

Appendix G

Agriculture Impact Statement

Bylong Coal Project

Gateway Certificate Application
Supporting Document

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Bylong Coal Project Agricultural Impact Statement

**Report prepared for Hansen Bailey Environmental Consultants
on behalf of Cockatoo Coal Limited**

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1. INTRODUCTION

Hansen Bailey (HB) engaged Scott Barnett & Associates (SBA) on behalf of Cockatoo Coal Limited (CCL) to undertake a preliminary agricultural impact statement (AIS) for the Bylong Coal Project (the Project) which is owned by KEPCO Bylong Australia (KEPCO). CCL has been engaged by KEPCO to manage the exploration, mine planning, and environmental approvals for the Bylong Coal Project.

This AIS has been prepared to accompany the Gateway Application for the Project as required by the New South Wales (NSW) Government's Strategic Regional Land Use Policy (the Policy) requirements.

1.1. GATEWAY PROCESS

1.1.1. Overview

The Mining and Petroleum Gateway process (Gateway process) is established through Part 4A of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP).

The Gateway process is an independent, scientific and upfront assessment of how a mining or coal seam gas production proposal will impact the agricultural values of the land (specifically Strategic Agricultural Land (SAL)) on which it is proposed to be located. It considers proposals at a very early stage before a development application is lodged.

To pass the Gateway process unconditionally, a proposal must demonstrate that it meets the Gateway criteria relating to agricultural and water impacts. If a proposal cannot demonstrate that it meets these criteria, it will be subject to requirements - included as recommendations in a Gateway Certificate - that must be addressed at the development application stage.

The Project will be required to proceed through the Gateway process as the proposed Project is likely to have some impacts on agricultural values.

1.1.2. Strategic Agricultural Land

SAL is defined as "*highly productive land that has both unique natural resource characteristics... as well as socio-economic value*". Two categories of SAL have been identified:

- Biophysical Strategic Agricultural Land (BSAL) – Land with a rare combination of natural resources highly suitable for agriculture; and
- Critical Industry Clusters (CICs) – Localised concentrations of interrelated productive industries based on an agricultural product that provides significant employment opportunities and contributes to the identity of the region. Two CICs have been recognised; the equine and viticulture CIC.

Each is defined by criteria contained within the *Strategic Regional Land Use Plan – Upper Hunter* (SRLUP) (DP&I, 2012a) which applies to the Project and other associated documents, including the latest guideline, the *Interim Protocol for Site Verification and Mapping of Biophysical Strategic Agricultural Land* (Interim Protocol) (OAS&FS and OEH, 2013). Further, the SRLUP provides regional mapping of BSAL and CIC to delineate the extent of SAL.

1.1.3. Verification

To determine whether the regional mapping presented within the SRLUP is accurate at a local scale (which is relevant to the scale of the Project) and to gain an appreciation of the extent and likely impact of the Project on SAL, verification of this land has been conducted.

The extent of BSAL within the Project Boundary is assessed in the Soils Assessment and Site Verification (SLR, 2013a). A total of 2,366 hectares (ha) of BSAL was verified and mapped within the Project Boundary. Of this area, only 401.3 ha of BSAL will be directly or indirectly impacted by the components within the Project disturbance footprint.

The verification of the areas that have been mapped within the SRLUP and recent draft mapping of CIC within the Project Boundary is assessed within this AIS. Further details pertaining to the verification process of the equine CIC in consideration of the Project is provided in **Section 3.2**.

The SRLUP does not map the viticulture CIC within or in the locality of the Project Boundary and is not considered to be a dominant land use within the area. As such, viticulture CIC has not been assessed further in this AIS.

1.1.4. Criteria

As part of the Gateway process, the criteria of Clause 17H (4) of the Mining SEPP are to be satisfied.

Clause 17H(4a) of the Mining SEPP states:

“in relation to biophysical strategic agricultural land – that the proposed development will not significantly reduce the agricultural productivity of any biophysical strategic agricultural land, based on a consideration of the following:

- (i) any impacts on the land through surface area disturbance and subsidence,*
- (ii) any impacts on soil fertility, effective rooting depth or soil drainage,*
- (iii) increases in land surface microrelief, soil salinity, rock outcrop, slope and surface rockiness or significant changes to soil pH,*
- (iv) any impacts on highly productive groundwater (within the meaning of the Aquifer Interference Policy),*
- (v) any fragmentation of agricultural land uses,*
- (vi) any reduction in the area of biophysical strategic agricultural land.”*

The Rehabilitation Strategy (SLR, 2013b) addresses clause 17H (4a) (i) to (iii) and (vi) and the Groundwater Impact Assessment (AGE, 2013) addresses clause 17H (4a) (iv). This AIS addresses the entirety of clause 17H (4a) having regard to the extent of BSAL verified within the Project Boundary and Project disturbance footprint and its impacts to agricultural productivity as a result for each criteria.

Clause 17H (4b) of the Mining SEPP states:

“in relation to critical industry cluster land – that the proposed development will not have a significant impact on the relevant critical industry based on a consideration of the following:

- (i) any impacts on the land through surface area disturbance and subsidence,*
- (ii) reduced access to, or impacts on, water resources and agricultural resources,*
- (iii) reduced access to support services and infrastructure,*
- (iv) reduced access to transport routes,*
- (v) the loss of scenic and landscape values.”*

This AIS addresses clause 17H (4b) having regard to the verified extent of the equine CIC. The Visual Impact Assessment provides the basis for the assessment included within this AIS to address part (v) of clause 17H(4b).

This AIS has been prepared in accordance with the requirements of the Gateway process as stipulated by the Mining SEPP and its associated documents, including the *Strategic Regional Land Use Policy - Guidelines for Gateway Applicants* (Guideline for Gateway Applicants)(DP&I, September 2013).

1.2. PROJECT DESCRIPTION

The Project is located wholly within Authorisation (A) 287 and A342 which both fall within the Mid – Western Regional Council Local Government Area. The closest regional centre is Mudgee located approximately 55 kilometres (km) west-south-west from the Project. The small settlement of Bylong Village is located within A287. The land to which the Project applies is within the Project Boundary and comprises the area within A287 and A342 covering approximately 10,317 ha of land.

The Project seeks the grant of a Development Consent for State Significant Development under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of an open cut and underground coal mining operation for a period of approximately 29 years (each to operate for approximately 7 and 23 years respectively). The Project will facilitate the recovery of approximately 121 Mt of ROM coal from the Illawarra Coal Measures at a maximum rate of up to 6 Million tonnes per annum (Mtpa) Run of Mine (ROM) coal.

The total Project mine life is anticipated to be approximately 29 years, comprising a two year construction period and a 27 year operational period, with underground mining operations commencing in approximately Year 7. Various rehabilitation and decommissioning activities will be undertaken following the 29 years of the Project. The Project generally comprises:

- The initial development of two open cut mining areas with associated haul roads and OEAs, utilising a mining fleet of excavators and trucks and supporting ancillary equipment;
- The two open cut mining areas will be developed and operated 24 hours a day, 7 days a week over an approximate 8 year period and will ultimately provide for the storage of coal processing waste products from the longer term underground mining activities;
- Construction and operation of an underground coal mine operating 24 hours a day, 7 days a week for a 22 year period, commencing in around year 7 of the Project;
- An extraction rate of up to 6 Mtpa of ROM coal;
- Underground mining operations utilising longwall mining techniques with primary access provided via drifts constructed adjacent to the rail loop and CHPP;
- The construction and operation of a CHPP with a throughput of approximately 6 Mtpa of ROM coal;
- The construction and operation of Surface Facilities to support underground mining operations including (at least) the main personnel access to the mine, main ventilation facilities, workshop, offices and employee amenities, water and gas management facilities;
- A workforce of up to approximately 1,000 full-time equivalent employees during

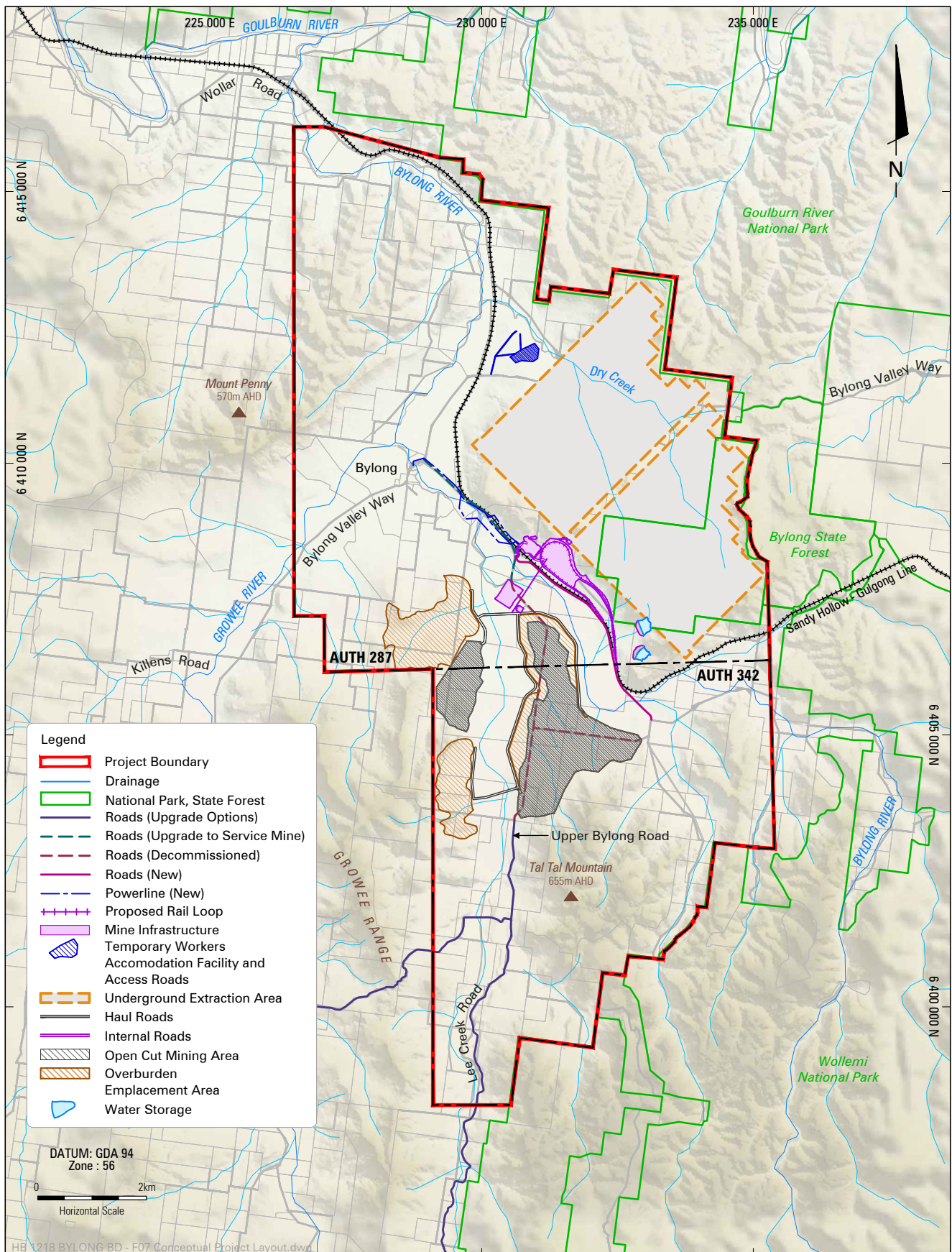
construction and up to approximately 550 full-time equivalent employees during operation of the Project at full production;

- The dewatering of tailings through belt press filters within the CHPP, and the co-disposal of dewatered tailings and coarse rejects within OEAs and final open cut voids;
- The construction and operation of a rail loop and associated rail loading facility and connection to the Sandy Hollow-Gulgong Railway Line to facilitate the transport of product coal;
- The upgrade of Upper Bylong Road and the construction and operation of a Mine Access Road to provide access to the site facilities;
- Relocation of sections of some existing public roads to enable alternate access routes for landholders surrounding the Project (whilst privately owned);
- The construction and operation of administration, workshop and other mining related facilities;
- The construction and operation of surface and groundwater management and water reticulation infrastructure including pipelines, pumping stations and associated infrastructure for access to water from the neighbouring groundwater aquifers;
- The installation of communications and electricity reticulation infrastructure;
- Construction and operation of a Temporary Workers Accommodation Facility and associated access road from Bylong Valley Way; and
- Progressive rehabilitation of all disturbed areas and the decommissioning of Project infrastructure and rehabilitation of the land at the completion of mining operations.

Figure 1 illustrates the conceptual Project layout as described above.

1.3. STUDY AREA

The study area for this AIS includes all the land within the Project Boundary and its immediate locality (defined as the land within a 2 km radius of the Project Boundary). This is discussed against the general nature of agricultural production within the Bylong Valley as a whole.



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Conceptual Project Layout

FIGURE 1

2. CURRENT AGRICULTURAL ENTERPRISES AND RESOURCES

2.1. CLIMATE

Site specific climatic data has been recorded at the Bylong Meteorological Monitoring Station within the Project Boundary since 2011. Temperatures within the Bylong region, including the area within the Project Boundary, range from an average maximum of 24°C in summer to an average minimum of 2.5°C in the winter months.

For the majority of the year, winds predominantly occur from the east-south-east, except during the winter and spring months when winds from the west and north-west prevail. The mean annual rainfall for the region is approximately 950 mm (BOM Station 062100) (BOM, 2013). This weather station, at Nullo Mountain is at an elevation of 1130 m, compared to Bylong's elevation of 303 m.

2.2. SOIL LANDSCAPES AND TOPOGRAPHY

A detailed characterisation of the soil landscapes and topography within the Project Boundary is provided in the Soils Assessment and Site Verification (SLR, 2013a), which has been prepared to support the Gateway Application for the Project.

2.3. WATER

The Project is located within the Bylong River catchment, which covers an area of approximately 700 km². The river flows from south to north through the Project Boundary intercepting the Goulburn River approximately 8 km north of the village of Bylong. There are several ephemeral minor creeks and streams that branch from Bylong River, including Crow's Nest Creek, Cousins Creek, Lee Creek, Growee River and Dry Creek.

The Bylong River its associated tributaries and alluvial aquifers are regulated by the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009*. The water sharing plan report card for the Bylong River water source indicates:

- Total surface water entitlement: 65 ML/year (100% used for irrigation purposes);
- 2 surface water licenses: peak daily demand = 1.4ML/day;
- Total groundwater entitlement covering 23 licences: 5,843 ML/year (100% used for irrigation purposes); and
- 20.29% of total Goulburn Extraction Management Unit entitlement.

2.4. HISTORICAL AGRICULTURAL ENTERPRISES IN LOCALITY

William Lawson and James Blackman were the first Europeans to explore the Bylong district setting out from Bathurst in 1822 heading out along the Goulburn River. For much of its early history, land within the Bylong Valley was occupied by a handful of pioneering families with the two most significant being the Lee and Tindale families.

Historical land settlement throughout Bylong's early settlement was dominated by pastoral activities. Initially sheep were grazed throughout the area; however, it was soon recognised for its potential for cattle and thoroughbred horses (Barrie, 1967). Further the Bylong Valley was well known for its production of crops such as Lucerne, rye prairie and English grasses.

In 1918, Herbert Thompson, part of the Thompson horse breeding family from Widden, purchased part of John Lee's old estate in Bylong. He called this property Tarwyn Park, which became famous in the period between 1927 and 1939 as the home of the famous thoroughbred racehorse "*Heroic*". The Thompson family also purchased Wingarra and Torrie Lodge in the 1920s, followed by Bylong Station and later Sunnyside, considerably

increasing their stud holdings in Bylong. The Thompson studs produced a large number of thoroughbreds from their properties in Bylong and Widden. Herbert Thompson became one of Australia's greatest horse breeders and was a founding member of the Sydney Turf Club. After his death in 1955, the Thompsons reduced their thoroughbred breeding activities across the Bylong stud properties (Barrie, 1967).

Land use in the Bylong Valley has remained unchanged from the 1830s and still retains its pastoral and grazing focus. Aside from a commercial cheese factory in the early twentieth century and the various general stores, commercial developments in Bylong have been limited.

Bylong today comprises of a small village with a general store, local hall, camp site with tennis courts and a public school (Upper Bylong Public School). The population of Bylong and neighbouring areas is less than 100.

2.5. CURRENT AGRICULTURAL ENTERPRISES IN LOCALITY

Staff from the NSW Department of Primary Industry (DPI) (former District Agronomist and District Livestock Office (Beef Cattle)) identified the main agricultural activity in the Bylong Valley as cattle breeding. DPI estimated that there are 6,000 breeding cows within the extended Bylong Valley turning off an approximate 4,800 progeny per annum, mainly for the European market (550 kilogram (kg) live weight). Additional to the breeding enterprise it is estimated 2,000 head of trading stock are grown out from 240 kg live weight to be turned off at 460 kg live weight per annum depending on seasonal and market conditions.

Hill grazing country, which is used for cattle breeding, has a carrying capacity of 3 to 4 Dry Sheep Equivalent (DSE)/ hectare (ha) while the lower slope grazing country 6 to 7 DSE/ha based on a mix of native, naturalised and improved pasture species. The arable irrigated pasture is capable of carrying 25 DSE/ha under intense management systems, but a more representative average is 10 DSE/ha. Heavily timbered country which is mainly for shelter grazing has a carrying capacity of 0.3 DSE/ha.

Of the stock turned off from Bylong Valley, 50% are sold via paddock sales, mainly to abattoirs at Tamworth, Scone and Singleton or direct to feedlots with the remaining 50% been sold through sale yards at Scone or Mudgee.

Of lesser importance is limited Lucerne hay production for the stock feed market or Sydney horse market. Most Lucerne is used on farm for grazing or supplementary feeding of livestock. Oaten hay production is also carried out. Forage millets for hay and sorghum forages are grown under irrigation in summer. Lucerne hay yields typically are 12-15 tonnes (t)/ha with the more proficient hay growers achieving 17-20 t/ha based on average irrigation water usage of 6 ML/ha and up to 8 ML/ha four years in five. Oaten hay yields of 8t/ha are expected with wheat grain crops yielding 3t/ha average, peaking at 5t/ha.

Opportune wheat and oat grain crops are also grown but mainly in the south-eastern end of the Bylong Valley. Cropping country is restricted to the alluvial flats of the Bylong and Upper Bylong Valley and associated creek flats with the irrigation areas being limited to the along the alluvial aquifer and associated water courses.

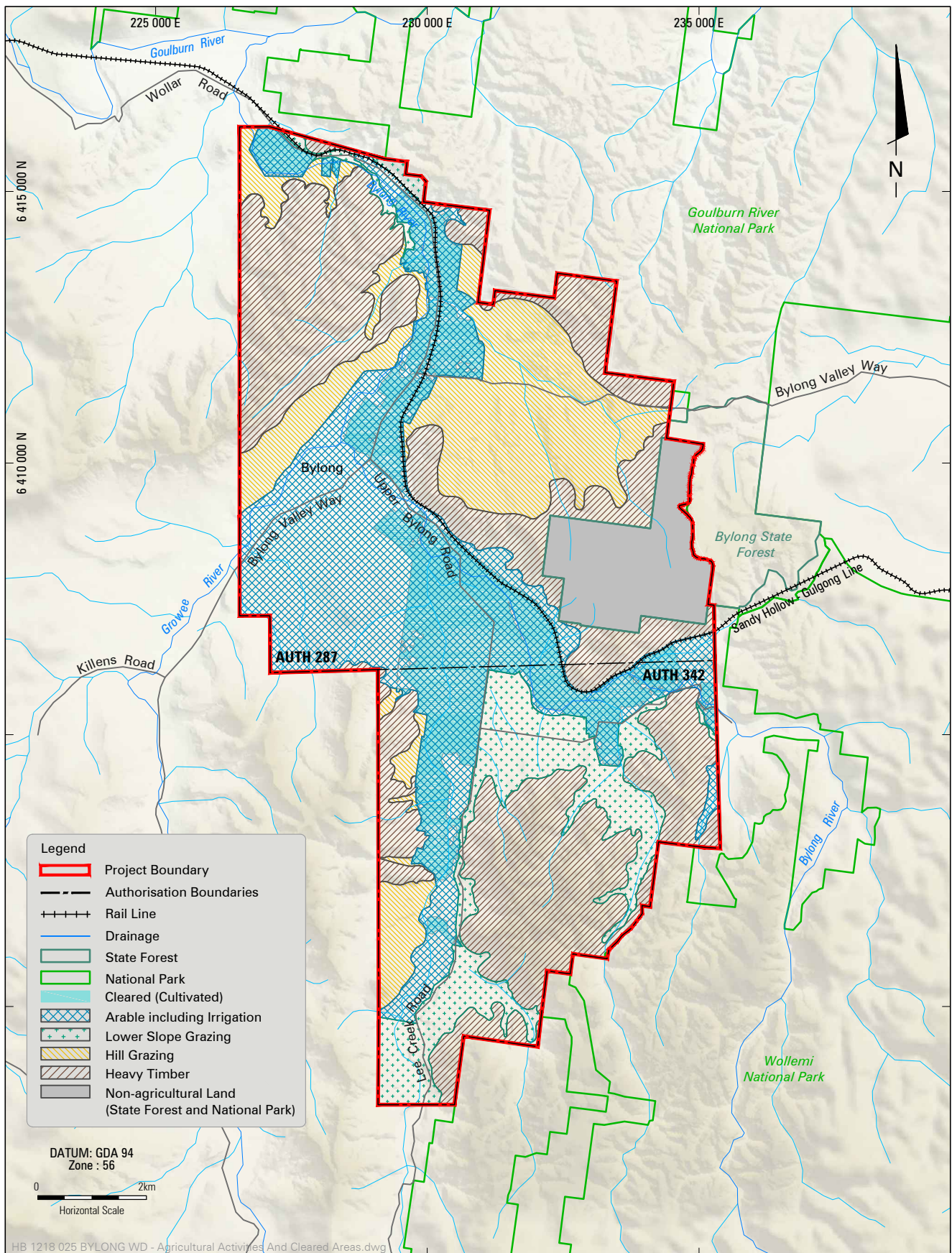
There are no thoroughbred breeding enterprises currently within the locality; however, there are a number of small equine enterprises (primarily associated with stock horse breeding and husbandry) many of which also run beef cattle.

2.6. CURRENT AGRICULTURAL ENTERPRISES WITHIN PROJECT BOUNDARY

Agricultural enterprises within the Project Boundary reflect the general agricultural land use of the regional locality. The spatial distribution and quantum of these enterprises is shown in **Figure 2** and **Table 1**.

Table 1
Current Agricultural Enterprises within the Project Boundary

Enterprise	Area (ha)	Area (%)	DSE/ha	DSE
Arable including irrigation areas	3,331	32.3	10.0	33,298
Lower slope grazing only	1,007	9.8	6.5	6,546
Hill grazing	1,763	17.1	3.5	6,169
Heavily timbered	3,691	38.1	0.3	1,107
Non-agricultural use	525	5.1	0	0
Total	10,317	100.0	-	47,120



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Agricultural Enterprises within the Project Boundary

FIGURE 2

The predominant enterprise within the Project Boundary is beef cattle grazing supported by fodder cropping (oats, Lucerne, millet and forage sorghum) and improved pastures on the better quality land and larger holdings. As provided in **Section 2.5**, this reflects the enterprises in the northern end of the Bylong Valley (where the Project is located), which is generally representative of cattle breeding with a lesser emphasis on Lucerne hay production and fodder cropping.

A representative beef cattle breeding enterprise within the Project Boundary for the EU market typically turns off progeny at 16 months of age weighing 550 kg live weight (300 kg carcass weight). The average feed requirement per cow and including followers is 23.66 DSE (NSW DPI, 2012). There is limited sale of fodder (Lucerne hay, oaten hay) as most is consumed within the enterprise.

There are no thoroughbred breeding enterprises currently within the Project Boundary or within 2km of the Project Boundary; however, a number of small equine horse breeding and husbandry enterprises (including an Australian Stock Horse stud) is situated within the Project Boundary many of which also run beef cattle (see **Section 3.2.1** for details on operations). These enterprises and their associated properties are discussed further in the context of the equine CIC in **Section 3.2**.

The current enterprises operating within the Project Boundary and the carrying capacity of each have been sourced by KEPCO from applicable land holders as commercial-in-confidence documents. As such not all information has been disclosed in this AIS.

It is estimated that the Project Boundary could carry approximately 1,992 beef breeders, turning off 1,653 sale cattle per year plus opportune trading cattle as warranted by seasonal and market conditions. The break-up of sale cattle would be:

- 837 steers,
- 438 heifers,
- 20 CFA bulls,
- 139 CFA cows, and
- 219 other culls.

It is noted that to estimate the agricultural production within the Project Boundary, it is assumed that all land is used for EU Trade beef breeding enterprises, the predominant agricultural activity. If land was turned over to production of fodder (Lucerne and cereal hay) or cereal crops for cash sale, then there would be a corresponding decrease in the number of breeding cattle and cattle sold.

Further examination of the agricultural productivity (quantum and value) generated by current agricultural enterprises within the Project Boundary will be undertaken as part of a detailed AIS, which will be prepared as component of the Environmental Impact Statement for the Project.

2.7. SUPPORTING SERVICES AND INFRASTRUCTURE

Agricultural input suppliers that service Bylong Valley are located in the surrounding towns of Mudgee (95 km from Bylong), Rylstone (52 km) and Denman (71 km) in the Hunter Valley with Mudgee being by far the major centre.

It was estimated by the DPI that 50% of the cattle produced in Bylong Valley are sold out of paddock direct to abattoirs or feedlots. The major abattoirs being located at Scone (121 km), Singleton (140 km) and Tamworth (250 km). The remaining 50% are sold through local sale yards, being Mudgee, Scone and Singleton.

Further examination of the quantum and economic contribution generated by current agricultural enterprises within the Project Boundary to each of the aforementioned supporting services will be undertaken as part of the detailed AIS, which will be prepared as component of the Environmental Impact Statement for the Project.

2.8. TRANSPORT ROUTES

The Bylong Valley is serviced by a regional and local road network. This network is used to transport all agricultural inputs and outputs from the valley and forms a vital connection to the agricultural network at Mudgee, Rylstone and the Upper Hunter.

The Bylong Valley Way forms the main regional road network and runs north south through the valley and contributes to part of the Greater Blue Mountains Tourist Route and an extension of the Tablelands Way (Canberra-Bathurst-Hunter Valley). Within the Project Boundary, there are a number of smaller rural local roads that provides access to the various properties. These include Upper Bylong Road, Lee Creek Road, Woolley's Road, Wally's Road and Wollar Road.

The Sandy Hollow to Gulgong Railway Line runs from the east to the north of the Project Boundary and is proposed to be used for the transport of coal from the Project to the Port of Newcastle. This rail line is not used for the transport of agricultural products or inputs. However, this line joins the Great Northern Railway Line at Muswellbrook, which is used for the bulk and containerised commodity transport (mainly cereal grains) from the north-west region to the Port of Newcastle. Australian Rail Track Corporation (ARTC) is responsible for the management of rail movements on the Great Northern Railway Line with demands from various rail users.

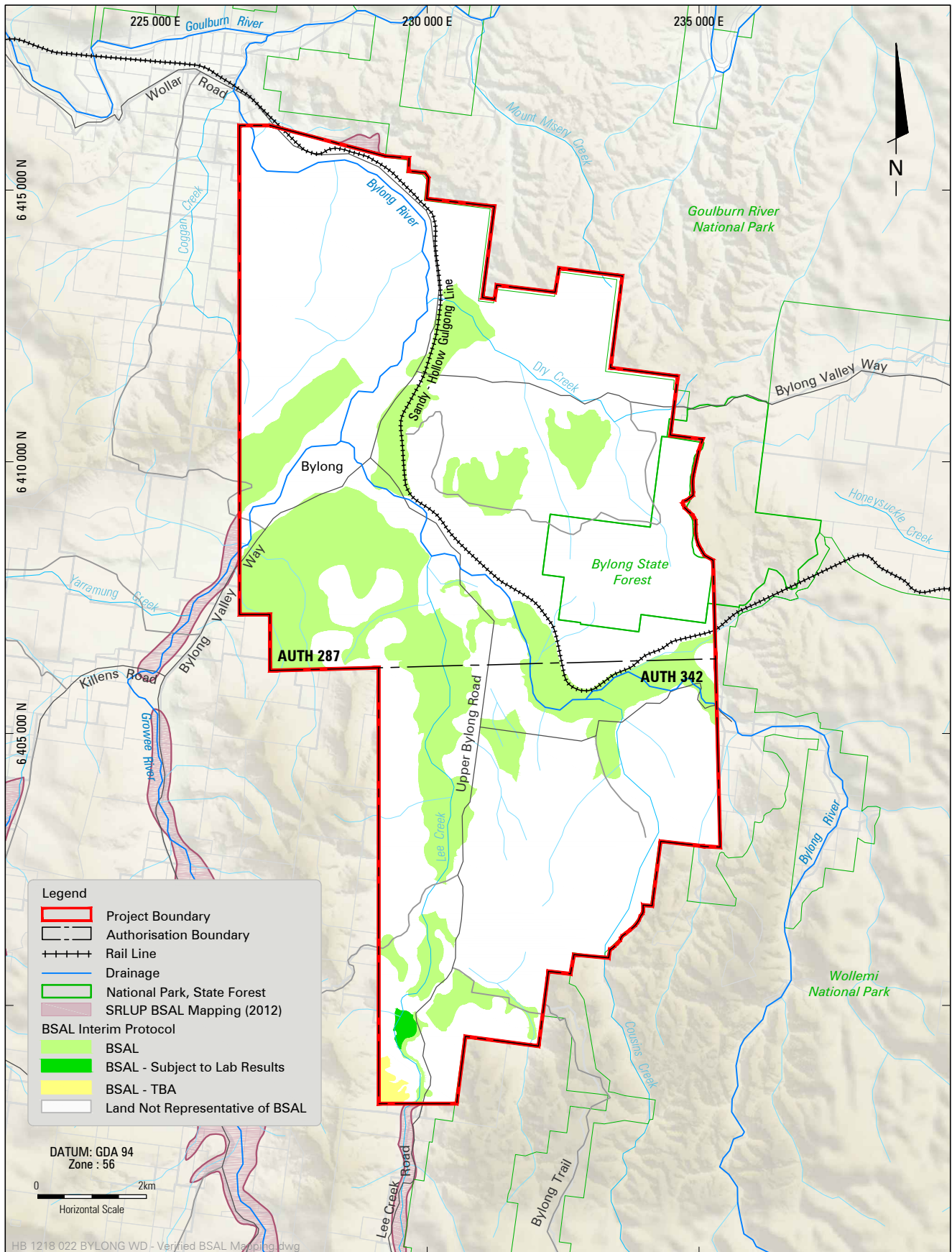
3. VERIFICATION OF STRATEGIC AGRICULTURAL LAND

3.1. BIOPHYSICAL STRATEGIC AGRICULTURAL LAND

The verification process, detailed in the Soils Assessment and Site Verification (SLR, 2013a), determined that 2,366 ha or 23% of the land within the Project Boundary represents BSAL. The work completed as part of this verification process involved the consideration of the relevant criteria of the SRLUP and the Interim Protocol. This process identified additional areas of BSAL (756 ha) at a local, Project-specific scale beyond that mapped at a regional scale by the SRLUP (1,610 ha), generally in areas beyond the alluvial flats. **Figure 3** illustrates the extent and distribution of verified BSAL within the Project Boundary.

The remaining land (7,951 ha or 77%) within the Project Boundary does not meet all relevant criteria to be classified as BSAL. This is generally as a result of a range of chemical and physical limitations, in particular unfavourable slopes (i.e. land slopes greater than 10%).

Any land situated outside the Project Boundary and mapped by the SRLUP as BSAL has been accepted at a regional scale. Given the Project is located wholly within the Project Boundary, land outside this extent has not been verified.



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Verified BSAL within Project Boundary
and Mapped BSAL within Locality

FIGURE 3



3.2. EQUINE CRITICAL INDUSTRY CLUSTER

When released in September 2012, the SRLUP provided mapping for the equine CIC across the Upper Hunter region and showed 6,617 ha of the equine CIC within the Project Boundary (see **Figure 4**). A number of equine facilities were encompassed in this mapped area, including Tarwyn Park, Bylong Park, Tinka Tong, Helvetia and Wingarra. All other equine facilities situated within the Project Boundary and within the locality, including Torrie Lodge, Sunnyside and Byleigh Ridge, were excluded from the mapping. **Section 3.2.1** provides further details regarding the type of equine enterprise associated each equine enterprise.

The SRLUP mapping (September, 2012) has since been revised with a second draft equine CIC map released in October 2013 for public exhibition and comment. The revised draft mapping shows 1,933 ha of the equine CIC within the Project Boundary (see **Figure 5**). This has been verified in accordance with:

- The equine CIC mapping criteria outlined in the Appendix of the SRLUP, which states:

"The equine cluster is spatially defined as land (excluding National Park and State Forest) having a slope of equal to or less than 18 degrees and falling within...the Mid Western Regional, Muswellbrook and Upper Hunter LGAs – within 5 km of the Bylong Valley Way..."

Figure 5 illustrates each of the mapping criteria from the SRLUP in relation to the revised draft mapping of equine CIC and the Project.

- The equine CIC site verification criteria outlined in the Draft Guideline for Site Verification of Critical Industry Clusters (DP&I, 2012b) states:

"A project site forms part of the Equine CIC if it is:

- *Wholly or partially within the area mapped as Equine CIC in the map accompanying the State Environmental Planning Policy (Mining, Extractive Industries and Petroleum Production) 2007; and*
- *Located on or within 2km of a property that is also within the area mapped as Equine CIC and which is primarily used for horse breeding, horse husbandry, horse sales, or forage sales directly to registered horse breeders."*

A total of 6346 ha of the equine CIC within the Project Boundary has been verified as meeting the mapping criteria contained within the SRLUP.

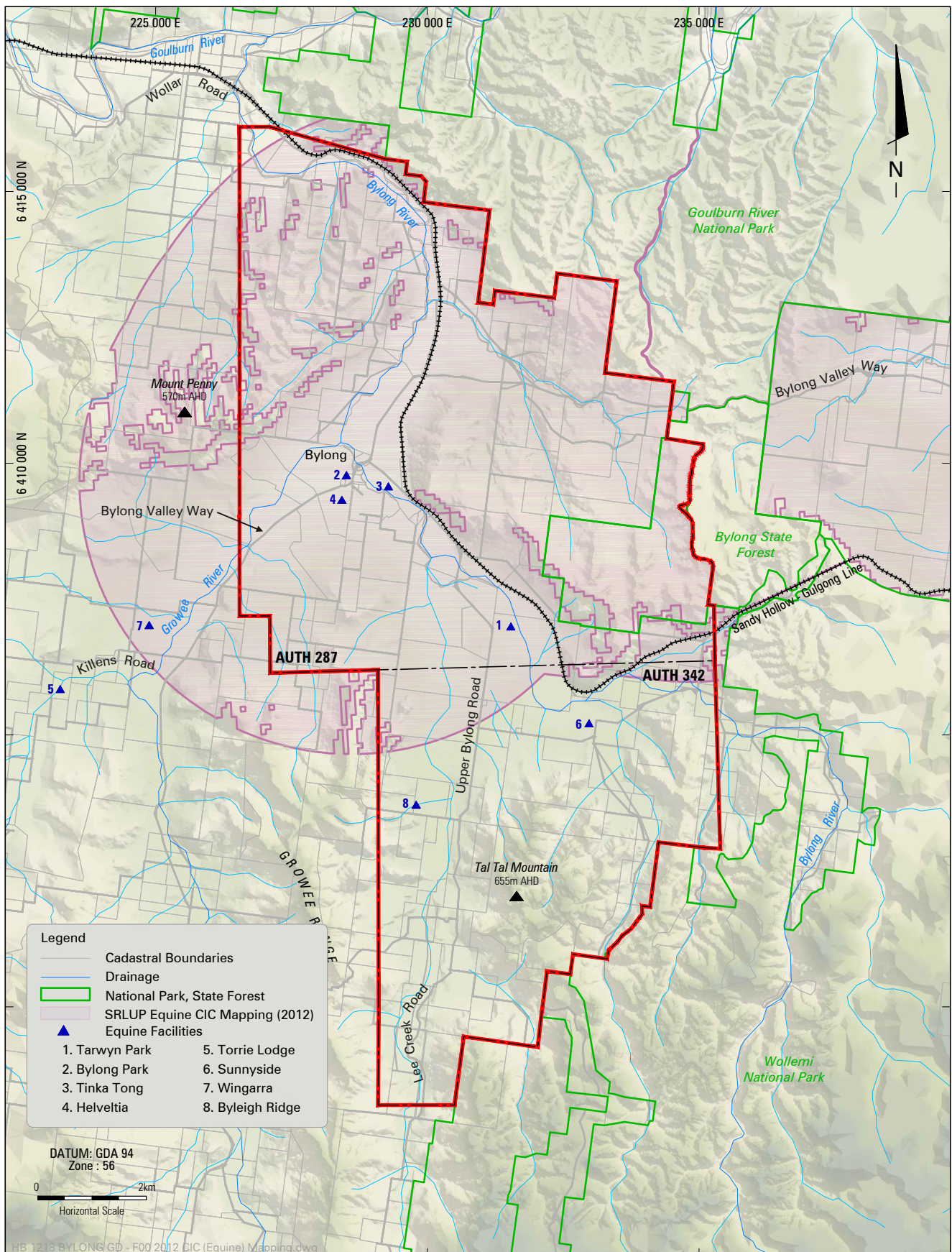
With regards to the site verification criteria, 1,933 ha within the Project Boundary is situated within an area of mapped equine CIC (as per the revised draft mapping). Of this area, 1683 ha meets the mapping criteria as described above.

Further, a portion of the land within the Project Boundary is located on two equine facilities and their respective properties, namely Tarwyn Park and Tinka Tong, which are within the area mapped as equine CIC (as per the revised draft mapping). These mapped areas also meet the mapping criteria as described above.

Another equine enterprise (Sunnyside) is not directly situated on land mapped as equine CIC (as per the revised draft mapping); however, it is associated with a property that is partially mapped. A portion of the land within the Project Boundary is located on this enterprise.

The type of equine enterprise associated each equine enterprise is outlined in **Section 3.2.1**. Of the three equine facilities, only Tinka Tong meets all criteria to be classified as part of the equine CIC. All other equine facilities situated within the Project Boundary

and within the locality, including Bylong Park, Helvetia, Torrie Lodge, Wingarra and Byleigh Ridge, do not conform to the criteria (see **Table 2**).



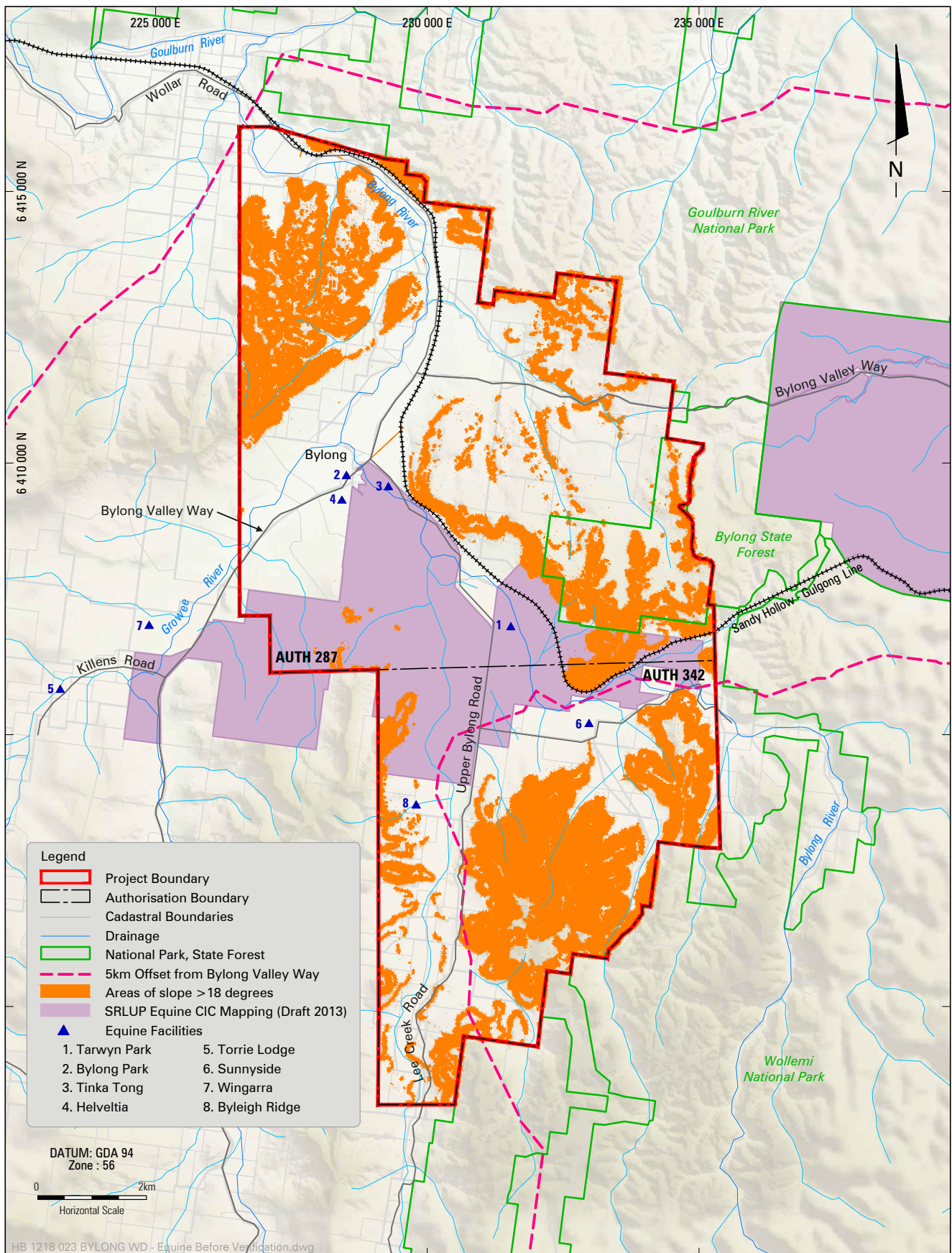
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2012 Critical Industry Cluster (Equine) Mapping

FIGURE 4



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Equine Critical Industry Cluster Mapping Criteria

FIGURE 5

Table 2
Summary of Equine Critical Industry Cluster Verification

Equine Enterprise	Land mapped as Equine CIC (SRLUP, September 2012)	Land mapped as Equine CIC (SRLUP Revised Draft Mapping, 2013) and meets Mapping Criteria (SRLUP Appendix, September 2012)	Land within Project Boundary located on or within 2km of a Property also within mapped Equine CIC (SRLUP Revised Draft Mapping, 2013)	Enterprise				Conforms to all Equine CIC Criteria
				Horse Breeding	Horse Husbandry	Horse Sales	Forage Sales	
Tarwyn Park	Yes	Yes	Yes	No	No	No	No	No
Bylong Park	Yes	No	No	No	No	No	No	No
Tinka Tong	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Helvetia	Yes	No	No	No	No	No	No	No
Torrie Lodge	No	No	No	No	No	No	No	No
Sunnyside	No	No	Yes	No	No	No	No	No
Wingarra	Yes	No	No	Yes	Yes	No	No	No
Byleigh Ridge	No	No	No	No	Yes	No	No	No

The SRLUP defines a CIC as *“a localised concentration of interrelated productive industries based on an agricultural product that provides significant employment opportunities and contributes to the local identity of the region. The CIC also needs to have potential to be substantially impacted by coal seam gas or mining proposals.”* It further provides criteria for what constitutes a CIC:

- *“There is a concentration of enterprises that provides clear development and marketing advantages and is based on an agricultural product,*
- *The productive industries are interrelated,*
- *It consists of an unique combination of factors such as location, infrastructure, heritage and natural resources,*
- *It is of national and/or international importance,*
- *It is iconic industry that contributes to the region's identity, and*
- *It is potentially substantially impacted by coal seam gas or mining proposals.”*

As noted previously, Tinka Tong is the only equine enterprise that has been verified as meeting all criteria to be classed as part of the equine CIC.

In consideration of the above criteria:

- The majority of the equine facilities within or in the locality of the Project Boundary do not meet the site verification criteria to be classed as an enterprise of the equine CIC. Tinka Tong, as a single enterprise, does not represent a concentration of enterprises that provide clear development and marketing advantages based only on the breeding and husbandry of Australian Stock Horses (not thoroughbreds);
- Tinka Tong is not interrelated with other agricultural enterprises within or in the locality of the Project Boundary, which is predominantly associated with cattle breeding and some minor cropping. Furthermore it is not interrelated with other equine facilities within or in the locality of the Project Boundary (which do not meet the criteria of the equine CIC);
- Tinka Tong does not represent an unique combination of factors such as location, infrastructure, heritage and natural resources;
- Tinka Tong is a small scale Australian Stock Horse stud and is not of national and/or international importance;
- The equine industry, which is represented solely by Tinka Tong (as per the verification process), does not contribute the Bylong Valley's regional identity; and
- Tinka Tong will not be substantially impacted by the Project as it is situated outside of the direct disturbance footprint.

Based on the above, Tinka Tong does not embody the definition or criteria of a CIC.

In support of this position, the Mid-Western Regional Council website and discussion with the council officers on 25 October 2013 show that within Bylong Valley there have been no equine related developments approved from September 2013 to present or any equine related developments awaiting determination. This explicitly covers the individual equine enterprises and their associated properties discussed in **Section 3.2.1**.

Discussion with DPI staff also indicated that there were no significant equine related enterprises within the Bylong Valley.

Furthermore, searches of White Pages and Yellow Pages website directories did not reveal any supporting services for the individual equine enterprises and their associated properties, as discussed in **Section 3.2.1**. This explicitly included:

- Horse breakers;
- Horse trainers;
- Farriers;
- Equine veterinarians nor,
- Commercial Lucerne hay producers, and
- Covered the verified mapped equine CIC and the broader locality in the Bylong Valley.

3.2.1. Equine Facilities

Tarwyn Park

Tarwyn Park is a property of approximately 610 ha. Current land use is for cattle breeding supplemented by fodder cropping. Tarwyn Park is where the concept of *Natural Sequence Farming* was first used and demonstrated. This methodology of land management is still used though the initial proponent of *Natural Sequence Farming* no longer lives at or manages Tarwyn Park.

Tarwyn Park was used as a horse breeding, spelling and training establishment for many years, being most famous as the home Heroic from 1927 to 1939 and for breeding the 1968 and 1969 Melbourne Cup winner *Rain Lover*. It is no longer used for breeding, spelling or training thoroughbred horses.

A search of the telephone directory lists PJ Andrews of Tarwyn Park, Bylong as a Horse Stud Breeder and/or dealer. To this author's knowledge, PJ Andrews no longer resides or manages Tarwyn Park.

An article from the *Racing and Sport* website accessed on 28 January 2011 (<http://www.racingandsports.com.au>) in relation to the awarding of an Order of Australian Medal to Peter Andrews states that "*The property (Tarwyn Park) is now used as a cattle raising farm operated by the Andrew's family*".

Horse related infrastructure remaining on the property includes:

- A stable complex comprising 14 stable and associated facilities;
- A stable complex of 16 stables in fair to poor condition;
- Covered round yard; and
- Steel and post and railing fencing which provides a disused 2,000m training track.

In consideration of the aforementioned, Tarwyn Park is not primarily used for horse breeding, horse husbandry, horse sales or forage sales directly to registered horse breeders and consequently does not meet a key criterion of the equine CIC site verification process.

Bylong Park

Bylong Park was acquired by KEPCO in August 2012. Prior to acquisition, the property was used by the then owner for thoroughbred horse breeding in conjunction with a smaller property in the Hawkesbury Valley of NSW. The previous owner has now placed their mares under the management of the operators of the boutique agistment and

broodmare farm, Benchmark Park at Martindale via Denman in the Upper Hunter Valley. The Bylong Park website (www.bylongpark.com) last recorded a sale in May 2010.

Horse related infrastructure located on the Bylong Park property include a stable complex of 10 to 15 stables, three stallion boxes, foaling yards and round yard. These facilities are not in use.

Since acquisition, Bylong Park is now used for cattle grazing supported by some fodder cropping.

In consideration of the aforementioned, Bylong Park is not primarily used for horse breeding, horse husbandry, horse sales or forage sales directly to registered horse breeders and consequently does not meet a key criterion of the equine CIC site verification process.

Tinka Tong

Tinka Tong is the home of an Australian Stock Horse stud. The property is approximately 56 ha in size. The Australian Stock Horse stud is run in conjunction with a beef cattle enterprise. Observations from public roads indicate that Tinka Tong has limited but adequate horse infrastructure for a small scale horse enterprise.

The Australian Stock Horse Association records showed that as of 28 October 2013 Tinka Tong Stud had 13 horses registered. The Australian Stock Horse Association notes that the register may include animals that have died or have been sold.

In consideration of the aforementioned, Tinka Tong is primarily used for horse breeding and horse husbandry. Consequently, Tinka Tong meets the equine CIC site verification criterion.

Helvetia, Torrie Lodge and Sunnyside

Helvetia, Torrie Lodge and Sunnyside are situated on a large aggregation of land comprised of over nine previous independent holdings (covering an area of approximately 3,358 ha) that have been acquired for management purposes over a period of 40 years.

Horse related infrastructure for each enterprise includes:

- Helvetia complex – Machinery shed/stable complex comprising eight stables and associated facilities;
- Torrie Lodge – Stable complex and part covered day yards in fair condition; and
- Sunnyside – Stable complex comprising 12 stables and associated facilities.

The current land use across the total landholding is beef cattle, fodder cropping and conservation (Lucerne and oats) and opportune winter cereal cropping. Furthermore, the owner of this landholding supports the proposition that their property does not meet the criteria to be included in the equine CIC (**Appendix A**).

In consideration of the aforementioned, Helvetia, Torrie Lodge, Sunnyside and the broader landholding is not used for horse breeding, horse husbandry, horse sales or forage sales directly to registered horse breeders and consequently does not meet a key criterion of the equine CIC site verification process.

Wingarra

Wingarra is the home of an Australian Stock Horse stud operated by Mrs P. Fearon and Mr S. and Mrs P. Fearon.

The Australian Stock Horse Association records showed that as of 28 October 2013 Mrs P. Fearon had nil horses registered whilst Mr S. and Mrs P. Fearon had 13 horses

registered. The Australian Stock Horse Association notes that the register may include animals that have died or have been sold.

In consideration of the aforementioned, Wingarra is primarily used for horse breeding and horse husbandry; however, it is not situated on land mapped as equine CIC (as per the draft 2013 mapping) or land which meets all mapping criteria (SRLUP Appendix). Consequently, Wingarra does not meet a key criterion of the equine CIC site verification process.

Byleigh Ridge

Byleigh Ridge lies within the Project Boundary. Byleigh Ridge has recently been used for thoroughbred horse training and spelling. Horse related infrastructure on site is limited and rudimentary but adequate at this stage.

Whilst Byleigh Ridge is primarily used for horse breeding and horse husbandry, it does not fall within the equine CIC mapping provided in the SRLUP (2012 and draft 2013 mapping). Consequently, Byleigh Ridge does not meet a key criterion of the equine CIC site verification process.

4. IMPACTS ON STRATEGIC AGRICULTURAL LAND

4.1. IMPACTS ON BIOPHYSICAL STRATEGIC AGRICULTURAL LAND

A detailed assessment of the impacts on BSAL, having regard clause 17H(4a) (i) to (iii) and (v) of the Mining SEPP, and associated mitigation and management measures are provided in the Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) and the Groundwater Impact Assessment (AGE, 2013) prepared to support the Gateway Application for Preliminary BSAL Rehabilitation Strategy the Project.

4.1.1. Surface Area Disturbance

A portion of the Project disturbance footprint will directly impact 950 ha of land through surface disturbance. Of the area to be impacted, 215.7 ha represent BSAL, which is 9.1% of the total verified BSAL resource within the Project Boundary.

Direct and Temporary Impacts

Approximately 152.7 ha of land within the Project disturbance footprint will be directly; however, temporarily impacted through surface disturbance to facilitate mine infrastructure, including roads. Of this area, 21.3 ha represent verified BSAL.

Major mine infrastructure (e.g. CHPP and main haul roads) will be constructed and remain operational for the life of the Project to facilitate coal recovery and processing. Other minor infrastructure (e.g. internal roads) will be established and decommissioned in line with the scheduling of the mine plan and remain relatively dynamic.

Agricultural productivity of BSAL will cease relative to the period for which mine infrastructure will be operational. Upon decommissioning, infrastructure will be removed and the land reinstated to its pre-mining condition.

This will be achieved by means of:

- Proposed methods for the stripping, handling and reinstatement of BSAL;
- Understanding the key learnings from recent examples of mine rehabilitation to productive agricultural land; and
- Preliminary success criteria for the reinstatement of BSAL consistent with the criteria of the Interim Protocol and *The Land and Soil Capability Assessment Scheme: Second Approximation – A General Rural Land Evaluation System for NSW* (LSC Scheme) (OEH, 2012).

The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) provides further details regarding each of the measures outlined above.

In consideration of the aforementioned, the agricultural productivity of 21.3 ha of BSAL is not anticipated to be significantly impacted in the long-term as a result of surface disturbance. Once the soils have been reinstated to the reshaped profile, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

Direct and Permanent Impacts

Approximately 797.3 ha of land within the Project disturbance footprint will be directly and permanently impacted through surface disturbance to facilitate the open cut mining areas and OEAs. Of this area, 194.4 ha represent land that has been verified to be BSAL.

The Project has been designed to avoid direct and permanent impacts on verified BSAL, as far as practical, without causing significant harm to other environmental aspects.

Agricultural productivity of BSAL will cease progressively as mining advances. Establishment and rehabilitation of the final landform will be undertaken in parallel

with the scheduling of such operations to achieve a post mining land and soil capability of Class 4.

In order to compensate for the direct and permanent impact of the Project, KEPCO has committed to progressively stripping and reinstating the soils from the 194.4 ha of affected BSAL (in line with the mining schedule) external to the Project Disturbance Boundary. This approach will afford the best outcome for stakeholders and maintain the integrity of the BSAL soil resources.

The reinstatement of BSAL will be achieved by means of:

- Proposed methods for the stripping, handling and reinstatement of BSAL;
- Understanding the key learnings from recent examples of mine rehabilitation to productive agricultural land; and
- Preliminary success criteria for the reinstatement of BSAL consistent with the criteria of the Interim Protocol and the LSC Scheme.

The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) provides further details regarding each of the measures outlined above.

In consideration of the aforementioned, the agricultural productivity of 194.4 ha of BSAL is not anticipated to be significantly impacted in the long-term as a result of surface disturbance. Rather there will be a change in the spatial distribution of BSAL from the pre-mining landscape. Once the soil resources have been reinstated on land external to the Project Disturbance Boundary, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

4.1.2. Subsidence

Indirect and Temporary Impacts

The remaining portion of the Project disturbance footprint (1,716.6 ha) will be indirectly and temporarily impacted by operations in the underground extraction area. Of this area, 185.6 ha represent verified BSAL.

Following coal extraction and progression of the longwall panels, the overlying landform will subside. Subsidence is anticipated to vary between less than 0.5 m and approximately 3.5 m. Subsidence will be most evident along valley floors, when longwall panels are equal to or greater than 200 m in width. These preliminary predictions will be subject to a detailed Subsidence Impact Assessment to be developed for the EIS, which will be based on a detailed longwall panel layout and known seam characteristics.

Once the land has subsided, topographical depressions of up to 1 m may occur in areas of natural shallow gradient. This will result in changes to the land surface micro-relief. Upon progression and settlement of the longwalls remediation will be undertaken to establish natural micro-relief.

Topographical depressions may also result in ponding, which could result in localised chemical changes to soil profile characteristics through the development of an anaerobic environment as well as physical changes through compaction from the accumulated, overlying water. This is largely predicted to be constrained to the lower reaches of Dry Creek and external to the extent of verified BSAL. In this regard, the impacts of ponding on BSAL are expected to be nil or minor.

Further investigations in relation to the potential for ponding will be undertaken in a detailed Subsidence Impact Assessment to be developed for the EIS with any relevant mitigation identified as required.

As a result of the underground extraction area, minor surface cracking (generally less than 100 mm) may also occur in the soil beds of the drainage lines on flat to gently inclined land with the potential for localised cracking of up to 200 mm associated with steeper slopes. Given that the BSAL to be impacted upon by subsidence is located on gently inclined land (3-10%), surface cracking is expected to be minor.

Further investigations in relation to the potential for surface cracking will be undertaken in a detailed Subsidence Impact Assessment to be developed for the EIS with any relevant mitigation identified as required.

In consideration of the above, the vertical component associated with the predicted subsidence is unlikely to change the soil profile to the extent that the 185.6 ha of BSAL and its associated agricultural productivity are significantly impacted. Upon progressive settlement (approximately two years following each subsided longwall panel), it is expected that BSAL will be able to retain its pre-mining land capability characteristics and be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

4.1.3. Soil and Landscape Characteristics

The following section assesses the impact of each Project component on the agricultural productivity of BSAL soil and landscape characteristics holistically, including consideration of slope, surface rockiness/outcrops, land surface micro-relief, soil fertility, effective soil rooting depth, soil drainage, soil pH and soil salinity.

Direct and Temporary Impacts

The Project will result in direct; however, temporary impacts (mine infrastructure including roads) on 152.7 ha of soil resources within the Project disturbance footprint, including 21.3 ha of BSAL. The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) determined that the existing soil and landscape characteristics of BSAL to be impacted is predicted to change temporarily from its pre-mining condition due to the removal of soil resources, including topsoil and subsoil stripping, to facilitate the construction of mine infrastructure.

Agricultural productivity of BSAL will cease relative to the period for which mine infrastructure will be operational. Upon decommissioning, infrastructure will be removed and the land reinstated to its pre-mining soil and landscape characteristics. This will be achieved by means of:

- Proposed methods for the stripping, handling and reinstatement of BSAL;
- Understanding the key learnings from recent examples of mine rehabilitation to productive agricultural land; and
- Preliminary success criteria for the reinstatement of BSAL consistent with the criteria of the Interim Protocol and the LSC Scheme.

The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) provides further details regarding each of the measures outlined above.

In consideration of the aforementioned, agricultural productivity of approximately 21.3 ha of BSAL will not be significantly impacted in the long-term as a result of the Project's operations on soil and landscape characteristics. Once reinstated, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

Direct and Permanent Impacts

The Project will result in direct and permanent impacts (associated with the open cut mining areas and OEAs) on 797.3 ha of soil resources within the Project disturbance footprint, including 194.4 ha of verified BSAL. The Preliminary BSAL Rehabilitation Strategy (SLR, 2013) determined that the existing soil and landscape characteristics of BSAL to be impacted is predicted to change from its pre-mining condition due to the removal of soil resources, including topsoil and subsoil stripping, to facilitate overburden removal and coal recovery.

Agricultural productivity of BSAL will cease progressively as mining advances. Establishment and rehabilitation of the final landform will be undertaken in parallel with the scheduling of such operations to achieve land and soil capability Class 4. As such, the post-mining soil and landscape characteristics will subsequently resemble this classification from its pre-mining condition. The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) provides further details regarding the post-mining Class 4 soil and landscape characteristics.

In order to compensate for the direct and permanent impact of the Project, KEPCO has committed to progressively stripping and reinstating the 194.4 ha of affected BSAL (in line with the mining schedule) external to the Project Disturbance Boundary. This approach will afford the best outcome for stakeholders and maintain the integrity of the BSAL resource.

The reinstatement of BSAL will be achieved by means of:

- Proposed methods for the stripping, handling and reinstatement of BSAL;
- Understanding the key learnings from recent examples of mine rehabilitation to productive agricultural land; and
- Preliminary success criteria for the reinstatement of BSAL consistent with the criteria of the Interim Protocol and the LSC Scheme.

The Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) provides further details regarding each of the measures outlined above.

In consideration of the aforementioned, agricultural productivity of approximately 194.4 ha of BSAL will not be significantly impacted in the long-term as a result of the Project's operations on soil and landscape characteristics. Once reinstated, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

Indirect and Temporary Impacts

The Project will result in indirect and temporary impacts (associated with the underground extraction area) on 1,716.6 ha of soil resources within the Project disturbance footprint, including 185.6 ha of BSAL.

Underground mining will not result in surface disturbance nor will predicted subsidence change the chemical or physical composition of the soil profile to the extent that BSAL and its associated agricultural productivity are significantly impacted from its pre-mining condition (see **Section 4.1.2**). Where potential issues, such as localised ponding and cracking, may occur surface remediation will be investigated to ensure BSAL and its associated agricultural productivity is not significantly impacted (see **Section 4.1.2**). In this regard, the Preliminary BSAL Rehabilitation Strategy (SLR, 2013b) determined the underground extraction area is unlikely to impact the existing soil and landscape characteristics of the overlying BSAL.

Upon progressive settlement (approximately two years following each subsided longwall panel), it is expected that BSAL will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

4.1.4. Highly Productive Groundwater

The Groundwater Impact Assessment prepared for the Gateway Application for the Project has predicted a maximum groundwater take of 469 ML from the Quaternary alluvium of the Bylong River Water Source, which is a highly productive groundwater source, at Year 10 of mining (see Groundwater Impact Assessment (AGE, 2013)).

KEPCO has secured approximately 2,000 units of water allocation from the Bylong Water Source under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009*, which is more than sufficient to license the predicted take of water from the alluvium and provide water (average of 6 ML per ha of irrigated land per year) to sustain current agricultural production of BSAL within the Project Boundary. Further allocations are likely to be secured into the future in association with the acquisition of land within the Project Boundary.

Furthermore, during and following the cessation of mining, groundwater levels in the alluvium will recover to pre-mining conditions. In this regard, agricultural productivity of BSAL will not be significantly impacted long-term as a result of the Project's impacts on highly productive groundwater.

4.1.5. Agricultural Fragmentation

The current spatial distribution of BSAL within the Project Boundary is substantially fragmented by land with a range of chemical and physical limitations, in particular unfavourable slopes (see Soils Assessment and Site Verification (SLR, 2012a)). The Project has been designed to minimise the amount of BSAL annexed from surrounding agricultural land use practices.

The following section assesses the impact of each Project component on the agricultural productivity of BSAL in consideration of existing and predicted fragmentation.

Direct and Temporary Impacts

The Project will result in direct, temporary impacts (associated with mine infrastructure including roads) on approximately 152.7 ha of soil resources within the Project Disturbance Boundary, including 21.3 ha of verified BSAL.

The Soils Assessment and Site Verification (SLR, 2013a) determined that the existing 21.3 ha of BSAL is significantly fragmented by land that is limited by its physical and chemical characteristics (and overarching soil fertility).

The agricultural productivity of BSAL will cease relative to the period for which mine infrastructure will be operational. Upon decommissioning, infrastructure will be removed and the land reinstated to its pre-mining characteristics.

Given that the land is significantly fragmented and the impact of mine infrastructure is temporary in nature, agricultural productivity of approximately 21.3 ha of BSAL will not be significantly impacted in the long-term as a result of the Project. Once reinstated, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

Direct and Permanent Impacts

The Project will result in direct and permanent impacts (associated with the open cut mining areas and OEAs) on approximately 797.3 ha of soil resources within the Project disturbance boundary, including approximately 194.4 ha of verified BSAL.

The Soils Assessment and Site Verification (SLR, 2013a) determined that the existing 194.4 ha of BSAL is substantially fragmented by land that is limited by its physical characteristics, in particular slopes greater than 10%.

Agricultural productivity of BSAL will cease progressively as mining advances. Progressive rehabilitation of the final landform will be undertaken in parallel thereby reducing disconnect to surrounding agricultural land at a relatively proportionate rate. However, this rehabilitated land will not be representative of BSAL.

In order to compensate for the direct and permanent impact of the Project, KEPCO has committed to progressively stripping and reinstating the 194.4 ha of affected BSAL (in line with the mining schedule) external to the Project disturbance boundary but within the Project Boundary or its surrounds. Upon reinstatement, KEPCO will aim to adjoin or create connectivity with larger areas of in situ BSAL. This approach will afford the best outcome for stakeholders and maintain the integrity of the BSAL resource.

In consideration of the aforementioned, agricultural productivity of approximately 194.4 ha of affected BSAL will not be significantly impacted in the long-term as a result of the Project. Once reinstated, the land will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

Indirect and Temporary Impacts

The Project will result in indirect and temporary impacts (associated with the underground extraction area) on 1,716.6 ha of soil resources within the Project disturbance boundary, including approximately 185.6 ha of verified BSAL.

The Soils Assessment and Site Verification (SLR, 2013a) determined that the existing 185.6 ha of BSAL is substantially fragmented by land that is limited by its chemical and physical characteristics, in particular slope.

Underground mining will not result in surface disturbance nor will it fragment overlying BSAL. In this regard, agricultural productivity of approximately 185.6 ha of BSAL will not be significantly impacted in the long-term as a result of the Project.

Upon progressive settlement (approximately two years following each subsided longwall panel), it is expected that BSAL will be capable of sustaining agricultural enterprises and production rates comparable to those currently observed.

4.1.6. Reduction in Verified Biophysical Strategic Agricultural Land

The Project disturbance footprint will impact 401.3 ha of BSAL. To compensate for direct and permanent impacts associated with the open cut mining areas and OEAs on BSAL (194.4 ha), KEPCO has committed to reinstating BSAL on less capable land within the Project Boundary proportionate to the predicted impact.

For other minor areas of BSAL (21.3 ha) that will be directly impacted for a temporary period, land will be rehabilitated to pre-mining conditions.

Underground mining is not anticipated to result in significant levels of surface disturbance nor is the vertical component associated with the predicted subsidence expected to change the chemical or physical composition of the soil profile to the extent that BSAL and its associated agricultural productivity are significantly impacted. Where potential issues, such as localised ponding and cracking, may occur surface remediation will be investigated to ensure BSAL and its associated agricultural productivity is not significantly impacted.

In consideration of the aforementioned, the direct and indirect impacts on BSAL will be temporary in the short to medium term. Ultimately there will be a negligible reduction in the availability of BSAL in the long term once BSAL is reinstated and other minor areas are rehabilitated. The spatial distribution of the reinstated BSAL will, however,

vary from the pre-mining landscape. As such, the agricultural productivity of BSAL will not be significantly impacted as a result of a reduction in the area of verified BSAL.

4.2. IMPACTS ON EQUINE CRITICAL INDUSTRY CLUSTER

As stated in **Section 3.2**, the overwhelming majority of the equine facilities within or in the locality of the Project Boundary do not meet the site verification criteria to be classed as an enterprise of the equine CIC. Only one equine enterprise met all the relevant criteria. In consideration of the SRLUP, this single enterprise does not embody the definition or criteria of a CIC. As such, it is concluded that the Project will not impact on the equine CIC. Further justification of this position having regard to clause 17(4b) of the Mining SEPP is provided in the subsequent subsections.

4.2.1. Surface Area Disturbance and Subsidence

Within the Project Boundary, three potential equine related enterprises are identified in the Revised Draft CIC (Equine) mapping, including: Wallings Pastoral Company (under Agreement with KEPCO), Tarwyn Park (under Agreement with KEPCO) and Tinka Tong.

Tinka Tong is located outside the both the area of direct surface area disturbance and subsidence from the Project.

The Project will directly impact 604 ha of the Wallings Pastoral Company property. Direct disturbance comprises 388 ha of open cut mining area, 11 ha infrastructure and 205 ha of OEA. This property is under Agreement with KEPCO.

The Project will directly impact 109 ha of the Tarwyn Park property and indirectly through 24 ha of subsidence. Direct disturbance comprises 60 ha of open cut mining area and 25 ha infrastructure. This property is under Agreement with KEPCO.

The land and any associated equine enterprise within the Project disturbance has been verified as not meeting the definition or criteria of the equine CIC as outlined in **Section 3.2**. In this regard, the Project will not impact the equine CIC through surface area disturbance or subsidence.

4.2.2. Access to Agricultural Resources

The Project disturbance footprint is not directly situated on land utilised for the operations of verified equine CIC enterprises. In this regard, the Project will not impact the equine CIC through reduced access to land resources.

Water from the Bylong River Water Source is a resource relied upon by agricultural enterprises, including those verified equine CIC enterprises. The land and any associated equine enterprise within the Project disturbance footprint, Project Boundary and the broader locality have been verified as not meeting the definition or criteria of the equine CIC as outlined in **Section 3.2**. In this regard, the Project will not impact the equine CIC in the immediate vicinity through reduced access or availability to water resources.

Whilst there may not be impacts predicted within the immediate vicinity of the Project, this AIS has considered any potential equine CIC enterprises located downstream.

The Groundwater Impact Assessment prepared for the Gateway Application for the Project has predicted a maximum groundwater take of 469 ML from the Quaternary alluvium of the Bylong River Water Source and 536 ML from the Permian coal measures at Year 10 of mining.

KEPCO has secured approximately 2,000 units of water allocation from the Bylong Water Source under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009*, which is more than sufficient to license the predicted take of water from the alluvium. Further allocations are likely to be secured into the future in

association with the acquisition of land within the Project Boundary. As the Project is within the framework of the water sharing plan, it accounts for the impact (take of water) on all groundwater users within the water source. In this regard, the Project will not impact the equine CIC downstream through reduced access or availability to alluvial water resources.

Given the poorer quality of water within the Permian coal measures, extraction of water from this aquifer for agricultural purposes is rare. Nevertheless, KEPCO will also seek relevant water access licences to account for any take of water from the Permian coal measures. Currently no water sharing plan exists for the Permian coal measure water source.

The Project is unlikely to impact the equine CIC downstream through reduced access or availability to Permian coal measure water resources.

4.2.3. Access to Support Services and Infrastructure

The predominant agricultural land use within the Project disturbance footprint and the broader Project Boundary is associated with cattle grazing with the major enterprise being beef cattle breeding supported by fodder cropping. To facilitate operations, minor infrastructure such as fencing, cattle yards, machinery sheds, reticulated stock water and internal farm access roads are utilised on site.

Agricultural output from the land contributes to the local supporting services, such as sale yards and abattoirs. This operation and its supporting services and infrastructure are not interrelated with existing equine facilities within or in the locality of the Project Boundary. The land and any associated equine enterprise within the Project disturbance footprint, Project Boundary and the broader locality have been verified as not meeting the definition or criteria of the equine CIC as outlined in **Section 3.2**. In this regard, the Project will not impact the equine CIC through reduced access to support services and infrastructure.

4.2.4. Access to Transport Routes

The Sandy Hollow to Gulgong Railway Line runs to the north of the Project Boundary and is proposed to be used for the transport of coal from the Project to the Port of Newcastle. This rail line is not used for the transport of agricultural products or inputs. In this regard, the Project will not impact the equine CIC through reduced access to rail transport routes, services and infrastructure.

The key transport route utilised by existing equine enterprises within or in the locality of the Project Boundary is Bylong Valley Way. Other minor routes include Upper Bylong Road, Lee Creek Road, Woolley's Road, Wally's Road and Wollar Road.

The Project will result in the closure of part of the Upper Bylong Road, which will result in restricting access to Lee Creek Road (to the south) and Woolley's Road (to the east). Suitable access to the Lee Creek Road shall be maintained by either the upgrade to Lee Creek Road down to the intersection with Bylong Valley Way to the south or an upgrade to Buddens' Gap Road which also connects to Bylong Valley Way south-west of the Bylong Village. Access will be maintained to the remaining areas of Woolley's Road and to the east of the Project by the construction of a realigned portion of road following the existing rail corridor and connecting to Woolley's Road and Wally's Road to the east of the eastern open cut mining area (see **Figure 1**).

These alternations to the local road network will ensure that existing agricultural enterprises are not fragmented from the rest of the Bylong Valley and efficient and economic agricultural production can continue. However, the land and any associated equine enterprise within the Project disturbance footprint, Project Boundary and the broader locality have been verified as not meeting the definition or criteria of the equine

CIC as outlined in **Section 3.2**. In this regard, the Project will not impact the equine CIC through reduced access to road transport routes, services and infrastructure.

4.2.5. Scenic and Landscape Values

The Visual Impact Assessment (Integral, 2013) prepared for the gateway application presents representative views from Bylong Valley Way and Woolley's Road looking towards the Project. These views are representative of views predicted to occur at key equine facilities. With the Project in the background, existing mature vegetation and topography acts as a visual screen limiting views. However, the land and any associated equine enterprise within the Project disturbance footprint, Project Boundary and the broader locality have been verified as not meeting the definition or criteria of the equine CIC as outlined in **Section 3.2**. In this regard, it is considered that the Project does not significantly compromise the scenic and landscape settings of the equine CIC to the south of the Project Boundary.

5. PRELIMINARY IMPACTS ON AGRICULTURE

Approximately 950 ha of the Project disturbance footprint (2,667ha) will directly impact land through surface disturbance. Approximately 153 ha of this land will be directly impacted; however, temporarily impacted through surface disturbance to facilitate the construction and operation of open cut mining infrastructure and roads (internal and haul roads). Once open cut mining operations have been completed, these Project components will be removed and the land reinstated to its pre-mining condition.

Approximately 797.3 ha of land within the Project disturbance footprint will be directly and permanently impacted through surface disturbance to facilitate the open cut mining areas and OEAs. During the life of the Project and upon mine closure, open cut mining areas and OEAs will be reshaped and rehabilitated.

The remaining portion of the Project disturbance footprint (1,716.6 ha) will be indirectly and temporarily impacted by operations in the underground extraction area. Following coal extraction and progression of the longwall panels the overlying landform will subside. Given the predicted nature of underground mining as provided in a preliminary Subsidence Constraints Study (MSEC, 2012), it is unlikely that subsidence would result in changes to surface microrelief or significantly alter the chemical or physical composition of the soil profile to the extent that the land and associated agricultural productivity is significantly impacted and cannot proceed without remediation. Upon progressive settlement of each subsided longwall panel, it is expected that the land will be able to retain its pre-mining land capability characteristics and, where applicable, continue current agricultural production.

Only the direct impacts (temporary or permanent) have the potential to impact the agricultural productivity of the land within the Project disturbance footprint. A preliminary break up and carrying capacity of the directly affect land is shown in **Table 3**.

Table 3
Agricultural Enterprises within the Project Disturbance Footprint (Direct Impacts)

Enterprise	Area (ha)	Area (%)	DSE/ha	DSE
Arable including irrigation areas	487	51.2	10.0	206
Lower slope grazing only	258	27.1	6.5	71
Hill grazing	44	4.7	3.5	7
Heavily timbered	158	16.6	0.3	1
Non-agricultural use	3	0.3	0	0
Total	950	100.0		285

Using the same method used to estimate the current agricultural productivity of the land within the Project Boundary, it is estimated that the directly impacted portion of the Project disturbance footprint would result in approximately 285 beef breeders to be foregone, which could turn off 237 sale cattle per year plus opportune trading cattle as warranted by seasonal and market conditions. The break up of sale cattle would be:

- 120 steers;
- 63 heifers;
- 3 CFA bulls;

- 20 CFA cows; and
- 31 other culls.

It is noted that to estimate the agricultural production foregone within the Project disturbance footprint, it is assumed that all land is used for EU Trade beef breeding enterprises, the predominant agricultural activity. If land was turned over to production of fodder (Lucerne and cereal hay) or cereal crops for cash sale then there would be a corresponding decrease in the number of breeding cattle and cattle sold.

The quantum of cattle foregone represents approximately 4.8% of the 6,000 breeding cattle and 3.5% of the 6,800 cattle sold from the whole Bylong Valley as estimated by NSW DPI officers.

Further examination of the agricultural productivity foregone (quantum and value) generated by agricultural enterprises within the Project disturbance footprint will be undertaken as part of a detailed AIS, which will be prepared as a component of the Environmental Impact Statement for the Project.

6. MITIGATION AND MANAGEMENT

6.1. STRATEGIC AGRICULTURAL LAND

6.1.1. Biophysical Strategic Agricultural Land

Measures to mitigate and manage the impacts of the Project on BSAL are provided in the Preliminary BSAL Rehabilitation Strategy and the Groundwater Impact Assessment prepared to support the Gateway Application for the Project. However, specific measures from an agricultural perspective for BSAL are provided below.

As provided in the Preliminary BSAL Rehabilitation Strategy, given the predicted nature of underground mining, it is unlikely that subsidence would result in changes to surface microrelief (MSEC, 2012) or significantly alter the chemical or physical composition of the soil profile to the extent that the land and, where applicable, associated agricultural productivity is significantly impacted and cannot proceed without remediation. Upon progressive settlement of each subsided longwall panel, it is expected that the land will be able to retain its pre-mining land capability characteristics and, where applicable, continue current agricultural production. In this regard, the 185.6 ha of BSAL overlying the underground extraction area will be capable of continued use for extensive grazing at the current estimated carrying capacity.

To compensate for the direct and permanent impact of the Project (associated with the open cut mining areas and OEAs) on BSAL, Cockatoo Coal has committed to reinstating an equivalent 194.4 ha of BSAL within the Project Boundary. These reinstated BSAL areas will be contiguous with other BSAL areas to enhance the total agricultural productivity of the non-disturbed areas within the Project Boundary. Soil stripping and handling protocols for BSAL are provided in the Preliminary BSAL Rehabilitation Strategy.

6.1.2. Equine Critical Industry Cluster

As provided in **Section 3.2**, the land and any associated equine enterprise within the Project disturbance footprint, Project Boundary and the broader locality have been verified as not meeting the definition or criteria of the equine CIC. Further **Section 0**, concludes that the Project will not impact on the equine CIC having regard to clause 17(4b) of the Mining SEPP.

In consideration of the aforementioned, no specific mitigation or management measures to avoid or reduce impacts of the Project on the equine CIC are deemed necessary.

6.2. AGRICULTURE WITHIN PROJECT BOUNDARY

6.2.1. Mine Plan

The conceptual Project design was developed in consideration of the agricultural resources within the Project Boundary and other safety, environmental and socio-economic issues. A number of alternatives were investigated:

- Option 1 – Do Nothing
- Option 2 – Underground Only Operation
- Option 3 – Open Cut Operations
- Option 4 – Large Scale Open Cut and Underground Operation
- Option 5 – The current proposed Project

The Project (as proposed) provides an economic mine plan that minimises potential environmental and social impacts whilst maximising coal recovery. This adopted design minimises the extent of impacts on agricultural resources (including soil and water)

within the Project Boundary, as far as practical, without causing significant harm to other environmental aspects.

6.2.2. Land Management

Operational Fencing

Agricultural land situated within the Project disturbance footprint will be progressively removed from production as a result of the Project. Cattle exclusion fencing will be established on the boundaries of operational mining areas in conjunction with the staged mine plans (from commencement of the Project through to Year 10).

Progressive Rehabilitation of Mine Disturbed Lands

KEPCO plans to minimise the time that disturbed areas are removed from agricultural production by progressively rehabilitating disturbed areas as soon as practical. The proposed mine plan sees all land to be rehabilitated for agricultural land use shall be done so by end of Year 10.

As detailed in the Preliminary BSAL Rehabilitation Strategy, the post mining land capability of the rehabilitated Project disturbance footprint will be Class IV. This will provide a post-mining landform capable of grazing enterprises along with some land that is best revegetated with trees and shrubs for erosion control. The post-mining void will not be suitable for any agricultural enterprise.

Agricultural activity and production will return to these areas as soon as practical with due regards for safety of mine workers, farm workers and livestock.

Land Manager

KEPCO is yet to confirm whether the management of its agricultural land shall be carried out internally or by third party. However a dedicated agricultural manager will be appointed to ensure the long term productivity of KEPCO-owned lands

Natural Sequence Farming

Tarwyn Park, which is within the Project Boundary, is the property that the principles of Natural Sequence Farming were first developed and implemented. The current land manager of Tarwyn Park still implements Natural Sequence Farming techniques as part of the property's land management program.

In the event Tarwyn Park is acquired to facilitate the Project, KEPCO will investigate the feasibility of continuing the use of Natural Sequence Farming on the property and other land holdings (held by KEPCO) and incorporating scientific monitoring and evaluation of the ecological and agricultural outcomes.

Sustainable Farming Practices

Sustainable farming practices, including reduced till farming and rotational grazing techniques will be implemented in available areas owned by KEPCO but outside of the Project disturbance footprint.

Weeds and Pests

The presence of weeds, in particularly noxious species, and feral animals in the landscape has the potential to significantly impact on agricultural productivity. Weed and pest management will be a critical component of continued agricultural production within the Project Boundary.

Weeds and pests will be managed through a series of controls, including herbicide application, biological controls, manual weeding and baiting. Regular inspections will be undertaken to identify potential weed and pest infestations. Control programs will be implemented according to industry best management practice for the weed or pest

species of concern and in consultation with the relevant Livestock Health and Pest Authorities. A monitoring and reporting system will be an integral part of this program.

6.2.3. Monitoring and Reporting

Various environmental mitigation and management measures will be established as a component of the Environmental Impact Statement to ensure the Project is operated in a responsible manner. These measures will be detailed in numerous environmental management plans for the Project, which will contribute to minimising and managing predicted impacts on receivers in the locality, including agricultural enterprises.

KEPCO will expand its existing environmental monitoring network within the Project Boundary and in the locality. This network will provide accountable personnel with information required to implement appropriate mitigation and management controls, such as adjustment of operational practices, to avoid or minimise environmental harm on receivers in the locality, including agricultural enterprises.

An Annual Review will be prepared for all operations associated with the Project. This document will summarise company activities and performance in the areas of health, safety, environment and community, including the results of environmental monitoring.

7. CONCLUSION

In consideration of the Gateway process and Mining SEPP, the Project is likely to impact upon the agricultural productivity of BSAL in the short to medium term. There is anticipated to be a negligible reduction in the availability of high quality agricultural land in the long term once the land is rehabilitated utilising the soils from land classified BSAL and other areas are rehabilitated. As such, the agricultural productivity of BSAL within the locality will not be significantly impacted as a result of the Project.

Further, the majority of the equine facilities that have been identified within or in the locality of the Project Boundary do not meet the site verification criteria to be classed as an enterprise of the equine CIC. Only one identified equine enterprise met all the relevant criteria. In consideration of the definition and criteria of a CIC under the SRLUP, this single enterprise does not embody a CIC. As such, it is concluded that the Project will not impact on the equine CIC.

When the impact of the Project is considered more broadly on agriculture within the Project Boundary (beyond the focus of SAL), it will result in approximately 285 beef breeders foregone, which could turn off 237 sale cattle per year plus opportune trading cattle as warranted by seasonal and market conditions. The quantum of cattle foregone represents approximately 4.8% of the 6,000 breeding cattle and 3.5% of the 6,800 cattle sold from the whole Bylong Valley.

Further examination of the agricultural productivity foregone (quantum and value) generated by agricultural enterprises within the Project Boundary will be undertaken as part of a detailed AIS, which will be prepared as a component of the Environmental Impact Statement for the Project.

The mine plan design in conjunction with land management and monitoring measures (as proposed) will ensure the impact of the Project on agriculture, including SAL, is avoided or minimised.

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