Australia Pacific LNG Project

Volume 2: Gas Fields

Chapter 6: Land Use and Planning

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6.1 Introduction

6.1.1 Purpose

Australia Pacific LNG will develop its coal seam gas (CSG) resources within the Surat Basin, also known as the Walloons gas fields, in south central Queensland. This will to supply its proposed liquefied natural gas (LNG) plant on Curtis Island near Gladstone via a gas transmission pipeline. The gas fields, gas pipeline and LNG facility make up the Australia Pacific LNG Project (the Project).

Development of the Project's gas fields will result in potential impacts to current land uses, infrastructure and resources. Australia Pacific LNG's sustainability principles will be applied to the planning, design, construction and operation of the gas fields to ensure that its activities do not adversely impact stakeholders or the environment.

Of Australia Pacific LNG's 12 sustainability principles, the key relevant sustainability principles in relation to land use and planning in the gas fields include:

- Minimising adverse environmental impacts and enhancing environmental benefits associated with Australia Pacific LNG's activities, products or services; conserving, protecting, and enhancing where the opportunity exists, the biodiversity values and water resources in its operational areas
- Respecting the rights, interests and diverse cultures of the communities in which Australia Pacific LNG operates
- Identifying, assessing, managing, monitoring and reviewing risks to Australia Pacific LNG's workforce, its property, the environment and the communities affected by its activities.

This chapter describes the existing land use, land tenure, native title interests, resources and infrastructure in the gas fields' development area. The local and regional planning frameworks applying to this area are also discussed. The potential impacts likely to arise from the development of the gas fields on the above elements are examined and mitigation measures are identified to manage these impacts.

6.1.2 Scope of work

The gas fields study area encompasses the general area within and adjoining Australia Pacific LNG's gas fields' tenements. The studies, which underpin the scope of works, were based on a desktop analysis using a geographic information system built from various databases, satellite imagery and high-resolution aerial photography flown for Australia Pacific LNG over the gas fields study area in June and July 2009 .

Potential land use and planning impacts from the Project's activities in the gas fields were assessed, based on the information obtained from the above sources, by:

- Considering the relevant legislation
- Identifying existing land use and planning activities
- Assessing potential impacts to land use and planning activities
- Devising mitigation measures to address these potential impacts.

The discussion addresses the items outlined in Section 3.2.3 of the terms of reference for the environmental impact statement (EIS).

6.1.3 Legislative framework

Land use planning for land comprising the gas fields is guided by a number of regional plans (statutory and non-statutory), relevant local government authority planning schemes, and applicable state planning policies.

The discussion in this section outlines the nature of these documents.

Central Queensland Regional Plan

The Central Queensland Regional Growth Management Framework, also known as the Central Queensland Regional Plan 2002, was endorsed by Queensland Government in July 2002. It is the principal, long-term, broad-based, integrated regional planning strategy that will guide the management, growth and development of the region over the next 20 years. This plan is currently a non-statutory regional plan which is being upgraded to a statutory plan.

The framework applies to lands located within the former Taroom Shire area. Part of the Combabula/Ramyard and the Woleebee gas field areas are located within the former Taroom Shire area and hence fall under this plan.

This regional plan focuses on six core themes:

- Resource use, conservation and management
- Economic development
- Infrastructure
- Social and cultural development
- Education, training and research
- Planning and governance.

The plan has been prepared under the *Integrated Planning Act 1997*. The framework identifies a number of policy outcomes, strategies and actions to guide development and activities within the region. This Act was replaced by the *Sustainable Planning Act 2009* on the 18 December 2009.

Central Queensland Strategy for Sustainability – 2004 and beyond (Fitzroy Basin Association)

The Central Queensland Strategy for Sustainability – 2004 and beyond is directed at the management of the resources and environments of the river catchments of the Central Queensland region. It is a regional natural resource management plan developed by the Fitzroy Basin Association. It aims to:

- Provide a framework for achieving continuous improvement towards the sustainable use of natural resources and the protection of the natural environment in Central Queensland
- Encourage the active participation of all stakeholders in natural resource and environmental planning, decision-making and management
- Guide investment in natural resources and environmental management in Central Queensland.

The strategy identifies a number of regional aspirations, targets and actions. The Fitzroy Basin Area incorporates the catchment of the Dawson River and its tributaries. This catchment area incorporates the northern part of the gas fields.

Maranoa Balonne Regional Plan

The Maranoa–Balonne Regional Plan 2009 is a statutory regional plan and as a statutory instrument has the force of law.

The region comprises the local government areas of the Maranoa Regional Council and the Balonne Shire Council. The planning area is a rich cropping and grazing area with significant reserves of CSG, conventional gas and petroleum. The region includes part of the Queensland portion of the Murray-Darling Basin which includes the catchments of the Maranoa and Balonne-Culgoa river systems.

The region is faced with a number of challenges and opportunities which include:

- Managing growth associated with the development of energy resources in the Surat Basin
- Maintaining profitability of enterprises reliant on transport services and facing fluctuating commodity prices
- Addressing irregular climatic and weather conditions
- Providing opportunities for young people who have traditionally migrated to urban areas
- Attracting and retaining skilled staff
- Accessing and providing essential services in smaller centres.

The plan outlines the desired future for the region, establishes a broad policy framework for growth management, and presents a set of planning principles and guidelines for managing land use and development. The gas fields are located in the north-eastern sector of this regional plan area.

Natural Resource Management Plan, Condamine Alliance

This Natural Resource Management Plan 2004 (NRM Plan) was prepared by the Condamine Catchment Natural Resource Management Corporation Ltd (trading as the Condamine Alliance), with support from the Australian and Queensland Governments. Development of the Plan was supported by the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. The Plan is an advisory document which provides the basis for natural resource management activities and specific project funding initiatives in the Condamine catchment area.

Under the National Action Plan for Salinity and Water Quality, the Condamine catchment forms part of the Condamine-Maranoa-Balonne Priority Investment Region. The Condamine Alliance is one of three regional NRM bodies established in the Queensland Murray Darling Basin.

The plan provides an overarching document for actions and investment designed to build community capacity and to ensure intended ecologically sustainable development outcomes. The plan integrates salinity, water, vegetation, biodiversity and nature conservation, land use and management, and community goals.

The management priorities for the Condamine catchment are as follows:

- No increase in land salinity
- Maintenance of water quality
- Control of exotic weeds and pests

- Improved soil health and reduced erosion
- Maintenance of healthy waterways
- Maintenance of biodiversity including flora, fauna and ecosystems
- Water reform
- Asset protection and maintenance.

Core elements of the Plan include targets for salinity, water quality and associated water flows, land use and management, vegetation and nature conservation, and stream and terrestrial biodiversity.

Natural Resource Management Plan, Queensland Murray Darling Committee

The Queensland Murray-Darling Committee (QMDC) is a natural resource management organisation that supports communities in the Queensland section of the Murray Darling Basin to sustainably manage their natural resources.

Two individual regional bodies, QMDC and the South West Natural Resource Management Group have developed this NRM Plan (2004) in partnership with the Maranoa-Balonne, Border Rivers Catchment Management Associations and the Bulloo Catchment Coordinating Committee and a number of other organisations involved in natural resource management.

This NRM Plan covers the catchments of Border Rivers, Maranoa-Balonne, Nebine-Mungallala, Warrego, Paroo, and Bulloo rivers, and encompasses the regional body areas of the QMDC and SWNRM regions.

The plan presents resource condition targets, aspirational targets and management action targets. Achieving the goals of the NRM Plan relies on the successful operation of the community–government partnership expressed in the plan.

State Planning Policies

State Planning Policy 1/92 – Development and the Conservation of Agricultural Land

State Planning Policy 1/92 – Development and the Conservation of Agricultural Land (SPP 1/92) states that the best and most versatile farming land has a special importance and should not be built on unless there is an overriding need for the development in terms of public benefit and no other site is suitable for the particular purpose. This land is a valuable resource that should, in general, be protected from irreversible development. Local authorities, the Planning and Environment Court; and the government are required to have due regard to this policy when carrying out their planning functions. This policy is relevant to decision making under the *Sustainable Planning Act 2009*.

Good quality agricultural land (GQAL) is defined as land which is capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. In this context, 'agricultural land' is defined as land used for crop or animal production, but does not include intensive animal uses.

The four classes of GQAL described in the policy are outlined in Table 6.1.

Table 6.1 GQAL classes

Class	Description
Class A	**Crop land** – Land that is suitable for current and potential crops with limitations to production which range from none to moderate levels.
Class B	**Limited crop land** – Land that is marginal for current and potential crops due to severe limitations, and suitable for pastures. Engineering and/or agronomic improvements may be required before the land is considered suitable for cropping.
Class C	**Pasture land** – Land that is suitable only for improved or native pastures due to limitations which preclude continuous cultivation for crop production, but some areas may tolerate a short period of ground disturbance for pasture establishment.
Class D	**Non-agricultural land** – Land not suitable for agricultural uses due to extreme limitations. This may be undisturbed land with significant habitat, conservation and/or catchment values or land that may be unsuitable because of very steep slopes, shallow soils, rock outcrop or poor drainage.

The lands within the gas fields' study area which contain GQAL are listed in Table 6.18 and shown in Figure 6.1 to Figure 6.7. The mapping of GQAL is based upon data provided by the Queensland Department of Environment and Resource Management (DERM).

Table 6.2 Land use, gas fields' development areas

Gas fields' development area	Combabula/ Ramyard	Woleebee	Carinya	Condabri	Talinga/Orana	Dalwogan	Kainama	Gilbert Gully
Area (km^2)	**1,847**	**154**	**1,075**	**460**	**518**	**230**	**153**	**1,292**
Land use category	**Percentage of gas fields' development area**							
Grazing natural vegetation/minimal use	74.0	78.4	50.9	72.0	65.8	91.4	97.5	32.8
Grazing modified pasture	16.6	13.4	18.1	10.0	11.8	5.6	1.6	6.0
Forestry – production*	5.3	4.5	0.3	2.9	0.4	–	–	57.1
Forestry – plantation	–	–	–	0.01	–	–	–	–
Dryland cropping/horticulture	3.9	3.6	27.6	5.3	19.5	0.3	0.2	3.3
Irrigated cropping/horticulture	–	–	–	1.9	0.7	–	–	–
Intensive animal/plant production	–	–	0.02	0.2	0.2	–	–	0.05
Rural residential	–	–	0.02	0.5	–	0.02	–	–

Gas fields' development area	Combabula/ Ramyard	Woleebee	Carinya	Condabri	Talinga/Orana	Dalwogan	Kainama	Gilbert Gully
Area (km^2)	1,847	154	1,075	460	518	230	153	1,292
Land use category	**Percentage of gas fields' development area**							
Urban	–	–	0.05	5.8	–	–	0.3	0.01
Mining and waste	0.001	–	–	–	0.9	0.0003	–	–
Nature conservation/protected areas	0.2	0.1	3.0	1.2	0.6	0.007	0.4	0.7
Water	0.004	–	0.07	0.02	0.2	–	–	0.01

(Note: Production forestry on state forest tenures – includes grazing activities as a co-use.)

SPP 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

SPP 1/03 sets out Queensland's interest in ensuring that the natural hazards of flood, bushfire, and landslide are adequately considered in development. A natural hazard is defined as a naturally occurring situation or condition with the potential for loss or harm to the community or environment. The policy aims to mitigate the adverse impacts of flood, bushfire and landslide for relevant development.

Within natural hazard management areas, SPP 1/03 applies to development that is to be compatible with the natural hazard. The exception is where an overriding need for the development exists in the public interest and no other site is suitable and reasonably available for the proposed development. Development which is not compatible, but is generally consistent with the above outcome, should minimise as far as practicable the adverse effects from the relevant natural hazard and should not result in an unacceptable risk to people and property.

In addition, SPP 1/03 also applies to development that increases the number of people in a natural hazard area or which involves the manufacture or storage of hazardous goods.

SPP 2/07 – Protection of Extractive Resources

SPP 2/07 identifies those extractive resources of state or regional significance where extractive industry development is appropriate in principle. It also aims to protect those resources from developments that might prevent or severely constrain current or future extraction when the need for the resource arises. The gas fields' development area does not incorporate any key resource areas (KRA) identified under this policy. The nearest resource, the Warrian deposit (KRA 85), is located on the Roma Taroom Road to the west of the Combabula/Ramyard development area.

Town planning schemes and other regulatory provisions

The gas fields are located within the Maranoa Regional Council, Western Downs Regional Council and Toowoomba Regional Council local government authority areas. The local government authority planning schemes current for the gas fields are those in force for the former Bungil, Bendemere, Murilla, Chinchilla, Wambo, Taroom and Millmerran shire councils. These planning schemes will apply until such time as the two regional councils prepare and adopt new town planning schemes for their

respective areas. The lands affected by the proposed gas fields' development are zoned for rural, open space or forestry uses under these planning schemes.

Under the Sustainable Planning Regulation 2009, development for an activity authorised by the *Petroleum Act 1923*, or the *Petroleum and Gas (Production and Safety) Act 2004* (PAG Act) or development for a petroleum activity defined under the *Environmental Protection Act 1994*, is exempt from assessment against a planning scheme. Those project components that do not fall under this exemption may require assessment against a relevant planning scheme.

6.2 Methodology

The information provided in this section has been sourced from available government and local authority databases, site visits, and from the interpretation of available air photo and satellite imagery. GIS mapping and spatial analysis has been used to interpret the data and to assist in the assessment of the development impact of the gas fields on the environment.

The relevant databases utilised during the assessment of land uses in the gas fields' development area include:

- World heritage areas, Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA)
- Cadastre and easements, Queensland Department of Environment and Resource Management (DERM) 2009
- Aircraft facility point, power line and railway stop point (based on 1:250,000 scale topography) Commonwealth of Australia (Geoscience Australia) 2009
- Pipelines, Mines and Energy Unit, Queensland Department of Employment, Economic Development and Innovation (DEEDI), MERLIN mining tenures system and database 2009; Commonwealth of Australia (Geoscience Australia) 2009
- Mines, Key Resource Areas, mineral resources, Mines and Energy Unit, DEEDI, MERLIN mining tenures system and database 2009
- Geology, Mines and Energy Unit, DEEDI 2008
- Central West Region – Good Quality Agricultural Lands, DERM 2009
- Land resource data reports and maps, DERM 2008
- Queensland Land Use Mapping Program, former Queensland Department of Natural Resources and Mines 1999
- Native Title, Indigenous Land Use Agreements, Commonwealth of Australia (National Native Title Tribunal, Geoscience Australia) 2009
- Indigenous Protected Areas, DEWHA 2009
- Protected Areas of Queensland (estate), Queensland Heritage Register Boundaries, Directory of Important Wetlands, DERM 2009
- Nature Refuges and Coordinated Conservation Areas, Environmental Protection Agency, DERM 2009
- Packaged digital data - land, vegetation and water 2006, former Queensland Department of Natural Resources, Mines and Water (now DERM)

- Australian Land Disturbance database – Wilderness Quality, DEWHA 2009
- Restricted land, Mines and Energy Unit, DEEDI 2009
- Building points and homesteads, Commonwealth of Australia (Geoscience Australia) 2009
- Planning schemes, DERM 2009; Gladstone Regional Council, Queensland, 2009
- Watercourses (based on 1:250,000 scale topography), Commonwealth of Australia (Geoscience Australia) 2009
- Wetlands, DERM 2009

6.3 Existing environment

6.3.1 Land use

Land use over the gas fields is shown in Figure 6.8 to Figure 6.14. The data in these figures is drawn from the Queensland Land Use Mapping Program 1999 database provided by DERM, and interpretation of recent aerial photography. The predominant land use over the gas fields' development area is cattle grazing. Various forms of cropping are found in areas of more fertile soil and where the use of machinery is not constrained. Other land uses include forestry, nature conservation, resource extraction and urban activities. Table 6.3 provides a breakdown of land usage in each of the proposed gas fields' development areas.

Agriculture

Agricultural land use in the area is characterised by beef cattle grazing, dry-land cropping, irrigated cropping, and intensive animal production. There is also some grazing of goats and sheep in the area. Crops are used for both stock fodder and as raw materials for a range of human food products. The predominant fodder crops are oats, forage sorghum and millet. The dominant human food crops are wheat, grain sorghum, chickpeas and sunflower seeds. There are small pockets of cotton and horticultural cropping throughout the gas fields.

Cropping mainly occurs on the deep, dark cracking and non-cracking clay soils (particularly of alluvial origin) which are the most productive soils in the region. The area's shallow texture contrast soils are predominantly used for grazing on improved and native pastures, while those soils with a predominance of stone support forestry activities and/or extensive grazing based on native pastures.

Forestry

Several state forests are located in part within the gas fields including the Combabula, Condamine, Dinoun, Dunmore, Emu, Gurulmundi, Kumbarilla, Western Creek, and the Woodduck state forests. These production forests form part of the State's hardwood and cypress pine timber resource and are utilised to provide timber to sawmills, fence posts and firewood. In addition, the forests are used by the honey industry and often contain commercial sand and gravel resources.

Conservation and recreation

The gas fields' study area contains a number of recreation and conservation resources. Apart from the state forests identified above, the main conservation resource is the Stones Country Resources Reserve is located in the Woleebee development area. This reserve is a protected area listed under Schedule 4 of the Nature Conservation (Protected Areas) Regulation 1994.

Timber in the state forests is managed on a sustained yield basis to ensure the basic resource is conserved. None of the identified forests provide organised recreational experiences.

Volume 5 Attachment 42 provides an outline of cultural, community and recreation facilities and organisations in the Project area.

Tourism

The gas fields' study area is traversed by two major highways – the Warrego Highway and the Leichhardt Highway, which provide access to several tourist attractions. Local tourist attractions include:

- Taroom (Leichhardt's tree)
- Miles (historical village, wildflower region)
- Kogan (Hugh Sawry art centre, Cobb & Co station, power station, native bird aviary)
- Wandoan (heritage trail, Waterloo Plains environmental park)
- Drillham (historical railway town)
- Dulacca (historical railway town).

Mining and petroleum activities

The gas fields' study area contains substantial reserves of coal and CSG which are currently being investigated by a number of exploration and production companies. The area also contains bentonite deposits, two of which are being mined. These are located 29km to the south-west of Wandoan and 5km to the south-west of Miles.

Rural homesteads

The identification of rural homesteads within the study area has been undertaken by air photo interpretation. The more closely settled rural areas are located to the east of Miles within the Talinga/Orana, Kainama, and Gilbert Gully gas fields' development areas. The locations of these homesteads are shown in Figure 6.15 to Figure 6.21.

The main concentrations of rural-residential properties are located on the fringes of Miles and in the south-eastern corner of the Gilbert Gully gas fields' development area in the Cypress Gardens/Millmerran Downs localities.

Urban uses

The larger communities in the gas fields region are Chinchilla, Dalby, Miles and Roma. The smaller towns and settlements in the region include Condamine, Dulacca, Drillham, Jackson, Kogan, Yuleba, Wandoan and Wallumbilla. Smaller towns outside of the project region include Brigalow, Cecil Plains, Millmerran, Tara, Taroom and Turallin.

The town of Miles and the smaller settlements of Drillham, Dulacca, and Kogan are located within the gas fields' development areas.

A description of the key characteristics of these communities is presented in Volume 2 Chapter 20.

6.3.2 Land tenure

The gas fields are located within three local government authority areas. These are the Maranoa Regional Council, the Western Downs Regional Council and the Toowoomba Regional Council.

The predominant land tenure in the gas fields' study area is freehold. The percentage of each land tenure category within each gas fields' development area is summarised in Table 6.3 and is presented in Figure 6.22 to Figure 6.28.

Table 6.3 Land tenure, gas fields' development areas

Gas field	Combabula/ Ramyard	Woleebee	Carinya	Condabri	Talinga/Orana	Dalwogan	Kainama	Gilbert Gully
Area (km^2)	**1847**	**154**	**1075**	**460**	**518**	**230**	**153**	**1292**
Tenure category	**Percentage of Gas field development area**							
Freehold	72.5	70.9	90.7	82.6	94.7	95.2	94.3	39.5
Leasehold	20.2	12.7	6.5	10.2	1.1	0.4	0.01	0.8
Reserve	0.25	0.4	0.1	0.5	0.2	0.3	0.3	0.3
National park	-	1.6	-	-	-	-	-	-
State forest	5.35	4.5	0.3	2.9	0.4	-	-	57.1
Unallocated state land	-	-	-	0.1	0.01	0.5	0.02	0.03
Roads, easements, watercourses	1.7	9.9	2.4	3.7	3.6	3.6	5.4	2.3

(Source: Digital cadastral database, Queensland, Sept. 09)

Protected areas estate

Items of the protected areas estate that are situated in the gas fields' study area or are located in the gas fields' locality are listed in Table 6.4 below and depicted in Figure 6.29 to Figure 6.35.

Table 6.4 Protected areas estate

Estate item	Location
National parks/state forests	
Combabula State Forest	Within Combabula/Ramyard development area (5,617 hectares (ha))
Condamine State Forest	Part within Condabri development area (1,263ha) Part within Talinga/Orana development area (188ha)
Dinoun State Forest	Within Combabula/Ramyard development area (811ha)
Dunmore State Forest	Part within Gilbert Gully development area (19,120ha)
Emu State Forest	Within Combabula/Ramyard development area (419ha)
Gurulmundi State Forest	Part within Woleebee development area (690ha) Part within Carinya development area (321ha)
Kumbarilla State Forest	Part within Gilbert Gully development area (18,020ha)
Western Creek State Forest	Part within Gilbert Gully development area (37,062ha)
Woodduck State Forest	Within Combabula/Ramyard development area (3,027ha)
Conservation Areas	
Stones Country Resources Reserve	Within Woleebee development area (255ha)

***Note**: For information on matters of national environmental significance protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* refer to Volume 2 Chapter 23

The gas fields lie within two declared sub-artesian basin areas of the Great Artesian Basin. These are the Great Artesian Basin area and the Eastern Downs area. The extraction of water from these areas is managed for a range of purposes.

Heritage and historic areas

Items of heritage significance located in the gas fields' study area are identified and discussed in Volume 2 Chapter 18 and Volume 2 Chapter 19.

Stock routes

The *Land Protection (Pest and Stock Route Management) Act 2002* establishes the Queensland's stock route network.

The primary purpose of this network is to provide for travelling stock, although other secondary uses may occur within a stock route. These other uses may include the short-term agistment of parts of the route, the establishment of watering agreements with private landholders, and the construction and maintenance of stock route facilities. A road that is a stock route may be used as a transport corridor for vehicles or for communication and utility infrastructure facilities, for example phone, power and gas lines.

The stock routes and their function are managed by DERM having regard to the Queensland Stock Route Network Management Strategy 2009.

Under this strategy, the stock route network is to be managed:

- To ensure it remains available for public use
- To maintain and improve the network's natural resources
- To provide travelling stock facilities for use by travelling stock.

The stock routes that occur within the gas fields' development areas are listed in Table 6.5 below, and their location is depicted in Figure 6.22 to Figure 6.28.

Table 6.5 Stock routes, gas fields' development areas

Gas field development area	Stock route location	Distance (km)
Combabula/Ramyard	Bundi Clifford Road	8.60
	Clifford Yuleba Road	14.60
	Un-named road	64.45
	Mantovas Road	4.33
	Jackson Wandoan Road	27.15
Woleebee	Jackson Wandoan Road	6.20
Carinya	Un-named road	24.60
	Jackson Wandoan Road	10.50
	Manatova Road / Homebush Road / Devencourt Road / Myranga Road	18.76
	Coates Road	9.17
	Warrego Highway	33.34
	Dulacca South Road	12.20
Condabri	Leichhardt Highway	22.22
	Warrego Highway	8.65
	Pelham Road	10.60
	Kogan – Condamine Road	9.16
Dalwogan	Leichhardt Highway	14.90
	Mount Myrtle Road	2.30
	Leichhardt Creek Taroom Road	3.50
	Warrego Highway	8.30
Talinga/Orana	Warrego Highway	8.60
	Kogan – Condamine Road	18.60
	Clyne's Road	3.80
	Chinchilla – Tara Road	11.60

Gas field development area	Stock route location	Distance (km)
Kainama	Warra – Kogan Road	6.10
	Tara – Kogan Road	5.50
	Dalby – Kogan Road	8.20
	Condamine – Kogan Road	10.25
Gilbert Gully	Cecil Plains Moonie Road	29.60
	Weir River Road	29.10
	Bulli Creek Road	17.10
	Un-named road	30.80

6.3.3 Native Title

The gas fields component of the Project covers areas that are currently subject to registered claims and areas that were previously subject to registered claims. The known Native Title parties potentially affected by the development and the status of their Native Title claims are listed in Table 6.6 below.

Table 6.6 Native Title parties and claims

Party	Date claim filed	NNTT claim number	Claim status
Barunggam	27/01/1999	QC99/5	Previously registered
Bigambul	14/04/2009	QC09/2	Registered
Iman People 2	30/10/1997	QC97/55	Registered
Mandandanji	06/11/2008	QC08/10	Registered
Mandandanji People 2	28/10/1997	QC 97/50	Previously registered
Western Wakka Wakka People	27/01/1999	QC99/4	No longer registered

Figure 6.36 illustrates the boundaries of the Native Title claim areas (or former claim areas). The gas fields' study area includes areas where native title rights and interests may exist. Australia Pacific LNG could undertake activities that may impact on native title rights and interests. Australia Pacific LNG will seek to negotiate a native title agreement for areas where native title rights and interests may exist.

This may be in the form of an Indigenous Land Use Agreement or pursuant to the 'right to negotiate' process. In the event that a right to negotiate agreement cannot be established for a particular area, Australia Pacific LNG will make application for the National Native Title Tribunal to arbitrate with respect to grant of the tenements.

Where an Indigenous Land Use Agreement cannot be secured after reasonable efforts, Australia Pacific LNG may seek to use acquisition powers that may be available. This could include application to the Energy Minister under the PAG Act or to the Coordinator-General under the *State Development and Public Works Organisation Act 1971* where an infrastructure facility of significance declaration is made.

6.3.4 Mineral resources

The gas fields are subject to a number of different mineral exploration tenures and mining leases, issued under the *Queensland Mineral Resources Act 1989*. Table 6.7 and Figure 6.37 to Figure 6.43 provide details of these exploration and mining tenements and their location.

Table 6.7 Mining tenures, gas fields' study area

Gas fields' development area	Tenement holder	Tenement number
Exploration permit for coal (EPC)		
Combabula/Ramyard	Xstrata Coal Queensland Pty Ltd	EPC789
	Metrocoal Limited	EPC1167, EPC1164
	Winzil Energy Pty Ltd	EPC1698(A), EPC1386(A)
	RNO Resources Pty Ltd	EPC1854(A), EPC1838(A)
	Australia China Corporation Of Coal Geology Engineering Pty Ltd	EPC1763(A)
Woleebee	Metrocoal Limited	EPC1164, EPC1609(A)
	Xstrata Coal Queensland Pty Ltd	EPC792
	RNO Resources Pty Ltd	EPC1838(A)
Carinya	RNO Resources Pty Ltd	EPC1838(A), EPC1873(A), EPC1833(A)
	Winzil Energy Pty Ltd	EPC1698(A), EPC1594(A)
	Walloon Energy Pty Ltd	EPC1370
Condabri	RNO Resources Pty Ltd	EPC1833(A), EPC1830(A)
	Walloon Energy Pty Ltd	EPC1376(A)
	Metrocoal Limited	EPC1165
Dalwogan	Surat Coal Pty Limited	EPC1134
	Metrocoal Limited	EPC1165
	Walloon Energy Pty Ltd	EPC1370
Talinga/Orana	SE Qld Coal Pty Ltd	EPC813
	Metrocoal Limited	EPC1165
	AMH (Chinchilla Coal) Pty Ltd	EPC873, EPC562
	Linc Energy Ltd	EPC1046, EPC635, EPC897
	Walloon Energy Pty Ltd	EPC1367
	Carbon Energy (Operations) Pty Ltd	EPC869

Gas fields' development area	Tenement holder	Tenement number
Kainama	Linc Energy Ltd	EPC635, EPC897
	Carbon Energy Pty Limited	EPC1132
	Swancove Enterprises Pty Ltd	EPC1282
	Peabody (Wilkie Creek) Pty Ltd	EPC770
	Carbon Energy (Operations) Pty Ltd	EPC869
Gilbert Gully	Walloon Energy Pty Ltd	EPC1373(A), EPC1818(A)
	Linc Energy Ltd	EPC1537(A)
	Clean Global Energy Pty Limited	EPC1745(A)
	New Hope Exploration Pty Ltd	EPC763
	Carbon Energy (Operations) Pty Ltd	EPC868
Exploration permit for minerals (EPM)		
Woleebee	Volclay International Pty Ltd	EPM16950
Dalwogan	Acronx Pty Ltd	EPM18163(A)
Mineral development license (MDL)		
Combabula/Ramyard	Xstrata Coal Queensland Pty Ltd	MDL411(A) (5,188ha)
Talinga/Orana	AMH (Chinchilla Coal) Pty Ltd	MDL247 (2,450ha)
		MDL246 (410.4ha)
Kainama	Linc Energy Ltd	MDL 407(A) (Chinchilla extended) (309ha)
	Peabody (Wilke Creek) Pty Ltd	MDL 174 (33.1ha)
Mining lease (ML)		
Combabula/Ramyard	Unimin Australia Limited (bentonite)	ML5900, ML5901, (49ha)
Dalwogan	Bioclay Pty Ltd (bentonite)	ML6960, ML5910, & ML5911 (63.5ha)
Kainama	Linc Energy Ltd (coal)	ML50242(A) (Hopeland 1) & ML50244(A) (Hopelend 3) (307.2ha)

Key: (A) = application

6.3.5 Petroleum resources

The petroleum tenures which cover the Walloons gas fields' development areas and surrounding petroleum tenements are depicted in Figure 6.44 to Figure 6.50.

The gas fields comprise the following CSG tenements under the Acts – authority to prospect (ATP), petroleum lease (PL) or applications for such tenements (Table 6.8):

Table 6.8 Australia Pacific LNG CSG tenements

Gas field development area	Tenement number
Combabula/ Ramyard	PLA 297
	ATP 606
	ATP 972 (application)
Woleebee	PL 209
Carinya	ATP 973 (application)
Condabri	ATP 702
	PLA 265
	PLA 266
	PLA 267
Talinga/Orana	PLA 272
	PLA 215
	PL 226
	ATP 692
Dalwogan	PLA 216
	ATP 692
Kainama	PLA 225
	PLA 289
	ATP692
Gilbert Gully	ATP 663

The petroleum tenements adjoining the gas fields are identified in Table 6.9 and shown in Figure 6.44 to Figure 6.50. Australia Pacific LNG will consult with the holders of tenements that could be affected by project activities.

Table 6.9 Petroleum tenements adjoining the gas fields

Gas fields' development area	Adjoining ATP number	Adjoining tenement holder
Combabula/ Ramyard	886(A)	Pure Energy Resources Limited
	852	Pure Energy Resources Limited
	651	Queensland Gas Company Limited
	631	Bronco Energy Pty Ltd
	810	Arrow Energy Ltd
	336	Santos QNT Pty Ltd
Woleebee	768	BNG (Surat) Pty Ltd
	651	Queensland Gas Company Limited
	574	Victorian Petroleum LN
Carinya	785(A)	Starzap Pty Ltd
	574	Victorian Petroleum LN
	631	Bronco Energy Pty Ltd
	810	Arrow Energy Ltd
	632	Queensland Gas Company Limited
	647	Starzap Pty Ltd
Condabri	747(A)	Arrow Energy Ltd
	610	Queensland Gas Company Limited
	810	Arrow Energy Ltd
	632	Queensland Gas Company Limited
	620	Queensland Gas Company Limited
	788	Pandgaea ATP 788P Pty Ltd
	647	Starzap Pty Ltd
Talinga/Orana	747(A)	Arrow Energy Ltd
	676	Australian CBM Pty Ltd
	610	Queensland Gas Company Limited
	632	Queensland Gas Company Limited
	620	Queensland Gas Company Limited
	648	Queensland Gas Company Limited

Gas fields' development area	Adjoining ATP number	Adjoining tenement holder
Dalwogan	747(A)	Arrow Energy Ltd
	574	Victorian Petroleum LN
	810	Arrow Energy Ltd
	632	Queensland Gas Company Limited
	647	Starzap Pty Ltd
Kainama	676	Australian CBM Pty Ltd
	648	Queensland Gas Company Limited
Gilbert Gully	971(A)	Blue Energy Limited
	746(A)	Arrow Energy Ltd
	683	Arrow Energy Ltd
	689	Arrow Surat Pty Ltd

Key: (A) = application

6.3.6 Extractive industry resources

There is no key resource area or quarry located within the gas fields' development area. However, there are a number of quarries located in the surrounding area. These are listed in Table 6.10 and shown in Figure 6.51 to Figure 6.57. Most provide material to local government authorities and the general public for road construction and maintenance, and building construction.

Table 6.10 Existing extractive resources

Quarry name	Operator	Production rate	Local authority	Operation type	Location
Black Swamp Pit	WDRC	low	WDRC	Hardrock	Junction of North Kogan/Warra Kogan Roads, Chinchilla locality
Chandlers Quarry	TRC	low	TRC	Hardrock	30km south of Millmerran, via Bringalily on Millmerran-Inglewood Road
Colls Pit	N & J Bobcat Hire	low	WDRC	Sand	Monmouth Bridge Road (Redhill Road) West Shire, Chinchilla locality
Hunter Road Pit	Neville Colls	low	WDRC	Sand	Hunter Road via Chinchilla, 'Monmouth Park', Chinchilla locality
Lavelle Road	TRC	low	TRC	Hardrock	Millmerran locality
Newton's	GCM Mining Pty Ltd	low	WDRC	Hardrock	

Quarry name	Operator	Production rate	Local authority	Operation type	Location
Warra-Kogan	WDRC	low	Chinchilla	Hardrock	Warra - Kogan Road, Condamine South, Chinchilla locality
Warrians	Boral Resources (Qld) Pty Ltd - Country	low	MRC	Hardrock	Roma - Taroom Road

KEY: WDRC = Western Downs Regional Council; MRC = Maranoa Regional Council: TRC = Toowoomba Regional Council
Source: Mines and Energy DEEDI, QRock Database.

6.3.7 Infrastructure

The location of major infrastructure within the gas fields including major roads, landing grounds, rail, pipelines, proposed pipelines and major power transmission lines are shown in Figure 6.58 to Figure 6.64 and are listed in Table 6.11 below.

Table 6.11 Gas fields infrastructure

Gas field development area	Combabula/ Ramyard	Woleebee	Carinya	Condabri	Talinga/Orana	Dalwogan	Kainama	Gilbert Gully
Major roads								
Jackson/Wandoan Road	25km	7.3km	10.3km	23km				
Warrego Hwy			33.3km	8.5km	8.6km	8.3km		
Kogan/Condamine Road				9km	18.6km		10.3km	
Leichhardt Hwy				21.5km		15km		
Chinchilla –Tara Road					11.6km			
Warra-Kogan Road							6.1km	
Gore Hwy								15km
Landing grounds								
	1		2	2				
Rail								
Western Line			33.3km	12.4km	9km			
Pipelines								
AGL CSG pipeline			41km	8.5km		28km		
Origin Energy			29km	9.8km	1.4km			

Gas field development area	Combabula/ Ramyard	Woleebee	Carinya	Condabri	Talinga/Orana	Dalwogan	Kainama	Gilbert Gully
(Wallumbilla) CSG pipeline								
Origin Energy (Walloons) CSG pipeline					12.1km			
APT CSG pipeline				3.8km		28km	24.2km	
APT gas pipeline				10.5km				
Braemar Power gas pipeline				17.4km				
ERM Braemar 2 gas pipeline				21.6km				
ERM Power gas pipeline				8.4km				
Roma - Brisbane gas pipeline				8.3km			17km	
QGC CSG pipeline					8.5km			
Moonie – Brisbane oil pipeline								25km
Proposed pipeline								
Surat - Gladstone CSG pipeline					28km		8.5km	
Major Power Transmission Lines								
			33.2km	8.4km	8.6km	8.4km	12.4km	33.2km

6.3.8 Gas fields project infrastructure

Australia Pacific LNG proposes to develop the following key infrastructure, as part of its proposed development of the gas fields:

- Gas wells – up to 10,000 to be developed over the 30-year life of the gas fields
- Gas and water gathering networks – low pressure pipelines which connect gas wells to gas processing facilities and/or water treatment facilities
- Water transfer stations – intermediate holding and pumping facilities for untreated associated water
- Gas processing facilities – gas compression and dehydration
- Water treatment facilities – water treatment facilities and associated water feed ponds

- Brine ponds – storage ponds for high salinity waste water
- High pressure gas and water pipelines – to link gas processing facilities or water treatment facilities across the gas fields
- Gas field supporting logistical infrastructure – e.g. workshops, site offices, stores and storage areas
- Permanent accommodation facilities and associated supporting infrastructure.

The land use characteristics applying to the gas processing facilities, water treatment facilities, water transfer stations, brine ponds and high pressure pipelines are summarised in Table 6.12. The approximate locations of the key infrastructure are shown in Volume 2 Chapter 3.

The gas wells and gas and water gathering networks are not included in this table as the location of these infrastructure facilities are yet to be defined.

Table 6.12 Gas fields project infrastructure

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
Brine pond (BP)					
BP_WOL_01	175ha	lease land	Grazing modified pastures / grazing natural vegetation	EPC applications 1609, 1838	B / C2
BP_GIL_01	140ha	freehold	Grazing modified pastures / grazing natural vegetation / minimal use	EPC application 1373, EPC 868	D
BP_MEL_01	140ha	lease land	Grazing modified pastures / grazing natural vegetation	EPC 1167	B
BP_Talinga (existing 70ha)	210ha		Mining and waste / minimal use	EPC 1165	C2
Water treatment facility (WTF)					
WTF_MEL_01	4ha	lease land	Grazing modified pastures / grazing natural vegetation	EPC 1167	B
WTF_Con_01	4ha	freehold	Grazing natural vegetation / minimal use / grazing modified pastures	EPC application 1376	C1
WTF_HCK_01	4ha	freehold	Grazing natural vegetation / minimal use	EPC application 1838	C1
WTF_Wol_01	4ha	freehold	Grazing natural vegetation	EPC 1164	B
WTF_BYM_01	4ha	freehold	Dry-land cropping	EPC application 1873	A
WTF_Gil_01a	4ha	freehold	Grazing modified pastures / grazing natural vegetation	EPC application 1373	D
WTF Talinga	4ha		Mining and waste / minimal use	EPC 1165	C2
Feed ponds (FP)					
WTF_MEL_01	20ha	lease land / freehold	Grazing natural vegetation / grazing modified pastures	EPC 1167, EPC applications 1386, 1854	A / B / C1
WTF_HCK_01	5ha	freehold	Grazing natural vegetation / minimal use	EPC application 1838	A / C1

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
WTF_BYM_01	10ha	freehold	Dryland cropping	EPC application 1873	A
WTF_WOL_01	10ha	freehold	Grazing natural vegetation	EPC 1164	B
WTF_GIL_01a	20ha	freehold	Nature conservation / grazing natural vegetation / minimal use	EPC application 1373	D
WTF Talinga	20ha	freehold	Minimal use / mining and waste	EPC 1165	C2
WTF_ CON_01	20ha	freehold	Grazing natural vegetation / grazing modified pastures / minimal; use	EPC application1376	C1
Gas processing facility (GPF)					
GPF_CNS_03	50ha	lease land	Grazing natural vegetation	EPC application 1376	B
GPF_Com_03a	50ha	lease land	Minimal use	EPC application 1386	B
GPF_LUK_02a	50ha	freehold	Grazing natural vegetation / minimal use / grazing modified pastures	EPC application 1854	C1
GPF_HCK_01a	50ha	freehold	Grazing modified pastures / grazing natural vegetation	EPC application 1838	B
GPF_MUG_06	50ha	freehold	Grazing modified pastures / grazing natural vegetation	EPC application 1763	C1
GPF_RCK_04a	50ha	freehold	Minimal use	EPC application 1854	C1
GPF_Wol_01	50ha	lease land	Grazing natural vegetation / minimal use	EPC application 1609	B / C2
GPF_Car_01a	50ha	freehold	Grazing natural vegetation	EPC application 1873	B
GPF_Ora_03b	50ha	freehold	Grazing natural vegetation / minimal use	EPC 869	C2
GPF_Oan_04	50ha	freehold	Dry land cropping / minimal use / grazing natural vegetation	EPC 897	A
GPF_Con_01b	50ha	freehold	Grazing modified pastures / minimal use / grazing natural vegetation	EPC application 1833	A / C2
GPF_Con_02b	50ha	freehold	Dry-land cropping / minimal use / grazing natural vegetation	EPC application 1376	A / C1
GPF_CNN_04	50ha	freehold	Grazing natural vegetation / minimal use	EPC 1165	C2

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
GPF_Dal_01b	50ha	freehold	Minimal use	EPM application 18163 / EPC (1165	C2
GPF_NGA_02	50ha	freehold	Grazing natural vegetation / minimal use	EPC application 1838	A / C1
GPF_BYM_03	50ha	freehold	Dry land cropping	EPC application 1873	A
GPF_Cas_05	50ha	freehold	Grazing natural vegetation / minimal use	EPC application 1873	C2
GPF_Kia_01a	50ha	freehold	Grazing natural vegetation / minimal use	EPC 897	D
GPF_Gil_02	50ha	freehold	Grazing modified pastures	EPC application 1373 / EPC 868	D
GPF_Waa_03	50ha	freehold	Grazing natural vegetation / minimal use	EPC 868	C2
GPF_Waa_04	50ha	freehold	Grazing natural vegetation	EPC application 1373	A
GPF_zig_05	50ha	freehold	Grazing modified pastures	EPC 8668	D
GPF_zig_06	50ha	freehold	Minimal use	EPC application 1748	C2
Water transfer station (WTS)					
WTS_TAL_00	24ha	freehold	Dry land cropping / minimal use / grazing natural vegetation	EPC 1165	A / B
WTS_COM_04	24ha	freehold	Grazing natural vegetation	EPC application 1386	C2
WTS_CMN_03	24ha	freehold	Grazing natural vegetation	EPC 1164	C2
WTS_MEL_02	24ha	freehold	Grazing natural vegetation	EPC 1167	B / C2
WTS_MEL_01	24ha	freehold	Grazing modified pastures	EPC 1167 / EPC 789 / MDL application 411	C2
WTS_PHS_07	24ha	freehold	Grazing natural vegetation / minimal use	EPC application 1386	B

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
WTS_MUG_08	24ha	freehold	Grazing modified pastures / grazing natural vegetation / minimal use	EPC application 1763	C1
WTS_RCK_06	24ha	freehold	Grazing natural vegetation	EPC application 1854	A
WTS_RAM_01	24ha	freehold	Grazing natural vegetation / minimal use	EPC application 1386 / ML 5901 (active)	C2
WTS_HCK_02	24ha	freehold	Grazing natural vegetation / minimal use	EPC application 1838	C1 / A
WTS_RCK_05	24ha	freehold	Grazing natural vegetation	EPC application 1854	C1
WTS_NGA_05	24ha	freehold	Grazing natural vegetation / minimal use	EPC application 1838	B / C1
WTS_BYM_04	24ha	freehold	Dry land cropping	EPC application 1873	A
WTS_BYM_03	24ha	freehold	Grazing natural vegetation / minimal use / grazing modified vegetation	EPC application 1873	C1 / C2
WTS_DAL_01	24ha	freehold	Grazing natural vegetation	EPC 1370	B
WTS_CAS_02	24ha	freehold	Grazing natural vegetation / nature conservation	EPC application 1873	C2
WTS_CAR_01	24ha	freehold	Grazing natural vegetation	EPC application 1873	B
WTS_DAL_02	24ha	freehold	Minimal use	EPM application / EPC 1165	C2
WTS_CNN_01	24ha	freehold	Grazing natural vegetation / minimal use	EPC 1165	C2
WTS_CON_02	24ha	freehold	Grazing natural vegetation / grazing modified pastures	EPC application 1833	C2
WTS_CNS_03	24ha	lease land	Grazing natural vegetation	EPC application 1376	B / C2
WTS_OAN_01	24ha	freehold	Grazing natural vegetation	EPC 813	B
WTS_OAN_02	24ha	freehold	Dry land cropping / grazing natural vegetation / minimal use	EPC 897	A
WTS_ORA_02	24ha	freehold	Grazing natural vegetation	EPC 869	C2

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
WTS_ORA_01	24ha	freehold	Grazing natural vegetation / minimal use	EPC 1367	C2
WTS_KIN_01	24ha	freehold	Grazing natural vegetation / minimal use	EPC 635 / ML application 50244 / MDL application 407 / EPC 1132	C2
WTS_KIA_02	24ha	freehold	Natural vegetation / minimal use	EPC 897	D
WTS_GIL_01	24ha	freehold	Grazing natural vegetation	EPC application 1373	D
WTS_WAA_02	24ha	freehold	Grazing natural vegetation	EPC application 1373	D
WTS_ZIG_03	24ha	freehold	Grazing modified pastures / minimum use	EPC application 1373	A /C2
WTS_HCK_03	24ha	freehold	Grazing natural vegetation	EPC application 1838	B / C1
WTS_WOL_02	24ha	freehold	Dry land cropping / grazing natural vegetation	EPC 792	B
WTS_CON_02a	24ha	freehold	Dry-land cropping / grazing modified pastures / grazing natural vegetation / minimal use / nature conservation	EPC application 1376	A
WTS_COM_04a	24ha	lease land	Grazing natural vegetation	EPC application 1386	B / C2
High pressure gas pipelines					
	4000ha	Freehold (85.3%) Leasehold (7.6%) Reserves (0.13%) State	Dry land cropping and horticulture (10.6%) Grazing modified pastures (8.5%) Grazing natural vegetation /minimal use (76.5%) Intensive animal and plant production (0.09%) Irrigated pastures and cropping (0.2%) Mining and waste (1.1%)	**EPC:** 635, 789, 792, 867, 868, 869, 897, 899, 937, 938, 1046, 1110,1132, 1164, 1165, 1166, 1167, 1274, 1367, 1370 **EPC applications**: 1275,1373,13761386,1609,	Class A: 20.5% Class B: 24.1% Class C1: 15.8%

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
		forest (6.9%)	Nature conservation (1.6%) Rural residential (0.02%) Production forestry (3.1%) Water (0.004%)	1698, 1736, 1739, 1741, 1743, 1745, 1748, 1763, 1770, 1830,1833, 1838, 1854, 1873 **EPM:** 18163, 16950 **MDL:** 374 **MDL application:** 371, 411 **ML:** 5911 **Petroleum pipeline (PPL) application:** 97, 140 **PPL:** 1, 2, 7, 74, 90, 91, 103, 107, 123, 125, 108, 125,132,133, 134 **PPL not current:** 57, 73, 75, 99	

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
High pressure water pipelines					
	1100ha	Freehold (85.6%) Leasehold (6.3%) State forest (4.5%) State Land (0.001%)	Dry land cropping and horticulture (10.12%) Grazing modified pastures (12.0%) Grazing natural vegetation/minimal use (73.0%) Irrigated pastures and cropping (0.3%) Mining and waste (1.5%) Nature conservation (1.3%) Rural residential (0.8%) Production forestry (1.9%)	**EPC:** 635, 792, 813, 869, 897, 1046, 1132, 1164, 1165, 1166, 1167, 1367, 1370 **EPC application:** 1376, 1386, 1609, 1698, 1736, 1743, 1748, 1763, 1830, 1833, 1838, 1854, 1873 **EPM:** 18163, 16950 **MDL:** 374 **MDL application:** 371 **ML:** 5900, 5901, 5911 **PPL application:** 140	Class A: 21.9% Class B: 21.5% Class C1: 11.8%

Facility name	Area	Tenure	Land use	Overlapping mineral tenures	GQAL Class
				PPL: 1, 2, 74, 91, 103, 107, 108, 125, 108, 123, 132, 133, 140	
Telecommunication towers					
Captains Mountain	0.49ha	freehold	Grazing natural vegetation	EPC 970, EPP 683	
Kumbarilla	0.49ha	freehold	Production forestry	EPC 763, EPP 648	C2
Braemar South	0.49ha	freehold	Grazing natural vegetation	EPC 867	C2
Orana 2	0.49ha	freehold	Grazing natural vegetation	EPC 1367	C2
Talinga (existing)	0.49ha	freehold	Mining and waste	EPC 1165, PPL 91, 108, 133, 134	C2
Dalwogan (was Condabri)	0.49ha	freehold	Minimal use	EPC 1370	C2
Conoli	0.49ha	freehold	Minimal use	EPC application 1838	C2
Ewingdale	0.49ha	lease land	Minimal use	EPC application 1386	C2
Muggleton 2	0.49ha	freehold	Minimal use	EPC application 1763	B
Spring Gully (existing)	0.49ha	freehold	Grazing natural vegetation	EPC application 1275 PPL 90 PPL application 97, 143 Non current PPL 96	B

6.4 Potential impacts

6.4.1 Regional planning frameworks

Consistency with the Central Queensland Regional Plan

The Central Queensland Regional Growth Management Framework (also known as the Central Queensland Regional Plan 2002) is the principal, long-term, broad-based, integrated regional planning strategy to guide the management, growth and development in the central Queensland region over the next 20 years. The framework identifies a number of policy outcomes, strategies and actions to guide development and activities within the region.

Table 6.13 examines the consistency of the development of the gas fields with this framework.

Table 6.13 Central Queensland Regional Plan – consistency assessment

Policy objectives	Strategies and actions	Consistency assessment
Theme: Resource conservation and management		
Socio-economic and environmentally sustainable waste management practices are adopted within the region.	Facilitate the development of best practice approaches to waste management.	The gas fields' development is designed to minimise process wastes. Any wastes produced will be managed in accordance with regulatory requirements. Refer Volume 2 Chapter 16.
Air quality is maintained at levels which ensure sustainable regional communities, protection of the natural environment and opportunities for continuing economic growth.	Protect air quality in areas subject to industrial and urban growth through the use of appropriate air quality standards, air emission standards and emission control technologies.	The Project's emissions will not exceed air quality objectives for any constituents, in particular nitrogen dioxide, odour, and carbon monoxide. Refer to Volume 2 Chapter 13.
Development takes place with a focus on efficiency to achieve economic progress with minimisation of greenhouse gas (GHG) emissions and with an understanding of the potential impact of climatic conditions.	Continue the development and implementation of practices and technology to minimise (on a per production basis) GHG emissions.	The gas fields' development will generate GHG emissions. The key mitigation action to reduce GHG emissions is to reduce flaring during operations through improved design. Measures to reduce flaring that have been incorporated into the current design include installation of automated well control Australia Pacific LNG is also committed to further mitigate GHG emissions by utilising waste heat from exhaust gases, by reducing glycol regeneration rates, and by utilising solar energy and, electric drives. Refer to Volume 2 Chapter 14.

Policy objectives	Strategies and actions	Consistency assessment
Theme: Economic development		
The region supports existing and emerging industries and encourages diversification ensuring growth and a viable and ecologically sustainable economy in the region.	Actively promote industry diversification to support economic stability and growth across the region.	The gas fields' development supports this strategy. The development forms part of the emerging CSG industry in the region. Australia Pacific LNG will seek to purchase materials and services locally and will source employees locally if appropriate skills are available.
The presence of a culture of innovation in the region which encourages the development of versatile, creative individuals and organisations.	Stimulate continuous improvement of current technologies, the development and adoption of new technologies and practices to improve productivity and competitiveness and to take advantage of emerging opportunities including, but not limited to, electronic service delivery, biotechnology, greenhouse gas mitigation and dry land farming.	The use of LNG for energy generation globally will enable a reduction in GHG emissions to be gained compared to alternative coal-fired electricity generation. Refer to Volume 2 Chapter 14. The development provides a number of opportunities to improve current technologies for associated water treatment for re-use and water injection to underground aquifers. Refer to Volume 2 Chapter 12.
The provision of a flexible and skilled workforce meeting industry requirements which is capable of responding to both industry and personal changes.	Through labour force planning, identify current and future labour market supply and demand characteristics of the region and its communities and encourage the sourcing of labour and skills within the region.	The gas fields' development will source part of the workforce locally for construction and operational phases. It is expected that the gas fields' development will progressively recruit and train personnel over time, building upon established training programs for the industry in the Western Downs/Maranoa regions.
	Maximise employment opportunities for the Aboriginal and Torres Strait Islander workforce through appropriate skills development / training / management strategies.	Australia Pacific LNG's employment policy treats all persons equally. Any training and skills development programs would apply to all personnel.
It is recognised there is an increased capacity of the region to engage directly with international markets which increases our global perspective and enhances the viability of organisations based in the region.	Identify and develop international, interstate and inter-regional markets for Central Queensland's current and potential goods and services.	Australia Pacific LNG has a gas marketing team who has considerable expertise in the Asian and North Pacific LNG markets. This expertise could assist other local entrepreneurs who wish to enter such markets.

Policy objectives	Strategies and actions	Consistency assessment
Theme: Infrastructure		
Air transport infrastructure and services that meet the needs of industry and the community and facilitate improved connectivity beyond the region.	Protect existing infrastructure from encroachment by development.	The gas fields' development will consult with the Civil Aviation Safety Authority and the Western Downs Regional Council on plans for the proposed gas processing facility near Miles aerodrome.
Provision of safe, effective and sustainable domestic, industrial and regulated waste management infrastructure for the region.	Promote effective and coordinated planning of waste management infrastructures.	The gas fields' development is designed to minimise process wastes. Any wastes produced will be managed in accordance with regulatory requirements. Refer to Volume 2 Chapter 16.
Theme: Social and cultural development		
Safe, secure housing that is affordable, appropriate, and designed efficiently, reflecting the climate, culture and character of the area, is located throughout the region in relation to services, open space, recreation and employment.	Encourage a range of residential development options that meet the demographic and socio-economic needs of the area, and are appropriate to the climate and lifestyle attributes.	The gas fields' development will provide temporary accommodation facilities to house its newcomer construction workforce. In some of the more remote situations, permanent accommodation facilities will be developed to house the operational workforce. The Social Impact Management Plan in Volume 2 Chapter 24 provides details of the measures proposed for the provision of this accommodation.
The region has implemented a plan that encourages individuals and families to relocate into the region in order to build and/or replace the community skills base.	Create employment opportunities that attract and retain young people and families.	The gas fields' development will provide a range of employment opportunities which will assist in the creation of a stable employment base in the region for the life of the Project.

In summary, the development of the proposed gas fields on balance supports the policy outcomes of the Central Queensland Regional Plan.

Consistency with the Maranoa-Balonne Regional Plan

The Maranoa-Balonne Regional Plan 2009 outlines the fundamental principles, policies and desired regional outcomes to guide planning and development assessment in the Maranoa-Balonne region over the next 20 years. The Project's consistency with these measures is outlined in Table 6.14.

Table 6.14 Maranoa-Balonne Regional Plan – consistency assessment

Desired regional outcome	Objectives	Consistency assessment
Natural environment		
Natural assets are managed to sustain a healthy natural environment resilient to the impacts of climate change.	To protect, manage, and enhance the extent, diversity, condition and connectivity of the regions natural areas to maintain ecological integrity and processes, reverse biodiversity decline and increase resilience to the expected impacts of climate change.	Gas fields' infrastructure sites have been chosen to avoid areas of high ecological value where possible. Where impacts on such areas are unavoidable, offsets and progressive rehabilitation will be undertaken. In addition, management measures specific to habitat and biodiversity have been developed and will be implemented throughout the Project in the identified areas Refer to Volume 2 Chapter 10.
Natural resource management		
The productive capacity and social and cultural values of the region's landscapes and supporting ecosystems are maintained through the stewardship of natural resource managers.	To ensure that the use of surface water and groundwater resources is sustainable.	The gas fields' development will generate associated water surplus to project requirements. Various end uses for this water are being considered. These uses include the provision of water to nearby mining activities, aquifer recharge, and discharge to the Condamine River. Refer to Volume 2 Chapter 12.
	To ensure the long term prosperity and sustainability of primary production while maintaining environmental values.	Good quality agricultural land has been identified within the gas fields. Such land will be avoided where possible. Where GQAL is temporarily disturbed by project activities, such land will be rehabilitated and returned to a use consistent with the surrounding area.

Desired regional outcome	Objectives	Consistency assessment
	To manage animal and plant pests for the protection of land use and economic opportunities.	The Project will develop a biosecurity management plan that addresses animal and plant pests. An integral part of the plan is to reduce the risk of the introduction or spread of invasive species.
Strong communities		
Engaged residents, actively participating in a healthy community that is enriched by its diversity, empowered by its influence on service provision and attractive to new residents.	To identify, protect, maintain and foster a shared appreciation of the unique identity and cultural heritage values of the region.	Australia Pacific LNG has undertaken studies to identify the existence of items of Indigenous cultural heritage significance. Cultural heritage management plans will be developed to manage items of Aboriginal cultural heritage significance in conjunction with relevant traditional owners.
		Australia Pacific LNG has undertaken studies to identify the existence of items of shared cultural heritage significance across its tenements. Known heritage sites of state significance are not impacted by the development. Other locally important sites have been avoided when selecting infrastructure sites for the Project. Similarly, well sites will also be located to avoid identified heritage sites.
Economic development		
A robust dynamic regional economy building on historic strengths, operating within the limits of natural systems and responding to new opportunities.	To broaden Maranoa-Balonne's economic base, employment and business investment, by taking advantage of the opportunities afforded by the development of the oil, mineral, and gas extraction industry.	The development of the gas fields will be undertaken using local labour and services where possible.
	To increase the provision and uptake of local training and education in order to increase the region's social and economic well-being and to meet business needs.	Australia Pacific LNG intends to support employment skills training locally and will assist with local infrastructure provision to meet the needs of the Project and its workforce.

Desired regional outcome	Objectives	Consistency assessment
Infrastructure		
A coordinated, safe and efficient network of all facets of infrastructure, which is well maintained and underpins the social, economic and environmental health of the region.	To provide and maintain all facets of regional infrastructure in a transparent, coordinated and planned manner.	The Project through the provision of its own infrastructure should not place undue demands on local public utility facilities. The gas fields' development will provide upgraded roads where required, vehicle washdown facilities and temporary and permanent accommodation facilities.
	To maintain at its current standard or develop to a better standard, a transport network that supports economic development and lifestyle needs and allows people to move in a safe, efficient and sustainable manner.	The Project through the provision of its own infrastructure should not place undue demands on local transport facilities. The Project will contribute to the extension and upgrading of the regional road network. The project will work closely with MRD and relevant local authorities to maintain road infrastructure. Refer to Volume 2 Chapter 17.

Consistency with the Central Queensland Strategy for Sustainability – 2004 and beyond (Fitzroy Basin Association)

The Central Queensland Strategy for Sustainability – 2004 and beyond is directed at the management of the resources and environments of the river catchments of the Central Queensland region. This strategy is a non-statutory, voluntary plan. Part of the Combabula/Ramyard and the Woleebee gas fields' development areas are located within the Dawson River catchment, which is part of the Fitzroy Basin. Table 6.15 examines components of the strategy of relevance to this element of the Project.

Table 6.15 Central Queensland Strategy for Sustainability - consistency assessment

Issue	Targets	Consistency assessment
Weeds and pest animals		
Certain plants and animals are declared as pests, and as such must be controlled. Targets compliment the Land Protection (Pest and Stock Route Management) Act 2002.	100% control of outbreaks of new agricultural and environmental pest plants and animals, including pests of aquatic environmental significance (ongoing target). Impact of agricultural and environmental pest plants and animals (Class 2 and 3) is contained within five years and trend reversed within ten years.	The Project will develop a biosecurity management plan that addresses animal and plant pests. An integral part of the plan is to reduce the risk of the introduction or spread of invasive species. Refer to Volume 2 Chapter 8.
Climate Change		
	Practices and technology developed and implemented to minimise net GHG emissions within ten years. Uptake of energy efficient practices and technology by consumers.	The gas fields' development will generate GHG emissions. The key mitigation action to reduce GHG emissions is to reduce flaring during operations through improved design. Measures to reduce flaring that have been incorporated into the current design include installation of automated well control. Australia Pacific LNG is also committed to further mitigate GHG emissions by utilising waste heat from exhaust gases, by reducing glycol regeneration rates, and by utilising solar energy and, electric drives. Refer to Volume 2 Chapter 14.

Issue	Targets	Consistency assessment
Air quality		
There are atmospheric discharge limits beyond which human health effects occur. Development to undertake measures to limit discharges.	Air pollutant emissions maintained at 2004 levels or reduced to improve air quality. Introduce alternative technologies and systems, where possible, to reduce pollution and emissions, in existing and new developments. Develop site-by-site plans to reduce fugitive emissions.	The Project's emissions will not exceed air quality objectives for any constituents, in particular nitrogen dioxide, odour and carbon monoxide. Refer to Volume 2 Chapter 13.
Cultural heritage		
European and Indigenous cultural heritage (landscape values, artefacts, historical sites etc) may easily be damaged or lost through insensitive planning, resource use, or development in ignorance of their existence.	No land and sea management, planning or development impacts in culturally (Indigenous and non-indigenous) sensitive areas unless under an approved cultural heritage management plan. Develop and implement a cultural heritage protection program to protect all cultural heritage (material and non-material) within five years.	The Project will be subject to approved cultural heritage management plans negotiated with the relevant Traditional Owners, and hence will support this aspect of the Central Queensland Strategy for Sustainability.
Native Title		
While Native Title rights do not supersede other property rights, there is a widespread lack of understanding of how resource management activities impinge on Native Title.	Land management and planning activities allow for full expression of Native Title rights. Native Title rights, and/or access, and any necessary compensation agreed and implemented.	Native Title agreements with relevant Aboriginal parties will be put in place to manage this issue in respect of those lands where native title exists.
Soil salinity		
Dry-land salinity is an emerging problem in the Fitzroy Basin as vegetation clearance changes the water balance in the soils.	Reduction of deep drainage and runoff. Maximising water transpiration by plants. Revegetation of cleared recharge areas to restore natural water balances.	Australia Pacific LNG intends to keep vegetation clearance to the minimum necessary to construct the Project. Infrastructure items have been sited to avoid native vegetation where possible. Disturbed lands will be revegetated with appropriate species.

Issue	Targets	Consistency assessment
Integrity of remnant vegetation		
Less than 40% of the remnant vegetation in the Dawson River catchment remains. Need exists to manage the clearing of this remnant vegetation in the future.	Voluntary protection of remnant vegetation on freehold lands. Regeneration of non-remnant native vegetation on private lands to re-establish wildlife corridors particularly in riparian areas.	Gas field infrastructure sites have generally been chosen to avoid the need to clear important remnant vegetation. Where such clearance is unavoidable, it is intended that areas be subsequently rehabilitated and revegetated with appropriate species, and/or vegetation offset areas established to compensate for the loss.
Aquatic habitats		
Modification of in-stream, near stream, and wetland habitats can disrupt the functioning of aquatic ecosystems and lead to deterioration in water quality.	Increase the length of functional riparian areas by 20% in 10 years. Maintenance of existing areas of high ecological value. Protection and restoration of significant wetlands. Removal of in-stream barriers to species movement in the waterways.	During construction and operation, sediment and erosion control devices will be employed to manage runoff quality. Disturbance of riparian wetlands will be avoided wherever possible, and prompt revegetation of disturbed riparian areas undertaken. Environmental flow objectives established under the Condamine-Balonne Resource Operation Plan would be considered as part of the management of potential negative effects on aquatic ecosystems that may result from project water discharges.
Water quality		
Water resources valued by the community for a variety of purposes. Need to ensure that water quality is improved for river health and human activities.	A measurable improvement in water quality over 15 years. Maintenance of electrical conductivity levels consistent with ANZECC guidelines while region-specific standards are developed.	Increased total suspended solids and turbidity from vegetation removal, and pipeline and road construction will potentially affect water quality. Erosion and sediment controls will be established to regulatory requirements to manage water quality. Water quality, prior, during and post construction will be monitored. Refer to Volume 2 Chapter 9.

Issue	Targets	Consistency assessment
Economy		
By 2050 the region has a robust and well-balanced economy which is economically, socially and ecologically sustainable, and able to withstand external pressures.	All industries in the region to have a clear natural resource management policy incorporating commitment to continuous improvement and / or best management practices for local conditions within 5 years. Identify and implement appropriate and cost-effective sustainable technologies and practices within 10 years.	The gas fields' development incorporates energy efficient technologies which reduce energy usage in comparison to standard facility technologies.
Social		
By 2050, the region supports a range of viable, resilient and cohesive rural and urban communities. By 2050, all regional stakeholders are participating in effective natural resource allocation, decision-making and management.	Levels of Indigenous and youth employment increased by 20% within 10 years.	The Project will have an operational workforce which will possess the technical skills necessary to competently undertake the facility's operations. Given the size of this operational workforce, opportunities for Indigenous and youth long-term employment will be available.

Consistency with Natural Resource Management Plan 2004, Queensland Murray Darling Committee

This document primarily outlines actions that the QMDC, together with stakeholders, plan to undertake to manage threats to the Plan area's natural resources. The Project's consistency with relevant sections of this NRM is examined in Table 6.16.

Table 6.16 QMDC NRM plan consistency assessment

Resource target	Actions	Consistency assessment
Weeds and pests		
All mineral and energy companies to adopt shire weed management plans	Ensure mineral and energy companies include terrestrial and aquatic pest awareness into induction and training courses for all company employees and contractors, and ensure protocols for vehicle inspections and wash down are adhered. Ensure mineral and energy companies have an on-site monitoring programme for terrestrial and aquatic weed and feral animal emergence, as determined by local authority weed management plans.	The Project will develop a biosecurity management plan that addresses animal and plant pests. An integral part of the plan is to reduce the risk of the introduction or spread of invasive species Refer to the Mitigation and management section of Volume 2 Chapter 8.
Energy and waste		
Increase community and industry benefits from the sustainable mineral and energy sectors operating within the NRM Plan area	Increase community and industry benefits from the sustainable mineral and energy sectors operating within the NRM Plan area	The Australia Pacific LNG Project will provide benefits to the NRM plan area through an increase in employment and local spending, and the potential availability of produced water for community and agricultural purposes. Refer to Volume 2 Chapter 11 and Volume 2 Chapter 21.
100% of mineral and energy companies operating within the NRM Plan area incorporate Australian Petroleum Production and Exploration Association Codes of Environmental Practice into management plans	Ensure the minerals and energy industry acknowledges Australian Petroleum Production and Exploration Association Codes of Environmental Practice.	Australia Pacific LNG conducts its exploration activities in accordance with the Australian Petroleum Production and Exploration Association codes of practice.

Resource target	Actions	Consistency assessment
Negotiate and assist mining and exploration companies to produce and submit an Environmental Impact Statement prior to the commencement of works	Negotiate and assist mining and exploration companies to produce and submit an Environmental Impact Statement prior to the commencement of works.	This EIS supports this plan action.
Water		
Ecological health of watercourses and water bodies is maintained in all catchments	Undertake an assessment of pool habitats, and native plants and animals associated with the habitats in watercourses	The environmental management plan for the Project provides for the monitoring of aquatic and riverine habitats. Refer to Volume 2 Chapter 8 and Volume 2 Chapter 9.
The efficiency of utilisation and storage of extracted water is increased by 20% by 2008	Assessment of current average usage of extracted water including storage and application. Research into methods of reducing evaporation from storage facilities.	The gas fields' development will generate associated water surplus to project requirements. Various end uses for this water are being considered. These uses include the provision of water to nearby mining activities, aquifer recharge, and discharge to the Condamine River. Refer to Volume 2 Chapter 12. The monitoring and management of associated water arising from project activities is an integral part of project operations. Refer to Volume 2 Chapter 11, Volume 2 Chapter 12, and Volume 2 Chapter 24.

Consistency with Natural Resource Management Plan 2004, Condamine Alliance

This document primarily outlines actions that the Condamine Alliance together with stakeholders plan to undertake to manage threats to the plan area's natural resources. The Project's consistency with relevant sections of this NRM is examined in Table 6.17.

Table 6.17 Condamine Alliance NRM plan consistency assessment

Resource target	Actions	Consistency assessment
Salinity		
No further increase in area of land affected by salinity from 2009 levels by 2025	Determine area of land affected by salinity by 2009. Identify recharge/intake and discharge areas by 2009. Determine natural and man made levels of salinity on land by 2009.	Australia Pacific LNG intends to keep vegetation clearance to the minimum necessary to construct the Project. Infrastructure items have been sited to avoid native vegetation where possible. Disturbed lands will be revegetated with appropriate species. Refer to Volume 2 Chapter 10.
Water		
Maintain water quality (nitrogen, phosphorus, turbidity) at Chinchilla Weir within current national guidelines, or state or local guidelines from 2004 levels by 2020	Identify technical solutions to improve water quality. Establishing the monitoring points at Chinchilla Weir and sub-catchments.	The Project will be designed to ensure that water released into the environment complies with State standards for such releases. The gas fields' environmental management plan provides for the monitoring of water quality. Refer to Volume 2 Chapter 11 and Volume 2 Chapter.
Achieve sustainable groundwater extraction levels by 2020	Determine sustainable groundwater extraction rates in accordance with the future water resource planning process by 2015. All existing and future bores to be maintained across the catchment in accordance with the Interim Metering Policy and the Condamine Balonne Resource Operations Plan by 2010.	Australia Pacific LNG extraction of associated water will be undertaken in accordance with regulatory requirements. Refer to Volume 2 Chapter 12.
Achieve ecological outcomes as specified in the Condamine Balonne Water Resource Operations Plan by 2015.	Establish sustainable environmental flows in accordance with Water Resource Plan by 2015. 20% reduction in seepage and evaporation losses from storage dams by 2008. Establish sustainable environmental flows in accordance with Water Resource Plan by 2015.	The discharge of treated water into local waterways is envisaged for the initial stages of the Project. These discharges will be undertaken in accordance with regulatory requirements. Refer to Volume 2 Chapter 12. The Project will give consideration to the Water Resource Plans and Resource Operations Plans for the Condamine Balonne water system.

Resource target	Actions	Consistency assessment
Vegetation communities, biodiversity, and nature conservation		
No net increase in the extent and impact of priority weeds for nature conservation from 2006 extent by 2020 *Priority weeds refers to national, State and regionally significant weeds*	Decrease weeds of national significance by 2% of area by 2008.	The Project will develop a biosecurity management plan that addresses animal and plant pests. An integral part of the plan is to reduce the risk of the introduction or spread of invasive species Refer to Volume 2 Chapter 8.
Increase the extent of endangered regional ecosystems as at 2001 levels by 2025	Implement a program to increase connectivity between remnants and corridors by 2008.	Gas field infrastructure sites have generally been chosen to avoid the need to clear important remnant vegetation. Where such clearance is unavoidable, it is intended that areas be subsequently rehabilitated and revegetated with appropriate species, and/or vegetation offset areas established to compensate for the loss. Refer to Volume 2 Chapter 8 and Volume 2 Chapter 24 for details of management measures.

6.4.2 Consistency with State planning policies

Consideration of how the Project addresses these policies is discussed below.

SPP 1/92 – Development and the Conservation of Agricultural Land

GQAL resources in the study area are outlined in Table 6.18. GQAL is defined as Class A, Class B and Class C1 lands for the purpose of this assessment. The classification of GQAL is discussed in detail in Volume 2 Chapter 5.

Table 6.18 Good quality agricultural land distribution by gas fields' area

Gas field development area	Gas field area (ha)	Class A		Class B		Class C1	
		Area (ha)	%	Area (ha)	%	Area (ha)	%
Combabula / Ramyard	184,469	18,752	10.2	93,314	50.6	40,520	22.0
Woleebee	14,776	873	5.9	6,543	44.3	106	0.7
Carinya	107,466	53,457	49.7	18,476	17.2	14,439	13.4
Condabri	45,970	8,230	17.9	11,621	25.3	5,744	12.5
Dalwogan	23,028	60	0.3	3,936	17.1		

Gas field development area	Gas field area (ha)	Class A		Class B		Class C1	
		Area (ha)	%	Area (ha)	%	Area (ha)	%
Talinga / Orana	51,796	11,722	22.6	13,697	26.4	7,983	15.4
Kainama	15,295			847	5.5		
Gilbert Gully	129,188	18,572	14.3	293	0.2	1,822	1.4
Total gas fields' development area	571,989	111,846	19.5	148,727	26.0	70,614	12.3

Data Source: DERM Good Quality Agricultural Lands Database-2009

From the above table, approximately 58% of the land within the gas fields' development area is classified as GQAL.

It is estimated that the full development of the proposed gas fields facilities (as described in Section 3) may initially disturb some 23,726ha of GQAL as a result of initial construction activity. This equates to approximately 4.14% of the gas fields' development area.

Following the completion of construction and associated rehabilitation activities, it is estimated that the ultimate development of the gas fields will remove from potential agricultural production in the order of 4,319ha of GQAL for the operational life of the facilities concerned. This equates to approximately 0.76% of the total gas fields' development area.

A list of project components and their estimated potential impact on GQAL land is presented in Table 6.19.

Table 6.19 GQAL potential impact

Project component	GQAL land disturbed by initial construction activities (ha)	GQAL potentially removed from agricultural production during project operational phase (ha)
Gas wells	5,848	132.
Gas and water gathering pipelines	10,404	Nil – returned to land use
Water transfer stations	504	126
High pressure gas network	2,416	290
High pressure water network	607	73
Gas processing facilities	747	747
Water treatment facilities	20	20
Feed ponds	65	65
Brine ponds	315	315
Scraper stations	7	7

Project component	GQAL land disturbed by initial construction activities (ha)	GQAL potentially removed from agricultural production during project operational phase (ha)
Access tracks/roads	2,536	2,536
Gas facilities temporary accommodation facilities	80	0
Gas facilities permanent accommodation facilities	80	80
Gas pipeline temporary accommodation facilities and lay down areas	61	0
Telecommunication towers	0	0
Total	23,726	4,319

In addition to the short-term disruption of land use outlined above, GQAL may be subject to a reduction in agricultural production due to:

- Interference with overland water flow through the modification of runoff controls
- An increase in soil compaction through heavy trafficking, reducing water infiltration
- Increased erosion
- Disruption of farming operations such as the timing of operations and temporary restrictions on farming practices.

These effects are discussed in Volume 2 Chapter 5.

State Planning Policy 1/92 states that the best and most versatile farming land has a special importance and should not be built on unless there is an overriding need for the development in terms of public benefit and no other site is suitable for the particular purpose. This land is a valuable resource that should, in general, be protected from irreversible development. As indicated above, the development of the gas fields will impact approximately 4,319ha of GQAL for the life of the Project.

However, in this case it is considered that the proposed use of a comparatively small area of potentially productive land for the production of CSG for the life of the Project constitutes an 'overriding need' given the benefits that will accrue to the region and the state as a result of the Project. The Project's investment will generate considerable long-term economic benefits for the region, state and nation, in excess of those benefits that would arise from agricultural production from the land in question. The key benefits of the Project are:

- Creation of a new long-term gas processing and export industry in Queensland utilising Australia Pacific LNG's substantial CSG resources
- Immediate and future employment of up to:
  - 2,000 people during construction of the gas fields' infrastructure

  - 845 permanent employees for the operation of the gas fields

- Expenditure in the local economy through the purchase and use of local resources, wherever practicable, for the construction and operation of the plant
- Creation of opportunities to diversify rural and regional economies in a manner that will help sustain their viability
- Potential commercial and beneficial use of treated CSG water for regional markets
- Generation of Queensland and Australian government revenue over the life of the Project.

SPP 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

Flooding

Australia Pacific LNG has carried out extensive flood modelling for the watercourses in the gas fields' study area to determine the potential for flooding to impact on project facilities and operations. The results of this modelling are reported in Volume 2 Chapter 11. A review of the conceptual locations of the proposed major infrastructure areas showed that the majority are predicted to be free from regional flooding for all the assessed rainfall events (10, 20, 100, 500 year ARI design rainfall events). Several proposed major infrastructure areas, however, were predicted to be partially located within the existing regional flood extents. At these locations it will be possible to site the infrastructure outside of the flood extents within the proposed infrastructure area, or to fill the site with minimal impact on flood levels in the floodplain.

Australia Pacific LNG will mitigate and manage the potential risk of damage to property or the risk of injury or death persons due to flooding by:

- Locating major infrastructure where practicable outside of the existing environment flood inundation extents and not over tributaries and flow paths
- Appropriate design of major infrastructure located within flood extents by way of fill or use of waterway structures (culverts, bridges) to minimise the risk of inundation or damage due to flooding.

Major infrastructure will be located outside of the existing flood extents where practicable to minimise potential for damage to the environment by changing natural flow regimes and causing erosion in waterways.

The implementation of the above actions should ensure that there is no unacceptable risk to people and property from flood events in the gas fields' development area.

Bushfire management

The risk of bushfire is a major concern of all landholders as a bushfire can severely impact upon all land uses. The damage to crops, fodder, buildings and other farm infrastructure from fire can be devastating to landholder livelihoods. This SPP requires that development maintains the safety of people and property by either avoiding areas of high or medium bushfire hazard; or by mitigating any introduced risk.

Volume 2 Chapter 22 identifies the potential risk of fire being generated by project activities and the risk to the project facilities and people from a bushfire.

Given the nature of the Project and its rural setting, it is impractical to locate all project components to avoid medium and high bushfire hazard areas. Hence, bushfire risk will be managed by implementing a range of appropriate measures as outlined in Section 6.5.8.

Landslide

The gas fields' development area contains areas with slopes in excess of 15% and consequently these lands may constitute a landslide natural hazard management area under this SPP. Project construction activities will involve vegetation clearing and earthworks, resulting in destabilisation of soils. The project area landform will be altered locally through changes to existing natural drainage patterns, slope changes, and diversion of stormwater around facilities.

Changes to natural drainage patterns and the destabilisation of soils may potentially lead to slope instability due to increased water infiltration and a loss in stability previously offered by vegetation.

The earthworks associated with the construction of the various project components will be designed to ensure such slopes are stable and do not constitute an increased landslide hazard.

SPP 2/07 – Protection of extractive resources

The gas fields' study area does not incorporate any Key Resource Areas identified under this Policy. The nearest resource, the Warrian deposit (KRA 85), is located on the Roma-Taroom Road to the west of the Combabula/Ramyard gas fields area. As the Project will not encroach upon this Key Resource Area (which supports an operating quarry), the Project is consistent with the intent of this policy.

6.4.3 Existing land uses

The impact of the construction and operation of the gas fields on existing land uses in, and adjoining, the gas fields' development area is expected to be minimal.

The initial planning for the development of the gas fields involved a preliminary site selection study. This study used high level multi-criteria analysis, which included environmental, technical, social and cultural heritage constraints. As a result, the facility locations selected generally avoid conflicts with other uses and are sited on the least constrained lands. During the Project's detailed design phase, further environmental, geotechnical and social investigations will be undertaken to confirm these locations.

The expected impacts on the locality's land uses are examined below.

Agriculture

The development of the gas fields will result in the temporary disturbance of some cropping and grazing lands and the temporary removal of some land from farming uses. It is estimated that some 40,717ha of land used for various farming purposes will be initially disturbed by construction activities, and that following construction, 7,524ha will be removed from agricultural or pastoral use for the life of the Project. This level of change of use is not expected to materially alter the land use balance in the gas fields' area as the change constitutes a 1.3% shift in land use patterns.

In terms of individual properties, the level of disruption to agricultural land uses will depend upon the siting of wells, access roads, underground pipelines and treatment facilities. Given the nature of the gas resource, there is some flexibility to vary the location of wells (subject to operational needs), from the sites forming the nominal 750m x 750m well site location grid. Similarly, the location of access tracks and pipelines easements may be varied to a limited degree. It is Australia Pacific LNG's

intention to discuss the location of these items with landholders to reduce the level of potential disruption.

The Project will put in place mitigation measures where the potential to disrupt farming practices exists. These measures would include the exchange of information about proposed Project activities with individual property owners. Such information would include an overview of infrastructure layouts, activity outlines, timetable of events, environmental and vehicle hygiene management plans and potential compensation arrangements. Landholders would be encouraged to contact a member of the Australia Pacific LNG landholder liaison group in relation to their property and/or the Project.

Further information about the landowner liaison team and about specific landowner reference material is provided on the website www.origintogether.com, or by calling 1800 526 369.

Further detail on mitigation measures is also provided in Volume 2 Chapter 2.

Conservation and recreation uses

The proposed infrastructure to be located in the gas fields has been sited to generally avoid recreation and conservation areas. The gas fields' development area contains one designated conservation area. The Stones Country Resources Reserve to the southwest of Gulugaba is not affected by gas processing or water treatment facilities or major pipelines. Given the management principles that apply to resources reserves it would be preferable to locate wells around the periphery of the reserve rather than in the reserve.

The development area also contains nine state forests which are not presently used for formal recreation purposes. The establishment of gas wells within these forests may provide access to the forest for a variety of recreation activities in the future.

Forestry operations and millable timber

The footprint of project facilities in state forest tenures within the gas fields will potentially impact upon forest resources by reducing the amount of land available for growing timber, and could limit access to extractive industry resources. The Project will result in a reduction of the amount of timber trees available for bee foraging and may disturb or alter the grazing practices of lessees. The clearing of land will also mean that partially grown trees will not meet their full potential.

The Code of Practice for Native Forest Timber Production on State Lands 2007 establishes procedures for the harvesting of timber products. These procedures address such matters as the protection of streams, drainage lines, wetlands, lakes, springs, and wildlife habitat, and the management of steep and unstable lands. The relevant state forest managers will be consulted to determine appropriate forest clearing techniques, tree harvesting and track construction and maintenance procedures for the impacted parts of the forests.

The clearing of site vegetation on private properties during the construction phase of the gas fields may involve some usable timber. Prior to the commencement of clearing operations, Australia Pacific LNG intend to carry out an assessment of the timber on the site, and to determine the least intrusive way to harvest this timber resource. Vegetation which is agreed as not suitable for timber production may be mulched and stockpiled for use in site rehabilitation and revegetation activities.

Stock routes

Impacts on stock routes will generally arise from the clearing of vegetation and ground disturbance associated with the laying of gas and water pipeline networks. It is expected that disturbed areas will

be progressively rehabilitated to return the disturbed areas to a status consistent with the surrounding area. No plant or water storage sites are located within a stock route.

Tourism

The Project is not expected to impact on existing tourist attractions in the area. However, the Project's need for short-term accommodation facilities could limit the availability of such facilities for tourists on occasions. Given the Project's intention to establish its own accommodation as soon as possible during the initial construction stage, such shortages should be infrequent.

Rural homesteads

The Project has the potential to impact on the lifestyles enjoyed by rural residences through the disruption of activities, the exposure to noise and dust associated with construction, and the increase in persons on the land holding. Volume 2 Chapter 13 and Volume 2 Chapter 15 discuss the nature and magnitude of these impacts and propose measures for their management.

Urban uses

Project facilities and activities will generally be located away from urban areas and will not physically impact on such uses. Where facilities such as housing, industrial yards, and offices are proposed, they will be located, and approvals sought for their operation, in accordance with the relevant local government authority town planning schemes.

The increase in business activity and the expected population influx into the area of the gas fields generated by the Project would increase the demand for local housing and community services. These impacts are discussed in Volume 2 Chapter 20 and Volume 2 Chapter 21.

6.4.4 Mineral resources

The establishment of CSG production well grid has the potential to restrict or delay the future mining of coal resources in the region. The Project has a number of tenements that have overlapping tenure where there is also potential for coal mining or underground coal gasification. Section 6.5.4 details Australia Pacific LNG's approach to overlapping tenures.

As identified above, the study area includes two coal mining leases (ML) held by Linc Energy Ltd. These are ML50242 (Hopeland 1) and ML50244 (Hopeland 3) which cover an area of 307.2ha.

Australia Pacific LNG's future gas wells should not impact these existing mining and processing operations as they do not cover large areas of land, and Australia Pacific LNG could potentially site their wells to avoid these mining lease areas. The project tenements also include areas subject to a mineral development licence (MDL), as outlined in Table 6.20.

Table 6.20 Affected mining development licences

Owner	Licence number	Licence area (ha)
Xstrata Coal Queensland Pty Ltd	MDL411	5,188.0
AMH (Chinchilla Coal) Pty Ltd	MDL247	2,450.0
	MDL246	410.4
Linc Energy Ltd	MDL 407 (Chinchilla extended)	309.0
Peabody (Wilke Creek) Pty Ltd	MDL 174	33.1

MDL 411 held by Xstrata Coal includes a proposed water transfer station site (WTS_MEL_01). The establishment of this facility could result in the possible temporary unavailability of part of Xstrata's potential coal resource.

Similarly, the establishment of in the order of 90 gas wells over this area could temporarily affect access to the coal resource. It should be noted that the extraction of CSG does not preclude the mining of the coal resource upon completion of the CSG extraction.

6.4.5 Petroleum resources

The Project will impact on adjoining petroleum resources through the construction and operation of high pressure gas and water pipelines. It is expected that the location of these pipelines will be determined by mutual agreement with the affected petroleum tenement holders. Given the flexibility inherent in siting a pipeline, the selected right of way location should not affect the tenement holders' ability to carry out resource exploration or production activities.

6.4.6 Extractive industry resources

As identified in Section 6.3.6, the gas fields' development area includes two bentonite mining operations.

Table 6.21 Affected extractive industry resources

Owner	Leases number	Lease area (ha)
Unimin Australia Limited (Bentonite)	ML5900, ML5901	49.0
Bioclay Pty Ltd (Bentonite)	ML6060, ML5910, & ML5911	63.5

Australia Pacific LNG's future gas wells should not impact these existing operations as they do not cover large areas of land. Further, it is possible that Australia Pacific LNG could potentially site their wells to avoid these lease areas. However, one proposed water transfer station (WTS_RAM_01) lies over the Unimin Australia mining lease 5901. The establishment of this proposed station could disrupt Unimin's mining operation.

The progressive construction of project infrastructure will create an increased demand for sand, gravel and road base products. The quantities of materials required are unknown at this stage of the Project. As most existing commercial quarries in the region have low production rates, an increase in production may be generated assuming the quality of the excavated product is suitable and that individual existing operations have sufficient resources. It is possible that new quarries may be established in response to increased demand created by this, and other CSG projects. New quarries and expansions to existing quarries will generate changes to land use and an increase in traffic on local roads.

6.4.7 Infrastructure

Roads

The development of the gas fields will result in the construction of some new roads and the upgrading of existing roads to enable heavy vehicle access to facility locations. The increased amount of traffic on local roads generated by the Project could result in the deterioration of the road surfaces if they are not adequately maintained. Pipeline construction will involve the crossing of existing roads and may involve some disruption to the operation of this infrastructure. Major roads pipeline crossing will be

achieved using boring techniques to avoid disruption. Volume 2 Chapter 17 examines these impacts in detail.

Railways

The CSG field development includes the installation of high pressure water pipelines which may be located running parallel to the Western Railway Line.

Project pipelines will cross the Western Line (three crossings), the Wandoan-Miles line (two crossings), and the Dalby–Tara line (one crossing). The installation of the pipeline at these crossing points will be undertaken using boring techniques under the railway line to avoid the disruption of rail services on these lines. For each crossing, discussions will be held with the facility owners to determine appropriate crossing points and methods to restrict impacts upon railway activities.

Should these railways or new railways be electrified, the potential for electrical interference between the railway and any continuous steel pipeline would exist. This situation would prevent the location of these facilities alongside each other. The electrification of the railway would interfere with the gas pipeline's cathodic protection system and could result in the possible transmission of electrical currents along the gas pipeline and lead to pipeline corrosion.

Aerodromes

One of the proposed gas processing facilities is planned to be sited within 2.2km of the Miles aerodrome. Modelling of the potential effects of air turbulence as a result of hot exhaust gases from the combustion engines and plant flare has been undertaken. The results of this exhaust gas plume rise assessment are presented in Volume 2 Chapter 22 and Volume 5 Attachment 47. The study found that while high speed plumes could exceed the obstacle limitation surface, the likelihood of such an event interfering with aviation operations was extremely remote due to the infrequency of the event. Australia Pacific LNG recognises the need to meet Civil Aviation Safety Authority requirements.

Pipelines

The gas fields' development area includes a number of existing and proposed petroleum pipelines. No proposed project surface facilities are planned to be sited on these pipeline easements. Similarly, no gas wells will be located where they may interfere with the operation of existing pipelines. The installation of the Project's gas and water pipeline network will require the crossing of established pipelines. These crossings will be undertaken in accordance with agreements reached with the various pipeline owners/operators.

Australia Pacific LNG proposes the co-location of project pipelines with existing pipeline easements where feasible. This will limit the amount of disturbance of new ground and have the further benefit of locating facilities together in a common location. The siting of facilities alongside each other will require the observance of operational and safety standards such as those stipulated in Australian Standard AS 2885.

High voltage power transmission lines

The opportunity exists for project pipelines to be established along side or within electricity easements. Such an action would reduce the amount of land disturbed by the pipeline. However, consideration must be given to the effect of induced currents on the gas pipeline. This will require appropriate engineering and will only be undertaken where feasible.

The height of drilling rigs is a major safety concern with respect to power lines. The potential for drilling activities to damage power lines and the resultant safety risks are unacceptable, so it is proposed to locate gas well sites in locations which will not impact upon existing power lines.

Telecommunications cables

The potential exists for unintentional damage to existing telecommunication infrastructure, particularly buried cables during the construction phase.

6.5 Mitigation and management

6.5.1 Good quality agricultural land

In response to stakeholder feedback, Australia Pacific LNG is seeking to improve on good quality agricultural land (GQAL) mapping within the tenement areas used for the Project. Improved mapping will provide more reliable information to assist with the Project's planning process.

The Project will have an unavoidable impact on GQAL where the location of project facilities and infrastructure cannot be sited to avoid it. As discussed, a proportion of GQAL land will be subject to short-term disturbance due to project construction activities. Once these lands are no longer required for construction activities, it is intended that they will be rehabilitated to a status consistent with the surrounding area as soon as practicable.

Underground gas and water pipelines will be buried at a suitable depth sufficient to permit the working of the land above the pipelines, where practicable and in accordance with relevant industry standards and an applicable risk assessment process.

In situations where GQAL is affected by project activities, landholder compensation agreements will be negotiated as provided for by the provisions of Part 5, Chapter 5 of the PAG Act in relation to such land, or compensation will be determined by the Land Court.

6.5.2 Farming practices

Grazing and cropping activities

It is Australia Pacific LNG's intention to limit any disruption to a landholder's ability to use their land for farming purposes. Australia Pacific LNG's land access team will work with landholders to develop and agree operational practices that will achieve this outcome.

It is expected that mitigation measures, established in consultation with land holders, could include the following:

- The development and implementation of a biosecurity management plan
- Establishment of property access points, lease access roads and associated infrastructure
- Access roads will be located where possible to avoid farming activities and steep slopes
- Implementation of property access protocols regarding the limitation of vehicle and machinery speeds and movements, the opening and closure of gates and the use of water
- Fencing of areas containing Australia Pacific LNG facilities to prevent unwanted access by stock and limit the access of unauthorised persons based on an appropriate risk assessment approach

- Progressive rehabilitation of disturbed land as soon as practicable.

Volume 2 Chapter 5 details the mitigation measures proposed to achieve successful rehabilitation. Where landholders are undertaking specialised and/or certified production practices, special management measures will be formulated with landholders to assist them to maintain current practices.

Compensation agreements will be negotiated in accordance with Part 5, Chapter 5 of the PAG Act to deal with impacts on farming activities or compensation will be determined by the Land Court.

Intensive animal and plant production

Australia Pacific LNG will generally avoid conducting gas fields operations where such operations would disturb intensive animal rearing activities or intensive horticultural production. However, in situations where no alternative exists, Australia Pacific LNG will consult with the landholder to determine appropriate site-specific compensation measures.

6.5.3 Stock routes

Australia Pacific LNG will seek to avoid stock route locations in its detailed planning of surface infrastructure to be sited in the gas fields. Where siting within a stock route is unavoidable, steps will be undertaken to minimise disturbance to the stock route's vegetation, waterways and watering points.

Ground disturbance to stock routes will be rehabilitated as soon as practicable following completion of construction and commissioning activities. Volume 2 Chapter 5 details the mitigation measures proposed to achieve successful rehabilitation.

Vegetation in some stock routes may have significant biodiversity values. It is proposed to reduce disturbance to this vegetation wherever practicable. Volume 2 Chapter 8 addresses mitigation measures to lessen impacts on areas important for the maintenance of biodiversity values.

6.5.4 Mineral and extractive industry resources

In instances where coal tenures overlap with petroleum tenure, Australia Pacific LNG will consult with holders of the overlapping mineral tenures to appropriately manage the interaction between the Project interests and the interests of the holders of the overlapping tenures. The extraction of gas from coal seams does not impact on the mineability of the coal. Degassing the coal could assist any future underground coal mining.

The *Mineral Resources Act 1989* outlines the process to be followed by persons applying for a coal mining lease over a petroleum tenure. This procedure includes consultation to determine the feasibility of a coordination arrangement between the parties. Similar provisions exist under the PAG Act where persons such as Australia Pacific LNG apply for a petroleum lease over coal tenures.

In February 2009, the Queensland Government released its underground coal gasification (UCG) policy which guides the management of overlaps between petroleum tenure holders and persons wanting to develop UCG projects. Australia Pacific LNG is represented on the UCG Industry Consultative Committee established by the Queensland Government to advance the policy. This committee has members representing both the major CSG and also UCG proponents, and is addressing issues such as potential resource impacts.

Australia Pacific LNG notes that the USG policy states that if the Minister is asked to make a preference decision between the developer of a CSG resource and the developer of a UCG resource,

except in limited areas, the decision will be made in favour of the CSG holder under the PAG Act to allow the CSG tenure to progress to production stage.

As discussed above, the Project has the potential to restrict access to resources held under an existing mining lease, mineral development licence or exploration tenures. It is Australia Pacific LNG's intention to negotiate the crossing of these tenures and/or the location of infrastructure facilities on these tenures, with the holders of these tenures.

Land tenure modifications

The conversion of an authority to prospect to a petroleum lease under the PAG Act, to enable the Project to proceed, will be undertaken in consultation with the DERM and DEEDI.

The creation of easements and access rights to land will be determined by negotiation with the affected landholders and other relevant stakeholders as necessary, following established practices and in accordance with the requirements of current regulations and legislation.

6.5.5 State forestry operations

Consultation will be undertaken with state forest managers to determine the terms of access to state forest tenures and negotiate appropriate arrangements where project activities would negatively affect current forestry operations.

Australia Pacific LNG proposes that the following mitigation measures will be implemented wherever practicable:

- Development of a biosecurity management plan that addresses animal and plant pests. An integral part of the plan will be to reduce the risk of the introduction or spread of invasive species
- Establishment of forest access points and roads in locations agreed with the forest manager and adjoining landholders
- Location of access roads in the forest to generally avoid constrained areas such as important vegetation and sensitive ecosystems, steep slopes, unstable areas, and erosion prone soils
- Siting gas wells and gas and water gathering networks to generally avoid watercourses, wetlands, lakes and springs
- Develop and maintain infrastructure in accordance with standard forest practice
- Harvesting of timber prior to land clearance, where required, in accordance with standard forest practice.

6.5.6 Conservation and recreation areas

No national parks are affected by the proposed gas fields and there are no wetlands of international or national significance within the gas fields' study area (refer to Volume 2 Chapter 9 – Aquatic Ecology). However, there are 22 state forests, one resource reserve and one nature refuge within the gas fields' study area.

A sensitivity mapping exercise has been undertaken and management measures established according to the significance and sensitivity of ecosystems. These measures are detailed in Volume 2 Chapter 10.

The environmental management plans outlined in Volume 2 Chapter 24 include guidelines for the management of threatened species, clearing, weeds, feral animals, rehabilitation and revegetation and ecological fire.

6.5.7 Infrastructure and services

Australia Pacific LNG will consult with all infrastructure owners and operators to establish the precise location of services and to develop measures for the crossing of, or co-location with, such infrastructure prior to undertaking land clearing, excavation and other construction activities.

6.5.8 Natural hazards

Flooding

Australia Pacific LNG will mitigate and manage the potential risk of damage to property or the risk of injury or death persons due to flooding by:

- Locating major infrastructure where practicable outside of the existing environment flood inundation extents and not over tributaries and flow paths
- Appropriate design of major infrastructure located within flood extents by way of fill or use of waterway structures (culverts, bridges) to minimise the risk of inundation or damage due to flooding.

The constraints analysis and facility design associated with the project FEED will address identified flood risks.

Bushfire

Australia Pacific LNG will manage bushfire risk in its operations by utilising a variety of measures as follows:

- Monitoring of a bushfire weather forecasting and forewarning system
- Observation of fire bans for high risk days/seasons where practical
- Implement fire prevention measures during construction
- Staff and contractor bushfire education and training
- Preparation and implementation of emergency response plans tailored to individual project component situations
- Implementation of fire prevention, fire watch, and fire response procedures during construction and operation, particularly within forested areas
- Provision of fire breaks around major facilities, plant and equipment
- Cooperate with the Rural Fire Service in respect to any controlled burning
- Regular consultation with the Rural Fire Service and landowners on matters of mutual interest (eg. which Australia Pacific LNG dams can be used for fire water)
- Installation of emergency shutdown systems
- Design, siting and construction of facilities using fire resistant materials and in accordance with the *Australian Standard 3959 – 1999* Construction of buildings in bushfire-prone areas.

Landslide

Generally, areas with slopes exceeding 15% will be avoided. Where facilities need to be located in landslide risk areas, earthworks will be engineered to ensure slopes are stable and do not constitute an increased landslide hazard.

6.6 Conclusion

6.6.1 Assessment of outcomes

The management of land and natural resources seeks to ensure that the health of our land, water and vegetation is improved, long term productivity is enhanced, and that regional communities are resilient and prosperous. Table 6.22 lists land use sustainability principles and project mitigation measures that support these principles.

In addition, includes the residual risk levels for land use and infrastructure. A risk assessment has been undertaken to identify potential risks, causes and consequences from gas fields' activities. Mitigation measures to reduce the risk have been nominated and the residual risk has been calculated. Further details on the risk assessment methodology are provided in Volume 1 Chapter 4.

Table 6.22 Summary of environmental values, sustainability principles, potential impacts and mitigation measures

Environmental values	Sustainability principles	Potential impacts	Possible causes	Mitigation and management measures	Residual risk level
Diversity of ecological processes and associated ecosystems.	Minimising adverse environmental impacts and enhancing environmental benefits associated with Australia Pacific LNG's activities, products or services; conserving, protecting, and enhancing where the opportunity exists, the biodiversity values and water resources in its operational areas.	Loss of or disturbance to lands with important conservation values. Disturbance to forestry operations	Inappropriate siting of project facilities.	Project facilities and infrastructure will be sited to reduce impacts on ecological sensitive areas Rehabilitation of disturbed land in a timely manner. Consultation with forest managers to determine forest access conditions in accordance with standard forestry practices	Low
Life, health and well-being of people.	Respecting the rights, interests and diverse cultures of the communities in which it operates.	Disruption to existing lifestyles and businesses Temporary disturbance to Infrastructure services.	Project construction activities and operation	Implement and monitor the Draft land access policy framework' and project 'code of conduct' to address minimising impact on communities including land access procedures that fosters the partnership approach to landowner negotiations. These practices will be introduced to the workforce through inductions and training. Consult with infrastructure owners and operators to develop measures for the crossing of, or co-location with, such	Low

Environmental values	Sustainability principles	Potential impacts	Possible causes	Mitigation and management measures	Residual risk level
				infrastructure prior to undertaking land clearing, excavation and other construction activities. Landowner compensation agreements will be negotiated under the provisions of Part 5, Chapter 5 of the PAG Act or compensation will be determined by the Land Court.	
		Improved infrastructure (such as roads) and improved access to water.	Upgraded roads Installation of high pressure water pipeline network.	Engage with the community to develop sustainable regional infrastructure strategies that address the interests of affected communities, landholders and government. Australia Pacific LNG will offer impacted landholders, near to the water pipeline network, the opportunity to access water on commercial terms or as a compensation offset, subject to availability and relevant approvals. Australia Pacific LNG will optimise commercial and beneficial water use through a flexible approach including: - water which can be reliably supplied long term will be contracted to commercial customers - investigation of opportunities for water to be managed in conjunction with other procedures including water aggregation.	
Management of finite resources – land resource. Land use capability, having regard to economic considerations.	Identifying, assessing, managing, monitoring and reviewing risks to Australia Pacific LNG's workforce, its property, the environment and the communities affected	Reduction of productivity of GQAL through temporary disturbance to land or the temporary removal of land from agricultural production	Location of project components	Engage with the community to develop sustainable regional land use strategies that combine the interests of CSG, agriculture and biodiversity values. Landowners will be consulted in relation to the location of infrastructure on their land Site infrastructure to minimise impacts to good quality agricultural land. Bury pipelines at appropriate depths to	Medium

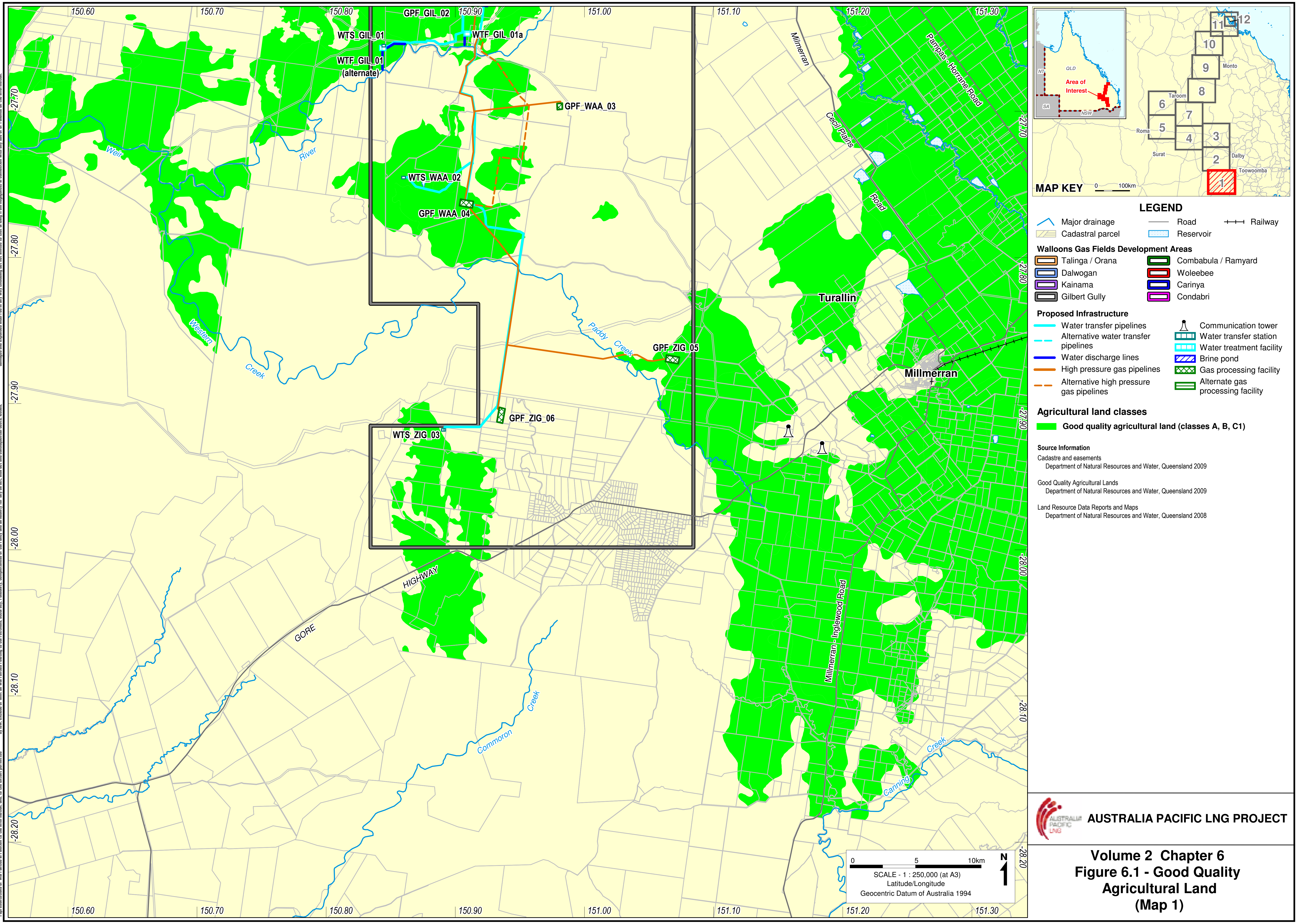
Environmental values	Sustainability principles	Potential impacts	Possible causes	Mitigation and management measures	Residual risk level
	by its activities.	Sterilisation of mineral resources		allow agricultural uses to continue. Integrate and manage project activities with consideration of the landholder business to minimise impact in consultation with the landholder.	
		Reduction in land available for timber production in state forests.		The Project will develop, in association with regional councils, a biosecurity management plan that addresses animal and plant pests. An integral part of the plan will be to reduce the risk of the introduction or spread of invasive species Negotiate with owners of mineral or timber resources impacted by the development.	

6.6.2 Commitments

Mitigation measures to address potential impacts associated with the gas fields are detailed in Table 6.22. Additionally, to minimise adverse impacts to existing or future land uses from its activities in the gas fields' development areas, Australia Pacific LNG will:

- Minimise the loss of good quality agricultural land
- Undertake ongoing assessments and update good quality agricultural land mapping so potential impacts can be mitigated
- Participate in proactive weed management and will work with regional councils to construct weed wash down facilities near Miles to support gas fields' construction and operations
- Prepare and implement property-specific plans to manage project activities around the landholder business and residences to minimise impacts
- Implement the adaptive associated water management plan, which includes the opportunity for impacted landholders to beneficially use water.

Figures



Volume 2 Chapter 6
Figure 6.1 - Good Quality Agricultural Land (Map 1)

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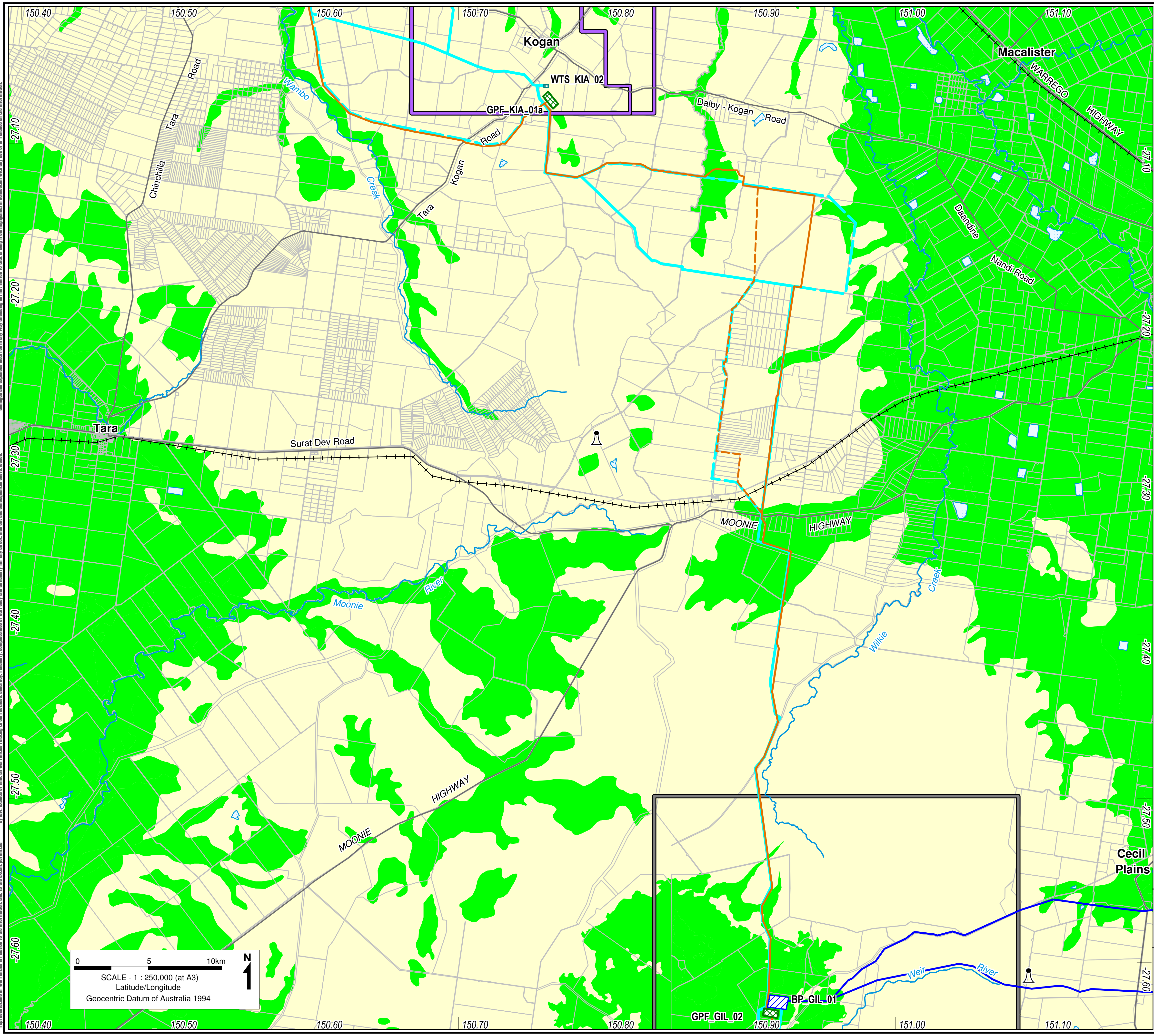

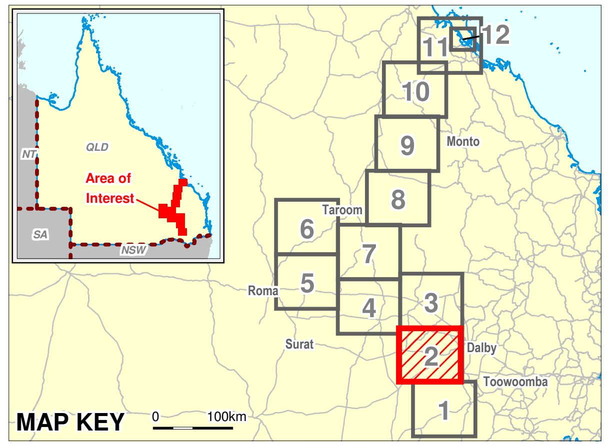

LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Communication tower
Alternative water transfer pipelines
Water transfer station
Water treatment facility
Water discharge lines
Brine pond
High pressure gas pipelines
Gas processing facility
Alternative high pressure gas pipelines
Alternate gas processing facility

Agricultural land classes

Good quality agricultural land (classes A, B, C1)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.2 - Good Quality Agricultural Land (Map 2)

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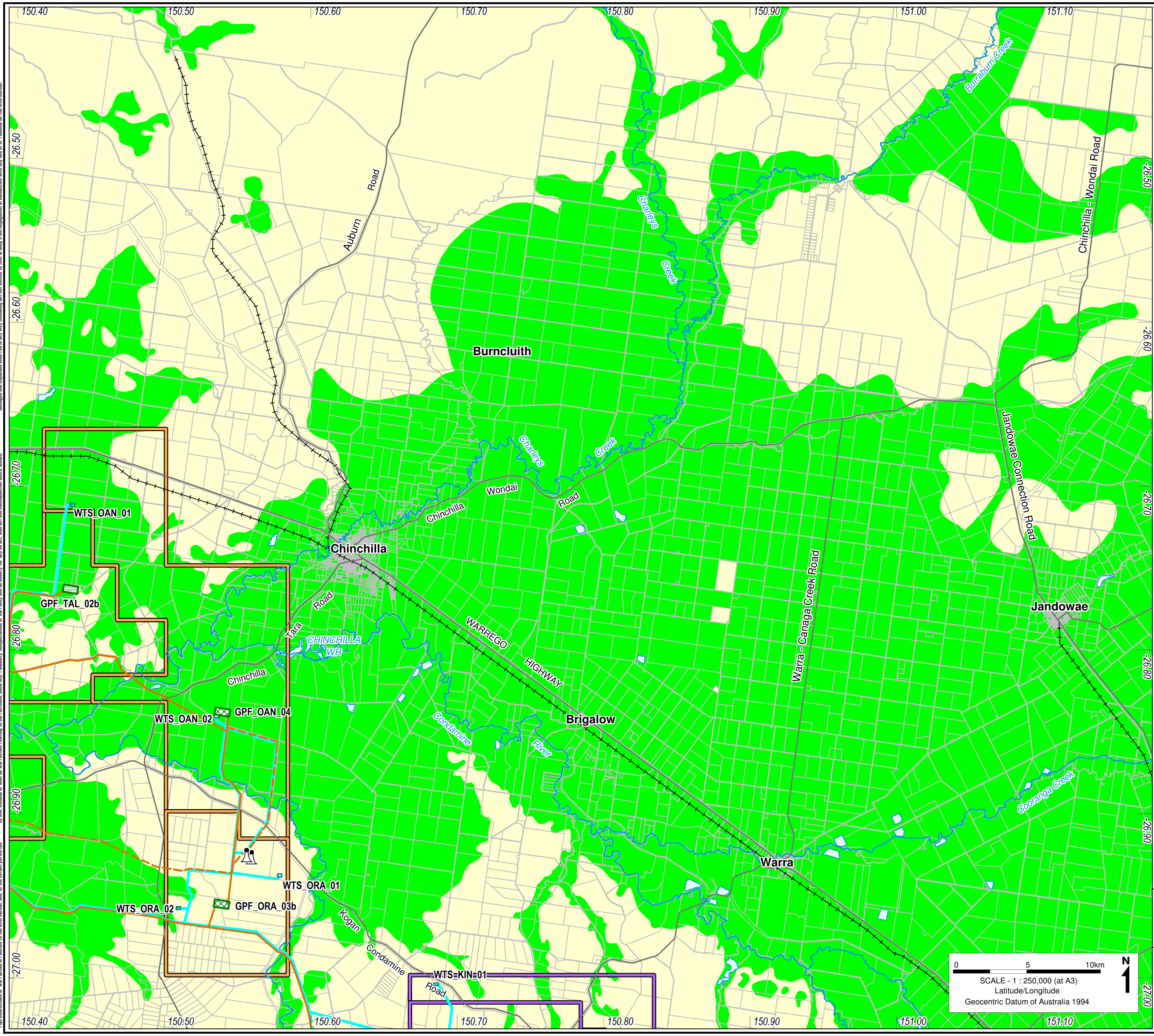

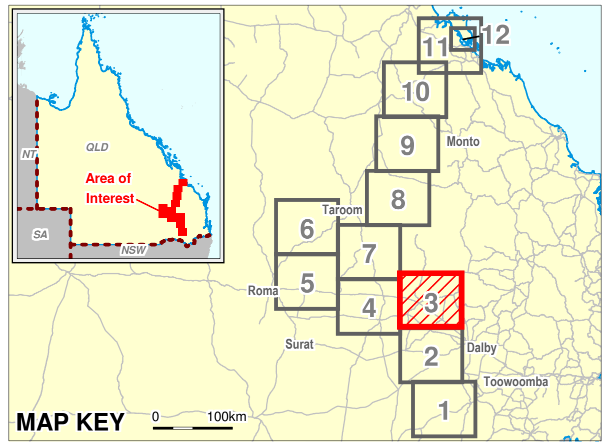

MAP KEY

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Agricultural land classes

- **Good quality agricultural land (classes A, B, C1)**

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.3 - Good Quality Agricultural Land (Map 3)

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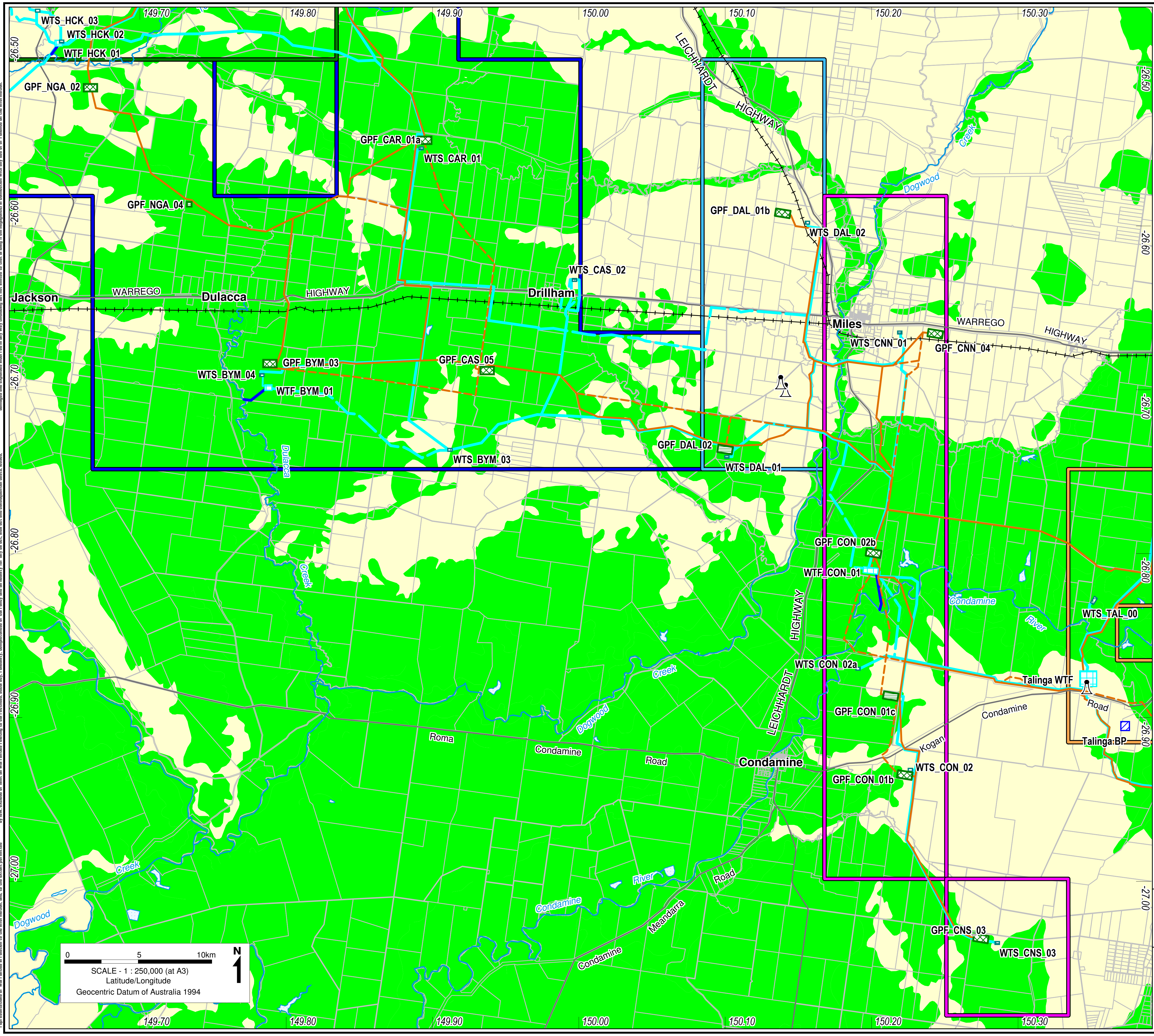

LEGEND

Major drainage — Road — Railway

Cadastral parcel — Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana — Combabula / Ramyard

Dalwogan — Woleebee

Kainama — Carinya

Gilbert Gully — Condabri

Proposed Infrastructure

Water transfer pipelines — Communication tower

Alternative water transfer pipelines — Water transfer station

Water discharge lines — Water treatment facility

High pressure gas pipelines — Brine pond

Alternative high pressure gas pipelines — Gas processing facility

Alternate gas processing facility

Agricultural land classes

Good quality agricultural land (classes A, B, C1)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

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Figure 6.4 - Good Quality Agricultural Land (Map 4)

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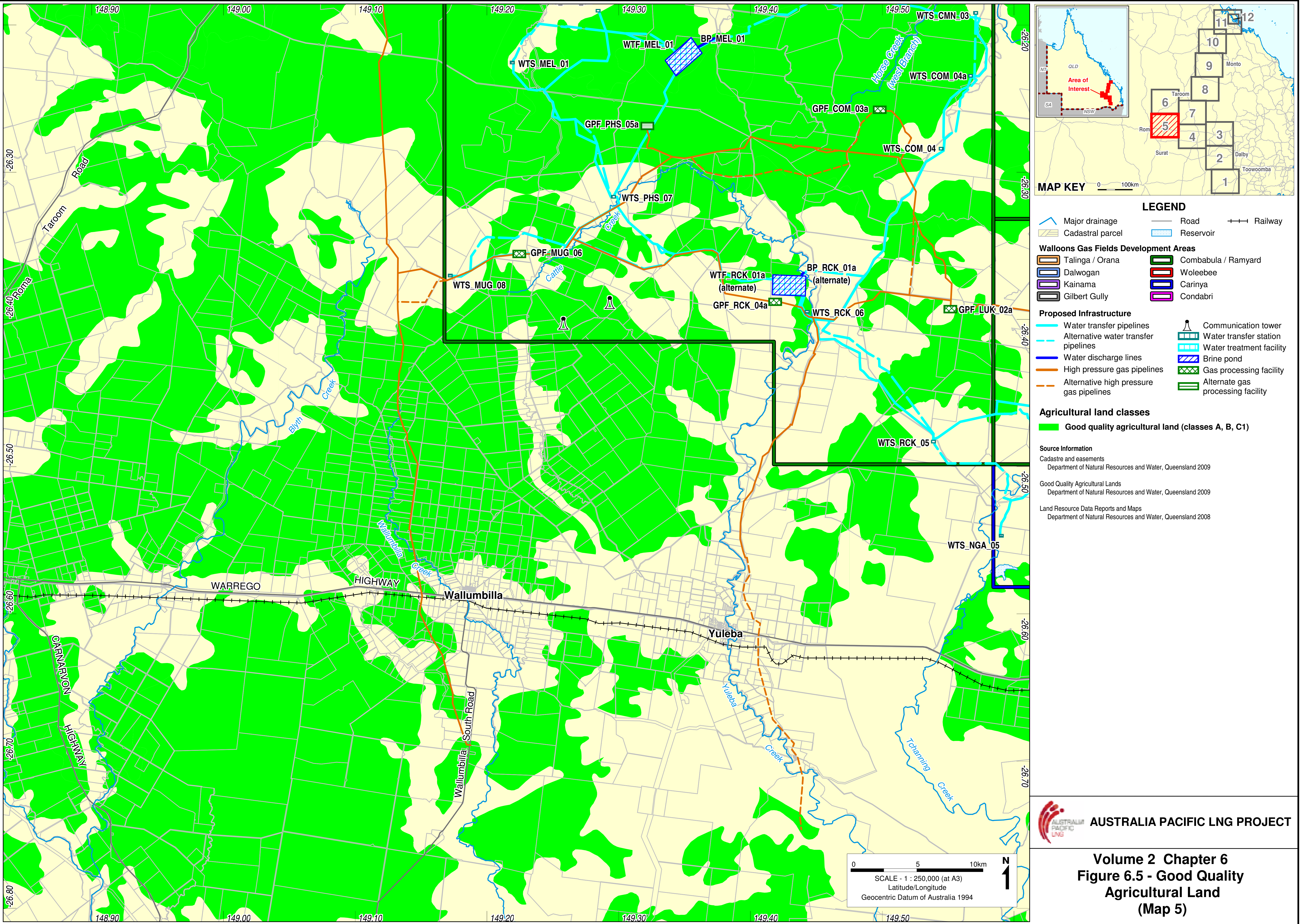

LEGEND

Major drainage | Road | Railway
Cadastral parcel | Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
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- Combabula / Ramyard
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- Brine pond
- Gas processing facility
- Alternate gas processing facility

Agricultural land classes

- Good quality agricultural land (classes A, B, C1)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.5 - Good Quality Agricultural Land (Map 5)

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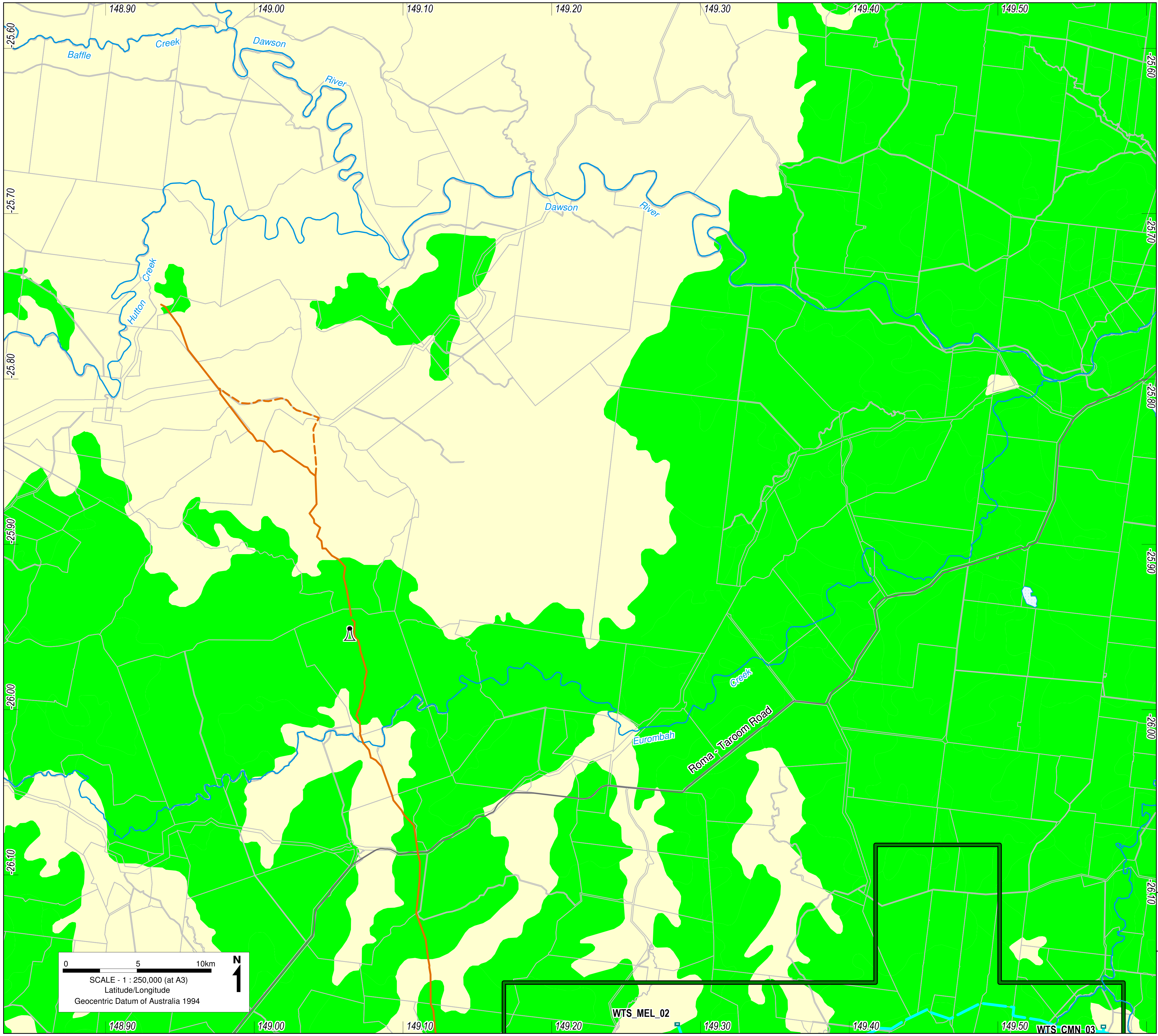

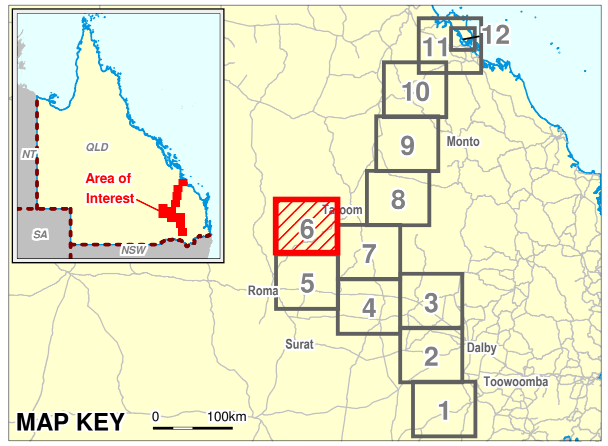

MAP KEY

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
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- Alternative high pressure gas pipelines
- Alternate gas processing facility

Agricultural land classes

- **Good quality agricultural land (classes A, B, C1)**

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.6 - Good Quality Agricultural Land (Map 6)

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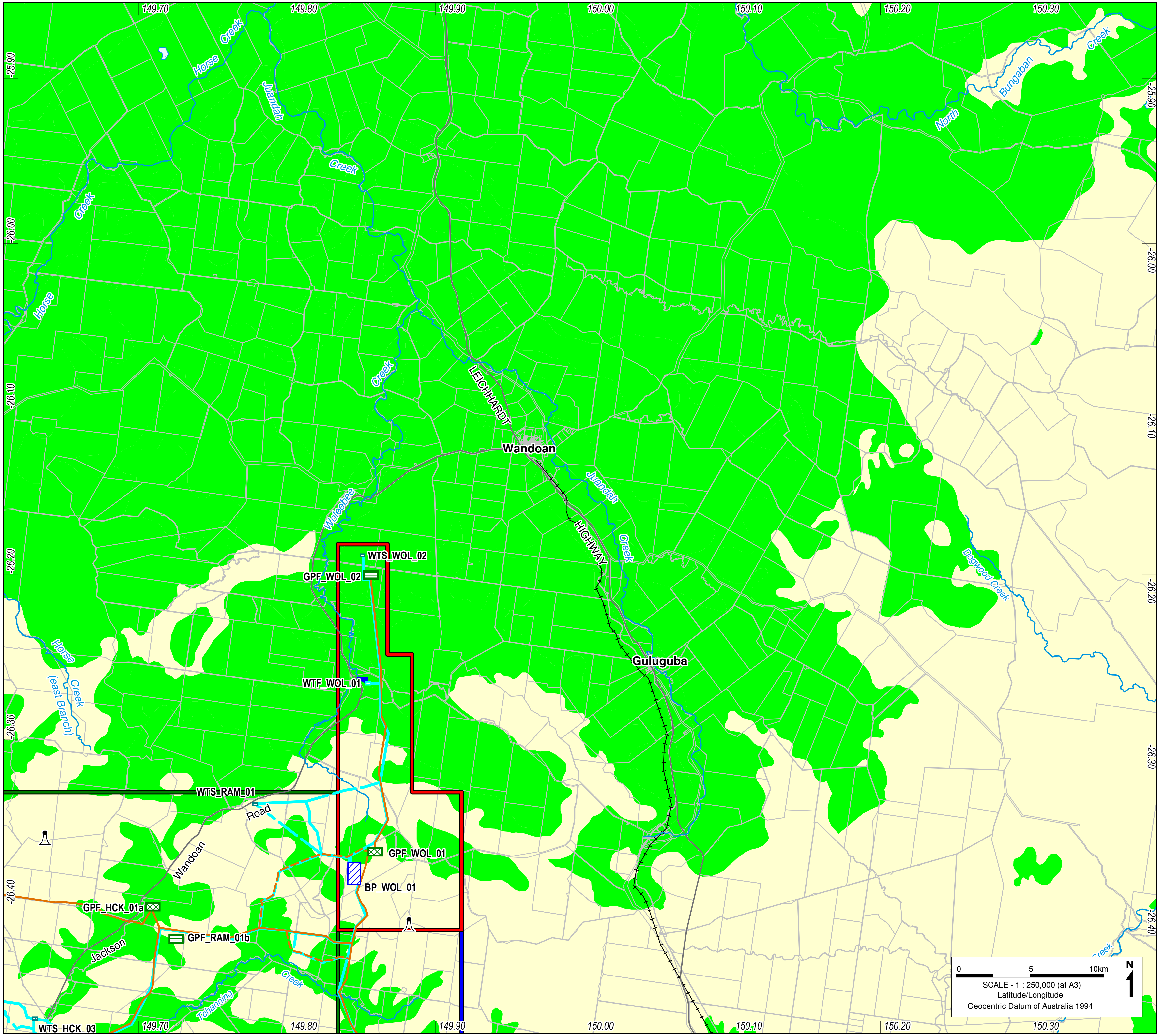

LEGEND

Major drainage | Road | Railway
Cadastral parcel | Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana | Combabula / Ramyard
Dalwogan | Woleebee
Kainama | Carinya
Gilbert Gully | Condabri

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- Gas processing facility
- Alternate gas processing facility

Agricultural land classes

Good quality agricultural land (classes A, B, C1)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Good Quality Agricultural Lands
Department of Natural Resources and Water, Queensland 2009

Land Resource Data Reports and Maps
Department of Natural Resources and Water, Queensland 2008

AUSTRALIA PACIFIC LNG PROJECT

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Figure 6.7 - Good Quality Agricultural Land (Map 7)

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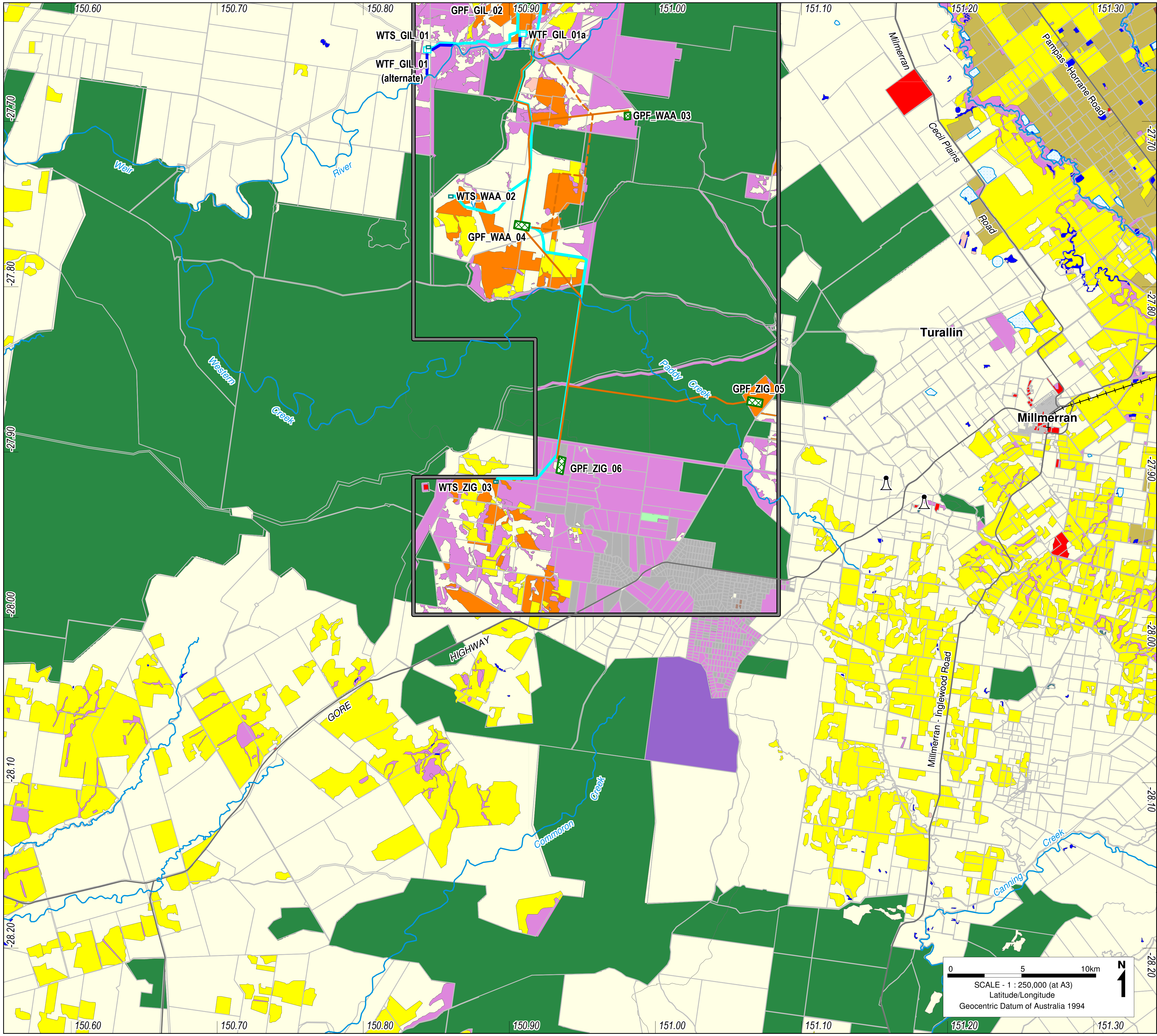

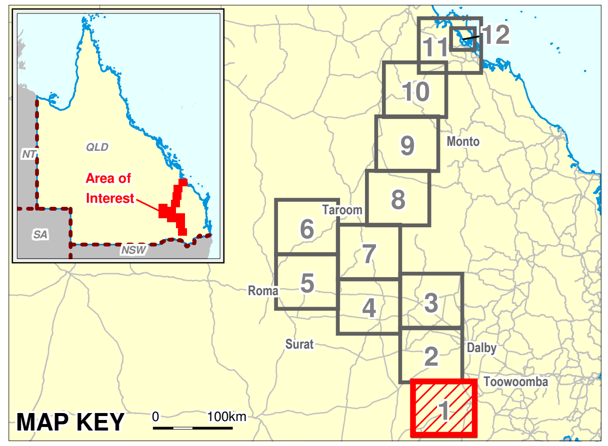

MAP KEY

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

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- Gas processing facility
- Alternative high pressure gas pipelines
- Alternate gas processing facility

Land Use Classes

- **Nature Conservation**
- **Dryland horticulture**
- **Other protected areas including indigenous uses**
- **Irrigated pastures and cropping**
- **Minimal Use**
- **Irrigated horticulture**
- **Grazing natural vegetation**
- **Intensive animal and plant production**
- **Production forestry**
- **Rural residential**
- **Plantation forestry**
- **Urban intensive uses**
- **Grazing modified pastures**
- **Mining and waste**
- **Dryland cropping**
- **Water**

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Queensland Land Use Mapping Program (QLUMP)
Department of Natural Resources, Mines and Water, Queensland Government 1999

Gasfield tenements landuse
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.8 - Land Use
(Map 1)

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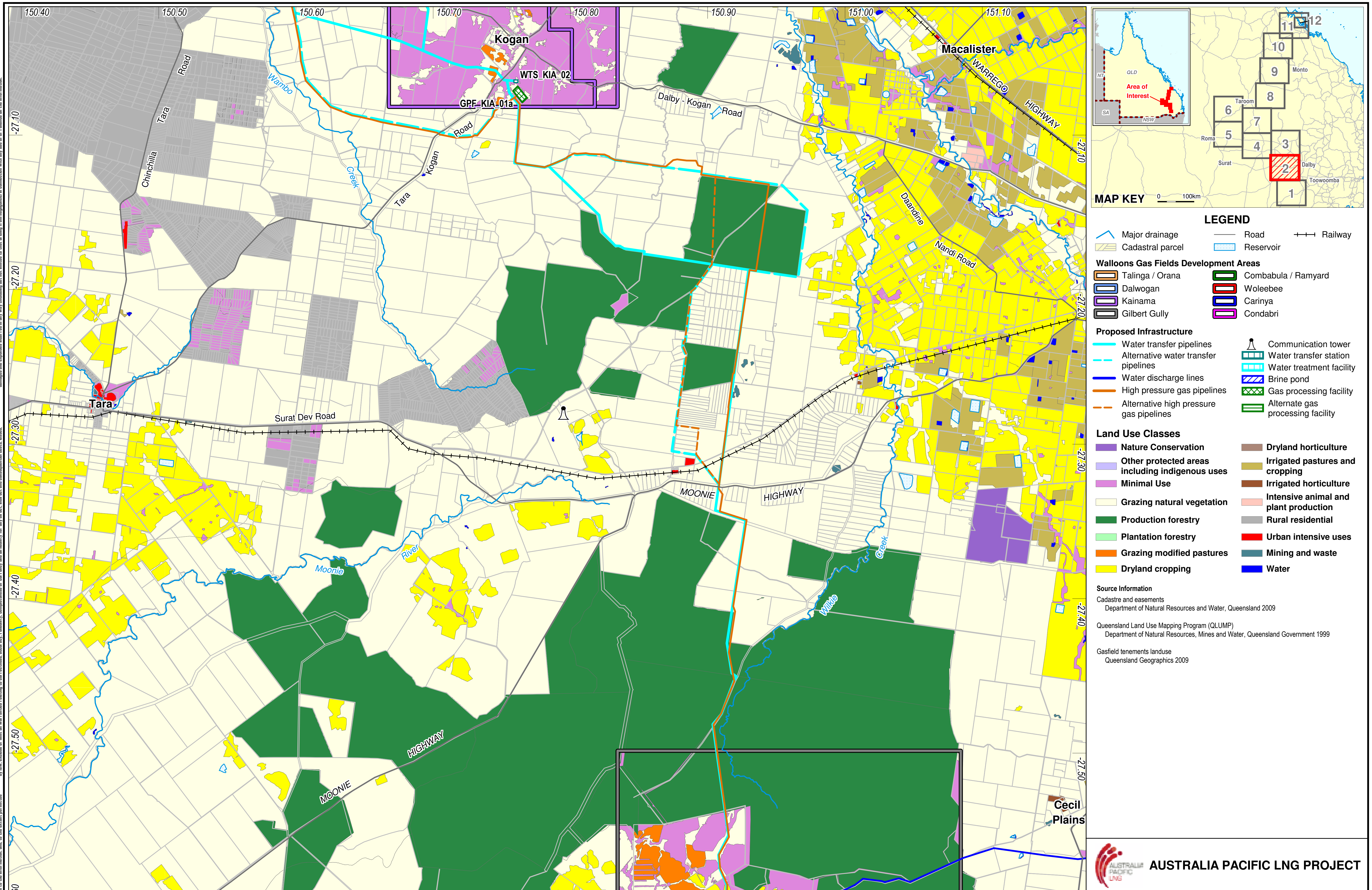

Volume 2 Chapter 6
Figure 6.9 - Land Use
(Map 2)

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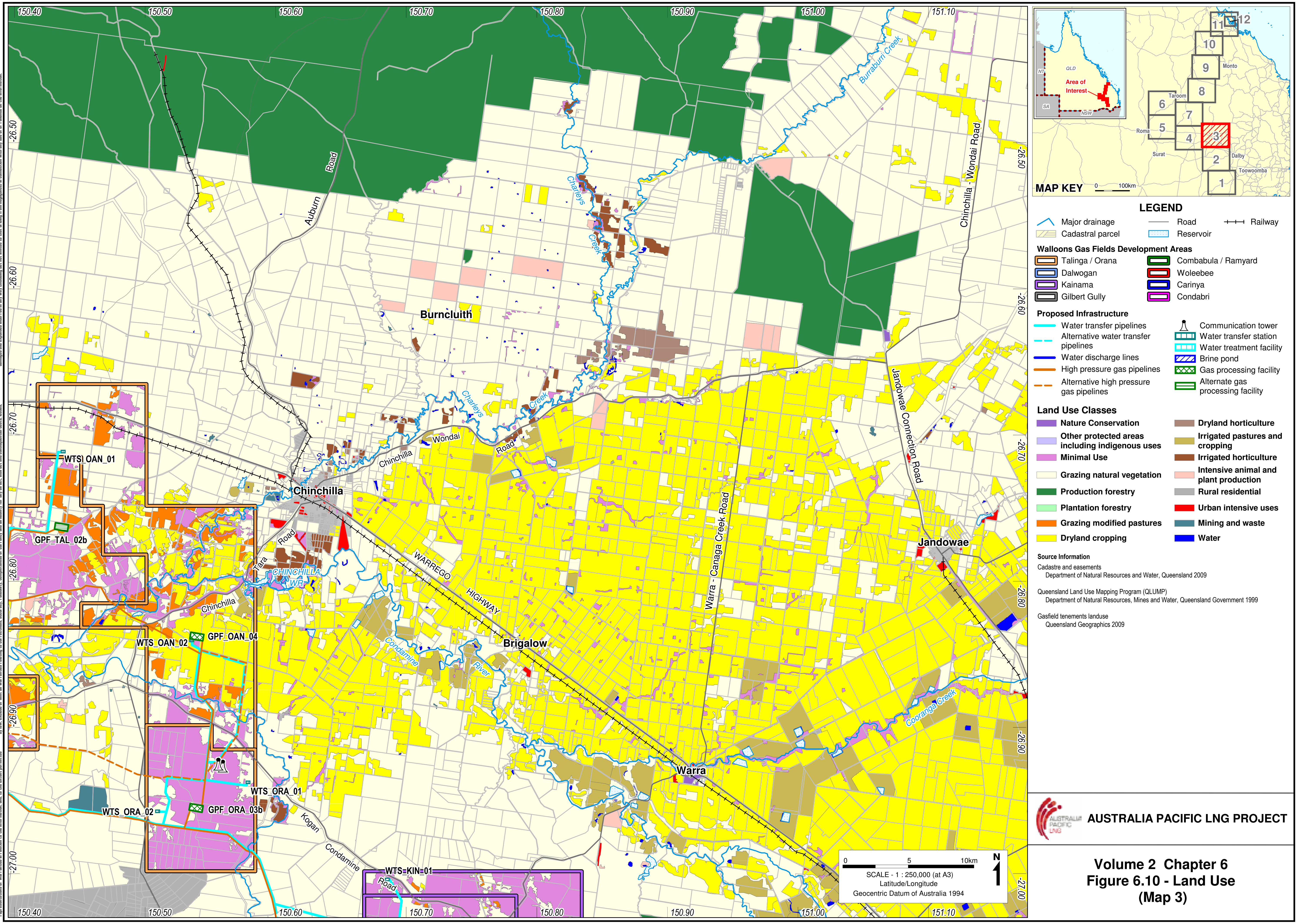

Volume 2 Chapter 6
Figure 6.10 - Land Use
(Map 3)

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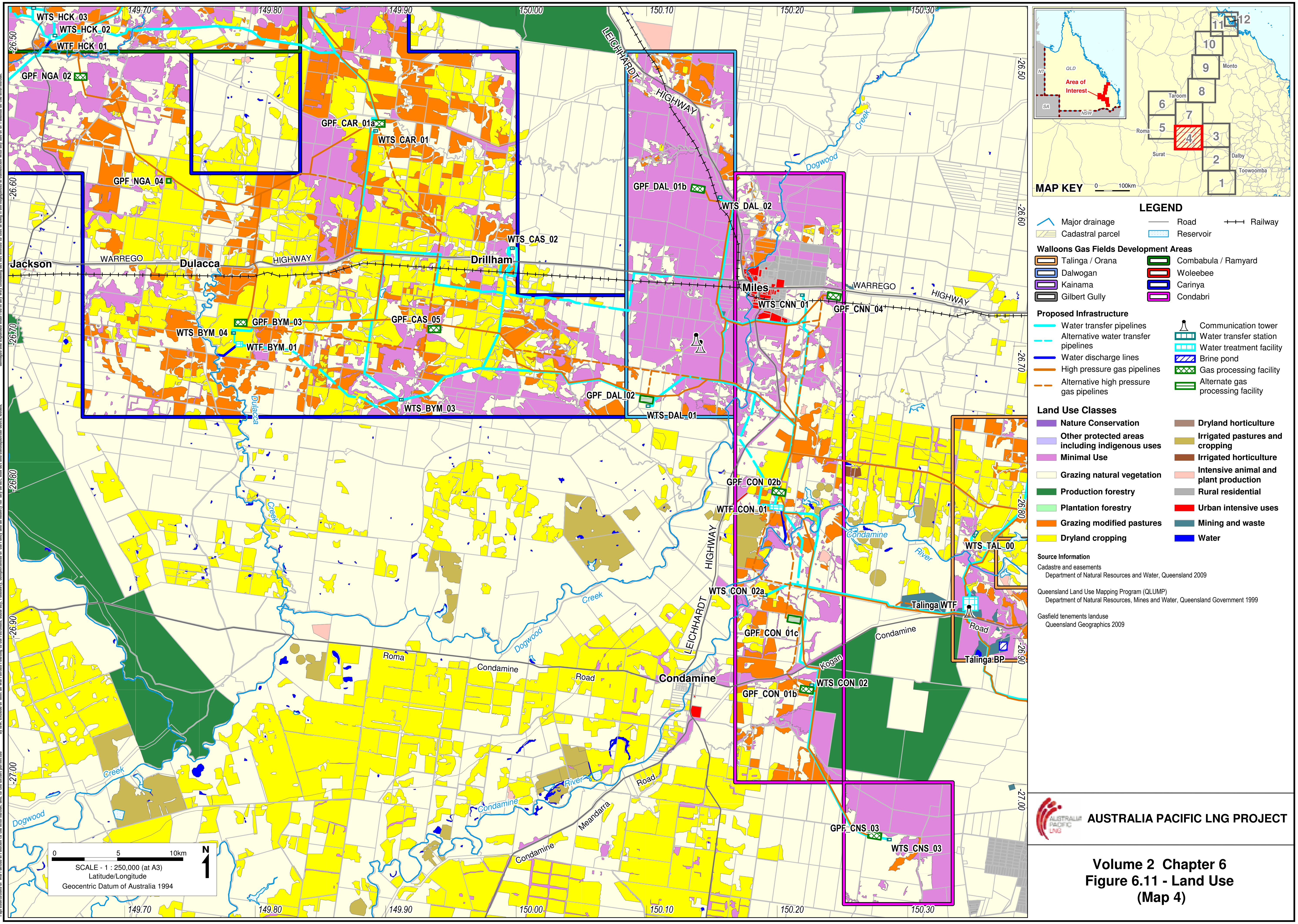
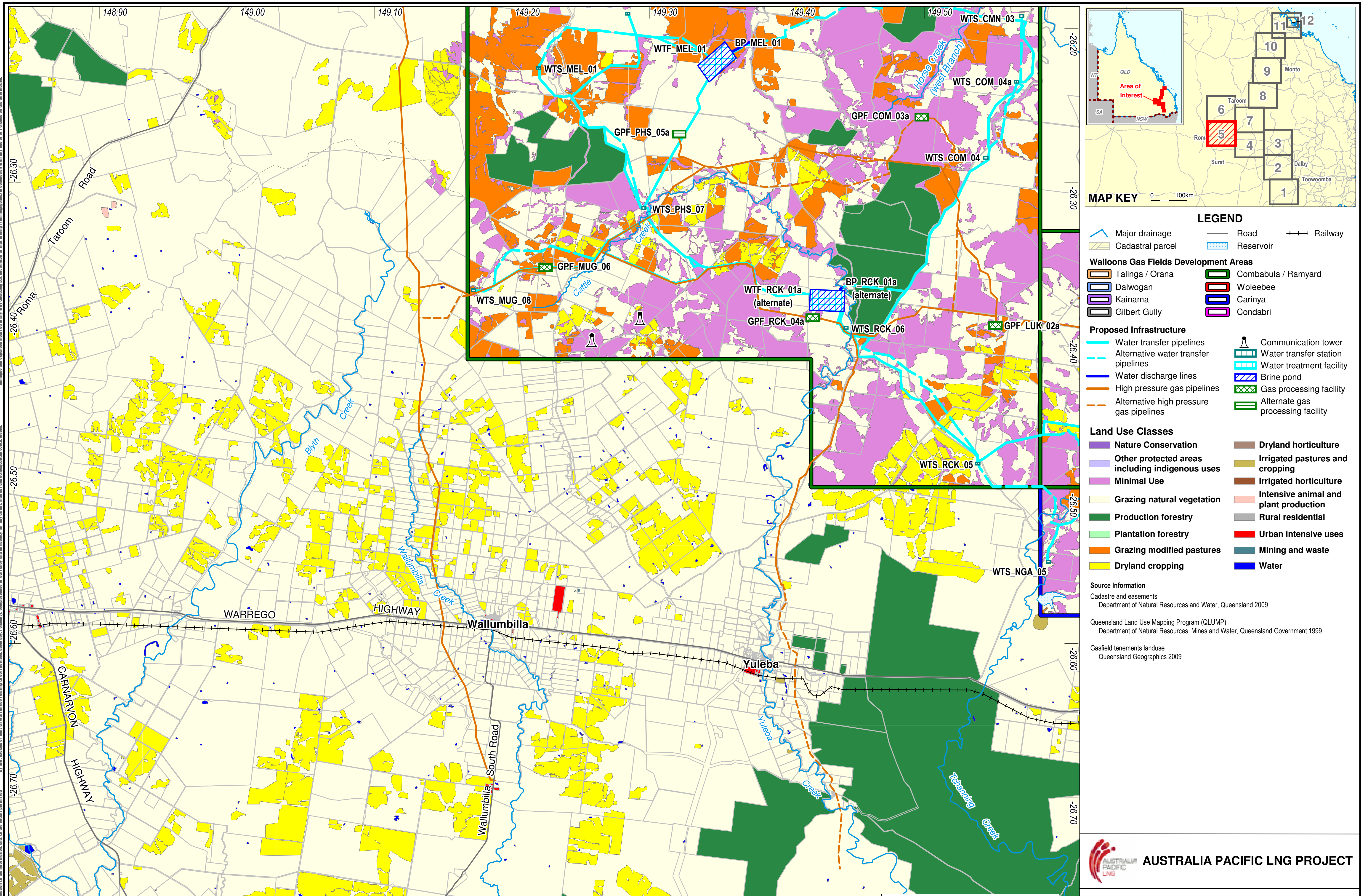


AUSTRALIA PACIFIC LNG PROJECT

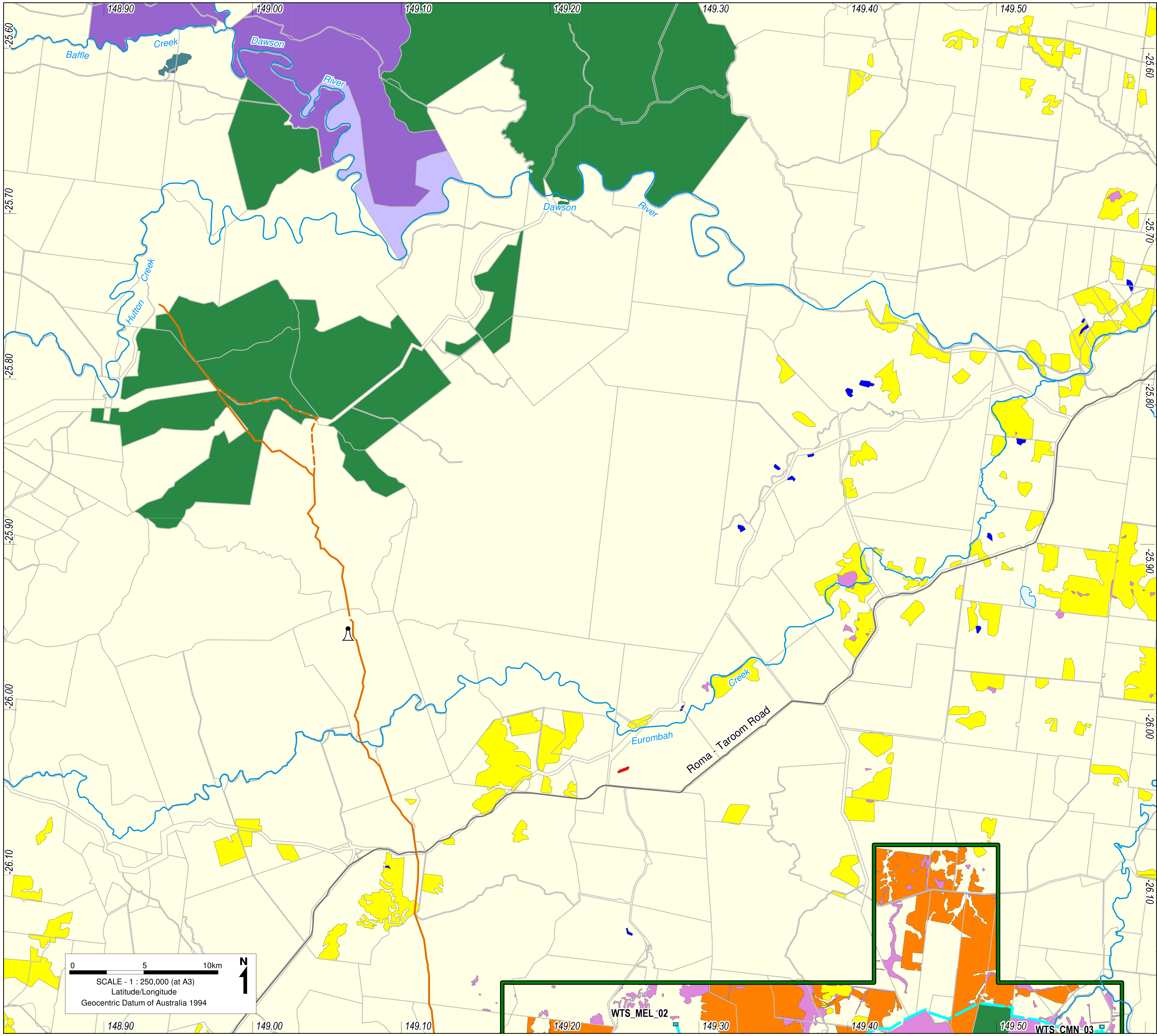
Volume 2 Chapter 6
Figure 6.11 - Land Use
(Map 4)

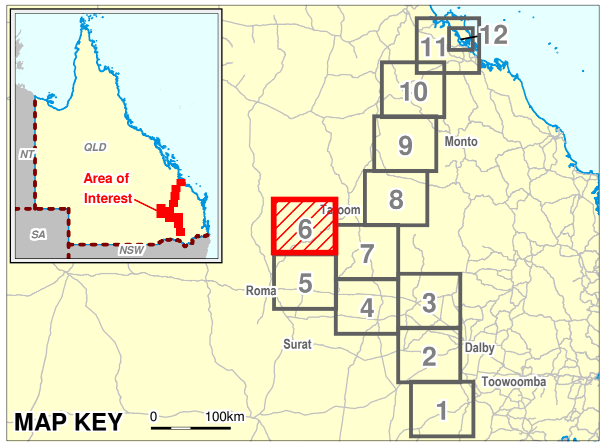
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2016-Rev0(Vol2Chp6_LandUse_04).wor



Volume 2 Chapter 6
Figure 6.12 - Land Use (Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2017-Rev0(Vol2Chp6_LandUse_05).wor





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Communication tower
Alternative water transfer pipelines
Water transfer station
Water treatment facility
Water discharge lines
Brine pond
High pressure gas pipelines
Gas processing facility
Alternative high pressure gas pipelines
Alternate gas processing facility

Land Use Classes

Nature Conservation
Dryland horticulture
Other protected areas including indigenous uses
Irrigated pastures and cropping
Minimal Use
Irrigated horticulture
Grazing natural vegetation
Intensive animal and plant production
Production forestry
Rural residential
Plantation forestry
Urban intensive uses
Grazing modified pastures
Mining and waste
Dryland cropping
Water

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

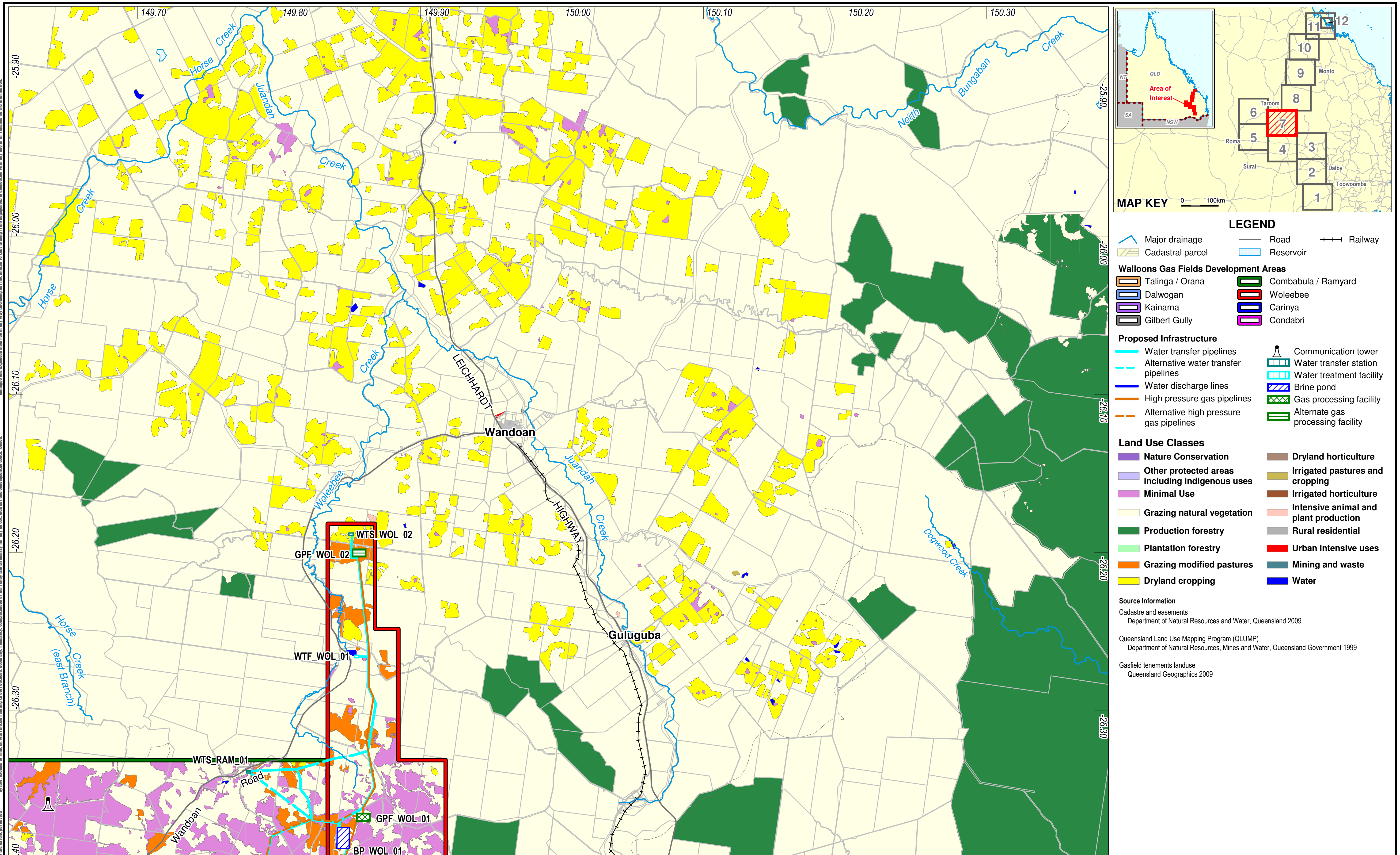
Queensland Land Use Mapping Program (QLUMP)
Department of Natural Resources, Mines and Water, Queensland Government 1999

Gasfield tenements landuse
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

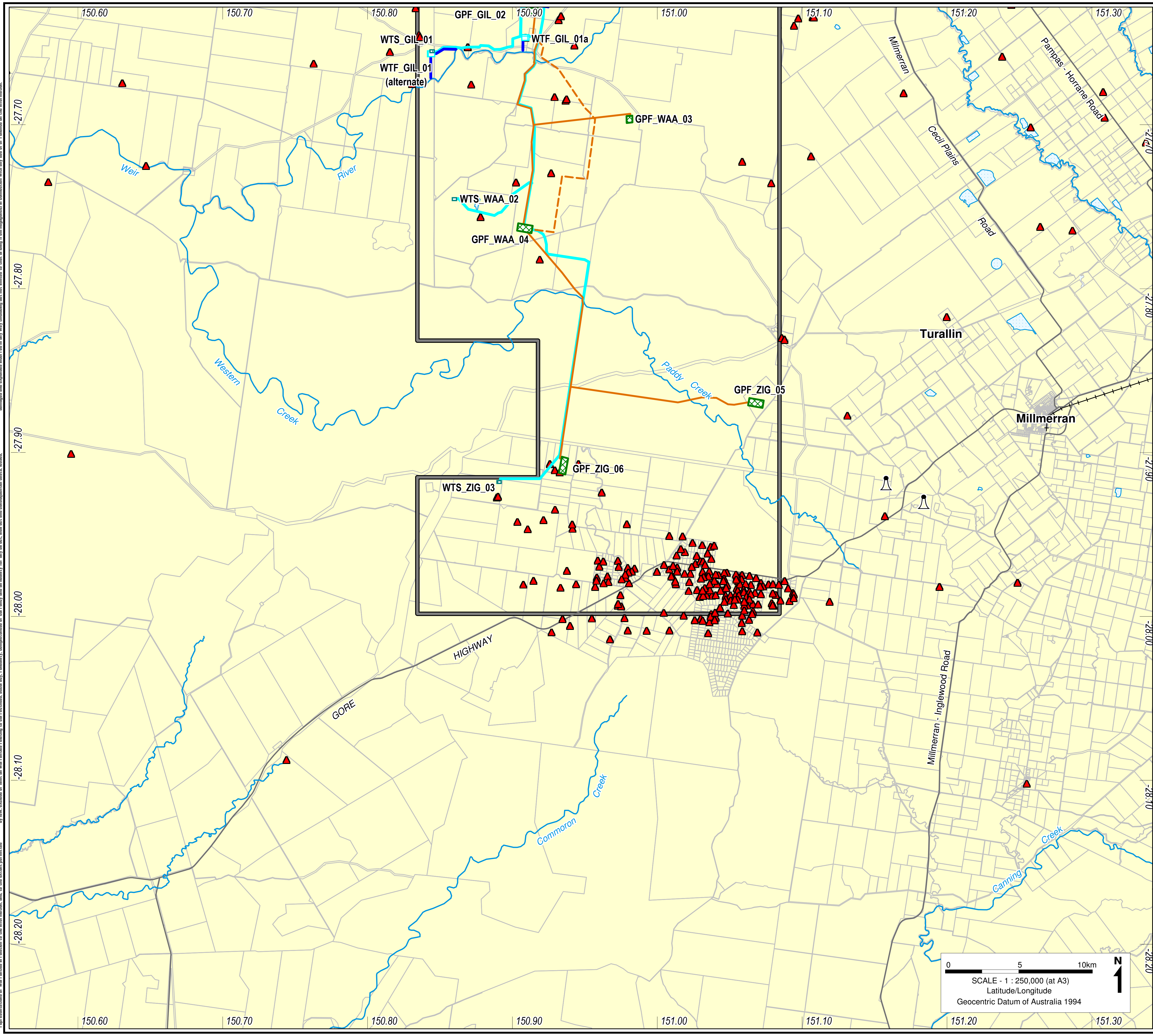
Volume 2 Chapter 6
Figure 6.13 - Land Use
(Map 6)

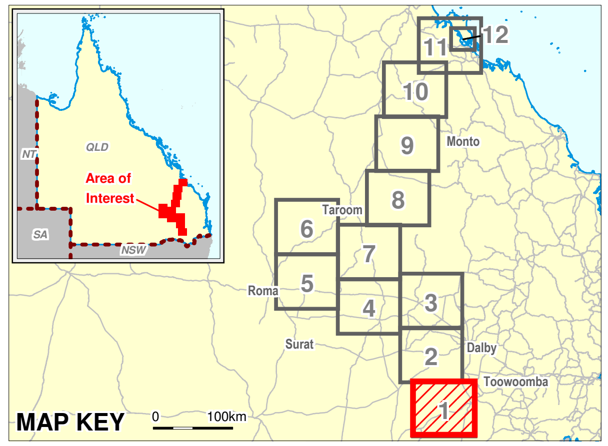
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2018-Rev0(Vol2Chp6_LandUse_06).wor



AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.14 - Land Use
(Map 7)





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Homestead

Rural homestead

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

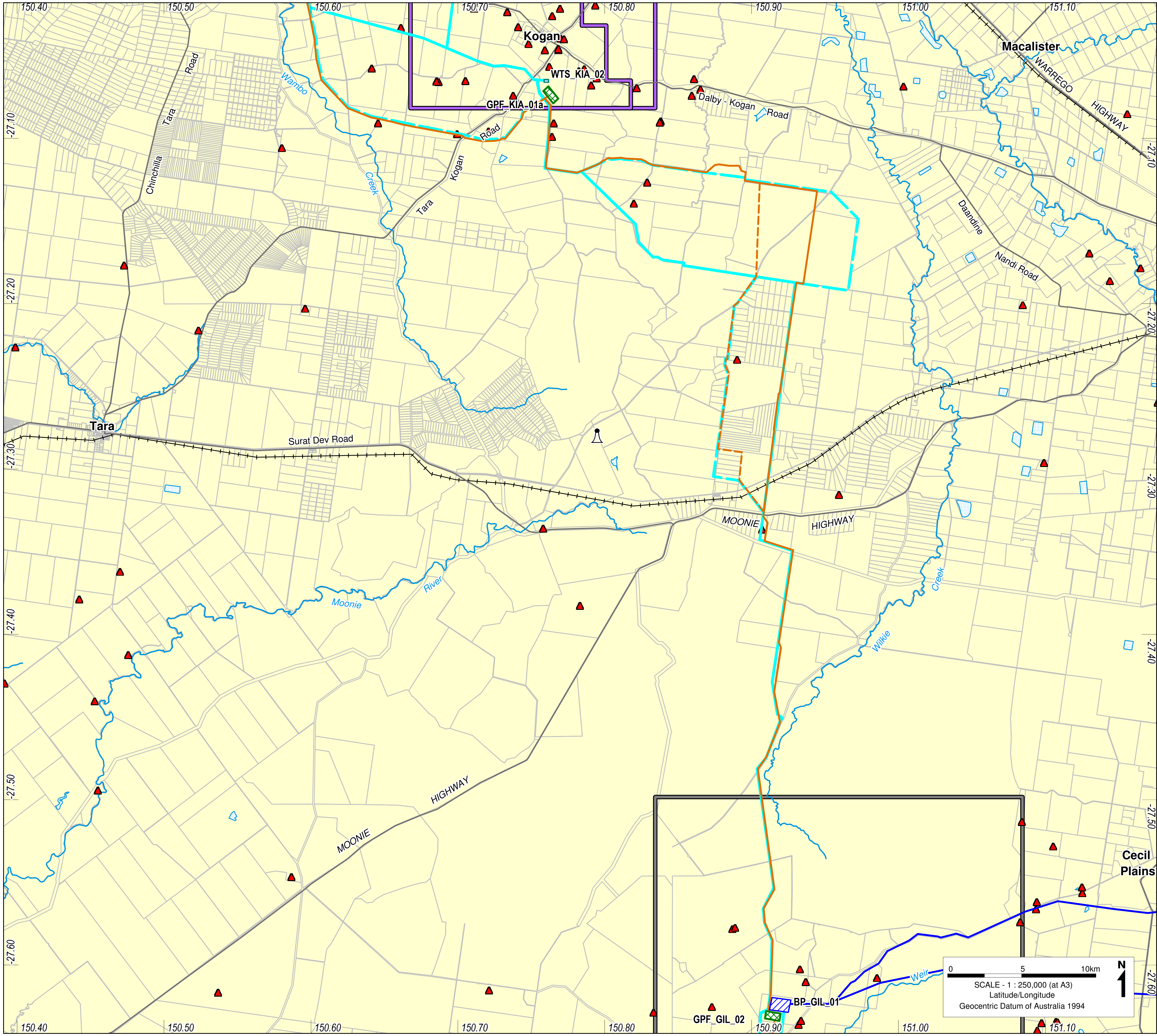
Homesteads
Commonwealth of Australia (Geoscience Australia) 2009

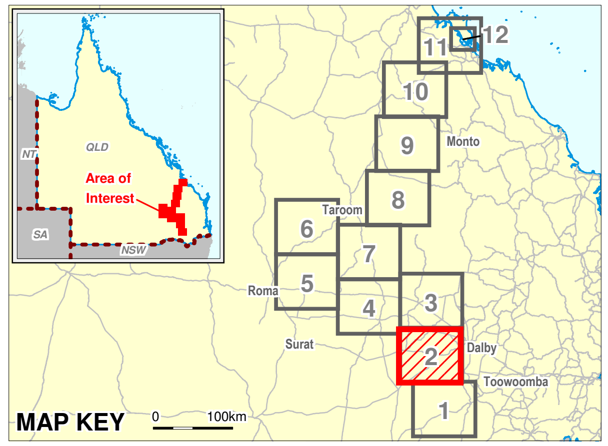
Homesteads
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.15 - Rural Homesteads (Map 1)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2147-Rev0(Vol2Chp6_RuralHomesteads_01).wor





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Homestead

Rural homestead

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Homesteads
Commonwealth of Australia (Geoscience Australia) 2009

Homesteads
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

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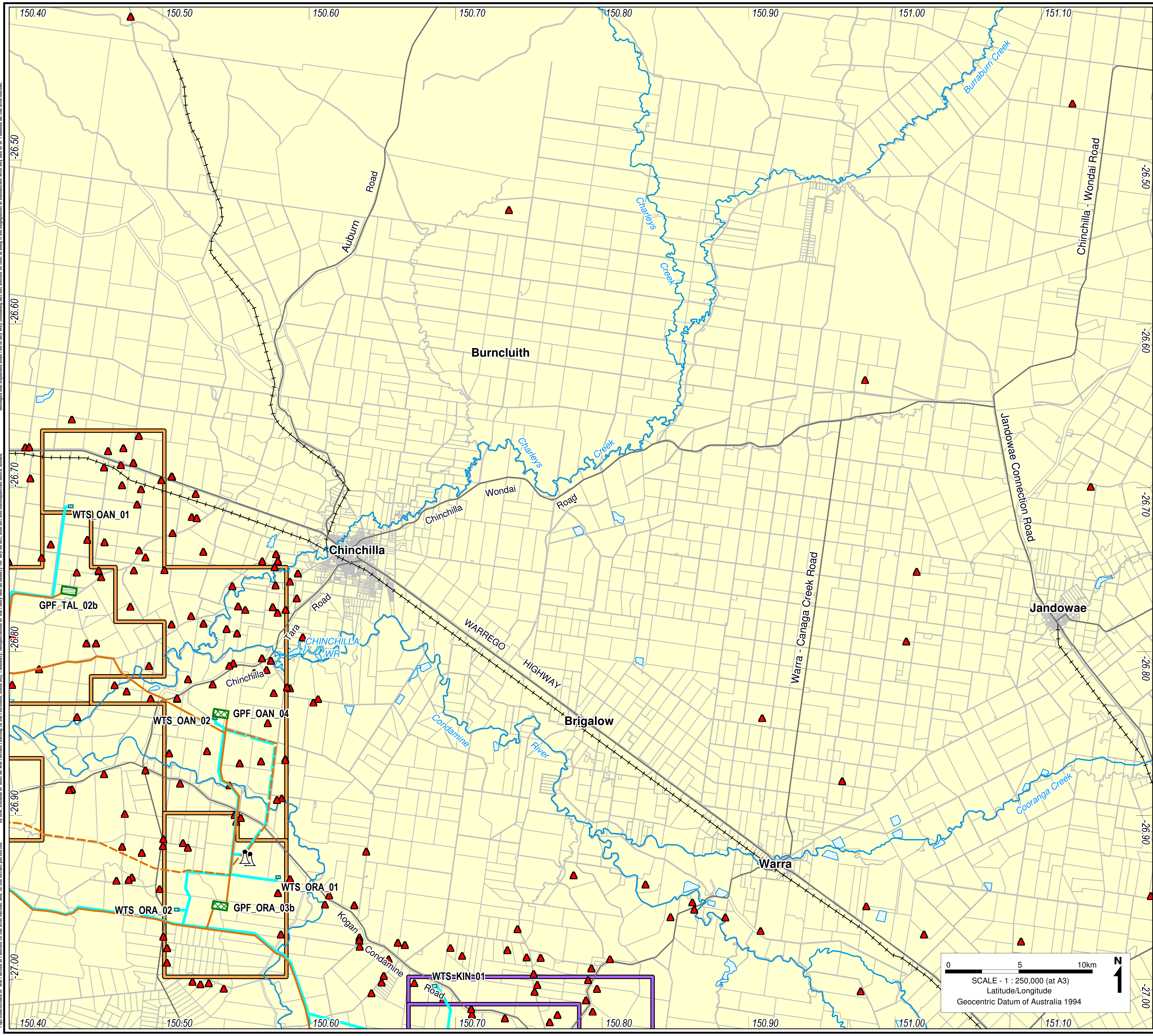
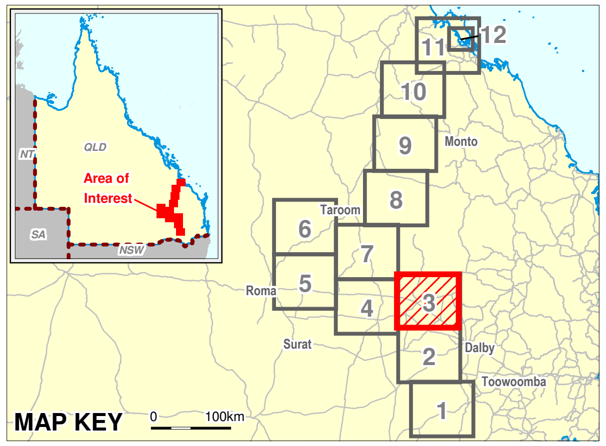
Figure 6.16 - Rural Homesteads (Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2148-Rev0(Vol2Chp6_RuralHomesteads_02).wor





MAP KEY

0 100km

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Homestead

- Rural homestead

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Homesteads
Commonwealth of Australia (Geoscience Australia) 2009

Homesteads
Queensland Geographics 2009

0 5 10km

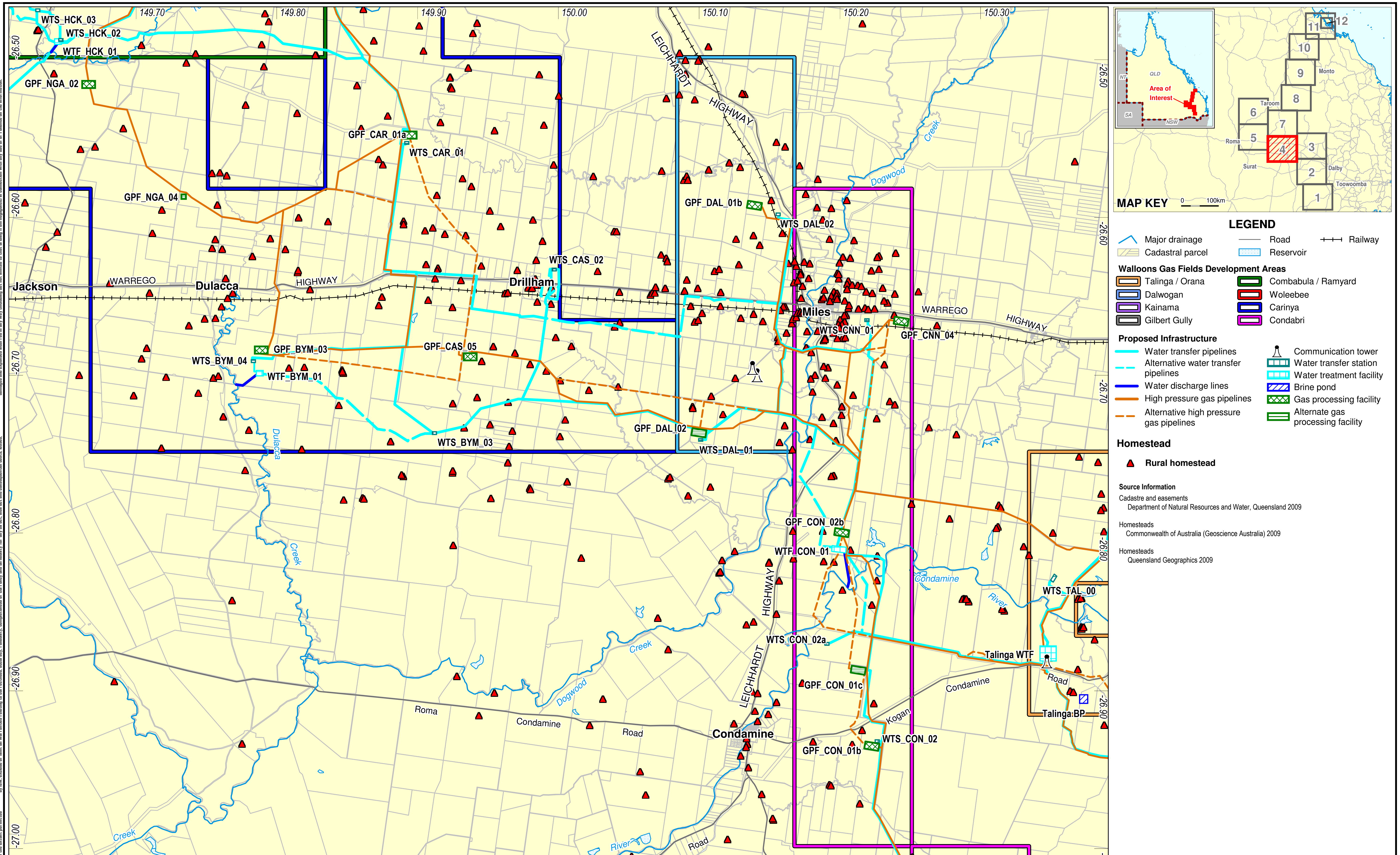
SCALE - 1 : 250,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994

N

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.17 - Rural Homesteads (Map 3)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2149-Rev0(Vol2Chp6_RuralHomesteads_03).wor



AUSTRALIA PACIFIC LNG PROJECT

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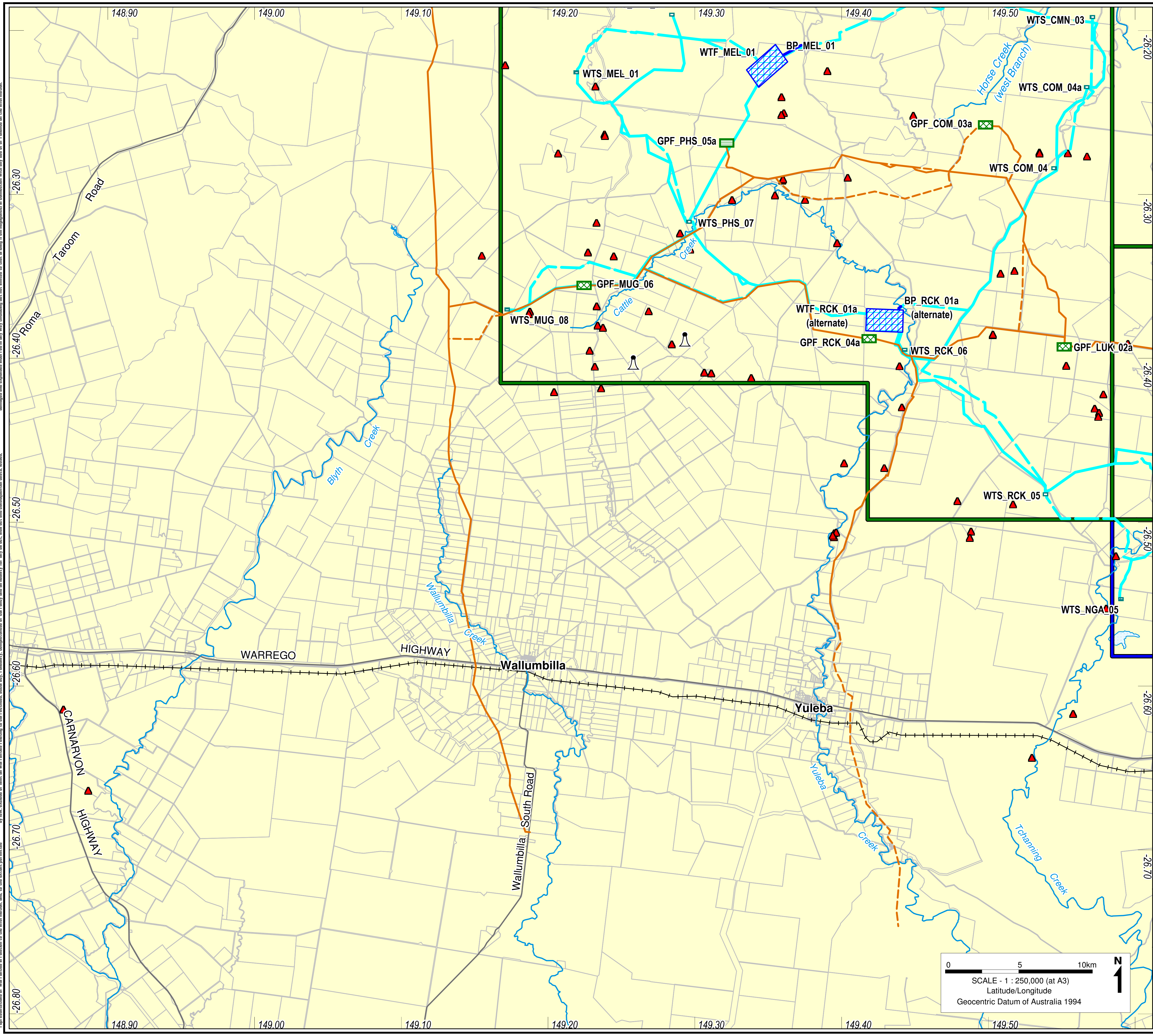
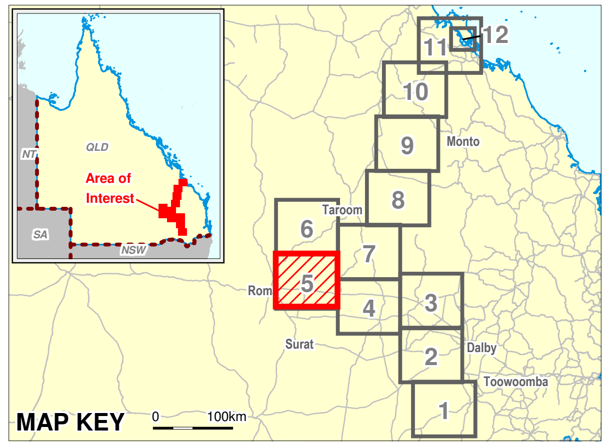
Figure 6.18 - Rural Homesteads (Map 4)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2150-Rev0(Vol2Chp6_RuralHomesteads_04).wor





LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Homestead

- **Rural homestead**

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

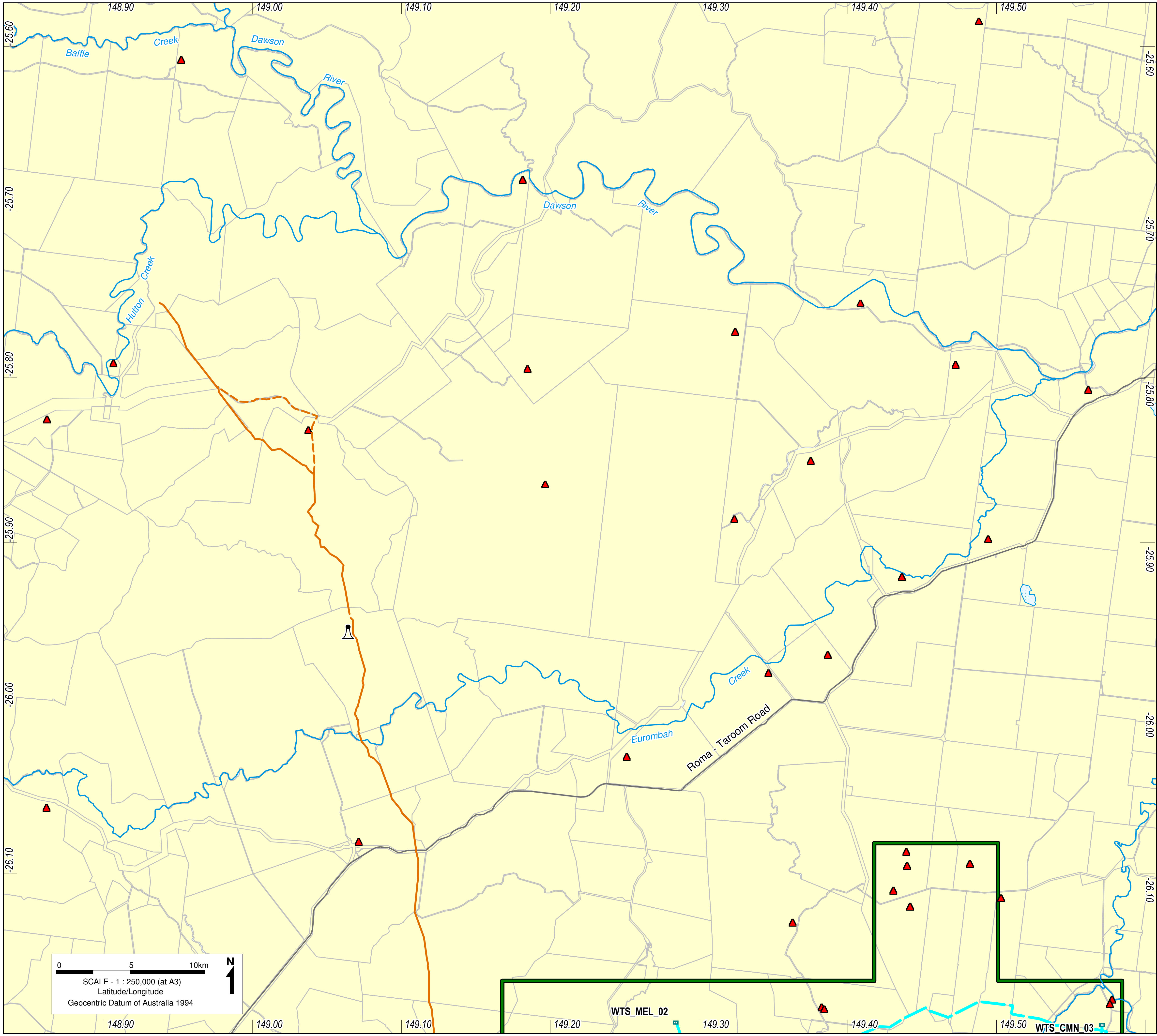
Homesteads
Commonwealth of Australia (Geoscience Australia) 2009

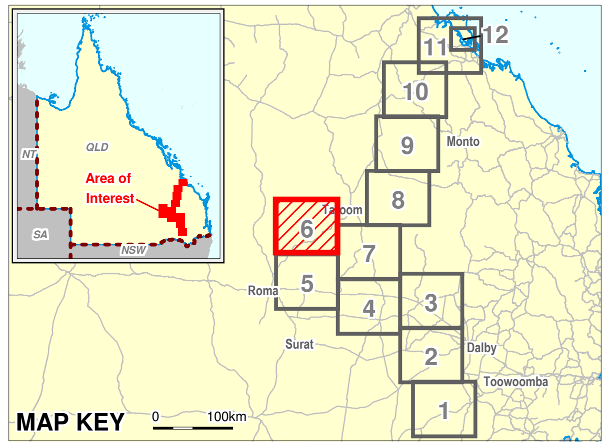
Homesteads
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.19 - Rural Homesteads (Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2151-Rev0(Vol2Chp6_RuralHomesteads_05).wor





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Communication tower
Alternative water transfer pipelines
Water transfer station
Water treatment facility
Water discharge lines
Brine pond
High pressure gas pipelines
Gas processing facility
Alternative high pressure gas pipelines
Alternate gas processing facility

Homestead

Rural homestead

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

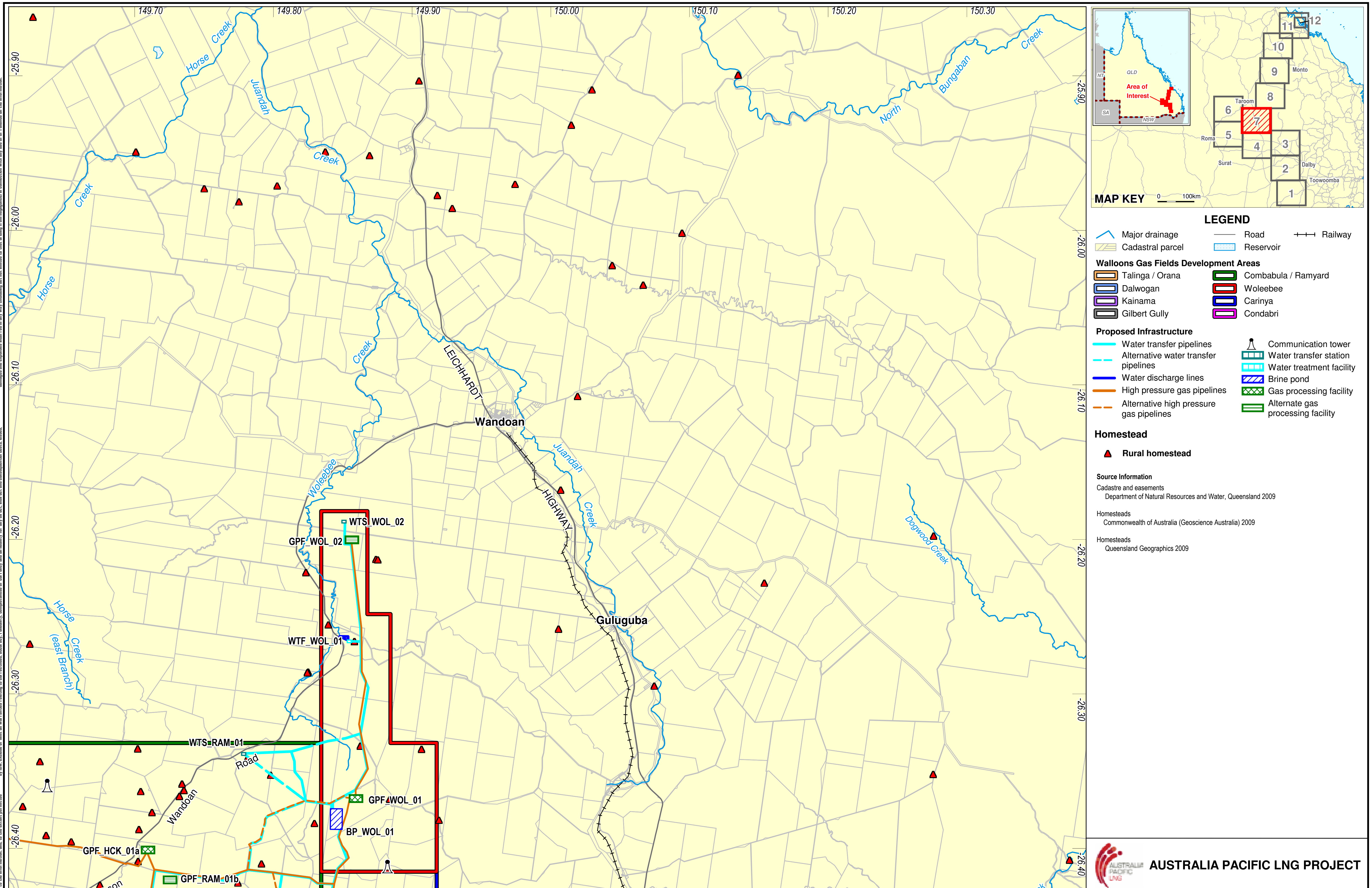
Homesteads
Commonwealth of Australia (Geoscience Australia) 2009

Homesteads
Queensland Geographics 2009

AUSTRALIA PACIFIC LNG PROJECT

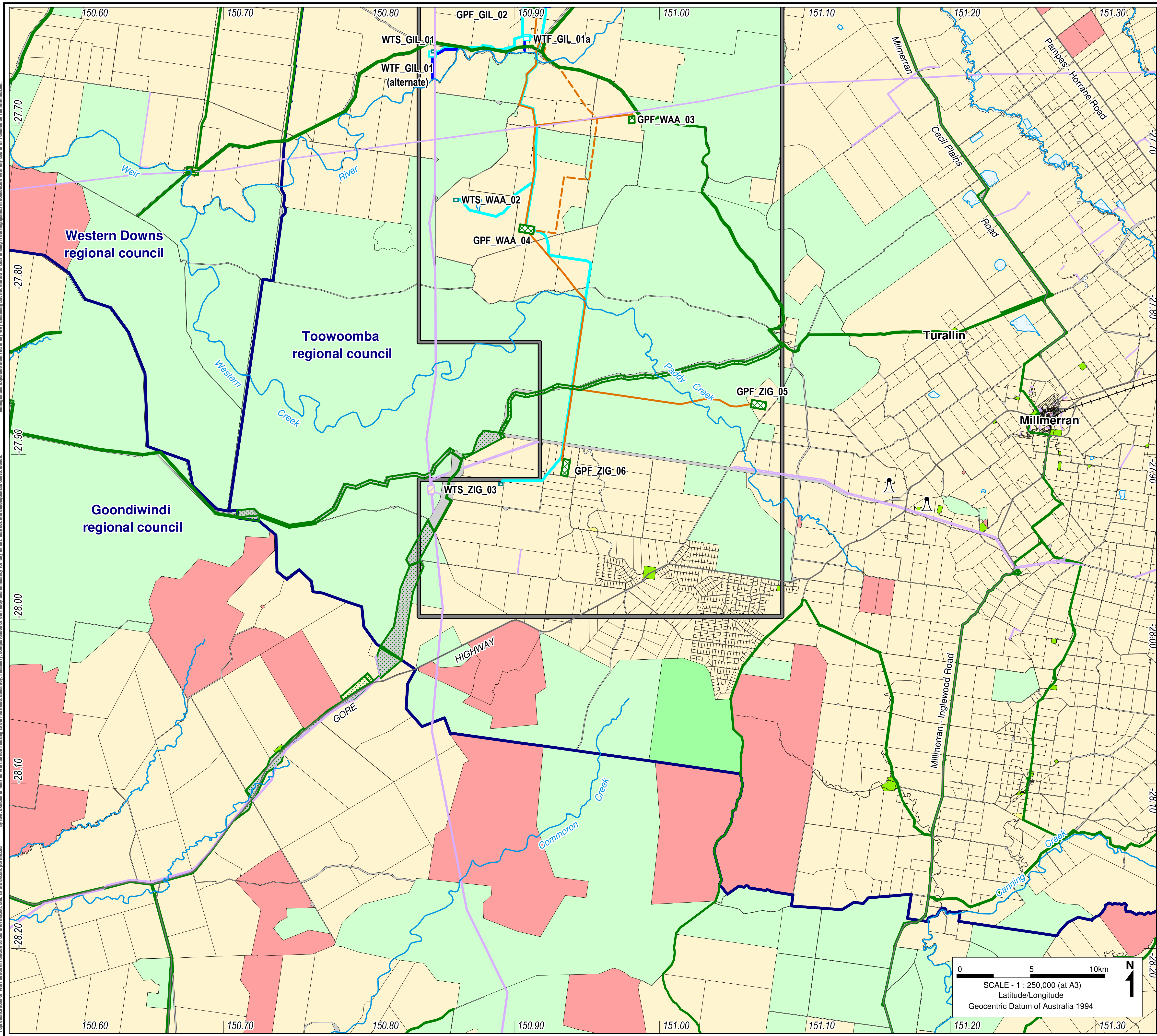
Volume 2 Chapter 6
Figure 6.20 - Rural Homesteads (Map 6)

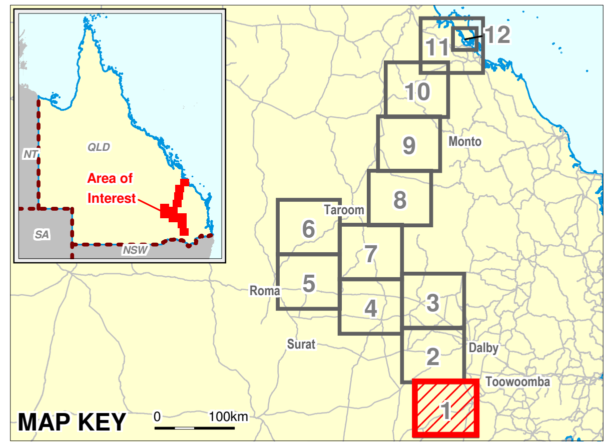
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2152-Rev0(Vol2Chp6_RuralHomesteads_06).wor



Volume 2 Chapter 6
Figure 6.21 - Rural Homesteads
(Map 7)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2153-Rev0(Vol2Chp6_RuralHomesteads_07).wor





LEGEND

Major drainage	Road	Railway
Local government area	Cadastral parcel	Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana	Combabula / Ramyard
Dalwogan	Woleebee
Kainama	Carinya
Gilbert Gully	Condabri

Proposed Infrastructure

Water transfer pipelines	Communication tower
Alternative water transfer pipelines	Water transfer station
Water discharge lines	Water treatment facility
High pressure gas pipelines	Brine pond
Alternative high pressure gas pipelines	Gas processing facility
	Alternate gas processing facility

Land Tenure

Freehold (FH)	State Forest (SF)
Port and Harbour Boards (PH)	Reserve (RE) and Forest Reserve (FR)
Housing Lease (HL)	Railway (RY)
Industrial Estates (ID)	Road (R)
Lands Lease (LL)	Easement
State Land (SL)	Stock Route

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Stock Routes (July 2004)
Department of Natural Resources, Mines and Energy 2009

Local Government Area (LGA) boundaries (2008)
Department of Natural Resources and Water, Queensland 2009

AUSTRALIA PACIFIC LNG PROJECT

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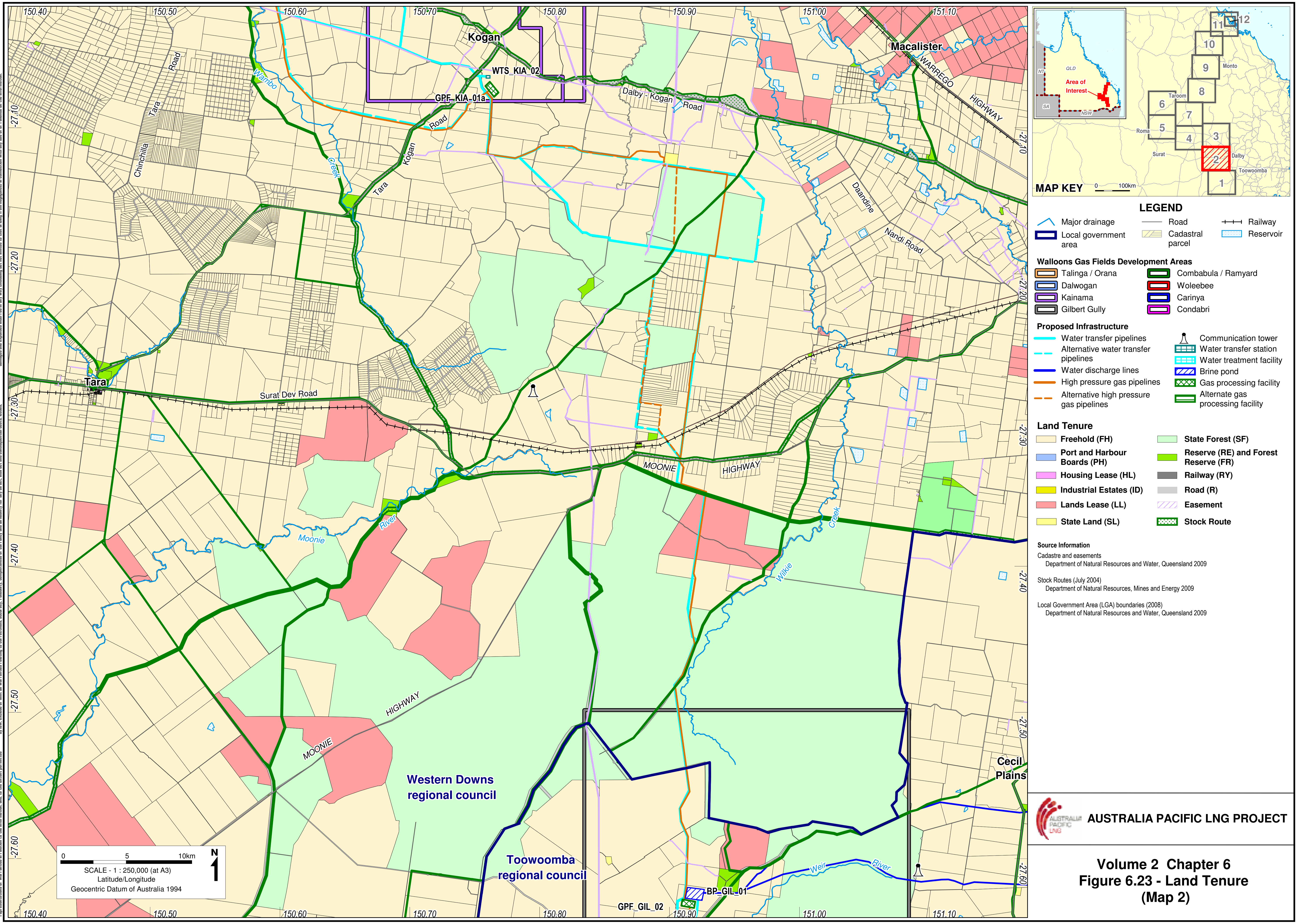
Figure 6.22 - Land Tenure (Map 1)

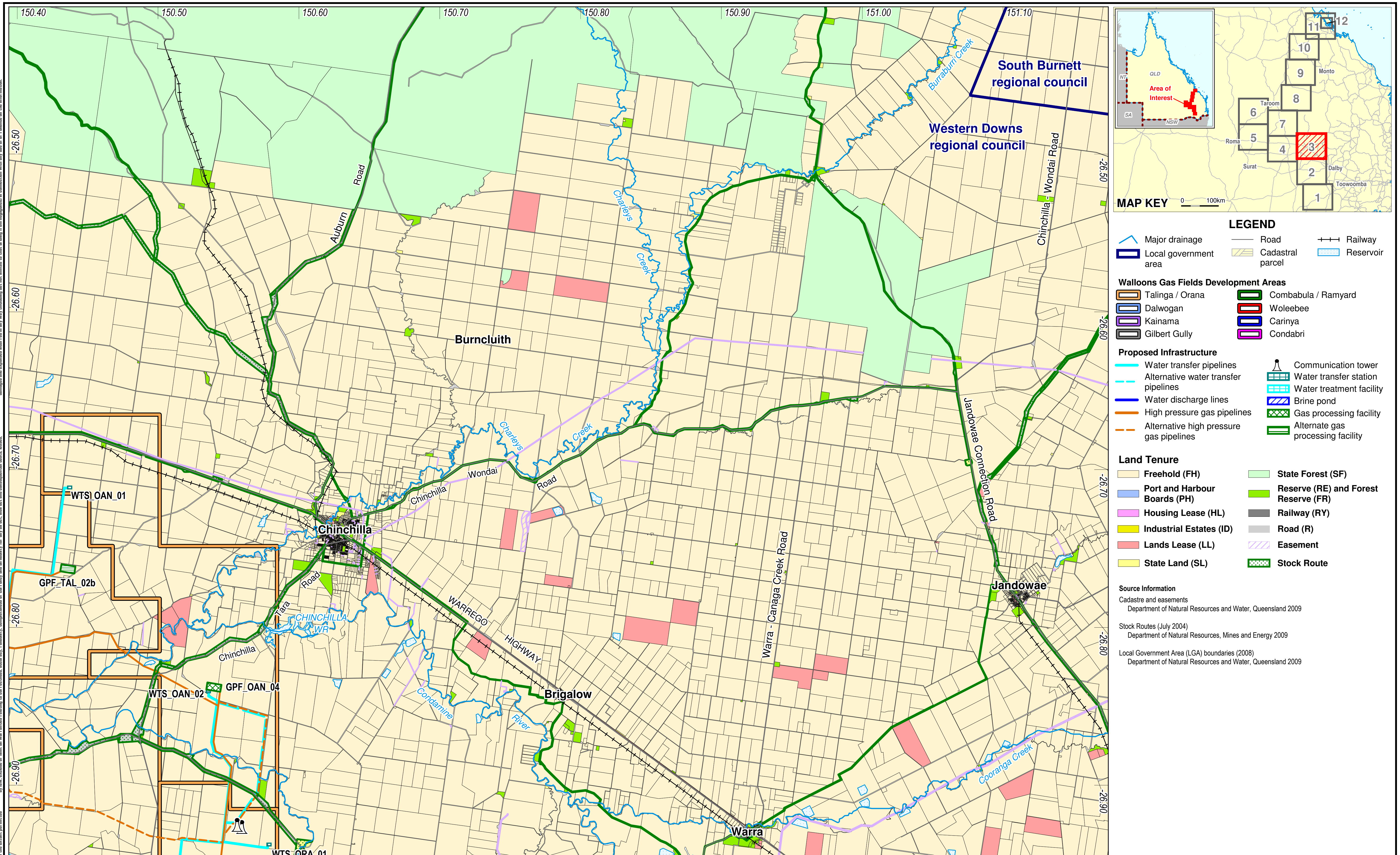
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2001-Rev0(Vol2Chp6_LandTenure_01).wor



AUSTRALIA PACIFIC LNG PROJECT

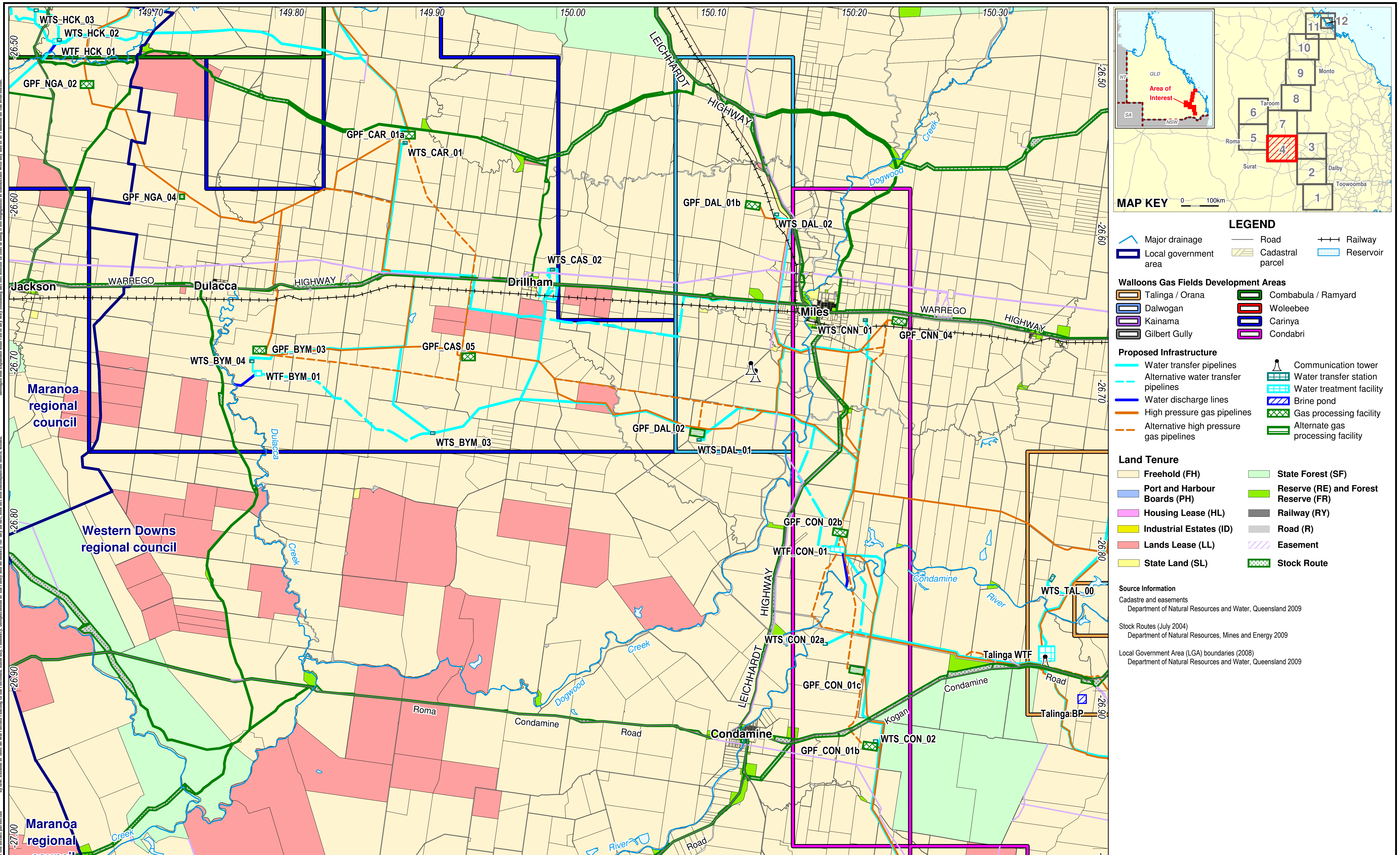
Volume 2 Chapter 6
Figure 6.23 - Land Tenure
(Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2002-Rev0(Vol2Chp6_LandTenure_02).wor



Volume 2 Chapter 6
Figure 6.24 - Land Tenure (Map 3)

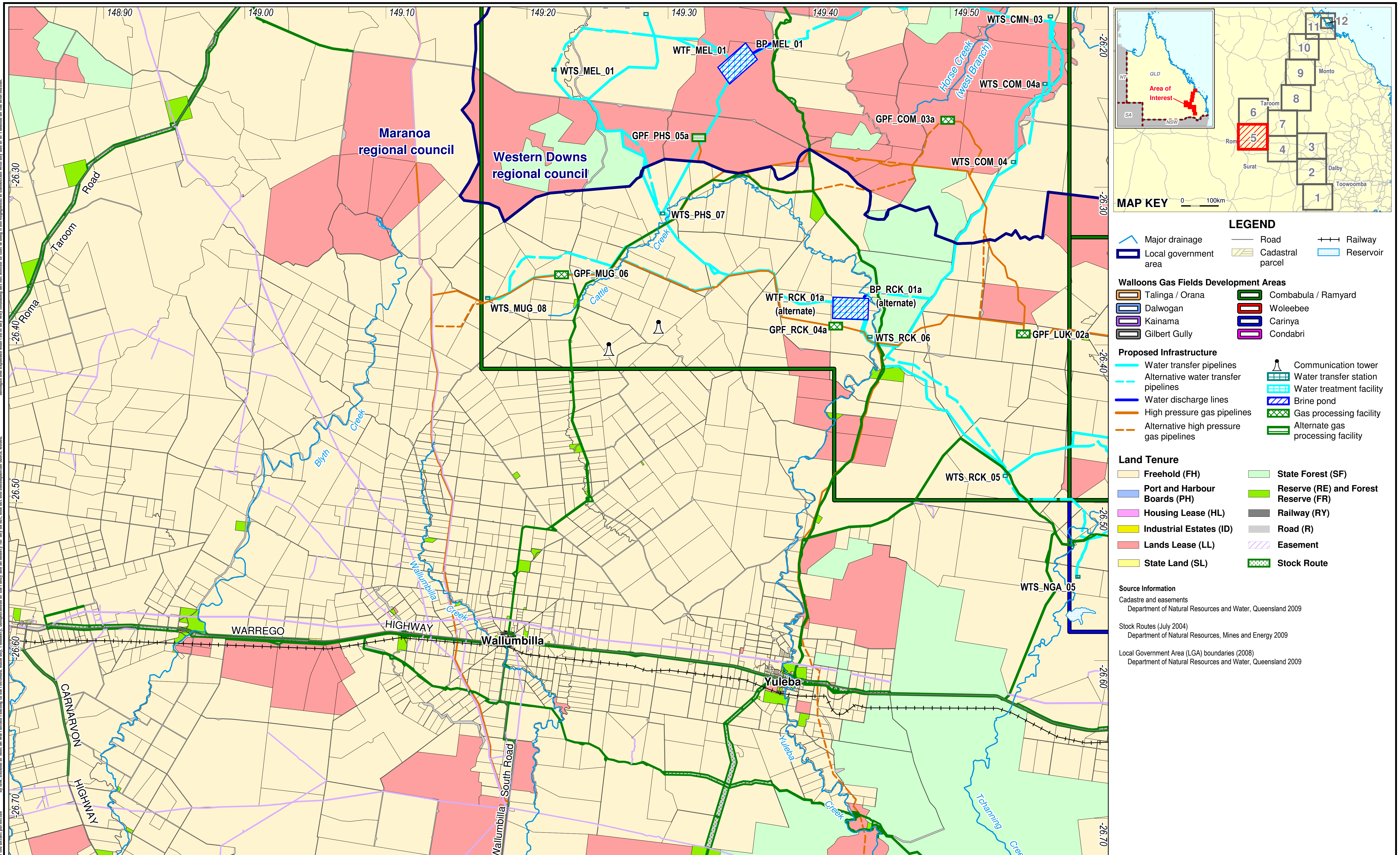
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2003-Rev0(Vol2Chp6_LandTenure_03).wor



AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.25 - Land Tenure (Map 4)

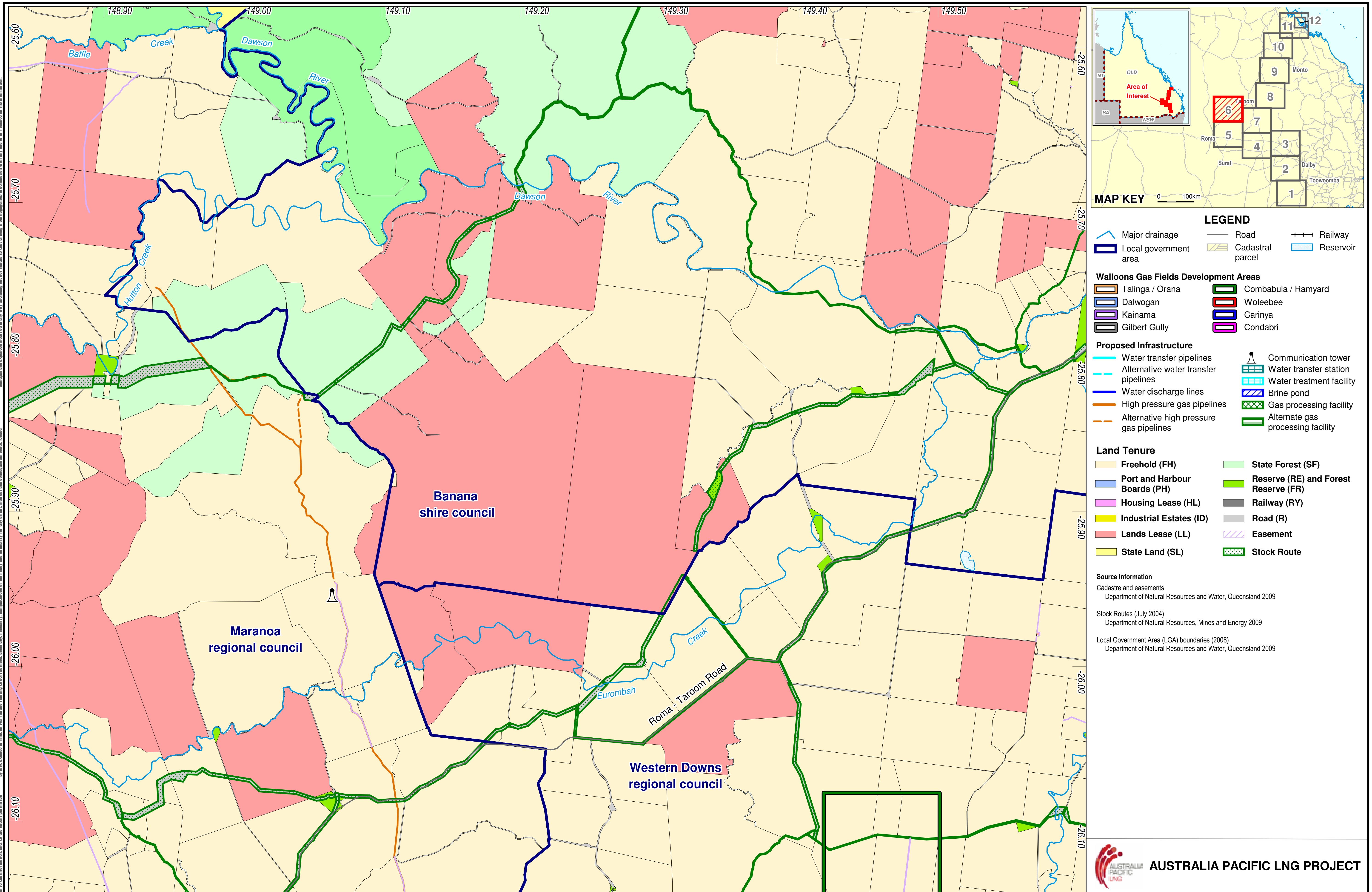
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2004-Rev0(Vol2Chp6_LandTenure_04).wor



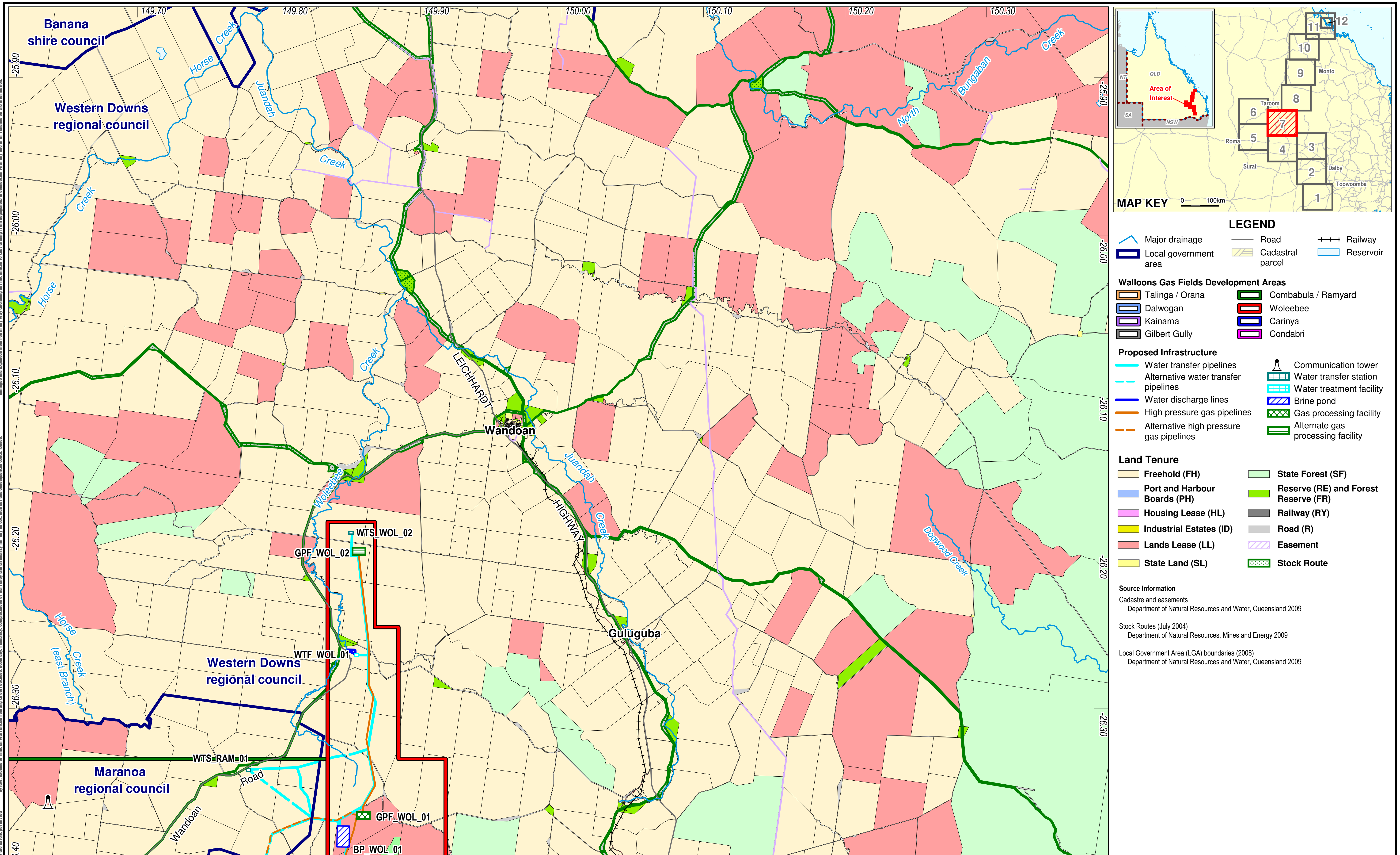
AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.26 - Land Tenure
(Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2005-Rev0(Vol2Chp6_LandTenure_05).wor



Volume 2 Chapter 6
Figure 6.27 - Land Tenure (Map 6)



AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.28 - Land Tenure
(Map 7)

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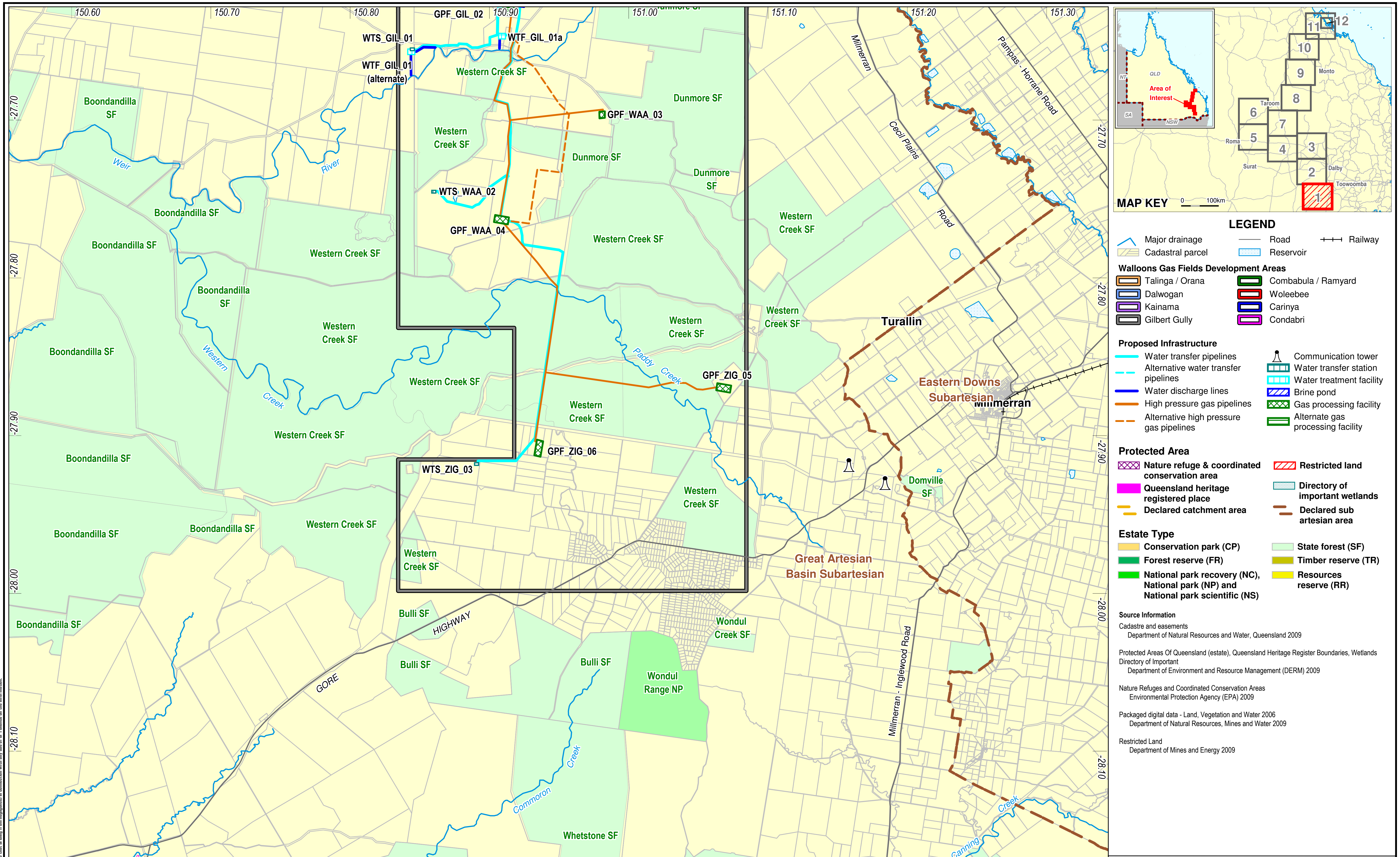


Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands Directory of Important
Department of Environment and Resource Management (DERM) 2009

Nature Refuges and Coordinated Conservation Areas
Environmental Protection Agency (EPA) 2009

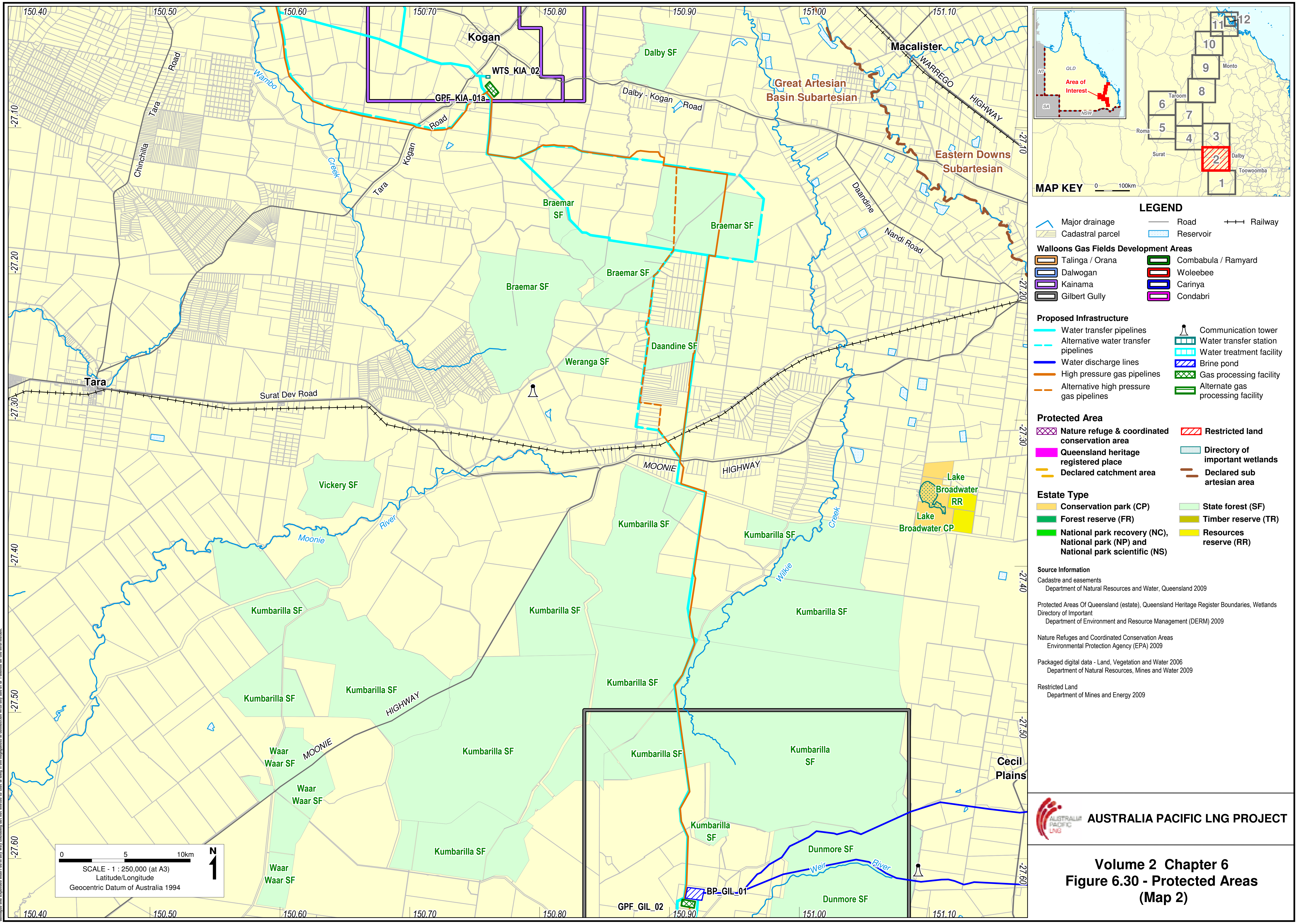
Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

Restricted Land
Department of Mines and Energy 2009

AUSTRALIA PACIFIC LNG PROJECT

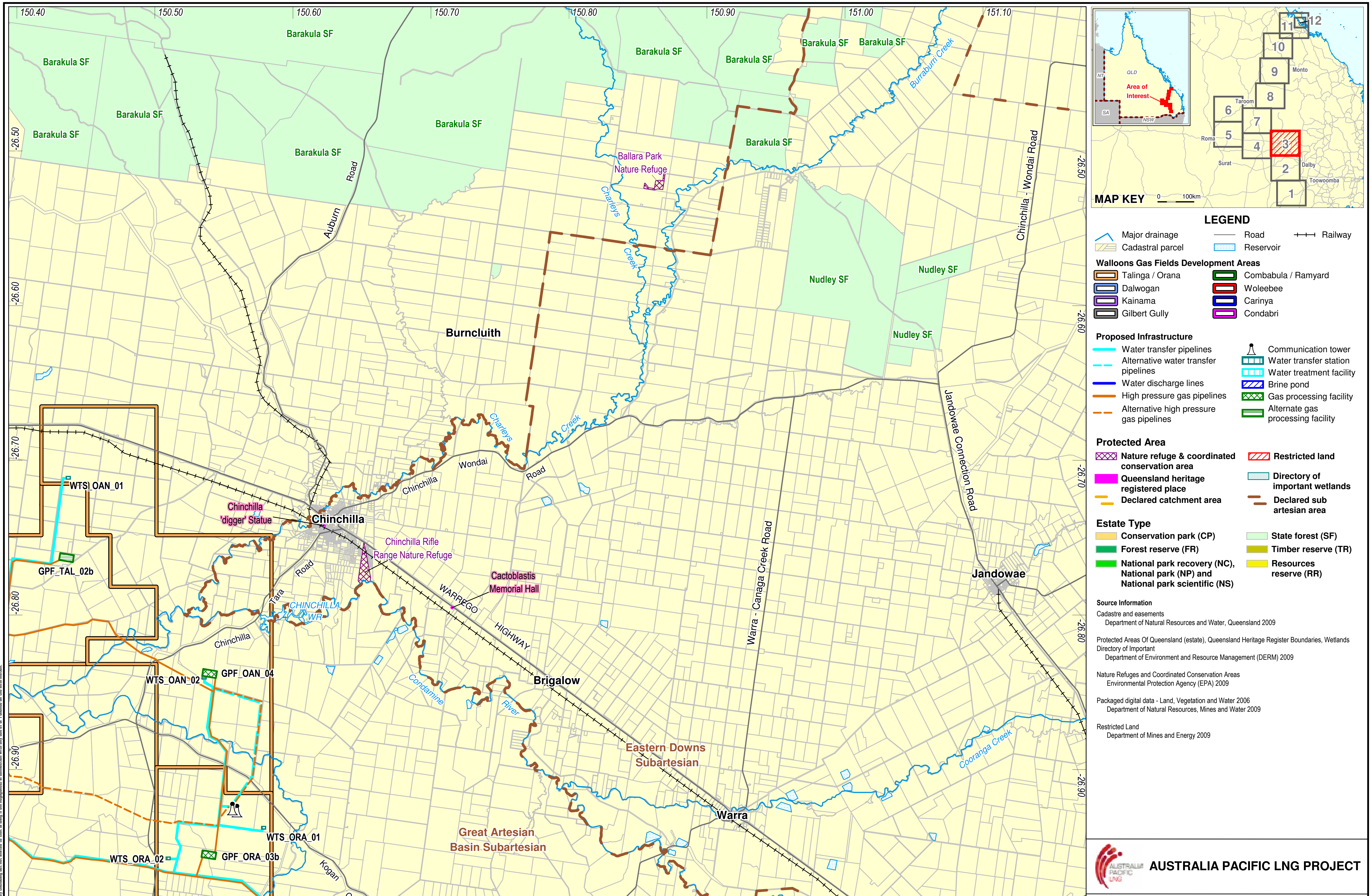
Volume 2 Chapter 6
Figure 6.29 - Protected Areas (Map 1)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2061-Rev0(Vol2Chp6_ProtectedAreas_01).wor



Volume 2 Chapter 6
Figure 6.30 - Protected Areas (Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2062-Rev0(Vol2Chp6_ProtectedAreas_02).wor



Volume 2 Chapter 6
Figure 6.31 - Protected Areas (Map 3)

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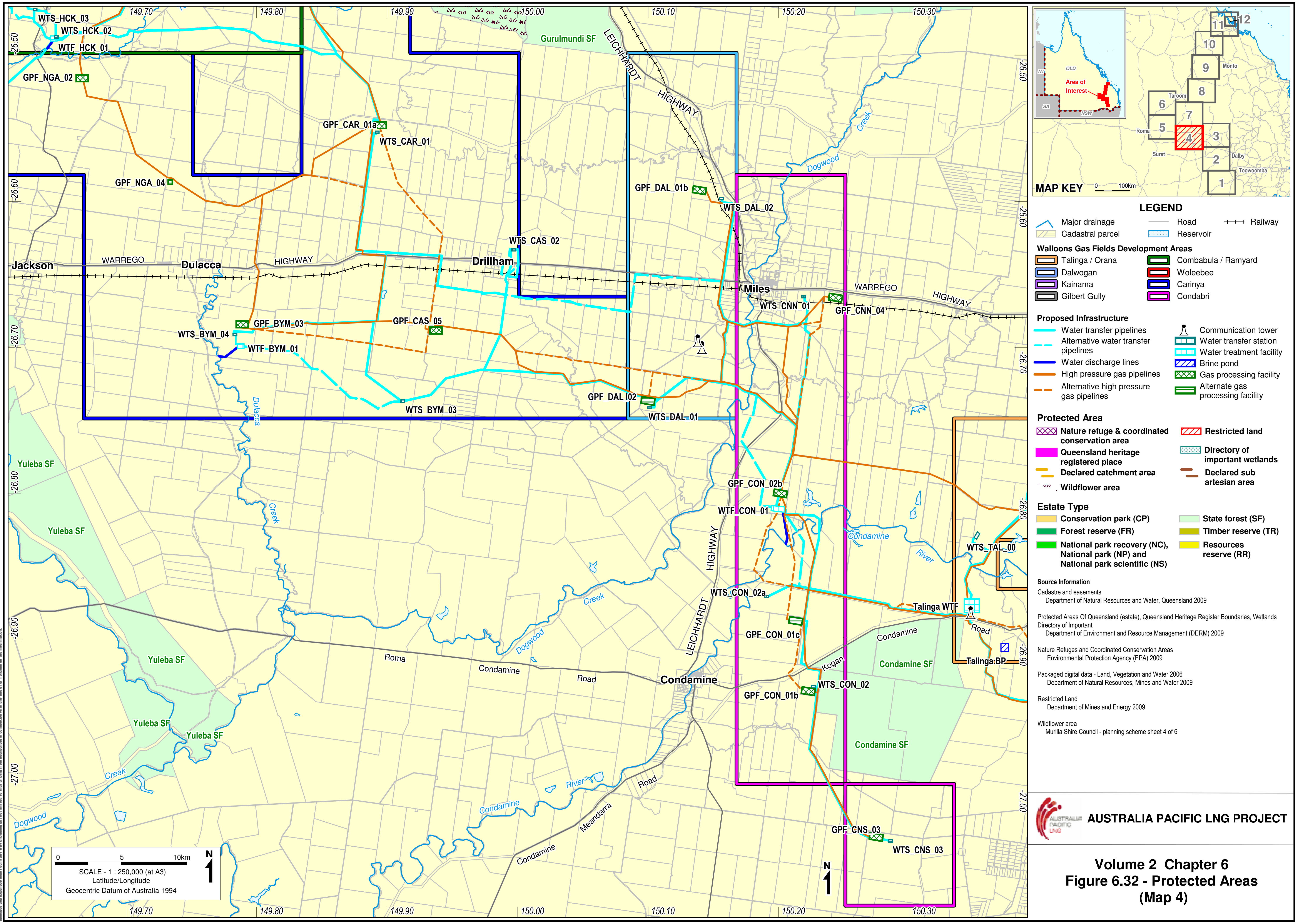
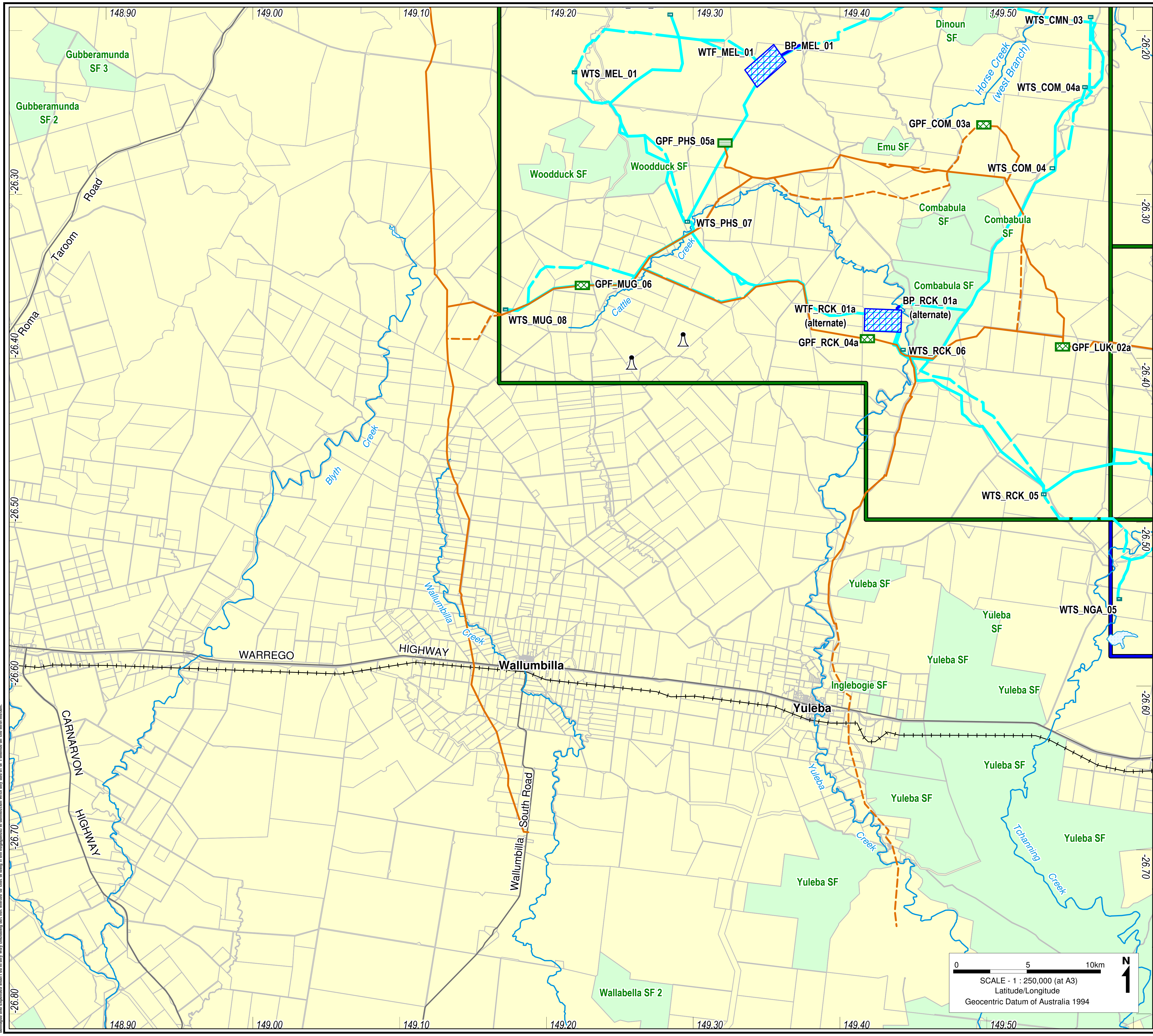
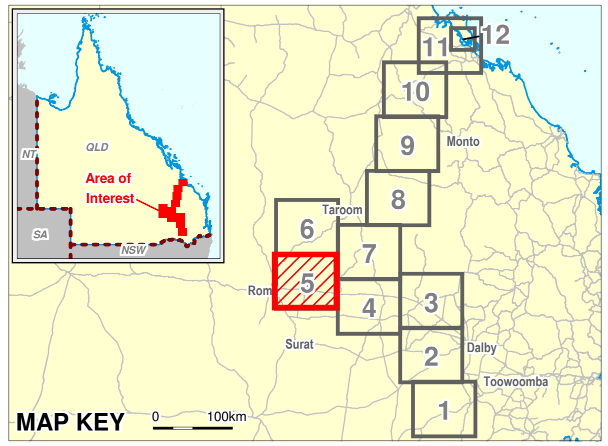


Volume 2 Chapter 6
Figure 6.32 - Protected Areas
(Map 4)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2064-Rev0(Vol2Chp6_ProtectedAreas_04).wor



148.90
149.00
149.10
149.20
149.30
149.40
149.50
-26.20
-26.30
-26.40
-26.50
-26.60
-26.70
-26.80
Gubberamunda SF 3
Gubberamunda SF 2
Roma
Taroom
Road
WTS_MEL_01
WTF_MEL_01
BP_MEL_01
WTS_CMN_03
Dinoun SF
Horse Creek (west Branch)
WTS_COM_04a
GPF_COM_03a
GPF_PHS_05a
Emu SF
Woodduck SF
WTS_COM_04
Combabula SF
WTS_PHS_07
Creek
GPF_MUG_06
Cattle
WTS_MUG_08
Combabula SF
WTF_RCK_01a (alternate)
BP_RCK_01a (alternate)
GPF_RCK_04a
WTS_RCK_06
GPF_LUK_02a
Blyth
Creek
WTS_RCK_05
Wallumbilla
Creek
Yuleba SF
WTS_NGA_05
WARREGO
HIGHWAY
Wallumbilla
Inglebogie SF
Yuleba
CARNARVON
HIGHWAY
South Road
Wallumbilla
Yuleba
Creek
Tchanning
Creek
Wallabella SF 2
0
5
10km
SCALE - 1 : 250,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994
N



LEGEND

Major drainage | Road | Railway
Cadastral parcel | Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana | Combabula / Ramyard
Dalwogan | Woleebee
Kainama | Carinya
Gilbert Gully | Condabri

Proposed Infrastructure

Water transfer pipelines | Communication tower
Alternative water transfer pipelines | Water transfer station
Water discharge lines | Water treatment facility
High pressure gas pipelines | Brine pond
Alternative high pressure gas pipelines | Gas processing facility
Alternate gas processing facility

Protected Area

Nature refuge & coordinated conservation area | Restricted land
Queensland heritage registered place | Directory of important wetlands
Declared catchment area | Declared sub artesian area

Estate Type

Conservation park (CP) | State forest (SF)
Forest reserve (FR) | Timber reserve (TR)
National park recovery (NC), National park (NP) and National park scientific (NS) | Resources reserve (RR)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands Directory of Important
Department of Environment and Resource Management (DERM) 2009

Nature Refuges and Coordinated Conservation Areas
Environmental Protection Agency (EPA) 2009

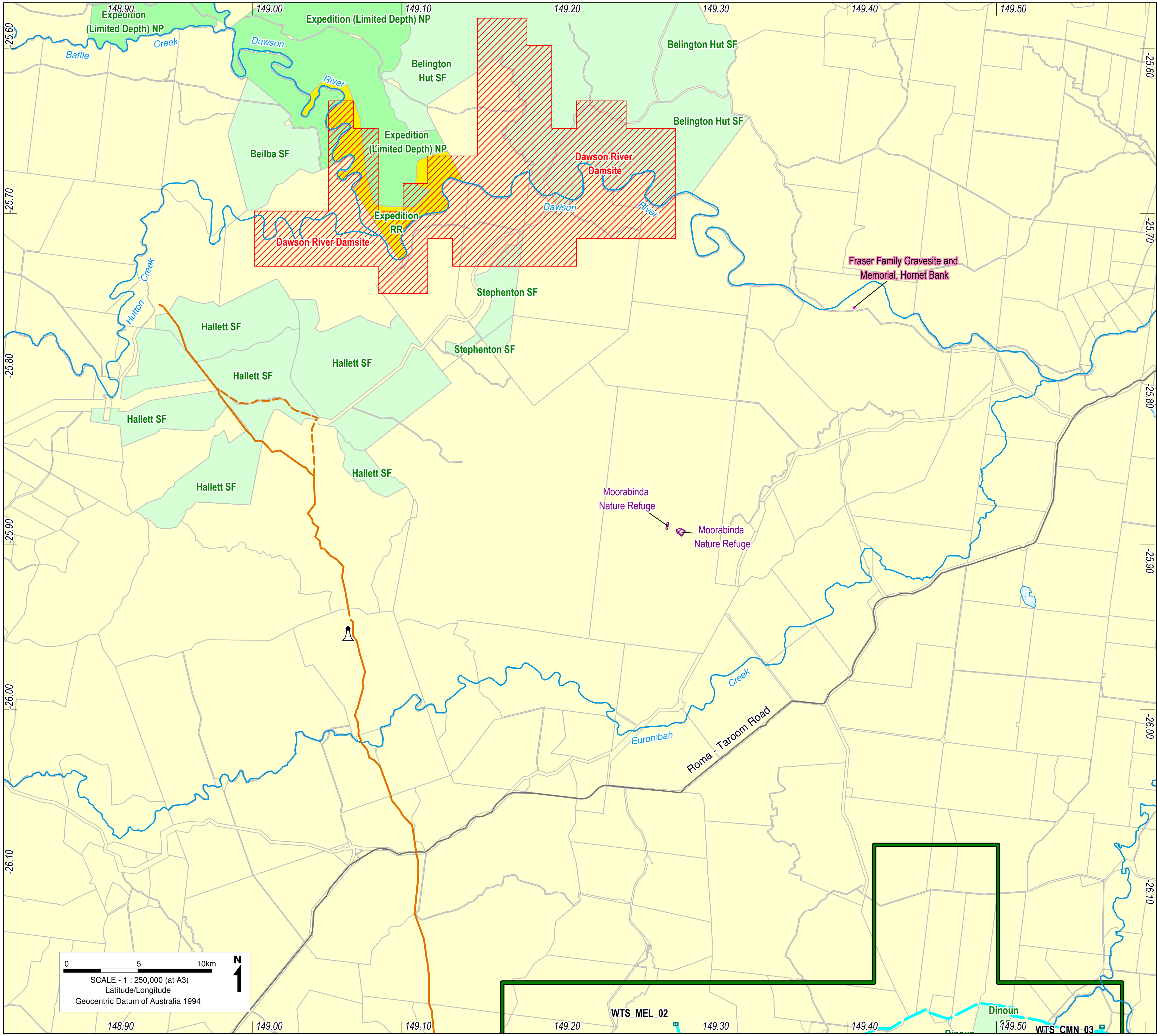
Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

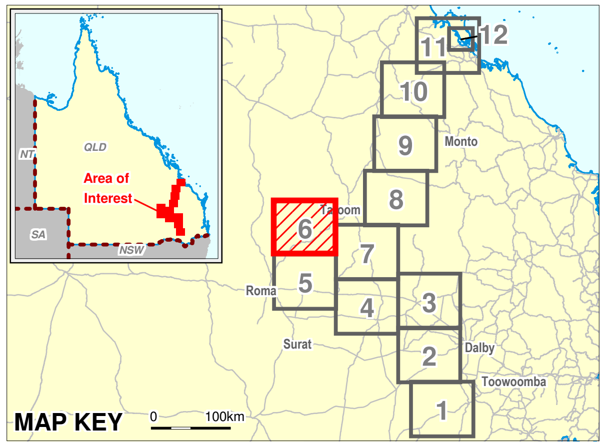
Restricted Land
Department of Mines and Energy 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.33 - Protected Areas
(Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2065-Rev0(Vol2Chp6_ProtectedAreas_05).wor





MAP KEY

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Protected Area

- Nature refuge & coordinated conservation area
- Queensland heritage registered place
- Declared catchment area
- Restricted land
- Directory of important wetlands
- Declared sub artesian area

Estate Type

- Conservation park (CP)
- Forest reserve (FR)
- National park recovery (NC), National park (NP) and National park scientific (NS)
- State forest (SF)
- Timber reserve (TR)
- Resources reserve (RR)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands Directory of Important
Department of Environment and Resource Management (DERM) 2009

Nature Refuges and Coordinated Conservation Areas
Environmental Protection Agency (EPA) 2009

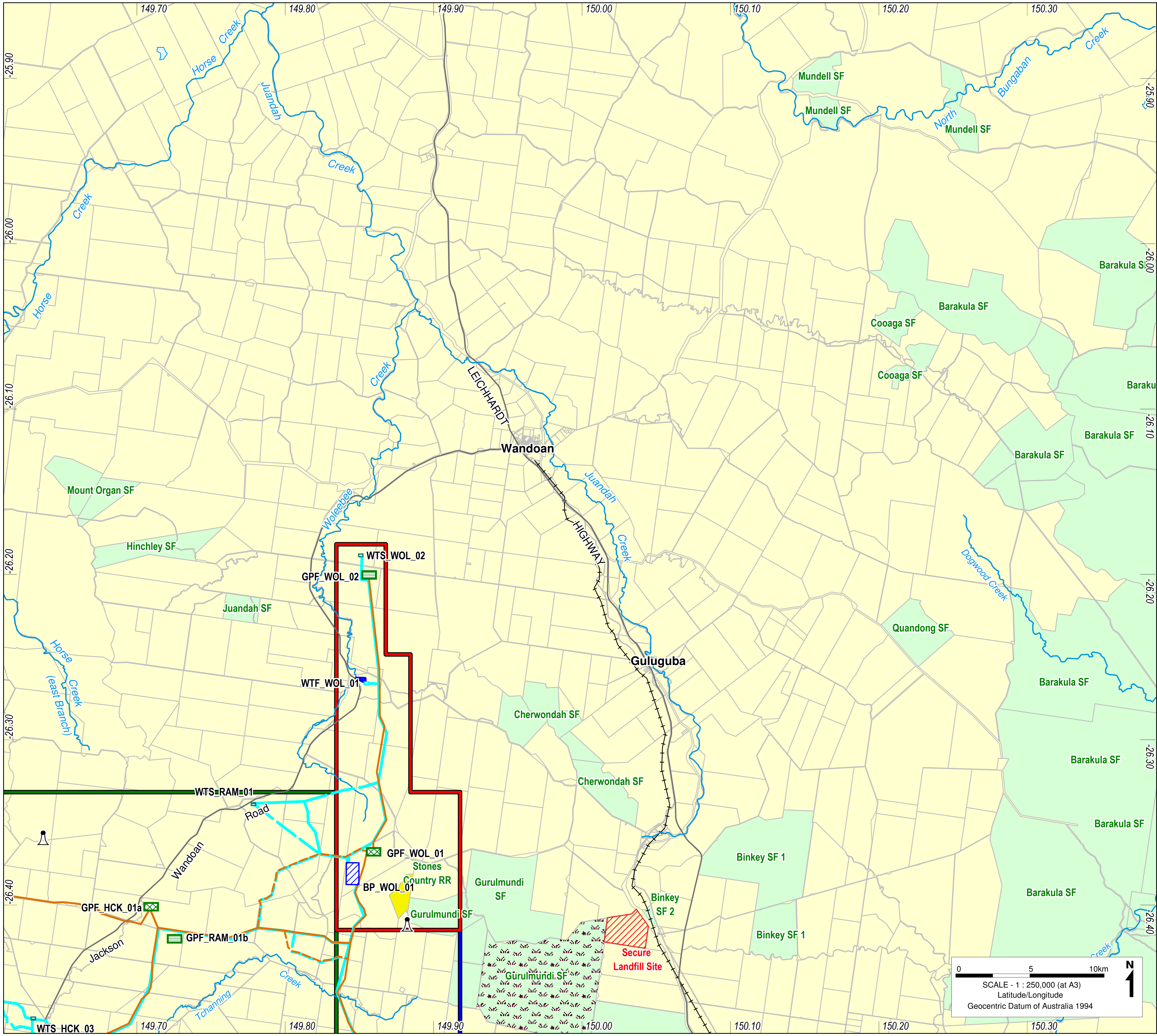
Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

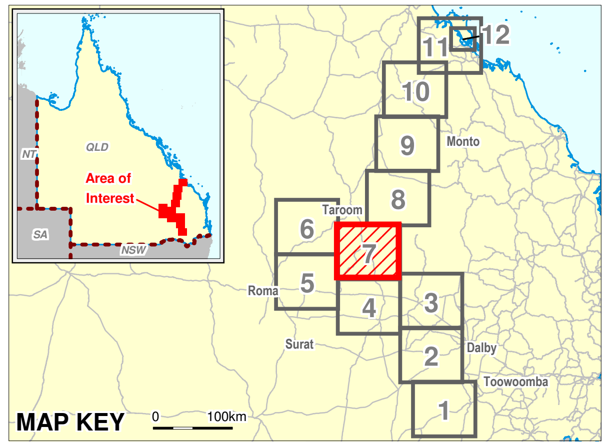
Restricted Land
Department of Mines and Energy 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.34 - Protected Areas (Map 6)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2066-Rev0(Vol2Chp6_ProtectedAreas_06).wor





MAP KEY

LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Protected Area

Nature refuge & coordinated conservation area
Queensland heritage registered place
Declared catchment area
Wildflower area
Restricted land
Directory of important wetlands
Declared sub artesian area

Estate Type

Conservation park (CP)
Forest reserve (FR)
National park recovery (NC), National park (NP) and National park scientific (NS)
State forest (SF)
Timber reserve (TR)
Resources reserve (RR)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Protected Areas Of Queensland (estate), Queensland Heritage Register Boundaries, Wetlands Directory of Important
Department of Environment and Resource Management (DERM) 2009

Nature Refuges and Coordinated Conservation Areas
Environmental Protection Agency (EPA) 2009

Packaged digital data - Land, Vegetation and Water 2006
Department of Natural Resources, Mines and Water 2009

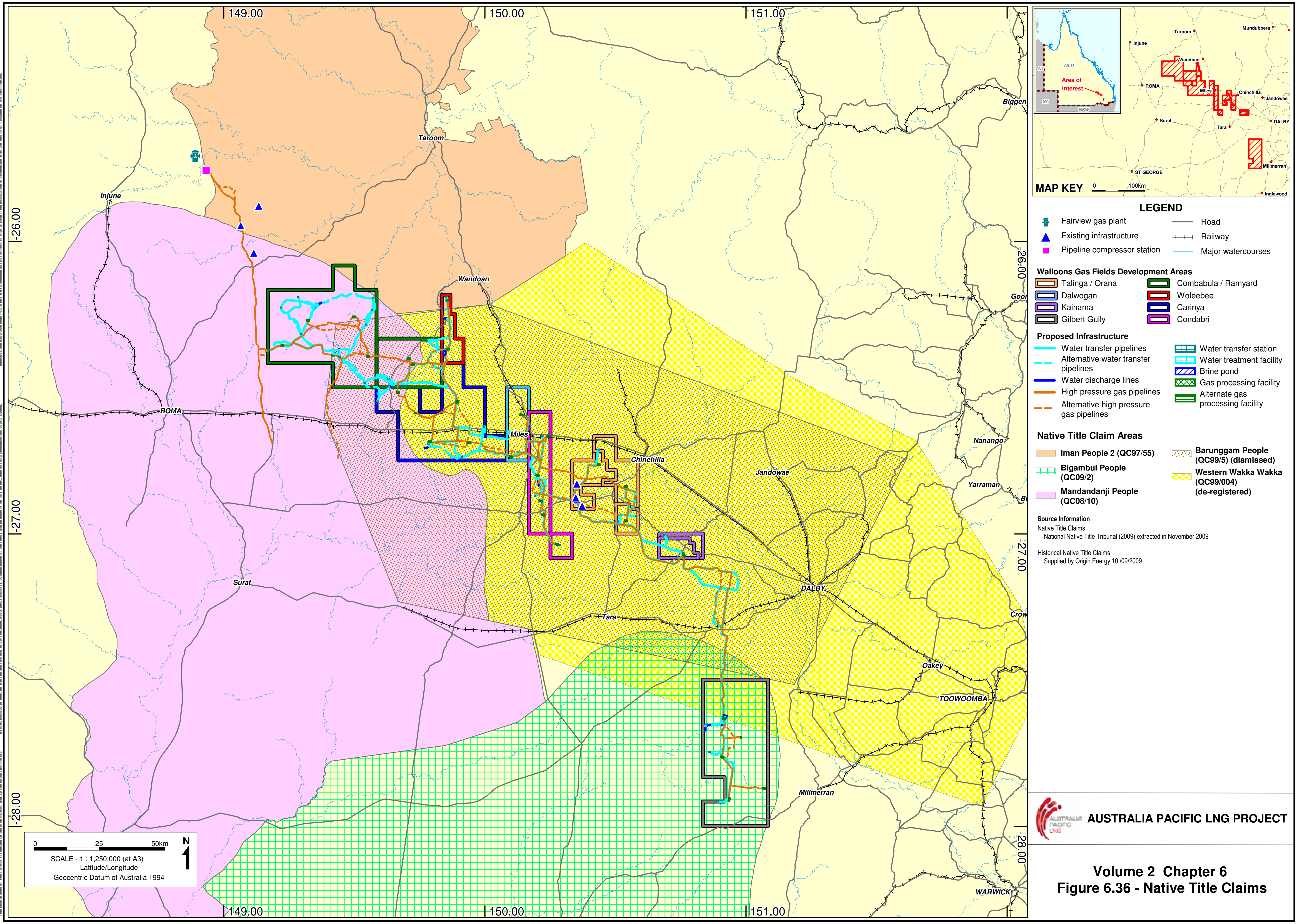
Restricted Land
Department of Mines and Energy 2009

Wildflower area
Murilla Shire Council - planning scheme sheet 4 of 6

AUSTRALIA PACIFIC LNG PROJECT

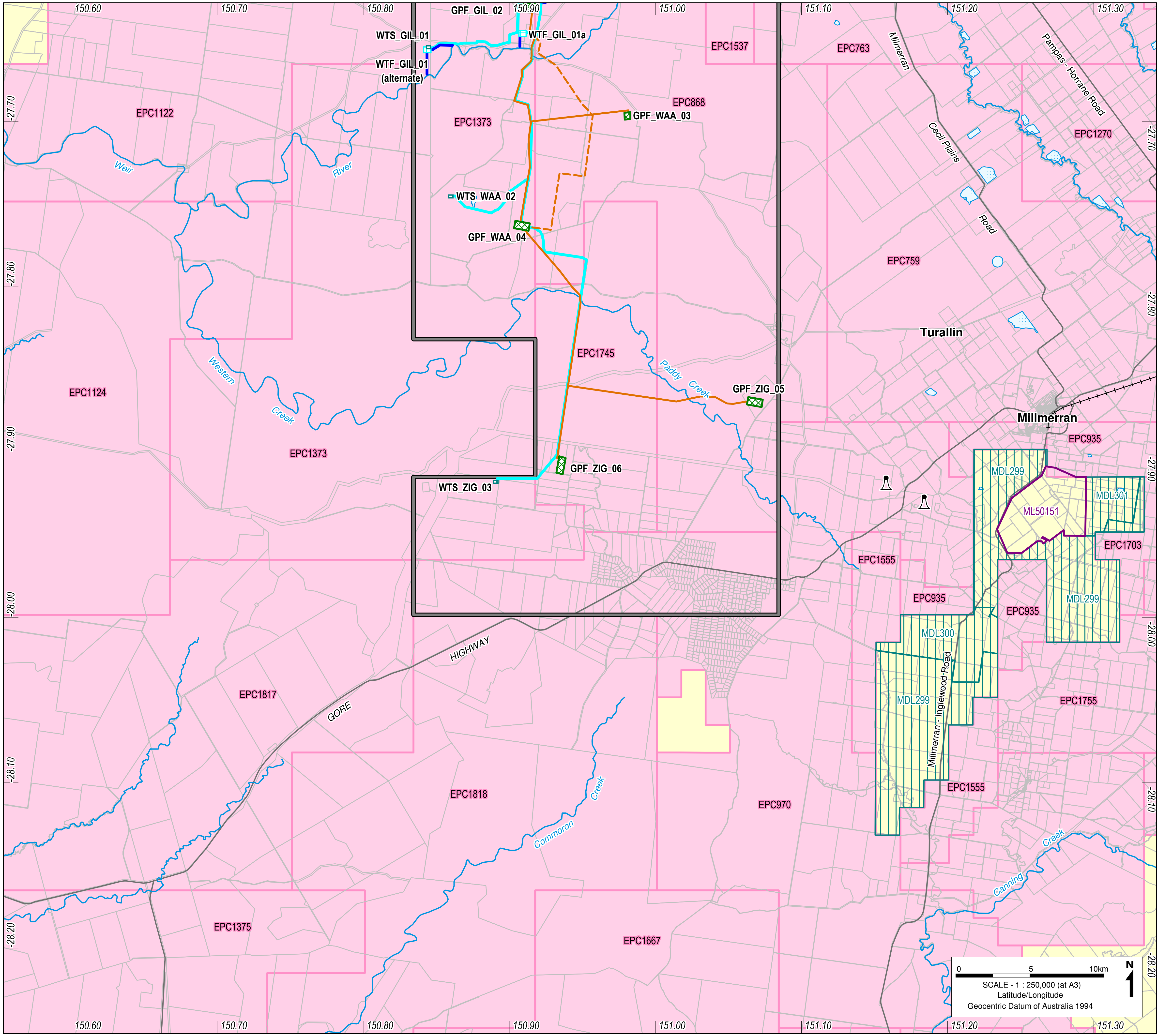
Volume 2 Chapter 6
Figure 6.35 - Protected Areas (Map 7)

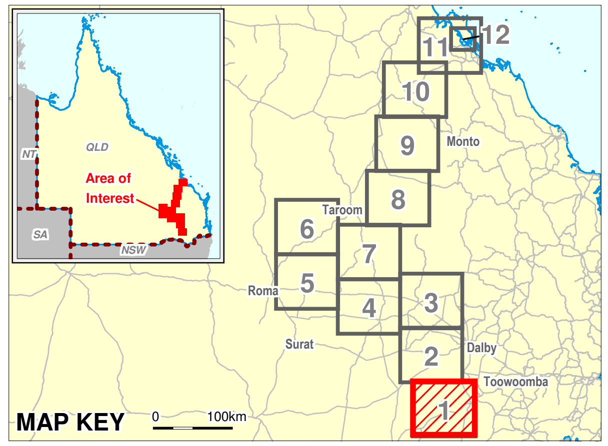
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2067-Rev0(Vol2Chp6_ProtectedAreas_07).wor



Volume 2 Chapter 6
Figure 6.36 - Native Title Claims

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2168-Rev0(Vol2Chp6_NativeTitle).wor





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gasfield Development Areas

Talinga / Orana
Combabula / Ramyard
Dalwogan
Woleebee
Kainama
Carinya
Gilbert Gully
Condabri

Proposed Infrastructure

Water transfer pipelines
Communication tower
Alternative water transfer pipelines
Water transfer station
Water treatment facility
Water discharge lines
Brine pond
High pressure gas pipelines
Gas processing facility
Alternative high pressure gas pipelines
Alternate gas processing facility

Mining Resources

Exploration Permits for Minerals (EPM)
Mineral Development Licenses (MDL)
Exploration Permits for Coal (EPC)
Mining Leases (ML)

Source Information

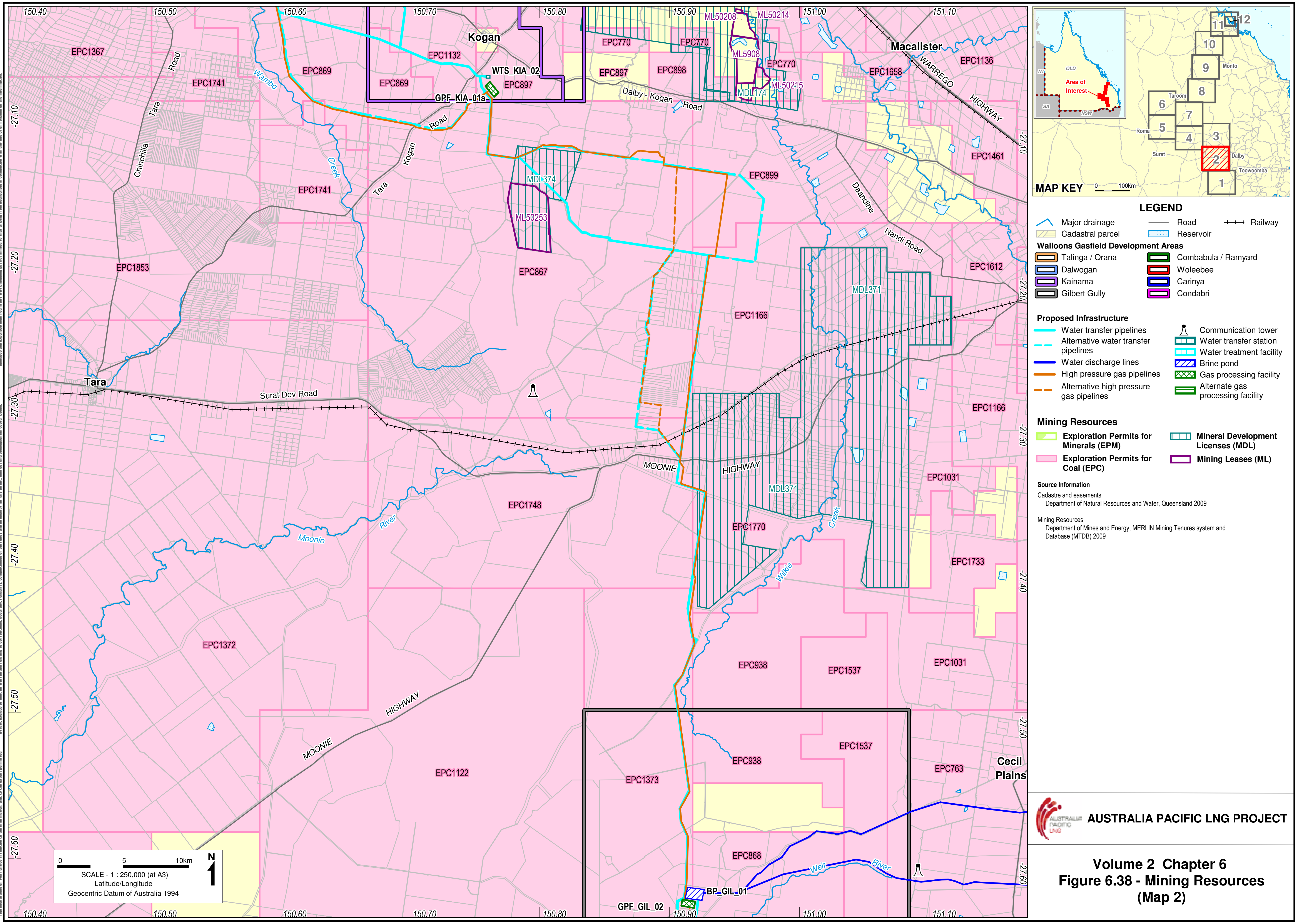
Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Mining Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

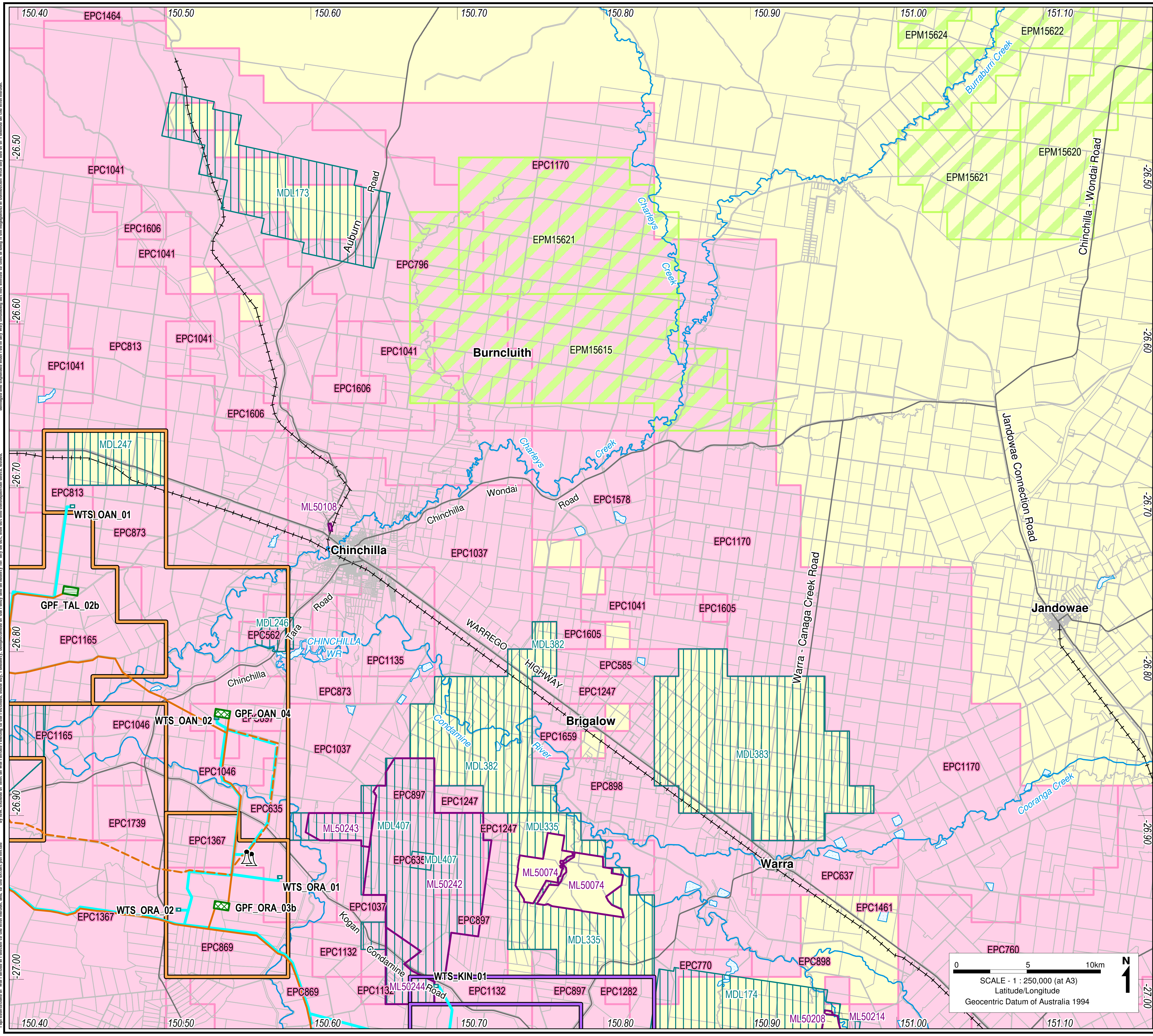
Volume 2 Chapter 6
Figure 6.37 - Mining Resources (Map 1)

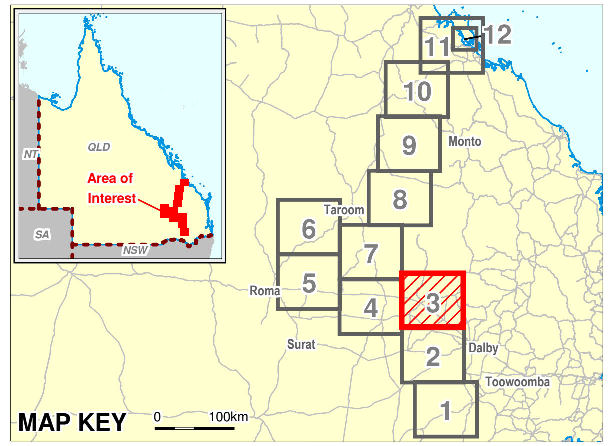
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2049-Rev0(Vol2Chp6_MiningResources_01).wor



Volume 2 Chapter 6
Figure 6.38 - Mining Resources
(Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2050-Rev0(Vol2Chp6_MiningResources_02).wor





LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gasfield Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Mining Resources

- **Exploration Permits for Minerals (EPM)**
- **Exploration Permits for Coal (EPC)**
- **Mineral Development Licenses (MDL)**
- **Mining Leases (ML)**

Source Information

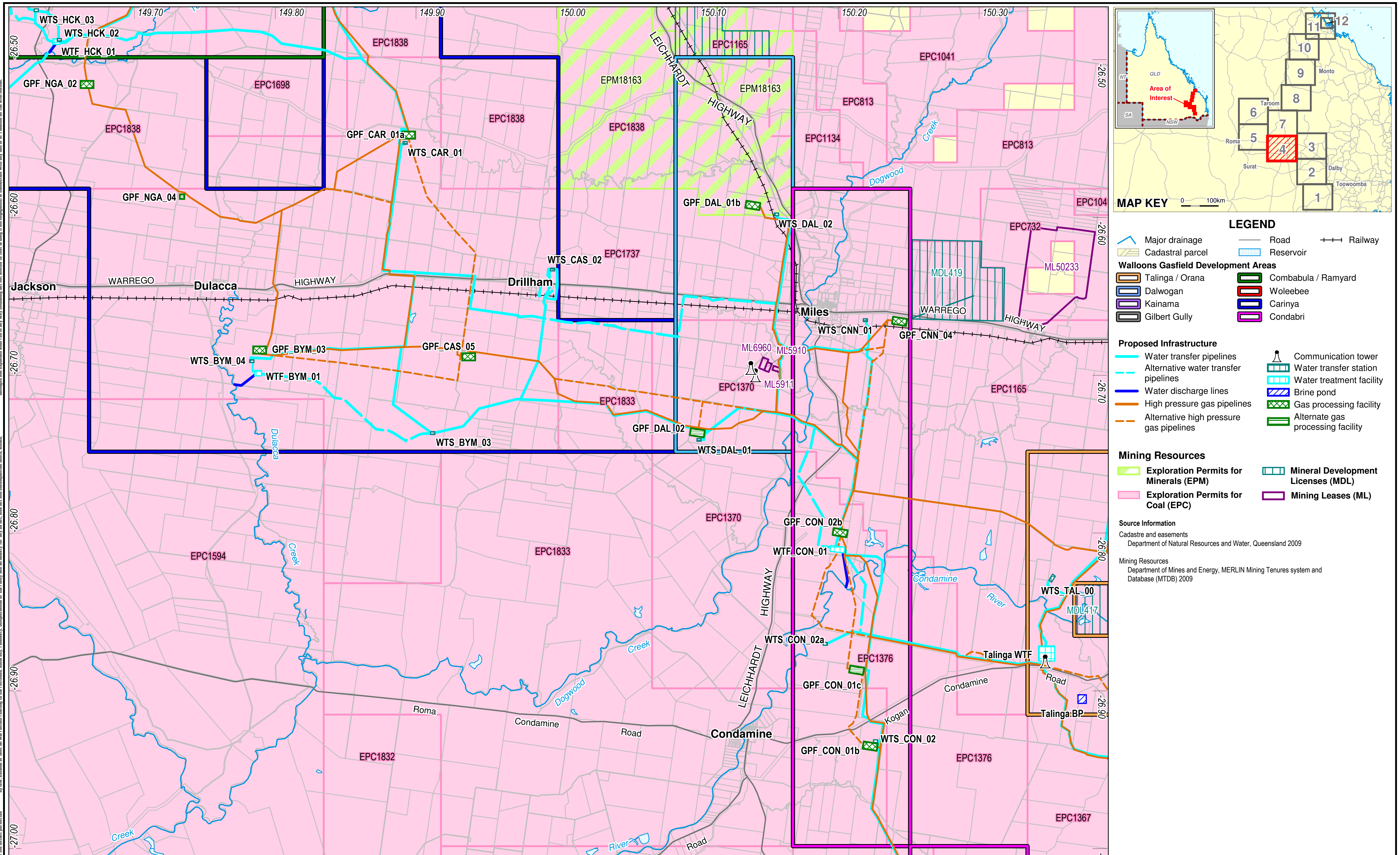
Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Mining Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.39 - Mining Resources (Map 3)

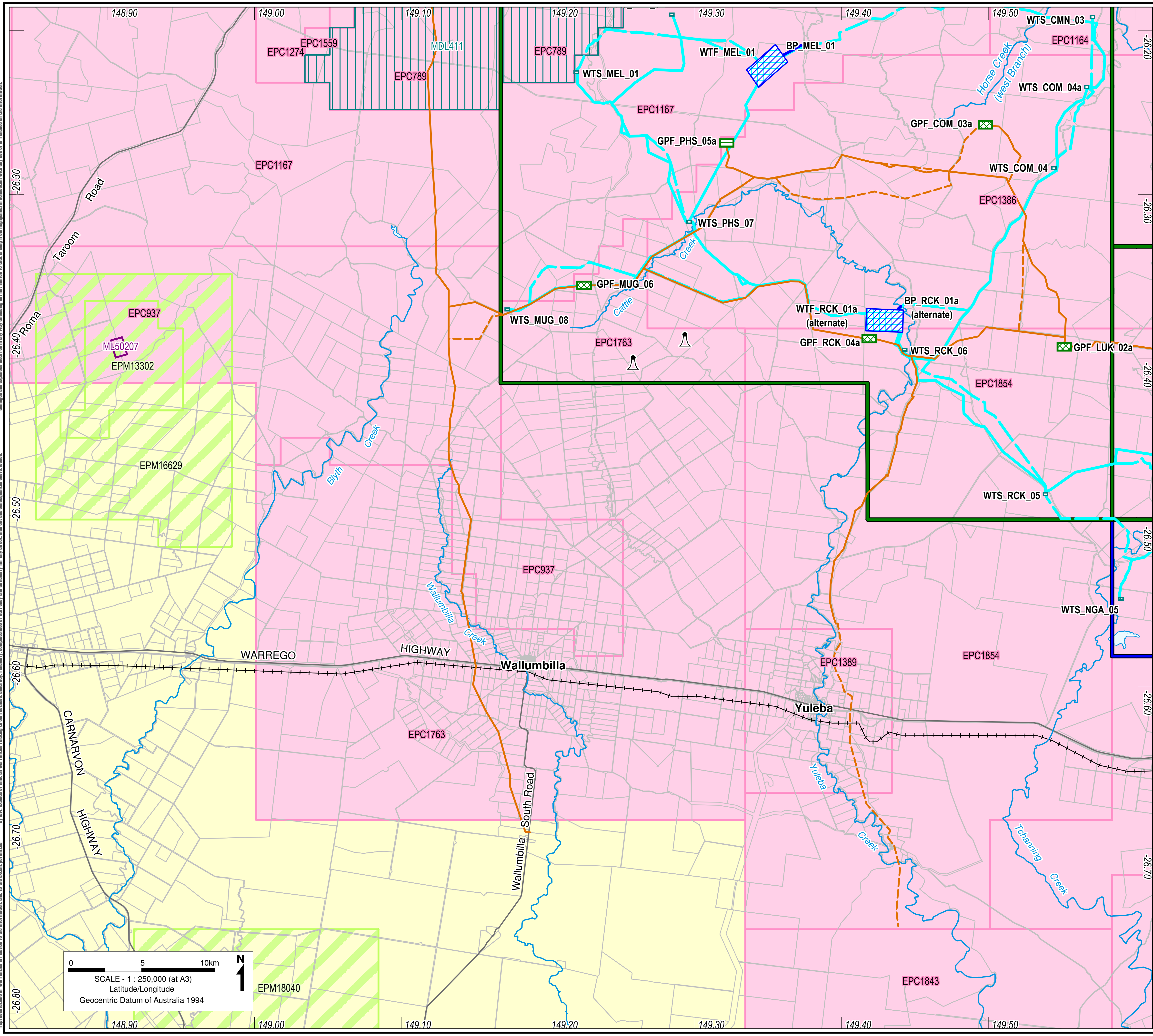
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2051-Rev0(Vol2Chp6_MiningResources_03).wor

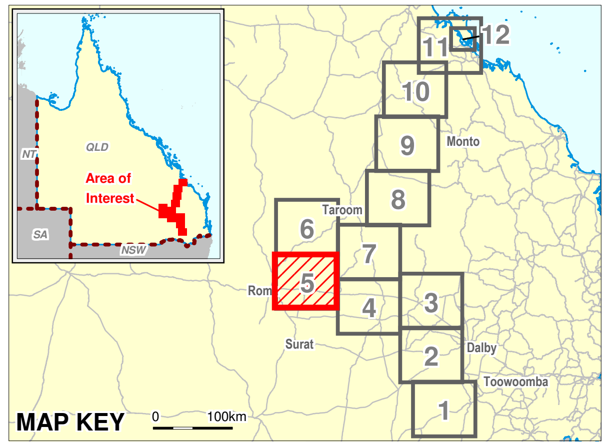


AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.40 - Mining Resources
(Map 4)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2052-Rev0(Vol2Chp6_MiningResources_04).wor





LEGEND

- Major drainage
- Cadastral parcel
- Road
- Reservoir
- Railway

Walloons Gasfield Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Mining Resources

- Exploration Permits for Minerals (EPM)
- Exploration Permits for Coal (EPC)
- Mineral Development Licenses (MDL)
- Mining Leases (ML)

Source Information

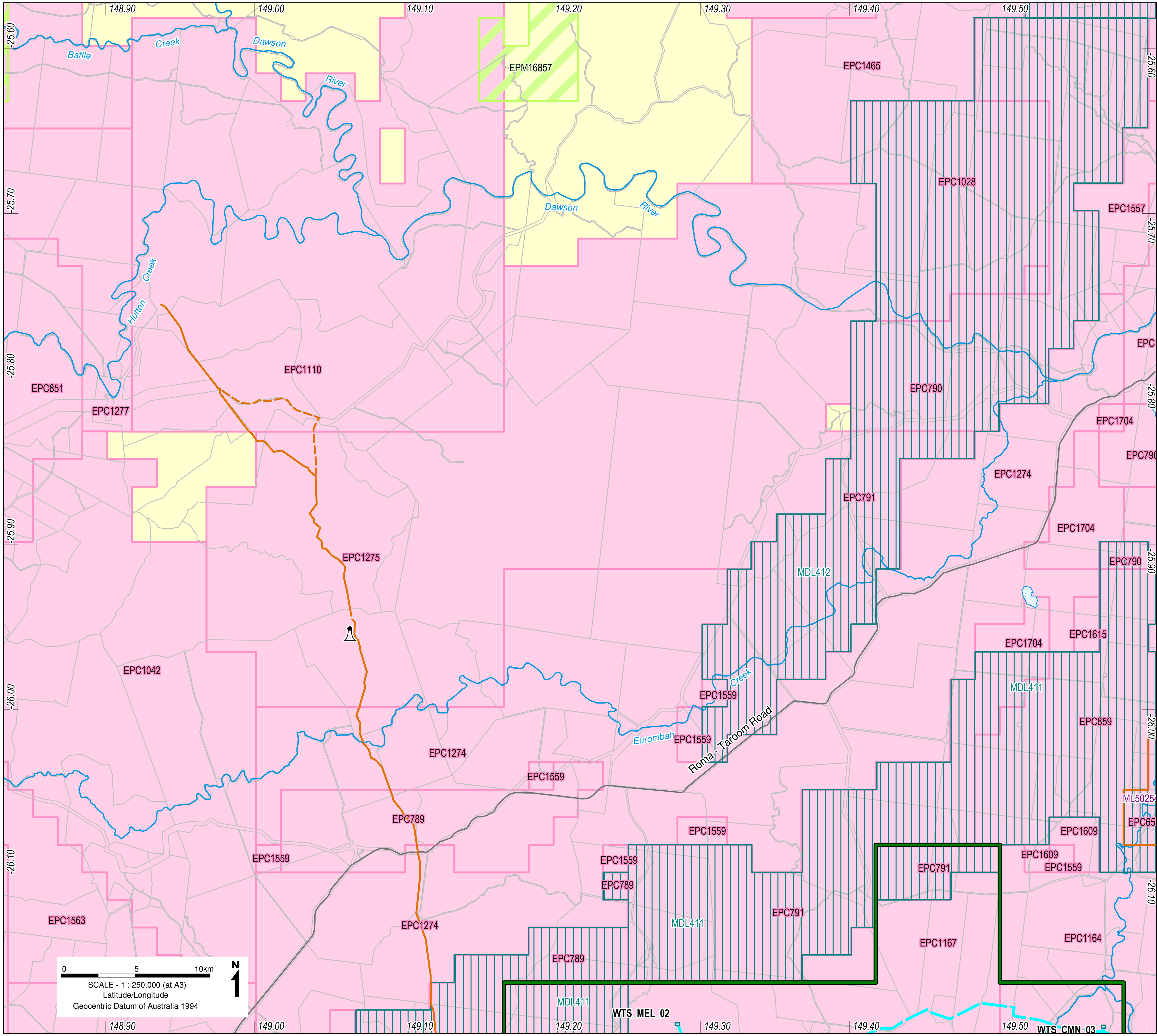
Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

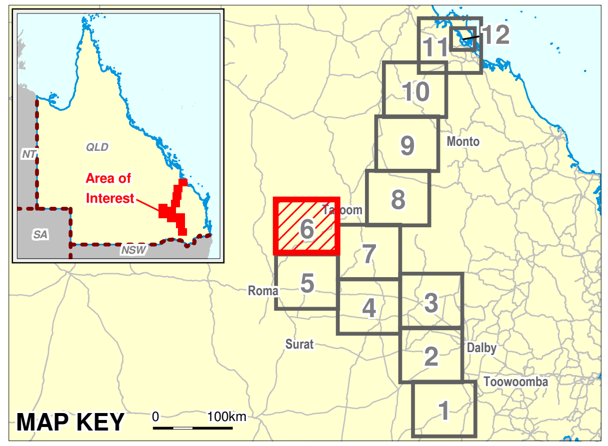
Mining Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.41 - Mining Resources
(Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2053-Rev0(Vol2Chp6_MiningResources_05).wor





MAP KEY

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gasfield Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Communication tower
- Alternative water transfer pipelines
- Water transfer station
- Water treatment facility
- Water discharge lines
- Brine pond
- High pressure gas pipelines
- Gas processing facility
- Alternative high pressure gas pipelines
- Alternate gas processing facility

Mining Resources

- **Exploration Permits for Minerals (EPM)**
- **Mineral Development Licenses (MDL)**
- **Exploration Permits for Coal (EPC)**
- **Mining Leases (ML)**

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Mining Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

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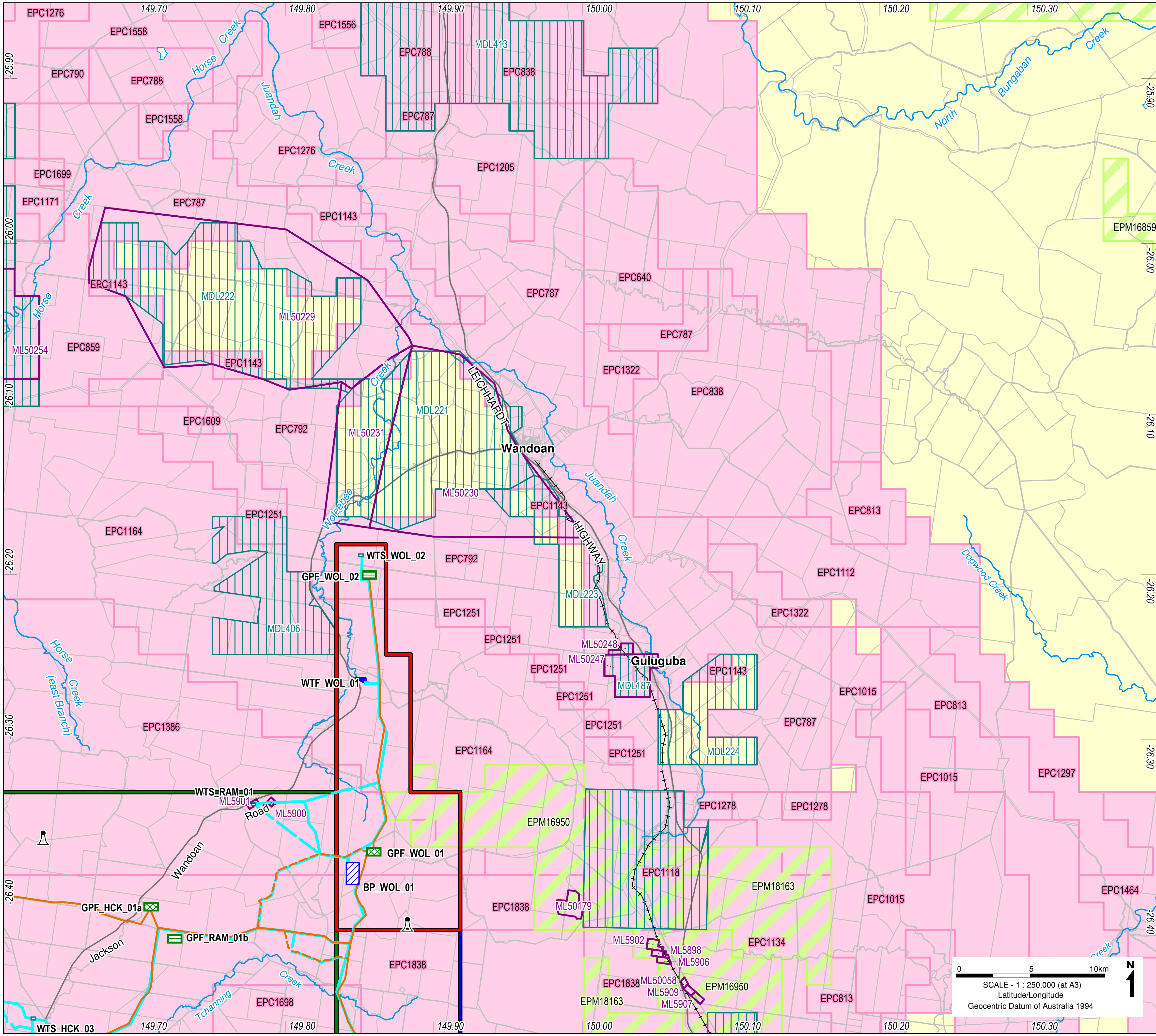
Figure 6.42 - Mining Resources
(Map 6)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2054-Rev0(Vol2Chp6_MiningResources_06).wor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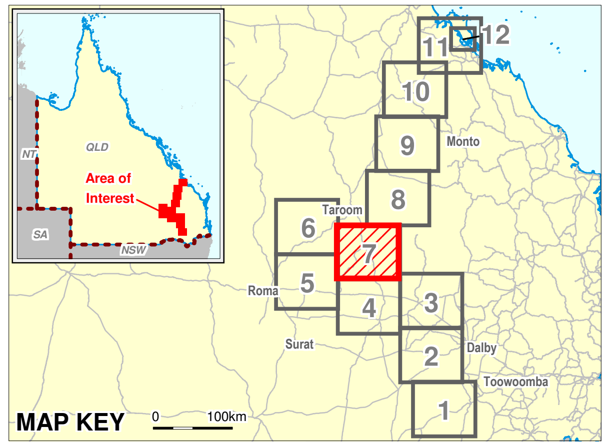
EPC1558
EPC1556
EPC788
MDL413
EPC838
EPC790
EPC787
EPC1205
EPC1699
EPC1171
EPC1143
EPC640
MDL222
ML50229
ML50254
EPC859
EPC1609
EPC792
MDL221
ML50231
ML50230
Wandoan
LEICHHARDT
HIGHWAY
EPC1322
EPC838
EPC813
EPC1164
EPC1251
MDL406
MDL223
WTS_WOL_02
GPF_WOL_02
WTF_WOL_01
ML50248
ML50247
Guluguba
MDL187
EPC1015
EPC1112
EPC1386
MDL224
EPC1297
WTS_RAM_01
ML5901
ML5900
Road
Wandoan
EPM16950
GPF_WOL_01
BP_WOL_01
EPC1118
EPM18163
EPC1278
EPC1838
ML50179
EPC1464
GPF_HCK_01a
GPF_RAM_01b
Jackson
ML5902
ML5898
ML5906
EPC1134
ML50058
ML5909
ML5907
EPC1698
WTS_HCK_03
EPM16859
Horse Creek
Juandah Creek
Woleebee Creek
Dogwood Creek
North Bungaban Creek
Horse Creek (east Branch)
Tchanning Creek
149.70
149.80
149.90
150.00
150.10
150.20
150.30
-25.90
-26.00
-26.10
-26.20
-26.30
-26.40
0 5 10km
SCALE - 1 : 250,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994
N



LEGEND

Major drainage · Road · Railway
Cadastral parcel · Reservoir

Walloons Gasfield Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Mining Resources

- Exploration Permits for Minerals (EPM)
- Exploration Permits for Coal (EPC)
- Mineral Development Licenses (MDL)
- Mining Leases (ML)

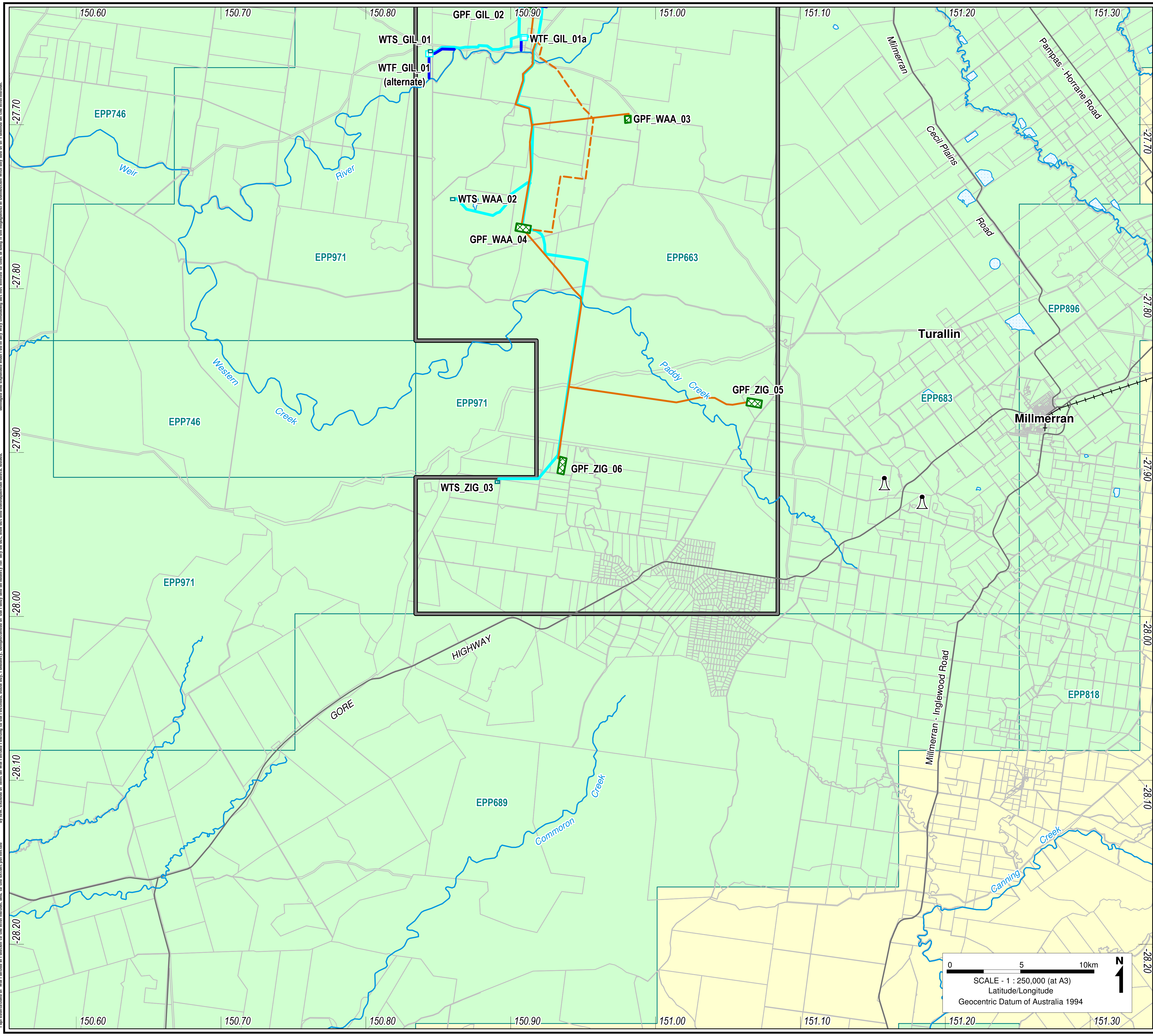
Source Information

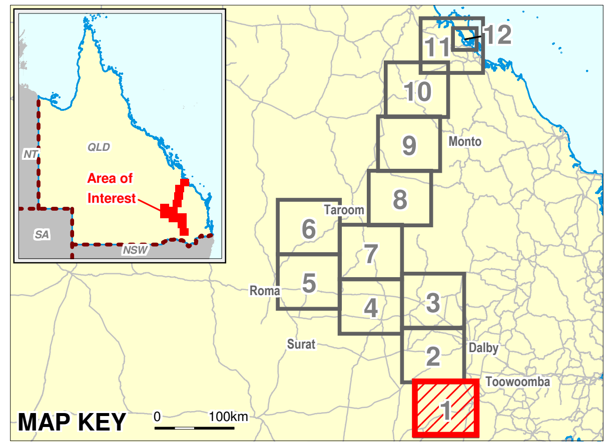
Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Mining Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.43 - Mining Resources (Map 7)





LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Communication tower
- Alternative water transfer pipelines
- Water transfer station
- Water treatment facility
- Water discharge lines
- Brine pond
- High pressure gas pipelines
- Gas processing facility
- Alternative high pressure gas pipelines
- Alternate gas processing facility

Petroleum Resources

- Exploration Permit for Petroleum (EPP)
- Petroleum Lease (PL)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Petroleum Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

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Figure 6.44 - Petroleum Resources (Map 1)

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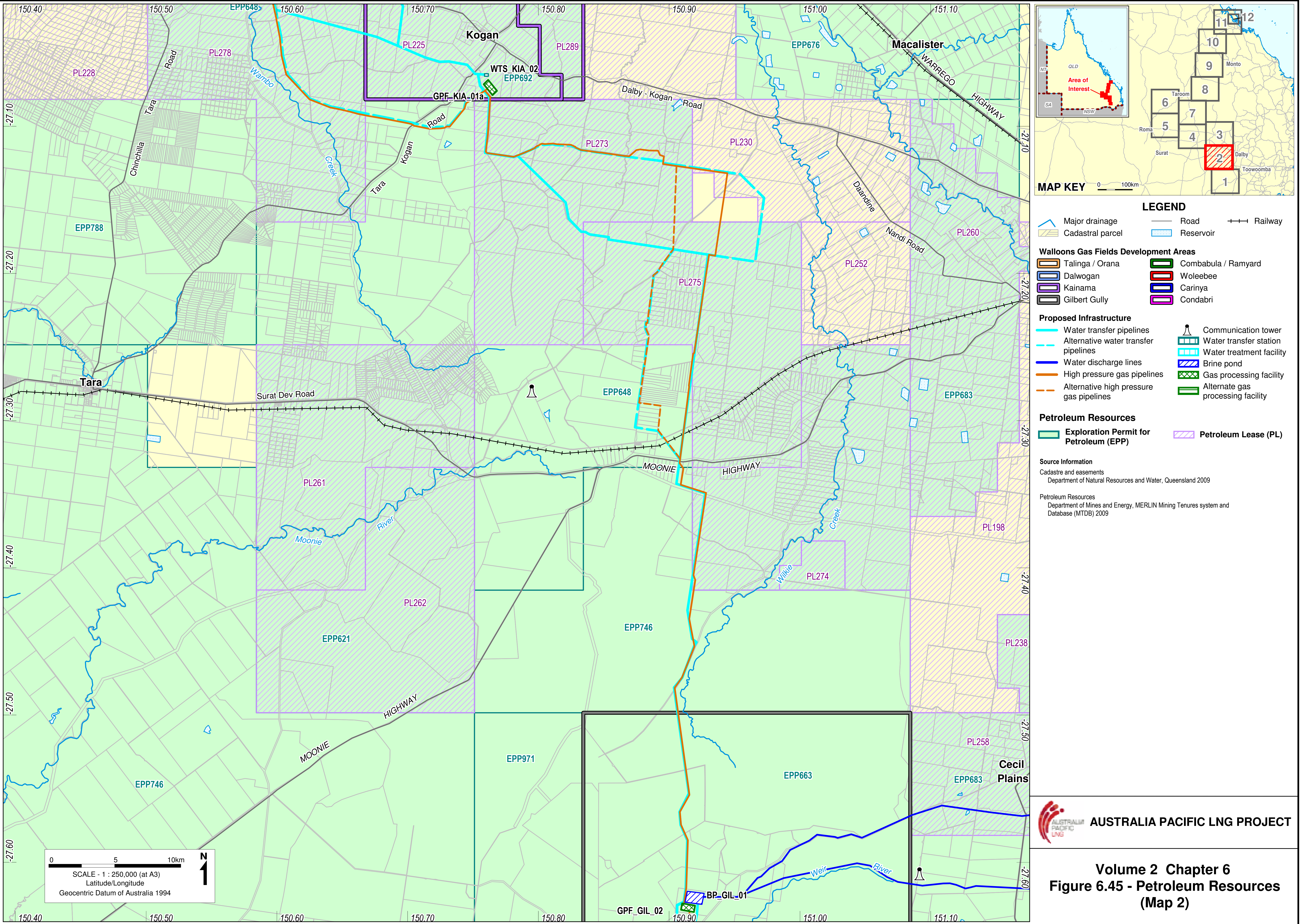


LEGEND

Major drainage | Road | Railway
Cadastral parcel | Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Petroleum Resources

- **Exploration Permit for Petroleum (EPP)**
- **Petroleum Lease (PL)**

Source Information

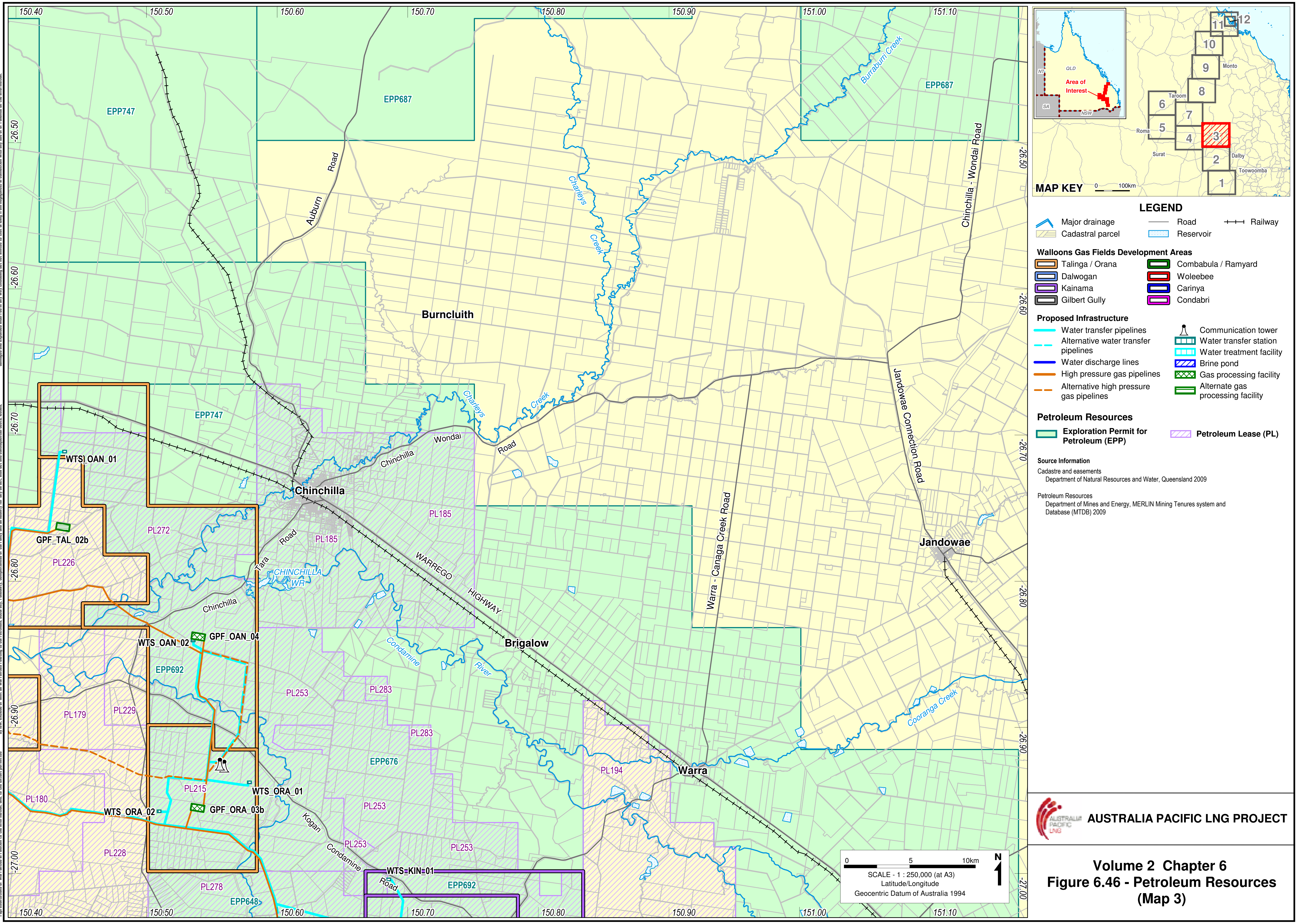
Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Petroleum Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.45 - Petroleum Resources (Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2230-Rev0(Vol2Chp6_PetroleumResources_02).wor



K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2231-Rev0(Vol2Chp6_PetroleumResources_03).wor

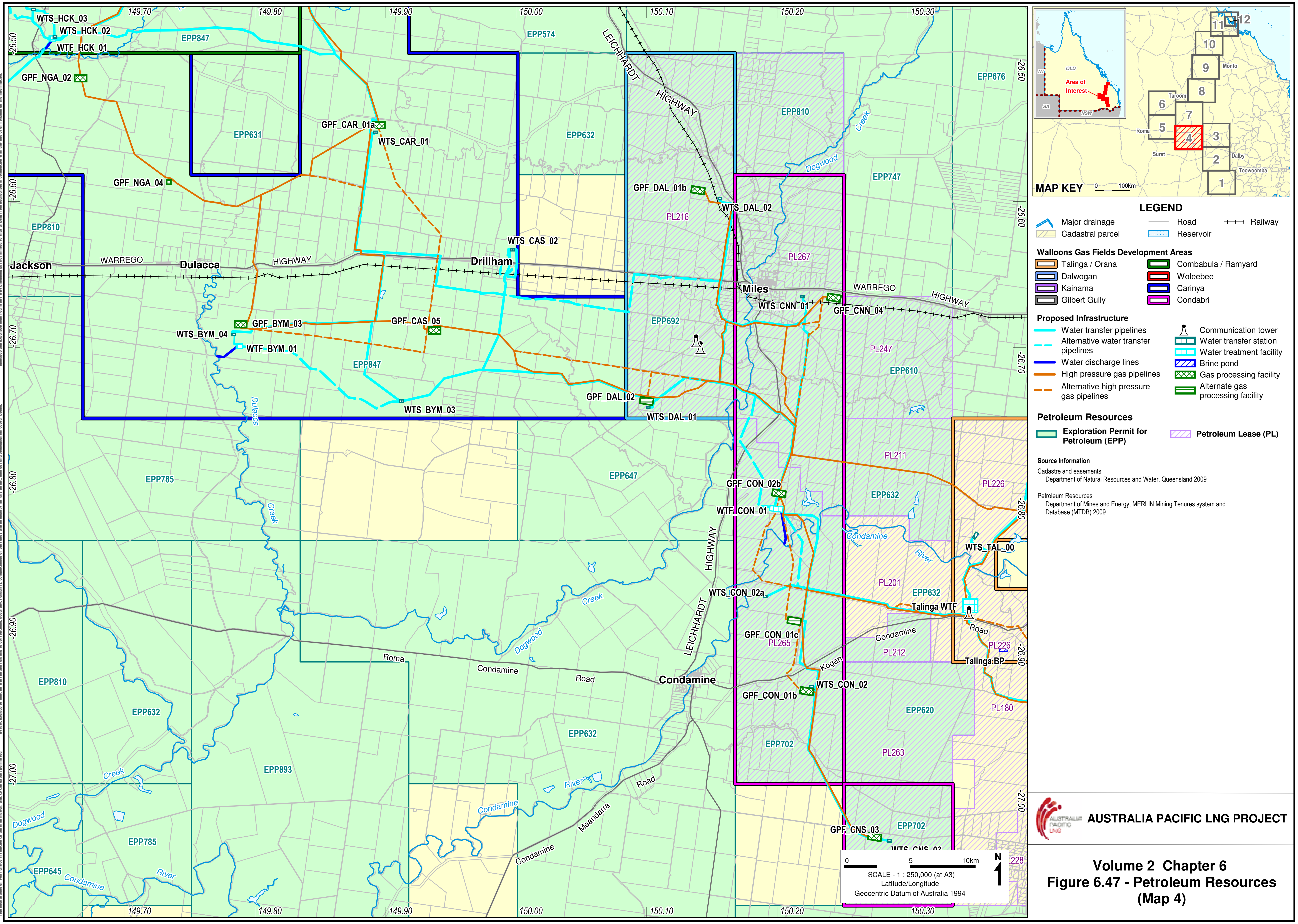


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Figure 6.47 - Petroleum Resources (Map 4)

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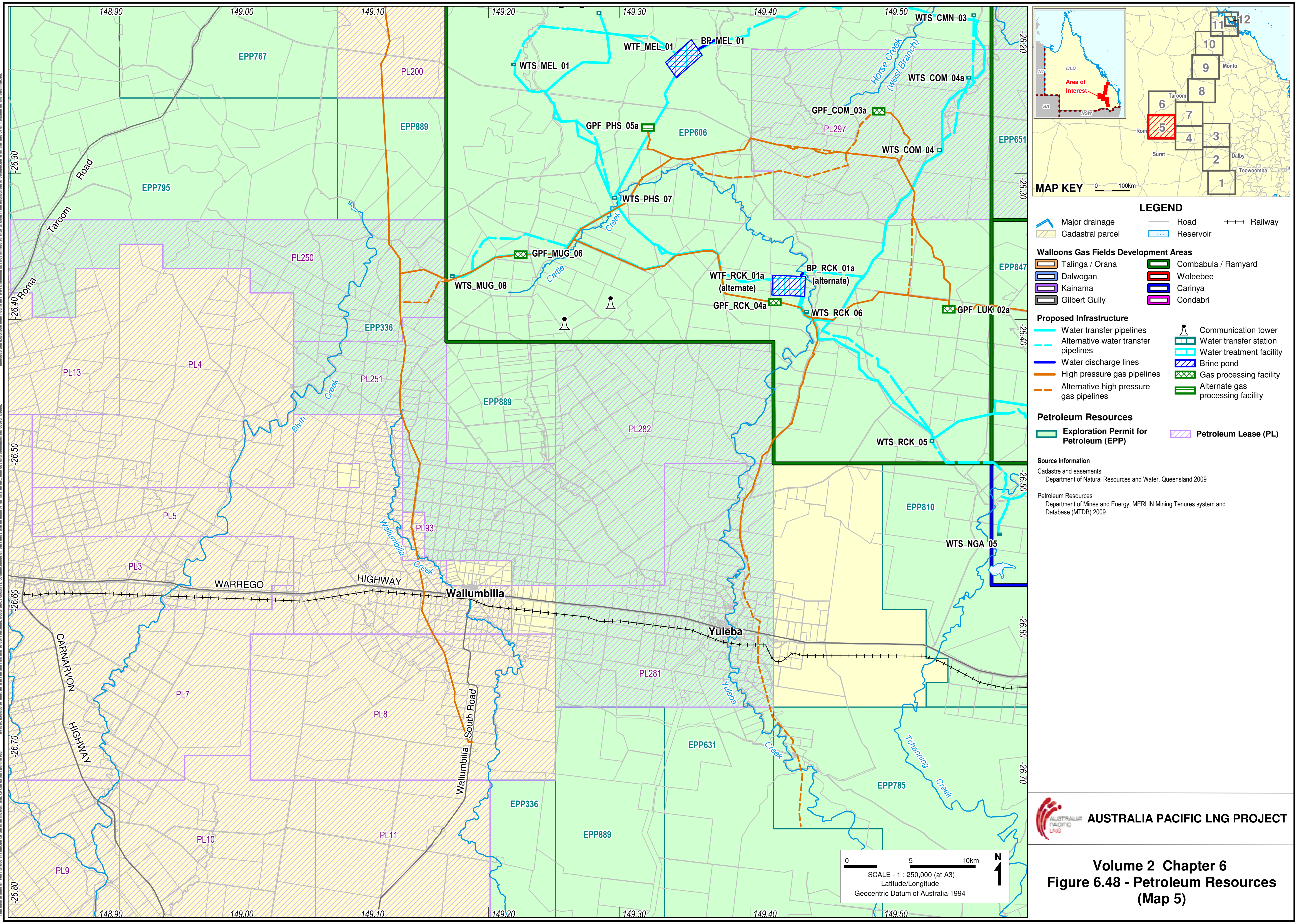
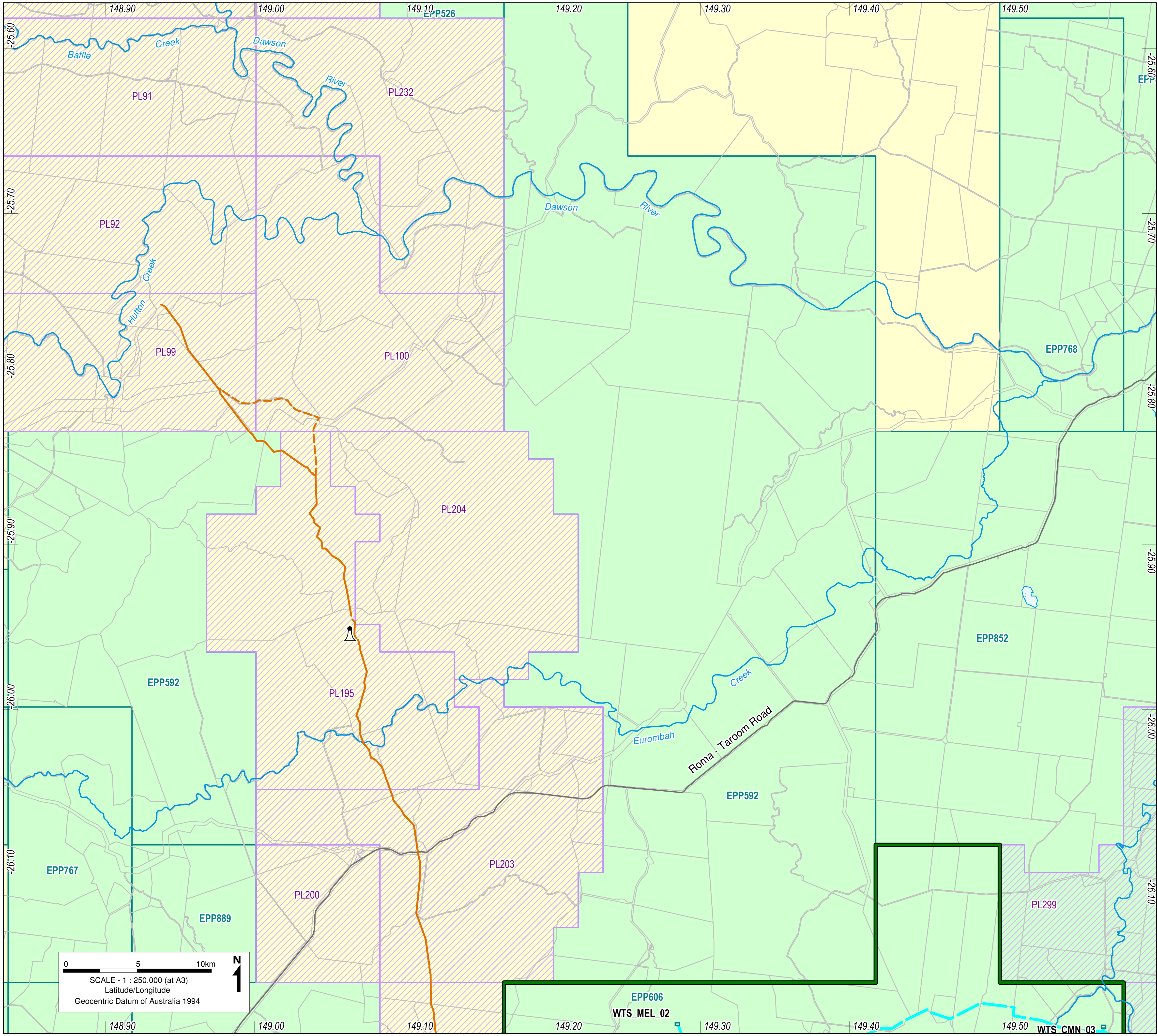
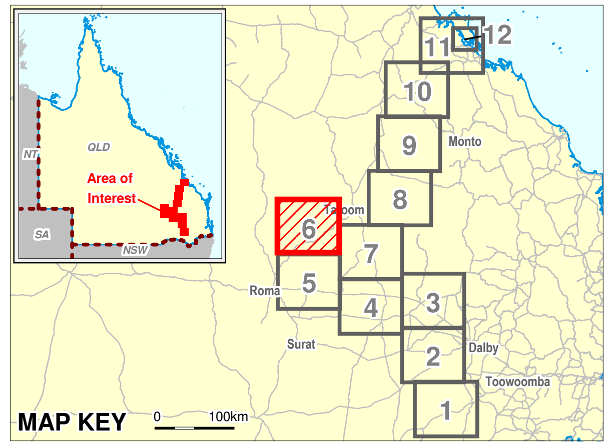


AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.48 - Petroleum Resources (Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2233-Rev0(Vol2Chp6_PetroleumResources_05).wor





LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Communication tower
- Alternative water transfer pipelines
- Water transfer station
- Water treatment facility
- Water discharge lines
- Brine pond
- High pressure gas pipelines
- Gas processing facility
- Alternative high pressure gas pipelines
- Alternate gas processing facility

Petroleum Resources

- Exploration Permit for Petroleum (EPP)
- Petroleum Lease (PL)

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Petroleum Resources
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.49 - Petroleum Resources (Map 6)

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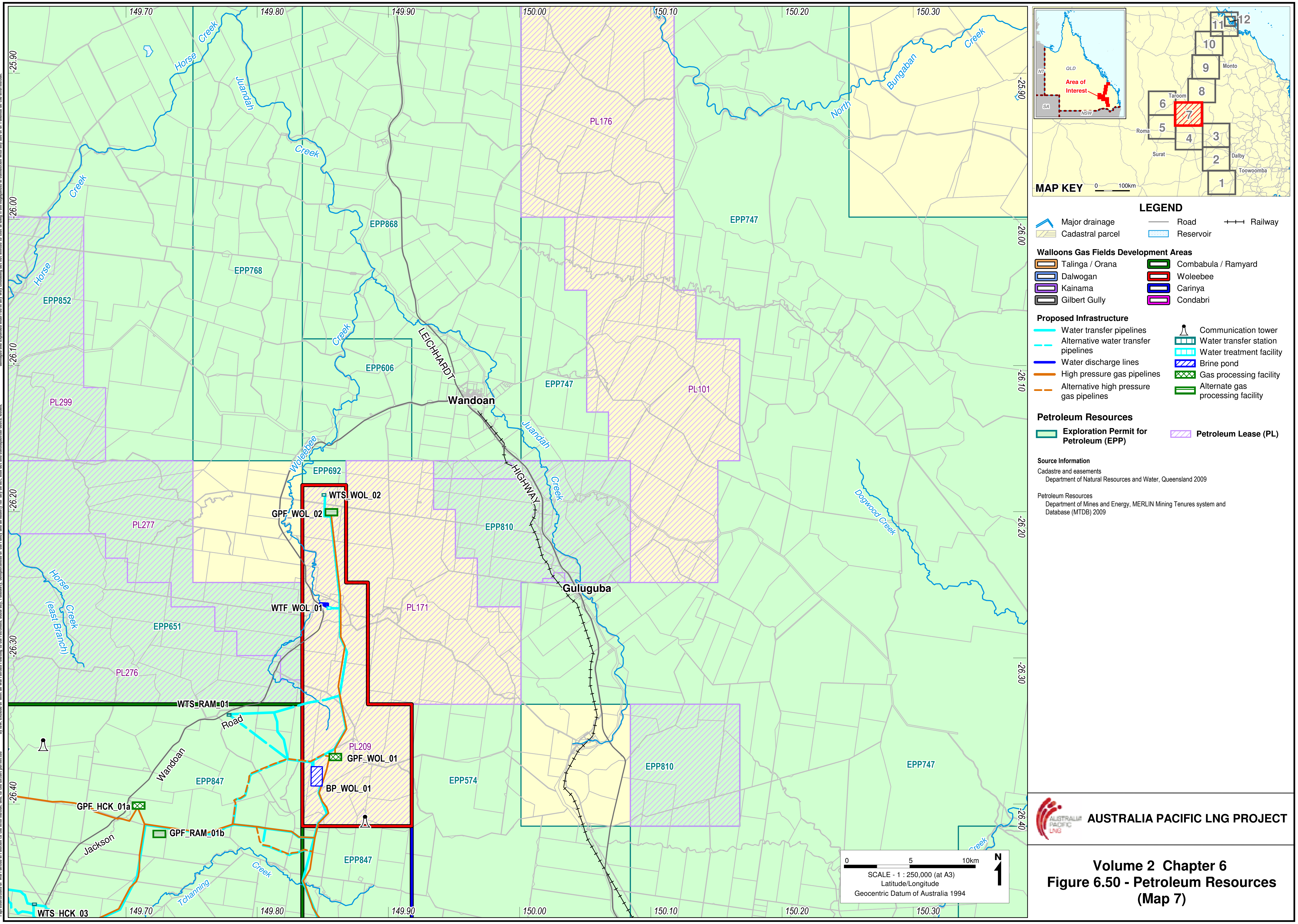
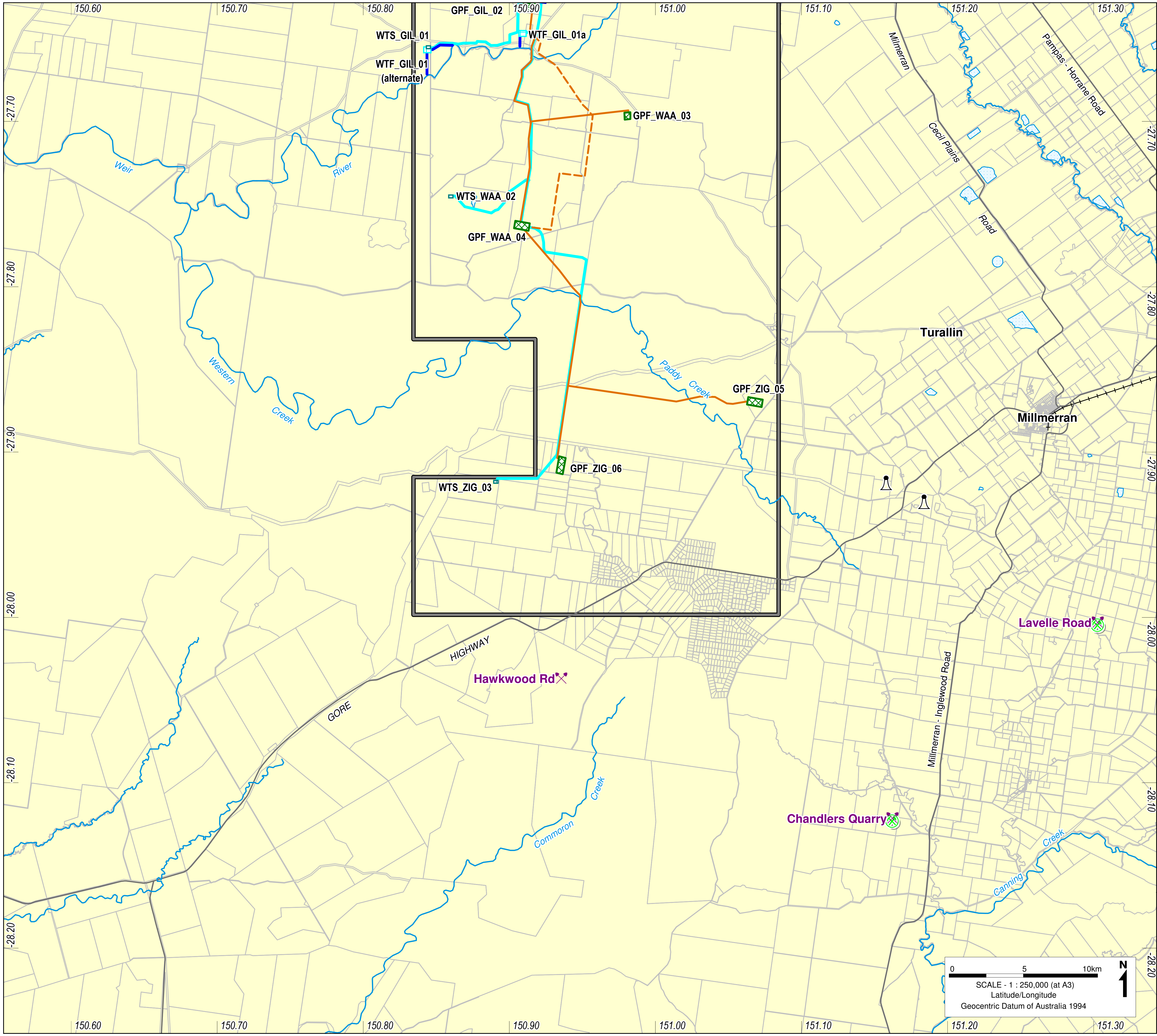
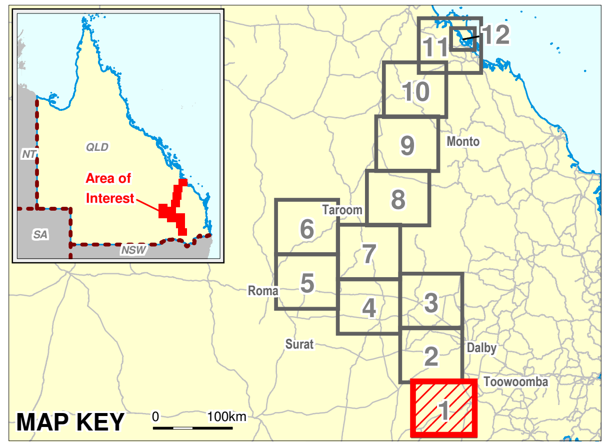


Volume 2 Chapter 6
Figure 6.50 - Petroleum Resources
(Map 7)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2235-Rev0(Vol2Chp6_PetroleumResources_07).wor





LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
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- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
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- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Extractive Resources

- Mine
- Abandoned Mine
- Quarry

Key Resource Area

- Transport Route
- Separation Area
- Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

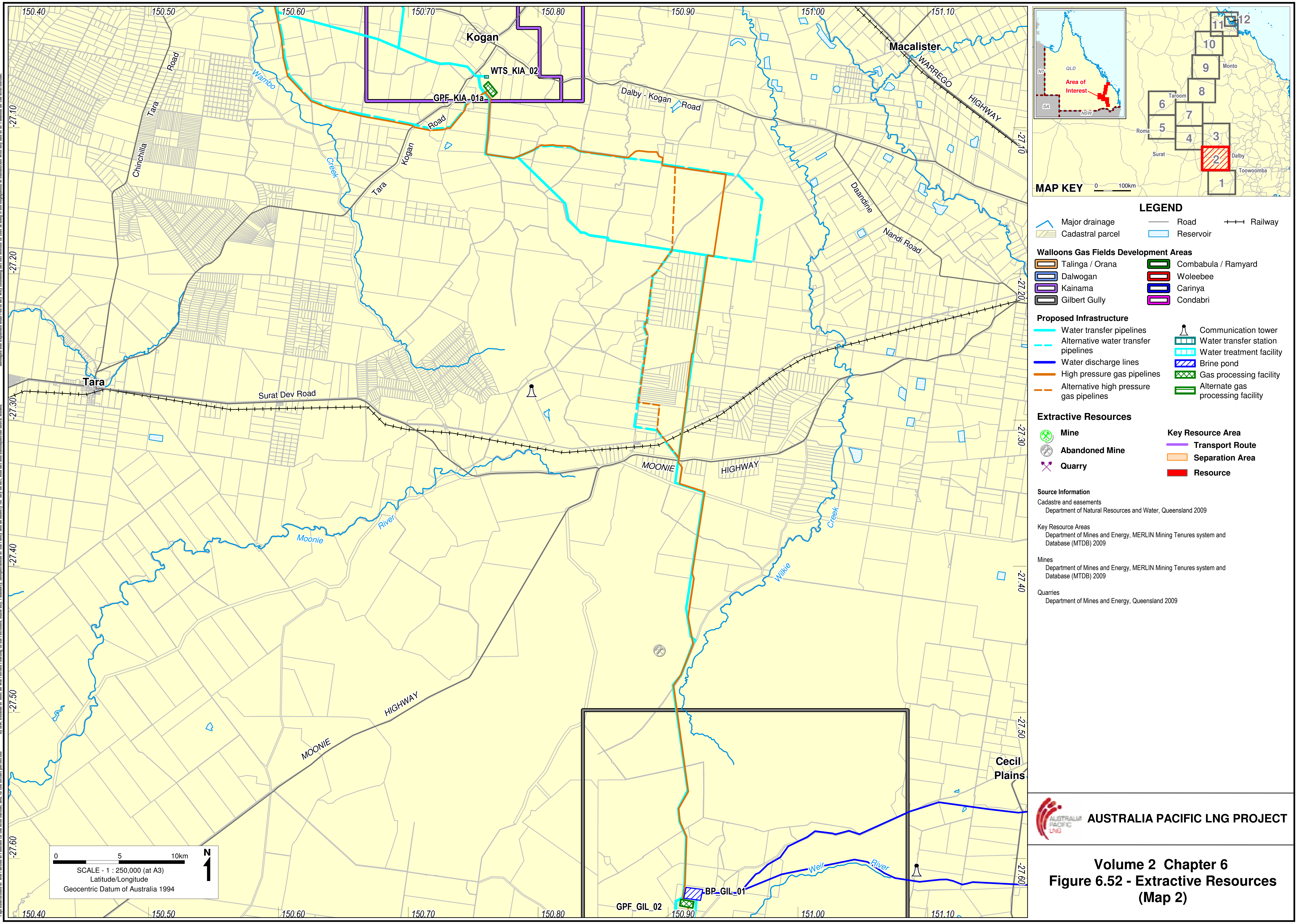
Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Quarries
Department of Mines and Energy, Queensland 2009

AUSTRALIA PACIFIC LNG PROJECT

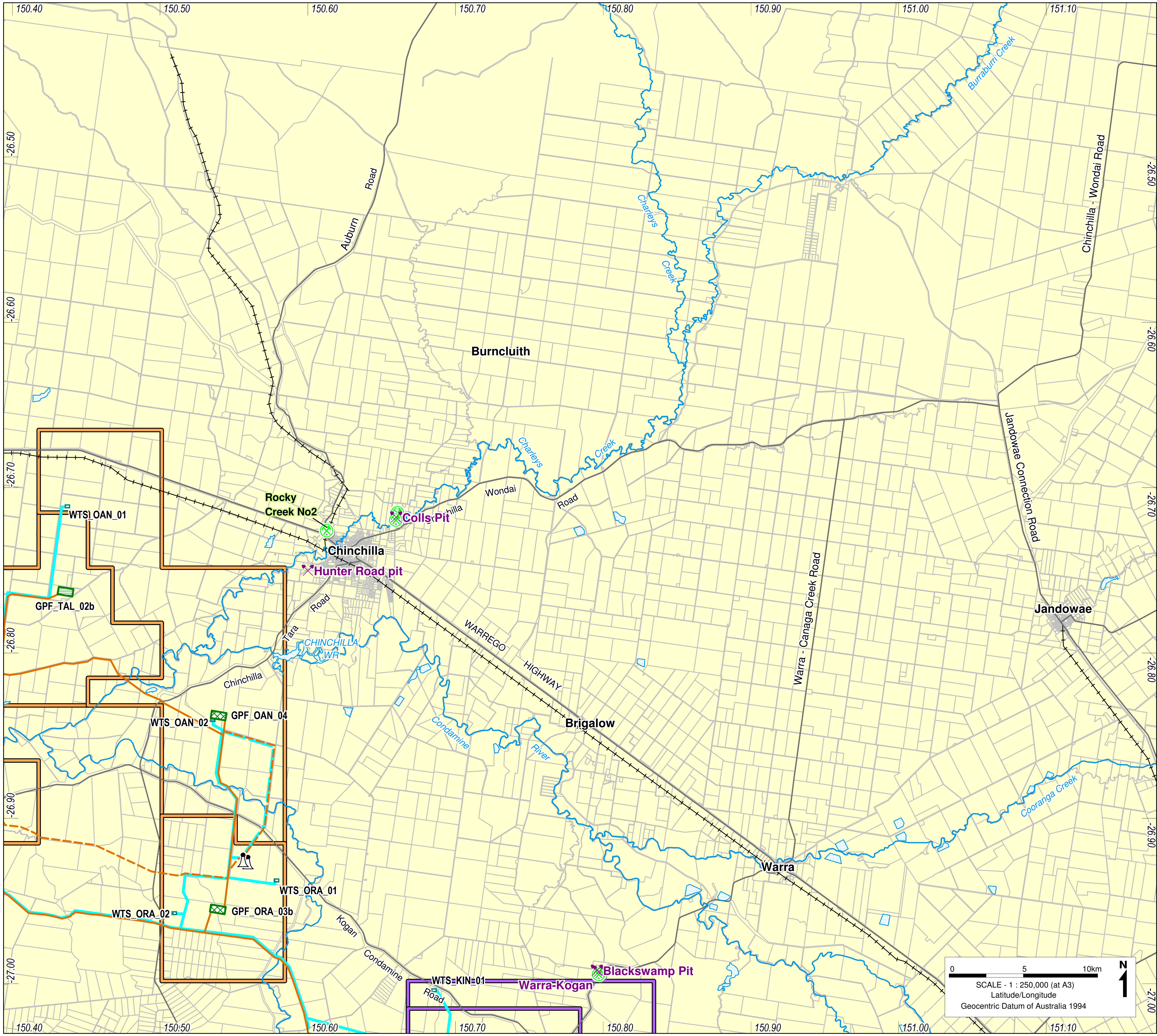
Volume 2 Chapter 6
Figure 6.51 - Extractive Resources (Map 1)

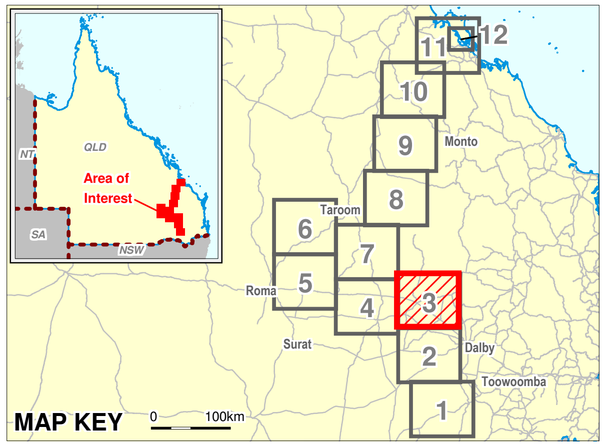
K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2114-Rev0(Vol2Chp6_ExtractiveResources_01).wor



Volume 2 Chapter 6
Figure 6.52 - Extractive Resources (Map 2)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2115-Rev0(Vol2Chp6_ExtractiveResources_02).wor





LEGEND

- Major drainage
- Cadastral parcel
- Road
- Reservoir
- Railway

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
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- Water transfer station
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- Brine pond
- Gas processing facility
- Alternate gas processing facility

Extractive Resources

- Mine
- Abandoned Mine
- Quarry

Key Resource Area

- Transport Route
- Separation Area
- Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

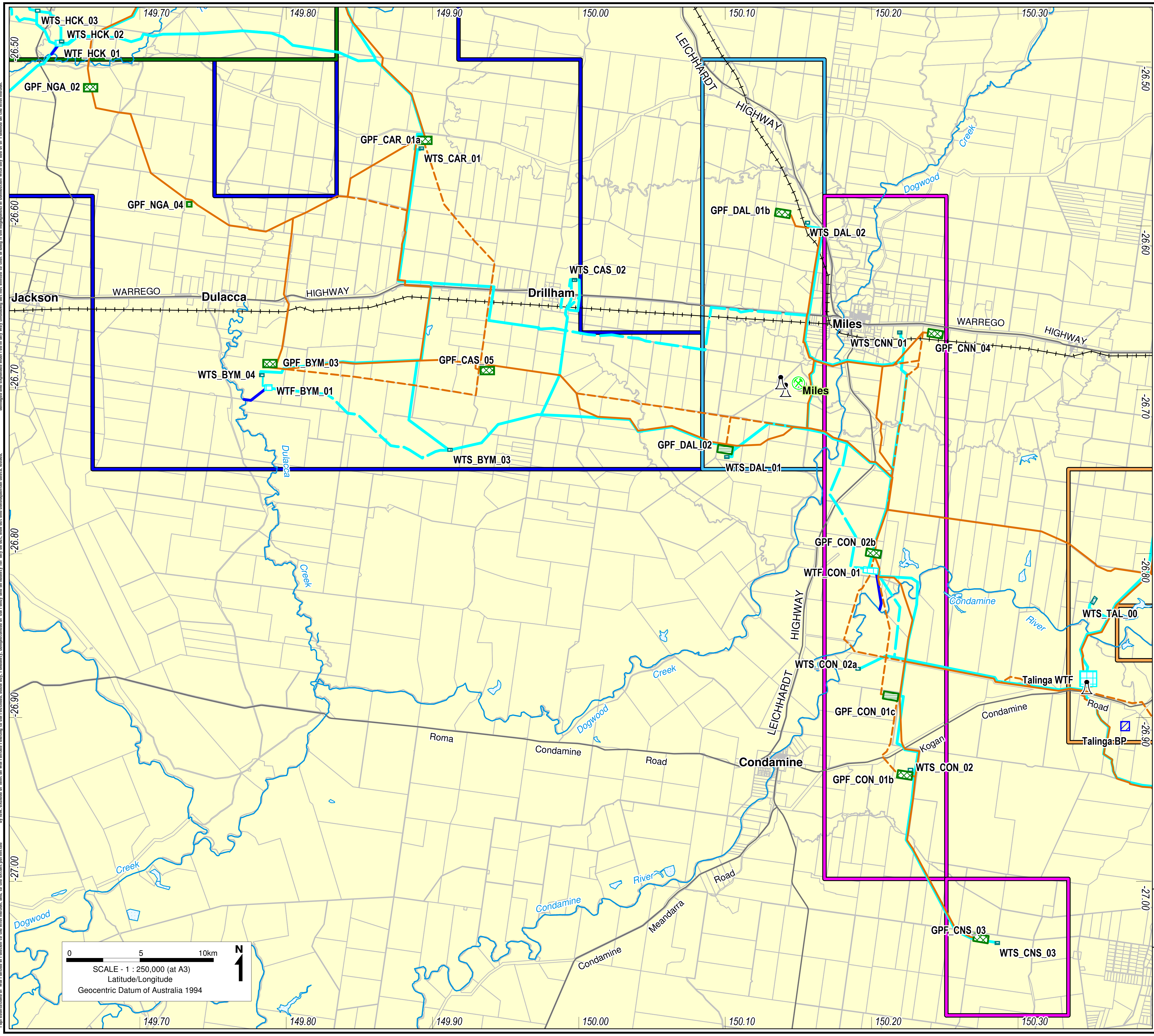
Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

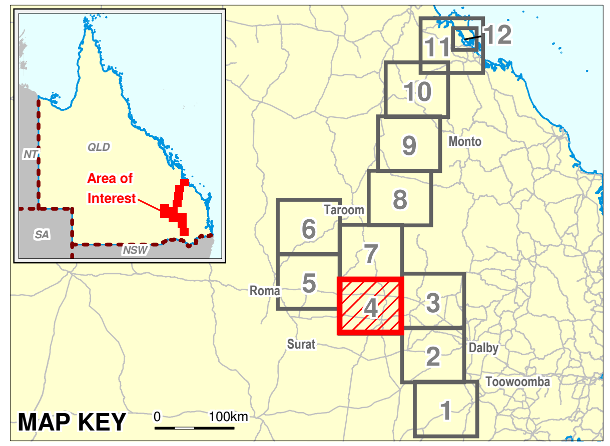
Quarries
Department of Mines and Energy, Queensland 2009

AUSTRALIA PACIFIC LNG PROJECT

Volume 2 Chapter 6
Figure 6.53 - Extractive Resources (Map 3)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2116-Rev0(Vol2Chp6_ExtractiveResources_03).wor





LEGEND

Major drainage
Road
Railway
Cadastral parcel
Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Extractive Resources

- Mine
- Abandoned Mine
- Quarry

Key Resource Area

- Transport Route
- Separation Area
- Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Quarries
Department of Mines and Energy, Queensland 2009

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Figure 6.54 - Extractive Resources (Map 4)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2117-Rev0(Vol2Chp6_ExtractiveResources_04).wor

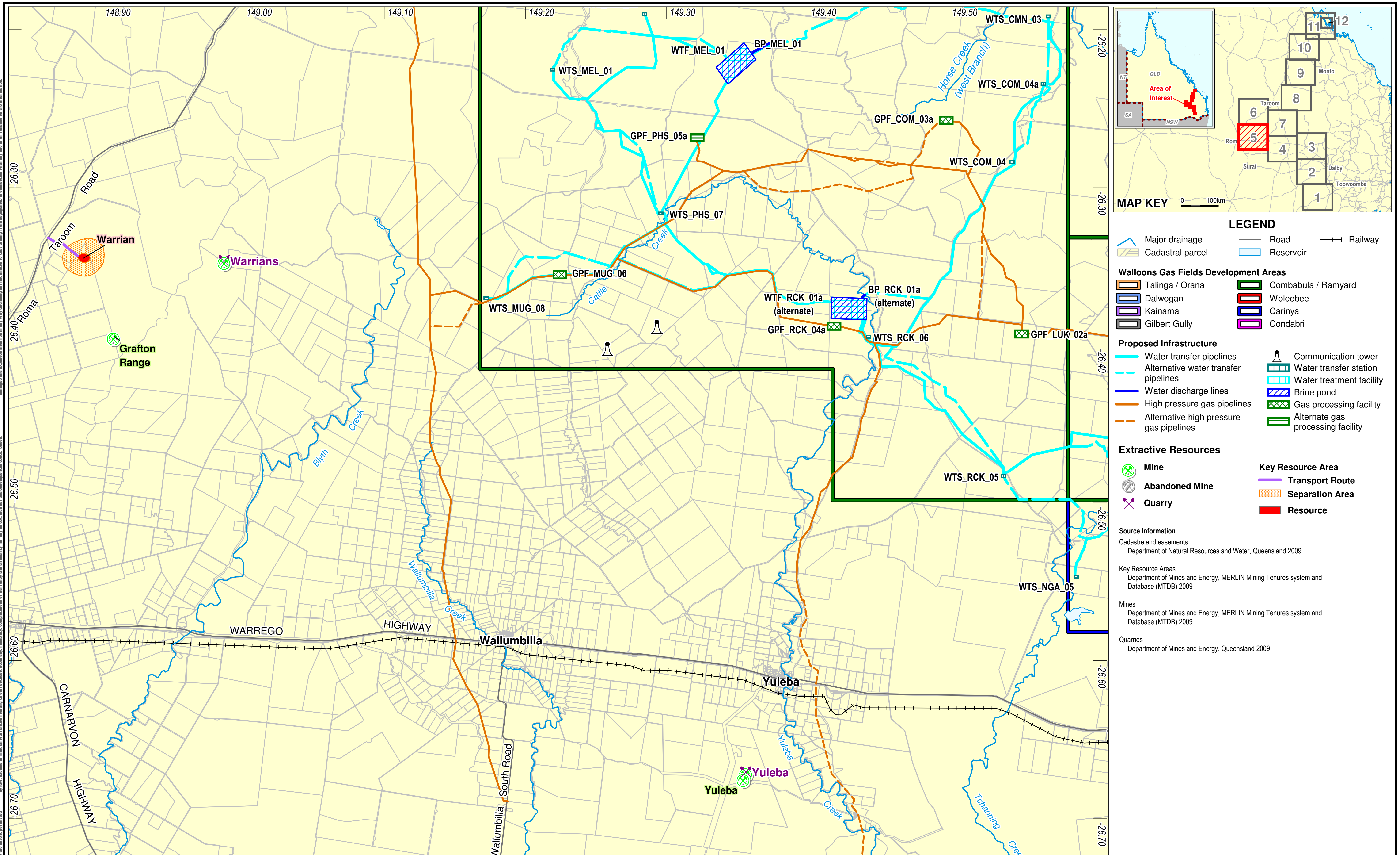

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Figure 6.55 - Extractive Resources
(Map 5)

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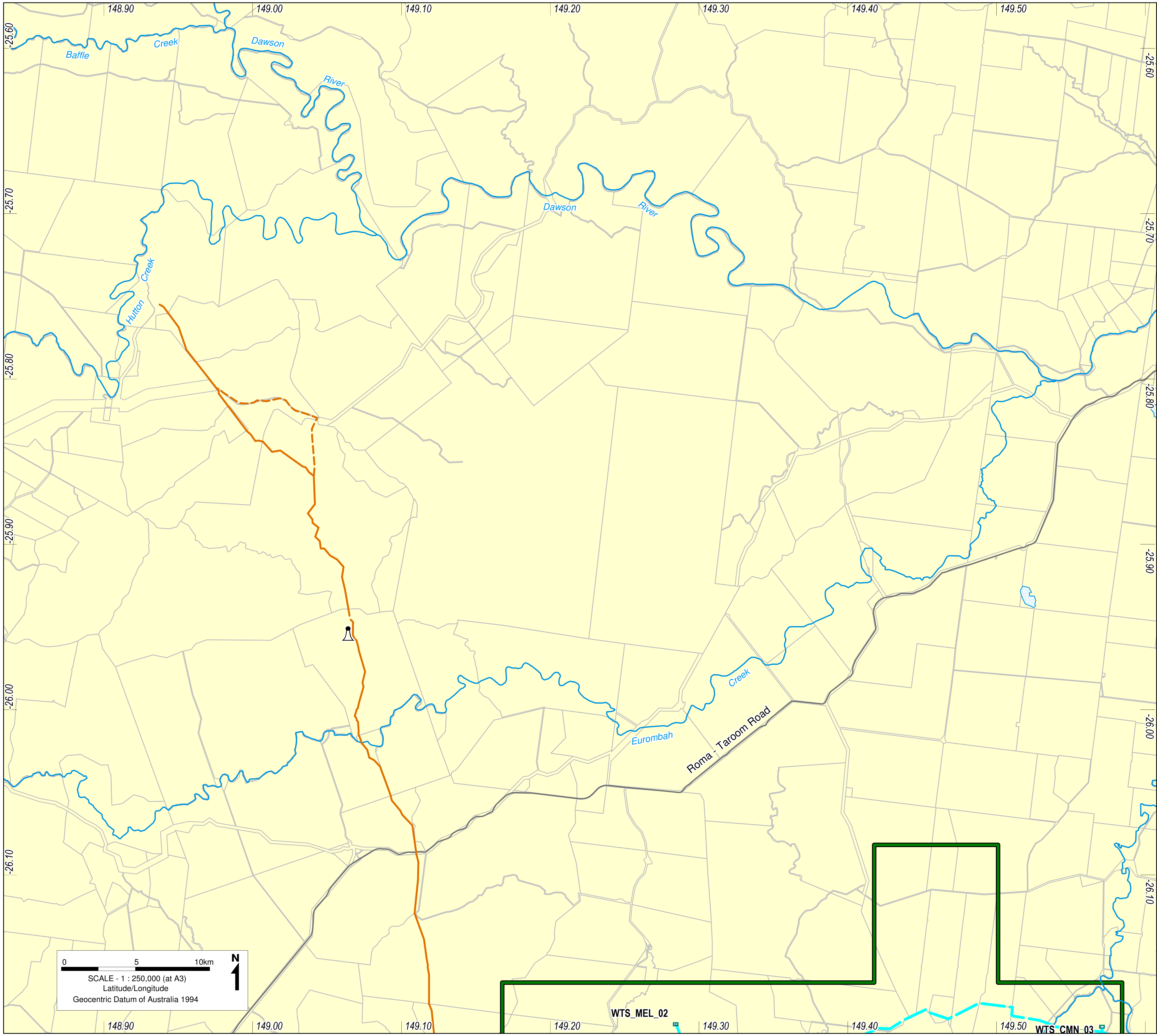

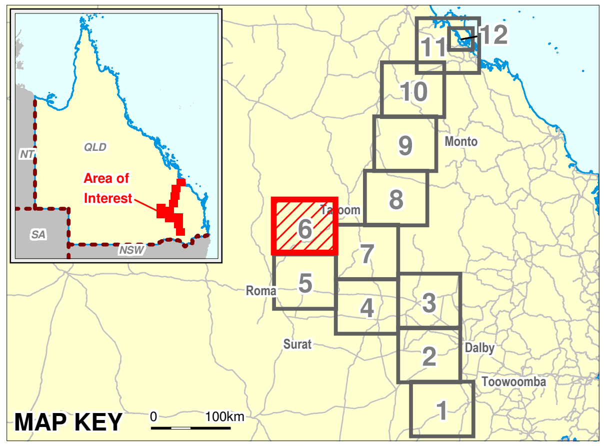

MAP KEY

LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Extractive Resources

Mine
Abandoned Mine
Quarry

Key Resource Area
Transport Route
Separation Area
Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Quarries
Department of Mines and Energy, Queensland 2009

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Figure 6.56 - Extractive Resources (Map 6)

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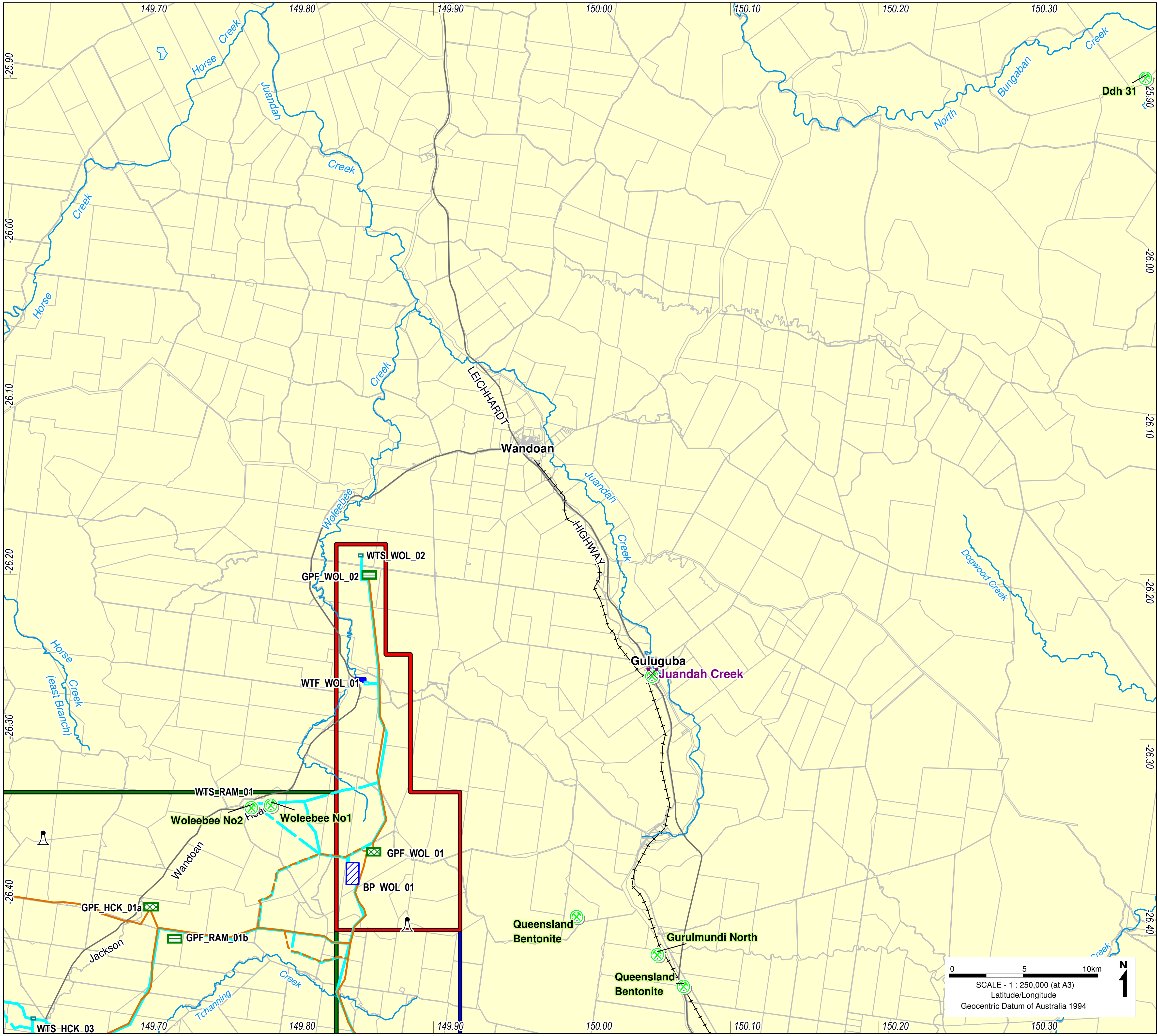

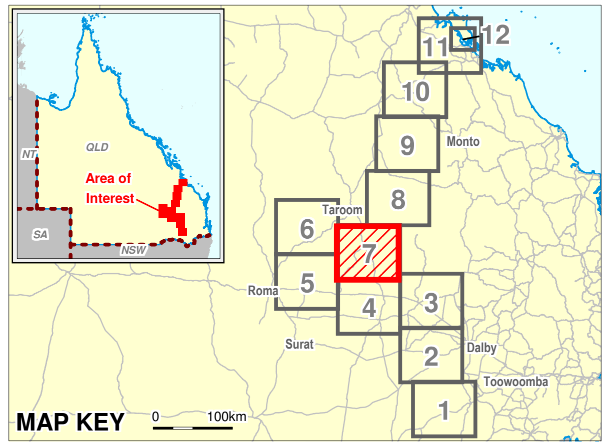

LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Extractive Resources

Mine
Abandoned Mine
Quarry

Key Resource Area

Transport Route
Separation Area
Resource

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Key Resource Areas
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Mines
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009

Quarries
Department of Mines and Energy, Queensland 2009

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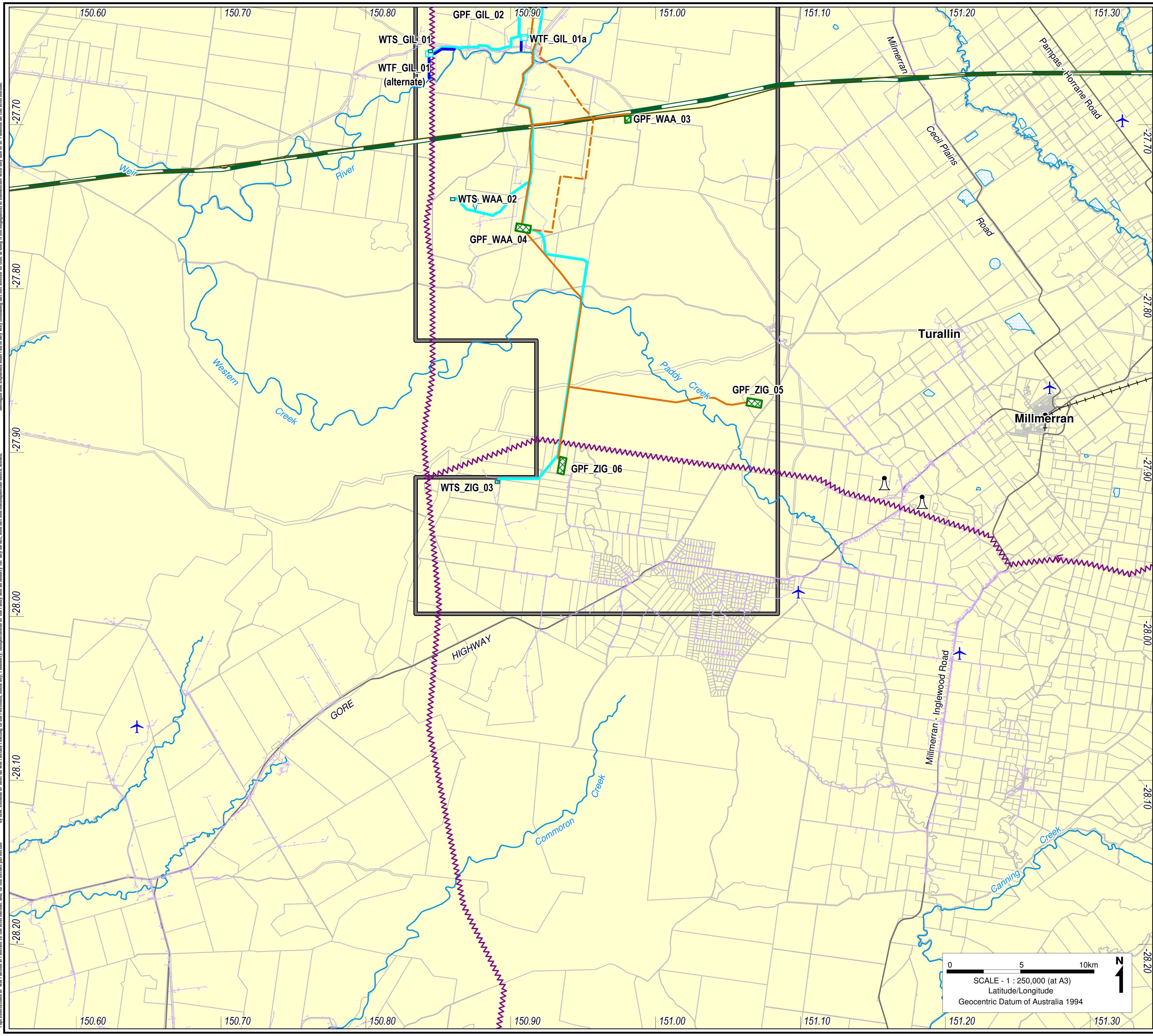
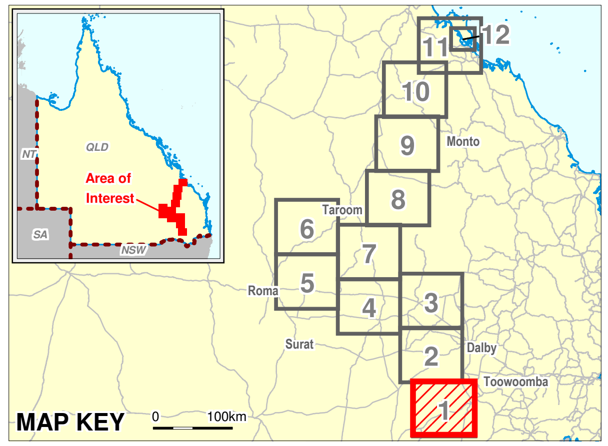
Figure 6.57 - Extractive Resources (Map 7)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2120-Rev0(Vol2Chp6_ExtractiveResources_07).wor





MAP KEY

LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Existing Infrastructure

Aircraft landing ground
Railway stop
High voltage power line
Telecommunication cable

Pipeline Type

Gas
Oil
Water
Petroleum pipeline
Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

AUSTRALIA PACIFIC LNG PROJECT

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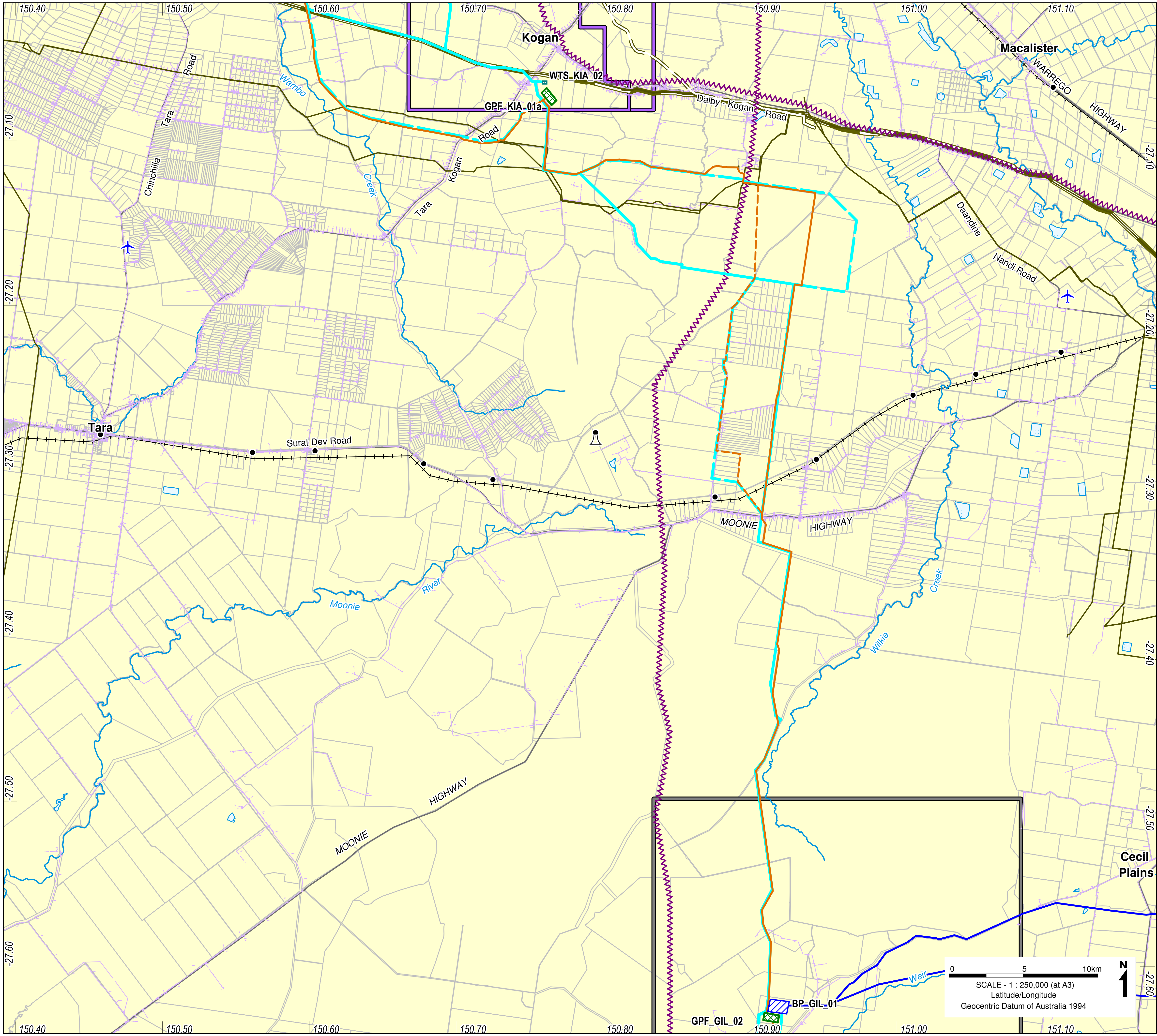
Figure 6.58 - Existing Infrastructure (Map 1)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2102-Rev0(Vol2Chp6_ExistingInfra_01).wor



MAP KEY

LEGEND

Major drainage | Road | Railway
Cadastral parcel | Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Existing Infrastructure

- Aircraft landing ground
- Railway stop
- High voltage power line
- Telecommunication cable

Pipeline Type

- Gas
- Oil
- Water
- Petroleum pipeline
- Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

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Figure 6.59 - Existing Infrastructure (Map 2)

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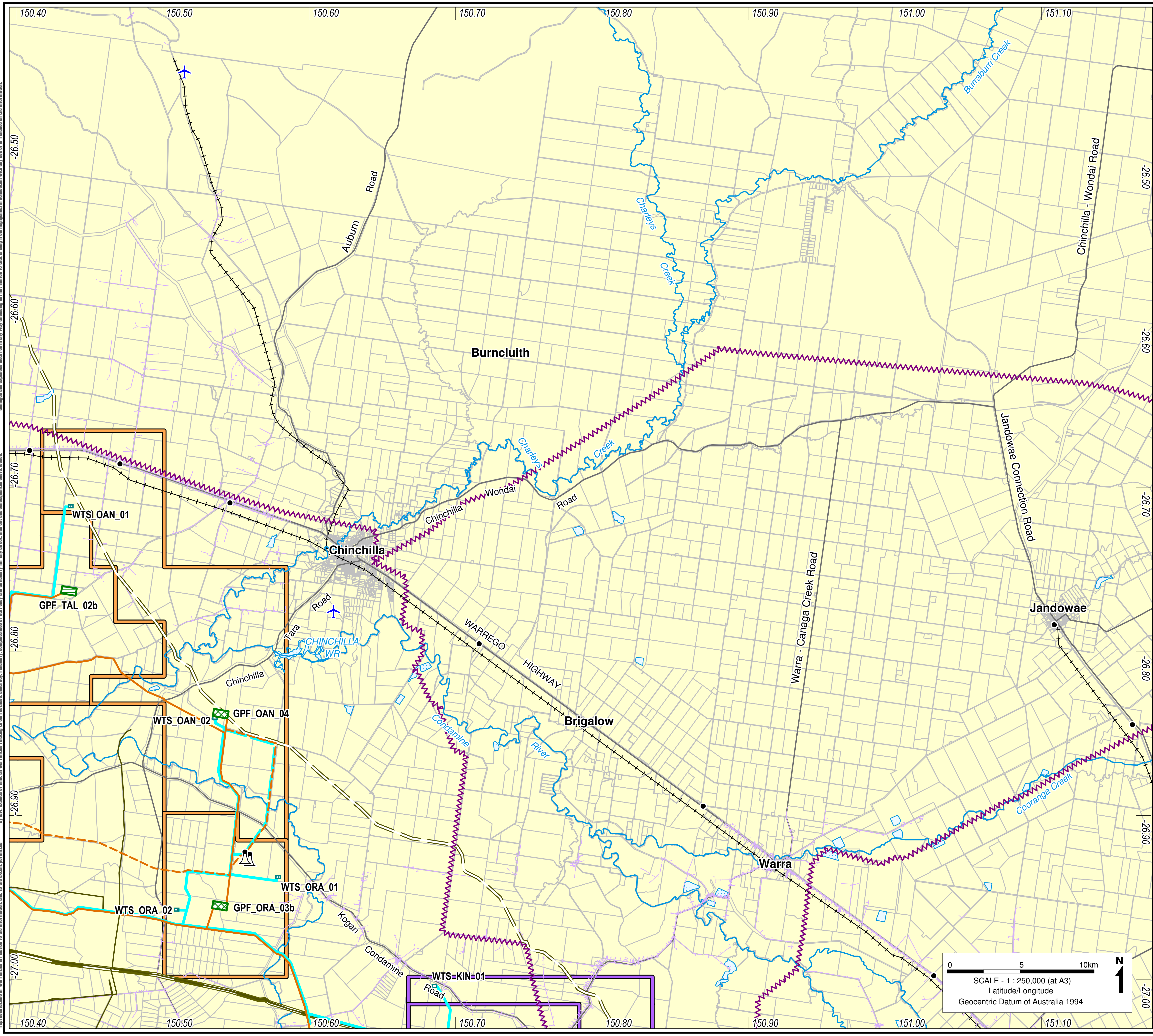
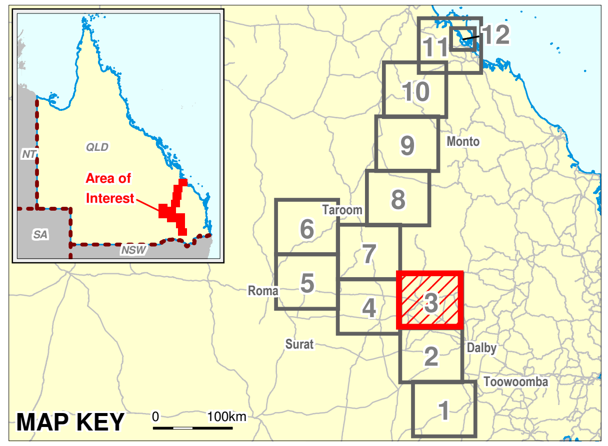


MAP KEY



LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Existing Infrastructure

Aircraft landing ground
Railway stop
High voltage power line
Telecommunication cable

Pipeline Type

Gas
Oil
Water
Petroleum pipeline
Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

AUSTRALIA PACIFIC LNG PROJECT

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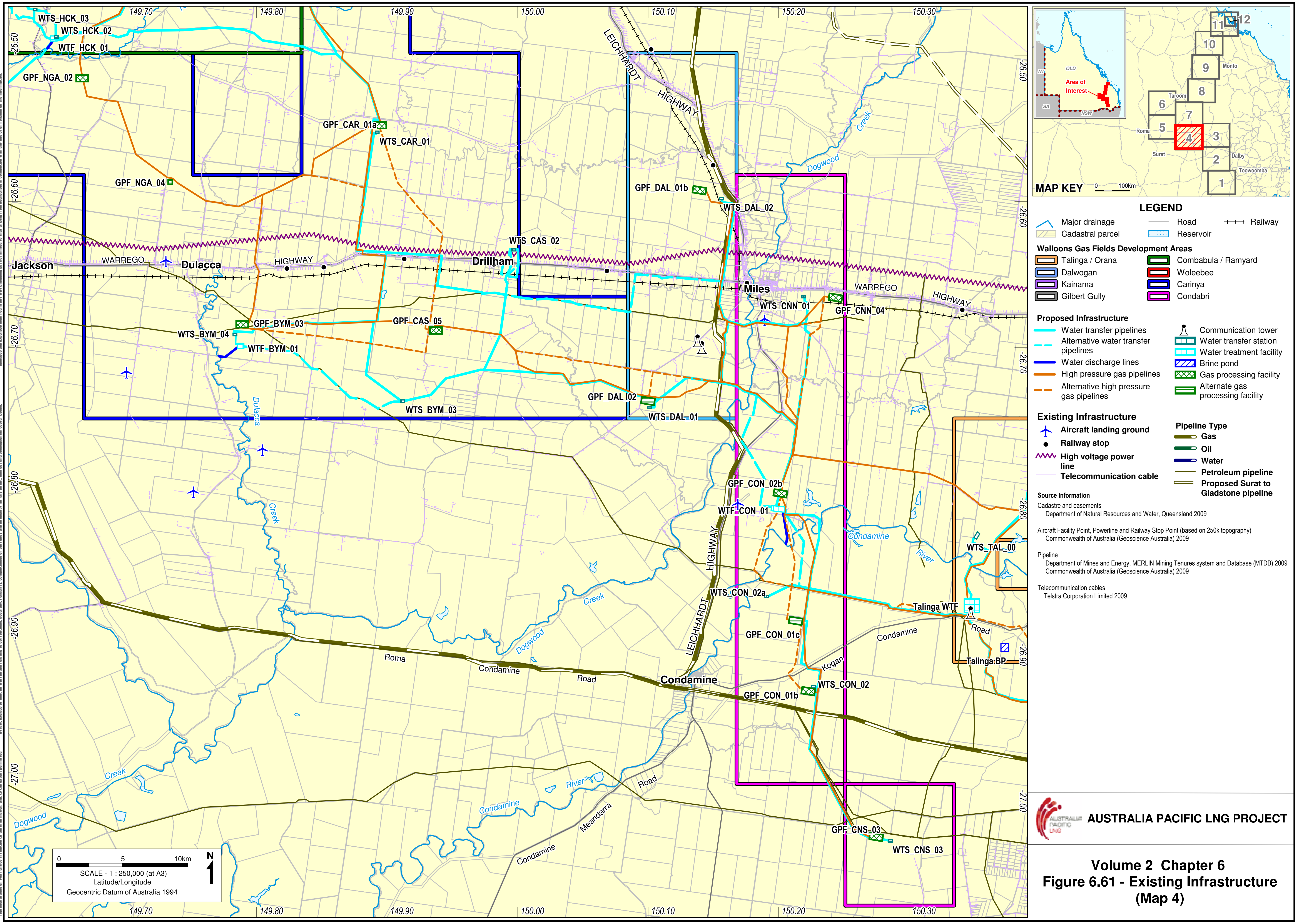
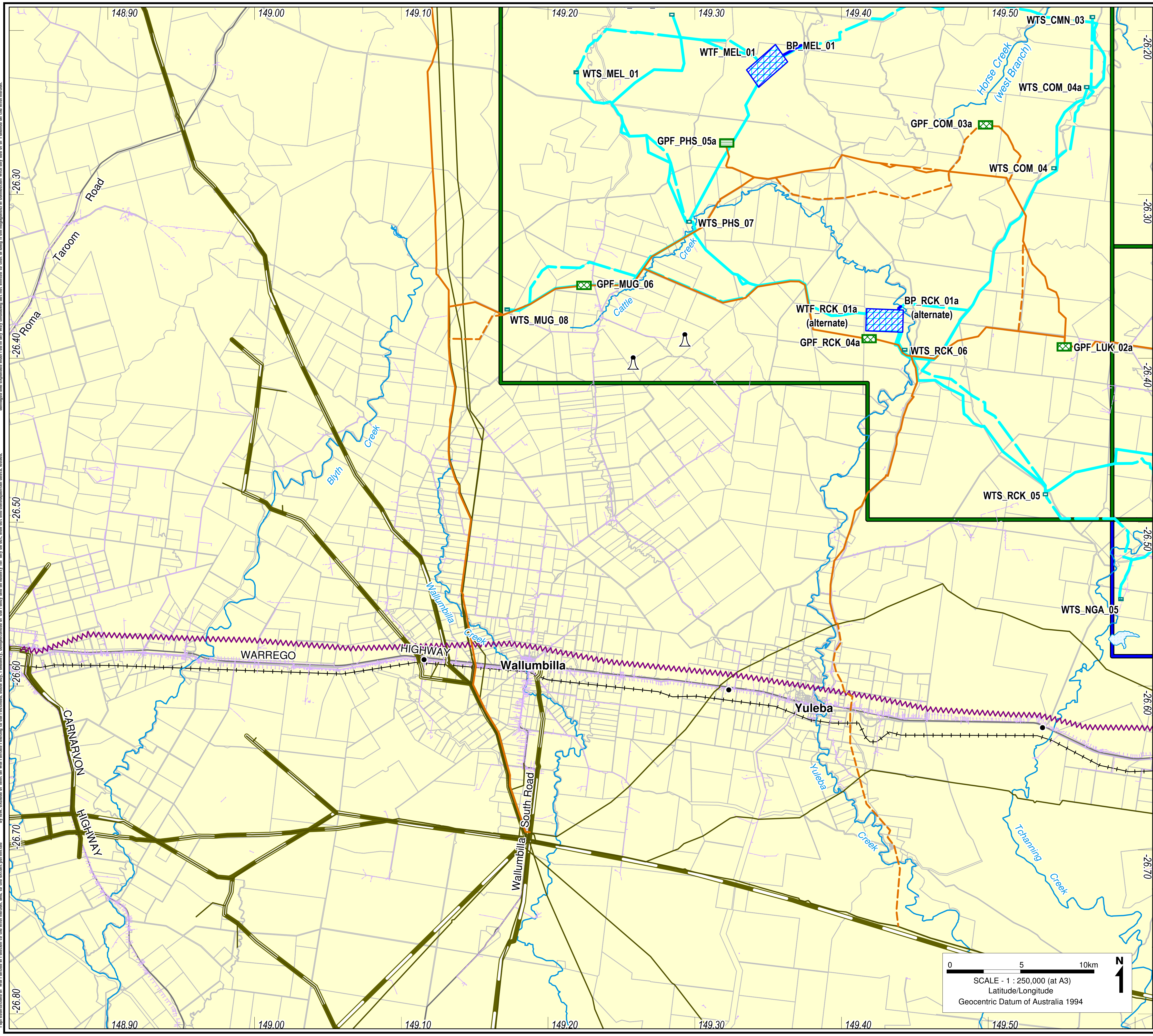
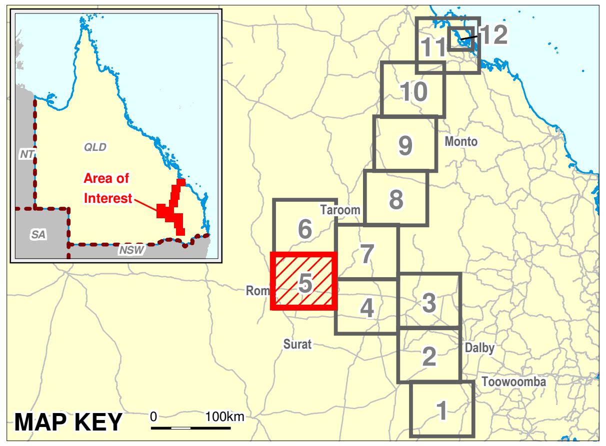
Figure 6.60 - Existing Infrastructure (Map 3)



Volume 2 Chapter 6
Figure 6.61 - Existing Infrastructure (Map 4)





LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

- Talinga / Orana
- Dalwogan
- Kainama
- Gilbert Gully
- Combabula / Ramyard
- Woleebee
- Carinya
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Existing Infrastructure

- Aircraft landing ground
- Railway stop
- High voltage power line
- Telecommunication cable

Pipeline Type

- Gas
- Oil
- Water
- Petroleum pipeline
- Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

AUSTRALIA PACIFIC LNG PROJECT

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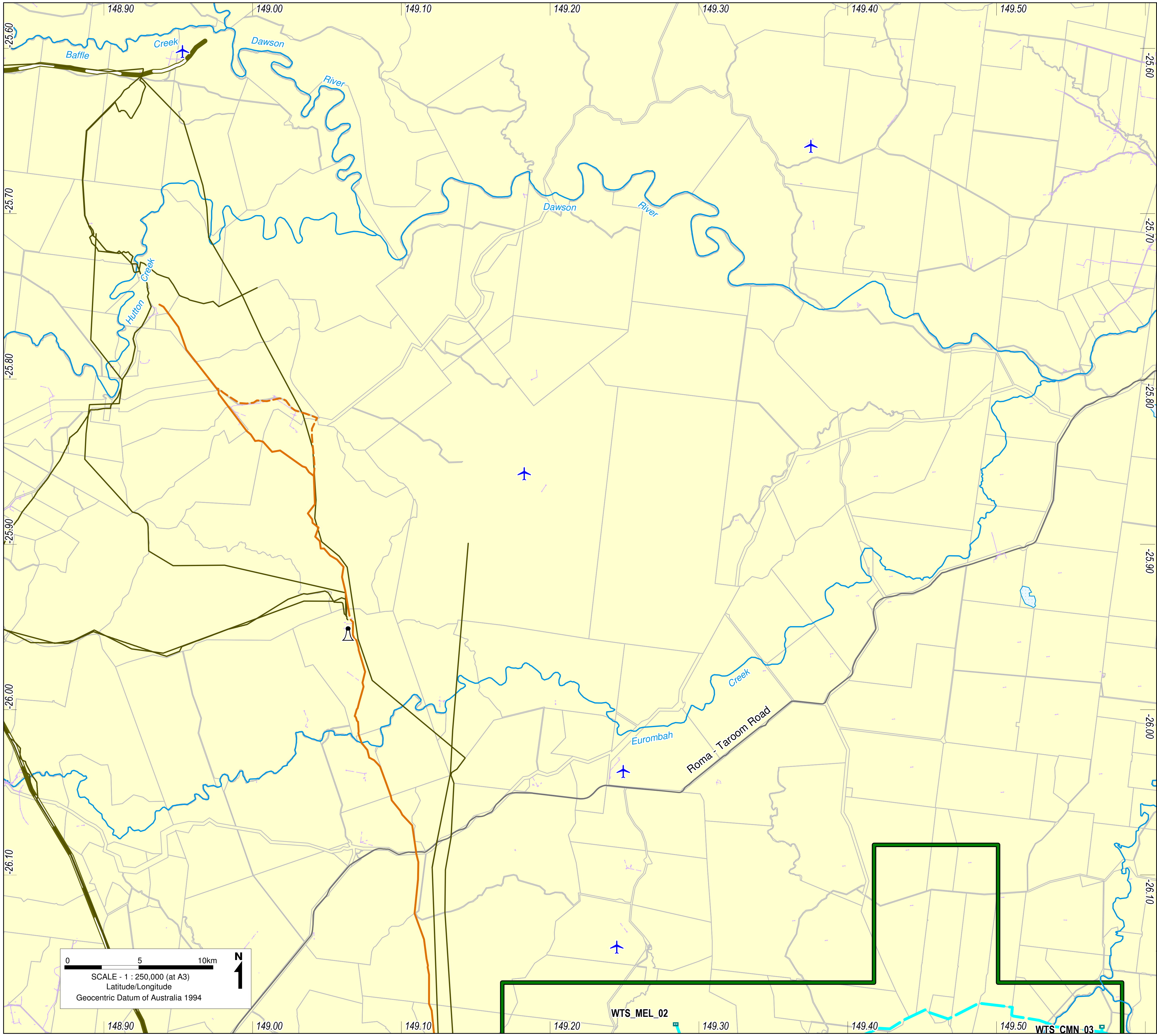
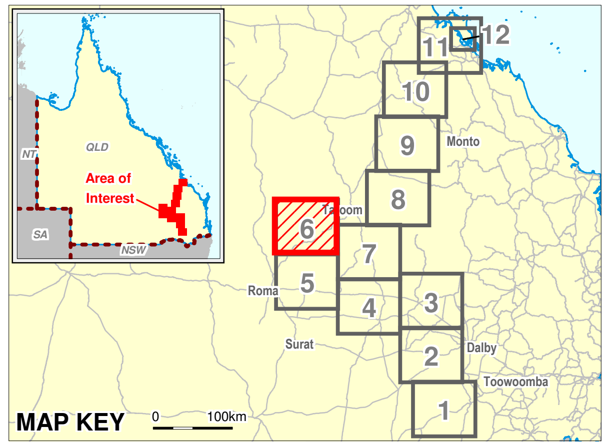
Figure 6.62 - Existing Infrastructure (Map 5)

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2106-Rev0(Vol2Chp6_ExistingInfra_05).wor





LEGEND

Major drainage
Cadastral parcel
Road
Reservoir
Railway

Walloons Gas Fields Development Areas

Talinga / Orana
Dalwogan
Kainama
Gilbert Gully
Combabula / Ramyard
Woleebee
Carinya
Condabri

Proposed Infrastructure

Water transfer pipelines
Alternative water transfer pipelines
Water discharge lines
High pressure gas pipelines
Alternative high pressure gas pipelines
Communication tower
Water transfer station
Water treatment facility
Brine pond
Gas processing facility
Alternate gas processing facility

Existing Infrastructure

Aircraft landing ground
Railway stop
High voltage power line
Telecommunication cable

Pipeline Type

Gas
Oil
Water
Petroleum pipeline
Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

AUSTRALIA PACIFIC LNG PROJECT

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Figure 6.63 - Existing Infrastructure (Map 6)

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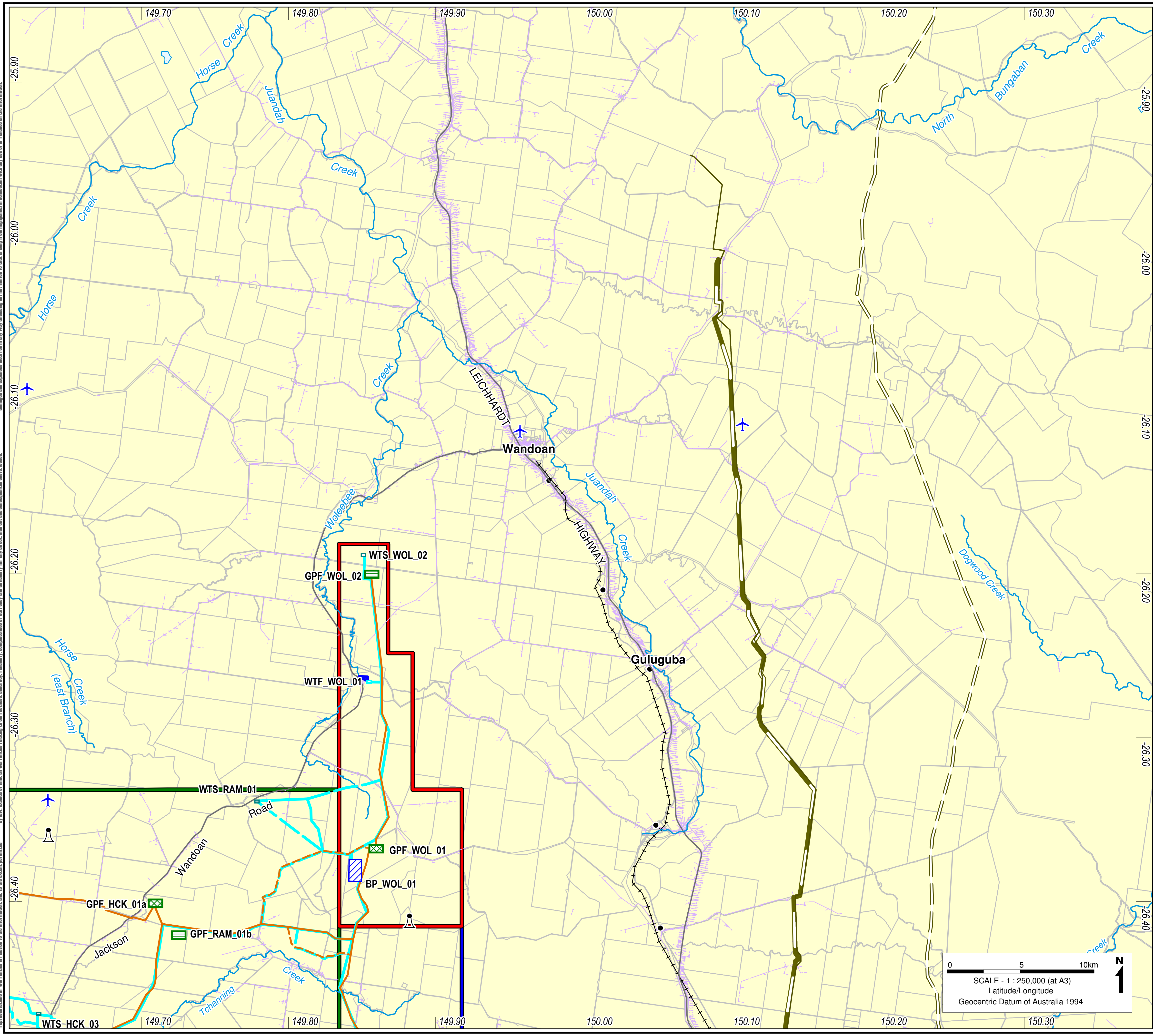

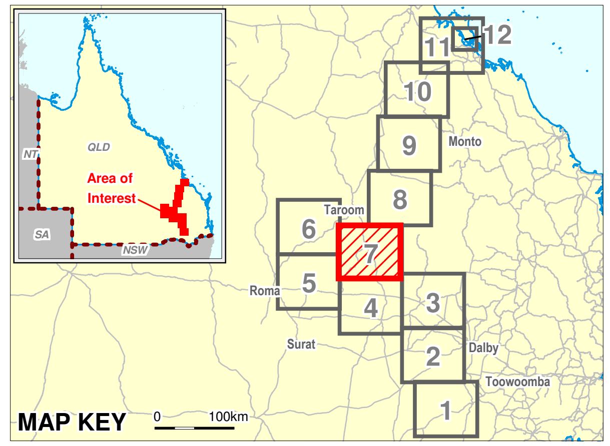

LEGEND

- Major drainage
- Road
- Railway
- Cadastral parcel
- Reservoir

Walloons Gas Fields Development Areas

- Talinga / Orana
- Combabula / Ramyard
- Dalwogan
- Woleebee
- Kainama
- Carinya
- Gilbert Gully
- Condabri

Proposed Infrastructure

- Water transfer pipelines
- Alternative water transfer pipelines
- Water discharge lines
- High pressure gas pipelines
- Alternative high pressure gas pipelines
- Communication tower
- Water transfer station
- Water treatment facility
- Brine pond
- Gas processing facility
- Alternate gas processing facility

Existing Infrastructure

- Aircraft landing ground
- Railway stop
- High voltage power line
- Telecommunication cable

Pipeline Type

- Gas
- Oil
- Water
- Petroleum pipeline
- Proposed Surat to Gladstone pipeline

Source Information

Cadastre and easements
Department of Natural Resources and Water, Queensland 2009

Aircraft Facility Point, Powerline and Railway Stop Point (based on 250k topography)
Commonwealth of Australia (Geoscience Australia) 2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Telecommunication cables
Telstra Corporation Limited 2009

AUSTRALIA PACIFIC LNG PROJECT

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Figure 6.64 - Existing Infrastructure (Map 7)