanced.	The pipeline passes through the towns of Macalister and Warra. **Chapter 25** describes the local economy, while strategies are provided to mitigate disruption to the local economy during construction and operation of the Project.
Productive rural land (such as the Jimbour floodplain), rural industries (such as intensive animal industries, cotton and grain processing) and natural features (including mineral and extractive resources and tourist resources such as the Bunya Mountains and Lake Broadwater) are protected to reflect and enhance their continued economic potential and viability.	Within the jurisdiction of the Wambo Shire Planning Scheme, much of the land surrounding the pipeline route is considered to be productive rural land. Assessment of the impacts of the Project considers the loss of GQAL and activities contributing to the local economy. Assessment of GQAL is provided in **Chapter 6**, while **Chapter 25** includes an assessment of the impacts of the Project on the local economy. Strategies are provided to mitigate disruption to the local economy during construction and operation.
The industrial area in Jandowae is consolidated and protected and its role as the key area for industrial activity is reinforced.	The pipeline does not pass through the town of Jandowae and will not have an impact on the industrial area in the town.
The built environment reflects community expectations and contributes to the amenity and rural character of Wambo Shire.	**Chapter 5** identifies the potential visual and amenity impacts of the Project. **Chapter 24** addresses the potential amenity issues.
People are connected to public spaces and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centres of the Shire.	The Project will be designed appropriately and where infrastructure is affected, it will be replaced and/or relocated as required.

Desired Environmental Outcome	Comment
Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.	This chapter identifies housing types in the Project area through the descriptions of land uses and zones. **Chapter 2** outlines the overall benefits of the Project, while **Chapter 24** provides an assessment of how the Project will affect the social values of the local environment.
Infrastructure (including water and sewerage and roads) reflects community expectations and engineering standards and is provided in an orderly and logical sequence to ensure cost effectiveness.	**Chapter 1** outlines the need for the Project and the socio-economic cost and benefits. **Chapter 2** describes the design and construction of the Project (dam, water storage and associated infrastructure, including roads) to required standards.

Zones

Under the Wambo Shire Planning Scheme, the pipeline is included predominantly within the Rural 'Zone'. As the pipeline route passes through the towns of Macalister and Warra following the railway easement and Warrego Highway, it also passes through the Small Town 'Zone'. The Open Space and Recreation 'Zone' is also in the vicinity of the pipeline adjacent to the northern side of the railway easement as it travels through Warra. These relevant zones are shown in Figure 7-14. The planning scheme outlines the purpose for each zone and these are provided in Table 7-14.

Table 7-14 Wambo Shire Planning Scheme – zones

Zone	Purpose
Rural	Consistent uses include primary production through grazing and farming, while allowable uses included tourist related uses (bed and breakfast premises and visitor accommodation) and intensive animal industries and extractive industries. Industrial uses are supported only where it can be demonstrated that those uses are associated with rural production and cannot reasonably be established in the Industrial Zone. Uses that may have detrimental impacts on existing intensive animal industries, extractive industries or GQAL are not supported.
Open Space and Recreation	Allows for the provision of recreational facilities that protect and enhance the local amenity, and the continued conservation of protected areas. Development in protected areas zoned under the planning scheme as Open Space and Recreation results in minimal impacts on the natural environment and maintains conservation, biodiversity and habitat values.
Small Town	Suitable uses include a range of residential and other small scale, low intensity, non-residential uses, necessary to service the town and its surrounding rural area. Uses must ensure residential amenity is protected.

7.1.3.4. Existing land use

Existing land uses along the water distribution pipeline route are shown in Figure 7-15. Predominant existing land uses in the vicinity of the pipeline route include:

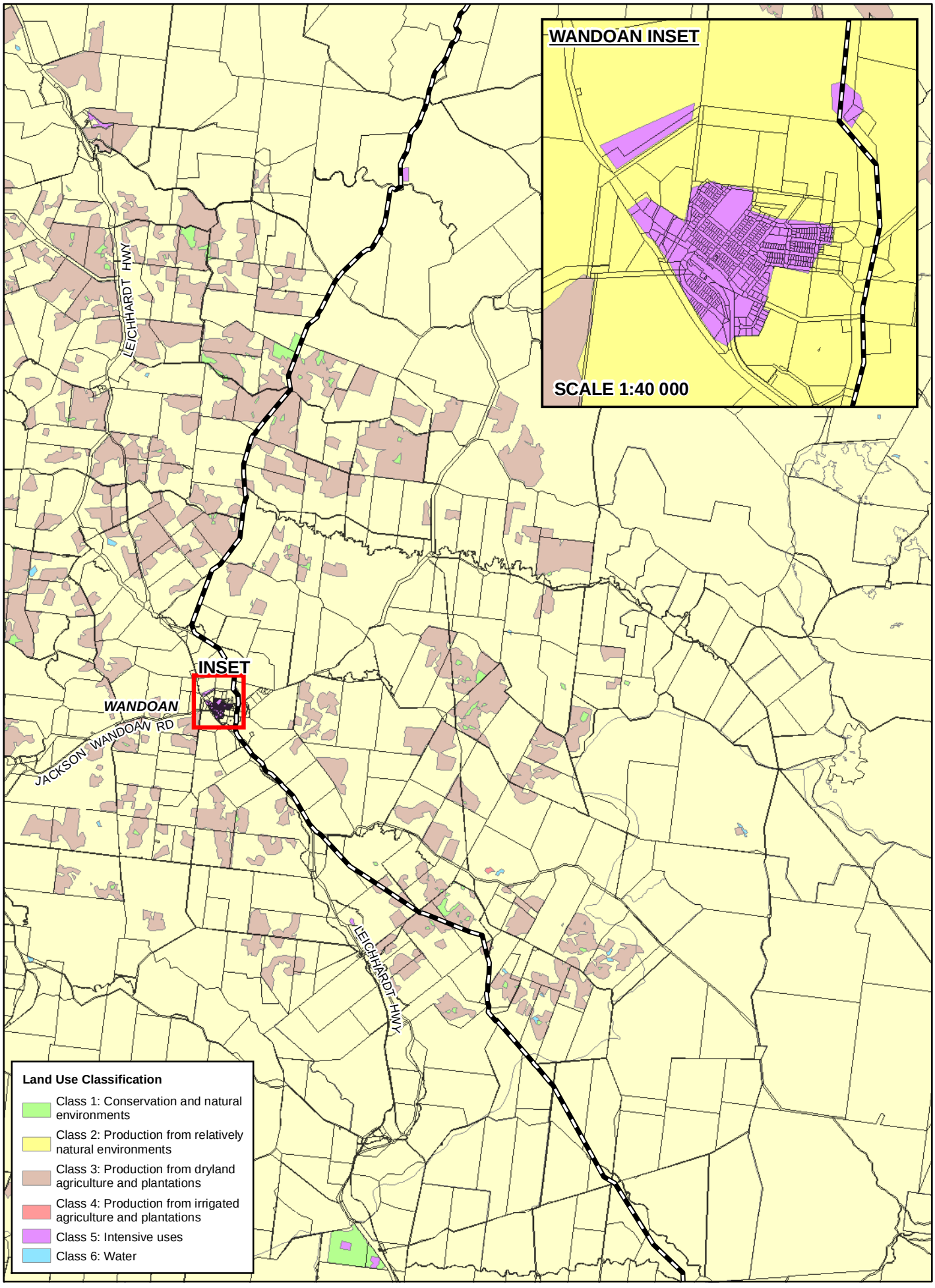
- cattle grazing;
- dryland and irrigated agriculture; and
- mining tenements.

Land use adjacent to the pipeline route from the dam to Chinchilla is predominantly grazing, including both breeding and fattening enterprises. Land to the north of Miles, however, is well vegetated and the topography is characterised mostly of rolling hillsides and escarpments, limiting the extent of potential grazing. This is reflected in the GQAL mapping in the Murilla Shire Planning Scheme. Nonetheless, there are some areas of dryland agriculture to the east and north east of Guluguba.

The most prevalent land use from Chinchilla to Dalby is dryland agriculture (cropping and plantations) with some areas of irrigated land. Crops grown along this section include wheat, oilseeds, fruit, maize, tobacco, oats, sorghum, millet, cotton, soybeans and navy beans (Australian Natural Resource Atlas, 2009). The topography of the land surrounding this segment of the pipeline route is flat, supporting mainly cropping land uses. This is reflected in the GQAL mapping in the Chinchilla Shire Planning Scheme and the Wambo Shire Planning Scheme and discussed in Section 7.1.3.3.

In the eastern outskirts of Wandoan, rural residential land uses are located in close proximity to the pipeline route fronting the eastern side of Windeyer Road. In the town of Chinchilla, the pipeline route traverses land used for rural residential purposes to the north of Chinchilla Wondai Road and grazing between Cemetery Road and Dawson Gates Road. At the end of the pipeline in Dalby, a residential estate is located to the south of the railway line on the western side of Dalby Jandowae Road, while industrial land uses (Figure 7-16) are located on the eastern side of Jandowae Road to the north of the railway line.

Where the pipeline passes though the small townships of Brigalow, Macalister and Warra following the Warrego Highway, surrounding land use is predominantly low density residential (Figure 7-17). In each of these townships, large grain silos are located adjacent to either the northern or southern side of the railway line (Figure 7-18). A primary school is located in the western area of Brigalow on the southern side of the Warrego Highway. Reserves used as rest stops for travelers are present in most of the towns and townships along the pipeline route.



LEGEND

- Proposed Pipeline
- Cadastre

Projection: GDA94 Zone 56

Figure 7-15A

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land use - pipeline

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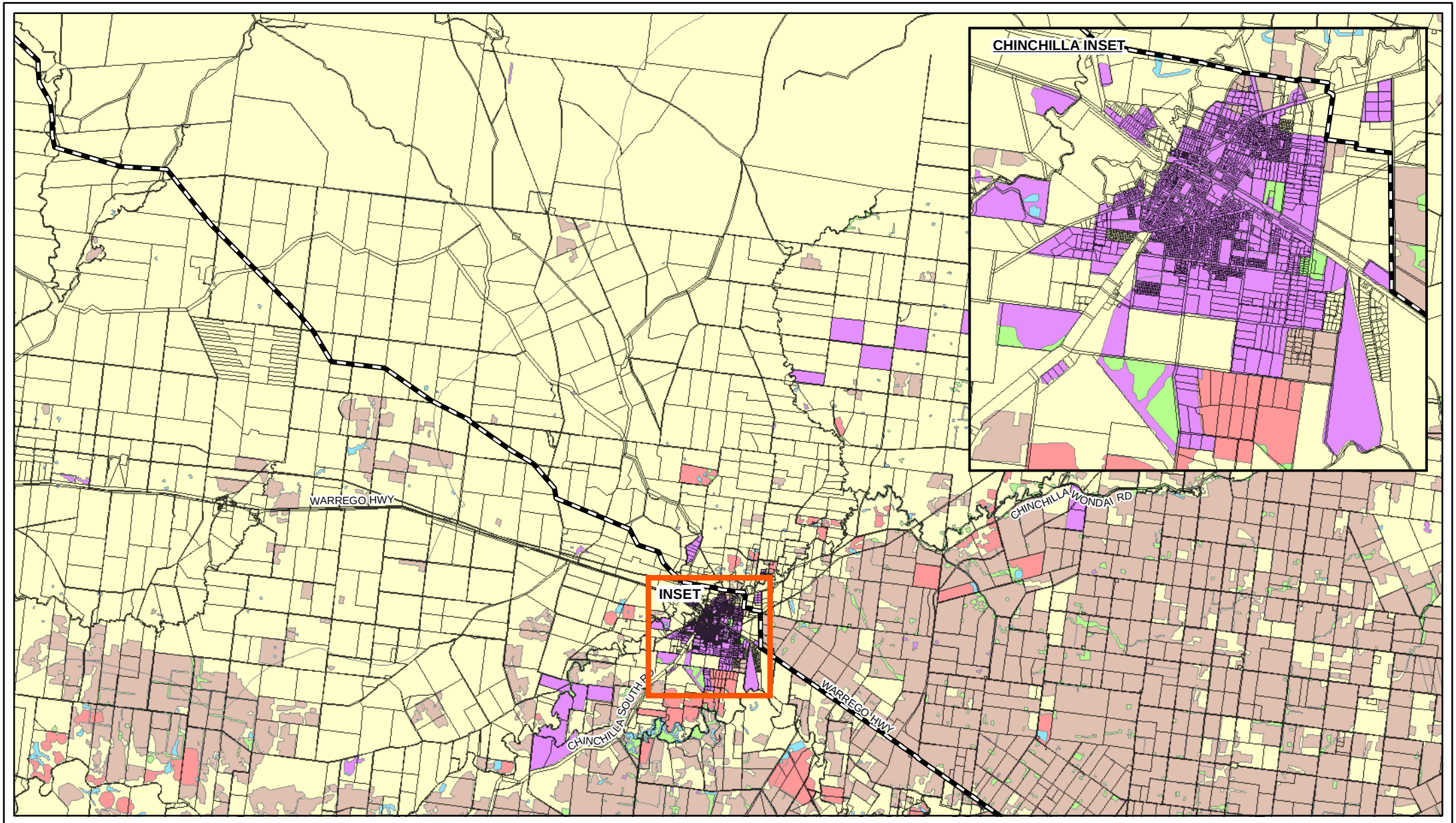

LEGEND

- Proposed Pipeline
- Cadastre

Projection: GDA94 Zone 56

Figure 7-15B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land use - pipeline

Land Use Classification

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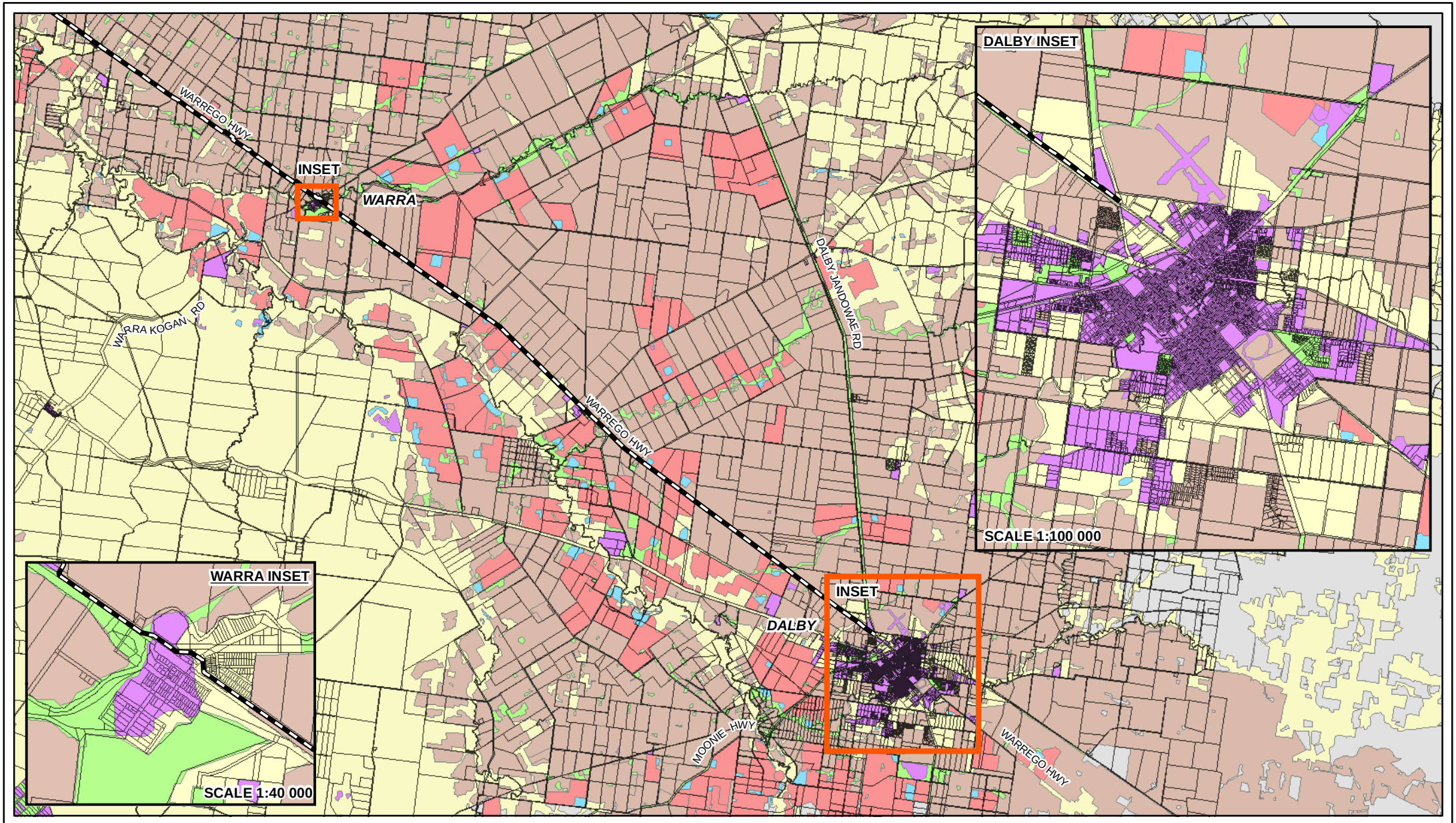

LEGEND

- Proposed Pipeline
- Cadastre

Land Use Classification

Projection: GDA94 Zone 56

Figure 7-15C

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land use - pipeline

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Figure 7-16 Industrial land use near the end of the pipeline in Dalby

Figure 7-17 Low density residential land use in Brigalow

Figure 7-18 Grain silos and low residential land use in Brigalow

7.1.3.5. Land tenure

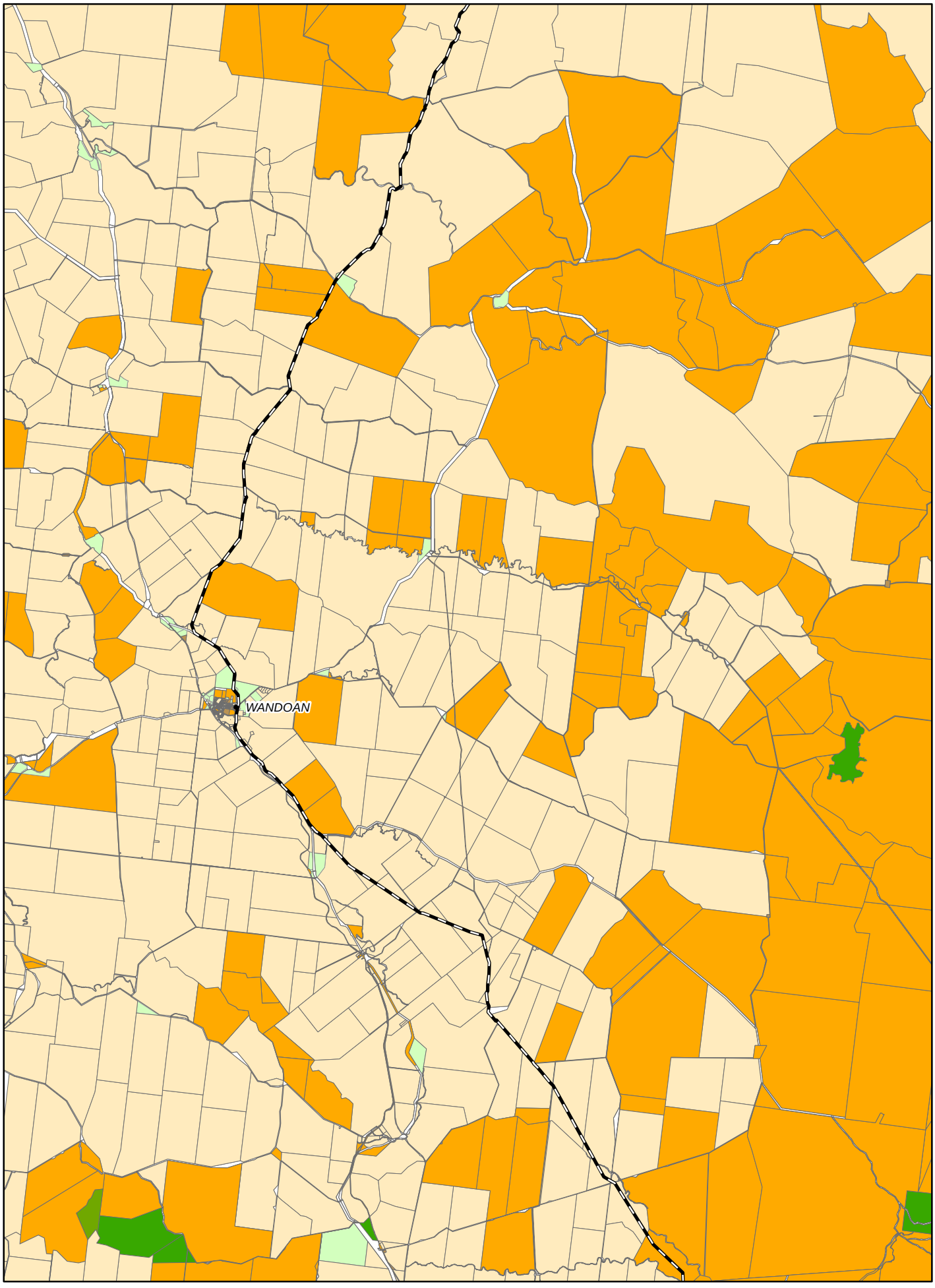
Land tenure in the vicinity of the pipeline route is shown in Figure 7-19 and comprises freehold, leasehold, reserve, rail corridor, road reserve and easement. Approximately two thirds of the pipeline route follows existing road reserves, rail corridors and easements, although just under half of the necessary easement width is proposed to be located within these reserves, corridors and easements. Tenure adjacent to these road reserves, rail corridors and easements is comprised of 50.5% freehold, 20.4% leasehold, 28.9% reserve and 0.2% Unallocated State land.

The pipeline route traverses a number of private properties, most of which are located between Wandoan and Chinchilla and a lesser number between Nathan Dam and Wandoan. Properties traversed by the pipeline route are identified in Chapter 2.

Stock routes along the pipeline route are generally confined to narrow road reserves (and require very large scale maps to be accurately depicted) are located as follows:

- crossing Nathan Road at the Taroom Cracow Road;
- crossing Nathan Road approximately 2.2 km north of Cockatoo Creek;
- along Nathan Road from approximately 0.5 km north of Cockatoo Creek south to the Cockatoo Road intersection (total length approximately 2.5 km);
- crossing Nathan Road at the crossroads approximately 0.7 km south of Bullock Creek (Bungaban Twelve Mile Road;
- along Leichhardt Highway for approximately 1 km south of the Nathan Road intersection;
- crossing Leichhardt Highway approximately 0.8 km north of the Jackson Wandoan Road intersection at Wandoan;

- along the Leichhardt Highway for approximately 16.5 km from approximately 2.8 km south of the Jackson Wandoan Road intersection to just south of Guluguba;
- west of Columboola Creek;
- west of Charleys Creek at Chinchilla;
- crossing the Warrego Highway at Warra;
- along the Warrego Highway for approximately 11 km from approximately 8 km north-west of Macalister to approximately 3 km south-east of Macalister; and
- crossing the presently-designated end of the pipeline at the Dalby – Jandowae Road on the outskirts of Dalby.



LEGEND

- Towns of Interest
- Proposed Pipeline

Tenure

- Covenant
- Easement
- Freehold
- Housing Land
- Lands Lease
- Marine Park
- Main Road
- National Park
- Reserve
- State Forest
- State Land
- No Tenure

Projection: GDA94 Zone 56

Figure 7-19A

0 1 2 4 6
Kilometres

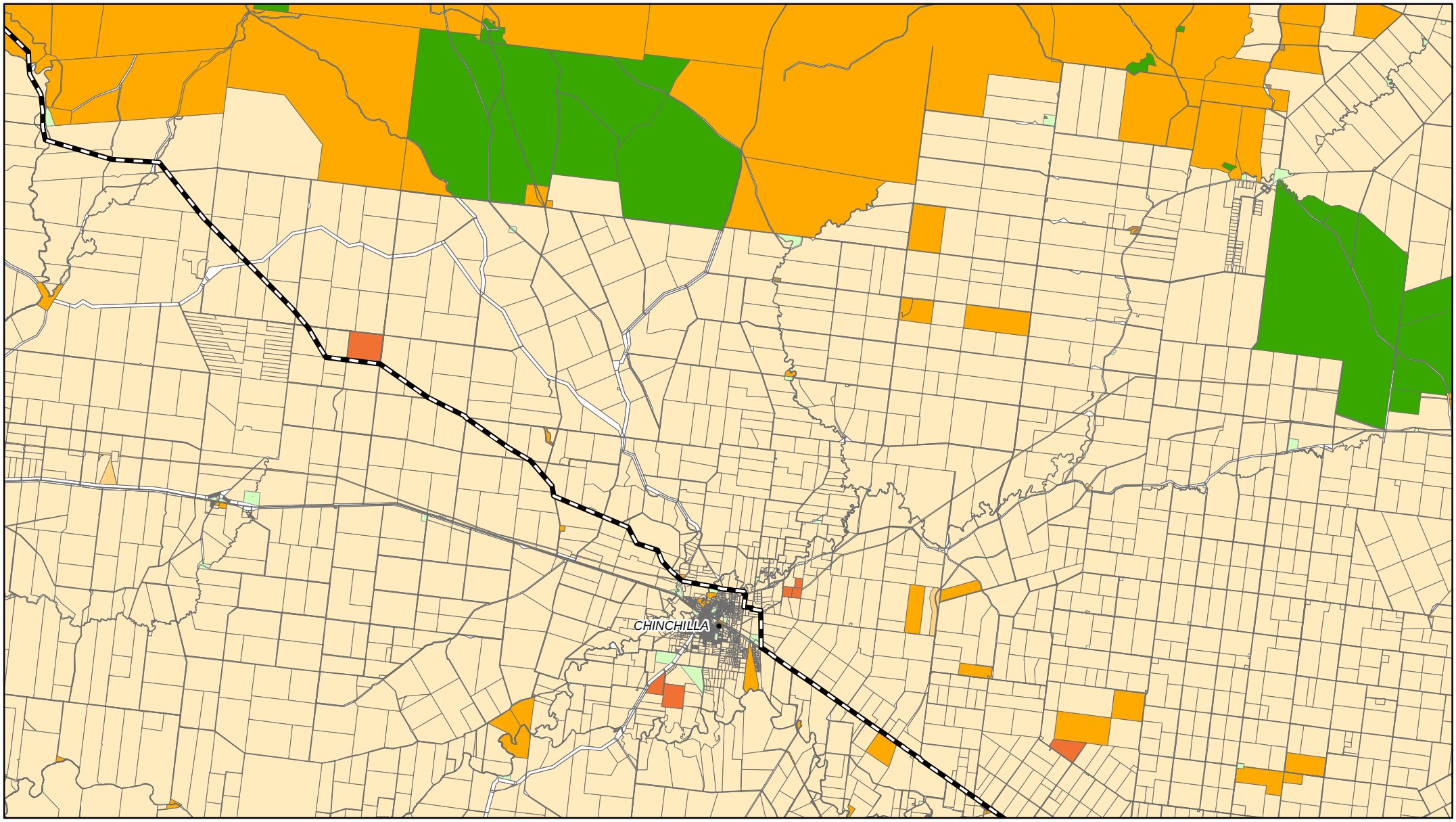
N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land tenure - pipeline



LEGEND

- Towns of Interest
- Proposed Pipeline

Tenure

- Covenant
- Easement
- Freehold
- Housing Land
- Lands Lease
- Marine Park
- Main Road
- National Park
- Reserve
- State Forest
- State Land
- No Tenure

Projection: GDA94 Zone 56

Figure 7-19B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land tenure - pipeline

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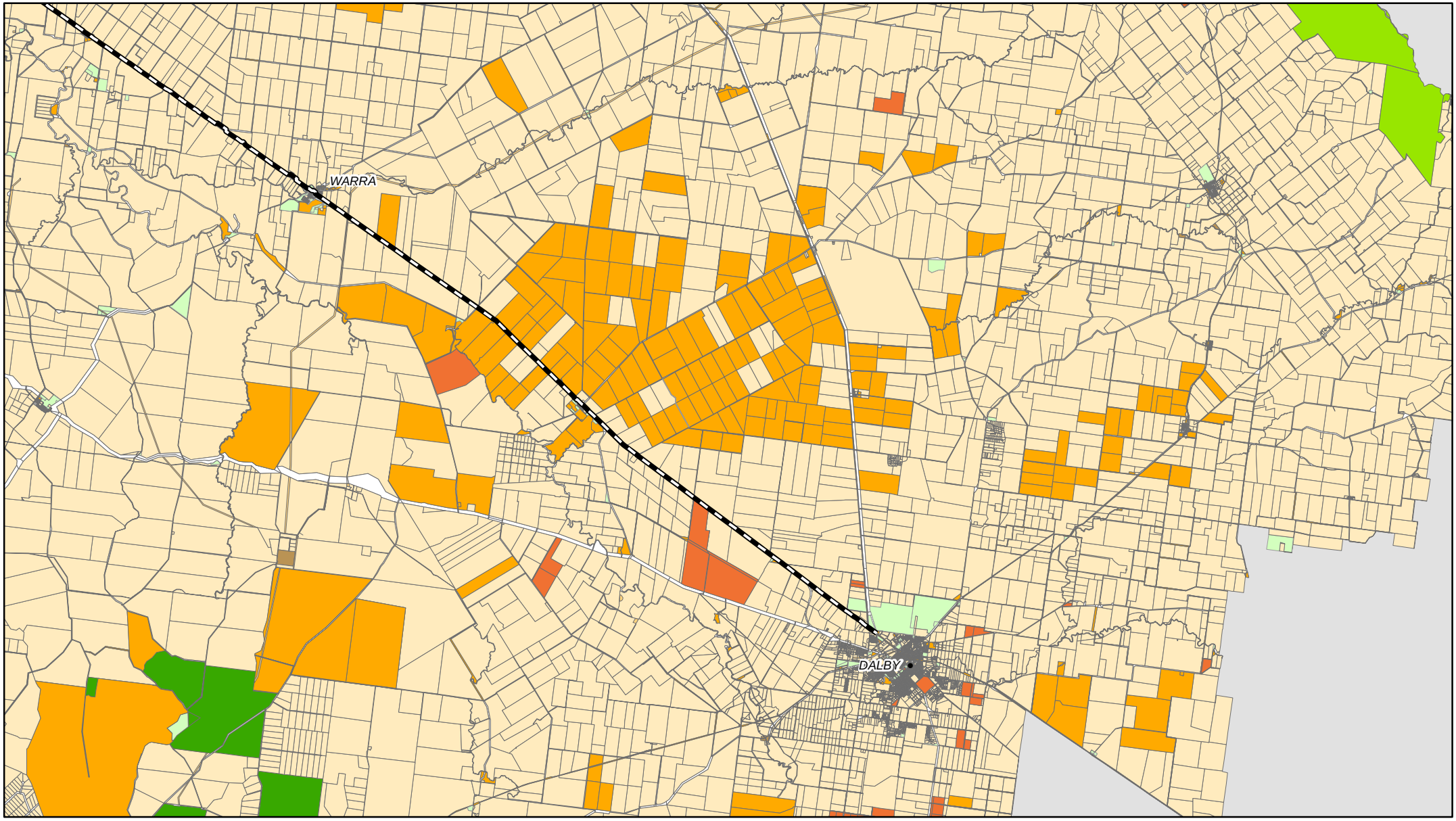

LEGEND

- Towns of Interest
- Proposed Pipeline

Tenure

- Covenant
- Easement
- Freehold
- Housing Land
- Lands Lease
- Marine Park
- Main Road
- National Park
- Reserve
- State Forest
- State Land
- No Tenure

Projection: GDA94 Zone 56

Figure 7-19C

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Land tenure - pipeline

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Mining and exploration tenures and extractive resources

Figure 7-20, Figure 7-21, Figure 7-22 and Figure 7-23 show the mining and petroleum & gas tenements in the vicinity of the pipeline route.

Mining

As shown in Figure 7-21, most of the land along the pipeline route is covered by coal exploration permits, either granted or applied for, while many remaining areas are covered by mineral development licences, either granted or applied for. The pipeline route does not traverse any mining leases or mines as indicated in (Figure 7-20). There are, however, a number of mining lease applications to the south of the pipeline route. Xstrata currently holds a coal mining lease application adjacent Wandoan. The EIS for the raising of Glebe Weir and associated pipeline was prepared as one of three raw water supply options specifically for this mining lease. This lease application is adjacent to a section of the pipeline route to the south of Wandoan. Other mining lease applications in close proximity to the pipeline route are (refer to Figure 7-20):

- approximately 4 km southwest of the pipeline at Guluguba, held by Surat Coal Pty Ltd; and
- approximately 12 km west of Chinchilla and 1 km south of the pipeline at its closest point, held by Syntech Resources Pty Ltd.

Petroleum and gas

As shown in Figure 7-22, the pipeline traverses a number of petroleum leases, both granted and current applications. Sections of the pipeline subject to leases include:

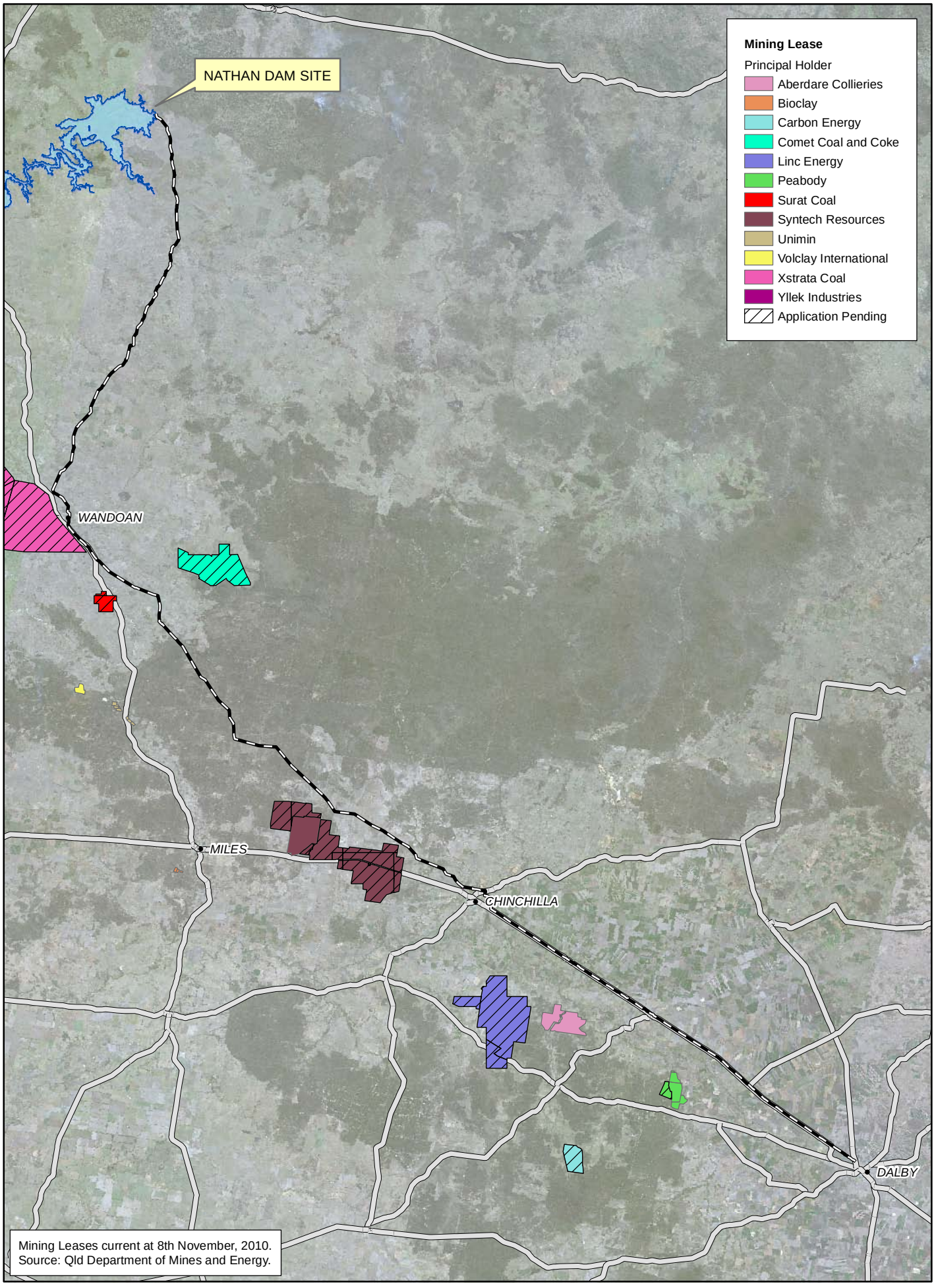
- from approximately 34.5 km to 18 km north of Wandoan held by Santos;
- from approximately 18 km to 22 km south east of Wandoan held by Australia Pacific LNG; and
- the northern corners of a lease from approximately 29 km to 35.5 km south east of Chinchilla held by Australian CBM.

Sections of the pipeline subject to lease applications include:

- from approximately 5.5 km to 18 km south east of Wandoan held by Arrow Energy;
- from approximately 14.5 km to 16 km south east of Guluguba held by Arrow Energy; and
- from approximately 7 km north west to 15.5 km south west of Chinchilla held by Australian CBM.

As shown in Figure 7-23, ATPs cover all of the pipeline route except for:

- an area along Nathan Road, with numerous coal seam gas wells, which is part of the Scoria coal seam gas petroleum lease; and
- an area to the north-west of Warra that is covered by a petroleum lease.



LEGEND

- Towns
- Proposed Pipeline
- Major Roads
- Full Supply Level (183.5m AHD)

Projection: GDA94

Figure 7-20

0 5 10 20
Kilometres

N

Scale 1:900,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Mining leases - pipeline

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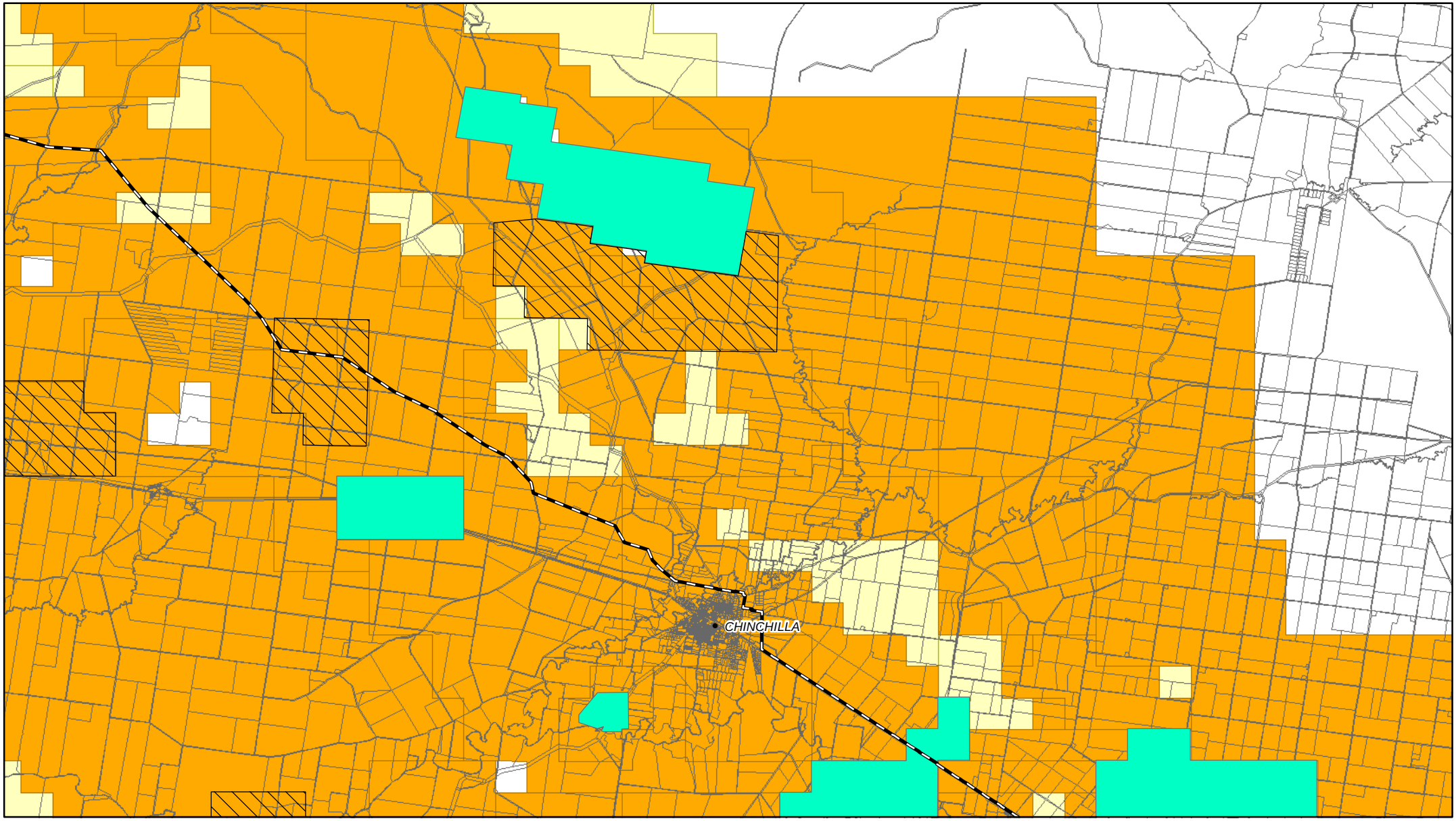

LEGEND

- Towns
- Proposed Pipeline
- Cadastre

Mineral Development Licence
- Application
- Granted

Exploration Permit Coal
- Application
- Granted

Exploration Permit Minerals
- Application
- Granted

Projection: GDA94

Figure 7-20B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Mining tenements - pipeline

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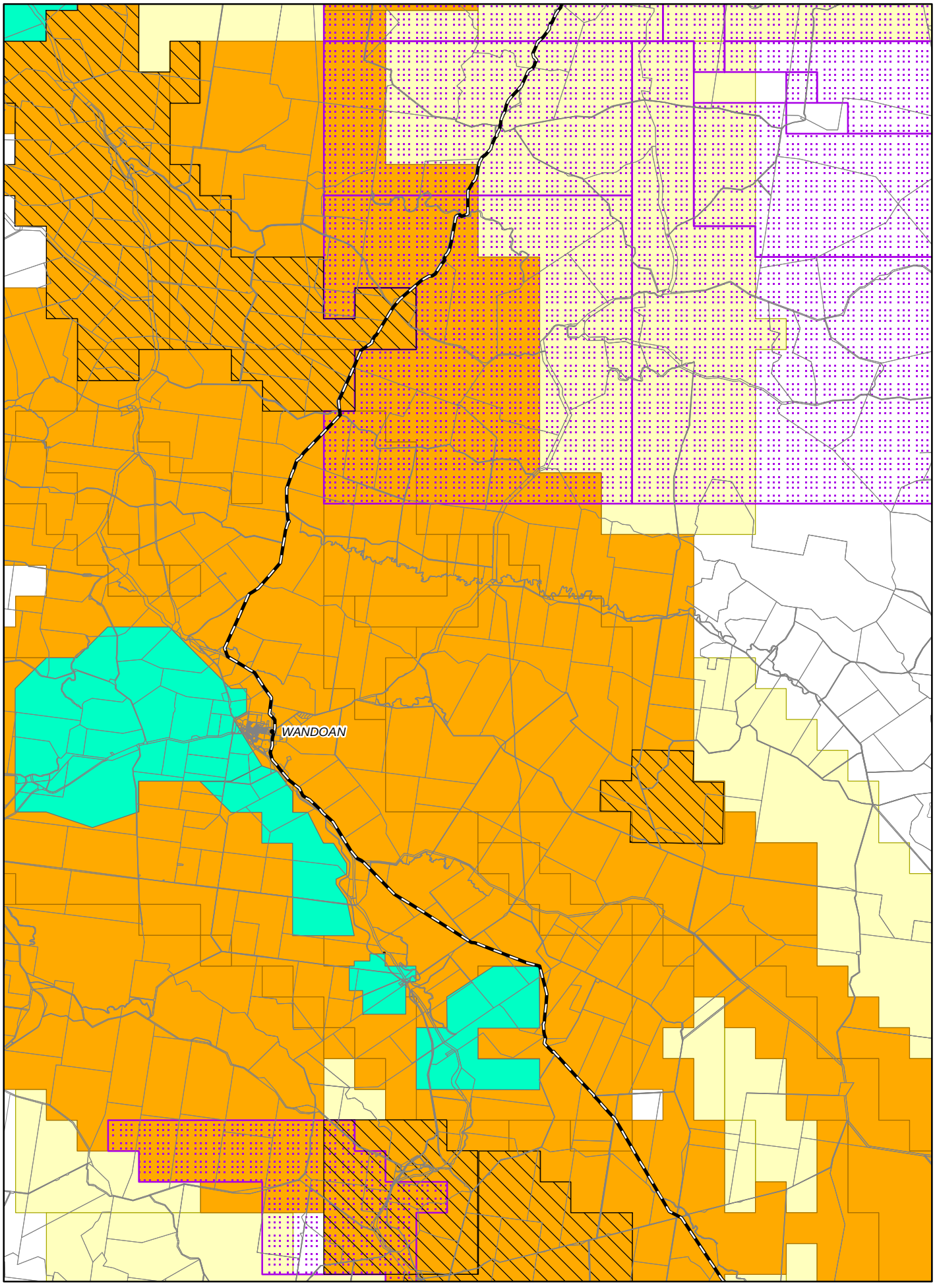

LEGEND

- Towns
- Proposed Pipeline

Mineral Development Licence
- Application
- Granted

Exploration Permit Coal
- Application
- Granted

Exploration Permit Minerals
- Application
- Granted

Projection: GDA94

Figure 7-21A

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Mining tenements - pipeline

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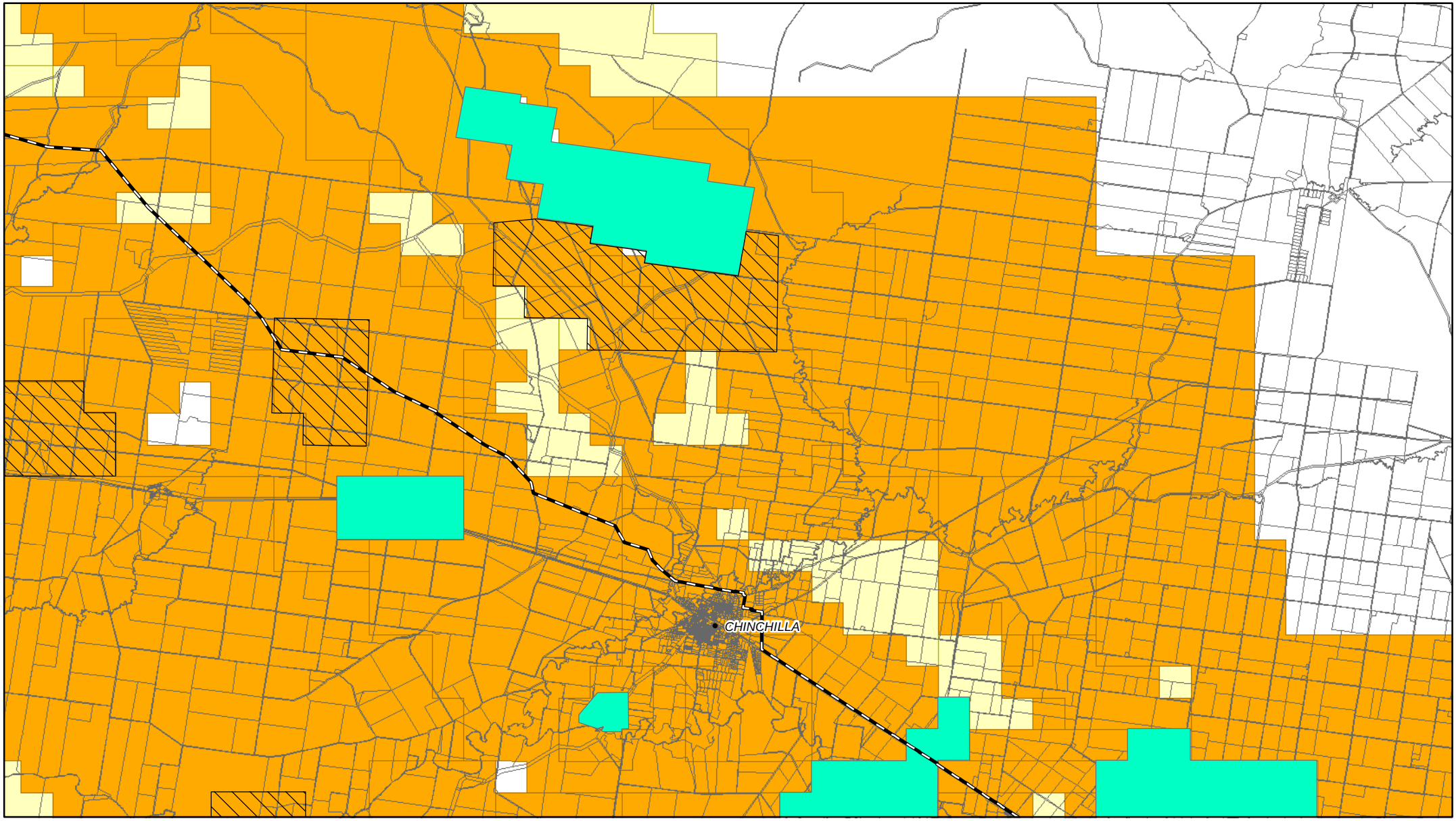

LEGEND

- Towns
- Proposed Pipeline
- Cadastre

Mineral Development Licence
- Application
- Granted

Exploration Permit Coal
- Application
- Granted

Exploration Permit Minerals
- Application
- Granted

Projection: GDA94

Figure 7-21B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Mining tenements - pipeline

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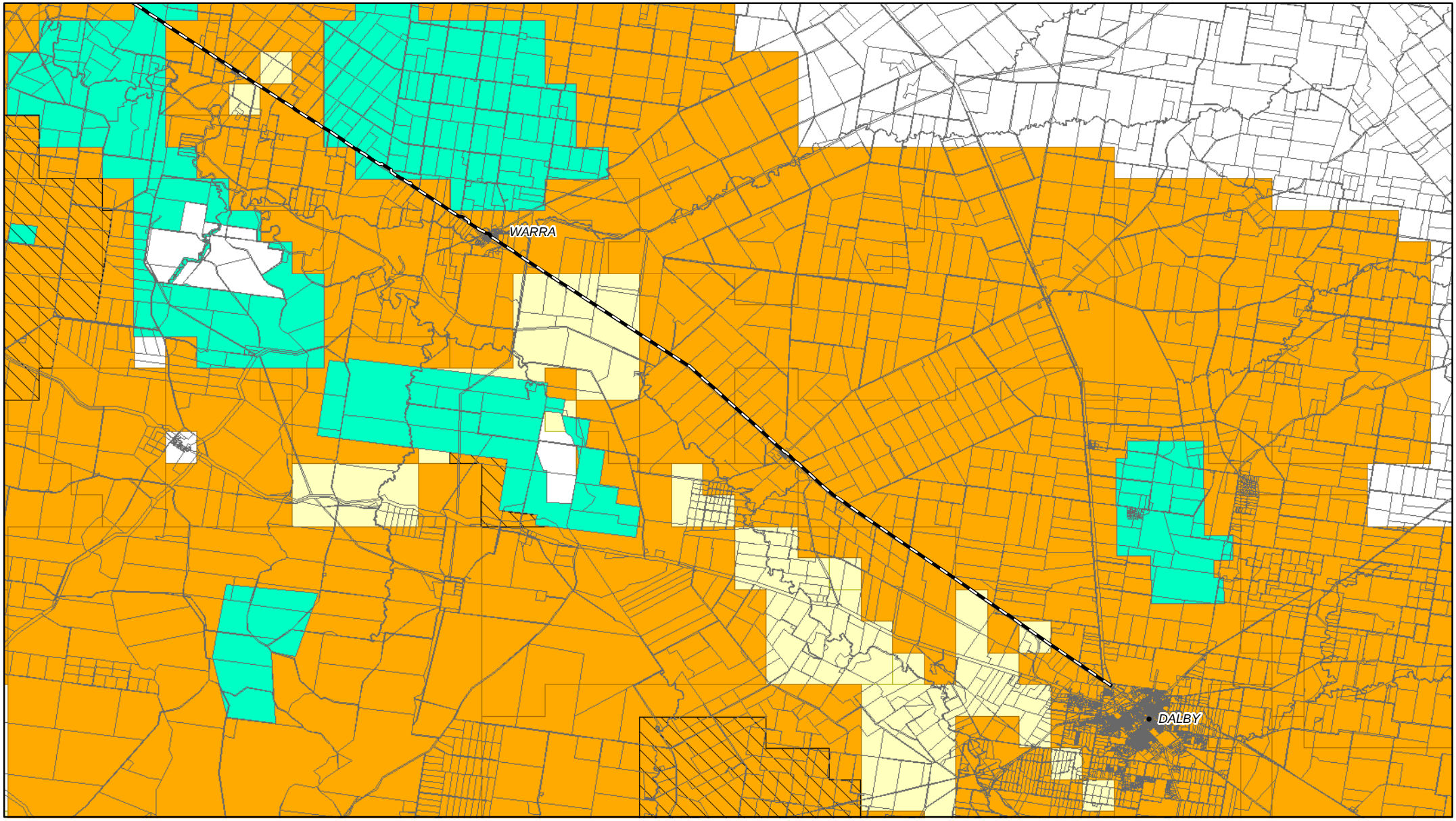


LEGEND

- Towns
- Proposed Pipeline
- Cadastre

Mineral Development Licence
- Application
- Granted

Exploration Permit Coal
- Application
- Granted

Exploration Permit Minerals
- Application
- Granted

Projection: GDA94

Figure 7-21C

0 1 2 4 6
Kilometres

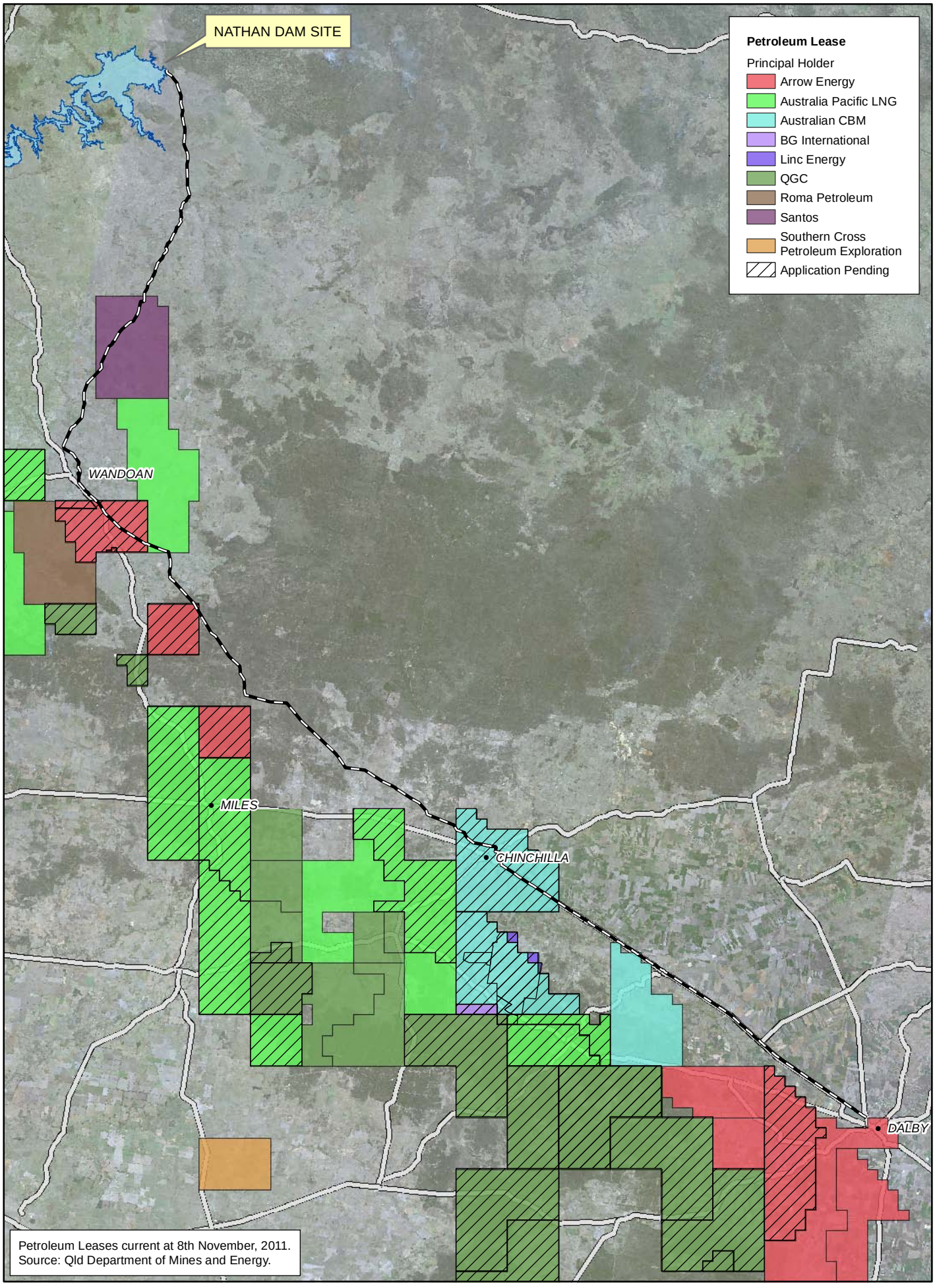
N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Mining tenements - pipeline



LEGEND

- Towns
- Proposed Pipeline
- Major Roads
- Full Supply Level (183.5m AHD)

Projection: GDA94

Figure 7-22

0 5 10 20
Kilometres

N

Scale 1:900,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Petroleum leases - pipeline

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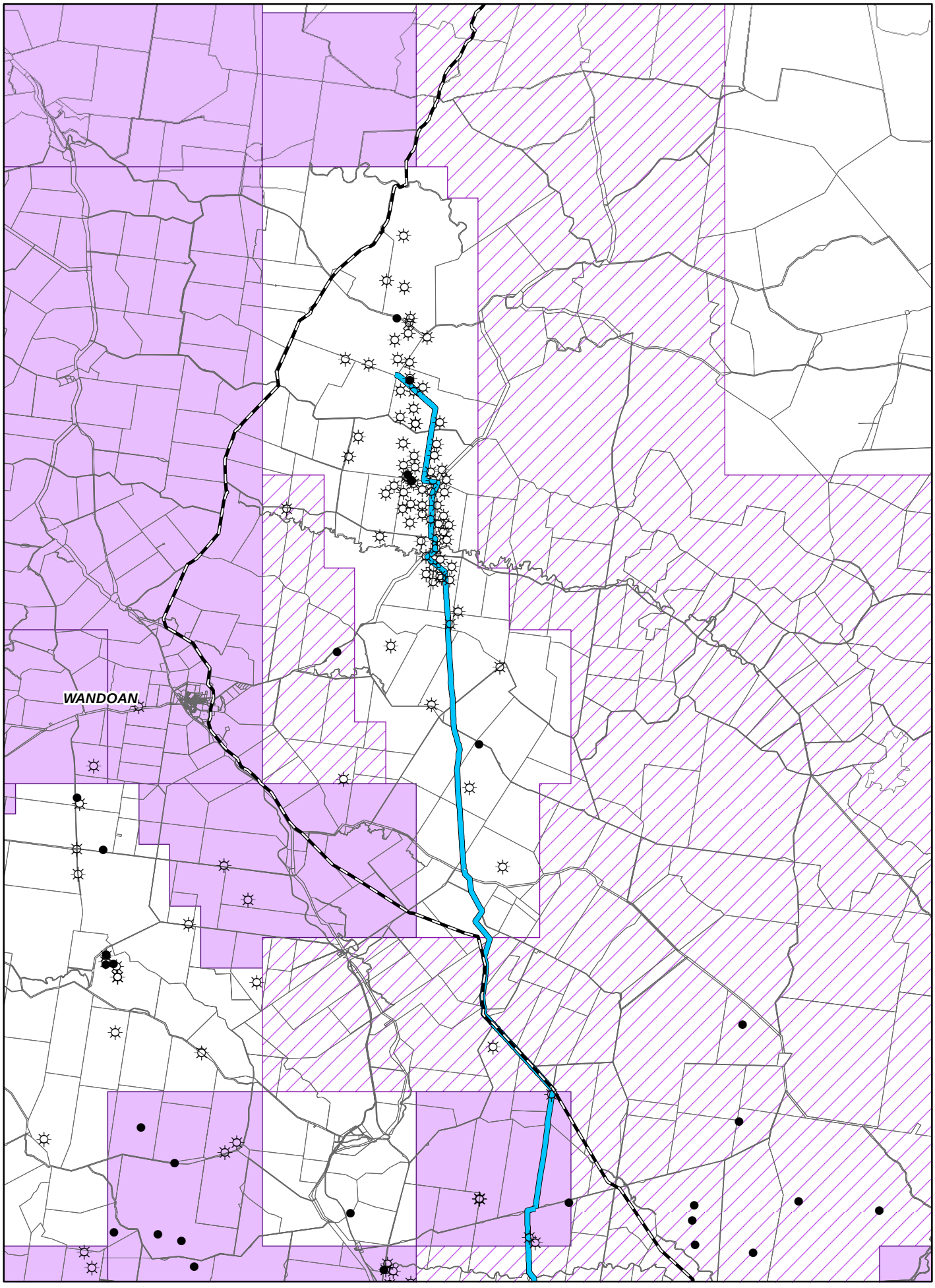


LEGEND

- Petroleum Exploration Well
- Coal Seam Gas Exploration Well
- Proposed Pipeline
- Petroleum Pipeline Licence
- Cadastre

Exploration Permit Petroleum
- Application
- Granted

Projection: GDA94 Zone 56

Figure 7-23A

0 1 2 4 6
Kilometres

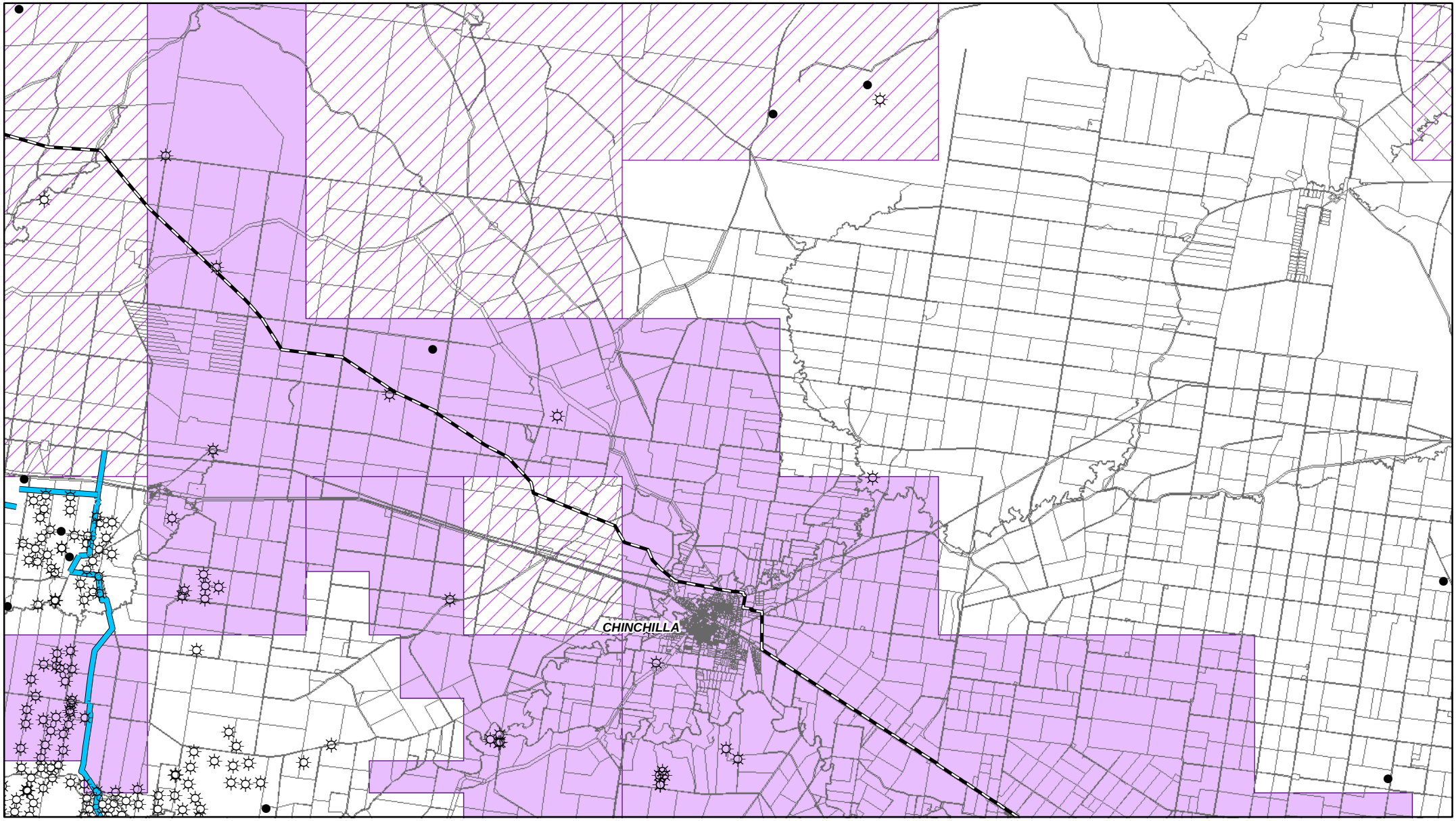
N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Petroleum and gas tenements - pipeline



LEGEND

- Petroleum Exploration Well
- Coal Seam Gas Exploration Well
- Proposed Pipeline
- Petroleum Pipeline Licence
- Cadastre

Exploration Permit Petroleum

- Application
- Granted

Projection: GDA94

Figure 7-23B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Petroleum and gastenements - pipeline

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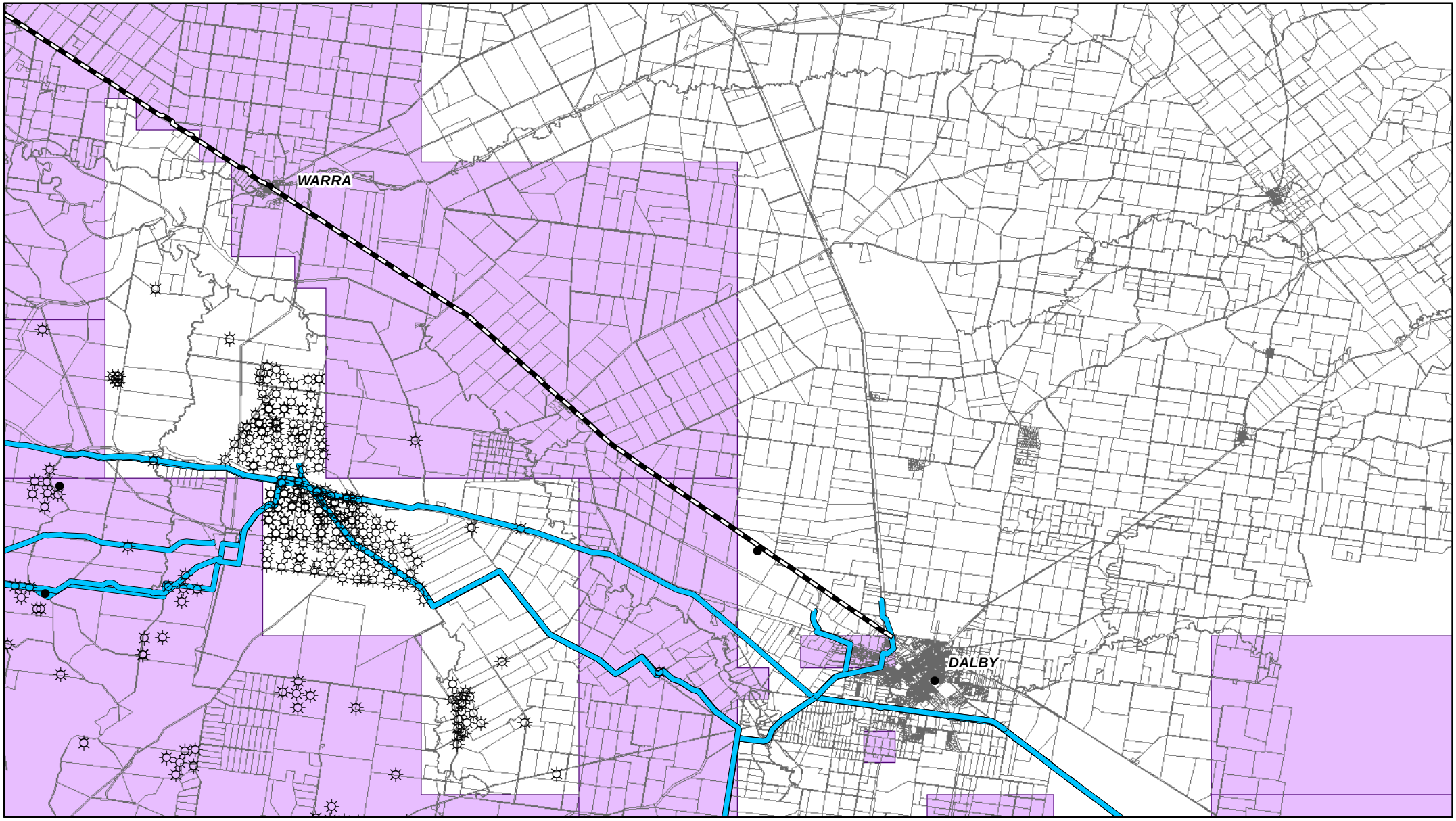

LEGEND

- Petroleum Exploration Well
- Coal Seam Gas Exploration Well
- Proposed Pipeline
- Petroleum Pipeline Licence
- Cadastre

Exploration Permit Petroleum

- Application
- Granted

Projection: GDA94 Zone 56

Figure 7-23C

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Petroleum and gastenements - pipeline

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- Native Title

At the time of writing this EIS, SunWater was undertaking an assessment of:

- native title extinguishment status of the lands the subject of the pipeline route; and
- appropriate native title future act compliance measures where applicable.

The relevant Native Title Representative Body for the area impacted by the pipeline route is Queensland South Native Title Services.

As of 30 June 2011, the following native title claims were registered within the Pipeline Route Area (Figure 22-1):

The Wulli Wulli People Federal Court file number QUD6006/00, Native Title Tribunal file number QC00/07; and

The Iman People #2 Federal Court file number QUD6162/98 and Native Title Tribunal file number QC97/55.

Further assessment of Native Title is provided in Chapter 22.

7.1.3.6. Protected areas

The preferred pipeline route does not traverse tenures of special interest such as protected areas, recreation reserves or forest reserves, though it is adjacent to a number of reserves including recreation reserves and cemeteries, particularly in town areas. Also, the pipeline route is adjacent to the Chinchilla Rifle Range (Lot 238 on SP129489) which is listed as a Nature Refuge under the *Nature Conservation Act 1992* and is a local fossil fauna site listed in the Register of the National Estate.

Local authority planning schemes show the route traverses areas of BPA significance. These are most common in the former Murilla Shire where there are appreciable areas south of the Great Dividing Range, north of Wallan Creek and approximately 8 km east of Miles. There are other areas in the former Taroom and Chinchilla Shires. More information on these areas is given in Chapter 9.

Further information on the GBRWHA and the Shoalwater and Corio Bays Area in relation to the Project is provided in Chapter 28.

More information on places of cultural heritage significance along the pipeline route is given in Chapter 22.

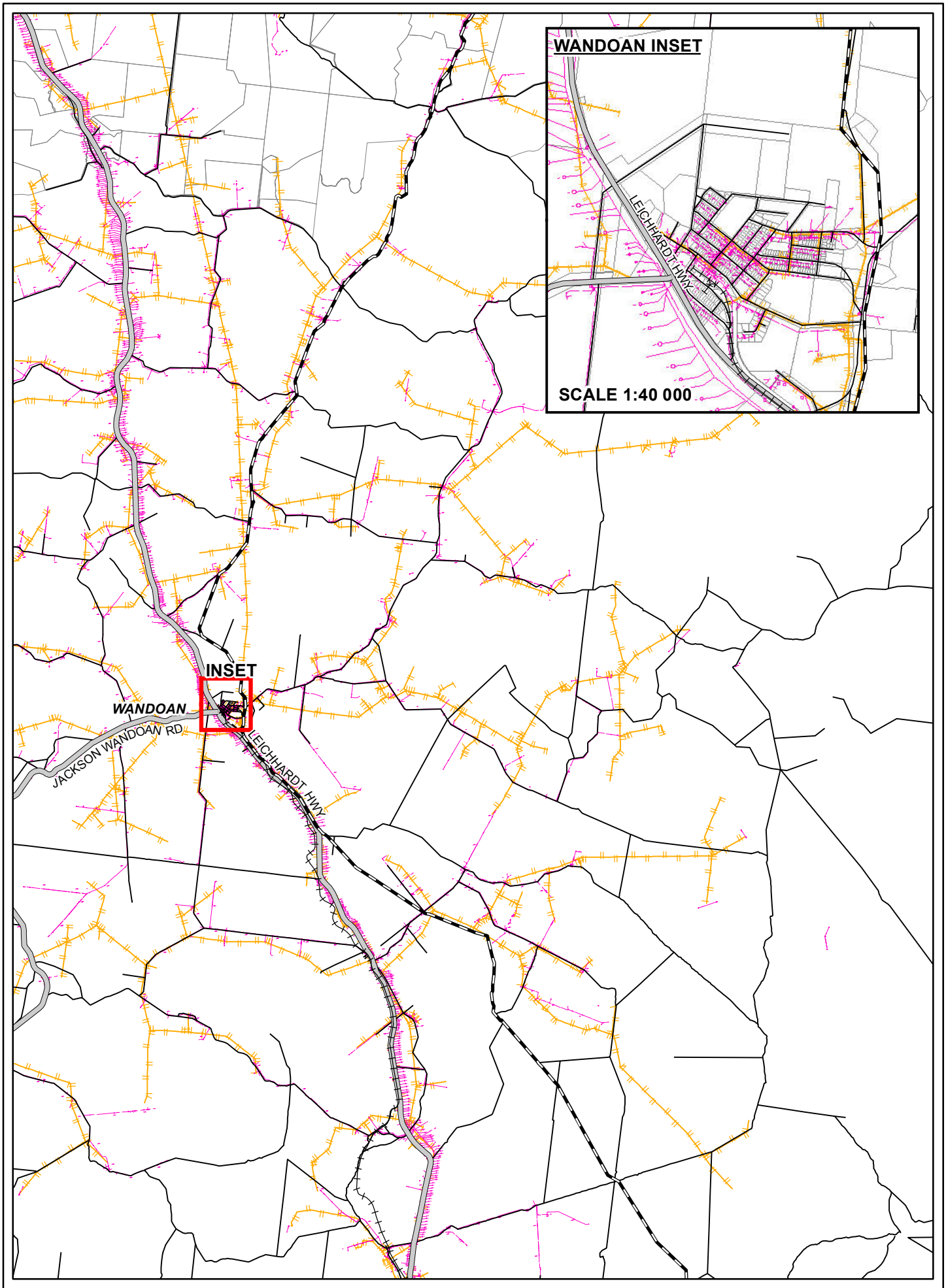
7.1.3.7. Infrastructure

Infrastructure in the vicinity of the pipeline route is shown in Figure 7-25 and existing petroleum pipelines and licences are shown in Figure 7-23. From Chinchilla to Dalby, the pipeline route is adjacent to the Warrego Highway and Western rail system (Figure 7-24). The pipeline route crosses and is in the vicinity of a number of existing petroleum pipelines and pipeline licences between Wandoan and Chinchilla. The pipeline follows petroleum pipelines from approximately 8 km east of Guluguba to 15 km south east of Guluguba and for a considerable section as it passes over the Great Dividing Range. A petroleum pipeline is located along the Dalby Jandowae Road in the vicinity of the end of the pipeline.

Figure 7-24 Western rail system and Warrego Highway

There are no major water supply pipelines along the route outside town areas but there are a number of private water pipelines carrying farm water supplies, including irrigation water, across the road reserves where the pipeline route will be located. Private water pipelines will be located in consultation with landholders early in the construction phase and plans made to relocate them above or below the project pipeline.

Field observations indicate that there is underground telecommunications cabling in the vicinity of the pipeline route in most places where it is to be located in developed road reserves. In addition to the cabling along the roads, there are numerous lateral connections to residences in rural areas, and residences and business in urban areas.



LEGEND

- Proposed Pipeline
- Railway
- Major Roads
- Local Roads
- Telstra Infrastructure
- Ergon Infrastructure
- Cadastre

Projection: GDA94 Zone 56

Figure 7-25A

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Infrastructure - pipeline

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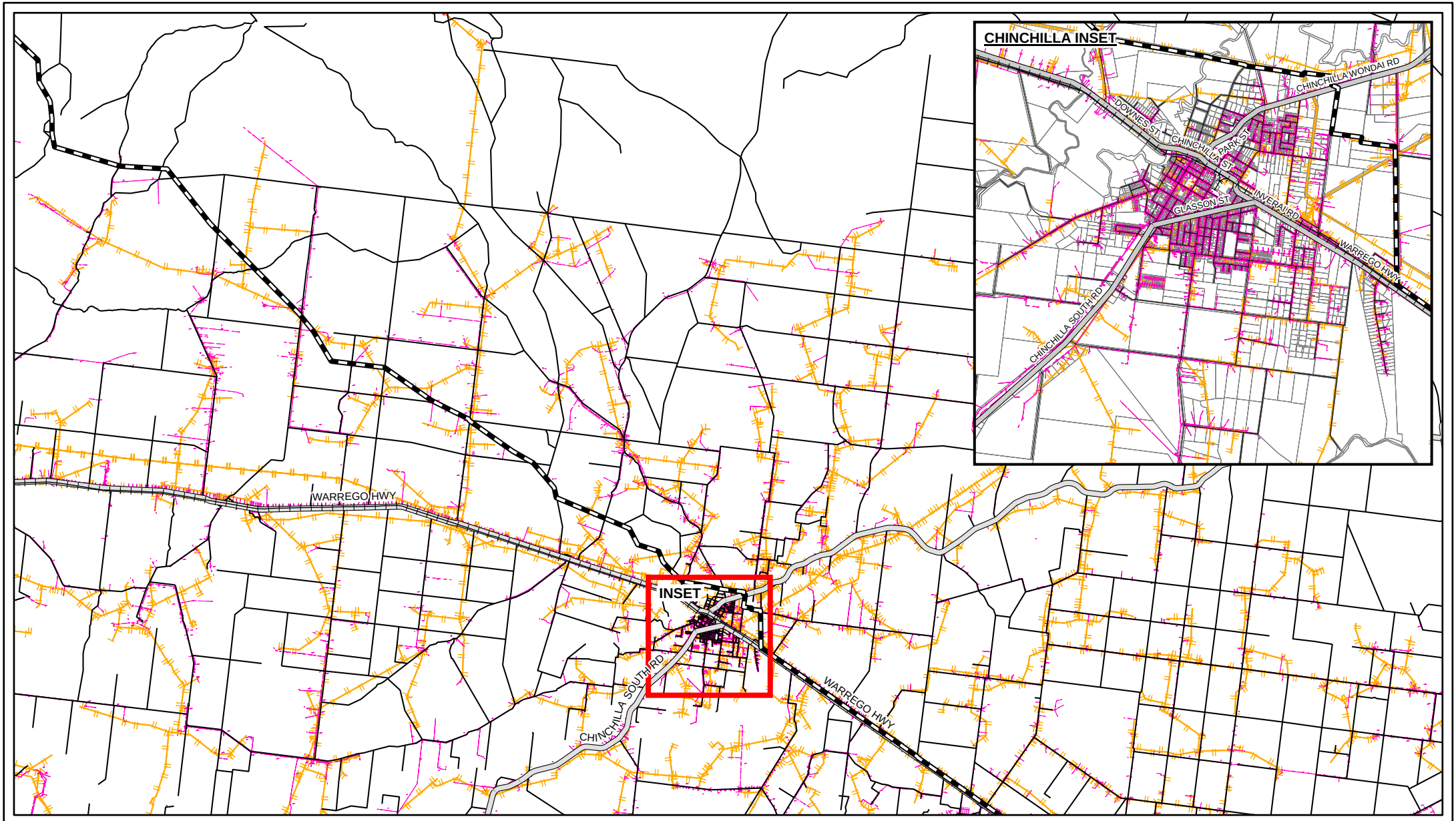

LEGEND

- Proposed Pipeline
- Major Roads
- Local Roads
- Railway
- Telstra Infrastructure
- Ergon Infrastructure
- Cadastre

Projection: GDA94 Zone 56

Figure 7-25B

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Infrastructure - pipeline

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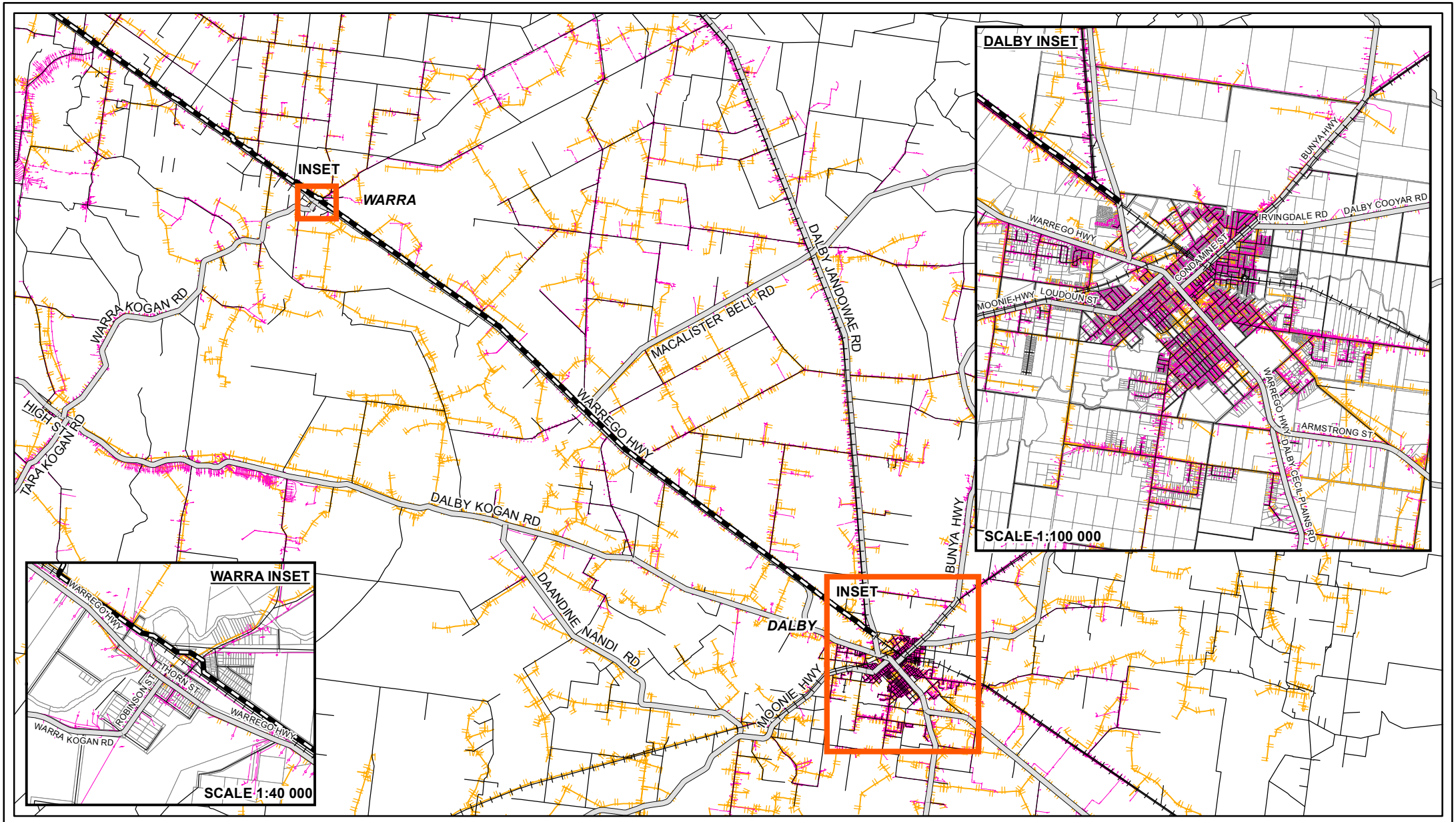

LEGEND

- Proposed Pipeline
- Major Roads
- Local Roads
- Railway
- Telstra Infrastructure
- Ergon Infrastructure
- Cadastre

Projection: GDA94 Zone 56

Figure 7-25C

0 1 2 4 6
Kilometres

N

Scale 1:300,000 (at A4)

SKM SunWater Making Water Work

NATHAN DAM AND PIPELINES EIS

Infrastructure - pipeline

I:\QENV2\Projects\QE40192\400 - Nathan - Spatial\ArcMXD\Figures\070_LandUse_&_Infrastructure\Figure_7-16C_Infrastructure_Pipeline.mxd Produced: 8/11/2010

A section of the pipeline route follows an existing easement containing high voltage powerlines as it approaches Chinchilla from the west (Figure 7-26). Overhead powerlines are also located within proximity (a few tens of metres) to the pipeline for substantial distances along road reserves (Figure 7-27), while lateral connections to properties cross the route at numerous points (Figure 7-28).

Infrastructure through town areas, such as that for power distribution, telecommunications and water supply, has not been investigated. It is accepted that there will be complex networks of infrastructure of these types in residential and commercial areas and this will be accurately located and decisions made about avoidance of interference during the final design and construction phases of the Project. The pipeline route, however, generally traverses the outskirts of towns and will therefore avoid complex networks of infrastructure.

The pipeline route traverses rural property infrastructure such as fences, gates, cattle grids and stockyards. Dingo fences and a rabbit-proof fence are also within the vicinity of the pipeline.

The proposed Surat Basin Railway from Banana to the Wandoan Coal Project runs to the east of the pipeline route from approximately 7 km north of Cockatoo Creek on Nathan Road to the mine site west of the Nathan Road – Leichhardt Highway intersection. The pipeline will cross this corridor, most likely just north of Wandoan.

Figure 7-26 High voltage powerlines to the west of Chinchilla

Figure 7-27 Powerlines in the vicinity of the pipeline

Figure 7-28 Powerlines and lateral connections in the vicinity of the pipeline

- Roads

The pipeline route joins State-controlled roads at the intersection of Nathan Road and the Leichhardt Highway and large sections of the route follow the Leichhardt and Warrego Highways. The pipeline route crosses the following State-controlled roads:

- Leichhardt Highway;
- Warrego Highway;
- Wandoan – Jackson Road at Wandoan;
- Chinchilla – Auburn, Chinchilla Wondai and Tara Roads at Chinchilla;
- Warra – Kogan and Durong Roads at Warra;
- Macalister – Jimbour Road at Macalister; and
- Dalby – Kogan and Jimbour Roads near Dalby.

In addition, the pipeline route crosses intersections with numerous local roads and rural property access tracks. There are numerous points of access to residential and commercial properties and reserves, including cemeteries, in or in the immediate vicinity of the towns or townships of Wandoan, Chinchilla, Brigalow, Warra, Macalister and Dalby.

The pipeline route follows Nathan Road from the Taroom Cracow Road to the Leichhardt Highway. This road is controlled by Banana Shire Council south to Maidens Road, then by Western Downs Regional Council. There are a number of intersections with minor council-controlled roads and farm access tracks along this section of the pipeline. Many culverts, diversion drains and catch drains occur along the developed road reserves followed by the pipeline. Significant road-related infrastructure along the route (i.e. bridges) is identified in Chapter 21.

7.1.4. Associated infrastructure

The existing environment relevant to the dam and surrounds and pipeline directly corresponds to the associated infrastructure of the Project.

Chapter 2 identifies that resource extraction areas will be required for the construction of the Project detailing potential locations. SunWater does not intend opening or operating any new rock quarry areas or sand supply sources to support the project but will purchase material from licensed operators. However, clay borrow areas will be established to obtain clay for the dam and balancing storages. The sites will be located within the water storage area and are discussed in Chapter 2.

7.2. Potential impacts and mitigation measures

As set out in Section 7.1, this section is divided into the dam and surrounds, pipeline, and associated infrastructure. It identifies the potential impacts of the construction and operation of the Project on current and known future land uses, infrastructure, tenures and the compliance with relevant planning scheme provisions outlined previously. This section also identifies measures to avoid or minimise any potential adverse impacts.

7.2.1. Dam and surrounds

7.2.1.1. Planning

State planning framework

As set out in Section 7.1.2.1 the following SPPs are relevant to the Project:

- SPP 1/92: Development and Conservation of Agricultural Land (SPP 1/92); and
- SPP 1/03: Mitigation and Adverse Impacts of Flood, Bushfire and Landslide (SPP 1/03).

As previously noted, maps have been released as part of the Draft Strategic Cropping Land Framework which identifies that much of the Project area being described as "Strategic Cropping Land".

The outcomes sought by the State, regional and local planning frameworks would be affected by the loss of GQAL (further discussed in Chapter 6) and rural designated land within the water storage area. However, the loss of GQAL within the water storage area will be adequately offset by the increased supply or security of supply of water in the region.

Regional planning framework

Section 7.1.2.2 sets out the Regional Outcomes from the RGMF. The water storage is proposed to supply water to mining operations which will contribute to the economic growth of the regional economy. The extraction of viable mineral and extractive resources that contribute to the economic growth of the local and regional economies are encouraged and the creation of a water supply would support the mining industry.

Local planning framework

The DEOs of the Taroom Shire Planning Scheme highlights connectivity of recreational areas through the provision of community infrastructure (roads). The water storage area will mean the recreation area adjacent Glebe Weir will be lost as will a number of local roads, however, as part of the Project, two new recreation areas and a viewing platform will be provided and affected local roads will be upgraded, thus maintaining the connectivity of the local area. Therefore, it is considered that the water storage complies with these DEOs.

The water storage area and the recreation areas should be reflected in the Taroom Shire Planning Scheme through a future planning scheme amendment or a future planning scheme preparation process. The planning outcomes would relate to the protection of water quality from inappropriate development (such as intensive agriculture) and the provision of recreational opportunities. SunWater propose that the recreation area be managed by Banana Shire Council, similar to the current arrangement of Council's management of the Glebe Weir Camping Reserve.

The DEOs in the Taroom Shire Planning Scheme regarding protected areas is affected by the water storage as a number of the artesian springs identified in the planning scheme on the north bank of the Dawson River will be inundated. Impacts on these springs are assessed in Chapter 9 and mitigation measures are provided.

The water storage area will inundate land which is predominantly included in the Rural 'Zone', however, the loss of this land is considered to be minimal from a shire wide perspective. The loss of land included in the Open Space and

Recreation 'Zone' in Taroom will have minimal impacts as only small areas along the banks of the Dawson River will be inundated at FSL.

7.2.1.2. Land use

The irrigated and dryland agricultural uses in the vicinity of the existing Glebe Weir and along the western bank of Cockatoo Creek will be inundated. Cropping land along Bundulla Road and to the north-east of Taroom will also be partially inundated at FSL.

Areas of cropping land near Precipice Creek and Dukes Plains Road downstream of the dam wall would not experience decreased water availability as these irrigators have a supplemented water supply from Gyranda Weir. However, irrigators that are waterharvesters with a medium to high flow threshold will experience decreased water availability and this may cause a reduction in irrigated agricultural land uses downstream of the dam.

SunWater has no objection to grazing and cropping continuing in viable parts of the catchment. It is intended that the current land use activities being undertaken within the flood buffer will continue, with easement conditions generally not impinging on these activities (Chapter 2). Grazing above the FSL would be permitted under grazing lease arrangements. The economic viability of the properties after acquisition is discussed in Chapter 25.

The reserve for recreation and camping activities adjacent to Glebe Weir will be inundated and will be removed, however, new facilities will be provided on both the northern and southern banks of the river. Further details are provided in Section 2.3.3.5. 'The Glebe' homestead is within the water storage area and the building will be relocated to a different area on the same property prior to the commissioning of the dam.

A total of 74 land parcels will be impacted from water storage area at FSL. Of these 74 land parcels, those that will experience inundation of 10% or greater and an area of impact over 1 ha of land are identified in Table 7-15. The potential impacts of the dam on these properties include the amount of inundated land and factors such as the loss of agricultural land and the severance of existing power line connections. A brief explanation of the impacts faced on each property is provided, together with details of any existing Native Title claims over the affected properties.

Table 7-15 Properties most affected by the water storage

Land Description	Address	Owner	Description of Current Use/ infrastructure	Potential Impacts
Lot 15 on LE230 (reserve) 10 ha	Glebe Weir Road, Spring Creek	DERM	Unallocated State land	The water storage would inundate 100% of the State owned land designated for Community or Public Purposes. Native Title claim QC00/07 (Wulli Wulli People).
Lot 14 on LE230 (reserve) 1.76 ha	Glebe Weir	Banana Shire Council (trustee)	Glebe Weir Camping Reserve	The water storage would inundate 100% of the recreation reserve. Existing facilities will require decommissioning. Native Title claim QC00/07 (Wulli Wulli People).

Land Description	Address	Owner	Description of Current Use/ infrastructure	Potential Impacts
Lot 4 on SP134955 (freehold) 425 ha	Bundulla Road, Taroom	DERM	Land cleared for dryland cropping purposes.	The water storage would inundate 76.6% of the property at FSL. A significant proportion of cropping land would be lost. No Native Title claims exist.
Lot 15 on FT2 (freehold) 3,861 ha	The Glebe, Glebe Road, Glebe	DERM	Large areas of cleared land for both grazing and dryland cropping, supported by cattle yards and a machinery shed.	The water storage would inundate 62% of the property, including the inundation of 'The Glebe' homestead. This building will be relocated if possible. Cropping land would be lost and the existing power connection and access to the property would be made redundant. No Native Title claims exist.
Lot 14 on FT1 (leasehold) 3,654 ha	Balcarris, 618 Glebe Road, Glebe	D.R. Joyce	Large areas of cleared land for both grazing and irrigated cropping land uses (on the south bank of the Dawson River), supported by a centre pivot irrigation system, cattle yards and an artesian bore.	The water storage would inundate 58.2% of the property, including irrigated cropping land. The existing power connection to residence would be made redundant. Native Title claim QC00/07 (Wulli Wulli People).
Lot 25 on F4037 (reserve) 65 ha	Cracow Road, Taroom	DERM	Park and recreation reserve	The water storage would inundate 49.1% of the park and recreation reserve at FSL. No Native Title claims exist.
Lot 3 on SP134955 (freehold) 359 ha	The Brae	DERM	Large areas of land cleared for dryland cropping purposes.	The water storage would inundate 78.5% of the property at FSL. A significant proportion of cropping land would be lost. No Native Title claims exist
Lot 104 on FT75, Lot 105 on FT75, Lot 98 on FT75, Lot 101 on FT75 (freehold) 598 ha	The Brae	B.H. & J.M. Smith	Large areas of land cleared for dryland cropping purposes.	The water storage would inundate 23.7% of the property at FSL. A significant proportion of cropping land would be lost in the eastern areas of the property. No Native Title claims exist.
Lot 6 on LE19, Lot 7 on LE19 (freehold) 1904 ha	Binghi, The Bend Road, Spring Creek	DERM	Land cleared for grazing purposes, supported by cattle yards.	The water storage would inundate 35.9% of the property at FSL. The residence on Lot 7 on LE19 will be inundated but has been historically abandoned. The property would be split in two and the existing power connection and access to the property would be made redundant. No Native Title claims exist.

Land Description	Address	Owner	Description of Current Use/ infrastructure	Potential Impacts
Lot 4 on LE135, Lot 5 on LE135 (freehold) 1,014 ha	Malara, 2344 The Bend Road, Taroom	P.V. Brodie	Large areas of land cleared for both dryland cropping (on the north bank of the Dawson River) and grazing purposes.	The water storage would inundate 35.8% of the property at FSL, including a significant proportion of cropping land. Residence on Lot 5 on LE135 is above FSL and above the Q100 flood level. No Native Title claims exist.
Lot 3 on F4037 (freehold) 2,282 ha	The Bentley, 2167 Cracow Road, Taroom	DERM	Large areas of cleared land for grazing purposes, supported by a stock water supply pump and cattle yards.	The water storage would inundate 25.3% of the property at FSL. Residence is above FSL and above the Q100 flood level. Property would be split in two and existing power connection and access to the residence would be made redundant. It is proposed that a new recreation area will be located on this property, requiring changes to tenure. No Native Title claims exist.
Lot 2 on LE284(freehold) 3,747 ha	Mount Rose, 1708 Glebe Weir Road, Spring Creek	DERM	Most of the property cleared for grazing and both dryland and irrigated cropping (on the north bank of the Dawson River), supported by a centre pivot irrigation system, shed, and cattle yards. Boggomoss Area Number 1.	The water storage would inundate 23.6% of the property at FSL. Residence is above FSL and above the Q100 flood level. Dryland and irrigated crops would be lost along with a significant proportion of grazing land. The existing power connection to residence would be made redundant. Southern area of Boggomoss Area Number 1 will be inundated. Native Title claim QC00/07 (Wulli Wulli People) affects part of this lot.
Lot 9 on LE68 (freehold) 4,524 ha	Spring Creek, 350 Spring Creek Road, Spring Creek	DERM	Approximately half of the property cleared for grazing and dryland cropping, supported by cattle yards and fences.	The water storage would inundate 19% of the property at FSL. A significant proportion of dryland cropping area would be lost and the existing power connection to residence would be made redundant. Part of the dam wall would be constructed on this property along with a site office. Native Title claim QC00/07 (Wulli Wulli People).
Lot 1 on FT823 (freehold) 2,952 ha	Beaumont, 53 Glebe Road, Glebe	R. & T. Ziesemer	Large areas of cleared land for grazing purposes.	The water storage would inundate 18.7% of the property. A small amount of grazing land would be impacted. No Native Title claims exist.

Land Description	Address	Owner	Description of Current Use/ infrastructure	Potential Impacts
Lot 1 on LE38, Lot 2 LE246 (freehold) 1,994 ha 1970 ha	The Bend, Brodies Road, Spring Creek	DERM	Large areas of cleared land for grazing purposes.	The water storage would inundate 21.6% of the property at FSL. The existing power connection to the residence would be made redundant. No Native Title claims exist.
Lot 83 on FT625 (freehold) 2,676 ha	Bundulla, 356 Bundulla Road, Taroom	M.A. & K.L. Liddle	Three residences are located on this property. Large areas cleared for grazing and dryland cropping purposes.	The water storage would inundate 15.3% of the property at FSL, including areas of cropping land. Access across the Dawson River from the north bank to the south bank would be made redundant with higher water levels. The existing power connection and Telstra network servicing the residence on the north bank would require realignment. No Native Title claims exist.
Lot 26 on FT5 (reserve) 291 ha	Cracow Road, Glebe	DERM	Park and recreation reserve – Boggomoss Area Number 2	The water storage would inundate 12.5% of the reserve and Boggomoss Area Number 2 at FSL. No Native Title claims exist.
Lot 3 on LE232 (freehold) 4,002 ha	Boggomoss, 82 Spring Creek Road, Spring Creek	E.S. & J.B. Otto	Cleared land for grazing purposes.	The water storage would inundate 11.3% of the property at FSL. The existing power connection to residence would be made redundant. Native Title claim QC00/07 (Wulli Wulli People).
Lot 97 on FT74, Lot 91 on FT73, Lot 92 on FT73, Lot 93 on FT50, Lot 95 on FT74, Lot 103 on FT75, Lot 70 on FT40. Lot 96 on FT74 (freehold) 1050 ha	222 Bradshaw Lane, Taroom	F.J. & L.E. Bradshaw	Large areas of land cleared for dryland cropping purposes.	The water storage would inundate 15.73% of the property at FSL. Large areas of cropping land would be lost. No Native Title claims exist.
Lot 11 on LHDT40331 (leasehold) 1429 ha	Baxters Lane, Taroom	P.M. Whyte	Large areas of land cleared for grazing and some cropping purposes.	The water storage would inundate 13.2% of the property at FSL. Areas of cropping land in the southern part of the property would be lost. No Native Title claims exist.
Lot 164 on FT136 (reserve) 10 ha	River Lane, Taroom	Banana Shire Council (trustee)	Park and recreation reserve.	The water storage area would inundate 16.2% of the park and recreation reserve at FSL. Native Title claim QC97/55 (Iman People #2).

As identified in Table 7-15, a number of properties will be affected by the water storage, impacting on their future land use. DERM is managing the land acquisition process associated with the dam and water storage area and will develop the final purchasing strategy for the acquisition phase of the Project (currently underway). The decision as to full or partial acquisition is based on the degree of impact caused by the Project and negotiations between DERM and landholders will occur. This is currently a voluntary process.

SunWater's preference is to only acquire ownership of land subject to inundation by the FSL on a partial acquisition basis. However, an assessment of the impact to each property will be undertaken based on the area of inundation and if a property is significantly impacted by this loss, consideration will be given to offering a full acquisition to the relevant landholder. A property will generally be deemed as significantly impacted where the balance of land not required by the project would not constitute a viable living area. Full acquisitions will only be undertaken with the consent of the landholder involved.

- Flood buffer

At the completion of construction, approximately 9,550 ha of flood buffer will be established above FSL. The flood buffer will be established as an easement to be owned and managed by SunWater. This area will in part be used to mitigate environmental impacts of the Project and potentially provide environmental offsets. Development within the flood buffer will be allowed, but inhibited from areas set aside for environmental purposes. Environmental offsets may be obtained in consultation with the landowner, but these will not form part of the standard easement agreement. Offset areas and mitigation areas will provide protection of remnant vegetation, restoration of non-remnant vegetation and re-vegetation of critical areas.

- Construction (accommodation) Camp and Site Offices

A location for the construction camp has been proposed on industrial land in Taroom on Racecourse Road, while site offices are to be located on both banks at the dam site (Chapter 2). The impact of the construction camp and site offices on land use will be temporary and minor as they would only be required for the duration of the construction period. The selection of the final location will be made to ensure there is a minimal impact on surrounding land uses and will be concluded through discussions with Council. The location will also require input from the construction contractor and would be negotiated with the respective landholders.

7.2.1.3. Tenure

The dam and water storage area will impact a number of different land tenures. Freehold, leasehold, Unallocated State Land, reserves and road reserves are present within the water storage. Construction of the dam will also change the use of the land. As previously identified, SunWater prefers that it obtains freehold ownership of land within FSL, with easements to be taken over the flood buffer.

Some reconfiguration of land parcels is possible in order to promote viable grazing and cropping land uses. The upgrade of the access road and new communication and power infrastructure will also result in changes in tenure (e.g. reserves and easements), however the latter will be the responsibility of the service provider.

Native Title

The total area of the Wulli Wulli claim (QC00/07) inundated by the water storage is 5,361 ha, while only small parts of the Iman People #2 claim (QC97/55) will be inundated along the banks of the Dawson River at the upstream limit. Native Title impacts, rights and interests are further discussed in Chapter 22.

Mining tenements

Mining

The water storage area has the potential to result in the sterilisation of viable mining land held under various mining tenements. The land inundated may have monetary value and it is possible that relevant mining companies in possession of these tenements will seek compensation. As identified in Section 7.1.2.5, there are coal exploration permits and mineral exploration permits present within and surrounding the water storage area (refer to Figure 7-7). The mineral exploration permit covering parts of Cockatoo Creek will be impacted by the water storage, as will mineral exploration permit applications adjoining the northern boundary of the granted mineral exploration permit. Applications for coal exploration permits are also affected by the water storage.

SunWater is not aware of any planning by mining companies to establish mining activities within the water storage area and surrounds. As proposals for Nathan Dam have been public knowledge since the 1920s (the last valid proposal being reported by Hyder Consulting in 1997), it is considered that mining companies would be aware of the history of the area and avoid commencing mining activities within the water storage area. SunWater will maintain discussions with relevant mining operators within the water storage area and surrounds.

Petroleum and Gas

As previously outlined in relation to mining, the water storage area has the potential to result in the sterilisation of viable land for petroleum and gas activities held under various tenements. The land inundated may have monetary value and it is possible that relevant petroleum and gas companies in possession of these tenements will seek compensation. As identified in Section 7.1.2.5, there are ATPs present within and surrounding the water storage (refer to Figure 7-8) and these will be impacted by the Project.

As discussed above, it is considered that petroleum and gas companies would not commence activities in the dam or water storage area. SunWater will maintain discussions with relevant petroleum and gas operators within the water storage area and surrounds.

Protected areas

The water storage area will inundate just under half of Boggomoss Area Number 1, while Boggomoss Area Number 2 will experience minimal inundation. A number of Artesian Springs will be inundated on the northern bank of the Dawson River in the general vicinity of Spring Creek. Impacts on Boggomoss Area Number 1 and 2 and the Artesian Springs are identified in Chapters 9 to 12, together with mitigation strategies.

'The Glebe' homestead, listed on the Queensland Heritage Register, will be inundated and the relocation of the building is being investigated. Further information regarding the relocation of 'The Glebe' homestead is provided in Chapter 2 and Chapter 23.

Less than 0.5 ha of the nature refuge on Lot 20 on LE232 will be inundated at FSL. It is not expected that the dam will have a significant impact on this protected area.

As outlined in Chapter 28, there will be no direct disturbance to habitat within or proximate to the GBRWHA or the Shoalwater and Corio Bays Area. Impacts of the Project on these protected areas are provided in Chapter 28.

7.2.1.4. Infrastructure

The water storage area will make redundant a number of accesses to properties within the surrounding area. Some rural infrastructure such as stockyards (potentially including livestock dips), sheds and fencing will be inundated and will therefore require removal and further details are provided in Chapter 8.

Ergon powerlines and Telstra telecommunications cables will be directly impacted from inundation at a number of locations. It is anticipated that some of this existing infrastructure may become redundant as a result of land use change around the water storage. The service provider will be responsible for removing redundant infrastructure in accordance with their normal practices.

The Glebe Weir is the largest piece of existing infrastructure that will be inundated. It will become redundant and will be decommissioned in accordance with the plan set out in Section 2.3.3.6. Infrastructure associated with the camping and recreation area adjacent Glebe Weir will be inundated and removed, along with the stream gauging stations. Stream gauging stations at Taroom and Palm Lea will be modified or relocated as necessary.

Given that water levels around Taroom at FSL will be only marginally above those experienced during low flows, it is not expected that the footbridge at approximately 382 km AMTD would require replacing or modification. Similarly, power, telecommunications and water infrastructure in Taroom will not be impacted as this infrastructure is above the predicted 1:100 flood level post dam. However, the gravel river crossing or ford at the south west end of North Street is currently unpassable for approximately 16% each year and this is expected to increase to 55% following construction of the dam (Chapter 14).

- Roads

A number of gazetted and un-gazetted roads in the area will be inundated. Impacts regarding roads are discussed in Chapter 21. Local roads that will be impacted by the water storage are:

- Glebe Weir Road;
- The Bend Road;
- Brodies Road;
- Bundulla Road;
- Cracow Road at Bentley and Cockatoo Creeks; and
- Wolsley Street.

These roads are shown in Figure 7-11 and impacts regarding these roads are discussed in Chapter 21. Some private roads and tracks that provide access to residences and on-property infrastructure will be impacted by the water storage.

7.2.1.5. Mitigation measures

The partial acquisition of affected properties will involve compensation to landholders. Where appropriate, replacement infrastructure will be provided where necessary (new fences and gates, culverts or signage) to mitigate any impacts on access and infrastructure to the properties. If any properties are acquired in full and leased back to previous owners, access and power would be restored. Future development within the flood buffer would only be restricted from areas set aside for environmental purposes.

Lots may be reconfigured to provide land parcels of appropriate area for viable grazing or cropping land use outside the water storage and flood buffer. These allotments could be sold where the Queensland Government (DERM) owns the land, or where SunWater acquires whole lots and new access and infrastructure would be provided as appropriate. Alternatively, some or all of these areas may be retained and included within the environmental management needs of the Project.

As the dam will take the place of Glebe Weir, this will become the headwater storage of the Dawson Valley Water Supply Scheme (DVWSS). Therefore, downstream supplemented irrigators and high priority water users' entitlements will be maintained. Downstream unsupplemented irrigators with low flow pumping thresholds will not be impacted as the low flow regime will be maintained by the dam's environmental flow release strategy. However, as the dam will cause changes to the high flow regime, it is anticipated that waterharvesters on the Dawson River and Lower Fitzroy would be impacted. High flow events may have a lower peak flow and may occur for a shorter duration and this will result in a reduction to pumping opportunities for waterharvesters. This may result in a reduction to irrigated agricultural land uses. Impacts to waterharvesters and potential compensation strategies are discussed further in Chapter 14.

Where it is required, SunWater will arrange for the provision of alternative services by way of relocation, upgrading or construction of replacement infrastructure. However, the replacement of this infrastructure will not be provided for affected properties that are no longer viable. Where an existing Ergon customer is impacted by the Project and cannot be reasonably re-connected to Ergon's local supply network, conversion to a remote area power supply system could be facilitated by SunWater.

Other measures to protect the water quality of the water storage will include the removal of harmful materials associated with inundated infrastructure such as stream gauging stations, irrigation pumps, cattle yards and sheds. The septic tank associated with the toilet block at the recreational area adjacent Glebe Weir will be pumped out and filled with soil or otherwise remediated (Chapter 8). Other pumps will be removed or relocated as necessary and bores within the water storage will be permanently plugged and capped. These issues are discussed further in Chapter 2. It is not expected that the recreational infrastructure within the reserves on the north and south bank of Dawson River in the vicinity of Taroom will need to be relocated as water levels at FSL will be only marginally above those experienced during low flows.

SunWater will maintain discussions with relevant mining or petroleum and gas operators within the water storage area and surrounds.

Public use of the water storage area will be restricted in the vicinity of the dam wall and outlet works for safety reasons. The water storage area will be available for fishing and boating, while areas may be restricted where necessary to maintain public safety.

The relocation of the 'The Glebe' homestead and associated buildings is being investigated to conserve the cultural heritage significance of the buildings. Further mitigation measures in regard to the cultural heritage significance of this premise are provided in Chapter 23.

SunWater's preferred strategy when dealing with Native Title claims is to negotiate Indigenous Land Use Agreements (ILUA) with the relevant Aboriginal groups. ILUAs will be established with the Wulli Wulli People and the Iman People #2 and negotiations towards this end are continuing. Further detail on ILUAs is provided in Chapter 22.

Specific mitigation measures in relation to the construction impacts on adjoining land uses, (e.g. dust and noise nuisances and amenity issues) are addressed in Chapters 5, 17 and 19.

7.2.2. Pipeline

7.2.2.1. Planning

The pipeline satisfies the outcomes of the RGMF and the strategic direction and DEOs of the Taroom, Murilla, Chinchilla, Dalby and Wambo planning schemes in regard to the provision of water to support the mining industry and facilitating continued economic development within the region and local government areas.

Given the pipeline will be a relatively benign use once installed, it is considered there will be no impact on the allocation of land included in each of the respective zones under the planning schemes.

The regional economy is generally based on coal mining and agriculture (Chapter 25). The planning schemes reflect the need to support and enhance these activities, which the pipeline would achieve by providing a secure water supply for mining operations and having little if any net detrimental impact on agriculture.

7.2.2.2. Land use

Agricultural land uses will be affected where the pipeline traverses private property. An easement of 15 m width will be established for the operation of the pipeline, however, this is expected to have minor impacts on land use as the pipeline route generally follows existing property boundaries. Where appropriate, the pipeline will be co-located in existing easements to minimise impacts on land use.

Sections of the pipeline traversing land used for grazing purposes will affect cattle movement temporarily during construction. Cattle movement will also be affected during operation, however, this will be confined to areas of where the pipeline is above ground a between Wandoan and Chinchilla as it passes over the Great Dividing Range. Access points will be provided for cattle movement at these locations. Where the predominant land use is cropping (Chinchilla to Dalby), impacts will be negligible as the pipeline will be underground and located within or adjacent to the Warrego Highway road reserve. The potential for impact on laser levelled fields has been recognised and SunWater will ensure that such fields are equally well prepared for farming when pipeline construction is completed.

Two of the three pump stations and balancing storages will be located on private properties – Lot 3 on FT733 and Lot 1 on RP144660. It is expected that the current use of these properties will not be compromised as less than 1% of Lot 1 on RP144660 or Lot 3 on FT733 will be affected (Appendix 2C). The third pump station and balancing storage will be located within the road reserve of Cockatoo Road and as such, surrounding land uses will be conserved.

The pipeline is supported by above ground infrastructure including surge tanks, control valves and air cushion standpipes. This infrastructure will be located over or next to the pipeline within the pipeline easement and is usually fenced for security reasons and to protect it from damage by farm vehicles, maintenance vehicles (if in a shared easement) and stock. As there is some flexibility in the exact placement of this infrastructure, the detailed design will take account of issues such as potential interference with line-of-sight on a roadway or similar detailed and safety review design factors.

Residences immediately adjacent to the pipeline route will experience impacts to property access during construction within road reserves, resulting in temporary access changes. However, temporary access will be maintained during construction and no long-term impacts are expected as existing access will be restored immediately following construction.

- Construction (accommodation) Camps and Site Office

It is expected that construction camps will be located at Wandoan and Chinchilla and their precise locations will be negotiated in consultation with the contractor, Council and relevant agencies. The impact of the construction camps on land use will be temporary (during the construction period) and of a minor nature. The selection of the final locations will aim to minimise any impacts on existing vegetation, land use or traffic in the vicinity. The site offices for the pipeline will be established within the towns of Wandoan and Chinchilla (Chapter 2) and will cause no further impact on land use.

7.2.2.3. Tenure

The land tenure affected by the location of the pipeline is identified in Chapter 2 and Appendix 2B. The pipeline will be located within or contiguous to existing easements, road reserves, State land and freehold and leasehold land. Where the pipeline traverses freehold and leasehold land, the creation of a new easement is required over affected properties and SunWater will acquire this tenure. Tenure changes would also be required for the pump stations and balancing storages.

- Native Title

The only impacts to Native Title caused by the pipeline will be when the route traverses leasehold tenure and Unallocated State Land (watercourse crossings) under a claim by the Wulli Wulli People or the Iman People #2. Native Title impacts, rights and interests are further discussed in Chapter 22.

- Mining tenements

Mining

The pipeline route traverses coal exploration permits and mineral development licences, both applications for and granted. SunWater is not aware of any current planning by mining companies to establish mining activities within the vicinity of the pipeline. Given the proposed pipeline route will mainly follow existing property boundaries and easements, should mining operations be activated, then there would be minimal impact to either.

Petroleum and Gas

The pipeline traverses petroleum leases, ATPs and lease applications. As outlined above, it is expected that impacts on petroleum and gas tenements would be minimal.

7.2.2.4. Infrastructure

The pipeline route passes in the vicinity of a number of existing gas pipeline easements as identified in Section 7.1.3.7. Where appropriate, the pipeline will be co-located within these existing easements in order to reduce the overall land impacted by the Project (Chapter 2). However, where co-location or crossings occur, there is the potential for these existing pipelines to be impacted during construction. Private water pipelines for irrigation purposes may also be impacted during construction. Additionally, where the water pipeline is co-located or crosses other existing infrastructure, the future augmentation of services may be impeded.

There are telecommunications cables (underground) and powerlines (above ground) in the vicinity of the pipeline for most of its length and there is the potential for this infrastructure to be impacted during construction. Particular attention is required in urban areas due to the concentration of this infrastructure.

The pipeline route will traverse State and council-controlled roads as it runs both parallel to and within existing road reserves for much of its alignment. Where the pipeline is predominantly located within a former highway reserve from Chinchilla to Dalby, it runs parallel to the Western Queensland railway corridor for approximately 80 km. Impacts on traffic flows will be experienced during construction, however, as road sections will be traversed quickly and traffic management will be in place, including temporary detours around the works, impacts will be minimal. It is not expected that construction of the pipeline will impact rail networks as the pipeline route will not be located within any existing railway corridors.

There will be no impacts to the road network during operation of the pipeline, other than when pipe maintenance or repair is required directly under the infrastructure and this would be a very rare occurrence. The existing rail network will not be impacted during operation of the pipeline as it is not located within any railway corridors. Further impacts on transport networks are discussed in Chapter 21.

The proposed Surat Basin Rail corridor follows a similar alignment to the pipeline where it runs parallel to the road reserve of Nathan Road. Therefore, interactions between the two projects are likely. Should the pipeline encroach or traverse the proposed rail corridor, it is likely that this will be managed (including leasing arrangements) through consultation with the Surat Basin Railway Joint Venture (SBRJV) comprised of the Australian Transport and Energy Corridor Pty Ltd (ATEC), Xstrata Coal Pty Ltd and Queensland Rail.

7.2.2.5. Mitigation measures

SunWater will maintain discussions with mining and petroleum and gas operators to ensure the locations of any new pipelines do not cause conflict with new pipelines in the vicinity of project works. Similarly, SunWater will monitor any mining or petroleum and gas activities within the vicinity of the pipeline route. Negotiations between SunWater and the relevant mining and gas/petroleum companies are currently occurring. This will ensure that any impacts are managed appropriately.

The co-location of the pipeline partly within existing easements, road reserves and rail corridors will be managed through continuing consultation with the infrastructure owners. SunWater and the construction contractor will liaise with the owners of existing infrastructure affected by the pipeline through the detailed design phase and during construction to ensure that minimum long term risk is achieved and that no damage is sustained. SunWater currently holds similar agreements in this region and elsewhere in the State.

Where sections of the pipeline are above ground between Wandoan and Chinchilla as it passes over the Great Dividing Range, access points will be provided for cattle movement.

Under-boring will be used wherever the pipeline encounters major road or rail crossings and these will be designed to ensure minimum impact and risk. Liaison with Queensland Rail, local Councils, SBRJV and the TMR will be established and maintained during detailed design and construction.

During construction, the impact on access roads to properties will be mitigated through consultation with landholders. It is intended that the location and detailed design of pipeline crossings of access roads be discussed with each landholder to achieve a mutually agreeable design. Alternative access will be provided, generally within 50 – 100 m of the affected area, however, as pipe laying occurs relatively rapidly, impacts will be of short duration. Some access roads may be used to transport construction material and construction workers to particular sections of the pipeline and this will require traffic management where appropriate.

SunWater's preferred strategy when dealing with Native Title claims is to negotiate Indigenous Land Use Agreements ILUA) with the relevant Aboriginal groups. ILUAs will be established with the Wulli Wulli People and the Iman People #2 and negotiations are continuing. Further detail on ILUAs is provided in Chapter 22.

Specific mitigation measures in relation to the construction impacts on adjoining land uses and residences (e.g. dust and noise nuisances and amenity issues) are addressed in Chapters 5, 17 and 19.

7.2.3. Associated infrastructure

7.2.3.1. Planning

The impacts relevant to the associated infrastructure are consistent with the assessment outlined above for the dam and surrounds and for the pipeline due to the location of the works.

7.2.3.2. Land use

Land use impacts as a result of associated infrastructure will occur mainly within the dam and surrounds area.

- Dam and Surrounds

The proposed recreation areas to be located on Lot 2 on LE284 and Lot 3 on F4037 will constitute a change in land use from rural use to public utilities/reserves and will likely require flood easements as at least part of it will be within the flood margin.

Two new roads will be constructed and a number of existing roads will either be upgraded, realigned or closed in particular sections. The location of these roads and further details are provided in Chapter 21. New roads and realignments will require new easements and therefore constitute a new land use, while road upgrades will have impacts to land use during construction. Properties that will be affected include:

- Lot 2 on LE246 – realignments of The Bend Road and Brodies Road;
- Lot 1 on LE38 – realignment of Brodies Road;
- Lot 9 on LE68 – new northern dam access road;

- Lot 1 on F4037 – new southern recreation area access road; and
- Lot 3 on F4037 – new southern recreation area access road.

Other associated infrastructure works within the dam and surrounds include the provision of powerlines and telecommunications services to the permanent dam facilities and to properties were it is severed. The provision of these facilities will require permanent infrastructure. Impacts are likely to be minor given the rural nature of the area.

The construction of gauging stations will be required at the headwater and tailwater of the dam and at major tributaries upstream of the dam. Minor impacts to existing land uses will occur with the construction of the gauging stations and access tracks, as these will change the current use of the land to allow for the gauging station and access tracks.

Clay borrow areas will have no impacts on land use as they will be inundated at FSL and the land subsequently lost.

Material transport from existing resource extraction areas will utilise existing road networks and newly constructed roads. The utilisation of existing roads will minimise impacts to land use, with only cattle movement impacted where the dam access roads are constructed.

Pipeline

The access tracks required to link the pipeline easement or balancing storages to the nearest roadway will either be via existing farm tracks or new tracks. Access arrangements to these locations will be determined in discussion with the land holders and it is likely that these will require easements to be created. Power provision to the pump stations will be required, however, the locations of this new infrastructure will be the responsibility of the provider. It is expected that new power connections would utilise the pipeline easement and/or access track easements wherever possible to minimise the impact on land use.

The pipeline easement will be grassed as part of rehabilitation in grazing areas and will be suitable for cropping in such areas, ensuring care will be taken to maintain the soil profile. Sharing of maintenance tracks with other linear infrastructure operators within the shared easements will reduce the total land use impact.

Temporary stockpile locations will be determined when the detailed construction plan is developed. These will be positioned on private property through negotiation with the landowners. Their impact on land use will only be experienced during construction of the pipeline and the sites will be rehabilitated once the pipeline is in operation to support resumption of long term land use.

7.2.3.3. Tenure

Impacts to land tenure from associated infrastructure apply to both the dam and surrounds and pipeline. Tenure changes would be required for the stream gauging stations, recreation areas and possibly clay extraction areas. However, the gauging stations may be included within the tenure of the dam. Also, the provision of powerlines and telecommunications services from existing sub-stations to the permanent dam facilities, including pump stations and balancing storages, will require the creation of new easements which will be held by the service provider, however, impacts to tenure are likely to be minor. SunWater will enter into shared easement arrangements will such providers.

Leasehold properties under a pastoral lease (grazing) prohibiting quarrying or extractive land uses such as clay extraction may be encountered when investigating resource extraction locations. If this occurs, a change in tenure arrangements will be required and would occur when ownership was transferred to SunWater.

Realignments to the existing local road network (Section 7.2.3.2) as a result of the water storage and new access roads to recreation areas and the dam wall will require new tenure.

7.2.3.4. Mitigation measures

The creation and management of new uses such as the recreation areas should be reflected in the Taroom Shire Planning Scheme through a future planning scheme amendment or a future planning scheme preparation process.

Due to the temporary nature of the stockpiles and extraction sites, mitigation measures are limited. Consultation with landholders regarding the most suitable locations will be undertaken and appropriate compensation will be agreed. Rehabilitation plans will be developed and the areas rehabilitated after cessation of work. There is some scope for SunWater to negotiate with landowners, or authorities to use or share pre-existing stockpile sites (such as for road works).

The clay borrow areas will be located within FSL and therefore, rehabilitation of these sites upon cessation of works will not be required. Nonetheless, the sites will be contoured to a stable landform with erosion protection maintained until the area is inundated.

The new easements for associated service infrastructure will need to be located outside of the water storage area, however, the flood buffer will not inhibit this infrastructure. Access to the pipeline is intended through existing easements and access tracks wherever possible which is appropriate to reduce impacts on existing land uses.

7.2.4. Impact assessment and residual risks

The methodology used for risk assessment and management is discussed in Section 1.8. This section asses the risks relevant to land use and infrastructure and summarises the mitigation measures proposed to minimize those risks.

Table 7-16 below sets out the impact assessment and residual risks of the land use implications of the proposal, consequence and likelihood ratings for the identified hazards are shown with explanatory notes. The risk assessment is of the Project described in Chapter 2, in which SunWater has already incorporated a range of risk reduction and mitigation measures.

Table 7-16 Impact assessment and residual risks

Hazards	**Factors**	**Impacts**	**Project Description Controls** & Standard Industry Practice	**Risk with controls**			Additional **Mitigation Measures**	**Mitigation** Effectiveness	**Residual Risk**		
				Consequence	**Likely**	**Current Risk**			**Consequence**	**Likely**	**Mitigated Risk**
Loss of GQAL in the water storage area and on pipeline route.	Inundation of the current GQAL	While the loss of GQAL is unavoidable, the area of GQAL lost is minimal in a regional context.	Compensation and acquisition of land. Improved regional water supply security	Minor	Absolute	Medium			Minor	Absolute	Medium
Relocation of the Glebe Homestead	Dam construction location.	The affected residence will require relocation. (Note: Risk has been ranked based on the social consequenc e scale).	Compensation and relocation of residence and associated buildings where possible.	Minor	Absolute	Medium	Assuming relocation goes ahead.	Significant	Minor	Rare	Low

Hazards	Factors	Impacts	Project Description Controls & Standard Industry Practice	Risk with controls			Additional Mitigation Measures	Mitigation Effectiveness	Residual Risk		
				Consequence	Likely	Current Risk			Consequence	Likely	Mitigated Risk
Loss of opportunities for co-locating of services.	The co-location of services in existing easements has been discussed with the relevant service providers to reduce future impacts.	The co-location of the pipeline with other services in easement will limit the ability of services to expand in the future.	Consultation with service providers to located the pipeline away from conflicting services	Minor	Possible	Medium			Minor	Possible	Medium
Loss of access during construction of the pipeline.	Construction of the pipeline through private property.	Reduced accessibility for residents during construction of the pipeline	Consultation with affected landholders. Rapid construction and rehabilitation process	Minor	Unlikely	Low			Minor	Unlikely	Low

Based on this risk assessment, the impacts relevant to land use and infrastructure can be effectively managed and the residual risks are acceptable.

7.2.5. Cumulative risks

The combined footprint of the dam wall, water storage, pipeline and associated infrastructure affects a large area of rural land as well as existing service easements and road reserves. Through the planning and design process, the impacts have been minimised to the extent possible whilst maintaining a high level of co-location with other services to reduce the overall impact.

7.3. Summary

The provision of water to service mining operations would support mining within the region, and support economic development within existing towns. Where compensation has been agreed, agricultural properties affected by the pipeline would also benefit from increased water availability for stock and domestic uses. This is consistent with the RGMF and the local planning schemes which support the mining industry, infrastructure, agriculture and growth of the various local towns.

The dam and water storage area will impact on existing rural land uses, tenures and infrastructure during the construction and operational phases. Land inundated within the affected properties will result in a loss of rural land and the productive areas (i.e. cropping). However, the loss of this productive rural land is considered minimal from a regional perspective. Furthermore, the dam will take the place of Glebe Weir as the headwater storage of the DVWSS so downstream irrigators and high priority water users' entitlements will be maintained.

The construction of the dam will result in a change to the downstream flow regime, potentially impacting on waterharvesters on the Lower Fitzroy. This may result in changes to land use downstream.

The vast majority of land acquisitions within the impoundment will be on a partial acquisition basis. An assessment will be undertaken of the impact to each property of the loss of the area under the full supply level, and if a property is significantly impacted by this loss then consideration will be given to offering a full acquisition to the relevant landholder.

Wherever possible, the pipeline will be located within or contiguous with existing easements, roads and rail corridors minimising the potential impact on land uses, and the need for new or full width easements. Although it is a positive for sections of the pipeline to be co-located within existing infrastructure easements or corridors to reduce the overall impact of the Project, the future expansion of these facilities will be constrained.

The impact of the pipeline on land use is likely to be minimal with the pipeline located underground. Existing land uses should be able to continue with the pipe being laid at sufficient depth to allow continued cropping and grazing over the pipeline route. Where access to private properties is affected during the construction of the pipeline, alternative access will be arranged through consultation with landholders.