

- Grevillea Close and Wingewarra Street.
- Hampden Street and Wingewarra Street.

Although traffic counts for these roads have not been obtained, significant volumes out of the listed side roads are considered to be unlikely during the 5 minute delay.

Delays at the associated rail crossings with Obley Road and Toongi Road would have a negligible impact as there is significantly less traffic than there is in the Dubbo urban area, and the delays are likely to be less than they are in town given that the train speeds would be greater than 10km/hr.

4.12.5.8 Other Road Users

The Applicant acknowledges that roads to be used for the transportation of reagents and products are used by a range of other stakeholders, including cyclists, school buses, residents and visitors to the locality and pedestrians. The proposed road upgrades would ultimately improve the standard of the road and several intersections and creek crossings, which in their current form do not conform to the minimum standards as set out in the *Guide to Road Design* and other RMS and Austroads publications. Furthermore, the Applicant has outlined various management measures aimed at informing other road users of the increased volume of traffic, managing periods of greatest risk to other road users, e.g. during road construction works, and enforcing safe and courteous driver performance.

Ultimately, the risk of a traffic incident cannot be completely removed, however, it is assessed that, with the implementation of the proposed management measures, these risks would not increase and in fact be significantly reduced.

4.13 VISUAL AMENITY

4.13.1 Introduction

The Director-General's Requirements (DGRs) issued by DP&I identified "**Visual**" as a key issue for assessment including "*a detailed assessment of the:*

- *changing landforms on the site during the various stages of the project;*
- *potential visual impacts of the project on private landowners in the surrounding area as well as key vantage points in the public domain, including lighting impacts; and*
- *a detailed description of the measures that would be implemented to minimise the visual impacts of the project."*

Based on the risk analysis undertaken for the Proposal (Section 3.5), the potential impacts relating to visual amenity and their risk rankings (in parenthesis) without the adoption of any mitigation measures are as follows.

- Decreased visual amenity from changes to visual characteristics of the site (high).
- Reduced amenity of night sky from night lighting (medium).

It is noted at the outset that the value placed upon visual amenity and the impacts upon surrounding visual amenity would vary from person to person and from location to location. As a result, a visual amenity assessment is, by its nature, somewhat subjective. As a result, during the visual amenity assessment, emphasis has been placed on providing a description of the existing visual amenity surrounding the DZP Site and the measures that would be undertaken by the Applicant to minimise potential visual amenity-related impacts on surrounding residents and others. In addition, indicative descriptions and impressions of the anticipated visual landscape following completion of mining-related operations have been provided.

4.13.2 Existing Visual Amenity

The existing visual amenity surrounding the DZP Site is typical of rural areas in the central west of NSW, with the outlook from most rural residences and other vantage points including land used for agriculture, transportation or other infrastructure, as well as remnant native vegetation. Outlooks from residences within the local setting, i.e. those identified on **Figure 4.6**, include views of agricultural paddocks, irrigation infrastructure, remnant vegetation (predominantly within the road easement of Obley Road, the riparian corridor of Wambangalang Creek and on Dowds Hill), occasional buildings and local roads.

The rural landscape surrounding the DZP Site is flat to moderately undulating and has been largely cleared of remnant native vegetation. In cleared areas, visual amenity changes with the seasons from red-brown fallowed paddocks to green growing crops and straw coloured harvest residues (stubbles). Livestock, predominantly sheep, are a common feature depending availability of feed. Remnants of native vegetation remain in the landscape, generally associated with road easements, the riparian corridor of local creeks and on Dowds Hill. These corridors of native vegetation limit the extent of views that may be obtained surrounding the DZP Site.

Typical views of the local setting from more elevated locations, including sections of the DZP Site, are provided by **Plates 4.22 to 4.29**.

Construction activities within the Macquarie River Water Pipeline Corridor may be visible from some rural residences and local roads, however, as the pipeline would be buried this would not be visible following installation. An 11kV ETL to be constructed within the corridor may be visible from some residences and rural roads. The upgraded rail line between Toongi and Dubbo would be visible from properties, residences and roads adjacent to the rail easement.

With the exception of vehicle movements on local roads, there are virtually no night-time activities planned in the vicinity of the DZP Site. As a result, lighting-related impact(s) on the existing night-time visual amenity are likely to be an important consideration.



Plate 4.22: View of Toongi Valley from
 Obley Road (Property 34)
 (Ref: E545V_001)

Plate 4.23: View towards the DZP Site
 and Dowds Hill from 200R Obley Road
 (R27)
 (Ref: E545V_002)



Plate 4.24: View towards the DZP Site
 from 215R Obley Road (R25)
 (Ref: E545V_003)

Plate 4.25: View over Toongi Valley
 from 216R Obley Road (R24)
 (Ref: E545V_004)





Plate 4.26: View towards the DZP Site from 218R Obley Road (R23) (Ref: E545V_005)

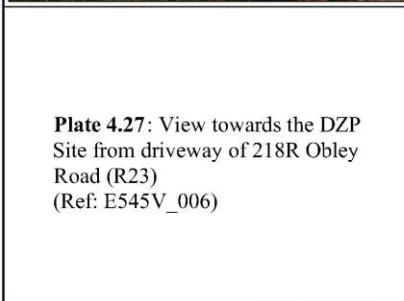


Plate 4.27: View towards the DZP Site from driveway of 218R Obley Road (R23) (Ref: E545V_006)



Plate 4.28: View towards the DZP Site from Obley Road (South of Wambangalang Creek crossing) (Ref: E545V_007)



Plate 4.29: View towards the DZP Site from "Strathgled" (R18) (Ref: E545V_008)



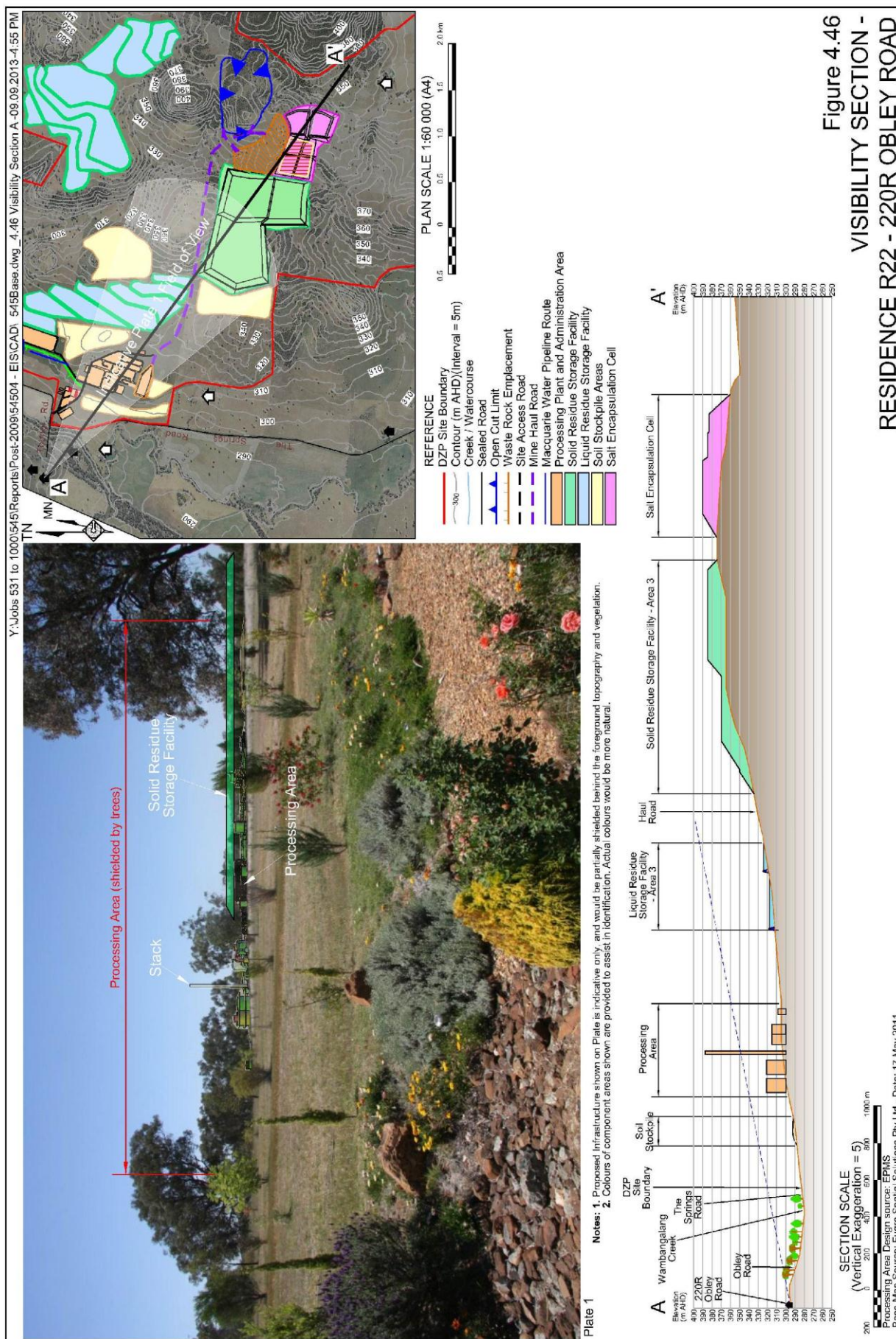
4.13.3 Management and Mitigation Measures

Managing the visual impact of the Proposal, in particular the construction of the processing plant, other infrastructure and various waste management facilities on the DZP Site, offers a variety of challenges and requires a range of solutions. The Applicant proposes the following measures to manage the impact of its activities on the visual amenity surrounding the DZP Site.

- Stockpile Area 1 (refer to **Figure 2.6**) has been designed to be oriented along the western side of the rail easement and would be vegetated with fast growing tree and shrub species to create a vegetated amenity bund.

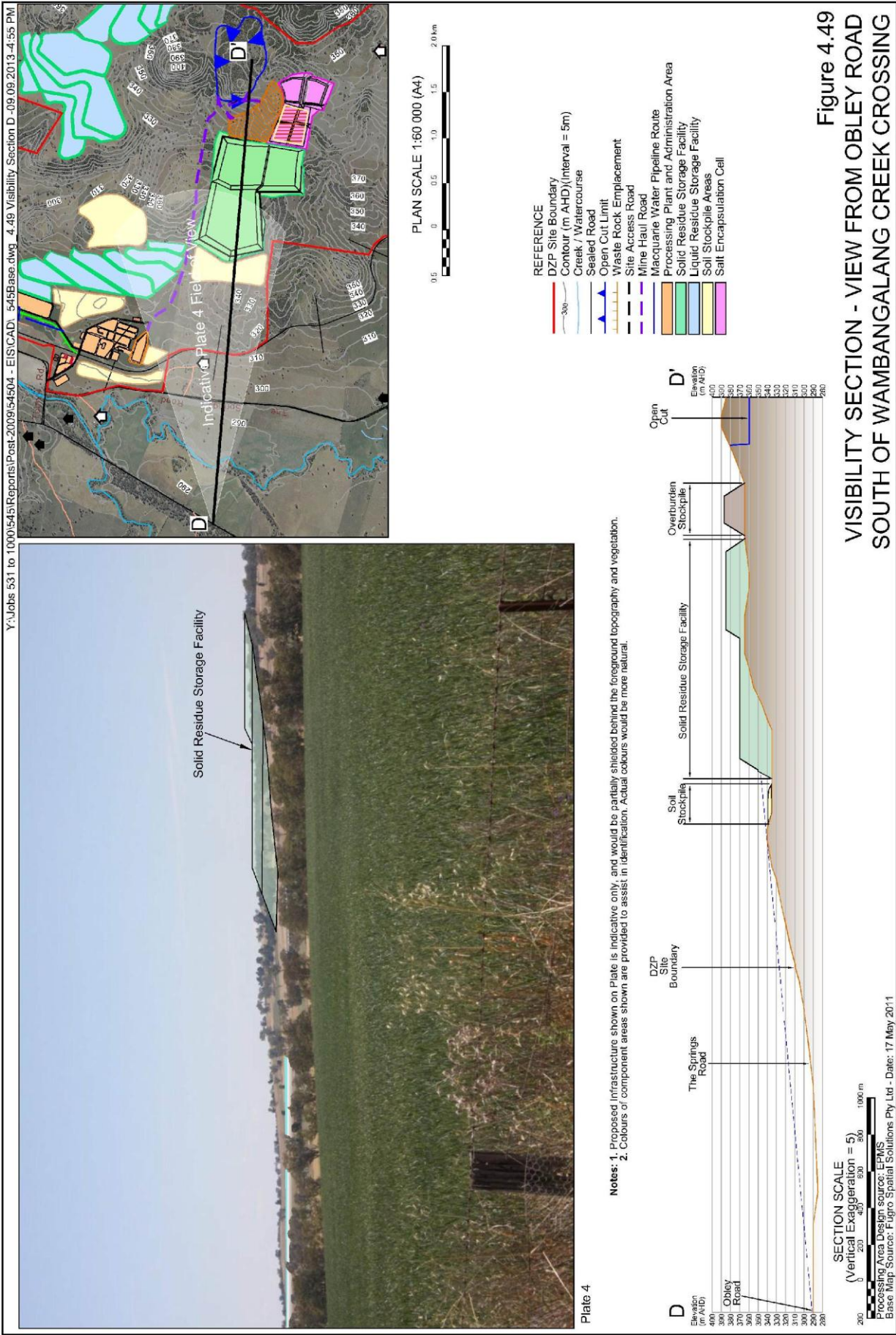
The amenity bund would provide screening of the processing plant operations from vantage points on Toongi Road, The Springs Road and to a lesser extent Obley Road. As establishment of the processing plant would be one of the initial construction activities to be undertaken on the DZP Site, the vegetation cover and trees on the soil stockpiles would have 18 months to 2 years to establish prior to commencement of operations.

- The outer embankments of the LRSF, SRSF, WRE and Salt Encapsulation Cells would be progressively rehabilitated. The establishment of a grass cover over these outer embankments would reduce the contrast between the surrounding agricultural paddocks and these structures.
- Implementation of the proposed BOA, which would incorporate the protection and enhancement of native vegetation across and surrounding the DZP Site (see Section 2.17.8).
- Construction of the processing plant and other infrastructure within the DZP Site from non-reflective, neutral coloured material. (It is noted that the colours used for the indicative processing plant infrastructure in the visual collages of **Figures 4.46 to 4.49**) are not representative of the colouring of this infrastructure but used to assist the viewer in differentiating between different items of the plant).
- Selection and placement of permanent and temporary lights that:
 - are not directed towards, and therefore do not impact on the vision of motorists using, the Newell Highway;
 - do not point towards surrounding residences; and
 - minimise the ‘lume’ created by the lights.
- The Applicant would consider any reasonable request by a potentially affected resident for assistance to create a visual screen adjacent to their residence through planting of fast growing vegetation and/or landscaping, where such a screen would effectively reduce the visual impact of activities throughout the life of the Proposal.









The Applicant does not propose any visual amenity-specific measures in the vicinity of the Macquarie River Water Pipeline as the proposed pipeline would be buried and the pumping infrastructure located away from local vantage points.

The Applicant does not propose any visual amenity-specific measures in the vicinity of the Toongi-Dubbo Rail Line as the rail line is an established feature of the local setting and it is considered that visual controls such as screens within the rail easement adjacent to Margaret Crescent and other locations within the Dubbo City Limits would be more visually intrusive than the one train per day proposed.

4.13.4 Assessment of Impacts

4.13.4.1 DZP Site

During the life of the Proposal, various features of the DZP Site would be visible from various private and public vantage points surrounding the DZP Site. Those features of the DZP Site likely to be most prominent would be as follows.

- The Processing Plant and DZP Site Administration Area: due to its proximity to Obley Road and rural residential dwellings to the west and the overall size and nature of these facilities, e.g. various stacks, tanks and industrial buildings.
- The LRSF: due to its large size and the contrast that could be created between the standing water or crystallised salt and surrounding grassy paddocks.
- The SRSF, WRE and Salt Encapsulation Cells: due to the large size and location of these features over relatively elevated sections of the DZP Site. It is noted that the nearest non-Proposal related residential vantage points to this complex would be at least 3km away, with the closest public vantage point (the very lightly trafficked The Springs Road) approximately 1.5km away. Eulandool Road, Obley Road and Benolong Road would be approximately 1.9km, 2.4km and 5.4km away.

The open cut itself would be screened from vantage points by other features of the DZP Site and the local topography.

Photographs were taken by the Applicant in November 2012 and the layout of the DZP Site overlaid to generate a collage of the likely visibility of the DZP from these locations. **Figures 4.46 to 4.49** present five such collages at locations to the north, west and southwest of the DZP Site considered to be indicative of the visibility of the Proposal operations within the local setting. It is re-iterated that the colours used to illustrate the various features of the DZP Site are not representative of the actual colouration of these features. In the case of the LRSF and SRSF, colours approximating that which could be expected have been chosen. In the case of the processing plant, the colours have been chosen to assist in the viewer in differentiating between different items of the plant. As noted in Section 4.13.3, non-reflective, neutral coloured material would be used for the tanks, stacks and buildings of the processing plant.

Whilst it is acknowledged that the features of the DZP Site noted above would be visible from both private and public vantage points, it is assessed that due to the natural screening provided by local topography and vegetation, as well as the implementation of the mitigation and management measures proposed in Section 4.13.3, the visual impact over the life of the Proposal would be minimised to greatest extent reasonable and feasible.

The proposed final landform within the DZP Site is described in detail in Section 2.17.4. In summary, however, the final landform would comprise the following.

- A single bunded and fenced open cut.
- A shaped and rehabilitated above ground structure combining the waste rock emplacement, SRSF and Salt Encapsulation Cells. At its most elevated point (between 380m and 390m AHD) this complex would be of equivalent height to the pre-disturbance landform (390m AHD over the open cut).
- Very mildly undulating grassy paddocks over the land where the LRSF would be constructed.
- A return to the pre-disturbance landform over the area of the Processing Plant and DZP Site Administration Area (unless nominated for retention for a land use to be developed at the completion of the Proposal and subject to separate approval).
- A range of retained and revegetated surface water control structures, e.g. contour banks, drainage channels and sediment basins.

The only components of the final landform that would be visible from outside the DZP Site would be the SRSF, WRE and Salt Encapsulations Cells complex. It is noted that each of these structures would be revegetated using species representative of vegetation communities that occur within the DZP Site. On the basis of the successful rehabilitation of the DZP Site, it is assessed that the visual impact of the Proposal on local visual amenity would be restricted to the life of the Proposal.

In summary, the visual amenity in the vicinity of the DZP Site would be altered through the construction of a variety of structures not associated with the local setting. However, the impacts of that change to the existing visual amenity (which would be limited to the life of the Proposal) would be minimised as far as practicable through the implementation of the proposed mitigation and management measures, rehabilitation of the DZP Site and development and implementation of a *Biodiversity Offset Strategy*. Furthermore, the Applicant would seek to address individual concerns in relation to impacts on visual amenity through discussions and negotiations with individual residents.

4.13.4.2 Macquarie River Water Pipeline Route

The water supply line would be buried and would have no impact on visual amenity.

4.13.4.3 Toongi-Dubbo Rail Line

It is assessed that the small number of rail movements proposed (one per day / six per week) does not warrant the construction of visual screens within the rail easement (which would block the current views over grassed paddocks and woodland beyond the rail easement along Margaret Crescent).

4.14 HAZARDS

4.14.1 Introduction

The Director-General's Requirements (DGRs) issued by DP&I identified "***Hazards and Risks***" as a key issue for assessment including "*a screening of potential hazards off and on site to determine the potential for offsite impacts and if a Preliminary Hazard Analysis (PHA) is required. If required, a PHA must be prepared in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis...*"

The hazards assessment of the Proposal encompasses potential hazards caused by operation of the processing plant, bush fires, traffic incidents and assessment of potential contaminated lands within the DZP Site prior to commencement of the Proposal. This section has been compiled based on the following assessments.

- An assessment of the applicability of *State Environmental Planning Policy 33 – Hazardous and Offensive Development* (SEPP 33) was undertaken by Sherpa Consulting Pty. The full assessment is presented as **Appendix 4** of the EIS and is referenced throughout this subsection as Sherpa (2013).
- The assessment of potential bush fire hazard undertaken by R.W. Corkery & Co. Pty Limited in consultation with Applicant.
- The traffic impact assessment of the Proposal was undertaken by Constructive Solutions Pty Ltd, referenced throughout this subsection as Constructive Solutions (2013). The full assessment is presented in Part 11 of the *Specialist Consultant Studies Compendium*. Potential traffic and transportation impacts are assessed in greater detail in Section 4.12.
- A Contaminated Lands assessment for a property adjoining the DZP Site and Dubbo-Molong Rail Line, which is considered the only likely source of land contamination locally was carried out by Ground Doctor Pty Ltd. The full assessment is present as **Appendix 10** and is referenced throughout this section as Ground Doctor (2012).

4.14.2 Reagent and Product Management

4.14.2.1 Potential Hazards

Table 4.82 identifies the potentially hazardous materials and their hazard type that would be present at the DZP Site, if the Proposal is approved. Sherpa (2013) developed a range of incident scenarios and rules to determine which materials could possibly pose an increased risk outside the boundary of the DZP Site and thereby requiring a Quantitative Risk Assessment (QRA) (see Sherpa, 2013). A detailed description of the Incident Scenarios and assumptions used to determine inclusion in the QRA are provided by Sherpa (2013) (**Appendix 4**).

Table 4.82
Hazardous Materials

Material	Hazard Type	Incorporated into QRA	Scenario
Hydrochloric acid (33%)	Corrosive/Toxic	Yes	Release of hydrochloric acid from storage tank Release of hydrochloric acid in loading bay
Sulphuric acid (98%)	Corrosive	No	
Sodium sulphide	Corrosive	No	
Sodium hydroxide	Corrosive	No	
Anhydrous ammonia	Toxic/Flammable	Yes	Breakthrough of ammonia from aqua ammonia production Release of ammonia from storage vessels Release of ammonia in anhydrous ammonia and transfer area Release of ammonia in loading bay
Chlorine (potable water treatment chemicals)	Toxic	Yes	Release of chlorine from G cylinders (70kg)
SX organic	Irritant	No	
Diesel fuel	Combustible	No	
Aluminium powder	Produces hydrogen (flammable gas)	No	
Tributyl phosphate	Combustible	No	
Automotive LPG	Flammable	No	
Petrol	Flammable	No	
Source: modified after Sherpa (2013) – Table 5.1 and Table 5.2			

Sherpa then undertook the QRA to calculate the risks in terms of the following.

- Individual Fatality Risk: which provides the likelihood of fatality to notional individuals at locations around the source, as a result of the defined fire/explosion and toxic gas release scenarios. This is shown as contours on a map of the area. The units for individual risk are probability (of fatality) per million per year.

By convention it is assumed that people are located outdoors, are always present and take no evasive action if an incident occurs. The results are presented cumulatively for all toxic impacts.

- Injury and Irritation Risk: which provides the likelihood of injury or irritation to individuals at locations around the source as a result of the same scenarios used to calculate individual fatality risk. Similarly to individual fatality risk, injury/irritation risk contours represent probability of injury or irritation experienced by a person located permanently at a particular location, assuming no mitigating action such as escape.

4.14.2.2 Safeguards and Controls

The dangerous goods classifications, storage quantities and locations for reagents to be imported to the DZP Site have previously been provided in Section 2.7 and on **Figure 2.10**. **Table 4.83** consolidates this information and provides the nominated design standards to be applied for each material.

Table 4.83
Reagent Storage

Reagent	DG Class	Storage Capacity	Storage Location	Design Standard	Comments
Sulphuric Acid	Class 8 (Corrosive)	10 000m ³	Two above ground mild steel tanks on concrete bunded surface	AS 3780-1994	Tanks to be maintained within bunded area designed and constructed in accordance with Section 5.7 of AS 3780-1994 (Bunds and Compounds)
Caustic Soda		20 Isotainers	Temporary storage in isotainers within Rail Container Laydown and Storage Area	AS 3780-2008	
		1 400t	Bulk storage tanks concrete bunded surface		
Hydrochloric Acid		7 Isotainers (140 000L)	Temporary storage in isotainers within Rail Container Laydown and Storage Area		
		1 600t	Bulk storage tanks concrete bunded surface		
Sodium Sulphide		220t	Bulk storage tanks concrete bunded surface		
Anhydrous Ammonia	Class 2.3 (Toxic Gas)	200t	Storage vessels maintained within an enclosed structure on a bunded concrete pad	AS 2202-1983	The storage area would be secured when not in use. The storage area would be well ventilated. The storage vessels not exposed to direct sunlight, sparks or flame. The storage vessels would be securely closed when not in use.
Aluminium powder	Class 4.1 (Flammable solid)	65t	Bulk storage tank within an enclosed facility on a bunded concrete pad.	-	The storage area would be kept cool, dry and well ventilated and out of direct sunlight. The storage tank would be kept away from sources of heat or ignition and out of direct sunlight. The following materials would not be kept near the storage tank: – Strong oxidising agents. – Water. – Acids.

Note 1: see **Figure 2.10** for storage locations

All other reagents would be transported, stored, handled and used in accordance with the relevant Material Safety Data Sheet for that material.

The Applicant has generated MSDS's for all products of the Proposal and would adhere to the management and contingency measures nominated (see **Appendix 11**).

In order to prevent the escape of liquid materials, the following measures would be taken.

- All chemicals would be stored within concrete bunded areas.
- Tanker deliveries would occur over sealed areas with kerbing and drainage design preventing any runoff to the environment if a spill occurs.
- Spill kits would be provided as appropriate, enabling recovery of small quantities of spilt materials.

Gaseous or volatile materials handled at the processing plant (including ammonia, chlorine, hydrogen chloride fumes) have toxic effects that are primarily health and safety-related. Long-term or continuous emissions that may arise from plant operations would be addressed via an Environment Protection Licence (EPL) and occupational health and safety management systems.

4.14.2.3 Assessment of Impact

4.14.2.3.1 Preliminary Hazard Analysis

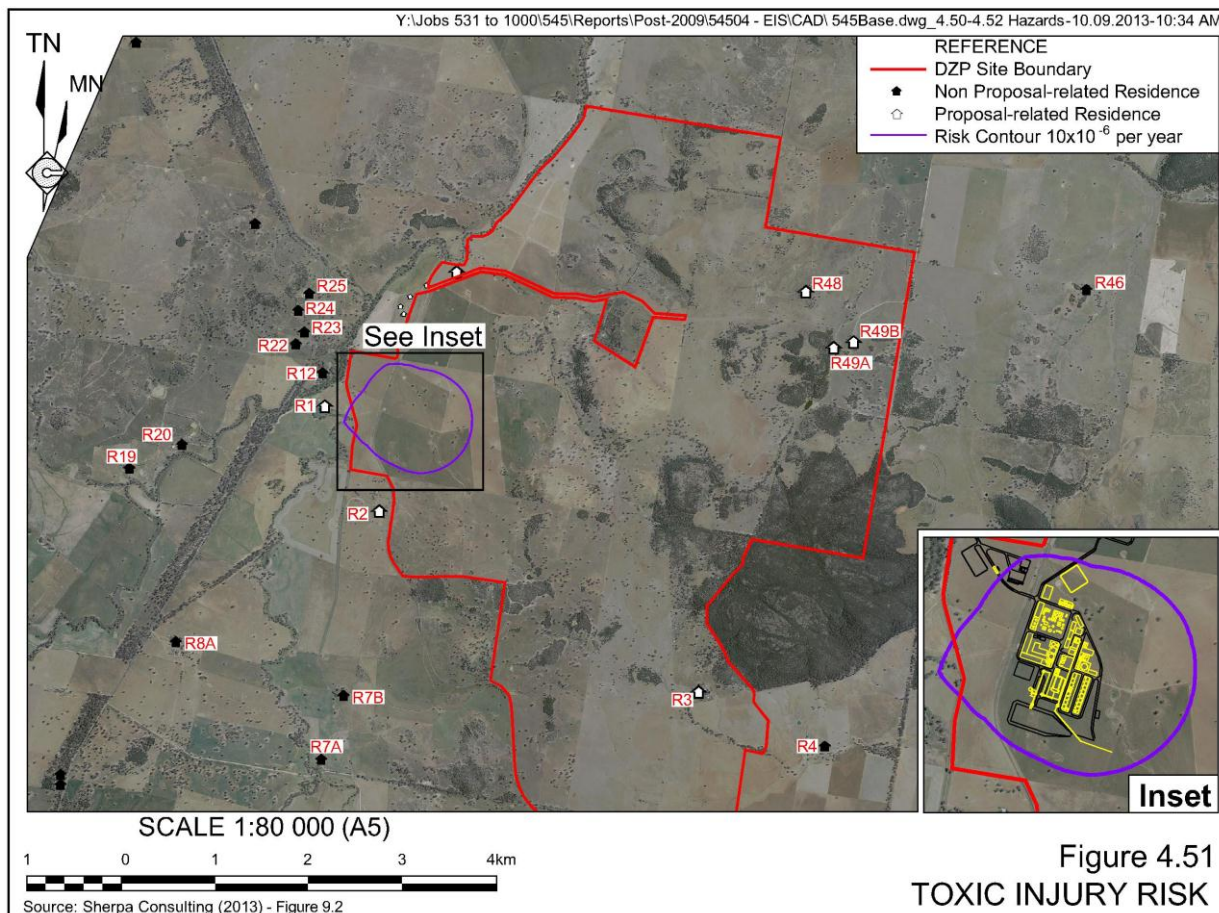
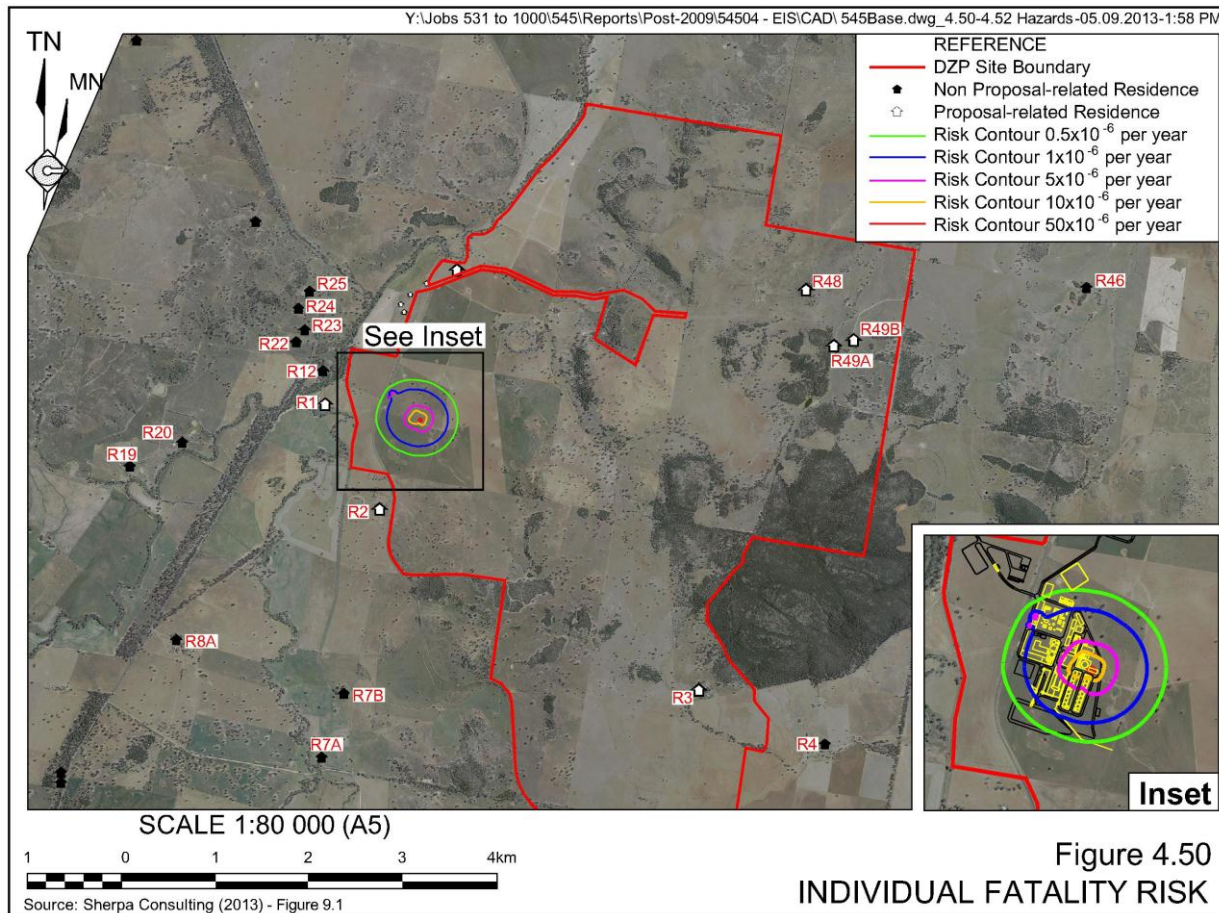
The results of the QRA identified that individual fatality and injury and irritation risk levels comply with the all criteria defined in the QRA. **Figures 4.50 to 4.52** show the risk contours for individual fatality risk, toxic injury risk and toxic irritation risk.

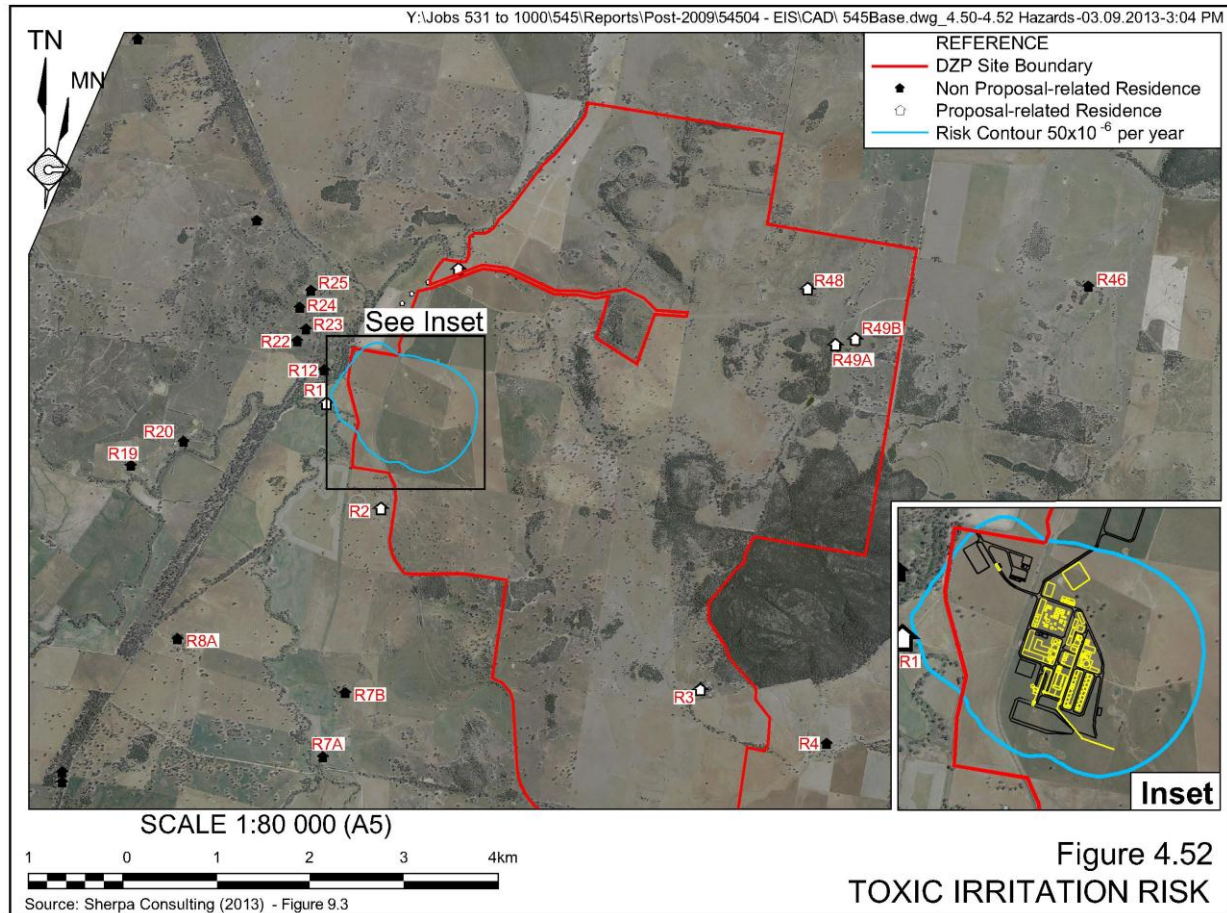
As the individual fatality risk contours do not extend beyond the DZP Site boundary, there are no significant off-site populations potentially affected by the Proposal. Societal risk levels are therefore minimal and were not quantified.

The main concern relating to environmental risk from accident events is generally with effects on whole systems or populations. The *NSW Hazard and Industry Planning Advisory Paper No. 4* (HIPAP 4) provides the following qualitative guidance for assessment of environmental risk due to accident events.

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects (consequences) of the more likely accidental emission may threaten the long-term viability of the ecosystem or any species within it.
- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood (probability) of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the background level of threat to the ecosystem.

Potential hazardous incident scenarios identified for the processing plant were toxic releases of ammonia, hydrogen chloride and chlorine. These releases have toxic impacts mainly on human health and safety. No accidental emissions were identified with the potential to threaten the long term viability of an ecosystem.





4.14.2.3.2 Reagent Spills and Other Incidents

On the basis of the proposed safeguards and controls for the storage, handling and transport of the various reagents and products, and assuming effective implementation of contingency measures (as identified on MSDS' for the relevant reagent or product), the impact on human health and the surrounding environment would be reduced to a risk level that is as low as reasonably possible.

4.14.3 Bush Fire Hazard

4.14.3.1 Introduction

This section identifies the dominant vegetation type(s) within and surrounding the DZP Site in order to determine the potential bush fire hazard associated with the Proposal. In identifying the bush fire hazard, the document produced by the Rural Fire Service (RFS) for DP&I entitled "*Planning for Bush Fire Protection*" (RFS, 2006) has been used. The Dubbo City Council *Development Control Plan 2013* (DCC, 2013) has also been utilised to determine the bush fire hazard within the local region. The Dubbo City Council *Development Control Plan 2013* identifies the following objectives for all land identified wholly or partly as bush fire-prone on the Bush Fire Prone Land Map.

- (1) *To minimise the risk to property and the community from bush fire and to minimise the impact of fire protection measures on the regions biodiversity;*

- (2) *To ensure bush fire protection is afforded to all new allotments and to minimise the impact of bush fires; and*
- (3) *To ensure bush fire protection can be afforded to existing settlement areas on a manner that does not limit future growth.*

The Dubbo City Council *Development Control Plan 2013* stipulates that all development is to comply with the provisions of the Rural Fire Service's *Planning for Bush Fire Protection 2006*.

The bush fire assessment was prepared by R.W. Corkery & Co. Pty Limited based, in part, on information on local vegetation provided in OzArk (2013a).

4.14.3.2 Bush Fire Management Objectives

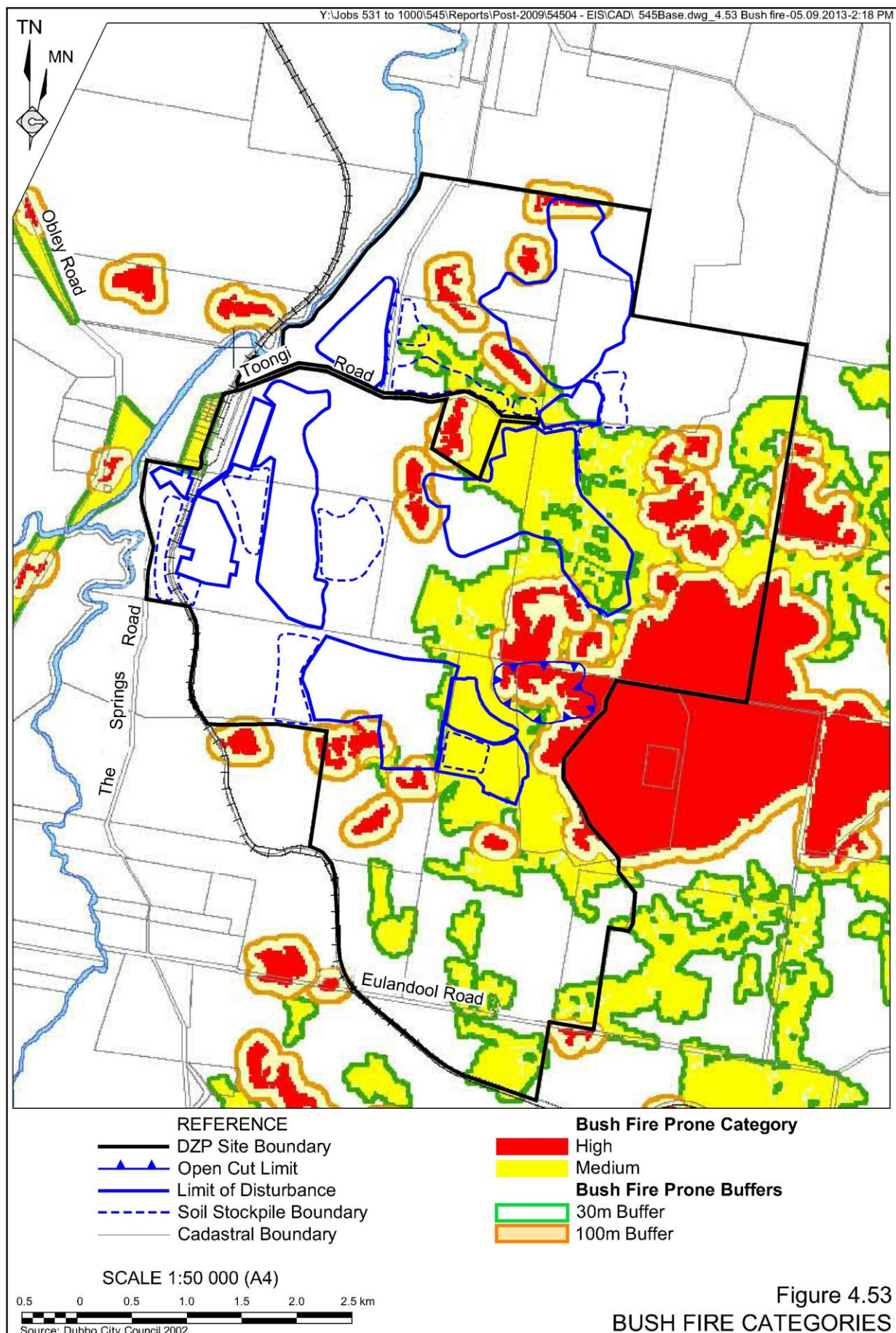
The objectives of RFS (2006), considered in this assessment of bush fire management of the Proposal, are to:

- afford occupants of any building adequate protection from exposure to a bush fire;
- provide for a defensible space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- ensure that safe operational access and egress for emergency service personnel and residents is available;
- provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the Asset Protection Zone (APZ); and
- ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).

4.14.3.3 Existing Bush Fire Hazard

Figure 4.53 identifies existing bush fire prone land status of the Site and surrounds as nominated in the Dubbo City Council *Bush Fire Prone Land Map*. The mapping indicates that the eastern portion of the Site is currently classed as bush fire-prone, corresponding generally to the slopes of Dowds Hill. The mapping also shows that the bush fire prone land is not linked to large areas of bush fire-prone land, but is geographically isolated.

The results of the bush fire vegetation category zone mapping, requires the Proposal to be assessed against the specifications and requirements of the RFS (2006), with particular reference to the APZ and construction requirements.



4.14.3.4 Bush Fire Classification

Vegetation Classification

Significant sections of the DZP Site have been cleared of large trees and shrubs and are now dominated by open, cleared grazing lands. However, some vegetated areas remain. Additionally, Section 2.17.8 identifies the Biodiversity Offset Area and strategies which may include planting of local provenance species in all of the overstorey, mid-storey, shrub and ground layers. **Figure 4.54** provides the classification of the vegetation within and surrounding the DZP Site based upon the classifications provided in RFS (2006). Vegetation formations within the Biodiversity Offset Area are assumed to be mature as those in the proposed offsets, and vegetation formations outside the Biodiversity Offset Area have been mapped as existing.

The vegetation has been classified into the following three formations based on the classifications provided in RFS (2006).

- Dry Sclerophyll Forest (open forest) – maximum fuel load of 25t/ha.
- Heathlands (shrublands) – maximum fuel load of 15t/ha.
- Grasslands – maximum fuel load of 6t/ha

The vegetation surrounding the DZP Site is similar to the vegetation occurring within the DZP Site as it is dominated by cleared agricultural land interspersed with woodland and open forest vegetation, predominantly along drainage lines, elevated land or areas with greater topographic relief.

Slope Classification

Slopes within the DZP Site vary from approximately 1:60 (V:H) in the vicinity of Wambangalang Creek to approximately 1:5 (V:H) on the flanks of the higher hills. The steepest slopes occur around Dowds Hill to the southeast of the DZP Site.

Fire Danger Index (FDI)

Table A2.3 of RFS (2006) nominates Dubbo LGA as occurring within the Lower Central West Plains NSW Fire Area which is designated a Fire Danger Index (FDI) of 80. This FDI is a number that has been determined by the NSW Rural Fire Service based upon assumed forest fuels within certain geographical regions (usually based upon local government area boundaries). The FDI, a combination of air temperature, relative humidity, wind speed and drought, is used to determine the Fire Danger Rating on a particular day. A FDI of 1 (low-moderate) means that a fire will not burn or will burn so slowly that it can be easily controlled, whereas an FDI of 100 (Catastrophic) means that the fire will burn so fast and hot that it is uncontrollable. An FDI of 80 (Extreme) means that a fire will likely be uncontrollable, unpredictable and fast moving with flames in the tree tops and embers likely to start spot fires up to 6km ahead of the main fire.

Hazard Assessment

It is possible to calculate the bush fire hazard (referred to as the bush fire attack category in RFS, 2006) from a combination of the FDI, vegetation formation, the maximum slope and the proximity of activities to the bush fire hazard, as is displayed within **Table 4.84**. It should be noted that the bush fire hazard assessment takes into account not only the vegetation and associated bush fire hazard within the Site, but also the vegetation immediately surrounding the DZP Site and the general local area.

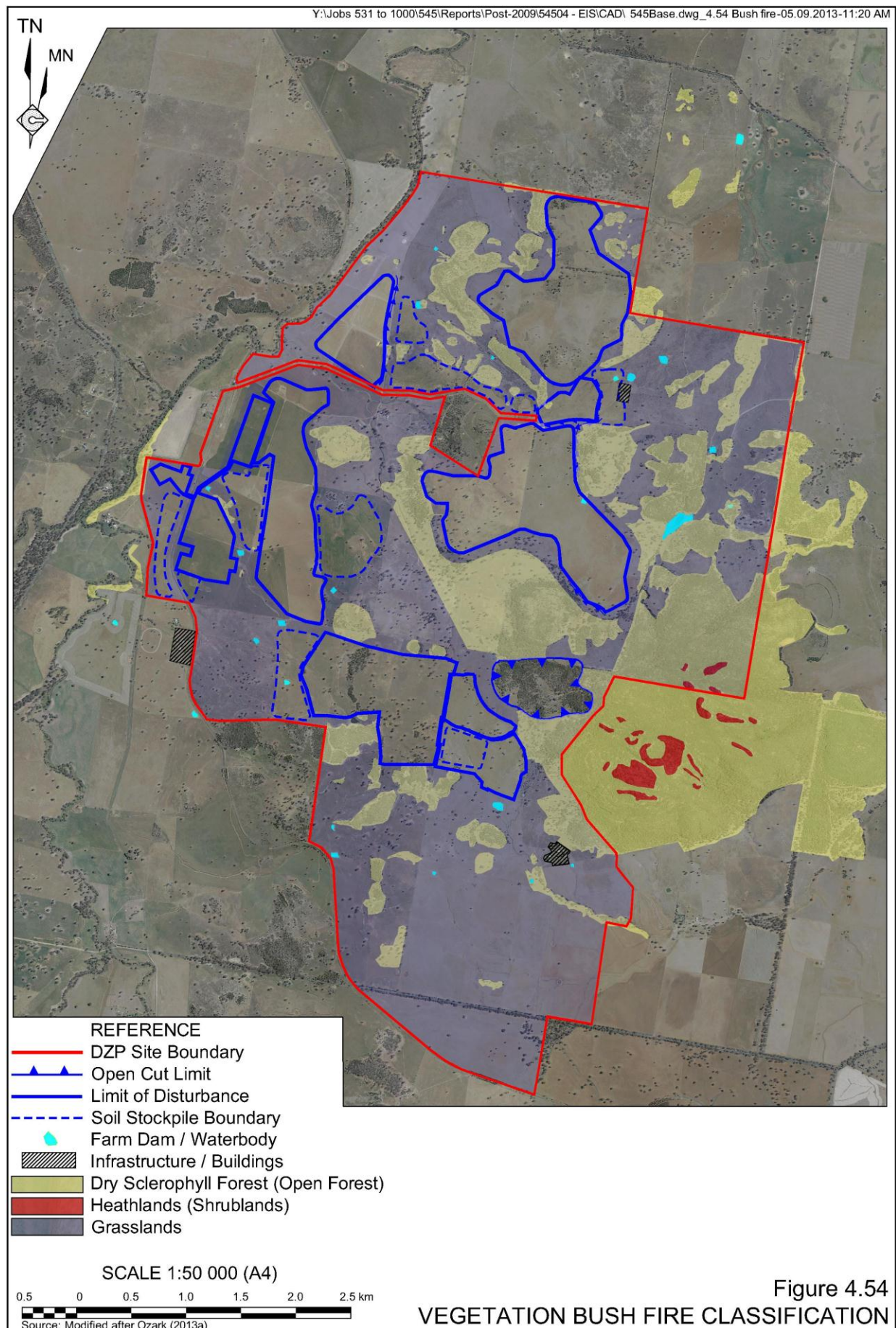


Table 4.84
Bush Fire Hazard Assessment

Vegetation Classification	Slope	Distance to Activities	Category of Bush Fire Attack
Dry Sclerophyll Forest (Open Forest)	>15 ° to 18°	>100m	Low
	>5 ° to 10°	52 – 100m	Medium
Heathlands (shrublands)	>15 ° to 18°	>100m	Low
Grasslands	0 ° to <5°	<20m	Low
Sourced: Based on Appendix 3.3 of RFS (2006)			

From the consolidated information and the matrix provided in *Appendix 3.3* of RFS (2006), the “Category of Bush Fire Attack” (or bush fire hazard) throughout the DZP Site is generally classified as low due to the distance of the more heavily vegetated areas on steep slopes from proposed activities. The notable exception being the construction of the open cut which would require clearing of open forest from the upper slopes, putting the personnel in proximity to the wider hazard.

4.14.3.5 Safeguards and Controls

Specific bush fire management measures to manage a local bush fire event would be prepared should approval be granted for the Proposal and would incorporate the following.

- An APZ of at least 50m would be maintained around the open cut. As defined by *Appendix 2* of RFS (2006) the APZ would provide for:
 - minimal separation for safe fire fighting (access to fire front);
 - reduced radiant heat;
 - reduced influence of convection driven winds; and
 - reduced ember viability thereby limiting the impact of ember attack.
- Fuel loads within the APZ would be monitored and reduced as required, i.e. no re-growth of shrub or tree vegetation would be allowed, grass growth would be monitored and cut back as necessary. Specialist advice would be sought, either from the NSW RFS or Dubbo City Council in relation to appropriate fuel load management within the APZ.
- The mine haul road to the open cut would be regularly maintained to ensure safe access and egress from the open cut in the event an evacuation is called.
- Water infrastructure located within the Processing Plant Area would be accessible for management of ember attack on the buildings of the Processing Plant and DZP Site Administration Area.
- Training would be provided to site personnel in relation to specific fire fighting tasks and procedures.
- Emergency and Evacuation Management Procedures would be developed.
- In the event of a local bush fire event, all personnel would be required to assemble at the designated Emergency Assembly Area (likely to be within the car park of the Processing Plant and Office Area). A head count would be undertaken to

confirm all site personnel and visitors are accounted for. At this time, instructions as to specific procedures to be followed, i.e. site protection or evacuation, would be provided in accordance with the Emergency and Evacuation Management Procedures and advice provided by the NSW RFS.

The preparation and implementation of the above notwithstanding, the Applicant would ensure that all personnel recognise the authority of the NSW RFS and other emergency services, e.g. NSW Police, and adhere to any and all instructions provided by these authorities. Furthermore, access to all DZP Site facilities and water storages would be provided to the RFS and any reasonable assistance offered.

The Applicant would implement the following management and mitigation measures to minimise risks associated with starting of bush fires within the DZP Site.

- Ensure refuelling is undertaken within designated fuel bays or within a cleared area of the DZP Site.
- Ensure vehicles are turned off during refuelling.
- Ensure no smoking policy is enforced in designated areas of the DZP Site.
- Ensure fire extinguishers are maintained within site vehicles and refuelling areas.
- Ensure a focus on housekeeping by mine management.
- Ensure that a water cart is available to assist in extinguishing any fire ignited.

4.14.3.6 Assessment of Impacts

The proposed operations would increase the number and type of ignition sources in the local area. However, the proposed management and mitigation measures, in conjunction with general clearing activities associated with the Proposal would ensure that an acceptable bush fire hazard is maintained within the DZP Site.

4.14.4 Traffic Incident

4.14.4.1 Potential Incident(s)

Mine traffic (road registered semi-trailers and light vehicles) would enter and exit the DZP Site from Toongi Road via Obley Road. The proposed major route for all inbound heavy vehicles to the DZP Site would originate from Dubbo via the Newell Highway, and could potentially result in an accident involving an over size or other Proposal related vehicle and a vehicle driven by a member of the public.

In addition, a list of expected types and quantities of hazardous materials transport movements to and from the DZP Site has been identified in Sherpa (2013), and a risk screening against relevant SEPP 33 screening thresholds has been undertaken. Sherpa (2013) identified that the transport screening thresholds are exceeded by the proposed number of hazardous material movements due to the number of ammonia truck movements, and that consequently a Transport Route Selection study is required.

4.14.4.2 Safeguards and Hazard Reduction Strategies

A Transport Route Selection Study would be undertaken prior to the commencement of operations that would identify the hazardous materials required to be transported to and from the DZP Site, quantities and locations where the materials would be transported from and to. The study would identify the preferred transport route to minimise risk to appropriate levels.

Material Safety Data Sheets (MSDS) have been produced for each of the products to be despatched from the DZP Site. The MSDS' document the relevant hazards and mitigatory responses to follow in the event of a spill of these materials and are included as **Appendix 11**.

While the risk associated with an incident between a Proposal-related vehicle (over size truck, road registered heavy vehicle or light vehicle) and a vehicle driven by a member of the public would be managed through the upgrading of roads and intersections to ensure these meet appropriate standards, the following hazard reduction measures or strategies would be implemented to further manage residual risks.

- Give way signs would be erected at the exit of the DZP Site to Toongi Road, and the exit of Toongi Road onto Obley Road.
- All truck drivers would be advised of the potential conflict between Proposal-related traffic and the general public and would be required to sign a Driver's Code of Conduct identifying minimum standards for driver behaviour.
- Appropriate traffic management controls would be implemented during the road and intersection upgrades. The Applicant would implement a comprehensive *Transport Management Plan* for construction and mine operation.

4.14.4.3 Assessment of Impacts

Risks associated with the transportation of hazardous materials to and from the DZP Site would be managed through the implementation of preferred routes to be identified through a Transport Route Selection Study.

Risks associated with an incident between a Proposal-related vehicle (over size truck, road registered heavy vehicle or light vehicle) and a vehicle driven by a member of the public are considered low given the proposed hazard reduction measures and strategies.

4.14.5 Land Contamination

4.14.5.1 Introduction

Prior to the purchase of Lot 1 DP 818802, Toongi, the Applicant identified the potential for contaminated land on a portion within that lot. Ground Doctor Pty Ltd (Ground Doctor) was commissioned to undertake a preliminary contamination assessment (*Preliminary Contamination Assessment- GrainCorp Operations Limited Rail Siding, Lot 1 DP818802, Toongi, NSW* [Ground Doctor, 2012], **Appendix 10**) with the following objectives.

- Assess the site setting, subsurface conditions beneath the subject land and the environment surrounding the subject land.
- Identify past and present land uses of the subject land.

- Identify potential sources of land contamination associated with past or present use of the subject land and potential contaminants of concern.
- Quantify potential contamination on the subject land through collection of preliminary field data.

The following subsections present the results of this assessment.

4.14.5.2 Methodology

To achieve the objectives outlined in Section 4.14.5.1, Ground Doctor completed the following work.

- Conducted a site inspection to establish current site conditions, surrounding land uses and potential human and environmental receptors located at/near the subject land.
- Reviewed and presented aerial photography held by NSW Land and Property Management Authority (LPMA). Aerial photographs reviewed were photographs taken in 1959, 1964, 1971, 1980, 1988, 1995, 2000 and 2004.
- Conducted various database searches to obtain as comprehensive a record of previous land use as possible.
- Reviewed available geology and soil landscape maps to assess sub-surface conditions beneath the subject land.
- Conducted preliminary soil sampling to quantify any potential sources of contamination identified at the subject land. Soil samples were collected at 12 locations which were analysed in a laboratory for organochlorine pesticides (OCPs), heavy metals and asbestos.

The following provides a summary of the preliminary contamination assessment prepared by Ground Doctor (2012) following the completion of these tasks.

4.14.5.3 Results

The subject land is believed to have been vacant and/or used for grazing purposes prior to 1921. In 1921, the subject land was acquired by the NSW Government as part of a rail corridor and Toongi siding. The land is believed to have been used as a grain storage and loading facility by the NSW Government up until 1991. In 1991, the NSW Government privatised grain operations and land ownership was transferred to the NSW Grain Corporation Limited. The subject land remained operable as a grain storage and loading facility until circa 1993 and has been vacant since. OCPs were commonly used to protect grain against insects between the 1940s and 1980s and were likely to have been used to protect former grain storages on the land.

Ground Doctor collected six near surface samples immediately adjacent to the former grain storages to assess them for the presence of OCPs and heavy metals. Some OCPs were detected in near surface soil samples. Reported concentrations of OCPs were well below the adopted commercial and/or industrial land use assessment criteria adopted for the site. Concentrations of heavy metals adjacent to the former grain storages were also well below the adopted assessment criteria.

Land immediately to the west of the subject land was a railway corridor which featured a main line and a siding which was believed to have been used for grain loading. Ground Doctor collected five near surface soil samples along the western boundary of the subject land (adjacent to the former railway siding). Some of these samples were analysed for commonly encountered contaminants of concern associated with former railway sites. The reported concentrations of PAHs, OCPs and heavy metals in these samples were less than the adopted assessment criteria. Asbestos was not identified in any near surface sample collected adjacent to the railway siding. Ground Doctor did not assess soil for petroleum hydrocarbons. Given the proximity to Dubbo of the subject land, it is unlikely to have ever been used for bulk storage and loading of liquid fuels.

Some filling was identified at the site. Synthetic inclusions were not identified on the surface within the filled areas. The location of the land is such that the imported fill was likely to have been imported from a nearby quarry and was likely to have met the current definition of virgin excavated natural material. Fill on the subject land was unlikely to have come from a contaminated site as industry in the surrounding area at the time of filling was limited, and remains limited. Fill on the land was not assessed for these reasons.

Based on the results of this preliminary contamination assessment, the subject land is considered suitable for ongoing commercial and/or industrial use.

4.15 SOCIO-ECONOMIC SETTING

4.15.1 Introduction

The Director-General's Requirements (DGRs) issued by DP&I identified "*Social and Economic issues*" as key issues that require assessment. The principal assessment matters from DP&I relating to socio-economic factors include:

- *"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; and*
- *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."*

Additional matters for consideration in preparing the EIS were also provided in the correspondence attached to the DGRs from the Central West CMA which requested that the EIS "*outline the social benefits to the local community as well as identifying the social impacts and mitigation strategies for the project.*"

Based on the risk analysis undertaken for the Proposal (Section 3.5), the potential impacts relating to socio-economic factors and their risk rankings (in parenthesis) without the adoption of any mitigation measures are as follows.

- Strain/drain on local skilled workforce due to transfer from other industries (high).
- Strain on local (Dubbo) housing and other community infrastructure and services from influx of additional workforce (medium).
- Reduced property values due to perceived and real reduction of local amenity (low-medium).
- Reduced amenity value of landholdings (medium).
- Loss of income associated with the removal of stock from the railway corridor (medium).

The socio-economic impact assessment for the Proposal was undertaken by Mrs Diana Gibbs of Diana Gibbs and Partners. The resulting report is presented as Part 12 of the *Specialist Consultants Studies Compendium* and is referred to hereafter as “DGP (2013)”. This subsection of the EIS provides a summary of the socio-economic impact assessment, concentrating on those matters raised in the DGRs and submissions to the DGRs provided by various government agencies. A consolidated list of the identified requirements and where each is addressed in the EIS is presented in **Appendix 3**.

4.15.2 Existing Socio Economic Setting

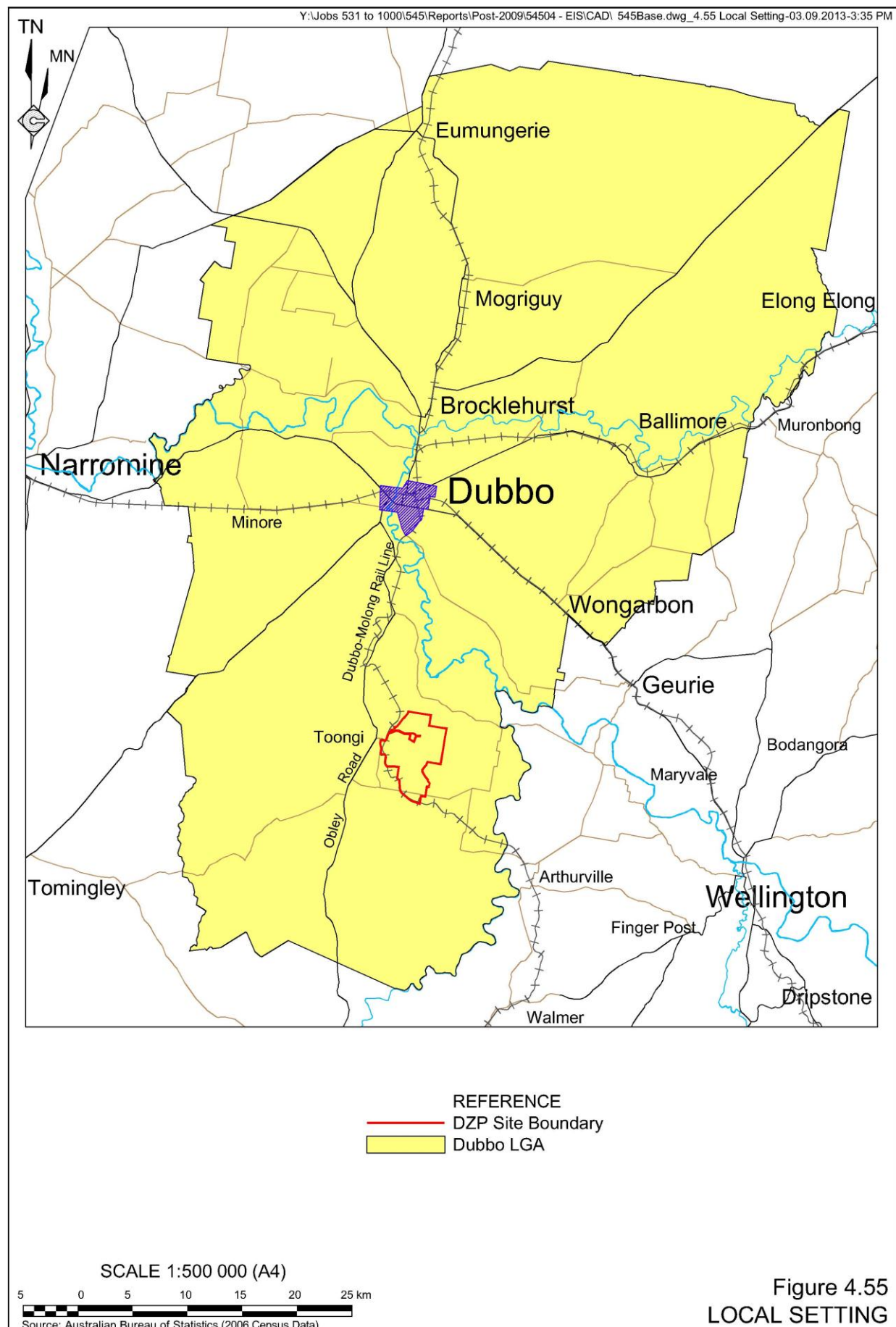
4.15.2.1 Overview

The location of the proposed activities is adjacent to the village of Toongi, approximately 25km south of the City of Dubbo, within the Local Government Area of Dubbo City, see **Figure 4.55**. The following subsections describe existing socio-economic setting of the Dubbo Region (the Dubbo City LGA) and the local setting (Toongi and surrounding agricultural properties).

4.15.2.2 Dubbo

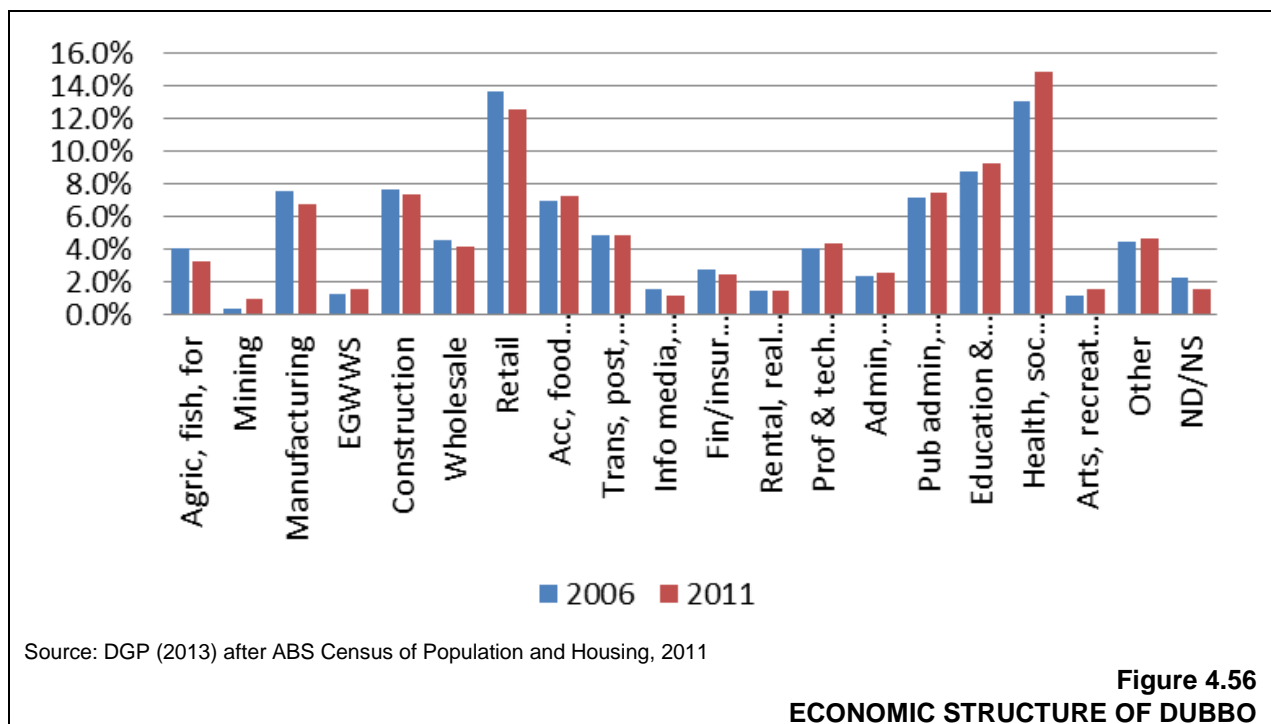
The population of Dubbo has expanded by an average of 0.8% per annum in recent years, to reach over 41,000 in 2009. The population is projected to increase to 46 500 by 2036 (DoP, 2011). Dubbo is the established service centre for the wider Orana region, and was estimated (by Dubbo City Council) to have had a Gross Regional Product (GRP⁶) 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.

⁶ GRP can be considered to be the net wealth created within the region



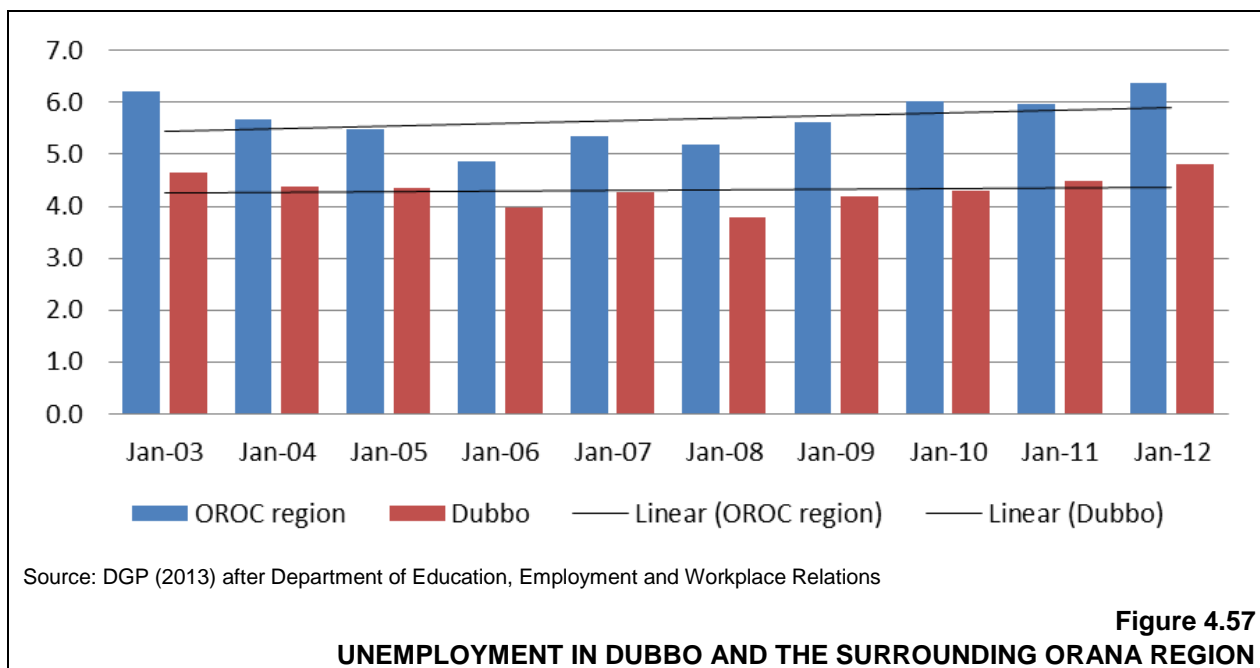
Confirming Dubbo as a growth centre of NSW, economic growth has averaged 8.5% pa over the last 3 years. This growth has been driven by expansion in leading service and industrial sectors, highlighting growth in both provision of services and industrial activity.

Agriculture still supports 18% of all businesses in Dubbo, however, only accounted for around 3.3% of total employment in Dubbo in 2011, declining from around 4% in 2005 (see **Figure 4.56**). Currently the mining sector contributes only 0.8% to the Dubbo GRP, compared with 15.8% to the wider region (which includes the established mines at Cobar and Mudgee). 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/week), the attraction of agricultural employment can be expected to decline in the future. The relative importance of the agricultural sector as a whole is expected to continue to decline in the Dubbo region. By contrast, the relative importance of the mining sector is likely to increase with Dubbo City Council identifying the development of a Mining and Mining Services sector as one of ten key strategies of the recently adopted *Dubbo City Economic Development Strategy* (DCC, 2012).



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 4.57**, 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 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 between 2003 and 2012 (contributed to by an abnormally dry period from 2001 to 2009 and the global financial crisis), the trend in unemployment rates over this ten year period is flat.



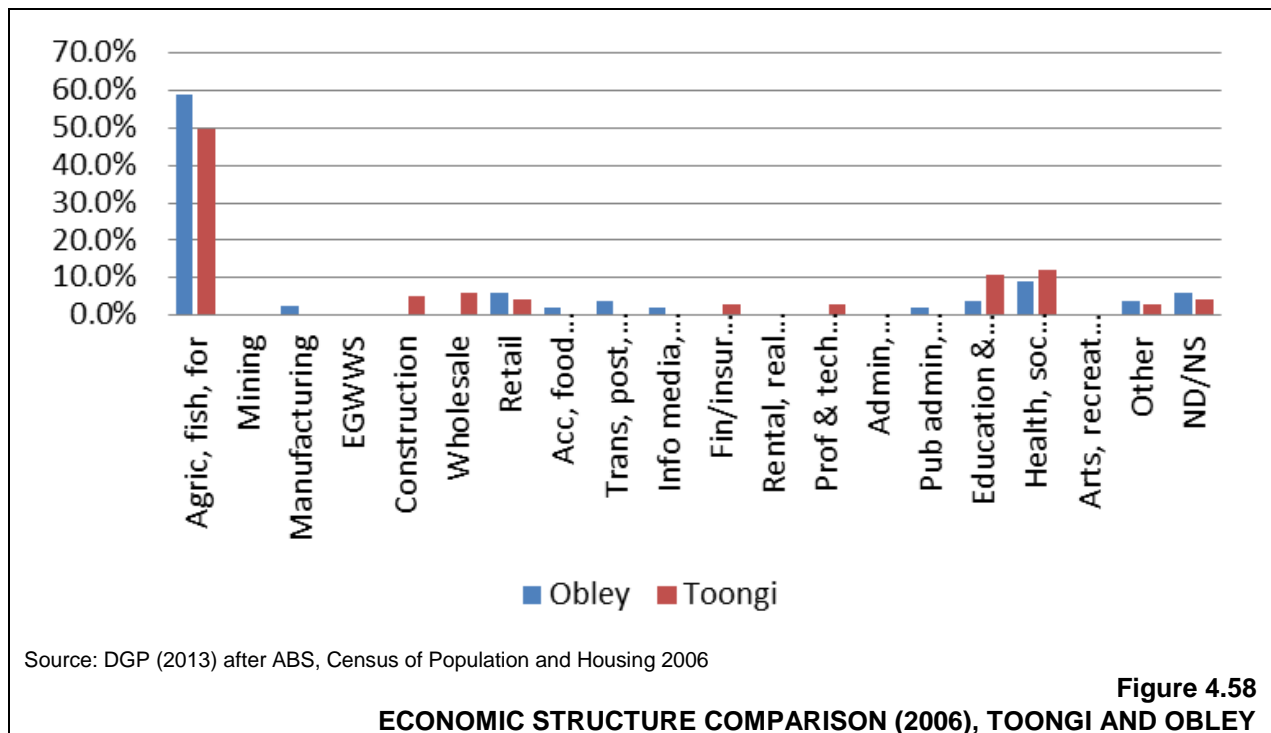
4.15.2.3 Toongi (Obley District)

Toongi is located within the LGA of Dubbo City. There are just four dwellings in the former railway village and, with the exception of ‘The Little Quilt Shop’, no commercial premises. Given the proximity of the village to the DZP Site, AZL has either purchased or has negotiated to purchase on approval of the Proposal, all freehold land within Toongi. At the time of the last Census for which specific published data is available for Toongi (2006), the Toongi community (including the surrounding agricultural properties and four smaller rural residential blocks on Obley Road opposite the intersection with Toongi Road) had a total resident population of 183 persons.

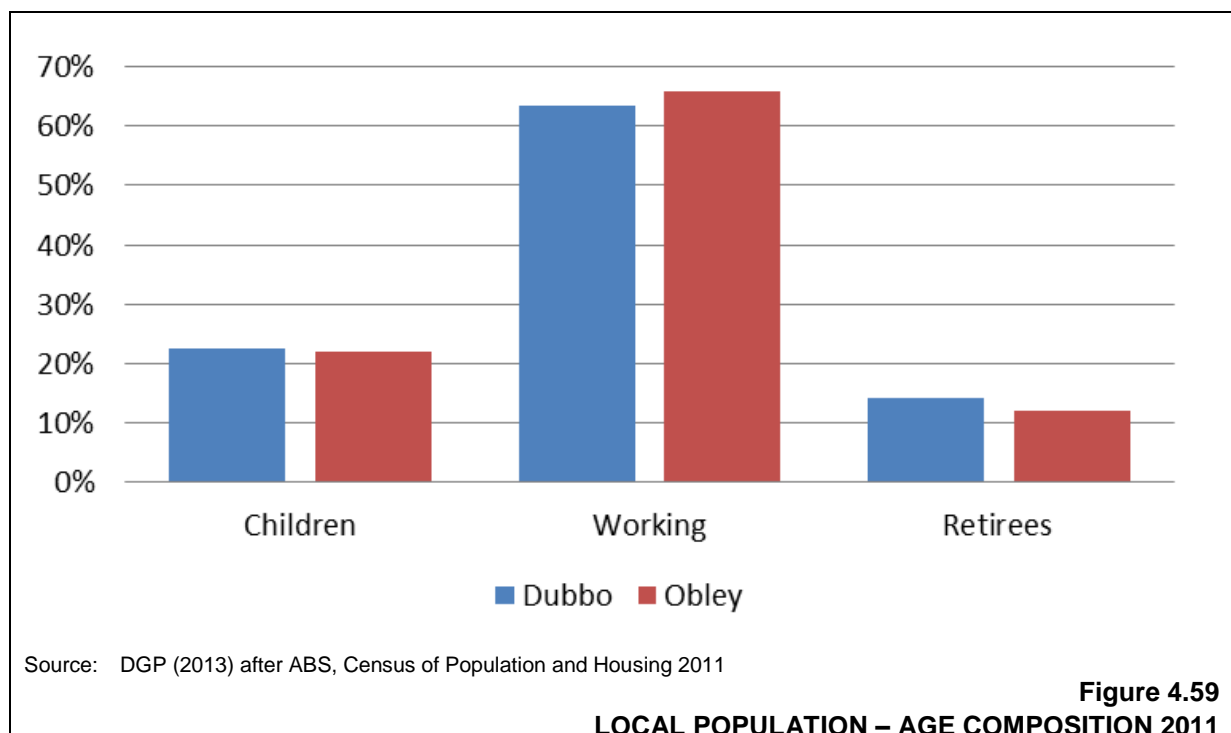
While Census data for 2011 is now available, collections for the Toongi locality are no longer made available by the ABS. To enable comparison between the socio-economic setting and demographic characteristics of 2006 and 2011, DGP (2013) considers the larger district of Obley. Through comparison of the 2006 Census datasets for Toongi and Obley, DGP (2013) confirms the larger Obley district provides for similar demographic data to the smaller Toongi locality (see **Figure 4.58**). DGP (2013) concludes therefore that changes in data for Obley, between 2006 and 2011, will reflect changes likely to have occurred in Toongi over the same time frame.

Both Toongi and Obley were heavily dependent on agriculture in 2006, with between 50% and 60% of all employment being in this sector (see **Figure 4.58**).

When compared to Dubbo, the population of the Obley district 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 (see **Figure 4.59**). 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.



The local area economy is heavily concentrated in the agricultural sector with nearly 40% of the local area labour force employed in agriculture (compared with just 4% in the Dubbo LGA). As a relative component of the local area economy, agriculture has declined from 60% in 2006 to 40% in 2011, presumably as a result of the increasing role of the local area as a “dormitory” for individuals holding jobs in Dubbo. Other sectors to make a notable contribution to overall employment for the local area residents are the public service sectors such as education and health care.



4.15.2.4 The DZP Site

The DZP Site is located on land either owned or to be purchased by the Applicant on approval of the Proposal. The total landholding (3 452ha) 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/or shelter. The areas involved in these land uses are:

- Cropping: 1 696ha (assessed as being 49.1% of the total area); and
- Grazing: 1 325ha (assessed as being 38.4% of the total area).

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

4.15.3 Management and Mitigation Measures

In addition to the mitigation measures and management procedures described previously throughout Section 4, the Applicant would implement the following management and mitigation measures to ensure that DZP-related benefits for the community surrounding the DZP Site are maximised and adverse impacts are minimised. Where possible, these measures have been categorised to reflect the particular aspect that would be addressed by each.

Social and Community

- Engage the community surrounding the Proposal in regular dialogue in relation to the proposed and ongoing operation of the Project and maintain an “open door” policy for any member of the community who wishes to discuss any aspect of the Proposal. The Applicant already has a demonstrated record of community engagement, including consultation completed for the current Proposal, community engagement for the recently commenced Tomingley Gold Mine and community engagement at the former Peak Hill Gold Mine (which operated between April 1996 and October 2002, with processing operations continuing until June 2005).
- Proactively and regularly consult with those residents most likely to be adversely impacted by the Proposal.
- Continue to support community organisations, groups and events, as appropriate, and review any request by a community organisation for support or assistance throughout the life of the Proposal.
- Consult with residences adjoining the Toongi-Dubbo Rail Line to ensure that all reasonable expectations related to local amenity are met, e.g. fencing or no fencing of the rail easement along Margaret Crescent.
- Implement a comprehensive and targeted environmental monitoring program, provide the local community with access to the results of monitoring and use these results, in consultation with the local community, to improve environmental performance at the DZP Site. It is again noted that the Applicant has a proven

record of managing mining operations in close proximity to local communities (at the former Peak Hill Gold Mine and currently at the Tomingley Gold Mine) without unacceptable impacts on this community.

The Applicant intends to use the lessons learnt, both in terms of environmental management of issues such as blasting and dust as well as community engagement at Peak Hill and Tomingley, to minimise adverse impacts (both actual and perceived) on the local community.

- Form and maintain a Community Consultative Committee (CCC), including representative members of the local community and Dubbo City Council. The CCC would be an important forum for reviewing and discussing environmental monitoring and performance, and discussing possible improvements that could be made to operations to improve environmental (and social) performance).
- Regularly brief the CCC on activities within the DZP Site and seek feedback in relation to Proposal-related impacts whether real or perceived. In addition, seek advice in relation to the most appropriate manner in which to provide assistance to the community in an effective, fair and equitable manner.
- Advertise and maintain a community complaints telephone line.

Employment and Training

- Give preference when engaging new employees, where practicable, to candidates who live within the Dubbo Local Government Area over candidates with equivalent experience and qualifications based elsewhere and ensure that the mining and other contractors do so as well. The Applicant has set a target of 80% of the start-up workforce to be drawn from the Dubbo and surrounding LGAs.
- Encourage the involvement of the local Aboriginal community in the workforce.
- Encourage and support participation of locally based employees and contractors in appropriate training or education programs that would provide skills and qualifications that may be of use throughout and following completion of the DZP.

Economic Contribution and Development

- Give preference, where practicable, to suppliers of equipment, services or consumables located within the Dubbo Local Government Area.
- Assist community members and others, as appropriate, to establish complementary businesses in the vicinity of the Proposal where those businesses would provide a benefit to the community through increased economic activity or development.
- Assist Dubbo City Council to promote and encourage economic development that would continue beyond the life of the DZP in the area surrounding the DZP Site.

- Enter into an agreement, possibly in the form of a *Voluntary Planning Agreement* (VPA) with Dubbo City Council, to assess any net costs to Council and to establish a fund to meet community needs identified as arising from the Proposal.

Infrastructure and Services

- Ensure that infrastructure and services installed for the Proposal, including the gas pipeline, electricity transmission line, appropriate buildings and hardstand areas, remain available for alternative uses following completion of the Proposal (provided that such uses are consistent with the final land uses identified in this document or any subsequent approval).
- Encourage and support, in consultation with the local community, the provision of services to the community (through a VPA). These may include health, education, transportation and other services.

Agricultural Lands

- Manage DZP Site drainage as described and discussed in Section 4.5.4.2 so as to minimise any changes to downstream water quantity, quality and flooding regime.
- Maintain agricultural operations on land not required for active mining or biodiversity offsetting purposes.
- Continue to appropriately manage weeds, pests and bush fire risks on land held by the Applicant in consultation with surrounding landowners.
- Undertake final landform construction and rehabilitation as nominated in Section 2.17 (so as to return all but 1 200ha of the DZP Site to agricultural production post-DZP).
- Ensure that the land capability of those sections of the final landform to be used for agricultural purposes is similar to the current land capability. Any agricultural land that forms part of the final landform would be more heavily treed than it is at present due to proposed biodiversity and screen plantings.

General

- Adhere to all operating conditions, e.g. restrictions on hours of operation and the required standard of facility.
- Prepare and make available detailed indicative illustrations of the proposed infrastructure and other facilities to be constructed on the DZP Site.
- Implement the recommendations provided in each of the specialist assessments of the Proposal.

4.15.4 Assessment of Economic Impacts

4.15.4.1 Introduction

The Proposal represents a new and relatively large business for Dubbo and New South Wales, one which provides many economic opportunities. The following subsections review the predicted economic and associated impacts of the Proposal on the local and regional setting.

4.15.4.2 Employment

One of the most significant impacts for the local community would be the creation of jobs. As a result of the location of the ore body and processing facility relative to Dubbo, it is likely that the majority of the operational jobs would be filled by existing local residents.

The construction workforce would 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. As a consequence of the proposed 300 to 400 personnel, to be accommodated (predominantly) in Dubbo, DGP (2013) suggests it is likely there would be a small increase in demand for temporary housing. Based on the short-term nature of many of the roles filled by the construction workforce, it is likely that the specialist contractors required would be accommodated in the extensive tourist facilities available in Dubbo.

During operations, the DZP would create approximately 250 permanent jobs. Notably, a large number of job applications have already been received by the Applicant, even though positions have not as yet been advertised. A residential workforce is proposed, i.e. no mining camp or fly-in/fly-out arrangements, and an 85% target for local employment (those currently resident in the Dubbo City and surrounding LGAs) has been set. DGP (2013) suggests that through the creation of employment generated by the Proposal, the unemployment rate of Dubbo could conceivably drop from the current 4.5%, to 3.6%. In reality, the creation of new employment opportunities is likely to create 'pull' factors to Dubbo whereby the labour market increases and as such the unemployment rate does not reduce as greatly as predicted.

The creation of new employment opportunities within the mining sector (with far higher than average weekly wages (see Section 4.15.2.2)), is likely to increase total wage payments across the Dubbo City LGA with flow-on affects to other businesses and sectors of the economy.

4.15.4.3 Regional Value of Output

The annual output from the Proposal is estimated to have a gross value of approximately \$500 million, to be delivered for 20 years. This new output would deliver a 23% addition to Gross Regional Product (GRP), currently estimated by Dubbo City Council at \$2.1 billion per annum. Over the 20 year "life" of the Proposal, this output is estimated to have a present value (PV) of \$4 257 million (at 10% discount rate). The Proposal would deliver a major stimulus to the output of the Dubbo region and would increase the contribution of mining to the Gross Value Added (GVA)⁷ of the Dubbo City LGA (which is currently only 0.8% - DGP, 2013).

⁷ Gross value added (GVA) is a measure of the value of [goods](#) and [services](#) produced in an area, industry or sector of an [economy](#). It is calculated as gross output (sales price) minus [intermediate consumption](#) (costs to generate output).

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 GVA for the Dubbo City LGA and Orana region, both via increased demand for local services, and via the consumption spending of income by employees.

4.15.4.4 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. Further discussion of the land use issues relating to the Proposal are set out in Section 4.15.5.7.

An *Agricultural Impact Statement* (AIS) has been completed for the Proposal (see **Appendix 9**) considering the current value of agriculture on the DZP and immediate surrounds, and the impact on this value during the life of the Proposal and on completion of the DZP and rehabilitation of the DZP Site. **Table 4.85** summarises the results of the analysis presented in the AIS.

Table 4.85
Estimated Effects of Land Use Changes

Indicator	Current	Mining	After Rehabilitation
Area available for agriculture use (ha)	3 452	1 623	2 233
Area lost to production (ha)	-	1 829	1 219
Value production from area (\$/yr)	1 464 000	789 000	1061 000
Loss of production (\$/yr)	-	674 000	403 000
Average Gross Margin (\$/ha)	424	486	475
Present Value (PV) loss at 10% discount* (\$)	-	5 779 000	6 251 000
Note: * assumes 20yr life of mine, then 20yrs after rehabilitation completed.			
Source: Modified after DGP (2013) – Table 3			

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 220ha would be returned to agriculture, and the value of production from the site is likely to be approximately \$400,000 per year lower than current levels.

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 (PV) 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.

The Proposal requires up to 4.05GL of water per annum which would be drawn from entitlements obtained within the surface water and groundwater water sharing plans nominated in Section 2.8.2. It is noted that while the draw of water under entitlement would be in accordance with the rules and regulations of the relevant water sharing plan, the change in use of this water (a finite resource) could impact on the economic output of other industries, e.g. agriculture. Section 5.3.3 of the AIS (**Appendix 9**) considers this, drawing reference from an analysis of water availability within the nominated water sources by Hennessy Water (2013)

(Appendix 7), and concludes that the entry of the Applicant to water market would not restrict access to this tradable commodity to agriculture and therefore the impact of the Proposal on agricultural production (as related to water) would not be significant.

4.15.4.5 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 the Applicant 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 \$10.5 million (steady state annual average) would be paid annually 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.

The Applicant has had initial discussions with Dubbo City Council regarding the establishment and implementation of a *Voluntary Planning Agreement* and to assess the net impact on Dubbo City Council infrastructure and services resulting directly or indirectly from the DZP. Dubbo City Council has requested that negotiations follow assessment of the EIS and socio-economic study.

Based on the above, the operation of the DZP is likely to contribute at least \$115.5 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 deliver raw materials to the DZP Site and to deliver products produced.

4.15.4.6 Adverse Economic Impacts

It is acknowledged that while the economic benefit for the local area, wider region, many businesses and individuals, there is the potential for some adverse economic impacts as well.

Land Value

DGP (2013), having consulted with local real estate agents, notes that there could be some minor (and one-off) loss of value for some properties which adjoin the rail line. DGP (2013) also notes, however, that all purchasers of affected houses would have known that the rail line had not been closed, but merely dis-used for a time. It is also considered likely that the value of properties on and surrounding the DZP Site, including those in Toongi Village would be affected by the Proposal. The Applicant has either; purchased, entered into contract to purchase or attempted to purchase those properties most likely to be affected by the DZP and therefore incur a reduction in land value. Landowners of properties located further from the DZP Site where impacts are not expected to be significant when compared against established impact assessment criteria, e.g. noise, air emissions, vibration, have been regularly consulted over the proposed operations and a general level of acceptance over the Proposal has been indicated (acknowledging the overall benefits the DZP would bring to the local area and region).

Costs to Other Industry / Employers

With the addition of 250 new jobs, and the proposed objective of the Applicant to employ 85% of the start-up operational workforce from those currently residing in Dubbo or surrounding areas, it is considered likely that individuals would leave existing employment in Dubbo to take up positions with the DZP. DGP (2013) reports that anecdotal evidence is available of Mid-Western Regional Council losing staff to new coal mines within the local area. 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. Should this occur, the original employer would incur the cost associated with recruitment and training for new (replacement) staff.

While the exact number of 'transferring' employees cannot be accurately estimated, it is considered some of these vacated positions would 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). This would reduce the burden on the employer as the prospective employee already resides within the local area.

It is also likely that, in a labour market the size of Dubbo's, this economic impact on local employers would be a one-off as the market adjusts to the entry of a new employer. Furthermore, the potential for business stimulus (an economic benefit) generated by an increase in GVA within the Dubbo LGA is likely to partially offset the impact in the short-term and ultimately provide net benefit in the medium to long-term.

Finally, the Applicant has already engaged with Regional Training Organisations (RTOs) and local educational institutions to create pathways for school leavers and others in the community to reduce the pressure that may otherwise be placed on other established employers (see Section 3.2.2.5). A review of an increased demand for education and training services is discussed further in Section 4.15.5.4

4.15.5 Assessment of Social Impacts

4.15.5.1 Introduction

In addition to the economic impacts that have been assessed for the Proposal, there could be some social impacts on the regional and local community. These impacts could relate to local traffic, demand for infrastructure and services, and amenity values held by the community.

4.15.5.2 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 various combinations of road and rail transport.

Rail

The incorporation of the Toongi-Dubbo Rail Line would have social benefits associated with a reduction in the volume of heavy vehicles using the State Highway and local road network.

Impacts associated with this option include the following.

- Access to the rail easement along Margaret Crescent Dubbo would be restricted. Notably, the rail line has never been officially closed, however, local residents have become accustomed to using this easement for passive recreation pursuits.
- Residents living adjacent to the rail easement would be subjected to rail noise and vibration. As discussed in Section 4.2.7.6, both rail noise and vibration would remain well within the nominated criteria and would only occur a maximum of six times per week (three return trips). Furthermore, modern engineering design and construction of railway line and rolling stock facilitates much quieter train operation than was the case several decades ago. Nonetheless, it is a new noise source which could impact on the amenity of those affected.
- The re-opening of the rail line would necessitate the construction and operation of level crossings within Dubbo. While these would only be closed six times per week, there could be some initial annoyance generated amongst local commuters not accustomed to the closure of these crossings.

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

Regardless of the incorporation of rail transport, various reagents and other materials and consumables would be transported to the DZP Site by road. To mitigate potential impacts on road condition and safety, the Applicant has committed to a road upgrading program to widen and deepen the pavement and realign various bends along Obley Road. The works would be undertaken in accordance with relevant road design and construction standards and in consultation with Dubbo City Council.

Despite the road upgrade, however, there could be some residual social costs 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; and
- potential reduction in property values along the route.

The “tax” component of fuel prices and heavy vehicle registration charges is designed to compensate the general community for such costs. Furthermore, the Applicant’s proposed road re-alignment and pavement upgrades (expenditure of approximately \$15 million) would minimise impacts on road users and property owners adjoining the route. DGP (2013) also reports 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.

4.15.5.3 Demand for Infrastructure

4.15.5.3.1 Housing and Accommodation

Construction Phase

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. The construction workforce would be accommodated (predominantly) in Dubbo and as such there would be a small increase in demand for temporary housing. 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. It is noted that the (indefinite) postponement of the Cobbora Coal Project should lessen the potential for excessive demand for temporary accommodation over the construction period.

A consequence of the creation of some longer-term construction positions, could be an increase in demand for rental accommodation for periods of between 12 and 18 months. This could place upward pressure on rents charged by landlords in response to increased demand. DGP (2013) reports that data available from the Real Estate Institute of NSW (REINSW), in a submission to DCC in January 2013, indicates that although there have been public expressions of concern over rising rents in Dubbo, trends in rents, sales, and bonds indicate a broad decline in all housing sectors. REINSW suggests this reflects a “deep seated structural decline in the Dubbo economy”. DGP (2013) reports that a recent trend of increasing rental prices, observed by REINSW, suggests a lack of sufficient residential housing choices for investors. The Proposal could, in fact, provide a stimulus for future land releases which would provide for the residential housing choices currently lacking or restricted in the current market and potentially result in reduced rental prices as more accommodation becomes available.

Operations Phase

The Applicant has targeted 85% local employment and as such the Proposal would generate some new, but not significant, ‘direct’ demand for housing. As local residents transfer from existing employment in Dubbo to take up positions with the DZP, some of these vacated positions would 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). However, a proportion of these positions would have to be filled by new residents attracted to move to Dubbo to fill these vacancies, resulting in a subsequent increase in demand for new housing via this “flow-on” effect.

DGP (2013) notes that 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. DGP (2013) also reports that discussion with representatives of the Orana Division of REINSW indicates that around 550 to 660 houses are sold, on average, each year in Dubbo. This pattern of sales suggests that the Dubbo housing market could accommodate up to 10 new purchasers each month, more than sufficient for the likely increase generated by the Proposal.

There could also be a potential impact on rental accommodation and pricing, in part due to an increase in demand driven by new residents to Dubbo taking up positions at the DZP or positions vacated by Dubbo residents. However, it is considered that the Proposal would only be a minor contributor to any added pressure on rental accommodation (given the overall size

of Dubbo and the Dubbo rental market). The primary factor affecting rental accommodation and prices is likely to be the availability of residential housing choices for investors. While this is beyond the control of the Applicant, the Proposal could ultimately have a beneficial impact as a stimulus for future land releases which could ease any reduction in available rental accommodation.

It is therefore considered likely that any new demand for housing could be accommodated within existing stock. Furthermore, the Proposal could provide a stimulus for greater investment in rental accommodation which would ultimately be beneficial for those currently in or seeking rental accommodation within Dubbo.

4.15.5.3.2 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 placed on hold, there is no other new project of a comparable size planned for the Dubbo area that would attract 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.

4.15.5.3.3 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 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 4.15.4.1, and the AIS (see **Appendix 9**), 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 would 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*.

4.15.5.4 Demand for Services

Based on the employment target of 85% local residents established by the Applicant, the Proposal would be unlikely to cause a major inflow of new residents to the area which could have the potential to increase demand for services.

An exception 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.

The above illustrates that the Applicant recognises the potential increase in demand for education and training tailored to the mining sector and has commenced negotiations with appropriate RTO's to ensure that relevant education and training is available locally. This notwithstanding, any costs borne by the local economy for training would likely be offset, at least partially, by the added economic stimulus the Proposal is likely to provide to the region (see Section 4.15.4).

Furthermore, any increased pressure on local services generally, generated by the Proposal, would be considered and included in negotiations with Dubbo City Council as part of the development of a VPA.

4.15.5.5 Amenity Values

Toongi

The Proposal would result in the construction of processing facilities and a rail laydown and container storage area adjacent to the rail line at Toongi. This would cause some change in visual amenity for local residents, particularly the few houses located on the western side of Obley Road near the Toongi turn-off. Section 4.13 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 the EIS, and have expressed an understanding of the nature of the operations. Furthermore, the Applicant has either purchased or entered into agreement to purchase the properties of Toongi, recognising the large change in setting to be created by the Proposal.

The acceptance of changes to visual amenity notwithstanding, the Applicant would construct earth bunding and undertake tree plantings west of the processing plant to minimise visual impacts from the Obley Road.

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 tasks.

Residents along Obley Road further north from Toongi would experience an increased volume of heavy vehicles along this road. To the extent that some residences 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.

Margaret Crescent

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 be restricted 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 use of the line was always possible and residents should have been aware of this when they purchased their properties; and
- b) use of the rail would reduce the need for heavy vehicle traffic moving through Dubbo.

4.15.5.6 Land Use

The Proposal would undoubtedly represent a major change in local land use. However, by providing opportunities for those likely to be most affected to move following purchase of their properties, and mitigating impacts on local amenity, the impact of this change in land use would be minimised.

Furthermore, the Applicant has aimed to maximise the potential for the DZP Site and surrounding lands for ongoing agricultural activities. The Agricultural Impact Statement, provided as **Appendix 9**, provides a detailed analysis of the impact of the proposal on this industry.

4.15.5.7 Cumulative Impacts

It is noted that the proposed Cobbora Coal Project (planned to supply coal to NSW power stations in 2015/2016) could place additional pressure on the delivery of services and infrastructure within Dubbo if developed concurrently with the DZP. However, the NSW government recently placed the Cobbora Coal Project on hold with Treasurer Mike Baird quoting the high cost of development (\$1.5 billion) (Dubbo Daily Liberal, 12 November 2012) as the determining factor.

As a result, the potential for excessive demand for accommodation and other services and infrastructure (most relevant during construction when the total workforce and proportion requiring temporary accommodation would be at its highest) would be lessened and more gradual given construction for the Cobbora Coal Project would be more likely to coincide with the operations phase of the DZP.

4.15.6 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 DZP Site, and this would assist in meeting the economic development goals of the Dubbo region. Negative socio-economic impacts would also be off-set, to varying degrees according to personal values and circumstances, by the 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 the DZP 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 would be 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 significant net economic and social benefits to the region.