AUSTRALIAN ZIRCONIA LTD

(A wholly owned subsidiary of Alkane Resources Ltd)

Dubbo Zirconia Project

Socio-economic Impact Assessment

Prepared by

Diana Gibbs and Partners

September 2013

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Socio-economic Impact Assessment

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EXECUTIVE SUMMARY

The Dubbo Zirconia Project ("the Proposal" or DZP) would comprise a small scale open cut mine and associated infrastructure (mineral processing plant and residue storage facilities) that would occupy an area of land currently used for mixed agricultural activities (livestock grazing and cropping). The proposed activities would be located near Toongi, a village approximately 25km south of the major regional centre of Dubbo.

The mining sectors, and services associated with mining, have been identified as a potential source of growth for Dubbo and the surrounding region (DCC, 2012).

The DZP would produce a range of rare metal and rare earth products, of which the more important are zirconium, niobium and yttrium, together with heavy and light rare earth elements (REEs). These minerals are used for catalysts, ceramics, electronics, refractory glass, special alloys (including coinage), magnets, and other "high tech" applications.

With a mining rate of approximately 1Mtpa of ore, the Proposal would produce around 75,000tpa of output, with a total revenue stream of over $500 million/year. The total capital investment required to deliver the Proposal is just under $1 billion ($996 million - including a contingency of $166M), with Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) generated estimated at around $5.4 billion over the 20 year life of the Proposal[1].

The construction phase of the Proposal would generate between 300 and 400 positions (although not all at one time), virtually all of whom would be based in Dubbo over this 18 month to two year phase. Accordingly, there is no plan to construct a "mining village" or construction camp to house the construction workforce. There would be no significant FIFO (fly in fly out) component involved in the construction phase, as the Applicant has committed to seeking local suppliers and workers for construction activities wherever feasible.

The operational phase of the Proposal would create permanent jobs for around 250 workers, most of whom would be sourced locally. It is therefore highly unlikely that there would be any FIFO workforce once the DZP is operational. Approximately 25 to 35 technical specialists with defined skills (Chemical Engineers, Metallurgists, and Industrial Chemists) are likely to migrate to Dubbo to join the operational workforce, as these skills do not currently exist locally. There is unlikely to be demand for new accommodation as a result of the Proposal significantly greater than would ordinarily be experienced for a growing regional centre such as Dubbo.

The operation of the DZP would generate around $50 million additional annual stimulus for the local economy, in the form of salaries and wages, payment for utilities, and purchase of other locally-provided goods and services. Payments to labour (wages and salaries) alone are estimated to total $34 million per year, with a further $13.4 million to be paid to the various utilities required. In addition, the DZP would yield royalties for the State of NSW of around $12 million/year, and generate corporate taxation for the Australian Government of around $75 million/year.

[1] It is noted that the rare metal and rare earth resource significantly exceeds that which could be mined and processed within 20 years. Subject to a future development application, there is potential for the operation of the DZP to continue well beyond 20 years with a commensurate increase in the EBITDA generated by the DZP.

The existence of services such as a substantial power supply and a gas pipeline, as well as transport infrastructure, workforce accommodation in Dubbo, and the potential availability of water from the Macquarie River, in close proximity to the mineral deposit, adds significantly to the viability of this Proposal.

The change in land use from agriculture to mining would involve a loss in the total annual value of agricultural production of around $674,000 per year. However, following rehabilitation after mining ceases, all but 1,220ha will be returned to agriculture, and the value of production from the site is likely to be $403,000 per year lower than current levels. The 1,220ha of land excised from agriculture would be managed as a biodiversity offset or other non-agricultural purpose.

When modelled over a 40 year period (i.e. assuming a mine life of 20 years, with a further 20 years following rehabilitation), the Present Value of the total loss of agricultural production (using a discount rate of 10%) is **$6.25 million**. This represents 0.15% of the estimated PV of the total value of production of **$4,257 million** (at 10% discount rate) from the proposed 20 years of operation of the DZP.

1. INTRODUCTION

The Dubbo Zirconia Project ("the Proposal" or DZP), located approximately 25km south of Dubbo (see **Figure 1**) would introduce a significant new component of mining activity into the Dubbo region. The Proposal would comprise a small scale open cut mine supplying ore containing rare metals (zirconium and niobium) and rare earth elements (REEs) to a processing plant and associated materials storage, loading/unloading facilities beside the Village of Toongi, approximately 25km south of Dubbo (see **Figure 1**). It would occupy 2,864 hectares of land currently used for mixed agricultural activities within the Dubbo City local government area (LGA).

The mining sectors, and services associated with mining, have been identified as a potential source of growth for Dubbo and the surrounding region (DCC, 2012).

An assessment of the social and economic impacts of the DZP is required to be completed as a part of the Environmental Impact Statement (EIS), prepared under the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act). This assessment consists of a summary of the socio-economic characteristics of the local area and the surrounding region, to provide some context for the assessment of relative impacts of the Proposal. Current uses made of the land involved in the Proposal are also outlined, although greater detail of the agricultural use made of this land area, and the assessed impacts of changes in land use resulting from the development of the DZP, are presented in an *Agricultural Impact Statement* (AIS) prepared for the Proposal.

The direct impacts likely to result from the Proposal are then assessed, for both the construction and operational phases. This assessment is based on standard economic principles, augmented by a series of consultations with local community representatives (particularly in the immediate locality of the proposed operations) spread over a period of twelve months.

2. DESCRIPTION OF THE DZP

2.1 DZP OVERVIEW AND APPLICATION AREA

The DZP would comprise a small scale open cut mine supplying approximately 1Mt of ore containing rare metals (zirconium and niobium) and rare earth elements (REEs) to a processing plant annually (19.5 million tonnes of ore over a period of 20 years). The land on which the proposed open cut, processing plant and associated facilities for the management of waste generated by these activities is collectively referred to as the DZP Site.

The Proposal also incorporates the following three component areas (see **Figure 1**).

- Potential upgrade and reactivation of the Toongi to Dubbo Section of the Dubbo-Molong Rail Line. AZL also proposes to construct a pipeline to deliver natural gas from the Central West Pipeline operated by APA Group within the 'Toongi-Dubbo Rail Line and Natural Gas Pipeline Corridor'.
- Construction of a water pipeline to deliver up to 4.05GL of water from the Macquarie River to the processing plant (the "Macquarie River Water Pipeline").
- Upgrades, including minor realignment, creek crossing upgrade and pavement strengthening, of the public road network (Toongi Road and Obley Road).

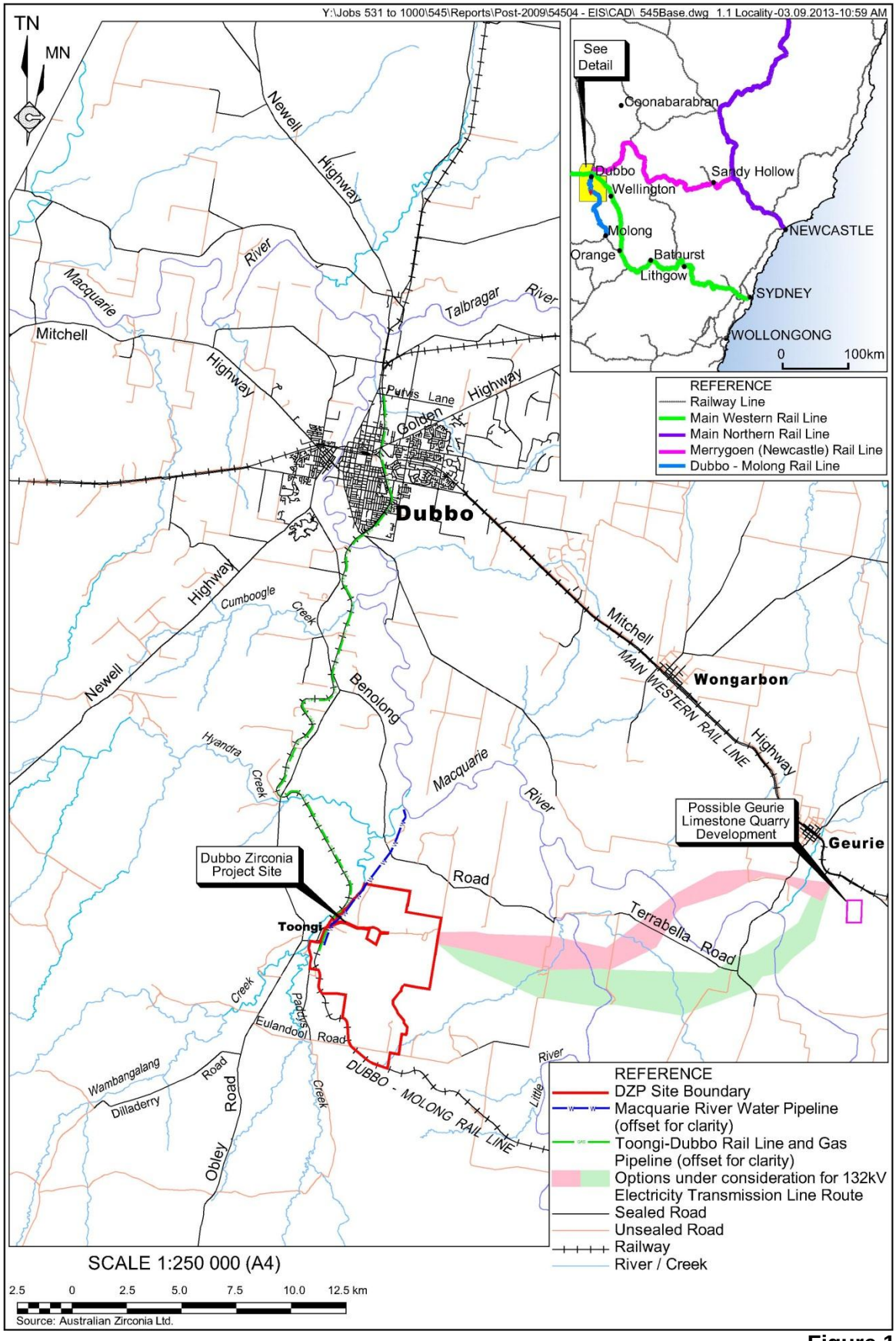


Figure 1
Locality Plan

Excluding the 132kV ETL, the component areas identified above comprise the DZP Application Area.

2.2 DZP SITE OPERATIONS

The following provides an overview of principal components and activities to be undertaken on the DZP Site (and illustrated on **Figure 2**).

- Extraction of approximately 19.5Mt of ore at a maximum rate of 1.1Mt total movement per year from a shallow open cut developed to a maximum depth of 32m (355m AHD) (remaining above the groundwater table).
- Extraction and placement of approximately 3.5Mt of waste rock (weathered material or rock containing insufficient grades of rare metals or REEs for processing) within a small waste rock emplacement (WRE) to the southwest of the open cut.
- A conventional method of transportation is proposed using trucks to haul the ore to a Run-of-Mine (ROM) Pad for crushing and grinding.
- Processing of the crushed and ground ore by:
  - Sulphation roast of ore and leaching to dissolve sulphated metals.
  - Solvent extraction, precipitation, thickening, washing and drying of the various rare metal and REE products.

  The sulphuric acid required as part of the sulphation process would be manufactured within the DZP processing plant from imported raw sulphur.
- Construction and operation of a rail siding from the Toongi-Dubbo Rail Line and a Rail Container Laydown and Storage Area for the unloading and temporary storage of reagents and loading of products for despatch.
- Other reagents would be transported to the DZP Site via the public road network, with sections of Obley Road and Toongi Road to be upgraded to accommodate the proposed increase in heavy vehicle traffic.
- Mixing of solid residues produced by the processing of the ore with crushed and washed limestone and transportation via conveyor to a Solid Residue Storage Facility (SRSF).
- Pumping of water used in the processing operations, which cannot be recycled, to a Liquid Residue Storage Facility (LRSF), comprising a series of terraced and lined crystallisation cells.
- Recovery and disposal of an estimated 6.7Mt of salt which would accumulate within the LSRF within a series of Salt Encapsulation Cells adjoining the WRE and SRSF.
- Other ancillary activities including equipment maintenance, clearing and stripping of the areas to be disturbed and rehabilitation activities.

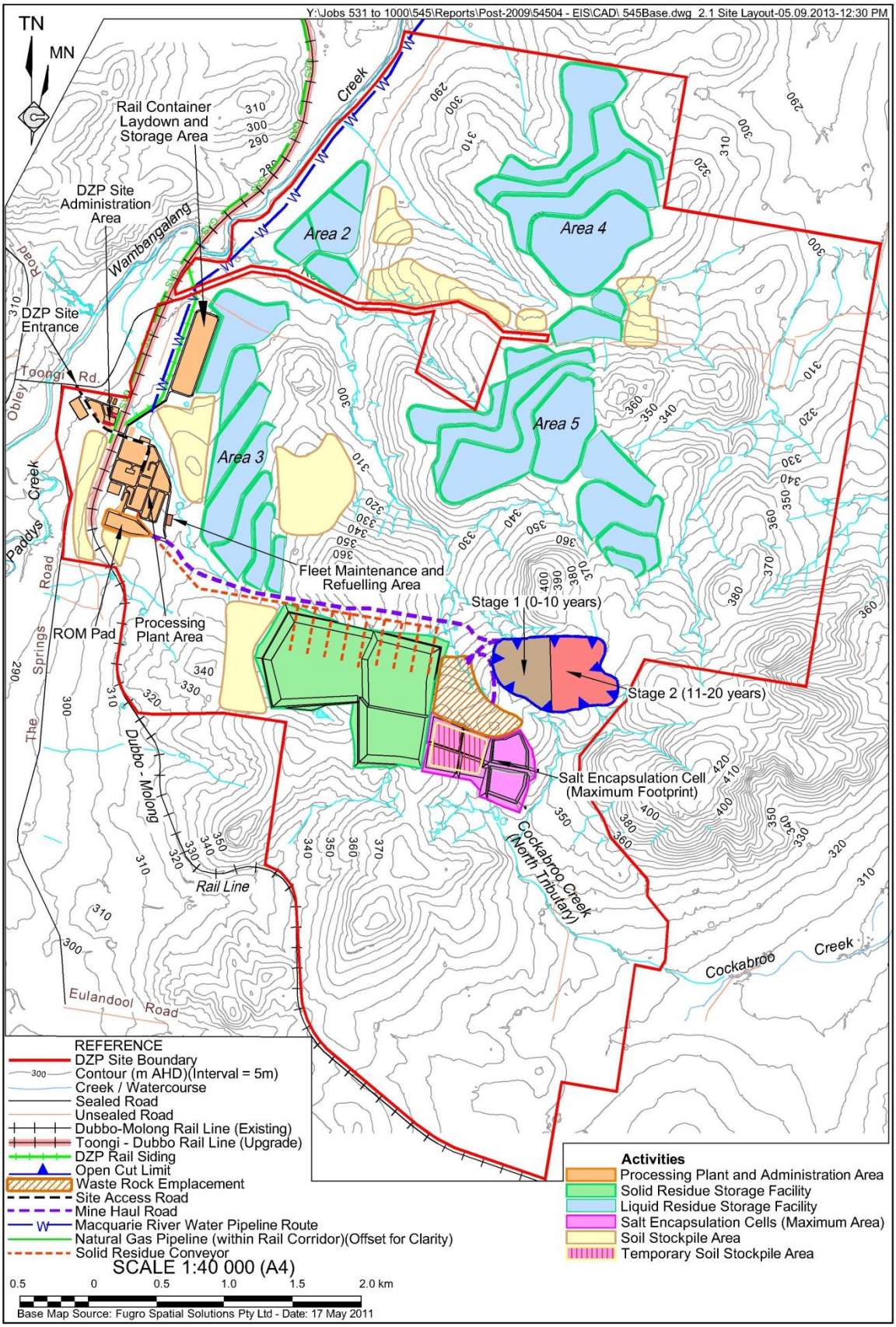


Figure 2
Principal Components and Activities

The maximum development footprint on the DZP Site would be approximately 807.7ha (within the Application Area of 2 864ha; see **Figure 2**). Component disturbance areas or the DZP Site are as follows:

- Open Cut Mine – 40.3ha.
- Waste Rock Emplacement Area – 20.4ha.
- ROM Pad – 4.2ha.
- Processing Plant and DZP Site Administration Area (incorporating the processing plant and associated reagent storage areas, rail siding and container laydown areas and site offices and administration complex) – 43.3ha.
- Solid Residue Storage Facility – 102.8ha.
- Liquid Residue Storage Facility (Salt Crystallisation Cells) – 425.4ha.
- Salt Encapsulation Cells – up to 34.6ha.
- Roads and other Infrastructure – up to 5ha.
- Soil Stockpile Areas – up to 129ha.
- Internal Haul Roads – 7.3ha.

The ore body to be mined is a roughly elliptical stock in shape with outcrop dimension of 600m x 400m. Exploration completed by AZL has demonstrated that the ore body extends below a thin veneer of soil and recent sediments to be approximately 900m (east-west) x 500m (north-south) (surface area of 36ha) and appears to be a near vertical body of indeterminate depth.

While there is limited scope to modify the area of impact associated with the open cut, in order to minimise the impact of the mining operations on the Pink-Tailed Worm-lizard (a threatened species under State and Commonwealth legislation), the Applicant has designed the mining sequence such that the initial 10 year mine plan develops the western half of the open cut with the eastern half developed and mined during the second 10 year mining period (see **Figure 2**).

The size and location of the other components of the DZP Site have been the subject of more detailed review, with impact minimisation a key consideration.

2.3 TOONGI-DUBBO RAIL LINE AND NATURAL GAS PIPELINE CORRIDOR

The processing operations require significant volumes of chemical reagents and other raw materials. While significant volumes of these reagents and materials would be delivered by road, the Applicant has identified the upgrade and use of the Toongi to Dubbo section of the currently disused Dubbo-Molong Rail Line as an opportunity to reduce the volume of traffic on the public road network. It is noted that the Applicant is still reviewing the viability of the rail line upgrade and has identified a preferred and two contingency transport options for consideration of environmental impacts (refer to Section 2.6).

Figure 3 provides the proposed alignment of the Toongi-Dubbo Rail Line, the key features of which are as follows.

- Upgrade of the Toongi to Dubbo section of the Dubbo-Molong Rail Line to a Class 1 track (92t gross/67t pay load capacity).
- Replacement or upgrade of steel bridges, culvert structures, and timber bridges.
- Reinstatement, civil works and installation back to the required standard at each of the 26 level crossings. Of these, seven are major crossings (of local roads), four of which occur in Dubbo (Wingewarra Street, Cobra Street, Boundary Road and Macquarie Street) and three (Cumboogle, Glengarra and Toongi) between the Macquarie River and the proposed DZP Rail Siding.

Figure 3 also identifies the proposed natural gas pipeline between the Central West Pipeline (of APA Group) at Purvis Lane, Dubbo, and the DZP Site which would deliver up to 970TJ/year of natural gas for the heating of various circuits within the processing plant.

2.4 MACQUARIE RIVER WATER PIPELINE

Processing operations would require up to 4.05GL of water annually which would be sourced (partially or completely) from the Macquarie River (under licence) and transferred to the DZP Site by water pipeline.

Figure 4 provides the proposed alignment of the Macquarie River Water Pipeline, the key features of which are as follows.

- A pumping station which incorporates a dual water inlet, wet well and vertical mounted axial flow pump configuration.
- A 400mm to 450mm diameter HDPE pipeline within an embedded trench.

The easement to be created for the Macquarie River Water Pipeline Corridor would be approximately 15.2ha (20m x 7.6km), although the actual area of disturbance within this corridor would be much less. An area of less than 2 500m^2 would be disturbed on the river frontage of the “Mia Mia” property to allow for the construction of the pumping station for water from the Macquarie River. An 11kV powerline would be erected in the same easement to power the water supply pump from a substation at the processing plant.

2.5 PUBLIC ROAD NETWORK

Significant quantities of the processing reagents and other raw materials would be delivered by road, via the Newell Highway, Obley Road and Toongi Road. To accommodate the proposed heavy vehicle traffic associated with this transport, the alignment and pavement depth of the two roads would be improved in several locations, with a number of creek crossings, rail level crossings and intersections to be upgraded. **Figure 5** provides the locations of these works.

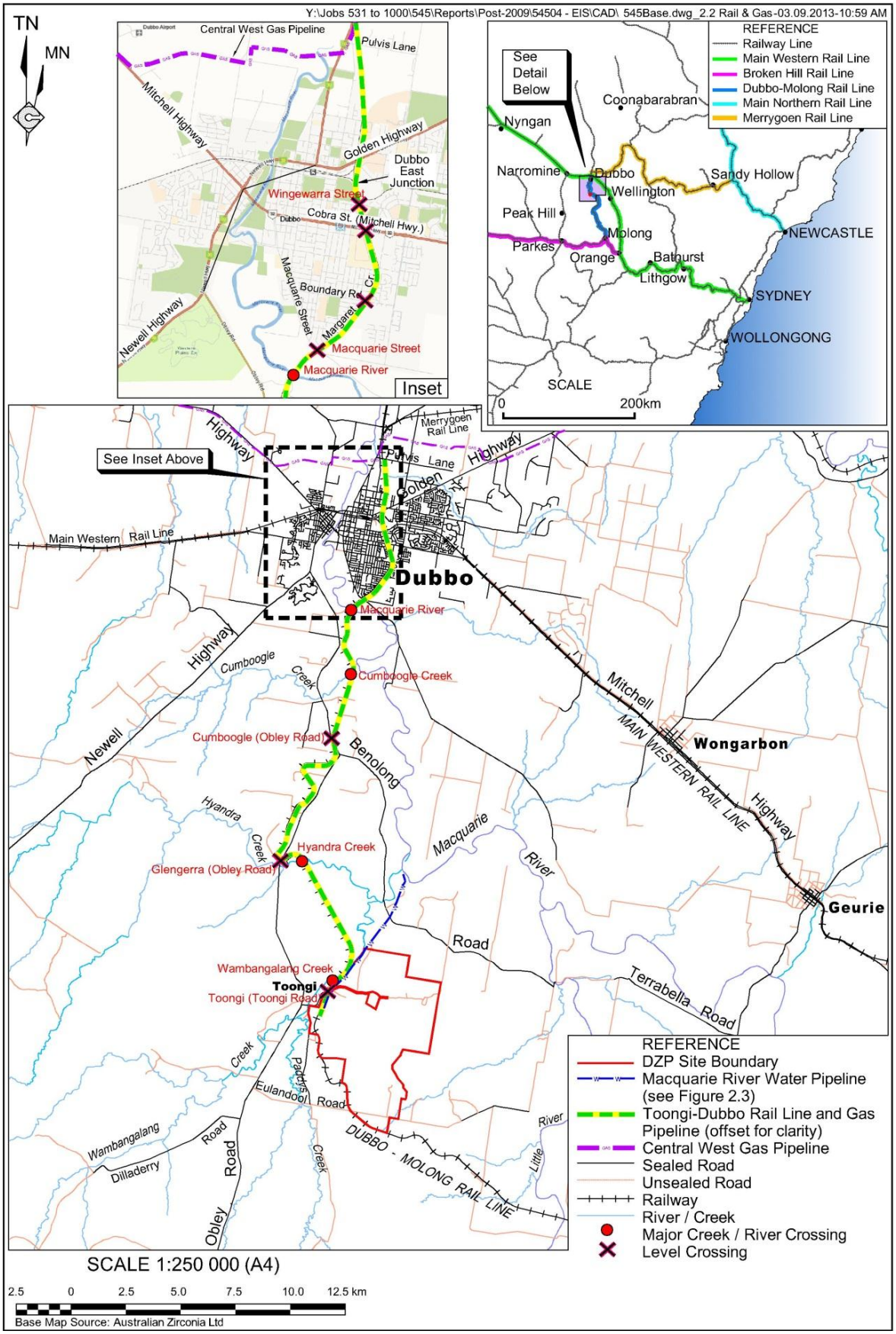


Figure 3
Toongi-Dubbo Rail Line and Gas Pipeline Corridor

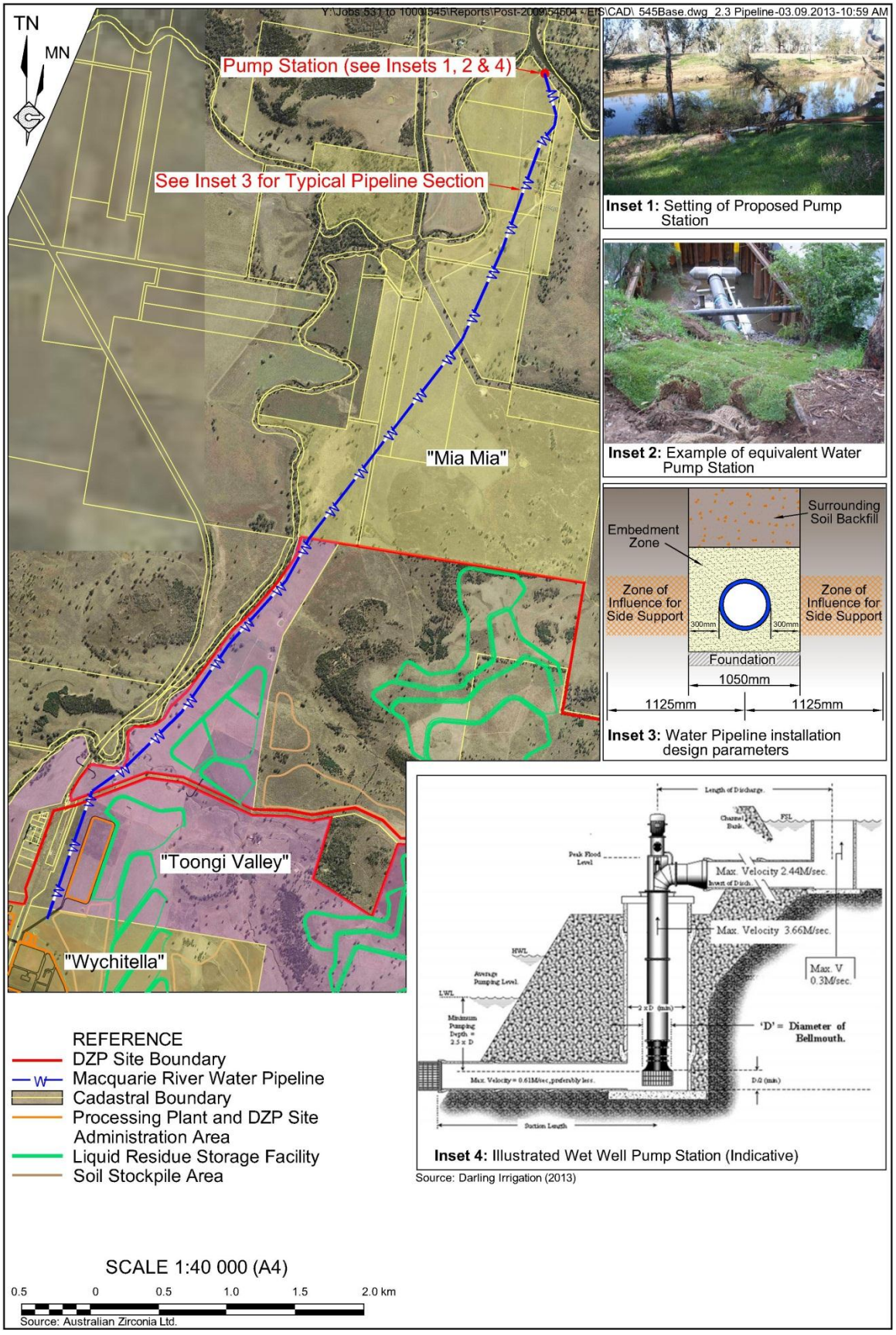


Figure 4
Macquarie River Pipeline

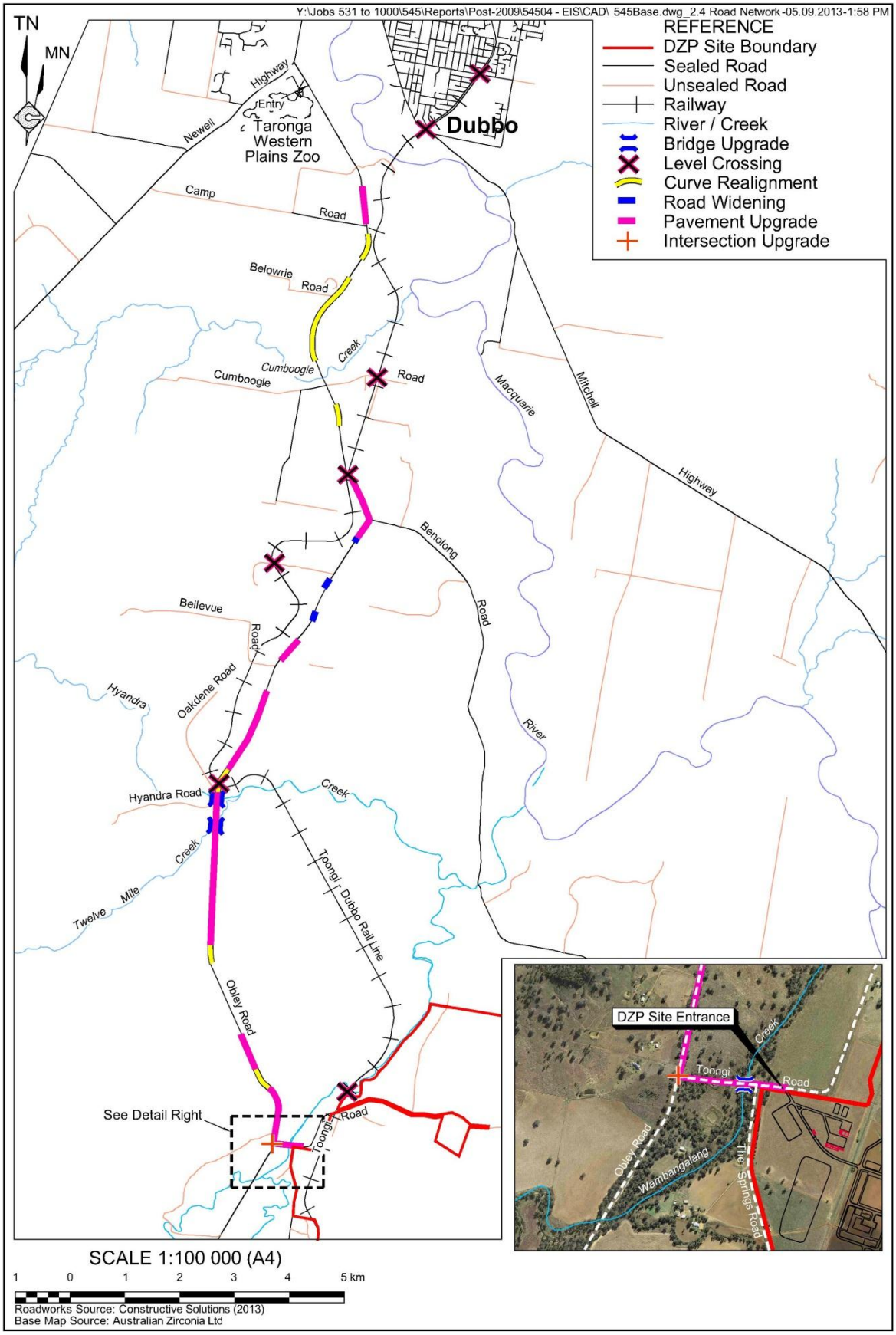


Figure 5
Road Network

The main entrance to the DZP Site would be constructed from Toongi Road approximately 360m from Obley Road. It would be a sealed two lane road suitable for light and heavy vehicles. The site entrance would provide access to the DZP Site, west of the rail line. Internal roads would connect the site entrance road to the Processing Plant and Administration Area and various areas of the DZP Site.

2.6 REAGENT DELIVERY AND PRODUCT DESPATCH

As noted in Section 2.2, processing operations would require several different reagents to be transported to the DZP. These include sulphur, limestone, quick lime, caustic soda, soda ash, salt, anhydrous ammonia, aluminium powder and several other reagents used in minor quantities. These would need to be transported to the DZP from several locations including Newcastle, Sydney, Charbon (NSW), and Cheetham (Victoria).

As noted in Section 2.3, the Applicant would prefer to incorporate rail transportation from the commencement of operations. However, there are various logistical, operational and economic factors that make it likely that it would be at least five years (approximately 2020) before this would be feasible. In recognition of this, the Applicant has identified two contingency transport options that could be implemented for the initial period of DZP operation. Under all options certain reagents would need to be transported all the way from where they are sourced to the DZP Site using the public road network.

Preferred Transport Option (A) – Rail to Toongi / Supplementary Road

For this option the bulk reagents of sulphur, caustic soda and hydrochloric acid would be transported by rail directly to the DZP Site along the reinstated Toongi-Dubbo Rail line. Three trains per week would be operated between Newcastle (from where the bulk reagents would be sourced) and the DZP Site. The timing of these movements would be beyond the control of the Applicant, as they would have to be integrated with overall operations of the broader rail network.

During a typical week, it is probable there would be one in-bound train movement to the DZP Site one day, with its out-bound movement the following day and one day per week with no train movements.

Some smaller quantity reagents would be transported by rail from Sydney via the Main Western Rail Line before being unloaded and transferred to trucks for delivery to the DZP Site. These rail movements would be combined with current freight rail movements between Sydney and Dubbo.

All other reagents, and other materials such as diesel fuel, would be transported to the DZP Site by road. Overall, however, this option would minimise the volume of heavy vehicle traffic on local roads generated by the DZP.

Contingency Transport Option (B) – Rail to Dubbo / Road to Toongi

In the event that there is the anticipated delay in Preferred Option A being implemented, the Applicant proposes that the bulk reagents of sulphur, caustic soda and hydrochloric acid would be transported by rail from Newcastle to a rail terminal operated by Fletcher International Exports Pty Ltd on the Merrygoen Rail Line north of Dubbo. The reagents would be unloaded

at this rail terminal and delivered to the DZP Site by road, utilising an approved heavy haulage route between the rail terminal and the Newell Highway. No B-doubles would be involved in the rail-road transfer, potentially increasing the overall number of heavy vehicles on Obley Road over Option (C) (below).

Contingency Option (C) – Road Only

In the event that the use of the rail terminal of Fletcher International Exports Pty Ltd is not possible, the Applicant would transport the majority of processing reagents and other materials (excluding those transported to Dubbo from Sydney by general freight rail) to the DZP Site by road. Reagents required in bulk quantities such as sulphur, limestone and hydrochloric acid would be transported to the DZP Site primarily by B-double trucks. Reagents required in lower quantities or requiring specialised vehicles (such as quick lime) would be transported by various heavy vehicles appropriate for their particular safe transportation requirements. This option involves more B-double movements than either of the others, yet has a lower overall volume of heavy vehicles than Option (B).

Table 1 summarises the likely average daily heavy vehicle movements under each of the three options described above. These totals include movements of processed product by B-double trucks on public roads from the DZP Site. It is estimated there would be 4,230 of these movements (one-way outbound form the DZP Site) each year.

Table 1
Daily Truck Movements

Option	Truck Type	Loaded	Empty / Return	Total
Preferred Option (A) – Rail to Toongi / Supplementary Road	B Double	30	30	60
	Single	14	14	28
	Total	**44**	**44**	**88**
Contingency Option (B) – Rail to Dubbo / Road to Toongi	B Double	30	30	60
	Single	49	49	98
	Total	**79**	**79**	**158**
Contingency Option (C) – Road Only	B Double	42	42	84
	Single	27	27	54
	Total	**69**	**69**	**138**

Table 1 shows the 'worst case scenario' of 158 daily heavy vehicle movements associated with Contingency Option (B).

2.7 OPERATING HOURS

Mine construction is expected to generally occur between 7 am and 10 pm Monday to Saturday. Selected activities would be undertaken between 8 am and 6 pm on Sundays, public holidays excluded.

Mining operations would be undertaken over a single shift (day time only), of between 10 and 12 hours, 5 days per week, public holidays excluded. However, the processing operations would be 24 hours a day, 7 days per week, including public holidays. The processing plant would not be operating during scheduled shutdown events or in response to unforseen incidents.

3. SOCIO-ECONOMIC CHARACTERISTICS OF THE REGIONAL AND LOCAL SETTING

3.1 INTRODUCTION

The Dubbo Zirconia Project (DZP) is located close to the Village of Toongi, approximately 25km south of the City of Dubbo. As indicated in **Figure 6**, the DZP is within the Local Government Area of Dubbo City.

3.2 ECONOMIC DIMENSIONS OF THE PROPOSAL

The DZP would produce a range of rare metals and rare earths, of which the more important (and their main applications) are:

- Zirconium – catalysts, ceramics, electronics, refractory glass.
- Niobium – special steels, alloys, superconducting magnets, coinage.
- Yttrium/Heavy rare earths – catalysts, metal alloys, electronics, magnets, ceramics, phophors.
- Light Rare Earths – polishing agents, glass, mirrors, electronics, batteries, fuel additives.

There is strong demand for these minerals in markets that relate to industries of the future such as electronics. Currently, the supply of these minerals on a global scale is dominated by China (producing 90% of the world's downstream zirconium chemicals, and 95% of world rare earth output) and Brazil (producing 90% of the world's niobium). China is limiting the export of rare earths materials, and so the DZP would be well placed for immediate access to global markets for these minerals. The products are becoming increasingly valuable as new applications are developed, with much "green technology" being dependent on rare metals and rare earths.

The definitive project feasibility study (DFS) is based on a mining rate of 1Mtpa, and anticipates annual production of around 75,000tpa, with a total revenue stream of over $500 million/year. The total capital investment required to deliver the Proposal is just under $1 billion ($996 million), with Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) generated estimated at around $5.4 billion over the 20 year life of the current Proposal[2].

The construction phase of the Proposal would re generate between 300 and 400 positions (although not all at one time), virtually all of which will be based in Dubbo over this 18 month to two year phase of the DZP. Accordingly, there is no plan to construct a "mining village" or construction camp to house the construction workforce. There would be no significant FIFO (fly in fly out) component involved in the construction phase, as the Applicant has committed to seeking local suppliers and workers for construction activities wherever feasible.

[2] It is noted that the rare metal and rare earth resource significantly exceeds that which could be mined and processed within 20 years. Subject to a future development application, there is potential for the operation of the DZP to continue well beyond 20 years with a commensurate increase in the EBITDA generated by the DZP.

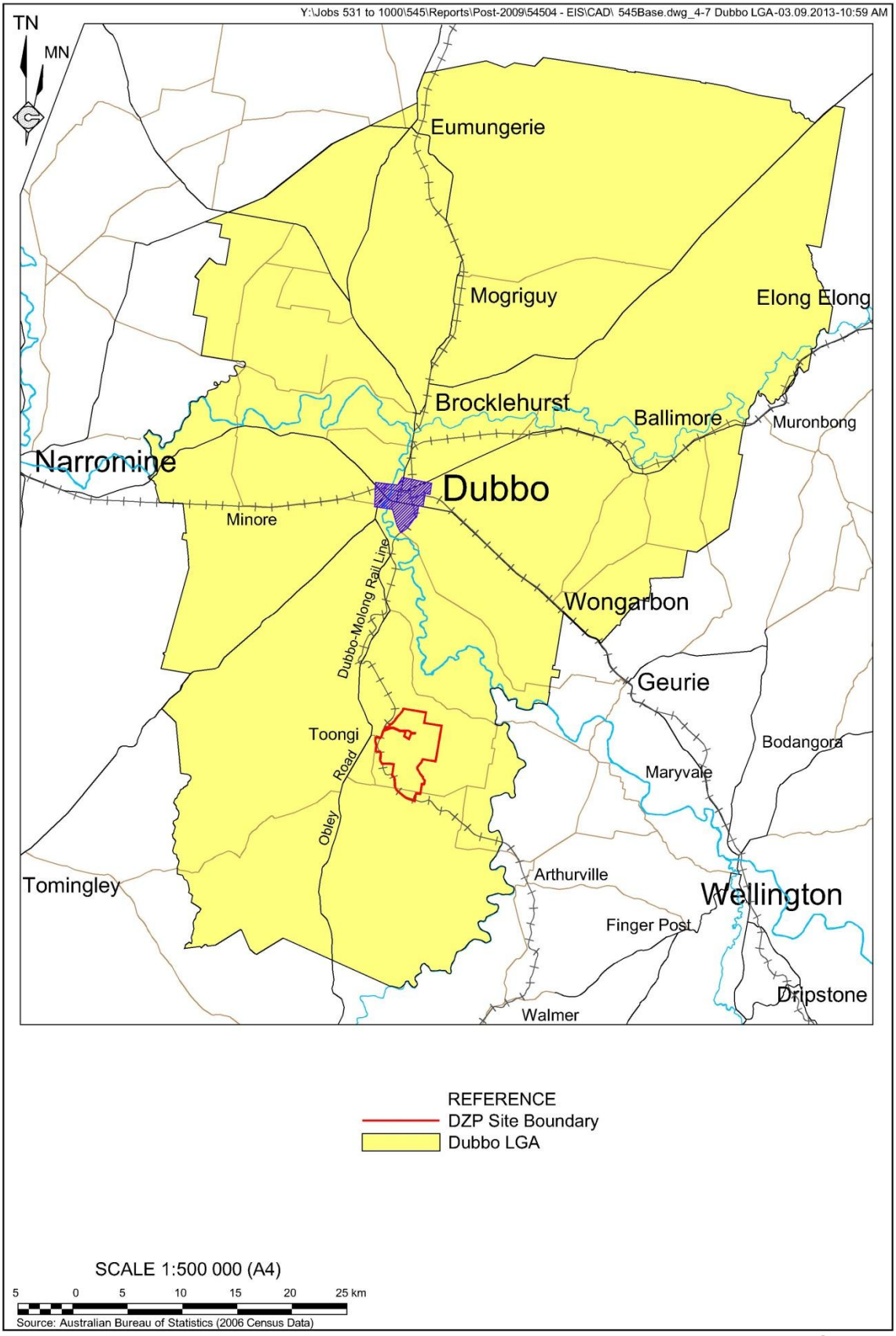


Figure 6
Local Setting

The operational phase of the DZP would create permanent jobs for around 250 workers, most of whom would be sourced locally. It is therefore highly unlikely that there would be any FIFO workforce once the DZP is operational. Approximately 25-35 technical specialists with defined skills (Chemical Engineers, Metallurgists, Industrial Chemists) are likely to migrate to Dubbo to join the operational workforce, as these skills do not currently exist locally. These new "specialist" residents could create demand for 25-35 properties in Dubbo (or surrounding localities), but generally there is likely to be little demand for new accommodation as a result of the Proposal. Possible impacts on the residential housing market are assessed in Section 4.4.3.1 (Housing) of this study.

The operation of the DZP would generate around $50 million additional annual stimulus for the local economy, in the form of salaries and wages, payment for utilities, and purchase of other locally-provided goods and services. Payments to labour (wages and salaries) alone are estimated to total $34 million per year, with a further $13.4 million to be paid to the various utilities required.

The existence of services such as a substantial power supply and a gas pipeline, as well as transport infrastructure, workforce accommodation in Dubbo, and the potential availability of water from the Macquarie River, in close proximity to the mineral deposit, adds significantly to the viability of this Proposal.

In addition, the DZP would yield royalties for the State of NSW of around $12 million/year, and generate corporate taxation for the Australian Government of around $75 million/year.

The DZP is a major project for Dubbo, being one of the world's largest known zirconia/rare earth metals mining projects (DPI, 2010). Now that the Cobbora Coal Project (originally planned to produce 30 million tonnes of coal per annum), has been indefinitely delayed, the DZP would provide an important stimulus to the development of new business opportunities for the City, based on the mining sector.

3.3 DUBBO REGION

3.3.1 Overview

It is anticipated that the very large majority of the workforce would live in Dubbo and would commute out to the DZP Site (or other location) each day for work. Additionally, other goods and services (including transport and utilities) required by the mine would also be sourced from the major regional hub represented by the City of Dubbo.

Dubbo is located at the intersection of the Newell and Mitchell Highways, and is readily accessible by road, rail, and air. As a major service centre, there is access to all major utility infrastructures for residents and for industry, i.e. natural gas, electricity, water/waste water services, and communications. Dubbo also has major community assets such as hospitals, schools, higher education facilities, and other social infrastructure which all make Dubbo a highly "liveable" city in regional NSW. The extent to which the DZP would create additional demand for this social and industrial infrastructure is assessed as part of this study.

3.3.2 Current Socio-Economic Characteristics

Dubbo's population has expanded by an average of 0.8% per annum (pa) in recent years, to reach over 41,000 in 2009, with a projected increase to 46,500 by 2036 (NSW Dept Planning, 2011). The city is the established service centre for the wider Orana region, and was estimated (by Dubbo City Council) to have had a Gross Regional Product (GRP, the net wealth created within the region) of $2.1 billion in 2008-09. The main sources of this economic activity were the construction and wholesale sectors, health care and social services, and public administration/safety. The agricultural sector contributed $43.7 million to this value of output, representing 2.6% of the total Dubbo GRP (compared to 10.2% of the total output for the Orana region). Largest growth has been observed in the wholesale sector, which expanded by over 130% in recent years to $149.4 million, due to the provision of services to regional agriculture, mining, and other industry. The mining sector contributes 15.8% to the Orana Gross Regional Value Added (with established mines at Cobar and Mudgee), but only 0.8% for Dubbo. The DZP would increase the importance of this sector for the Dubbo economy in the future, which is in line with anticipated growth as outlined in the *Dubbo City Development Strategy* (DCC, 2012a).

Economic growth in Dubbo has averaged 8.5% pa over the last 3 years, driven by expansion in leading service and industrial sectors, and highlighting growth in both provision of services and industrial activity in Dubbo. Agriculture still supports 18% of all businesses in Dubbo, but with average wage rates in the agricultural sector of $649/week, compared to rates of $1,219/week in mining (and average Dubbo wages of $753), the attraction of agricultural employment can be expected to decline in the future, with other sectors taking a more significant role within the local economy.

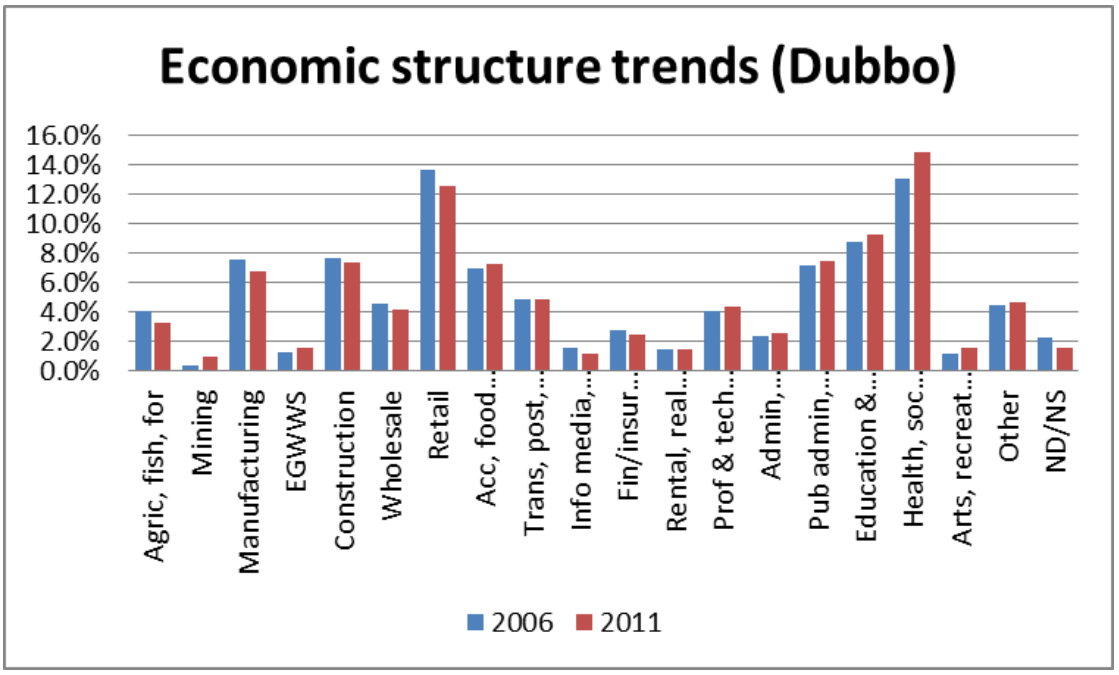
As indicated in **Figure 7**, agriculture accounted for around 3.3% of total employment in Dubbo in 2011, declining from around 4% in 2005. The relative importance of this sector to Dubbo is expected to continue to decline, although still remaining important within the surrounding Orana region. The most important sources of employment for Dubbo are the service sectors such as retail and health, education, and public administration. The latter three sectors have all increased their share of total employment in Dubbo, demonstrating the city's role as the "shop and service centre" for northwestern NSW.

Dubbo has a relatively young working age population (compared to the State of NSW as a whole), suggesting the need for a significant education and training infrastructure based locally to support skilling and development of this growing workforce. As indicated in **Figure 8**, unemployment rates in Dubbo have been relatively low (4.8% in June 2012), compared to the wider region covered by the Orana Regional Organisation of Councils (OROC) (6.4%).

The total labour force in the Dubbo region has increased by almost 2,500 in the past 5 years (reaching over 20,000 in the June Quarter of 2012). This growth in the labour force, combined with relatively low unemployment rates, is evidence of strong employment opportunities in an expanding economy. Despite fluctuations in economic conditions over the observed period (caused by the Millennium drought[3] and the global financial crisis, for example), the trend in unemployment rates over this ten year period is flat.

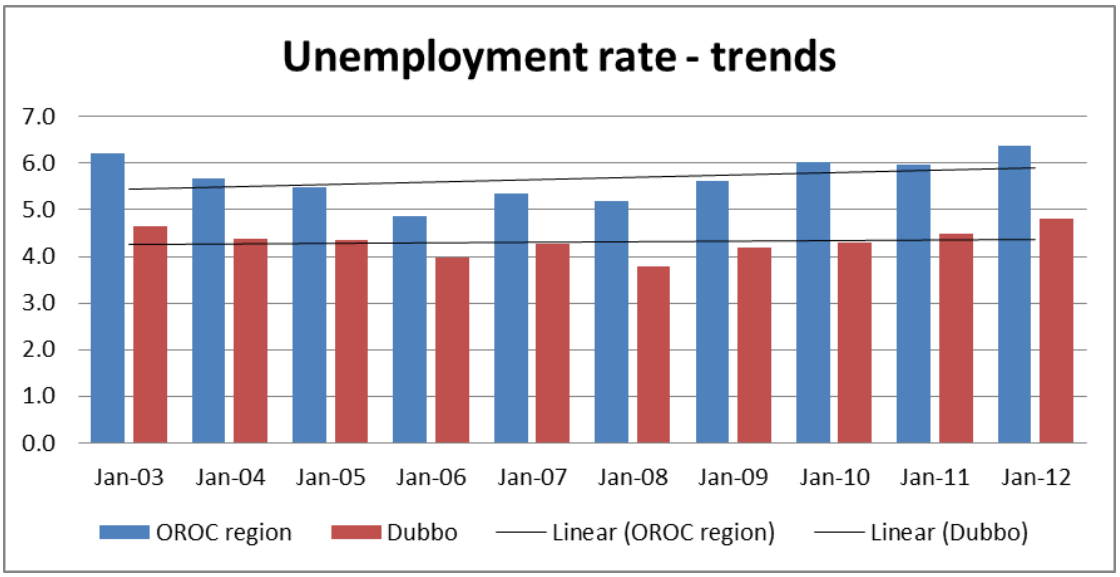
[3] The abnormally dry period from 2001 to 2009 is commonly referred to as "the Millennium Drought".

Figure 7
Economic Structure of Dubbo



Source : ABS Census of Population and Housing, 2011

Figure 8
Unemployment in Dubbo and the Surrounding Orana Region



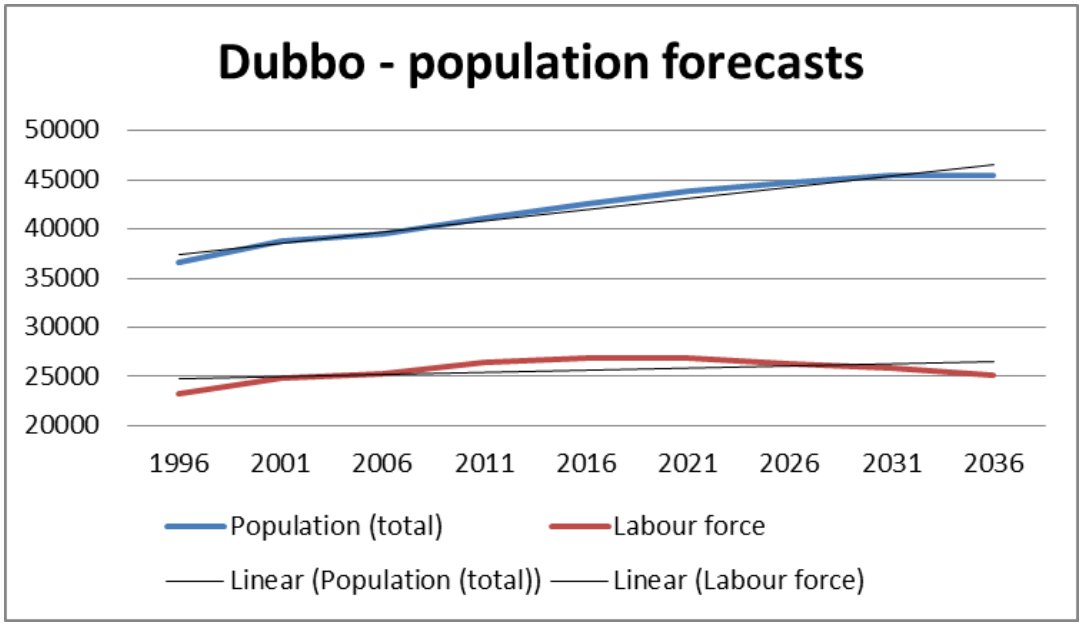
Source: Aust Govt Dept of Education ,Employment and Workplace Relations

3.3.3 Planned Future Growth

As summarised in "Population Outlook for Dubbo City Council" (KPMG Feb 2012) Dubbo "*has experienced a period of sustained population growth in the 39 years to June 2010*", during which the population has more than doubled from 1971 to 2010. It has been local events (such as droughts, and business openings and closures) that have impacted on Dubbo's population change.

Forecasts of population prepared by the NSW Government indicate that Dubbo's population is expected to increase by 10.7% between 2011 and 2036, growing to 45,500 by the end of this period (see **Figure 9**).

Figure 9
Forecasts of population in Dubbo to 2036



Source : NSW Department of Planning, 2012

Dubbo has recently completed an update of the City's *Economic Development Strategy* (DCC, 2012a). Of a total of ten identified strategies for development in Dubbo, Strategy 2 has the goal of developing the Mining and Mining Services sector of the City so that Dubbo becomes established as the mining service centre for NSW.

There are a number of major mining projects in the wider area around Dubbo, from Tomingley, Parkes and West Wyalong in the south, to Bourke in the north-west and Gunnedah in the north-east. The Cobbora Coal Project, located to the east of Dubbo (and predominantly within the Warrumbungle LGA – see **Figure 10**) would have also contributed to the growth of the mining sector within this region, but now appears unlikely to proceed in the near future.

The key strategic outcomes and tasks identified for Dubbo in order to achieve the goals set (within the City's Development Strategy) for the "Mining and Mining Services" sector include the following.

- Provide support including networking on specific business development issues.
- Ensure appropriate infrastructure investment and planning (hard & soft).
- Promote Dubbo as a premier mining service centre.
- Ensure adequate land is available for mining service industries to establish and/or expand in Dubbo.
- Support micro-enterprise initiatives related to the mining services sector.
- Encourage and support the provision of specialist training and education within Dubbo.

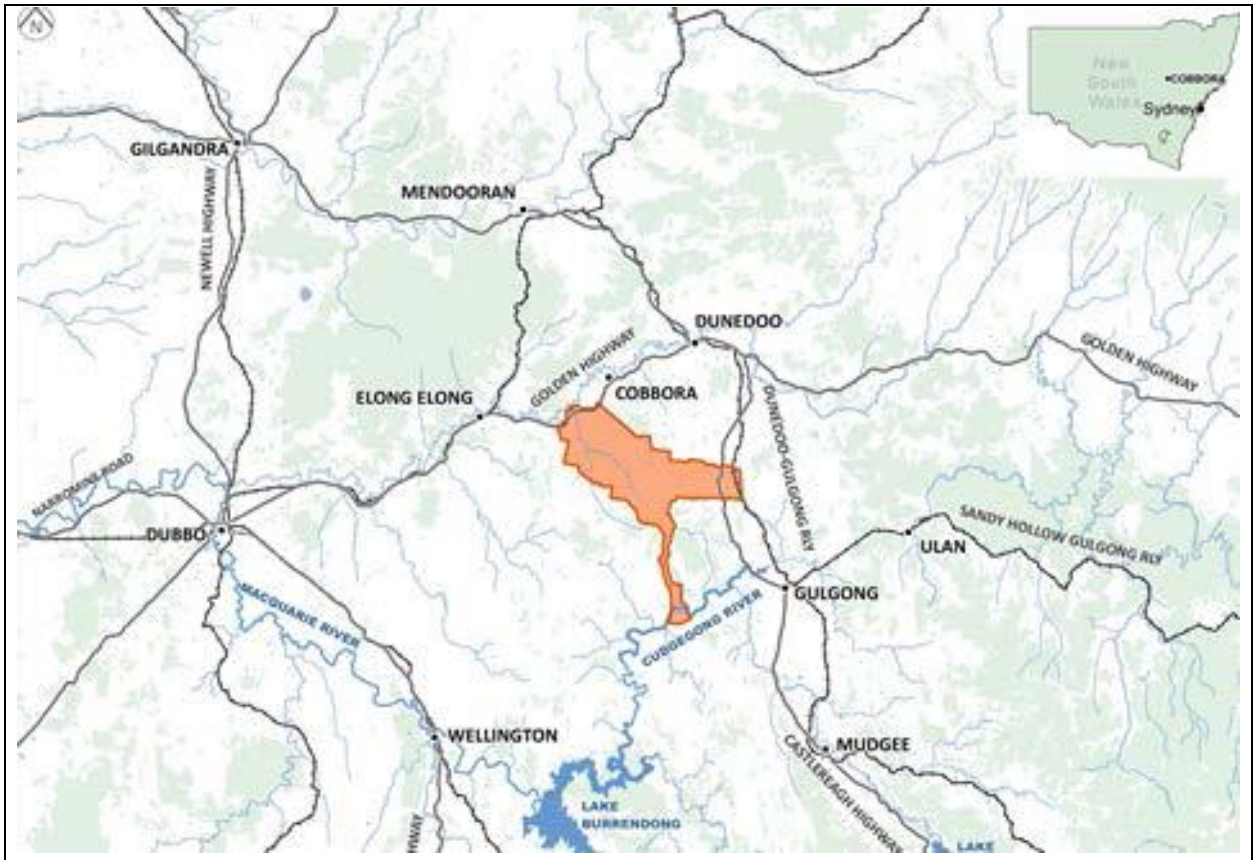


Figure 10
Location of the Proposed Cobbora Coal Project

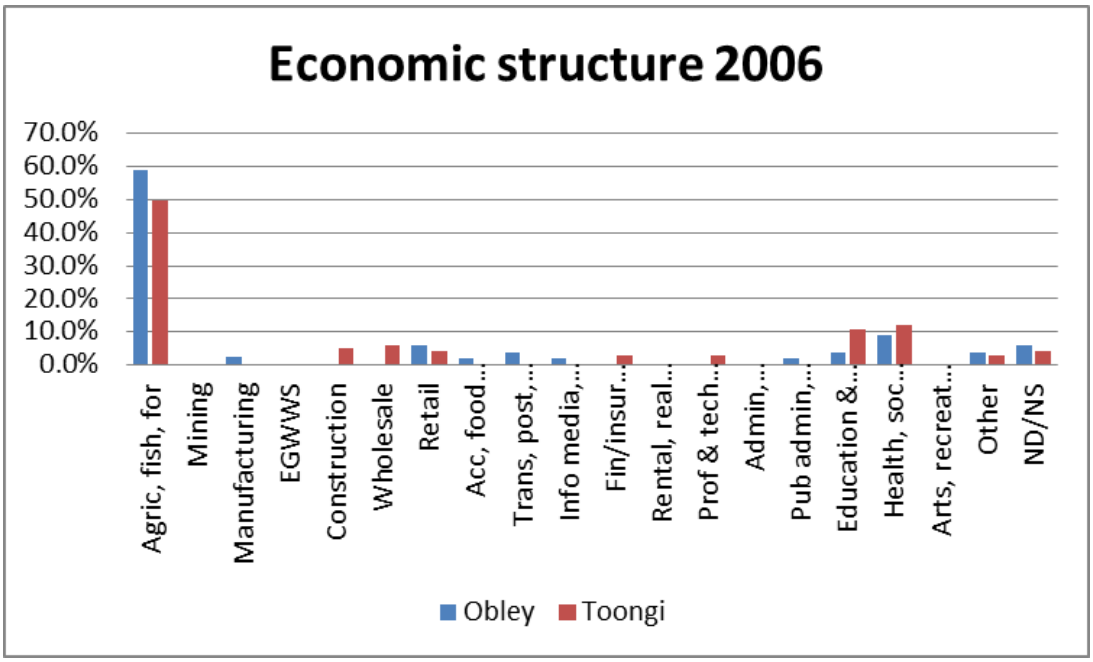
It is clear that the development of the DZP would be entirely consistent with the goals already set for future economic development in Dubbo. Dubbo's population is expected to grow, and the mining sector is recognised as contributing to this future growth. Lower than average unemployment rates, combined with existing levels of social infrastructure (education and health facilities) can be expected to continue to attract additional residents to Dubbo.

3.4 TOONGI LOCALITY

The DZP would be located close to the Village of Toongi (see **Figures 1** and **2**), which is located within the LGA of Dubbo City. There are just four dwellings in the former railway village. AZL has purchased the majority of properties and has Put and/or Call Options over the remaining private landholdings in the village. At the time of the last Census for which specific published data is available for Toongi (2006), the Toongi community had a total resident population of 183 persons, consisting mainly of persons located in surrounding rural residential and agricultural properties.

While Census data for 2011 is now available, collections for the Toongi locality alone are no longer made available by the ABS. Instead, data for the larger district of Obley have been analysed to indicate trends in likely socio-economic and demographic characteristics between 2006 and 2011. Data for Toongi and Obley (from the ABS 2006 Census) have been compared to ascertain that the larger Obley district is not dissimilar to the smaller Toongi locality. For example, the comparison of employment by industry sector (an indicator of economic structure) for Obley and Toongi is presented in **Figure 11**.

Figure 11
2006 – Economic Structure Comparison, Toongi and Obley

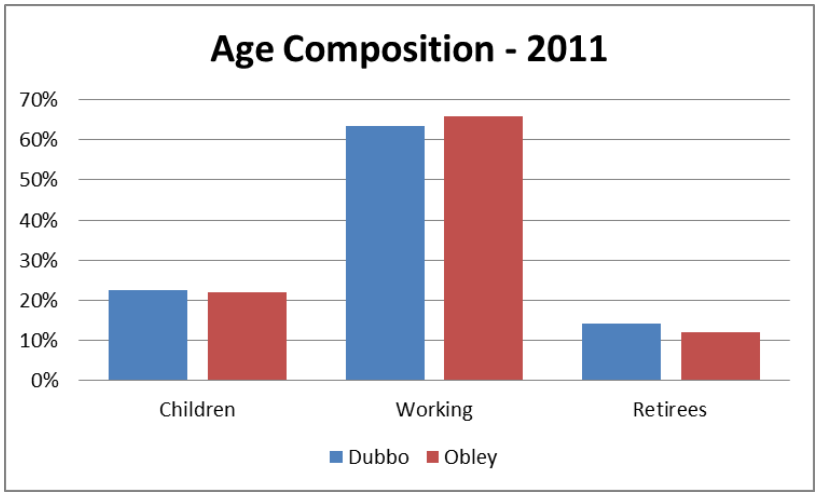


Source: ABS, Census of Population and Housing 2006

It has therefore been concluded that changes in data for Obley, between 2006 and 2011, will adequately reflect changes likely to have occurred in Toongi, from the base data available for 2006. Based on employment source, both Toongi and Obley were heavily dependent on agriculture in 2006, with between 50% and 60% of all employment being in this sector.

Compared to Dubbo, the population of the Obley district (see **Figure 12**) is concentrated more in the "working" age group (those aged 15-64), with a relatively lower proportion of children and those aged 65 and over. This is consistent with the anecdotal evidence that residents of Toongi commute to jobs in Dubbo, or otherwise are occupied in the management of their own properties in the locality. Operators of rural holdings, in particular, tend to "retire into town" and leave Toongi in favour of a closer location to services and facilities in Dubbo.

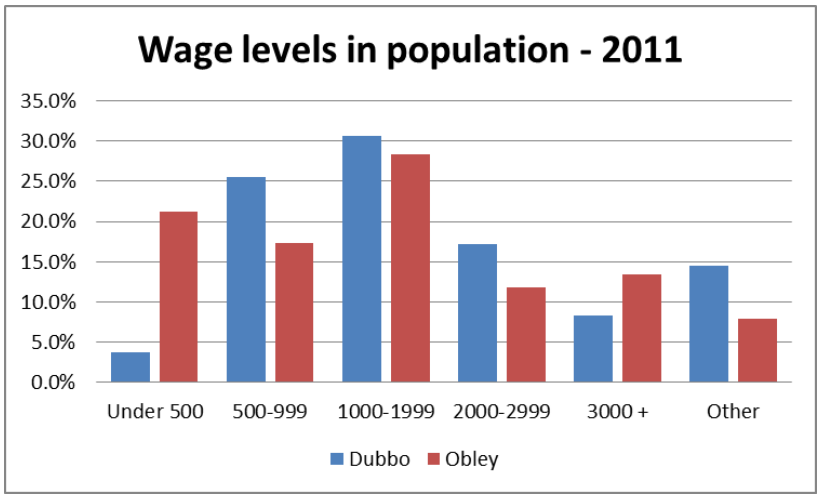
Figure 12
Local Population – Age Composition



Source: ABS, Census of Population and Housing 2011.

The population of the Obley district also has slightly lower average weekly earnings than the total population of the Dubbo LGA. The data in **Figure 13** indicate that there are more Obley residents in the "under $500/week" group, and fewer in all categories between $500 and $2999 per week. However, there is also a higher proportion of Obley residents in the "$3000 +" group. Again, this pattern is consistent with the local area population consisting of both owner/operators on rural properties, and managers and professionals, with a wide range of skill levels, commuting to employment in Dubbo.

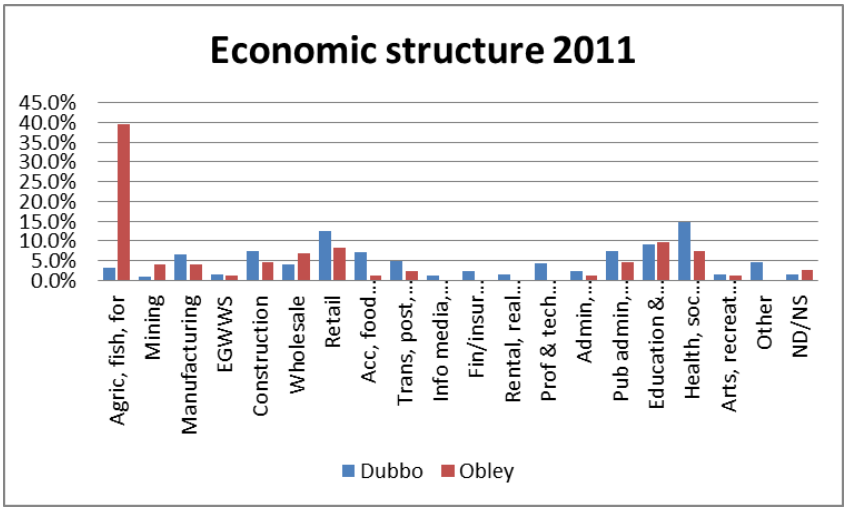
Figure 13
Average Weekly Earnings, Dubbo and Obley



Source: ABS, Census of Population and Housing 2011.

The local area economy is heavily concentrated in the agricultural sector. As indicated in **Figure 14**, nearly 40% of the local area labour force is employed in agriculture, compared with just 4% in the Dubbo LGA as a whole. Other sectors to make a contribution to overall employment for local area residents are the public service sectors such as education and health care. The local area appears to have virtually no employment in some of the services sectors such as finance/insurance, real estate, professional and technical services.

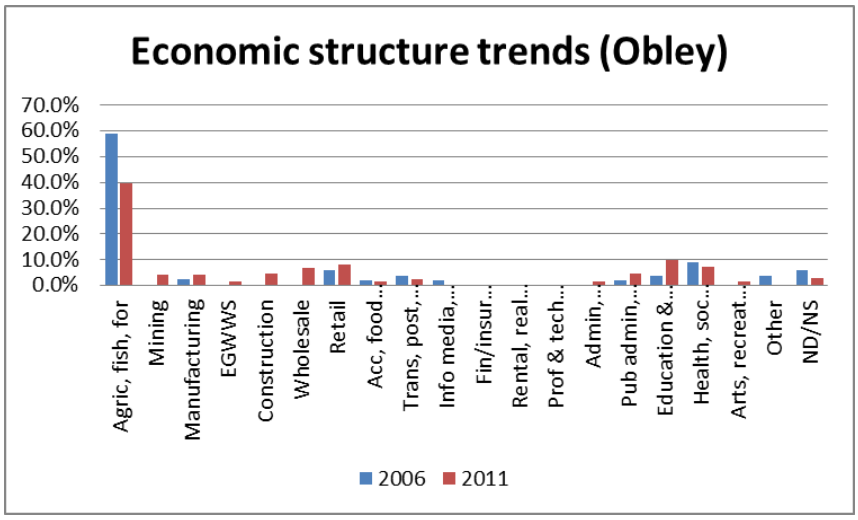
Figure 14
Structure of the Local Economy



Source: ABS, Census of Population and Housing 2011

Over the five year period from 2006 to 2011, agriculture has declined as a relative component of the local area economy. As indicated in **Figure 15**, from contributing nearly 60% of all employment in the local area in 2006, agriculture accounted for only 40% in 2011. This decline in the importance of agriculture within the local area is likely to be related to an increasing role of the locality as a "dormitory" for individuals holding jobs in Dubbo, with some agricultural activity being undertaken on a "hobby farm" basis. This likely trend is also supported by the apparent increased role of service sectors such as construction, wholesale and retail, and education as a source of employment for local residents – these jobs are in Dubbo, but filled by residents of the local Obley area.

Figure 15
Trends in the Local Economy



Source: ABS, Census of Population and Housing 2011

The role of agriculture as a source of employment for residents of the local area is also demonstrated by the predominance of "manager" as the stated occupation of the workforce, which is consistent with self-employed agricultural operators (see **Figure 16**).

3.5 CURRENT LAND USE

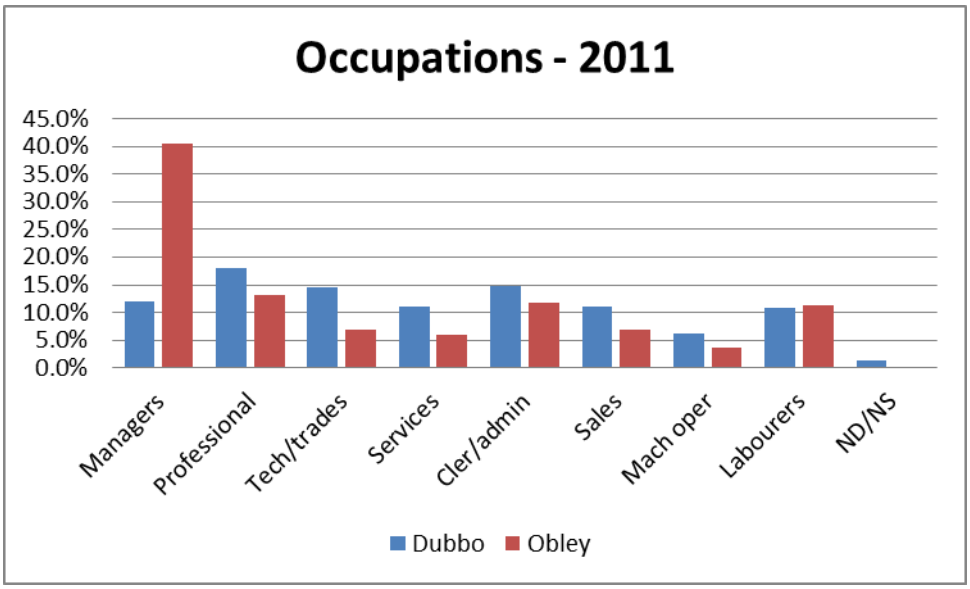
While the DZP Site, as displayed on **Figure 2**, covers an area of 2,507 ha, the Applicant either owns or has negotiated to acquire a larger area of 3,450 ha (see **Figure 17**).

This area is currently used for grazing (sheep and cattle) and for the production of both grain and fodder crops. Significant parts of this area are covered with native woodland, with some use for grazing and for shelter. The areas involved in these land uses are:

- Cropping 1,696 ha (assessed as being 49.1% of the total area)
- Grazing 1,325 ha (assessed as being 38.4% of the total area)

The remaining 431 ha (12.5% of the total area) is considered to be of virtually no commercial use, being heavily timbered.

Figure 16
Occupations of Workforce



Source : ABS, Census of Population and Housing 2011

The following **Figure 18** indicates the distribution of the land capability classes found within the DZP Site and surrounding land owned or contracted to the Applicant. For the purposes of the analysis of land use values (and changes imposed as a result of the Proposal), the following assumptions have been made:

- Land capability classification 1, 2, and 3 – suitable for cropping use
- Land capability classification 4 and 5 – suitable for grazing use
- Land capability classification 6 and 7 – not suitable for any productive use.

3.6 FUTURE LAND USE

Owing to the nature of the mining activity proposed for the DZP, it has been assessed that the operation of the DZP can be considered to have a relatively minimal long term impact on land use. This is because:

- Agricultural activities would be able to continue in close proximity to the impact footprint of the Proposal, as most of the impact area is represented by facilities for the storage of waste residues, both solid and liquid, generated by the Proposal.
- It is the intent of the Applicant to continue to use as much of the land under its control as possible for agricultural production
- The majority of the area disturbed by mining and processing activities would be available to be returned to agricultural production at the completion of mining.

The exception to the above is the 1,021 ha of land that has been proposed for inclusion within a Biodiversity Offset Area to compensate for the disturbance to native vegetation on the DZP Site. The changes in land availability, by land capability classification, that would be caused by the DZP both during mining activity and after rehabilitation at the cessation of mining, are set out in **Table 2**.

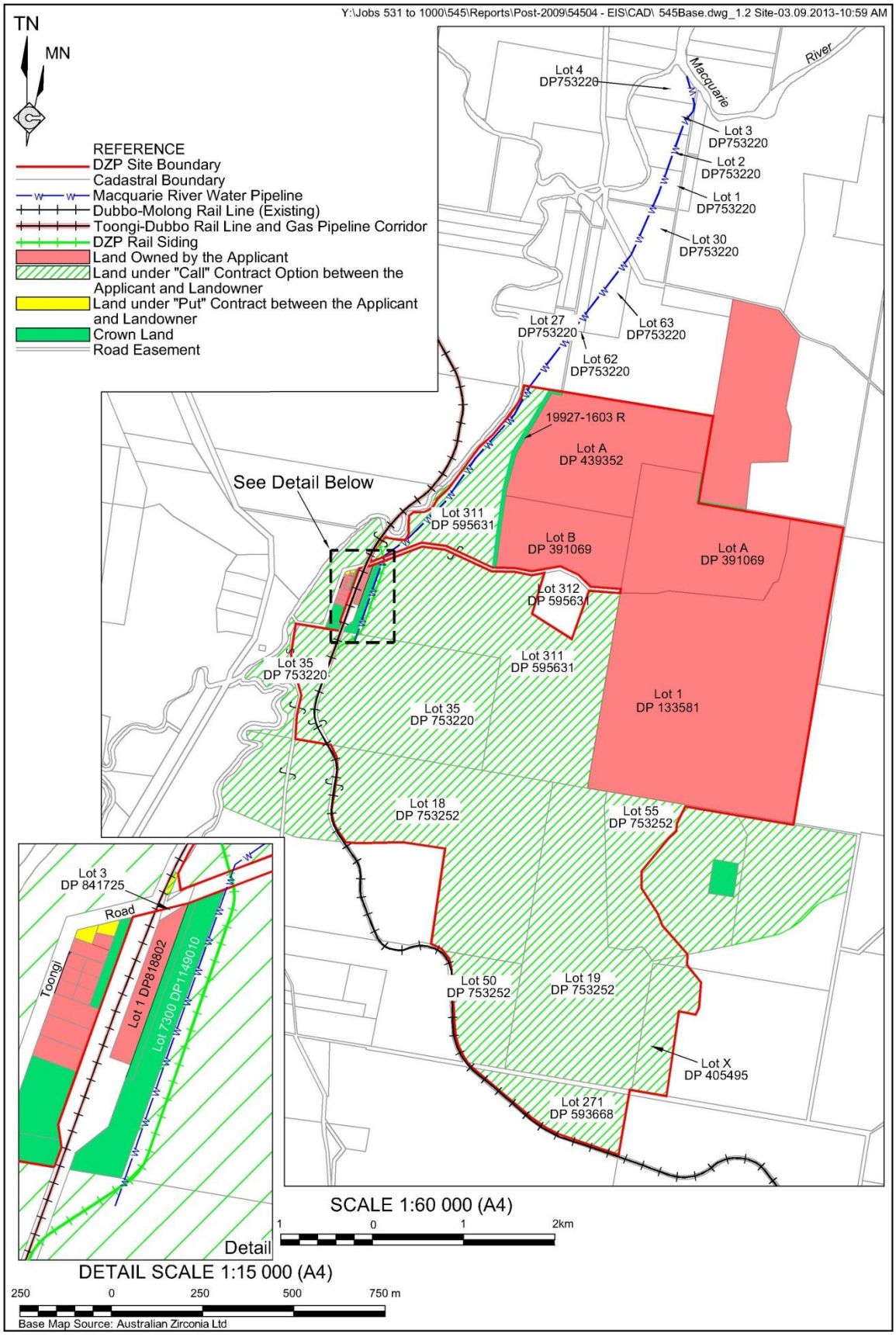


Figure 17
Applicant Owned or Contracted Land Associated with the DZP

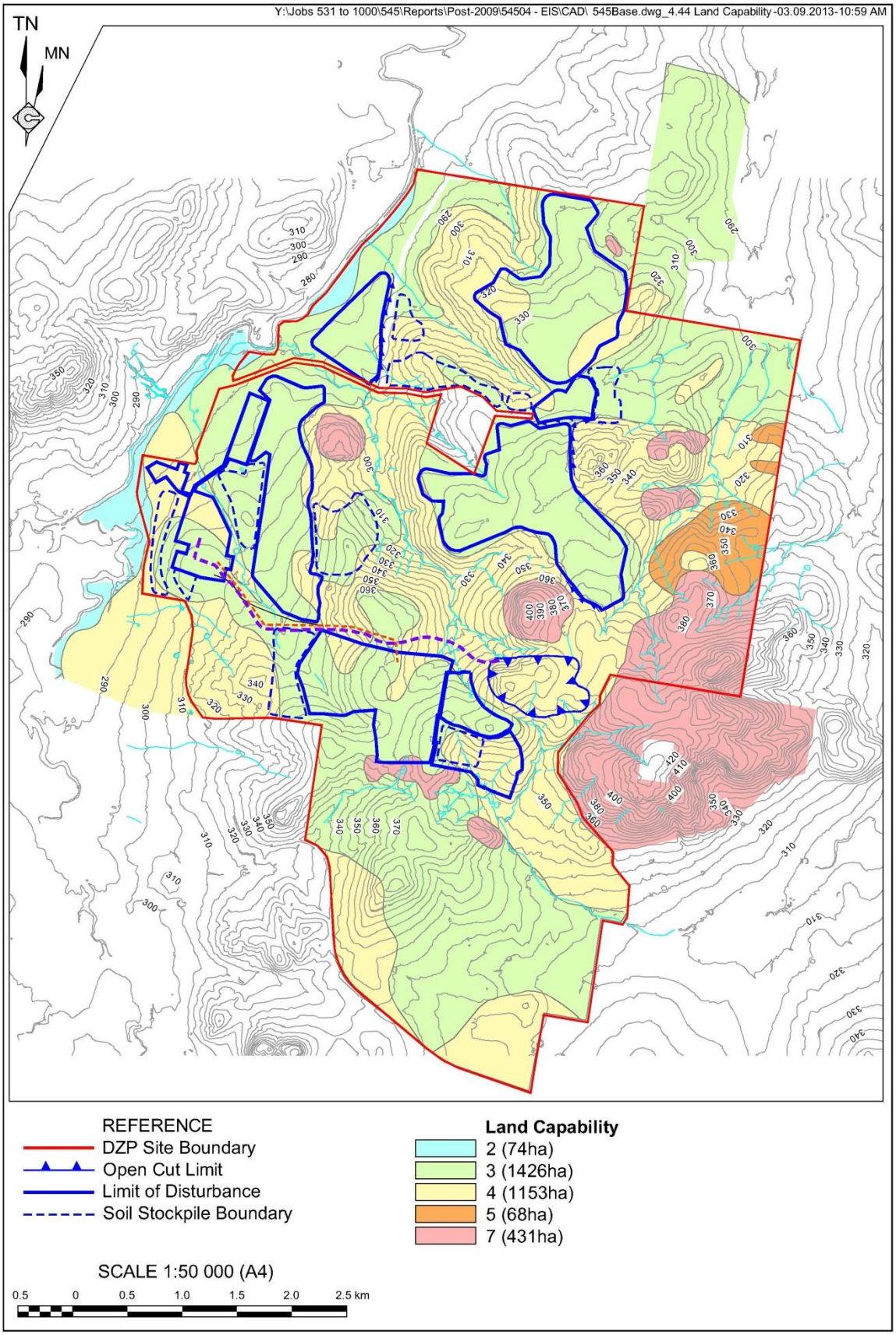


Figure 18
Land Capability of Land Owned or Contracted to the Applicant

Table 2
Land Areas Available by Use (ha)

	Cropping	Grazing	Unproductive	Total
Current	1696	1325	431	3452
During mining	893	731	0	1623
After mining	1396	837	0	2233

It is clear that 1,220 ha would be permanently removed from agricultural production as a result of the operations involved with the DZP Site and the establishment of a Biodiversity Offset Area (BOA). The BOA would be established during the construction of the Proposal and would require ongoing monitoring and management following rehabilitation at the completion of the Proposal.

3.7 ASSESSMENT OF IMPACT OF CHANGES IN LAND USE

Full details of the impact of the DZP on local land use both during mining operations, and following rehabilitation of the site, are presented in the AIS that accompanies this EIS. The area considered for analysis is the 3,452 ha identified on **Figure 17** as owned by or contracted to the Applicant.

Based on Gross Margin (GM) budgets prepared by the NSW DPI for winter cropping and livestock grazing activities, it is estimated that the current land use could have a total value of approximately $1.46 million per annum. The company intends to continue agricultural production on available land areas, with a total of 808 ha removed from production in order to accommodate the various operational activities of the Proposal. **Table 3** indicates the summary of the changes in land use likely to result from the DZP, both during operations and following rehabilitation.

Table 3
Estimated Effects of Land Use Changes

	Current	Mining	After rehabilitation		
INDICATORS :					(units)
Area available for agric use	3,452.00	1,623.30	2,233.00		hectares
Area lost to production	-	1,828.70	1,219.00		hectares
Value production from area	1463.56	789.23	1060.65		$'000/yr
Loss of production	-	674.33	402.91		$'000/yr
Av GM/ha from avail area	423.97	486.19	474.99		$
PV loss at 10% discount*	-	5,778.94	6,250.81		$'000
* assumes 20 yr life of mine, then 20 yrs after rehabilitation completed					

Table 3 summarises the results of the analysis presented in the AIS. It is expected that the total annual value of agricultural production could drop by $674,000 per year as a result of mining activities. However, following rehabilitation after mining ceases, all but 1,220 ha would be returned to agriculture, and the value of production from the site is likely to be $403,000 per year lower than current levels.

Much of the area from which agriculture would continue to be excluded (1,220 ha) would be incorporated into the proposed BOA (1,021ha) required as a condition of approval. If these areas were to be valued in terms of the carbon sequestered (which is only one of the values which can be attributed to these areas), then a carbon price of between $24 and $33 per tonne would be sufficient to replace the lost value of agricultural production (carbon sequestration rates from CSIRO, 2011).

When modelled over a 40 year period (i.e. assuming a mine life of 20 years, with a further 20 years following rehabilitation), the Present Value of the total loss of agricultural production (using a discount rate of 10%) is **$6.25 million**. This represents 0.15% of the estimated PV of the total value of production of **$4,257 million** (at 10% discount rate) from the proposed 20 years of operation of the DZP.

4. SOCIO-ECONOMIC IMPACTS

4.1 INTRODUCTION

This section describes the impact that the construction and operation of the DZP is likely to have on the local (Toongi and Dubbo) communities. Specifically, this section considers the DGRs issued by the Department of Planning and Infrastructure which, with respect to socio-economic assessment of the DZP, are as follows.

"*The EIS must include an assessment of the:*

- *potential direct and indirect economic benefits of the project for local and regional communities and the State.*
- *potential impacts on local and regional communities, including:*
  - *increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services); and*
  - *impacts on social amenity;*
- *a detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the project, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism.*
- *a detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community.*"

As the DZP Site is located in such close proximity to the major centre of Dubbo, there would be no need for FIFO arrangements to provide an operational labour force for the DZP. Similarly, construction workers could also be based in Dubbo, removing any need to construct a "construction camp" or "mining camp" of the type seen in association with many other mining developments.

Specific items of economic and social impact are discussed in this section. However, close consultation with the community of Toongi (and with specific groups in the Dubbo community who may be affected by the DZP) has been conducted, and some general concerns raised in relation to the proposal are outlined first. These are the concerns that are "front of mind" with

the community, who are not necessarily aware of the other impacts that the DZP would have, such as the number of jobs created and the total economic stimulus that would result from the operational demand for goods and services generated.

4.2 GENERAL CONCERNS IN THE COMMUNITY

A series of workshops have been held with representatives of the community of the Toongi district, to better inform them as to the DZP (which has been public knowledge in this locality for around 10 years) and gain a clearer understanding as to the issues of critical concern to the community. At a workshop on 28 March 2012 the community was asked to nominate issues that gave them a level of concern relating to the Proposal. Several concerns were raised in the form of questions and information was provided by the Applicant in response to these questions.

Following the discussion at the March 2012 Workshop, some possible strategies for addressing these concerns have been identified. The concerns, and possible strategies, are summarised in **Table 4** and then outlined in more detail.

Table 4
General Concerns Expressed by Community of Toongi

Mitigating Strategy:	**Operating conditions**	**Investment by Company**	**Artist's impression**	**Specialist reports**
Concern:				
Noise	☑			☑
Dust	☑			☑
Odour	☑			☑
Visual Impact (incl site lights)	☑		☑	☑
Road traffic	☑	☑		☑
Amenity		☑		
Social impacts	☑			
Concern:				
Social risk (security, fire)	☑	☑		
Water contamination	☑			☑
Access across rail				☑
Future expansion	☑			
Presence of construction village / camp	☑			
Source : Workshop output plus consultant's analysis				

The strategies identified to address the community concerns include the following.

- The imposition and adherence to operating conditions as a result of the approval process (e.g. restrictions on hours of operation, required standard of facility).

- Investment by the Applicant that would affect the community (such as the purchase of land and houses that would be affected by the operation of the DZP and its associated facilities, as well as upgrades to road access to the site).
- Preparation of an artist's impression of what the completed facilities would look like, within the scale of the existing landscape. This would include representation of the Liquid Residue Storage Facility and Solid Residue Storage Facility, so that visual impacts can be assessed by local residents.
- Implementation of recommendations generated by the specialist consultants' reports, in which the extent of likely impacts (e.g. noise and dust) of the operations have been assessed. The compilation of these management measures and controls would form a consolidated Statement of Commitments which would be appended to the development consent on issue. These commitments then become auditable features of the Proposal. These reports may also suggest innovative mechanisms by which some concerns and negative impacts could be mitigated.

4.3 ECONOMIC IMPACTS

4.3.1 Introduction

The DZP represents a new and relatively large business for Dubbo and New South Wales. The delivery of capital investment in the DZP of between $670M and $995M, and the resultant processing of approximately 1Mtpa of ore, production of 75,000tpa of products equating to $500M worth of export per annum, would have a number of impacts on the local and regional economies, and the residents of these areas. Around 615,000 tonnes of raw materials would need to be transported in to the DZP Site each year.

4.3.2 Employment

One of the most significant impacts, for the local community, would be the creation of jobs, in both the construction and the operational phases of the Proposal. As a result of the location of the ore body relative to Dubbo, it is likely that the majority of the operational jobs would be filled by existing local residents. Local residents are also expected to make a contribution to the construction workforce.

The **construction** workforce is likely to consist of both local residents (employed as short term contracts are issued to local construction operators), and members of the permanent workforces of specialist contractors who may be required for particular tasks associated with the Proposal. It is estimated that the construction workforce would be around 300 to 400 people, required in various stages, who would be accommodated (predominantly) in Dubbo.

To the extent that construction jobs available for the Proposal may attract higher wage rates than existing employment opportunities in Dubbo, there could be some shift of labour away from other lower paying industries or employers to the Proposal. If this occurs, then some existing employers in Dubbo may have to train new employees. It is reported that the Mid-Western Regional Council have lost some staff to new coal mines within the local area. Costs associated with recruitment and training for new (replacement) staff have subsequently been incurred by the Council. In other areas of the State, agricultural workers appear to have been

attracted by the higher pay and perceived better conditions associated with mining (and construction) jobs, leading to shortages of agricultural workers.

The **operational** phase of the DZP would create around 250 permanent jobs. A large number of job applications have already been received by the Applicant, even though no jobs have as yet been advertised. The operational workforce would be a residential one, preferentially sourced from the local area, i.e. no mining camp or FIFO arrangements. A limited number of specialist or technical positions, e.g. chemical engineers, metallurgists, industrial chemists, would have to be sourced from outside the local area, and inevitably there would be movement from surrounding areas to Dubbo to take up the employment opportunities provided by such a large employer. The Applicant has reviewed the position descriptions required for the Proposal and considers that only 10% to 15% of positions (25 to 35) are of a specialist or technical nature that would require import from more established mining regions. On this basis, the Applicant aims to employ 85% of the start-up operational workforce from those currently residing in Dubbo or surrounding areas.

The addition of 250 new jobs, assuming that the labour force stays at its current size (i.e. no new residents coming in to take up employment positions at the mine), could result in the unemployment rate in Dubbo dropping from the current 4.5%, to 3.6% (calculated on basis of constant labour force, and numbers unemployed dropping by 200). However, as with construction employment, there could be a shift of employment resulting from the creation of 250 new operational jobs at the DZP. Those taking up positions with the DZP could leave existing jobs in Dubbo, causing new residents to come to Dubbo to fill the vacated positions. If this were to occur, then there could be a need for additional training costs to be incurred by employers, and also an increased demand for housing in Dubbo. These issues are addressed in Section 4.4 (Social Impacts).

4.3.3 Regional Value of Output

The annual output from the DZP is estimated to have a gross value of $500 million, which would be delivered for 20 years. This new output would deliver a 23% addition to Gross Regional Product (GRP), currently estimated (DCC) at around $2.1 billion per annum. Over the 20 year “life” of the Proposal, this output is estimated to have a PV of $4,257 million at 10% discount rate. It is clear that the DZP would deliver a major stimulus to the output of the Dubbo region.

The expenditure of some $47.4 million per annum on locally-supplied goods and services (including utilities) is also expected to be generated by the Proposal, with around $34 million of this consisting of wages and salaries paid to the operational workforce. This expenditure would add to Gross Value Added (GVA) for the region, both via increased demand for local services, and via the consumption spending of income by employees.

4.3.4 Impact on Adjacent Activities

The impact of the Proposal on adjacent activities would be minimal. As the Applicant would own significant areas of surrounding land, the impact on neighbours would be minimised. It is noted that there are isolated blocks of land (Lot 312 DP595631 and several Crown land blocks or easement) adjoining the DZP Site which remain uncontracted to the Applicant. The Applicant continues to negotiate for the acquisition of these blocks, however, in the interim has

considered the impacts of the Proposal on the air quality, noise, water resources, etc. on these. The impact on local agricultural production has been assessed in the Agricultural Impact Statement (AIS) prepared and appended to the EIS for the DZP (as Appendix 9) (see also Section 3.7 for a summary).

There would be no impact on any adjacent water users, as water required by the DZP would be obtained from an entitlement to draw water from the Macquarie River, and potentially other groundwater sources regulated by *Water Sharing Plans*. The draw of water under entitlement would be in accordance with the rules and regulations of the relevant *Water Sharing Plan*. The AIS considers the impact of the possible 'change of use' of water within the regional setting.

If the rail link between Dubbo and Toongi is used, impacts on properties adjoining the rail line would be minimised as far as possible, with all crossings and fencing to be constructed as required. Use of the Obley Road for transport of raw materials in to, and finished product out of, the DZP Site would have impacts on other road users and on properties adjoining Toongi and Obley Roads, as a result of increased traffic movements. However, the Applicant proposes an investment of over $15 million in upgrading the Obley Road, to deliver a road that is capable of taking B-double trucks.

Further discussion of the transport issues relating to the DZP are set out in Section 4.4 on social impacts.

4.3.5 Public Sector Revenues

The operation of the DZP would make significant contributions to the public sector, via a range of payments made to the national, State, and local governments under existing legislative arrangements.

At a national level, corporate tax would be paid by Australian Zirconia Ltd, as operators of the DZP, to the Australian Tax Office. Assuming a corporate tax rate of 30%, then the steady state annual average corporate tax payment from the Proposal would be in the order of $70 million.

Royalties would also be paid to the NSW State Government. Based on planned production levels, and current royalty rates (4% of revenue), approximately $9.5 million (steady state annual average) would be paid to the NSW Government. Annual payroll costs are estimated at around $34 million, and payroll tax would be levied on this amount, also accruing to the State Government.

Estimates have also been made on likely levels of payment to the local (Dubbo City Council) government, of around $1 million per year. The Applicant has commenced discussions with Dubbo City Council regarding the establishment and implementation of a Voluntary Planning Agreement (VPA) to account for the additional impacts on Dubbo City Council infrastructure and services resultant directly or indirectly from the DZP. The proposed upgrade of Obley Road and Toongi Road is likely to form part of this VPA. Dubbo City Council has requested that negotiations over the structure and content of a VPA follow assessment of the EIS and socio-economic assessment, to enable contributions from the Applicant to be as targeted as possible to likely impacts.

The operation of the DZP would therefore contribute a minimum of $114.5 million each year to the public sector. Additional to this sum would be income tax and local rates paid by employees of the Proposal, as well as fuel tax paid by road transport contractors employed to bring raw materials in to the site, and take finished product out.

4.4 SOCIAL IMPACTS

4.4.1 Introduction

In addition to the economic impacts that have been assessed for the DZP, there could also be some social impacts imposed on the regional and local community. Some of these potential social impacts have been outlined above, as issues of general concern to the community (see Section 4.2). Other potential social impacts include issues relating to transport options for the Applicant, demand for infrastructure and services, and amenity values held by the community.

4.4.2 Transport

The final decision on the arrangement of transport to and from the DZP Site remains to be confirmed and a range of specialist consultant reports have considered logistical options, costs involved, and construction/rehabilitation requirements of three possible options involving various combinations of road and rail transport.

Rail Transport

The Dubbo-Molong Rail Line remains open, even though the line has been dis-used for around 20 years. This rail corridor runs through residential areas (along Margaret Crescent) as it exits the Dubbo city limits to the south (see **Figure 19**).

Transport studies that have been conducted estimate that a total of 321,765 tonnes of materials could use this rail link, consisting of bulk raw materials such as sulphur, caustic soda, soda ash, and hydrochloric acid (total of 238,800 tonnes), with around 8,000 tonnes of imported materials, and the export of 75,000 tonnes of product moved out. Prior to commencement of transport, a final transport route options study would be completed to ensure that all risks are reduced as low as reasonably possible. A Preliminary Hazard Analysis (PHA) has been completed for the storage and use of these materials on the DZP Site, with the proposed management measures reducing the associated risks to acceptable levels.

Detailed information on timing, duration of passage, frequency and other controlling factors of any train movements along this rail line are not yet available, however, it is acknowledged that use of the rail line would change “free use” of the rail easement that residents of Margaret Crescent have become accustomed to. Discussions with real estate agents have concluded that there could be a minor (and one-off) slight loss of value for some properties which adjoin the rail line, but that all purchasers of affected houses would have known that the rail line had not been closed, but merely dis-used for a time. There would also be significant social benefits from use of the rail line for materials transport, in terms of the reduced need for heavy vehicles using roads through Dubbo.

Figure 19
Transport Links from Dubbo

If this rail option is selected, there would be a major refurbishment of the rail line required, involving not only replacement of the rails, but also considerable fencing and crossings. Modern engineering design and construction of railway line and rolling stock facilitates much quieter train operation than was the case several decades ago.

The use of the rail line is not considered to have any major impact on future residential land developments in southern parts of Dubbo, as the easement has existed since early last century.

Road Transport

Even if it is decided to make maximum use of the rail transport option, there would still be a requirement for transport along the Obley Road, from the Newell Highway junction to the DZP Site. If 321,765 tonnes per annum are transported by rail (as described above), a total of 367,463 tonnes would be transported to the DZP Site by road. If the rail link is not used, then 689,228 tonnes of freight could use Obley Road and Toongi Road.

A major road upgrade would be undertaken, so that the surface and width standards would accommodate B-double trucks. This would also involve replacement of existing bridges and causeways, and the refurbishment of rail crossings. Despite the road upgrade, there could be social costs imposed as a result of increased heavy vehicle traffic along the 22km of the Obley Road between Dubbo and Toongi. Such costs could include:

- Possible increased travel times.
- Possible increase in traffic accidents.
- Environmental costs associated with air and noise pollution.

The "tax" component of fuel prices and heavy vehicle registration charges are designed to compensate the general community for such costs. However, it is unlikely that the national or State Governments will re-direct any of the income received from these charges to the Obley Road. The Applicant has conducted road alignment and road pavement investigations to assess current condition and required upgrades to improve the standard of the roads to accommodate the increased heavy vehicle traffic. Based on these initial investigations, which are discussed in further detail in Constructive Solutions (2013) (Part 11 of the *Specialist Consultant Studies Compendium* accompanying the EIS), the Applicant has identified expenditure of at least $15 million (to be incurred by Alkane) on upgrading the road to minimise social costs associated with increased road usage. It is reported (*pers comm*) that the impact of the Cadia Valley Operations (CVO) mine near Orange has not led to a fall in property prices despite the increased traffic and minimal road upgrade.

4.4.3 Demand for Infrastructure

4.4.3.1 Housing and Accommodation

As a result of the location of the ore body relative to Dubbo, it is likely that the majority of the operational jobs, and a large proportion of construction jobs, would be filled by existing local residents.

The **construction** workforce is likely to consist of both local residents (employed as short term contracts are issued to local construction operators), and members of the permanent workforces of specialist contractors who may be required for particular tasks associated with the Proposal. It is estimated that the construction workforce would require 300 to 400 people at various stages, who would be accommodated (predominantly) in Dubbo. There would be a small increase in demand for temporary housing, but it is likely that the specialist contractors who are required to come to the site for short periods would be accommodated in the extensive tourist facilities available in Dubbo. The (indefinite) postponement of the Cobbora Coal Project should lessen the potential for excessive demand for temporary accommodation over the construction period. There could be some demand for rental accommodation for periods of between 12 and 18 months, which could place upward pressure on rents charged by landlords in response to increased demand. Anecdotally, this has been the experience in other centres affected by mining developments, such as Orange and West Wyalong, where rental charges increased during peak construction periods for local mining projects, and then dropped back to more "normal" levels once the construction phase had been completed.

Data available (Real Estate Institute NSW [REINSW], Submission to DCC, January 2013) indicates that although there have been public expressions of concern over rising rents in

Dubbo (e.g. article in "The Daily Liberal" - 4 June 2012), trends in rents, sales, and bonds indicate a broad decline in all housing sectors. In the opinion of the REI (Orana) this reflects a "deep seated structural decline in the Dubbo economy". However, increases in rents observed in the 12 months to September 2013 (16.7% for 2-bed houses and 5.9% for 4-bed houses – REI data) suggest a shortage of supply in Dubbo. In the opinion of the REI, this trend suggests that Dubbo is not offering sufficient residential housing choices for investors. Dubbo has more recently been identified (Australian Property Investor, Jan 2013) as a centre of potential for residential investment. This publication also states that "the mines collectively are expected to be a population, jobs, and service booster for Dubbo".

The **operational** phase of the DZP would create around 250 permanent jobs. The operational workforce would be a residential one, preferentially sourced from the local area, i.e. no mining camp or FIFO arrangements. As noted in Section 4.3.2, the Applicant has reviewed the position descriptions required for the Proposal and aims to employ 85% of the start-up operational workforce from Dubbo or surrounding areas residents.

The addition of 250 new jobs, assuming that the labour force stays at its current size (i.e. no new residents coming in to take up employment positions at the DZP), could result in the unemployment rate in Dubbo dropping from the current 4.5%, to 3.6% (calculated on basis of constant labour force, and numbers unemployed dropping by 200). If this expectation is fulfilled, then there would be limited new 'direct' demand for housing directly resulting from the Proposal. However, it is possible that individuals would leave existing employment in Dubbo to take up positions with the DZP, with new residents attracted to Dubbo to fill the vacancies created in other industries. Some of these vacated positions could also be filled by existing Dubbo residents who are currently unemployed, underemployed, new to the labour market (e.g. school leavers) or returning to the labour market (e.g. parents returning from maternity/paternity leave) which could create demand for additional training.

The creation of employment opportunities through transfer of workers from current positions to positions with the DZP would also be likely to attract new residents to the Dubbo area to take up these vacated positions. The DZP, although intending to employ existing residents, could therefore create some demand for new housing via this "flow-on" effect. Notably, this increased demand is likely to be created over an extended period, i.e. there will be a progressive rather than immediate filling of vacated positions. Discussion with representatives of the Orana Division of REINSW indicates that 550 to 660 houses are sold, on average, each year in Dubbo (see **Figure 20**). This pattern of sales suggests that the Dubbo housing market could accommodate up to 10 new purchasers each month without too much restriction.

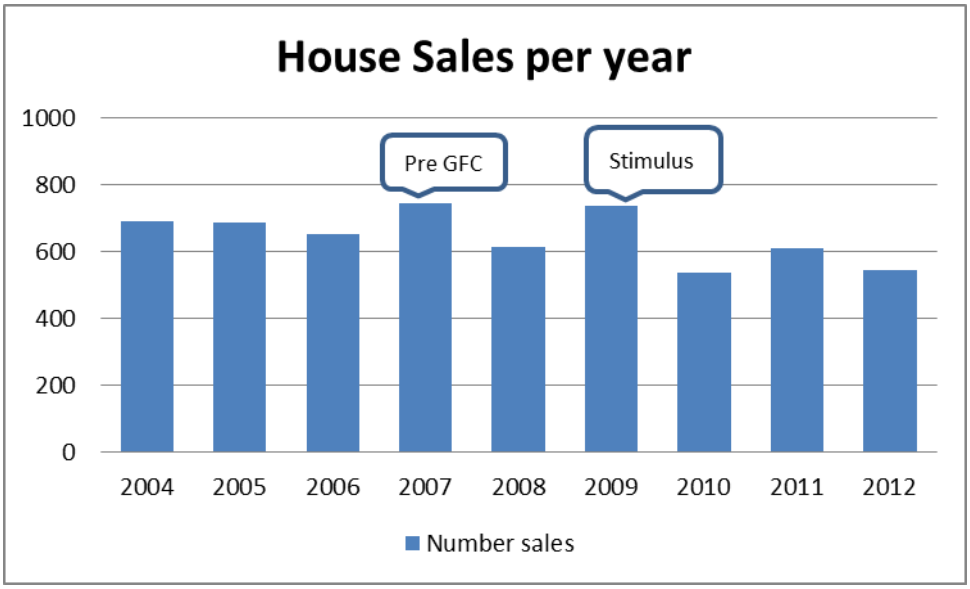
Figure 20 indicates that up to 750 houses were sold in the last year before the GFC (2007) and in the year following the GFC when the Australian Government embarked on spending in the construction sector to deliver some stimulus to the Australian economy. At average levels of sales, it is considered likely that any new demand for housing could be accommodated within existing stock. However, any stimulus for increased home construction would be welcomed by the Dubbo economy, as it could take place gradually over several years.

4.4.3.2 Other Social Infrastructure

For similar reasons as discussed for accommodation, no big increase in demand is expected for other social infrastructure such as schools and hospitals. With the Cobbora Coal Project having been indefinitely delayed, there is no other new project of a comparable size planned

for the Dubbo area that would bring in new residents. Existing residents (within 70km of the DZP Site) would fill most of the operational jobs created by the DZP, and new residents (coming in to fill vacancies in other sectors where people have opted to leave employment to take up positions with the DZP) would be gradually absorbed into the community. It is also noted that the Applicant has committed to the development and implementation of a VPA with Dubbo City Council, which would include upgrades to Obley and Toongi Roads of at least $15 million, to offset or compensate for any increased demand on local services and infrastructure.

Figure 20
Level of demand observed in the Dubbo residential (house) market



Source : REI (Orana Division) "Review of Dubbo LEP 2011" submission to DCC

4.4.3.3 Industrial Infrastructure (Utilities)

Operation of the DZP would require utility infrastructure such as power (electricity) and potable water. Easements to establish these services to the DZP Site (Toongi) have been identified as a component of the Applicant's development application. The volumes of water required for operations of the DZP would be purchased via acquisition of entitlements, drawn from the Macquarie River. As discussed in Section 4.3.4 (and the AIS), there is not expected to be any impact on neighbouring water users as a result of the DZP. Electricity would be purchased from the NSW grid and delivered via a proposed new 132kV electricity transmission line from Geurie (which will be assessed and approved separately under Part 5 of the EP&A Act). Compressed natural gas would be delivered to the DZP Site via a spur line to be developed, under licence issued in accordance with the *Pipelines Act 1967*.

Figure 21 provides an illustration of the proposed easements for the delivery of these industrial utilities required by the DZP. Notwithstanding the location of the ore body, the availability of access to these utilities, as seen in **Figure 21**, all add to the attraction of Toongi site for development of the DZP.

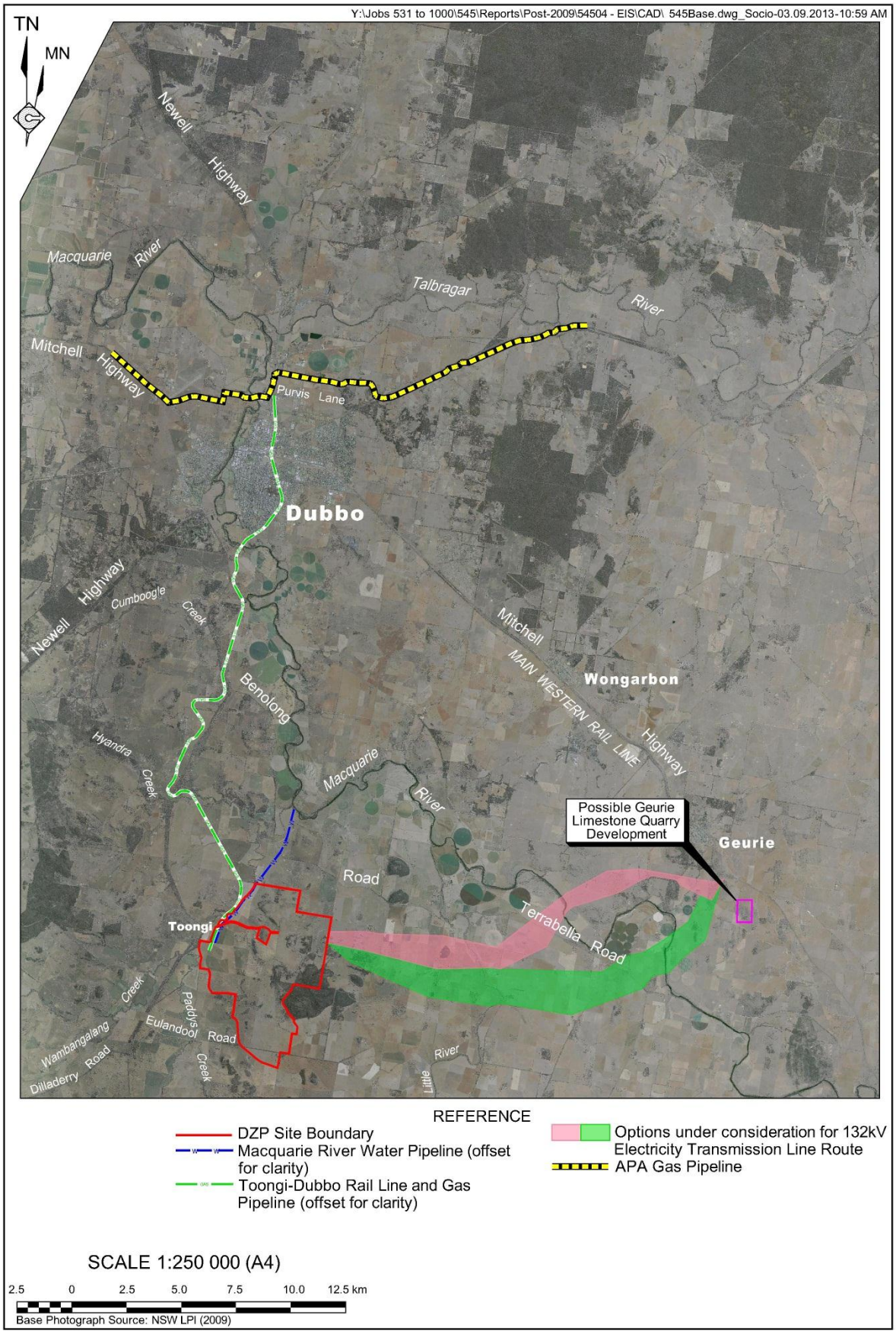


Figure 21
Utility Infrastructure to the DZP

4.4.4 Demand for Services

Increased demand for services has been considered along with social infrastructure in Section 4.4.3.

There could be an increase in demand for local educational or training services within the region so that school leavers, or those wishing to transfer from current employment to the mining sector, obtain the appropriate skills. In recognition of this, the Applicant has engaged with Regional Training Organisations (RTOs) and local educational institutions over several years with the aim of preparing Dubbo to supply a locally skilled workforce

- During 2012 and 2013 the Applicant has engaged with Region 21 Governing Committee which facilitates partnerships between schools, business and community so that communities are empowered and have access to quality education, training and employment opportunities.
- The Applicant has also consulted with the Central West Mining Steering Committee, coordinated by Tony Fuller (Regional Coordinator Aboriginal Affairs – DEC). The Applicant's General Manager NSW also met with Regional Vocational Education Consultant, Mr Wade Greenwood on 30 July 2013 to discuss methods to ensure information on future job opportunities to be provided by the Proposal and skills requirements could be best disseminated to both prospective employees and training providers.
- The Applicant also hosted a visit to the pilot plant at the ANSTO Lucas Heights facility, with representatives of RTOs attending to gain an understanding as to the likely skills required of the workforce.

It is also noted that NSW TAFE (Dubbo Campus) currently provides targeted training to satisfy the requirements for the Applicant's workforce at the Tomingley Gold Mine and the technical training requirements specific to the industrial processing operations of the Proposal have been discussed on several occasions.

As it is anticipated that most of the operational workforce would consist of employees who are already resident in Dubbo, this Proposal would be unlikely to cause a major inflow of new residents to the area which could have the potential to increase demand for other services. It is actually considered likely (*pers comm*, real estate agent in Dubbo), that a gradual inflow of new residents to take up employment positions vacated by local residents opting for employment with the DZP would cause a beneficial stimulus to the residential construction sector in Dubbo which REINSW note displays a shortage of residential housing choices for investors.

4.4.5 Amenity Values

The DZP would result in the construction of processing facilities, a rail laydown and container storage area adjacent to the rail line at Toongi as well as various residue (liquid and solid) storage facilities over the wider DZP Site. This would cause some change in visual amenity for local residents, particularly those houses located on the west side of the Obley Road near the Toongi Road turn-off. Section 4.13 of the EIS provides a detailed review of the likely impact of the Proposal on visual amenity, including representative views of the operations. These residents have been interviewed during the preparation of this study, and have expressed an understanding of the nature of the operations. Current residents of Toongi Village have either

sold their properties to the Applicant, or have elected to stay, implying an acceptance of changes to visual amenity. The acceptance of changes to visual amenity notwithstanding, the Applicant would construct earth bunding and undertake tree plantings west of the mineral processing facilities to minimise visual impacts from the Obley Road.

An increase in road traffic would have the greatest impact on the current amenity of the properties west of the Toongi Road intersection with the Obley Road. The Applicant is committed to managing the transport contractors to ensure that a fuel efficient and quietly operated fleet is engaged for the freight task.

Residents along the Obley Road further north from Toongi would experience an increased volume of heavy vehicles along this road. To the extent that some houses may have views of the road, there could be some loss of visual amenity, and some noise impacts. However, major expenditure by the Applicant in upgrading this road, with accompanying increased amenity for local residents in terms of road safety and travel times, could be seen as providing some compensation for any such loss.

Residents in the Margaret Crescent area adjoining the Dubbo-Molong Rail Line may also consider that they would experience some amenity loss as a result of the Proposal. These residents have become accustomed to using the rail corridor as a walking track, and in some cases have planted trees and other vegetation to attract birds to the area. In addition to noise impacts, this ready access to the corridor would no longer be possible should the rail transport option be selected by the Applicant. Efforts would be made to restrict train movements (should rail be used) to acceptable hours to minimise noise disturbance for these residents. While the Applicant acknowledges that some residents could be unhappy with this perceived amenity loss, it should be noted that:

a) the rail line has never been de-commissioned, so reactivation has always been a possibility that residents should have been aware of on purchase; and

b) use of the rail will reduce the need for heavy vehicle traffic moving through Dubbo

4.4.6 Other Values

Section 4.2 (General Concerns in the Community) has outlined some of the possible impacts of the DZP on other values held by the community. These include:

- concerns as to possible changes to social structures, as current Toongi residents could leave the area when their houses are purchased by the Applicant;
- some concerns over security issues for residents, as a result of DZP attracting visitors to local area; and
- reactivation of rail potentially causing temporary inconvenience at crossings, and loss of right of ways for some landowners.

Measures to address such concerns have been set out in Section 4.2.

5. COMMUNICATIONS STRATEGY

The Applicant has already adopted a detailed communication strategy for the DZP, whereby the community (and different groups within the general community) have all been kept informed of the nature of the Proposal, and of progress with the development of the Proposal.

The local Toongi community has been aware of the existence of the ore body for more than 13 years, as several exploration programs have been undertaken to quantify the nature and size of the resource. A community meeting was convened on the evening of 28 November 2011 for members of the local Toongi community and surrounds for the Proposal to be described in detail and an opportunity provided to the community to identify issues of specific concern.

A community meeting was convened by the Applicant in Dubbo on the evening of 10 July 2012, particularly focussing on urban neighbours to the Dubbo-Molong Rail Line. Information was provided, and expressed views from affected residents were received by the Applicant. Several additional meetings have been held at Toongi for local residents, to inform them of the DZP, and progress/likely timing of the Proposal. In addition, a regular newsletter is provided to anyone who wishes to be added to the mailing list (eight newsletters have so far been distributed, the last in July 2013).

These consultations have been well received by the local community, who appreciate that their views are important to the Applicant. It is proposed to continue with this form of consultation (i.e. individual meetings, community meetings, and the newsletter) as the basis of a communications strategy as the Proposal proceeds into construction and operational phases.

The Applicant has also engaged in communications with Regional Training Organisations (RTOs) and local educational institutions over several years with the aim of preparing Dubbo to supply a locally skilled workforce. This communication is proposed to continue.

6. CONCLUSION

This assessment of the social and economic impacts of the Proposal has indicated that the overall impact on the regional community would be beneficial. Jobs would be created for local residents, and a mineral resource accessed that would allow Australia to enter into the global market for raw materials required by a range of “high tech” industries.

There would be a change in land use (temporary for part of the DZP Site, and permanent for a smaller area) in the local area, with a corresponding loss in the value of agricultural production. This loss would be off-set by a very much greater increase in the value of output from the site, and this would assist in meeting the economic development goals of the Dubbo region. Negative socio-economic impacts would also be offset, to varying degrees according to personal values and circumstances, by the Applicant’s acquisition of houses and farms affected by the Proposal.

It is acknowledged that converting a relatively quiet rural setting into an industrial scale mineral processing facility is a significant change. Change by its nature impacts every person in different ways. Students at school may look at this project as a long term career opportunity, local workers may see an opportunity to re-train and take on new skills and retirees may see the Proposal in an entirely different light. Negative impacts would be concentrated more in the

local area, but are out-weighed by the larger regional benefits. In addition, the Applicant proposes to take steps to minimise local socio-economic costs via major expenditure on local road upgrade, the purchase of affected local houses and farms, and the use of landscaping measures to minimise visual impacts.

A new intensive industry and employer (AZL) in the Dubbo LGA would increase the level of diversification in the local economy, in accordance with the defined goals of *Dubbo City Council's Economic Development Strategy* (DCC, 2012).

On balance, the Proposal is assessed as providing a significant net benefit to the region.

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