



**Planning &  
Environment**

***ENVIRONMENTAL ASSESSMENT:  
Northern Coal Logistics Project  
(SSD-5145)***



Secretary's Environmental Assessment Report  
Section 89E  
*Environmental Planning and Assessment Act 1979*  
August 2015

Cover photograph: Newstan LDP001 Licensed Discharge Point site

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## EXECUTIVE SUMMARY

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Centennial Coal Company Ltd (Centennial) proposes through the Northern Coal Logistics Project to optimise and consolidate the receipt, handling, processing and transport of run-of-mine coal from its underground coal mining operations at Newstan Colliery, Mandalong Mine and Awaba Colliery.

Existing infrastructure at surface sites would be upgraded to provide for processing, handling and transport of larger volumes of coal to both domestic and export markets. This includes providing coal to Eraring and Vales Point power stations and to ports at Newcastle and Port Kembla for export. Surface site infrastructure extends from Newstan Colliery to Mandalong Mine, which are located 25 and 35 kilometres southwest of Newcastle, respectively. The project includes requirements for discharging increasing volumes of mine-water make to local creeks in the Lake Macquarie catchment.

The project has a capital investment value of over \$194 million. It would generate economic benefits for the Lake Macquarie region and the rest of NSW and provide approximately 195 peak construction and 120 operational jobs. The employment generation would support the broader economy by an increase in demand for additional goods and services.

The project is State significant development under section 89C of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it is development for the purpose of mining related works that has a capital investment value of more than \$30 million, as specified in clause 5(1)(c) of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*.

The Environmental Impact Statement for the project was publicly exhibited from mid October to mid November 2014. The Department received 228 submissions, including ten from public authorities, 31 from special interest groups and 187 from the general public. Of the public submissions, 180 supported the project and six objected, with one providing comments.

Centennial's formal Response to Submissions addressed issues raised in agency and public submissions. The Department provided this document to the ten agencies that provided submissions and invited further comments. Subsequent agency comments were then provided to Centennial, which responded to all outstanding issues in its Response to RTS Submissions Report.

The Department has completed its assessment of the merits of the project, including consideration of all potential environmental, social and economic impacts and the relevant requirements of the EP&A Act. The Department considers that the project is a logical extension to support the expansion of mining operations at Newstan and Mandalong. The project would make use of existing infrastructure and facilitate the continued supply of coal for domestic power generation and for export, bringing significant economic benefits to the State and region.

The development would provide for direct economic benefits to the Lake Macquarie region and revenue to the State, as well as creating jobs and flow on benefits for employment and local businesses. These benefits should be given appropriate weight in assessing the overall merits of the project.

The Department considers that the key issues relating to the project are:

- surface water quality associated with minewater discharges and potential impacts on downstream aquatic ecology; and
- air quality impacts, particularly in the area surrounding the Newstan surface facilities.

Local creeks and water bodies, including LT Creek, Stony Creek and Muddy Lake, are currently subject to relatively high volumes of water discharges resulting from mine-water make in existing underground workings. The Environment Protection Authority (EPA) has ongoing concerns over the water quality of these discharges and resulting ecotoxicological impacts. It is seeking to regulate pollutant loadings through current and proposed environment protection licences (EPLs). Given that the EPLs remain under review, the Department considers that impacts on water quality can be best managed through conditions of consent that require compliance with section 120 of the *Protection of Environment Operations Act* and development of site-specific in-stream water quality and aquatic ecology (macroinvertebrate health and ecotoxicity assessment) objectives in consultation with the EPA. The Department is satisfied that hydrological impacts from increased water discharges, such as erosion would be minimal.

Potential impacts from dust can be mitigated, through appropriate responses to coal processing, handling and transport operations as coal transport by rail continues to increase. Centennial has committed to

continue ongoing monitoring of dust levels and ensuring that dust criteria are met. In order to ensure air quality impacts remain below relevant criteria the Department proposes that Centennial be required to construct and utilise an automated coal recovery and trainloading system prior to 5.5 million tonnes per annum of coal being railed from the Newstan site.

Proposed clearing of 7.29 hectares of native vegetation would have some impacts on threatened flora species. Mitigation measures proposed by Centennial include translocation of 341 clumps of Black-eyed Susan (*Tetradlea juncea*). Centennial has committed to ensuring that the offset is established for this clearing and the Department is satisfied that an appropriate offset would be developed, in consultation with OEH.

The Department is satisfied that the project would result in acceptable noise impacts, provided that recommended mitigation measures, including those associated with the new coal processing plant, are implemented. A condition is being recommended to require noise attenuation measures for this plant.

The Department has carefully considered all potential environmental, social and economic impacts of the project in accordance with the relevant requirements of the EP&A Act. The Department has carefully weighed the key areas of concern and is satisfied that the impacts, particularly on water quality can be managed. Consequently, the Department believes the project should be approved subject to the recommended conditions of consent.

# 1. BACKGROUND

## 1.1 Existing Mining Operations

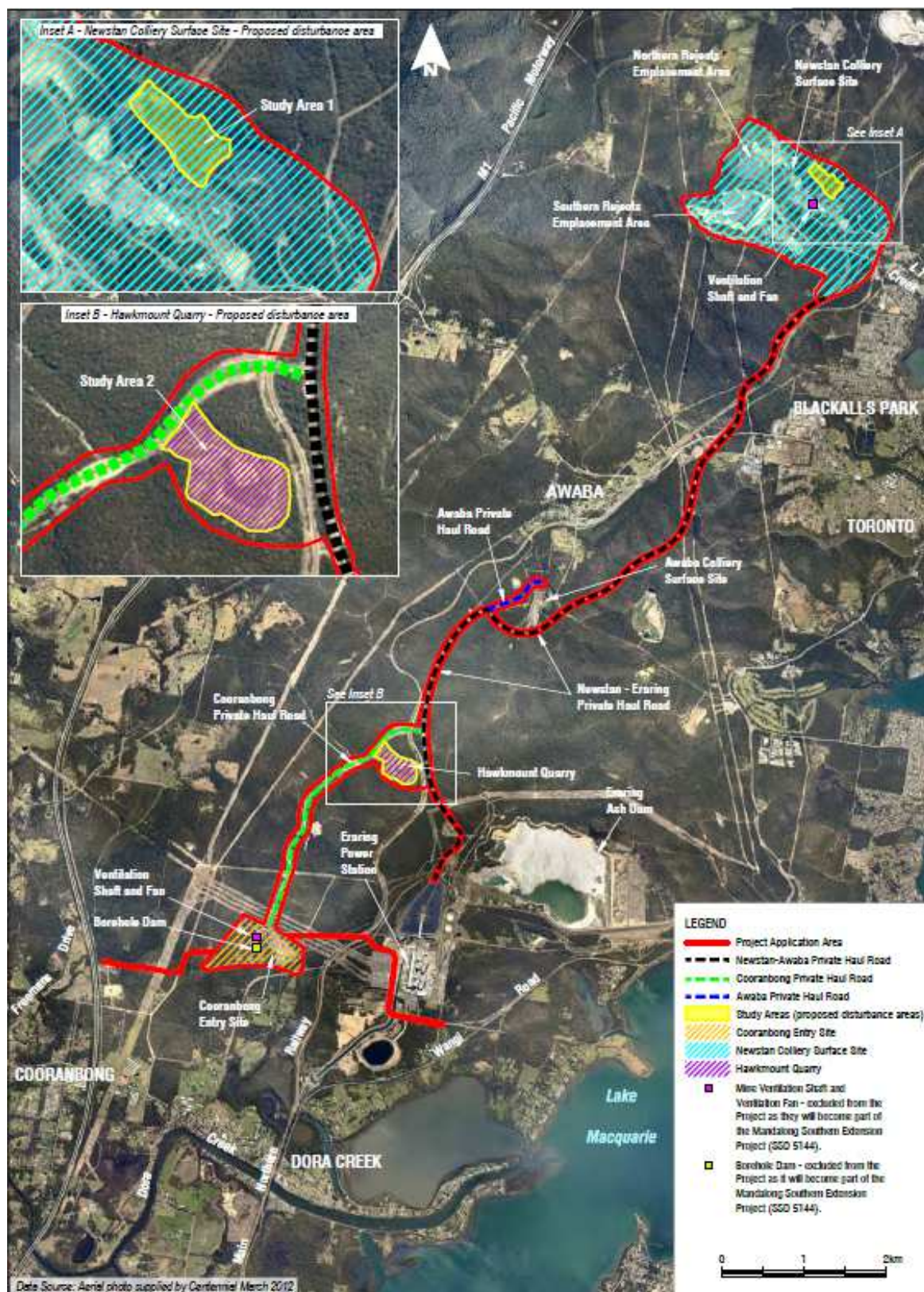
Centennial Coal Company Ltd (Centennial), through its subsidiary companies, owns and operates the existing Newstan Colliery (Newstan), Mandalong Mine (Mandalong) and Awaba Colliery (Awaba), which are underground coal mines located west of Lake Macquarie, within the Newcastle Coalfield (see **Figures 1 and 2**). The mines are all within the Lake Macquarie local government area.



**Figure 1: Regional location**

Newstan is located approximately 25 kilometres (km) southwest of Newcastle. The mine commenced operations in 1887 and continued to mine coal under continuing use rights until 1999. On 14 May 1999, the then Minister for Urban Affairs and Planning granted development consent (DA 73-11-98) for the Newstan Life Extension Area Project under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The approval has undergone six modifications, enabling mining within existing areas as well as in new mining areas. Newstan's surface facilities, including buildings, coal handling infrastructure, mine access, mine ventilation fans and a water management system, are located at the Newstan Colliery Surface Site (NCSS) at Fassifern.





**Figure 2: Proposal area and existing mining operations**

At Newstan, up to 4 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal is extracted using longwall and bord-and-pillar mining methods. ROM coal, as well as coal received from Mandalong and Awaba, is processed and dispatched for sale in domestic and export markets. Newstan employs a maximum of 320 full-time persons at full production (including 75 employees engaged at NCSS in coal handling, processing and transport) and operates 24 hours per day, 7 days per week. Mine life is approved up to 6 July 2020.

Mandalong is located approximately 35 km southwest of Newcastle. The mine was previously known as Cooranbong Colliery Extension, which was approved in 1998 by the then Minister for Urban Affairs and Planning (DA97/800) following a Commission of Inquiry. The approval has undergone ten modifications. Centennial purchased the mine in 2002 and commenced longwall mining in 2005, following construction of the Mandalong Mine Access Site (MMAS) and decline tunnel. The MMAS encompasses underground workings and associated surface infrastructure near Morisset. The Cooranbong Entry Site (CES) also forms part of Mandalong Mine and encompasses a coal delivery system and surface infrastructure for coal handling and processing near Dora Creek. The existing consent for Mandalong allows the extraction of up to 6 Mtpa of ROM coal until 2019. Mining takes place using longwall and bord-and-pillar mining methods. Mandalong employs 305 full-time employees at full production (including 14 employees at the CES) and operates 24 hours per day, 7 days per week. Mine life is approved up to 14 October 2019. CES processes and despatches up to 4 Mtpa of product coal to NCSS.

Mandalong also connects to the Delta Entry Site, incorporating a conveyor portal and coal delivery system near Wyee which enables a portion of Mandalong's coal to be delivered to Vales Point Power Station. Centennial does not own the infrastructure at Delta Entry Site, or control the site's activities except for the delivery of coal via its underground conveyor to the Wyee Coal Unloader at the surface (regulated under DA 35-2-2004 and referred to as the Delta Link Project). Receipt of coal at the surface and onward delivery are regulated under a separate consent held by Delta Electricity.

Awaba is located approximately 5.5 km southwest of Toronto. Awaba began operating in 1947. Extraction operations ceased in early 2012 as the available coal at the approved depth had been mined. Current operations at Awaba include ongoing mine-water management and stockpiling of ROM coal and stone material from former mining operations. The mine primarily operated under its mining lease and continuing use rights. However, following legislative changes in 2005, the Planning Assessment Commission (PAC) granted project approval (MP 10\_0038) on 13 May 2011 under the former Part 3A of the EP&A Act, to enable the mining operations at Awaba to continue past December 2011. The Awaba Colliery Mining Project allowed for continued operation of the mine to 31 December 2015, expanded the extraction area and allowed maximum production of 880,000 tpa of ROM coal.

The Northern Coal Logistics Project seeks to optimise and consolidate the surface receipt, handling, processing and transport logistics for all coal at Newstan, Mandalong and Awaba. As well as seeking to consolidate these operations, Centennial is seeking to expand its coal processing and transporting capacity from 4 to 8 Mtpa, with respect to processing facilities at NCSS.

## 2. PROPOSED DEVELOPMENT

### 2.1 Description

The Northern Coal Logistics Project (NCL Project) proposes to optimise and consolidate all coal receipt, processing and transport functions for Centennial's Newcastle Coalfield projects. In general terms, the project is a continuation of existing surface activities associated with surface operations at Newstan, NCSS, Mandalong and CES. The project would optimise the operation of existing surface infrastructure, including coal processing, private haul roads, rail loading and delivery infrastructure and equipment. As part of the project, Centennial seeks to increase the volume of water discharged at LDPs at NCSS and CES, as well as to install additional LDPs at NCSS and Hawkmount Quarry.

Key components of the NCL Project are summarised in **Table 1** and a project overview is shown in **Figure 3**. **Table 2** shows the relationships between approved developments and the NCL Project. The project is described in detail in its Environmental Impact Statement (EIS), attached as **Appendix A**.

**Table 1: Northern Coal Logistics Project - Proposal Summary**

| Aspect                                | Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coal Receipt, Handling and Processing | <ul style="list-style-type: none"> <li>Continued use and upgrade of existing coal preparation and handling infrastructure at NCSS to enable receipt, handling and processing of up to 8 Mtpa of ROM coal sourced from Newstan (up to 4.5 Mtpa), Awaba (up to 0.88 Mtpa) and Mandalong (up to 6 Mtpa). This includes use of the existing CPP and Coal Handling Plant (CHP) and installation of a new CPP and new CHP infrastructure, including an automated train loading facility.</li> <li>Continued use and upgrading of the CES coal processing facility to enable receipt and handling of up to 6 Mtpa of ROM coal from Mandalong Mine.</li> </ul> |
| Coal Stockpiling                      | <ul style="list-style-type: none"> <li>Continued use of existing stockpiles, except two 50,000 tonne product stockpiles proposed to be removed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | <ul style="list-style-type: none"> <li>Extension of Newstan's existing 80,000 tonne ROM coal stockpile to 150,000 tonnes.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Coal Transport</b>                     | <ul style="list-style-type: none"> <li>Increasing the tonnage of coal able to be transported to: <ul style="list-style-type: none"> <li>up to 6 Mtpa from CES to NCSS via existing private haul roads;</li> <li>up to 6 Mtpa from CES to Eraring Power Station via the overland conveyor;</li> <li>up to 4.5 Mtpa from NCSS to Eraring Power Station via Newstan Eraring Private Haul Road;</li> <li>up to 8 Mtpa from NCSS to the Port of Newcastle, Port Kembla and/or Vales Point Power Station by rail; and</li> <li>up to 6 Mtpa from Mandalong to Delta Entry Site via the existing underground conveyor system.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Coal Rejects and Tailings Handling</b> | Transporting coal rejects from NCSS via private haul roads to Newstan Northern Rejects Emplacement Area (NREA) and Southern Rejects Emplacement Area (SREA) and/or the Hawkmount Quarry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mine-water Management</b>              | <ul style="list-style-type: none"> <li>Increasing the volumetric limits for water discharges at licensed discharge points (LDPs) at: <ul style="list-style-type: none"> <li>NCSS, from 11 Megalitres/day (ML/day) to 14.5 ML/day at Newstan LDP001;</li> <li>CES, from 5 ML/day to 8 ML/day at Cooranbong LDP001; and</li> <li>Hawkmount Quarry, via a new LDP, for up to 3 ML/day during construction.</li> </ul> </li> <li>Upgrading the water management system at NCSS to include: <ul style="list-style-type: none"> <li>pipework an additional 300 metres (m) of LT Creek between the Main By-Wash Dam and the rail loading facility;</li> <li>decommissioning the existing Rail Loop Dams and commissioning three new sedimentation dams to manage dirty water runoff; and</li> <li>installing new belt filter presses, to reduce water use in the CPPs and the volume of water discharged to the Main Tailings Dam.</li> </ul> </li> <li>Continued operation of the CES water management system.</li> </ul> |
| <b>Employment</b>                         | Employing up to 120 full-time staff (106 employees at NCSS and 14 employees at CES).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Hours of Operation</b>                 | Operating 24 hours per day, seven days per week.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

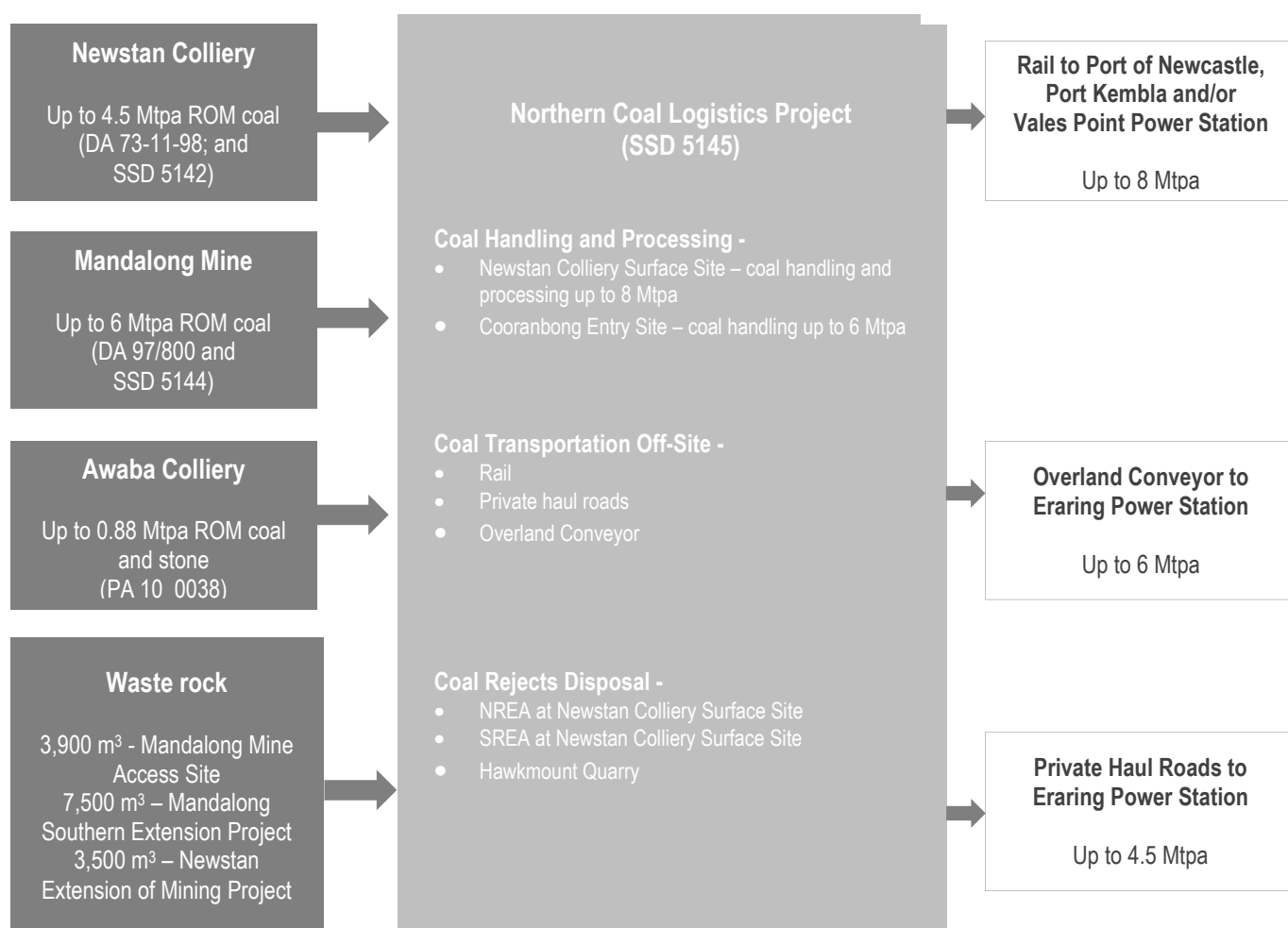


Figure 3: Proposal overview



### 3. STRATEGIC CONTEXT

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#### 3.1 Surrounding Environment

The NCL Project is located in the central part of Newcastle Coalfield, surrounded by varying topography and landforms, including the Watagan Mountains to the west. The topography within and around the development area generally consists of rolling hills, with short side slopes and several closely spaced drainage lines. The main creek systems that traverse the project area are LT creek, Dora Creek, Jigadee Creek, Palmers Creek, Stony Creek, Lords Creek and Stockyard Creek, as well as numerous unnamed creeks and tributaries.

Land immediately surrounding the project area is predominately undeveloped, containing medium to dense native vegetation. A number of residences are located in close proximity to the site. The nearest privately-owned residence is located approximately 300 m from NCSS, on Miller Road in the Wakefield rural-residential area. Nine residences in Dora Creek are located within 1 km of CES. Table 3 of the EIS identifies these and all other sensitive receptors relatively close to the project site.

The nearest towns of Fassifern and Blackalls Park are located approximately 1 km from NCSS and 1 km from the Newstan-Awaba Private Haul Road, respectively. Fassifern Public School is located immediately east of NCSS, on the northern outskirts of Fassifern. The main township of Dora Creek is approximately 2 km to the south of CES. Toronto is located approximately 1 km east of the Newstan-Eraring Private Haul Road and Awaba is 1 km north of that road and 500 m north of the Awaba Private Haul Road.

Awaba, NCSS and CES are three of a number of industrial premises in the area. The Main Northern Railway Line travels on a north-south alignment, immediately east of NCSS and approximately 360 m east of CES. It passes through Hawkmount Quarry and adjacent to private haul roads. The M1 Pacific Motorway is located approximately 2 km west of NCSS and 1.8 km west of CES. Other industrial areas include Teralba Quarry, located approximately 1.6 km northeast of NCSS, Eraring Power Station, and several overhead power transmission lines which traverse the project area and surrounds. Bat Alley, a disused mine tunnel, is located within the NCSS area.

The closest natural features to the project area include Sugarloaf State Conservation Area, located approximately 500 m west of NCSS and 1 km west of the Newstan-Eraring Private Haul Road. Awaba State Forest is located approximately 4 km west of NCSS and 1.5 km west of Awaba Private Haul Road. Lake Macquarie, which is used for recreational activities, is situated approximately 800 m to the southeast of NCSS and 2 km from CES.

#### 3.2 Economic Benefits

NSW's major coal resources are located within the Sydney-Gunnedah Basin, which comprises five major coalfields, one of which is the Newcastle Coalfield. Access to coal for supply to domestic energy markets has been a major contributor to the economic development of NSW. Centennial has over 1,800 employees and is one of the largest underground coal producers in NSW, supplying thermal and coking coal to domestic and export markets and fuelling approximately 40% of the State's coal-fired electricity. It has growing export capability, with approximately 40% of Centennial's coal being exported via the Port of Newcastle or Port Kembla. Newstan, Mandalong and Awaba have the potential to cumulatively produce up to 11.38 Mtpa of ROM coal, which Centennial states is approximately 50% of its annual ROM coal production. Newstan and Mandalong are proposed to continue production for up to 30 years and 25 years, respectively.

The project would generate economic benefits for Lake Macquarie and the rest of NSW, with a direct capital investment of over \$194 million and approximately 195 peak construction and 120 operational jobs. The employment generation would support the broader economy by increasing demand for additional goods and services.

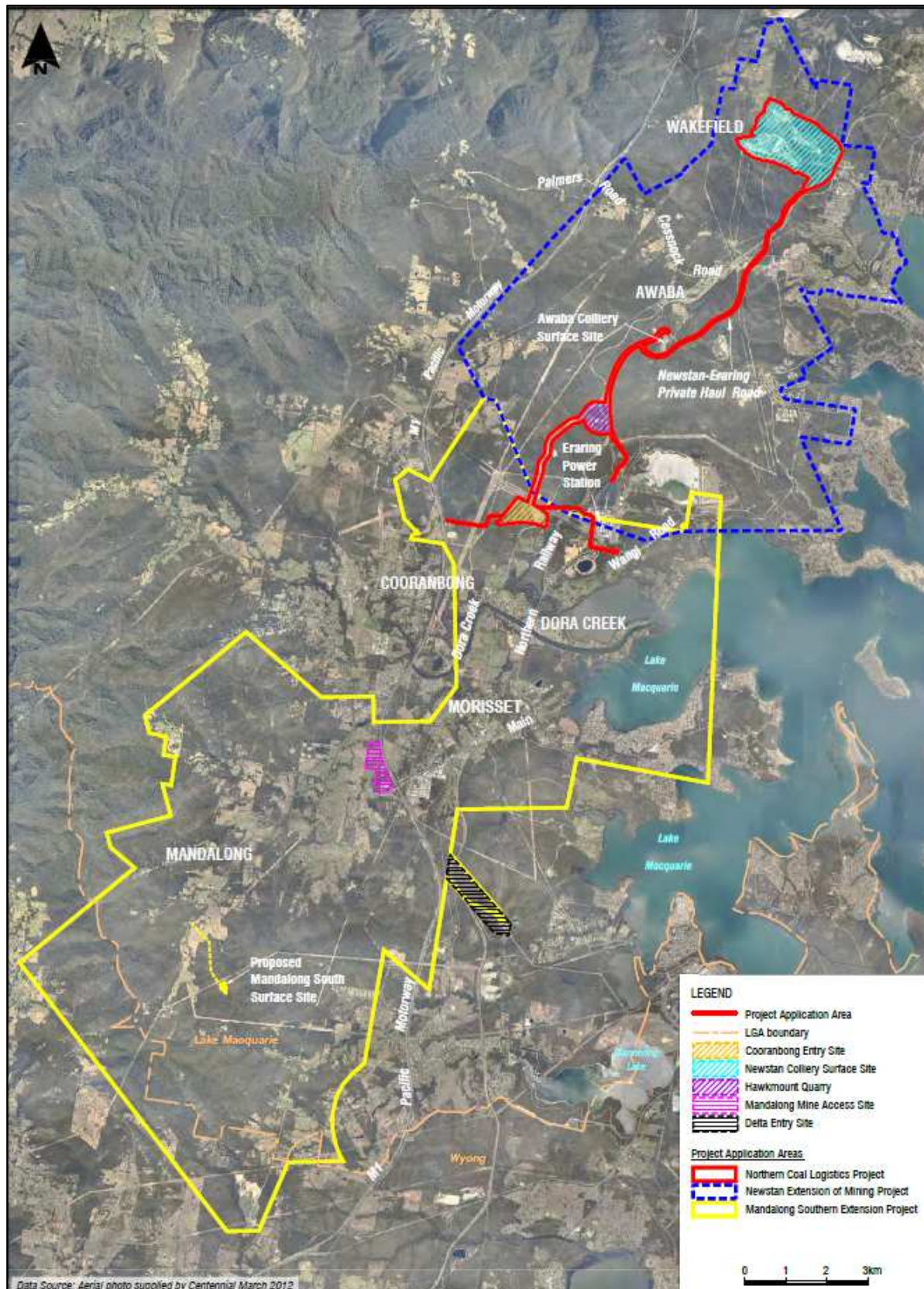
In addition to direct economic benefits, the project would provide ongoing revenue to the Commonwealth and State governments through taxes, and to local government through rates, over the approximate 30-year life of the development. The EIS's economic assessment estimates that the total contribution to all Government revenues is \$26.9 million.

**Table 2: Comparison of existing, approved and proposed operations**

| Site          | Northern Coal Logistics Project (NCL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mandalong Southern Extension Project (as relevant for NCL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Newstan Extension of Mining Project (as relevant for NCL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Newstan Colliery (Existing and Approved)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mandalong Mine (Existing and Approved)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mandalong/CES | <ul style="list-style-type: none"> <li>Receipt and handling of up to 6 Mtpa of ROM coal from Mandalong;</li> <li>maintenance of existing stockpiles;</li> <li>CES excluding mine ventilation shafts and fans, and the Borehole Dam upgrade;</li> <li>increase of up to 6 Mtpa of coal transported from CES to NCSS, using existing private haul roads;</li> <li>increased coal transported from CES to Eraring Power Station, using existing dedicated overland conveyor, from 4 Mtpa to up to 6 Mtpa;</li> <li>receipt of 0.5 Mtpa of coal middlings (lower quality coal product) at CES from NCSS; and</li> <li>receipt and emplacement of coal reject at Hawkmount Quarry and a LDP for water discharge;</li> <li>14 FTE personnel;</li> <li>operations 24 hours a day, seven days per week; and</li> <li>30 year mine life.</li> </ul>                                                                                                                             | <ul style="list-style-type: none"> <li>All currently approved operations, facilities and infrastructure of Mandalong, except operations, management and rehabilitation of CES and Hawkmount Quarry;</li> <li>modifications to existing facilities and infrastructure;</li> <li>expansion of underground mining into Mandalong Southern Extension Area (MSEA);</li> <li>mine ventilation shaft and ventilation fan; and</li> <li>Borehole Dam upgrade to 1.5 ML (increased settling capacity and residence time).</li> </ul> | <ul style="list-style-type: none"> <li>N/A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>N/A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>Up to 6 Mtpa of ROM coal extraction from within Area 1 and Area 2;</li> <li>Mandalong Mine Access Site and two surface ventilation fans;</li> <li>CES and a surface ventilation fan;</li> <li>transport of ROM coal via underground drift conveyor to CES, at a rate of up to 4 Mtpa;</li> <li>CES CHP (not yet constructed);</li> <li>up to 4 Mtpa of coal transported from CES to Eraring Power Station by the dedicated overland conveyor;</li> <li>up to 4 Mtpa of coal transported from CES to NCSS via private haul roads for processing and transport into domestic and export markets;</li> <li>up to 0.5 Mtpa of middlings back-hauled from NCSS via private haul roads to CES for subsequent supply to the Eraring Power Station via dedicated overland conveyor;</li> <li>Coarse rejects from CES transported via private haul road to Hawkmount Quarry for emplacement; and</li> <li>Tailings from CES pumped in disused underground workings at Mandalong.</li> </ul> |
| Newstan/NCSS  | <ul style="list-style-type: none"> <li>Upgrade of CPP to process up to 8 Mtpa ROM coal;</li> <li>receipt, handling and processing of up to 4.5 Mtpa from Newstan, up to 0.88 Mtpa from Awaba and up to 6 Mtpa from Mandalong via CES;</li> <li>increased coal transported from NCSS to Eraring Power Station, via private haul roads, from 2 Mtpa to up to 4.5 Mtpa;</li> <li>increased coal transported from NCSS rail loading facilities for export and/or to Vales Point Power Station from 3 Mtpa to up to 8 Mtpa;</li> <li>operations, management and rehabilitation of NCSS;</li> <li>transport of coal reject to Hawkmount Quarry via Cooranbong Private Haul Road and to NREA and SREA at NCSS;</li> <li>increased volume of water discharged via LDPs and new LDPs at NCSS and Hawkmount Quarry;</li> <li>receipt of waste rock from Mandalong; and</li> <li>excluding underground mining and operation of the mine ventilation system at Newstan.</li> </ul> | <ul style="list-style-type: none"> <li>N/A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>All currently approved operations, facilities and infrastructure of Newstan, except existing infrastructure and operations at NCSS and disposal of reject material;</li> <li>expansion and continuation of mining for 25 years, followed by rehabilitation;</li> <li>modification to existing facilities and infrastructure, and construction and operation of new facilities and infrastructure required to support the project, including at Awaba; and</li> <li>mine ventilation shafts and ventilation fans.</li> </ul> | <ul style="list-style-type: none"> <li>Up to 4 Mtpa of ROM coal extraction;</li> <li>receipt of up to 4 Mtpa of coal from Newstan, Awaba and Mandalong;</li> <li>transport of ROM coal via underground conveyor to NCSS, at a rate of 3.5 Mtpa;</li> <li>transport of ROM coal from CES via private haul roads to NCSS, at a rate of up to 4 Mtpa;</li> <li>transport of up to 0.88 Mtpa coal and/or stone material from Awaba via private haul roads to NCSS;</li> <li>transport of up to 2 Mtpa of coal to Eraring Power Station via private haul road;</li> <li>transport of up to 3 Mtpa of coal by rail to the Port of Newcastle and/or Port Kembla for export, and /or to Vales Point Power Station;</li> <li>transport of up to 0.5 Mtpa of middlings via private haul roads to CES for supply to Eraring Power Station;</li> <li>NCSS and two surface ventilation fans;</li> <li>Awaba Colliery Surface Site &amp; surface ventilation fans;</li> <li>CPP and CHP, each with approved capacity of 4 Mtpa;</li> <li>up to eight trains per day;</li> <li>management systems in place for clean, dirty and mine-water, CWP and Stony Creek Pipeline;</li> <li>approval to pipe two sections of the north arm of LT Creek through NCSS;</li> <li>coarse rejects transported to SREA and NREA;</li> <li>fine rejects pumped from underground workings and/or the tailings dams at NREA and/or SREA;</li> <li>up to 0.88 Mtpa of stone material from Awaba via private haul roads to NCSS for rehabilitation or emplacement; and</li> <li>up to 7,800 tpa of stone material from CES transported via private haul roads to NCSS.</li> </ul> | <ul style="list-style-type: none"> <li>N/A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### 3.3 Relationship to Centennial's other Newcastle Coalfield Projects

The NCL Project stems from Centennial's long-term development strategy in Newcastle Coalfield to provide infrastructure and the flexibility required to meet future opportunities in both domestic and export coal markets. Centennial has lodged separate SSD applications for its proposed Mandalong Southern Extension Project and Newstan Extension of Mining Project (see **Figure 4**).



**Figure 4:** Centennial's Interrelated Projects – Long Term Strategy

The Mandalong Southern Extension Project involves consolidating existing operations and associated infrastructure at Mandalong and extending mining operations at up to 6.0 Mtpa of ROM coal for another 25 years (see **Table 2**). This application is presently with the PAC for determination. Operation, management and rehabilitation of CES and Hawkmount Quarry are proposed under the NCL Project.

The Newstan Extension of Mining Project involves extending existing operations to enable extraction of up to 4.5 Mtpa of ROM coal. That proposal also seeks continued use of existing approved infrastructure. This application has been lodged with the Department, although no environmental impact statement (EIS) has been finalised and Centennial has recently placed this project 'on hold'. Continued use of existing infrastructure and operations at NCSS, including disposal of rejects and tailings material, transport of coal and other material from Awaba, is proposed under the NCL Project.

The three applications together reflect Centennial's long-term strategy for its operations in the Newcastle Coalfield (see **Figure 4**). The NCL Project is seeking to consolidate coal handling, processing and transport logistics for Mandalong, Awaba and Newstan. Consolidation of these operations would maximise use of existing surface infrastructure and provide flexibility to supply varying quantities of coal to domestic and export markets. The existing surface facilities of NCSS, CES, Hawkmount Quarry and private haul roads are key components of the on-going handling, processing and transport of coal to domestic and export markets.

Most of the current development consents would need to be surrendered following consent for the NCL Project. However, the Department considers that DA 73-11-98 needs to stay in place in order to provide for continuing underground mining activities and associated activities at Newstan. This consent would, in time, be replaced by a new consent for the Newstan Extension of Mining Project.

## 4. STATUTORY CONTEXT

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### 4.1 State Significant Development

The development is State significant development under section 89C of the EP&A Act as it is development for the purpose of mining related works (including primary processing plants or facilities for storage, loading or transporting any mineral, ore or waste material) that has a capital investment value of more than \$30 million, as specified in clause 5(1)(c) of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*.

As the affected Council did not raise an objection to the application, no political disclosure statement has been made regarding the application and the Department has received less than 25 public objections, the Executive Director Resource Assessments & Compliance may determine the development application under the Minister's delegation dated 16 February 2015.

### 4.2 Permissibility

The NCL Project site is within the Lake Macquarie Local Government Area. Whilst the *Lake Macquarie Local Environmental Plan 2014* (Lake Macquarie LEP 2014) was in force at the time of the Department's assessment, the application (and accompanying EIS) was lodged prior to that instrument's commencement. Clause 1.8A of the Lake Macquarie LEP 2014 requires that, if a development application was made and not determined before that instrument commenced, then the application must be determined under the preceding Lake Macquarie LEP 2004.

The site is subject to various zonings under the Lake Macquarie LEP 2004, as outlined in **Table 3** below. Whilst the development is permissible with consent on land zoned 1(1) Rural Production, 4(1) Industrial (Core) and 9 Natural Resources, it is prohibited within the other land use zones listed in the table.

Notwithstanding the provisions of the Lake Macquarie LEP 2004, sub-clause 7(1)(a) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* states that development for the purposes of underground mining and facilities for the processing or transportation of minerals (if the minerals were mined from that land or adjoining land) may be carried out on any land with development consent. As the project is for the purpose of underground mining and the processing and transportation of minerals mined within the site, it is permissible with consent.



**Table 3: Land Use Zones under Lake Macquarie LEP 2004**

| <b>Development Area</b> | <b>Land Use Zoning</b>                                                                                                                                                                                                                                                               |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NCSS                    | <ul style="list-style-type: none"> <li>• 1(1) Rural (Production)</li> <li>• 4(1) Industrial (Core)</li> <li>• 5 Infrastructure</li> <li>• 6(1) Open Space</li> <li>• 7(2) Conservation (Secondary)</li> <li>• 7(3) Environmental (General)</li> <li>• 9 Natural Resources</li> </ul> |
| CES                     | <ul style="list-style-type: none"> <li>• 4(1) Industrial (Core)</li> <li>• 7(2) Conservation (Secondary)</li> <li>• 9 Natural Resources</li> </ul>                                                                                                                                   |
| Hawkmount Quarry        | <ul style="list-style-type: none"> <li>• 5 Infrastructure</li> <li>• 9 Natural Resources</li> </ul>                                                                                                                                                                                  |
| Private Haul Road       | <ul style="list-style-type: none"> <li>• 4(1) Industrial (Core)</li> <li>• 4(2) Industrial (General)</li> <li>• 5 Infrastructure</li> <li>• 6(1) Open Space</li> <li>• 7(2) Conservation (Secondary)</li> <li>• 9 Natural Resources</li> </ul>                                       |

### 4.3 Integrated and Other State Approvals

Under section 89J of the EP&A Act, a number of other approvals have been integrated into the Part 4 approval process and are not required to be separately obtained for the development. These include:

- heritage related approvals under the *Heritage Act 1977* and *National Parks and Wildlife Act 1974*; and
- particular water-related approvals under the *Water Management Act 2000*.

Under section 89K of the EP&A Act, several further approvals are required to be obtained, but must be approved in a manner that is consistent with any development consent. These include:

- a mining lease under the *Mining Act 1992*;
- an environment protection licence under the *Protection of the Environment Operations Act 1997*; and
- a consent under the *Roads Act 1993*.

The Department has consulted with the relevant public authorities responsible for these other approvals (see Section 5) and has considered the issues relating to these approvals in its assessment of the development (see Section 6). None of the relevant authorities objected to the development being approved, subject to the imposition of suitable conditions.

### 4.4 Commonwealth Approval

The project was referred to the Commonwealth Department of the Environment, which declared that it is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) because it could have a significant impact on threatened species and communities. As such, the NCL Project requires approval from the Commonwealth Minister for the Environment.

The Commonwealth has determined that the development would be assessed by preliminary documentation, in which case the assessment will be based on the referral information and any other relevant material identified by the Commonwealth as being necessary to assess the proposal. This means the Commonwealth and State assessment processes will be separate. A separate assessment of the project and a separate decision on its merits will therefore be made by the Commonwealth.

### 4.5 Requirements of the EP&A Act

#### Objects

Decisions made under EP&A Act must have regard to the objects of the Act, as set out in Section 5 of the Act. The objects of most relevance to the development are found in section 5(a)(i),(ii),(vi)&(vii), as these form key areas of assessment and are of particular relevance to the determination of the application. These are:

(a) to encourage:

- (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,

- (ii) *the promotion and co-ordination of the orderly and economic use and development of land,*
- (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- (vii) *ecologically sustainable development.*

The Department is satisfied that the development encourages the proper use of resources (Object 5(a)(i)) and promotes the orderly and economic use of land (Object 5(a)(ii)). The encouragement of environmental protection (Object 5(a)(vi)) is considered under Section 6 of this report. Based on its consideration of the potential environmental impacts of the development, the Department is satisfied that such impacts can be adequately mitigated, managed and/or offset to an acceptable level of environmental standard.

The Department has carefully considered the encouragement of ecologically sustainable development (ESD) (Object 5(a)(vii)) in its assessment of the development application. The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991*, as follows:

*"ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:*

- (a) the precautionary principle;*
- (b) inter-generational equity;*
- (c) conservation of biological diversity and ecological integrity; and*
- (d) improved valuation, pricing and incentive mechanisms."*

The Department has considered each of these principles and programs in its assessment. The Department's assessment of the ecological impacts of the project (see Section 6) is based on a conservative assessment of the likely ecological impacts and the likely offset requirements. This assessment ensures that appropriate and adequate measures would be put in place to prevent the threats of serious or irreversible environmental damage and is consistent with the precautionary principle and the principle of conservation of biological diversity and ecological integrity.

The Department considers that the development's potential key environmental impacts can be adequately minimised and/or mitigated and the residual impacts can be managed to an acceptable level (see Section 6). The development also has social and economic benefits on a State and Commonwealth level (see Section 3). It considers that the development would be ecologically sustainable in the context of these principles.

The Department's assessment has sought to integrate all significant environmental, social and economic considerations in preparing a recommendation to the consent authority. The costs and benefits of the project have been carefully considered as part of the assessment, including the valuation of environmental impacts. Centennial would bear the cost of implementing the necessary management plans to comply with the Department's recommended conditions of consent over the life of the project. Centennial is also required, and has committed to, rehabilitating the surface facilities and reject emplacement areas (REAs) following cessation of mining operations.

In addition to this, the government agency and community consultation undertaken as part of the assessment process (see Section 5 of this report) addresses the objects in section 5(b)&(c) of the EP&A Act.

#### *Significant effect on threatened species, populations or ecological communities, or their habitats*

In deciding whether there is likely to be a significant effect on threatened species, populations, endangered ecological communities, or their habitats, the consent authority is required to take into consideration:

- the factors listed in section 5A(2) of the EP&A Act (the 7 part test); and
- any assessment guidelines issued and in force under the *Threatened Species Conservation Act 1995* (TSC Act) or *Fisheries Management Act 1994*.

The Department has considered the 7 part tests which have been presented in the EIS and the *Threatened Species Assessment Guidelines* (DECC 2007) in deciding whether there is likely to be a significant effect on threatened species, populations, ecological communities, or their habitats. This consideration has informed the Department's assessment of impacts to threatened species, populations and ecological communities and their habitats which is presented in Section 6 of this report.

#### *Matters for consideration under section 79C*

The consent authority, in determining a development application is required to take into account the matters for consideration listed in section 79C of the EP&A Act as are relevant to the development. These matters

have been considered throughout the Department's assessment report, in particular the provisions of any environmental planning instruments or proposed instruments, including exhibited draft EPIs and development control plans (see below and also **Appendix B**), the likely impacts of the development (Section 6), the suitability of the site (Sections 3, 4 and 6), submissions (Section 5 and 6) and the public interest (considered through the entire assessment, but summarised in Section 8). The Department has also noted Centennial's consideration of these instruments in its EIS (see **Appendix A**).

The key instruments relevant to the development include:

- Lake Macquarie LEP 2004 (see Section 4.2 above);
- *SEPP (State and Regional Development) 2011*;
- *SEPP (Mining, Petroleum Production and Extractive Industries) 2007*;
- *SEPP (Infrastructure) 2007*;
- *SEPP No. 55 – Remediation of Land*;
- *SEPP No. 44 – Koala Habitat Protection*;
- *SEPP No. 33 – Hazardous and Offensive Development*; and
- *SEPP No. 14 – Coastal Wetlands*.

The Department has also undertaken its assessment of the project in accordance with all relevant matters prescribed by the *Environmental Planning and Assessment Regulation 2000*.

## 5. CONSULTATION

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### 5.1 Description of Consultation Process

Under section 89F of the EP&A Act, the EIS is required to be publicly exhibited for at least 30 days. After accepting the EIS, the Department:

- publicly exhibited the EIS for 32 days, from 17 October until 17 November 2014 at the:
  - Department's Information Centre in Sydney;
  - Lake Macquarie City Council (LMCC) offices;
  - Centennial's NCL project office at Fassifern;
  - Nature Conservation Council offices; and
  - Department's website;
- notified relevant State and Commonwealth government authorities and LMCC by email;
- notified relevant electricity supply and transmission and road authorities, in accordance with the *SEPP Infrastructure (2007)*; and
- advertised the exhibition in the *Sydney Morning Herald* and *The Daily Telegraph* on 22 October 2014, and in the *Lakes Mail* on 16 and 30 October 2014.

### 5.2 Submissions

The Department received 228 submissions on the development, including:

- 10 from public authorities;
- 31 from special interest groups; and
- 187 from individuals.

The public authorities raised several assessment matters for the Department's consideration (with none objecting or supporting the project). Of the 187 individuals, six objected, 180 supported and one provided comments. Of the special interest groups, three objected, 24 supported and four provided comments. A full copy of these submissions is attached in **Appendix C**.

### 5.3 Response to Submissions

Centennial provided a formal Response to Submissions (RTS) on 16 February 2015 (see **Appendix D**). The Department forwarded the RTS to all public authorities that had previously lodged submissions for their review and further comment, as necessary. Six public authorities provided a response to the RTS and these responses can be found in **Appendix E** of this report.

On 14 April 2015, Centennial submitted a further response to the additional comments provided by public authorities, titled Response to RTS Submissions Report (see **Appendix F**). A copy of the Response to RTS Submissions Report was provided to those public authorities that had provided comments on the RTS.

The Department also separately requested copies of reports on the *Tetratheca juncea* translocation trials at Mandalong and Newstan referred to in the RTS, as well as additional information in relation to the proposed *T. juncea* research program. This information was provided by Centennial on 12 March 2015.

#### **5.4 Discussion of Key Issues raised by Agencies and Centennial's Responses**

**Department of Primary Industries (NSW Office of Water (NOW))** noted that the proposed capture and reuse of clean surface water runoff is limited to intermittent extraction at NCSS from the Main By-Wash Dam. NOW stated that this extraction is to be conducted in accordance with the site's water access licence and the requirements of the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources*. The RTS stated that extraction would continue to be in accordance with the licence and the Water Sharing Plan.

NOW was generally satisfied with Centennial's water management and mitigation measures. However, it requested that Centennial investigate design options for mitigation and rehabilitation of potential impacts on channel morphology due to the increased surface water discharges. NOW also asked that the review's outcomes are included in a site Water Management Plan.

**Department of Primary Industries (Crown Lands)** stated concerns in relation to the management of the large portion of Crown land within the project area and requested that Centennial directly consult with it. The matters raised included access management, illegal dumping of material, acquisition process for significantly affected Crown land, Aboriginal land claims and Native Title and the need to rationalise existing Crown land tenures. The RTS clarified that the project is within both privately-owned freehold and land owned by the State, with all surface infrastructure to be within existing mining leases held by Centennial's subsidiaries and that no new mining leases would be required for the project. Centennial would consult with Crown Lands and LMCC regarding the use of land at Hawkmount Quarry, which it holds under a permissive occupancy.

In its review of the RTS, the Department of Primary Industries had no further comments on the project, or comments on the RTS.

**NSW Resources & Energy (DRE), part of NSW Trade & Investment**, recommended conditions in relation to rehabilitation of the site, stating that it must be undertaken to DRE's satisfaction and be substantially consistent with the Rehabilitation Objectives outlined in the EIS and Centennial's accompanying Statement of Commitments (SoC). DRE also stated that Centennial should undertake progressive rehabilitation of the site as soon as reasonably practicable and prepare a Rehabilitation Plan prior to carrying out any of the surface disturbing activities, to its satisfaction. The RTS stated that all rehabilitation at the site would be to DRE's satisfaction and all surface disturbing activities would be undertaken in a manner that minimises dust as is reasonably practicable.

**The Environment Protection Authority (EPA)** raised a number of matters in relation to water quality, air quality and noise. EPA advised that Centennial would need to apply for a variation of its existing environment protection licences (EPLs) in relation to increased pollutants proposed to be discharged in waste water. The RTS acknowledged that the project would need new or revised EPLs that would include both existing and proposed LDPs.

EPA also advised that, given the lack of appropriate mixing models and pollutant modelling, as well as assessment of the impact of metal loads to receiving waters, it would only be able to undertake an EPL variation for the development if Centennial treats proposed waste water discharges with a Reverse Osmosis (RO) plant in order to remove salt and dissolved metals, so as to achieve ANZECC Guidelines water quality objectives for fresh and marine waters. Centennial in its RTS stated that, while it had considered the use of RO, it would be at a high cost with low benefit for water quality.

EPA advised that the EIS did not identify rail transport as potentially impacting the environment and recommended that Centennial's air quality assessment be amended to reflect this. EPA also stated that the measures proposed in the EIS to address likely exceedances of air quality criteria for PM<sub>10</sub> at NCSS once operations reach 6 Mtpa, should be implemented once 5 Mtpa of ROM coal is exceeded. Centennial's Response to RTS Submissions Report stated that dust management practices would continue to be implemented. These measures would enable Centennial to meet the relevant PM<sub>10</sub> criteria.

EPA questioned Centennial's use of 2010 air quality data as a base year, given that this year had significantly lower dust concentrations than other years and less frequent incidence of stable conditions. The RTS did not provide an adequate explanation for using this baseline data, in EPA's view.



EPA's submission on the EIS, as well as its response to the RTS, recommended conditions on water treatment, water discharges, dust management and air quality monitoring. These issues are discussed in Sections 6.1 and 6.3.

EPA found Centennial's noise assessment to be inadequate, as it did not consider Project Specific Noise Levels (PSNLs) in accordance with the *NSW Industrial Noise Policy*. EPA further considered that an assessment of acceptability of impacts against the correct PSNLs needs to be provided. Noise impacts are considered in detail in Section 6.5.

**Transport for NSW (TfNSW)** stated that Centennial's traffic impact assessment was not adequate, particularly in relation to the prediction of rail traffic generated by the development and the assessment of potential impacts of the project's rail traffic on the rail network and railway crossings.

The RTS provided additional information on likely train movements and acknowledged that additional train paths would be required. Centennial would consult with the relevant rail network stakeholders to access those additional paths, consistent with the rail access priority system. In its response to the RTS, TfNSW advised it had no further comments.

**Roads and Maritime Services (RMS)** considered that Centennial's traffic impact assessment did not assess the potential impacts of traffic volumes at the Wangi Road/Dora Street intersection near CES nor the Main Road/Macquarie Road intersection near NCSS. RMS requested a revised traffic impact assessment. The RTS noted that these intersections would only be used by heavy vehicles during the construction stage and that a Construction Traffic Management Plan would be prepared. Subsequently, RMS stated that it has no objections to the project, subject to the preparation of a Construction Traffic Management Plan.

Rail transport and road traffic impacts are considered fully in Section 6.6.

**Office of Environment and Heritage (OEH)** found that the EIS did not adequately address issues in relation to flooding risks, such as impacts on the safety of residents downstream of NCSS and CES, and impacts on threatened biodiversity, including the provision of appropriate biodiversity offsets.

The RTS stated that while the project would have increases to daily water discharges, there are no significant changes in factors that would influence hydraulic operation of creeks such that properties may be subject to an increased risk of flooding. The RTS also noted that an emergency flood response plan would be developed in consultation with stakeholders. Hydrological impacts are considered in Section 6.2.

The RTS provided additional information on biodiversity impacts, including the amount of native vegetation to be cleared and clarified mitigation and offset measures proposed.

OEH subsequently stated that issues it had previously raised in relation to biodiversity impacts were not adequately addressed in the RTS, and that these should be covered in the assessment process. These issues include proposed mitigation measures in relation to downstream impacts from altered flow regimes and the biodiversity value of wetlands in the Hawkmount Quarry site. OEH considered that Centennial's proposed offsets were not adequate. Biodiversity impacts are considered in detail in Section 6.4.

**Hunter New England Population Health (Health)** was generally satisfied with the conditions associated with the existing operations but noted the potential for air quality impacts at the NC6 and NC2 receptor sites. Health stated that it would be important to ensure that the proposed mitigation measures are implemented.

**LMCC** raised a number of matters in relation to the surrendering of development consents, impacts on waterways and water quality, property management and the need for a rail impact study. LMCC was concerned that environmental controls are retained in spite of any surrender of consent (see Section 3.3).

LMCC stated that there have been significant exceedances of licence conditions for water discharges at Newstan LDP0002. LMCC further noted that it is aware of concerns in the local community regarding the need for dredging of LT Creek to address the historic impacts of mining activities from Newstan. LMCC sought clarification on whether Centennial would be providing contributions to dredging as part of the NCL proposal.

The RTS noted that a number of projects across NCSS have been implemented over time to improve the management of water and the quality of water discharged from the site, including installation of a clean water diversion drain at SREA and a Clean Water Plant to treat water prior to discharge from NCSS. The RTS stated that while existing management measures would continue to be implemented, no additional management actions are proposed to improve the stream health along LT Creek (see Section 6.2).

LMCC also raised the issue of cumulative impacts of coal projects on the existing rail network. The RTS advised that this was a regional issue to be dealt with in consultation with rail network providers.

**Ausgrid** noted that the private road network and the conveyor to Earing Power Station could impact on existing Ausgrid overhead power line assets, in respect to access for maintenance. Ausgrid also noted that it would require continued access to the substation site at CES, as under existing arrangements. Ausgrid would continue to work with Centennial to ensure the site electricity requirements are addressed.

The RTS stated that Centennial would consult with Ausgrid regarding the assessment of safety and access to its assets and any impacts arising from infrastructure upgrades, throughout the life of the project.

## 5.5 Special Interest Group Submissions

The key matters or concerns raised in submissions from special interest groups are summarised below.

### *Air quality*

- increase in coal dust, including total suspended particulates, PM<sub>10</sub> and PM<sub>2.5</sub>;
- increase from 28 to 32 truck movements per hour, equating to an extra 96 truck movements over a 24 hour period;
- cumulative increase in the effects of air pollution, including from greenhouse gas emissions;
- use of the private haul road and rail haulage would increase fine particulate matter in the atmosphere of the Lower Hunter;
- need for additional sensitive receptor modelling and monitoring of air quality at Awaba, Blackalls Park, Fassifern, Fennell Bay, Toronto and Woodrising, and reporting of findings of these studies to the Newstan Community Consultative Committee (CCC) and LMCC;
- fugitive fine coal dust emissions from uncovered coal rail wagons from transporting 8 Mtpa for the next thirty years and the consequent need to cover all coal rail wagons;
- risk of coal dust impacts from rail loading and transportation on the suburban communities of Lake Macquarie, Newcastle, the Sydney Metropolitan Area and communities to the south to Port Kembla;
- limited research being undertaken to assess the fraction of PM<sub>2.5</sub> from a wide range of sources and availability of this data, as well as concerns over using eight year old data to calculate the emission rates for PM<sub>2.5</sub> and the need to research PM<sub>2.5</sub> and its health effects on the population;
- the EPA's independently monitored air quality sites at Newcastle, Wallsend and Beresfield are too distant from the project to properly reflect local background and impacts; and
- air quality impacts associated with emission products of combustion from vehicle engines.

### *Biodiversity*

- offsets in the Awaba Conservation Area for the conservation and protection of biological diversity and ecological integrity;
- inadequacy of bat survey effort, including the 30 m buffer around Bat Alley; and
- research projects to be undertaken at Jigadee Estate, given it is known to have significant biodiversity and a number of threatened species including Black-eyed Susan (*T. juncea*).

### *Climate Change*

- expansion of Mandalong and Newstan would contribute to climate change and global warming; and
- increased tonnage of coal exports would increase consumption of fossil fuels overseas, leading to increased global emissions of CO<sub>2</sub> and further global warming.

### *Consultation*

- improved reporting to the Newstan CCC, LT Creek Sustainable Neighbourhood Group, LMCC and OEH on progress and findings in regards to:
  - o the nesting box program;
  - o the Black-eyed Susan translocation research project; and
  - o development and implementation of the research project investigating genetic patterns among and within populations of Black-eyed Susan.

### *Economic*

- potential reduced demand for electricity sourced from coal fired power stations such as Earing and the overall demands for coal from Mandalong and Newstan;
- improved uptake of renewable forms of energy in Australia and globally to reduce the total demand for coal and the need to continue and expand coal production at the proposed sites;

- increased uptake of renewable sources of energy by home owners and businesses who are responding to climate change;
- weakening of global demand for coal; and
- potential for switch from dirty fossil fuels to clean renewable sources of energy such as solar and wind.

#### *Infrastructure*

- requirement in the existing Newstan consent to remain for the train loading system to be automated when export exceeds 3 Mtpa; and
- high dust readings at Fassifern Public School and need to advance this automation schedule.

#### *Social*

- Fennell Bay not included in the EIS's Social Impact Assessment (SIA); and
- SIA failed to acknowledge in its summary of air quality modelling that NC6 and Fassifern Public School may have exceedances of PM<sub>10</sub> under some scenarios.

#### *Traffic and train movements*

- the Traffic Impact Assessment (TIA) did not adequately address impacts on users of the Private Haul Road or potential external effects such as additional noise, additional light pollution during hours of darkness and interactions with local subsidence areas;
- potential need to increase the number of locomotives and wagons to haul the additional 5 Mtpa; and
- impacts of increased coal loading rate on air quality and greenhouse gas emissions on the residents of west Lake Macquarie.

#### *Other*

- need for a cumulative noise assessment of increased truck movements on private haul roads impacting local receptors; and
- visual assessment did not address additional or cumulative impacts of light pollution from haul trucks.

### **5.6 General Public Submissions**

The six objections from individual submitters were based on the following issues:

- potentially significant air quality (particularly dust) impacts;
- loss of habitat, including hollow-bearing trees and the cumulative effects on local biodiversity;
- inadequate survey of Bat Alley;
- indicated past breaches and environmental incidents in relation to existing operations;
- lack of transparency in meetings held with the local community;
- potential increased risk of mine subsidence;
- likely water quality impacts and lack of adequate pollution controls;
- lack of economic justification;
- potential bushfire and hazard risks;
- uncertainty in the extent of actual remediation that can be achieved;
- potential amenity impacts from rail noise;
- increased risks of climate change; and
- risk of not being able to source employment locally.

The 180 individual submissions in support of the project were based on the following issues:

- employment opportunities and support to local businesses;
- the benefits to be realised as a result of increased local spending;
- the environmental performance of the existing operations and benefits to the local community;
- use of private haul roads and rail to transport coal in order that local road networks are safer;
- long history of mining in the local area and multigenerational employment history amongst families; and
- support for a flexible approach to mining operations across Centennial's Newcastle Coalfield mines.

One individual submission did not raise any adversarial issues and merely provided comments on:

- principles of ecologically sustainable development and social impacts on Fennell Bay and Toronto; and
- recommended management measures for air quality and biodiversity impacts to be implemented.

## 6. ASSESSMENT

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In its assessment of the merits of the project the Department has considered:

- Centennial's EIS, all agency and public submissions, Centennial's RTS and additional information since provided; and
- all relevant provisions of the EP&A Act.

The Department considers that the key issues relating to the project are:

- surface water quality associated with mine-water discharges and potential impacts on downstream aquatic ecology; and
- air quality impacts, particularly in the area surrounding NCSS.

### 6.1 Surface Water Quality

Water quality can be affected by pollutants discharged into a waterway which can have impacts on ecological health. Metals and salts in mine-water discharges are potential pollutants in sufficient concentrations and/or volume loading.

Water management systems at CES and NCSS separate clean and dirty water, in order to manage impacts on water quality. Clean water typically consists of runoff from undisturbed catchment areas and impervious areas such as sealed roads and car parks and is diverted to local creeks. Dirty water consists of runoff from disturbed areas, likely to contain coal, oils, grease and hydrocarbons, including workshop and fuel storage areas; as well as mine-water make. The WIA addressed the water quality issues associated with surface water management and proposed water discharges from the site (see **Table 7**).

#### Water quality impact assessment

The EIS's Water Impact Assessment (WIA) included an assessment of existing water quality downstream of NCSS, Hawkmount Quarry and CES to establish baseline water quality for receiving waters, in accordance with the assessment framework and methodologies outlined in the ANZECC Guidelines.

Water quality datasets are available for the project area for the 3-year period from 2011 to 2013. Centennial has derived Site Specific Trigger Values (SSTVs) for each of LT Creek, Stony Creek and the unnamed tributary of Muddy Lake, based on a review of ANZECC Guidelines' Default Trigger Values, hardness correction factors and water quality observed from monitoring at reference sites. The SSTVs cover a range of variables including pH, total suspended solids, electrical conductivity (EC), nitrogen, phosphorus and a range of metals.

EPA notes in its submission that insufficient documentation of assumptions and methods is provided in the WIA in relation to derivation of Centennial's SSTVs and proposed EPL concentration limits. SSTVs are considered to be very high compared to ANZECC default guidelines. EPA also considers that it's unclear if derived SSTVs have taken into account the increased loads and concentration of pollutants that would occur as a result of the increased daily volumetric discharges at Newstan and Cooranbong or whether derivation is in response to EPA requirements for current discharges and licensing conditions. EPA's submission also notes that proposed bicarbonate SSTVs appear to have been exceeded on numerous occasions at both Newstan and Cooranbong LDPs. In its response to the RTS, EPA noted further that the derivation of SSTVs for EC is flawed and not consistent with ANZECC guidelines, given that appropriate reference site information has not been used. The derivation of SSTVs for mercury, selenium, arsenic, nitrogen and phosphorus is also considered to be inconsistent with ANZECC guidelines.

EPA concluded in its submission that the discussion in the EIA of options for water treatment and any options for mitigating discharge impacts from the discharge of waste water is poor. EPA further concluded that the EIS has not demonstrated that the project would adequately mitigate and manage increased pollutant loads. Centennial provided additional information in the RTS in relation to pollutant loads of metals that may be generated, with an analysis based on 50<sup>th</sup> percentile pollutant concentrations. EPA assumes the loads are for the life of the project rather than annual loads but notes that there is little information about these figures. EPA needs to understand the impacts of the worst case scenario as concentration limits and volumetric limits are set as maxima under the EPL, ie 100<sup>th</sup> percentiles and not as averages. These loads have only been reported and not included in any environmental impact assessment or modelling of the fate of these loads on the receiving environment. Furthermore, Centennial has not addressed how impacts would be mitigated. Comparisons of 50<sup>th</sup> and 100<sup>th</sup> percentile concentrations of key water quality variables monitored at Newstan and Cooranbong LDPs are presented in the following sections with respect to individual sites.

- **Newstan Colliery Surface Site**

EPL 395 sets pollutant concentration limits for Newstan. The EPL was varied in October 2012 to include a pollution reduction program (PRP) for the assessment of potential impacts of metals in water discharges and an ecotoxicology monitoring program for LT Creek. A Clean Water Plant (CWP) was commissioned in March 2014, as part of the PRP. The CWP has capacity to treat 14.5 ML/day and employs coagulation, flocculation, sedimentation, filtration and ultra-violet treatment to reduce concentrations of total suspended solids (TSS) and total (unfiltered) metals before water is discharged to LT Creek via LDP001. Sediment removed from the CWP is transferred to the Main Tailings Dam. EPL 395 was revised in December 2014 following consideration of monitoring data since the previous revision. This 2<sup>nd</sup> revision further lowered permissible limits for EC, TSS, bicarbonate alkalinity, nitrogen and a range of metals. The Department notes that Centennial is currently contesting the revised EPL in the Land and Environment Court.

EPA completed a five year review of water quality, ecotoxicology, sediment and macroinvertebrate monitoring and the commissioning of the CWP. EPA notes in its submission that the CWP reports do not demonstrate that the CWP has any capacity to reduce the pollutants present in waste water, as dissolved metals or salinity. The WIA's statistical summaries of existing discharge water quality, following treatment in the CWP, show large exceedances above EPL limits for EC, nitrogen and phosphorus.

The WIA includes summaries of water quality monitoring results compared to EPL limits for Newstan LDP001, discharging to LT Creek; and Newstan LDP017, discharging to Stony Creek; as shown in **Tables 4 and 5**.

**Table 4: Water quality monitoring results for Newstan LDP001**

| Parameter                   | Median    | Maximum       | EPL 395 limit |
|-----------------------------|-----------|---------------|---------------|
| pH                          | 7.8       | 8.5           | 6.5-6.8       |
| TSS (mg/L)                  | 5         | <b>94</b>     | 50            |
| EC (µS/cm)                  | 2,330     | <b>14,500</b> | 3,250         |
| Total nitrogen (mg/L)       | 0.2       | <b>52.7</b>   | 2.7           |
| Total phosphorus (mg/L)     | 0.01      | <b>0.68</b>   | 0.41          |
| Sulphate ions (mg/L)        | 168       | <b>386</b>    | 232           |
| Total potassium ions (mg/L) | <b>13</b> | <b>18</b>     | 6             |
| Dissolved cadmium (mg/L)    | 0.0001    | <b>0.0637</b> | 0.0004        |
| Dissolved copper (mg/L)     | 0.001     | <b>0.693</b>  | 0.007         |
| Dissolved zinc (mg/L)       | 0.005     | <b>0.335</b>  | 0.04          |

\*Values shown in bold italics indicate exceedances of EPL limit.

**Table 5: Water quality monitoring results for Newstan LDP017**

| Parameter                   | Median     | Maximum     | EPL 395 limit |
|-----------------------------|------------|-------------|---------------|
| pH                          | 7.6        | 8.0         | 6.5-6.8       |
| TSS (mg/L)                  | 6          | <b>688</b>  | 50            |
| EC (µS/cm)                  | 1,515      | 2,590       | 3,250         |
| Total nitrogen (mg/L)       | 0.4        | <b>146</b>  | 2.7           |
| Total phosphorus (mg/L)     | 0.02       | <b>17.5</b> | 0.41          |
| Sulphate ions (mg/L)        | <b>325</b> | <b>370</b>  | 232           |
| Total magnesium ions (mg/L) | <b>19</b>  | <b>31</b>   | 16            |
| Total potassium ions (mg/L) | 5          | <b>16</b>   | 6             |
| Dissolved aluminium (mg/L)  | 0.06       | <b>3.15</b> | 0.22          |

\*Values shown in bold italics indicate exceedances of EPL limit.

The Department notes that the maximum recorded EC for LDP001 is 14,500 µS/cm, very much higher than the current EPL limit of 3,250 µS/cm and intended limit of 3,000 µS/cm. Results of water quality monitoring for LDP017 show large exceedances above EPL limits for TSS, total nitrogen and phosphorus, sulphate, magnesium, potassium and aluminium. The Department also notes that there is no indication provided in the EIS or RTS as to how Centennial's proposed SSTVs can be achieved, other than through treatment of discharges in the CWP.

Wherever possible, ambient water quality should not be allowed to degrade to the levels prescribed by the NSW Water Quality Objectives. However, it is accepted practice to apply the concept of a *mixing zone*, an explicitly defined area around an effluent discharge where the management goals of ambient waters do not need to be achieved and certain environmental values are not protected. Effective discharge controls that consider both concentration and total mass of contaminants, combined with *in situ* dilution and waste treatment, should ensure that the mixing zone is limited in area and the values of the waterbody as a whole are not jeopardised.



The Main By-Wash Dam is the mixing zone for water discharged via Newstan LDP001. The Department notes that a mixing zone model has not been developed for the proposed increased discharges from Newstan. Centennial claims that the mixing zone for the increased discharges would remain within the extent of the Main By-Wash Dam. However, there are no data in the EIS to support this assertion. EPA also notes that there is no discussion of the impact on the mixing zone of extracting up to 9.5 ML/day from this dam. The EPA noted further, in its response to the RTS that Centennial has not demonstrated that SSTVs can be met at the edge of the mixing zone in the Main By-Wash Dam.

- *Cooranbong Entry Site*

EPL 365 sets pollutant concentration limits for Mandalong with respect to oil and grease, pH and TSS, but there are no specific limits for EC or other pollutants. A summary of water quality monitoring results for Cooranbong LDP001, compared to EPL 365 limits is shown in **Table 6**.

**Table 6: Water quality monitoring results for Cooranbong LDP001**

| Parameter                   | Median         | Maximum         | EPL 365 limit |
|-----------------------------|----------------|-----------------|---------------|
| pH                          | 8.0            | <b>8.9</b>      | 6.5-8.5       |
| TSS (mg/L)                  | 5              | <b>244</b>      | 50            |
| EC (µS/cm)                  | <b>(4,130)</b> | <b>(41,100)</b> | ns            |
| Dissolved cadmium (mg/L)    | 0.0001         | <b>(0.0007)</b> | ns            |
| Dissolved cobalt (mg/L)     | <b>(0.006)</b> | <b>(0.016)</b>  | ns            |
| Dissolved molybdenum (mg/L) | 0.022          | <b>(0.062)</b>  | ns            |
| Dissolved nickel (mg/L)     | <b>(0.056)</b> | <b>(0.108)</b>  | ns            |

\*Values shown in bold italics indicate exceedances of EPL 365 limit (or equivalent EPL 395 in bracket).

\*\*ns = non-specified pollutant limit. Note that, whilst there are no EPL limits for specific pollutants discharged, the licence does not authorise the pollution of waters by any pollutant other than those specified.

Very large EC values have been recorded in discharges from Cooranbong LDP001, with a median of 4,130 µS/cm and maximum of 41,100 µS/cm. Centennial's proposed SSTV for EC discharges is 2,200 µS/cm, being the ANZECC Guidelines Default Trigger Value. Monitored EC levels in discharges already far exceed the proposed SSTV at Cooranbong, as well as the EPL limit for Newstan. Salt loading is expected to increase four-fold by 2035.

Maximum concentrations of 244 mg/L TSS also far exceed the current EPL concentration limit and proposed SSTV of 50 mg/L. Centennial proposes to mitigate pollutant concentrations in discharges through flocculation and increasing residence time in storages prior to discharge. The Department notes that there is no modelling of the extent to which the proposed treatment measures would reduce pollutant concentrations or loading, making it difficult to assess the extent of expected environmental benefits on receiving waters.

The ecotoxicology study of the EIS recommended that the extent of the mixing zone downstream of Cooranbong LDP001 be defined, where catchment runoff mixes with mine-water discharged to the unnamed tributary of Muddy Lake. The ecotoxicology study estimated that a dilution of 1:6.25 is required to provide ecosystem protection at a 95% species protection level, for average discharges of 1.6 ML/day. Results show that the target dilution factor is not met under average annual rainfall conditions and that the mixing zone is predicted to extend downstream. EPA notes in its submission that the proposed 2 km mixing zone is inconsistent with ANZECC guidelines and that the mixing zone model, being based on a discharge of 1.6 ML/day, needs to be reviewed in order to reflect the proposed maximum increase in discharge to 8 ML/day. The EPA noted further, in its response to the RTS that Centennial has not provided the mixing zone model for the unnamed tributary of Muddy Lake or demonstrated that SSTVs can be met at the edge of the mixing zone.

- *Hawkmount Quarry*

The WIA reports that water in Lords Creek catchment is generally slightly acidic to slightly alkaline and fresh, although underground water from Awaba Colliery workings that discharged previously into Lord's Creek has raised EC levels. SSTVs have not been previously derived for discharges to Lords Creek. For the purposes of the WIA, proposed SSTVs were derived from data for monitoring stations located in an adjacent catchment to Lords Creek and upstream of potential impacts from CES discharges. Centennial advises that SSTVs would be derived for Lords Creek following approval for the Project. The Department considers that until then, it is unable to assess the appropriateness of SSTVs.

There are potential impacts on water quality from pollutants contained in runoff from the proposed REA which would be operated similarly to the SREA at NCSS. The WIA notes that the most likely source of water quality degradation would be increased concentrations of TSS for which exceedances of proposed SSTVs have already been recorded. As observed in the assessment of water quality data monitored historically from the SREA, predominant water quality parameters in runoff were increased concentrations of filterable aluminium, iron, copper, lead and zinc. EPL limits and other conditions are yet to be set for Hawkmount Quarry discharge

point. However, the Department notes from water quality monitoring results reported in the WIA that values of 136 mg/L TSS and 1.175 mg/L dissolved aluminium considerably exceed the current EPL 395 limits, by way of comparison (see **Table 4** above). The Department notes further that TSS concentrations may be reduced with the operation of the Sediment Dam and use of flocculants. However, no assessment of the extent to which reductions in TSS could be achieved, using these treatment methods has been provided in the WIA or subsequent information. Further, no treatment methods for the reduction in metal concentrations, such as aluminium, have been proposed.

#### Aquatic ecology impact assessment

A number of aquatic ecology and ecotoxicity investigations were undertaken at NCSS from 2011-2014 to assess impacts of mine-water discharges on aquatic ecosystems. The EIS reported that there has been an improvement in macroinvertebrate community health in LT Creek over time. It also stated that macroinvertebrate studies conducted in the unnamed tributary of Muddy Lake in 2012 and 2013 showed an improvement in water quality within sites, as well as increased taxa richness in Muddy Lake.

Centennial's RTS included an Aquatic Monitoring and Ecotoxicology Assessment Summary Report, which included ecotoxicity tests undertaken in accordance with the Newstan EPL and also a revised CWP Ecotoxicology Assessment.

In its response to the RTS, EPA considered that this additional data failed to provide evidence that proposed additional water discharges would not have a detrimental impact on the environment. EPA indicated that it would need to undertake a further assessment of the impact of discharges on ecotoxicology of freshwater cladoceran (water flea) and eastern rainbow fish. EPA previously noted in its comments on the EIS that a 2014 OEH draft report identified the northern section of Lake Macquarie as sensitive in relation to flushing times and pollutant loading, resulting in a diminished ability to assimilate toxicants.

EPA also noted that the updated report includes 'reference sites' for macroinvertebrate monitoring undertaken for LT Creek, Stony Creek and the unnamed tributary of Muddy Lake not present in the EIS. EPA considers that in most cases, these reference sites are also impacted by nutrients, suspended sediments and metals do not provide reliable data on which to determine appropriate SSTVs. The Department agrees with the EPA that the choice of reference sites is important for accurately comparing impacted sites and determining if an impact has occurred. As a result, it is difficult to conclude that there is no effect of discharge on macroinvertebrate health and that increasing discharge would not have a detrimental effect.

EPA notes that post-hatch survival toxicity test results for the eastern rainbow fish are not provided and that it would need to review these results, to ascertain any chronic toxicity to the current discharge. In its Response to RTS Submissions Report, Centennial notes that the results of the ecotoxicity testing show that the treated discharge from the CWP is not acutely or chronically toxic to test species and meets EPL requirements. No additional information was provided by Centennial, subsequent to the RTS.

The Department notes that the current NCSS EPL requires a Macroinvertebrate and Ecotoxicological Monitoring Program, including macroinvertebrate monitoring to be undertaken twice annually at several locations downstream of the LT Creek and Stony Creek LDPs. There is also a requirement for ecotoxicology assessments to be undertaken three times within the first six months of licence issue and then twice annually.

EPA also noted that no data are presented in the EIS for the ecotoxicology component of the most recent aquatic assessment and ecotoxicity testing undertaken at CES in 2014. Centennial confirmed that only one ecotoxicology assessment has been conducted on the discharge from Cooranbong LDP001, which occurred in September 2012 and that results of this assessment are discussed in the RTS's Aquatic Monitoring and Ecotoxicology Assessment Summary Report. The results of ecotoxicity testing show that the discharge was not acutely toxic to test species but (slight) chronic toxicity was observed in fish and cladoceran species. Chronic toxicity was observed for both cladoceran reproduction and rainbow fish post-hatch survival.

The ecotoxicology assessment concluded that slight chronic toxicity of test species was possibly due to elevated dissolved nickel concentration or high EC. Statistical summaries of water quality at Cooranbong LDP001 show a nickel concentration which is in excess of 4 times the Newstan EPL's concentration limit, by comparison. As previously discussed, the recorded EC maximum at Cooranbong LDP001 is very high, being ten times greater than the indicative limit for Newstan EPL. The Department notes that there are currently no requirements for ecotoxicology assessments under Mandalong EPL.

The Department concludes that there are some outstanding concerns with macroinvertebrate assessments and ecotoxicity testing results for NCSS and CES for both current and potential impacts of mine-water discharges. Water quality data for discharges appear to indicate that bicarbonate concentrations of 973 mg/L

and/or dissolved metals such as nickel are likely to be significant drivers in observed toxicity effects on organisms. The Department recommends a condition requiring development of site-specific in-stream water quality and aquatic ecology (macroinvertebrate health and ecotoxicity assessment) objectives, to the satisfaction of EPA. This condition gives discretion to EPA to require these objectives to be set across sites.

#### EPA position regarding Reverse Osmosis

EPA notes that heavy rainfall events result in overflows from a number of water treatment devices at NCSS and CES directly into receiving waters. These overflows have not been characterised in the EIS nor the impacts of these pollutant loads assessed in relation to acute or chronic effects on downstream environments. Receiving waters are poorly mixed and it is likely that contaminants may accumulate within these environments, including Muddy Lake and Fennell Bay.

EPA has recommended a condition of approval that any increase in volume of groundwater discharged from either NCSS or CES above current EPL volumetric limits must be treated with a reverse osmosis (RO) plant or an equivalent level of treatment that treats water such that it removes salinity (salts) and total and dissolved metals to achieve ANZECC Guidelines for fresh and marine waters.

EPA proposes a staged program over the next ten years to treat all dewatered and discharged groundwaters, in order to reduce salinity and metal loading and enable rehabilitation of the receiving waters and environment during the lifetime of the mine. This should be undertaken regardless of when or if current EPL volumetric discharges are exceeded.

Centennial considers that the use of RO is a high cost, low benefit solution due to:

- receiving environments of NCSS and CES having adapted over time to the typical water quality of discharges, such that RO permeate would significantly alter the chemistry of discharge water, in particular the ionic balance;
- likely hardness of intake water causing scaling and fouling of RO membranes;
- installation of an RO plant requiring strong understanding of technical complexity and challenges and capital and operating costs; and
- existing water hardness (ie presence of calcium and magnesium) having potential to ameliorate metal toxicity which would not occur if these chemicals are removed by RO.

EPA considers that the philosophy of continuing historical pollution to avoid change is contrary to the ANZECC Guidelines and NSW Government policy. The Department supports this view. EPA also notes that there are many third party agreements in NSW whereby water treatment plants are operated very successfully on behalf of clients. Regarding the issue of low ionic strength RO permeate, EPA advises that it can be diluted with surface waters if required, prior to discharge. EPA determined that there are no potential benefits of water hardness (attributable to calcium and magnesium) in reducing metal toxicity, as the RO plant would remove the dissolved metals along with bicarbonate and hence remove overall toxicities. Removal of calcium and magnesium is unlikely to have any negative impact on the environment.

#### Conclusion

A number of EPA concerns regarding the content of Centennial's EIS, RTS and Response to RTS Submissions Report remain outstanding. These concerns cover adequacy of data for predicted pollutant concentrations, loadings and compliance with existing EPLs; appropriate reference sites; derivation of SSTVs and appropriate EPL limits; functioning of mixing zones; potential environmental impacts; and effectiveness of mitigation methods such as water treatment.

The Department considers that opportunities to reduce the volume of discharges and pollutant loading over the life of the proposed operations are limited. The Department disputes Centennial's view, that with receiving waters having adapted to higher salinity environments, there is justification for maintaining current conditions. Ultimately, local creeks would return to a freshwater environment, once mining operations cease.

However, the Department is not in a position to recommend firm, quantitative conditions regarding future standards and limits for pollutants, including metals and salts, or conditions regarding additional treatment (including RO treatment) for discharges to receiving waters.

The NCSS EPL is subject to current and ongoing review by the EPA. The Department considers that there is some risk in setting particular discharge limits (whether volumetric or contaminant) in the consent, since section 89K of the EP&A Act requires that a later EPL remains 'substantially consistent with' the development consent. The Department proposes instead that the consent merely contain its standard condition that "*except as may be expressly provided by an EPL, the Applicant shall comply with section 120 of the Protection of the*

*Environment Operations Act 1997*". On this basis, it would become the EPA's responsibility to set appropriate volumetric and contaminant limits for mine-water discharges from Newstan LDP001 and other licensed discharge points to LT Creek, Stony Creek and the unnamed tributary of Muddy Lake. This responsibility falls within EPA's 'core business'. The Department therefore considers that, when the EPA has come to a settled position regarding appropriate concentration limits and treatment options, then it should impose appropriate conditions via its EPL. The proposed conditions of consent would not in any way limit the EPA's options in obtaining strategic and appropriate outcomes for managing salinity and metals in discharges.

Proposed temporary and emergency discharges from Hawkmount Quarry to Lords Creek have relatively low volumes and water quality modelling generally shows likely compliance of pollutant concentrations with trigger values. The Department considers that any necessary discharge limits should be imposed as part of an EPL.

The Department also recommends conditions requiring the development of site-specific in-stream water quality and aquatic ecology (macroinvertebrate health and ecotoxicity assessment) objectives to the satisfaction of EPA. This condition gives discretion to EPA to require these objectives to be set across sites, where and as required.

## **6.2 Surface Water Hydrology**

### Existing Environment

The NCL Project area is located within the catchment of Lake Macquarie, the largest coastal lake in NSW. Several watercourses traverse the project area, including LT Creek, Stony Creek, Lords Creek and an unnamed tributary of Muddy Lake, an estuarine coastal wetland which is connected with Lake Macquarie via an aqueduct.

Existing water management systems deal with surface water and groundwater and include diversions, storage, reuse strategies, management (including treatment) and discharge. The private haul roads are sealed and surface water drainage from them is managed. Changes to surface water management are proposed for NCSS, Hawkmount Quarry and CES. A water balance model was developed for all sites covering the duration of the project. This model considered both existing and proposed water management systems, in order to determine changes in the local water cycle and quantify potential impacts of the project.

The water management system at Newstan covers both underground and surface water as well as water transfers, and includes clean and dirty water diversion channels and diversion control structures to prevent dirty water contaminating clean water. Clean water runoff is managed via the Main By-Wash Dam on the north arm of LT Creek and may be directed to the Coal Processing Plant (CPP) or to meet other water demands at NCSS under an existing water access licence. Dirty water is also exchanged among several surface and underground storages and conveyed to the CWP for treatment, then re-used in the CPP or for dust suppression, or may be discharged to LT Creek or Stony Creek.

Dirty water is directed via surface and sub-surface drainage to several management structures and storage dams. The dams enable suspended solids to settle out of the water column, allowing the reuse of dirty water where possible. Mine-water is stored in underground workings and discharged under an EPL which permits discharge of water via three LDPs, being Newstan LDP001, LDP002 and LDP017. LDP001 has a discharge limit of 11 ML/day but LDP002 and LDP017 have no volumetric limits, being used solely for emergency purposes.

At Mandalong, both MMAS and CES have clean and dirty water separation systems. Water is discharged through two LDPs. Cooranbong LDP001 is approved to discharge up to 1,825 ML/year (or 5 ML/day). Cooranbong LDP002 is used for daily discharge during rain periods. Underground inflows are stored in the former Cooranbong Colliery workings. This water is delivered to and from the Borehole Dam at CES for treatment and licensed discharge. CES manages mine-water discharges (currently 574.2 ML/year and 8.9 ML/year from Cooranbong LDP001 and LDP002, respectively).

Impacts on surface water hydrology may occur through mine-water discharges that can create altered flow regimes, erosion and/or changes to stream morphology. A summary of existing and proposed changes to surface water management at each of the sites is presented below, followed by an assessment of impacts.

### Hydrological impact assessment

The WIA assessed the potential impacts resulting from site water management on the surface water environment within the project area and its surroundings.

Anticipated flow rates, in terms of discharge volumes following predicted maximum rainfall, were modelled for NCSS, Hawkmount Quarry and CES. Centennial acknowledged that the volumes produced by rain events would far exceed operational surface water storage capacities on site currently and in future, with overflows managed by clean water diversion structures.

The WIA estimated likely changes in downstream flood levels and concluded that new areas of flooding were unlikely. OEH raised concerns over the adequacy of the risk assessment for flooding risks associated with potential failure of water management structures and whether appropriate mitigation and management measures are proposed. The existing Newstan Water Management Plan includes an extensive Failure Modes and Effects Analysis (FMEA) risk assessment which was made available in Centennial's Response to RTS Submissions Report. The Department reviewed the FMEA risk assessment, which considers that most risks of failure of water management structures are low to moderate. For significant or greater risks of failure, controls include appropriate diversions of flows to containment areas or structures. Centennial also noted the role of the NSW Dams Safety Committee (DSC) to ensure safety of dams whose failure has community consequences. The Department assessed potential for flooding, based on reference to the FMEA and the conclusions of the WIA.

The major current and predicted impacts from surface water management result from discharges from Newstan LDP001 and Cooranbong LDP001. Other licensed surface water users are not expected to be impacted by the project. A comparison of existing and proposed discharges from LDPs is shown in **Table 7**. Impacts are discussed for each of NCSS, CES and Hawkmount Quarry in the following sections.

**Table 7: Existing and Proposed Water Discharges**

| <b>LPD No</b>                      | <b>Current Use &amp; Discharge Limit</b> | <b>Proposed Use &amp; Discharge Limit</b>              |
|------------------------------------|------------------------------------------|--------------------------------------------------------|
| Newstan LDP001                     | Daily discharge, 11 ML/day               | Daily discharge, 14.5 ML/day                           |
| Newstan LDP002                     | Emergency discharge, no limit            | No change                                              |
| Newstan LDP003 ( <i>proposed</i> ) | N/A                                      | Emergency discharge, no limit                          |
| Newstan LDP0017                    | Emergency discharge, no limit            | No change                                              |
| Cooranbong LDP001                  | Daily discharge, 5 ML/day                | Daily discharge, 8 ML/day                              |
| Cooranbong LDP002                  | Daily discharge (rainfall), no limit     | No change                                              |
| Hawkmount LDP ( <i>proposed</i> )  | N/A                                      | Daily discharge (construction period only)<br>3 ML/day |
|                                    |                                          | Daily discharge (rainfall), no limit                   |

- **Newstan Colliery Surface Site**

NCSS is located within the upper catchments of the northern and southern arms of LT Creek, on the western side of Lake Macquarie. The NCSS water management system consists of transfers among surface water dams and a large underground storage, the Fassifern Underground Storage (FUS). Proposed surface water storage capacity is approximately 785 ML. The largest input is the transfer of mine-water which occurs as a result of inflow to Newstan's underground mine workings. Surface water dams collect sediment-laden runoff from disturbed areas, some of which undergoes on-site treatment for re-use.

Transfers from the FUS are predicted to increase substantially due to increased mine-water make, by up to 1,547 ML/year in 2036 (from current annual discharge of 4,047 ML/year). On this basis, Centennial proposes to increase the volumetric limit for LDP001 by 3.5 ML/day, consistent with modelling of predicted maximum discharges in 2036.

During prolonged or significant rainfall events, excess surface water is redirected to the FUS. The Final Pollution Control Dam discharges via LDP002 to the northern arm of LT Creek during significant rainfall events. Discharges are not expected to increase substantially between existing and proposed conditions. However, insufficient capacity of the Final Pollution Control Dam and the Road Side Dam are currently high/significant risks of environmental damage due to dirty water discharge. Centennial proposes an expansion of the Final Pollution Control Dam and upgraded pumping system to Connolly's Dam.

Centennial proposes to establish LDP003 on the southern arm of LT Creek, to cater for emergency discharges from the Clean Water Dam in the SREA during heavy rainfall. Water levels in the Clean Water Dam are managed through pumping to the Main Tailings Dam, Connolly's Dam or the FUS. Average discharges through the proposed LDP003 are predicted to be 12.9 ML/year. Discharges are not expected to increase substantially under proposed conditions.

During wet weather periods, when water inflows to FUS cause the storage level to rise above 16.6 m below ground level, stored mine-water in the FUS discharges from the surface into Stony Creek via LDP017. From 2029, increased mine-water make plus large stormwater flows are predicted to more regularly exceed the FUS capacity and cause an increased frequency of emergency discharges via LDP017. Centennial proposes to increase average discharges via LDP001 to improve its ability to manage FUS's reserve capacity for a period of at least 10 years, following the anticipated recommencement of mining at Newstan in 2019.

Centennial holds a water access licence under the *Water Management Act 2000* to extract water at a rate not exceeding 9.5 ML/day from the Main By-Wash Dam, located on LT Creek. The licence has an annual allocation of 750 ML. This water is used to supplement supply to the Newstan CPP and/or is used underground, as a backup supply. Extraction from the Main By-Wash Dam occurs occasionally during dry periods or when other supplies are compromised due to infrastructure failures.

The project includes further piping of the north arm of LT Creek. Piping is undertaken in order to mitigate the risk of coal entering the creek and impacting downstream water quality. One 175 m section of this creek has already been piped, inside the rail loop. A second 150 m section has been approved for piping, between the Main By-Wash Dam and rail loop.

Due to the reduction of water volumes directed to the Main Tailings Dam, as a result of the proposed belt filter presses, water levels in the Main Tailings Dam would be lower. The recycled portion of water from tailings is expected to increase by 92.8 ML/year. The Main Tailings Dam would be managed such that rainfall should not cause any overflows. This dam has an emergency storage capacity, based on the volume of runoff generated from a 1 in 100,000 year average recurrence interval (ARI) storm event.

The WIA noted that the channel invert of LT Creek downstream of NCSS is generally wide and densely vegetated, dissipating flows and minimising potential impacts on channel morphology. Increased discharges via LDP001 are not expected to have any significant impact on downstream channel morphology when discharges are released during high intensity, prolonged rainfall events (one-year ARI flow event or greater). Centennial notes some risk to morphological stability of the creek through Fassifern Archery Club when discharging during low-flow periods. This is intended to be mitigated by stabilising the creek with a combination of instream structural works and improving riparian vegetation.

If a blockage of LT Creek was to occur, the Final Pollution Control Dam would receive emergency overflow prior to discharge via LDP002, if its capacity was exceeded. Centennial has committed to undertake hydrological modelling for construction of the pipeline and related structures, to ensure no increased flood risk. The hydraulic assessment found that the maximum increase in water level attributed to the proposed increased discharge in LT Creek would be very small (approximately 30 mm). Discharges are expected to result in only a minor change in overall flow volumes during high-intensity storm events, given they account for 0.4% of total storm flows.

The immediate downstream reach from proposed LDP003 does not exhibit any existing instabilities that may be exacerbated by potential discharges. The predicted increase in flow velocity of 0.01 m/s for the one year ARI event is unlikely to result in new erosion, given existing instream vegetation. Further downstream of the proposed discharge point and culvert crossing, flows in the creek are managed by an existing stilling basin that acts to dissipate flow energy. This is consistent with permissible velocities predicted under NSW guidelines for managing urban stormwater, whereby vegetated channels are expected to be stable for critical velocities less than 0.9 m/s.

Stony Creek exhibits a generally well-vegetated channel with a relatively low gradient. Therefore, the extent and severity of erosion is not expected to increase in response to increased and/or regular discharge flows. Existing instabilities are limited to localised sections of bank erosion that may be exacerbated by significant and prolonged discharges.

- *Cooranbong Entry Site*

CES is located within the upper reaches of an unnamed tributary of Muddy Lake. Current water management at CES includes clean water diversion to the Construction Dam and two Rehabilitation Dams, the latter having a total storage of approximately 0.2 ML. The two Rehabilitation Dams collect clean water runoff from vegetated areas and discharge to the Construction Dam. Dirty water is diverted to Settlement Dam No.1. Due to the poor quality of surface water collected, water is not reused on site or underground. Water transfers occur from the CHP Settlement Tank, 5 ML Dam, Sediment Dam 1 and Sediment Dam 2 to Cooranbong Underground Storage (CUS). The largest input is the transfer of mine-water from underground which occurs as a result of groundwater inflows to Mandalong. Total surface water storage capacity is approximately 20 ML.



EPL 365 permits discharge of water from CES via LDP001 and LDP002 into the unnamed tributary of Muddy Lake. LDP001 has a discharge limit of 5 ML/day, with a recent average rate of discharge of approximately 1.2 ML/day. Water transferred from underground storage is directed to the Borehole Dam at CES prior to discharge via LDP001. Exceedance of the 5 ML/day discharge limit is permitted for the discharge of rainfall exceeding 10 mm during the 24 hours immediately prior to commencement of the discharge.

Centennial proposes to increase the volumetric limit for LDP001. This would be associated with development of main headings in Mandalong commencing in 2015 and associated longwall extraction commencing in 2018 and continuing until 2036. Transfers from CUS are expected to increase substantially, due to increased mine-water make. Water discharges are expected to increase from 563 to 2,631 ML/year. A water access licence would be required for transfers from the 5 ML Dam, Sediment Dam 1 and Sediment Dam 2 to CUS. The 5 ML Dam discharges via LDP002 into the unnamed tributary of Muddy Lake during times of prolonged wet weather. These discharges are not predicted to increase significantly as a result of the project, with predicted maximum discharge under both existing and proposed conditions being up to 16 ML/year.

Discharges from LDP001 are proposed to be undertaken in a controlled manner such that the downstream environment would remain stable and any existing areas of erosion would not be promoted. Current discharge is via a stilling pool, dissipating energy before flows are conveyed downstream. The current discharge configuration would be maintained.

Consequently, the fluctuations in level of Muddy Lake due to storm events are significantly greater than those resulting from either existing or proposed discharges.

Results of the hydraulic assessment indicate that the maximum increase in water level in Muddy Lake resulting from existing peak discharges through LDP001 is approximately 70 mm. The increased discharge from LDP001 as a result of mine-water make in the existing and proposed underground workings of Mandalong is expected to result in an increase in water level in Muddy Lake by a maximum of 30 mm. The EIS concluded that, given natural variation in water levels in the swamp-like environment of Muddy Lake, this would have minimal impact on existing ecology (see Section 6.1). Surface catchment runoff would result in peak flow rates in the unnamed tributary of Muddy Lake that are significantly greater than average mine-water discharges during periods of high rainfall. There would be no detectable changes in water level at the aqueduct that conveys flows from Muddy Lake over Eraring Power Station Inlet Channel. Although there may be a change in natural flow regime as a result of increased discharge via LDP001, the EIS concluded that stability of the waterway is unlikely to be impacted.

- *Hawkmount Quarry*

Hawkmount Quarry and the majority of Cooranbong Private Haul Road are located within Lords Creek catchment, with several tributaries conveyed beneath the haul road. The Hawkmount Quarry site includes the disused quarry void, an access road from Cooranbong Private Haul Road and a sediment dam. The majority of catchment run-off is diverted around the quarry void to the haul road culvert and directed downstream to an unnamed tributary of Lords Creek.

There is currently no formal water management system at Hawkmount Quarry. Some surface runoff drains to the quarry void where a pool of water is regularly present. Once void capacity is exceeded, water overflows into the Sediment Dam adjacent to the quarry which then overflows into a culvert and into the unnamed tributary of Lords Creek.

Centennial is proposing to use the Hawkmount Quarry void for the disposal of coal rejects. Dewatering of the quarry void and Sediment Dam is intended during initial establishment of the Reject Emplacement Area (REA) within the void. This would occur over the construction period of approximately six months when water would be discharged to the unnamed tributary of Lords Creek at a rate of 3 ML/day. This represents approximately 11% of the runoff predicted for a one year ARI event. Following this, any water within the quarry would be directed to the Sediment Dam via a gravity-fed pipe and the Sediment Dam would discharge through a proposed LDP via a manually-operated valve. Overflows from the Sediment Dam are expected to be minimal due to management of the dam at low levels.

Hawkmount Quarry would continue to have a similar hydraulic regime as currently. There are no active reuse strategies proposed at this location. Average discharge to the creek under existing conditions is approximately 29 ML/year and is predicted to be 40 ML/year under proposed conditions. It is unlikely that discharges would create any new erosion processes downstream of the quarry. Given the predicted minimal increase in flow velocity of 0.02 m/s for the one year ARI event and the currently well vegetated area within the unnamed tributary of Lords Creek, it is expected that the energy of increased flows would be sufficiently dissipated. Further downstream, flows within the creek are managed by an existing stilling basin.

### Conclusion

The Department considers that the likelihood and consequences of risks of failure of water management structures are low and that appropriate mitigation and management measures would be adequately addressed in the Surface Water Management Plan for the NCL Project. The Department agrees with Centennial that the potential impacts of downstream flooding, either from discharges or failure of structures, are very low. The structural risks associated with prescribed dams also must be assessed and managed by the DSC.

Predicted increases in discharges are unlikely to affect the hydraulic regime of receiving waterways downstream of discharge points at any of the three sites. Predicted flow velocities are not considered sufficient to have an impact on stream hydrology and/or morphology. Receiving waterways are well vegetated and incorporate energy dissipation structures, sufficiently minimising potential impacts from increased stream flow. Rainfall-induced stream flow is much more significant, compared to discharges from the project. Similarly, impacts of increased discharges and increased water levels in Muddy Lake are not likely to have any detrimental hydraulic effects, nor impact on the aquatic ecology of Muddy Lake.

Recommended conditions require that the Surface Water Management Plan includes detailed baseline data on water flows in watercourses that could be affected by the development and performance criteria for the proposed piping of LT Creek.

### **6.3 Air Quality**

The Air Quality Impact Assessment (AQIA) in the EIS predicted that dust concentrations would meet relevant criteria at nearly all identified sensitive receptors for all modelled scenarios, at both CES and NCSS. This included modelled annual average deposited dust, Total Suspended Particulates (TSP), PM<sub>10</sub> and PM<sub>2.5</sub>. In addition, the 24-hour average PM<sub>2.5</sub> concentrations are unlikely to exceed the relevant criterion at any identified sensitive receptor for all modelled scenarios for both NCSS and CES.

However, the predicted maximum 24-hour average PM<sub>10</sub> concentrations would exceed the relevant criterion for three scenarios at receptor 'NC6' (Fassifern Public School).

The school is located about 500 m from the product coal stockpile and its adjacent train loading area. The entrance to the NCSS rail loop west from the Main Northern Rail Line is opposite the school (east of the rail line). The current practice is to use two or three front end loaders (FELs) to load the trains. This is a relatively dusty operation and it has been identified, as early as the time of the 1998 EIS for the Newstan Lease Extension Area, that automating train loading would reduce dust emissions per tonne of coal handled. The AQIA established that the combined contribution of the dozer, trucks and FELs operating on the rail loop stockpile contributed about 60% of the dust emissions from NCSS that are received at NC6 and it is important for the Department to consider whether these emissions are significant and should be better controlled.

In its submission, EPA indicated that it believed the measures proposed by Centennial to address the likely exceedances of air quality criteria for PM<sub>10</sub> once operations reach 6 Mtpa of coal railed, should be implemented before a throughput of 5 Mtpa of coal is reached. In the Response to RTS Submissions Report, Centennial committed to implementing dust mitigation measures to meet the relevant air quality criteria. This would include the automation of NCSS coal handling (coal transfers between the CPP and the rail loop stockpile) and train loading facilities to be *"implemented as required to meet operational efficiencies"*. In effect, Centennial committed to meeting the criteria, but considered it was up to the company as to how these were to be met and that conducting operations in accordance with best practice was not a consideration if the relevant air quality criteria are met.

The EPA responded that it *"views best practice as unrelated to criteria chosen to assess impacts on the air environment"* and continued to advocate for a limit to be placed on coal throughput that would trigger implementing best practice approaches (automation of coal loading and coal transfers) to minimise emissions.

In deciding whether best practice measures should be introduced, the Department considers it is important that such measures be reasonable and feasible. The automation of train loading and coal handling is technically feasible, as demonstrated at most other similar operations in NSW. NCSS is one of the last facilities to use FELs to load coal trains. The main issue in automating this facility is whether the capital required to automate the facility (estimated by Centennial to be about \$80 million) is justified by the reduction in operational costs to load trains, coupled with the resulting reduction in air and noise emissions.

The capital costs of automation would be offset over time by a reduction in operating costs. Some of these are self-evident such as a reduction in labour requirements by the elimination of the FELs. Others are less evident, such as a reduction of 5% in the number of trains required to move a given tonnage of coal. This comes about because FELs are not as accurate in filling each coal wagon as an automated coal bin. Consequently, to avoid

overloading the coal wagons, Centennial aims to underfill each wagon by 5% and avoid high penalty freight rates imposed on overloaded wagons.

Historically Centennial has never railed more than 3 Mtpa of product coal from NCSS. At these relatively low rates it is unlikely that automation of coal handling and train loading could be economically justified. Coupled with improved dust mitigation measures already implemented, air quality would not be significantly improved compared to historical dust emission rates from NCSS. Naturally, as coal throughput increases, unless further mitigation measures are introduced, dust emissions would increase. Centennial is seeking approval to rail up to 8 Mtpa from NCSS.

The Department's view is that, well before such a large increase in coal throughput is reached, further measures should be introduced to reduce the rate at which dust is emitted. The difficulty lies in determining the level of increased rail despatch where major new dust mitigation measures should be introduced. Centennial's view, until recently, was that the only trigger, provided relevant air quality criteria are met, should be *"operational efficiencies"*. It is true that at some higher rate of coal throughput, it would be less costly to automate than to continue to operate FELs, or that an automated system would be needed due to FELs not being quick enough to load trains to move the higher volume of coal.

As it is uncertain when operational and economic forces would cause automated coal handling and train loading to be introduced, the Department believes that it must set a trigger point in its recommended conditions. The AQIA predicts that, without automation, the relevant air quality criteria would be exceeded 'prior to 6 Mtpa' of coal being moved through this facility. The Department therefore initially proposed a trigger of 5 Mtpa of coal railed from NCSS, as did the EPA and LMCC in their submissions.

Following further discussion with Centennial about air quality impacts, the Department is satisfied that 5.5 Mtpa of coal could be railed from the existing facility at NCSS and remain under the relevant 24-hour maximum PM<sub>10</sub> air quality criterion, as well as all other relevant air quality criteria. The Department therefore recommends that prior to railed tonnages exceeding 5.5 Mtpa, Centennial must implement major air quality mitigation measures through the automation of the NCSS coal recovery and train loading facilities. The Department has also recommended conditions of consent that require Centennial to implement all reasonable and feasible measures to mitigate against environmental harm and, specifically, *"to implement all reasonable and feasible measures to minimise the...dust emissions of the development"*.

There are three main reasons for the Department's position regarding reduction of air emissions before railed tonnages exceed 5.5 Mtpa. The first is that it is aligned with the AQIA predictions; being before exceedances of air quality criteria. The second is that the most sensitive receptor is the Fassifern Public School. The students of this school should be afforded the benefits of the better air quality that would accrue from the implementation of reasonable and feasible air quality mitigation measures, even though relevant air quality criteria may generally be met. The third accords with the EPA's view that *"best practice [is] unrelated to criteria chosen to assess impacts on the air environment."*

The EPA also requested a condition of consent for the establishment of an ambient continuous particulate monitoring site for PM<sub>2.5</sub> and PM<sub>10</sub> at, or near, Fassifern Public School, being a close sensitive receiver. Centennial's proposed monitor location is about 20 m from the school boundary. The Department accepts this location as being more appropriate (and more conservative) than a site within the actual grounds of the school. The siting of this monitor is able to be reviewed over time as a component of regular reviews (at least every 3 years) of the proposed *Air Quality and Greenhouse Gas Management Plan*. The Department has recommended a condition of consent that requires the use of both PM<sub>2.5</sub> monitors and real-time monitoring *"to evaluate the performance of the development"*.

### Conclusion

The AQIA predicts that maximum 24-hour PM<sub>10</sub> concentrations are likely to exceed the relevant criterion at the Fassifern Public School (NC6) if air quality mitigation measures are not implemented as the tonnage of coal railed from NCSS approaches 6 Mtpa.

As the criterion would be exceeded prior to 6 Mtpa, the Department recommends that when railed tonnages reach 5.5 Mtpa, Centennial is required to implement major air quality mitigation measures through the automation of the NCSS coal recovery and train loading facilities. The Department has also recommended conditions requiring that air quality criteria are met and all reasonable and feasible avoidance and mitigation measures are implemented. As well, the recommended conditions include an air quality monitoring program that adequately supports the air quality management system, includes PM<sub>2.5</sub> monitoring, and uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development.

#### 6.4 Flora and fauna

A Flora and Fauna Impact Assessment (FFIA) was provided in the EIS and an aquatic ecology assessment was included with Centennial's RTS. The FFIA identified broad habitat types, including open forest/woodland areas, riparian areas and cleared/disturbed areas. No threatened ecological communities or populations listed under the TSC Act or the EPBC Act were found within the disturbance footprint. However, two threatened flora species, Black-eyed Susan (*Tetradlea juncea*), and Small-flower Grevillea (*Grevillea parvifolia*) were identified on the project site. The two species are listed as vulnerable under both the TSC Act and EPBC Act and the proposal was declared as a 'controlled action' under the EPBC Act in respect of these species.

The Commonwealth Department of the Environment (DoE) is undertaking its own assessment of the impacts of the project and the requirements for mitigation and/or offsets, as the project predates the Bilateral Agreement that provides for the Department's assessment of matters for the Commonwealth. DoE's separate assessment will be reported to the Commonwealth Minister for the Environment.

#### Impacts

Land clearing would result in approximately 19.94 hectares (ha) of disturbance. Of that area 11.63 ha is already cleared or disturbed with the remaining 7.29 ha comprising remnant native vegetation in varying condition. An additional 1.46 ha (1.37 ha MU 15 and 0.09 ha MU 30) was originally included in the area proposed to be cleared at NCSS. However, clearing of this area had previously been approved, and the Department has therefore deleted it from the assessment of the project's biodiversity impacts. Consequently, the project involves clearing of land as follows:

#### NCSS:

- 2.13 ha of Coastal Foothills Spotted Gum – Ironbark Forest (MU 15);
- 1.13 ha of Coastal Plains Smooth-barked Apple Woodland (MU 30);
- 341 Black-eyed Susan clumps; and
- 3.26 ha of habitat for Little Bentwing Bat and Large-eared Pied Bat.

#### Hawkmount Quarry:

- 3.93 ha of Coastal Plains Smooth-barked Apple Woodland (MU 30), of which 2 ha is regrowth on the quarry floor);
- 0.10 ha of Coastal Narrabeen Moist Forest (MU 6);
- one Small-flower Grevillea plant.

OEH considered that altered flow regimes downstream of CES and Hawkmount Quarry may cause impacts and should be offset. The EIS and FFIA concluded that the proposed increased volumes of water discharges are not expected to have an adverse impact on the SEPP 14 wetland or potentially occurring threatened flora and fauna downstream. The Department agrees with this position.

OEH also raised concerns about the adequacy of surveys of the wetlands at the Hawkmount Quarry site. The flora and fauna report states that the site was comprehensively surveyed (including random meanders) and that there was potential for the vulnerable flora species *Maundia trigochinoides* in the riparian zone downstream of the quarry. The FFIA includes a 7-part test, which determined that the project would not have a significant impact on this species. The WIA concluded that the relatively good quality and low volumes of the planned water discharges from the quarry would be unlikely to affect downstream ecosystems, including any that may contain this species. The Department agrees with this position.

#### Mitigation and Offsets

Mitigation measures proposed by Centennial include refinement of the surface disturbance footprint to reduce impacts to the two threatened flora species, including avoidance of direct impact to Small-flower Grevillea, except for one plant at Hawkmount Quarry. The Department has not further considered the loss of this individual plant.

Indirect offsets initially proposed by Centennial included:

- a Black-eyed Susan translocation research program, involving translocation of the 341 affected clumps and investigation of genetic patterns of populations to assist conservation;
- avoidance of impact to significant fauna habitat as far as practicable; and
- installation of nest boxes to replace hollows of five hollow-bearing trees proposed to be cleared at a 1:1 ratio.

OEH considered that the indirect offsets proposed are inadequate. It considered that the proposed Black-eyed Susan translocation would be a 'mitigation' of impacts, rather than an offset, and noted that previous

translocation efforts for this species have had limited success, possibly due to grazing. The previous translocation trial for Small-flower Grevillea was successful. Centennial's RTS included an assessment of proposed indirect compensatory measures against the six biodiversity offsetting principles. It also included the most up to date reports on translocation trials for Black-eyed Susan and Small-flower Grevillea.

OEH requested that offset measures for the clearing of native vegetation be consistent with the *NSW Biodiversity Offsets Policy for Major Projects*. However, Centennial maintained that this policy does not apply to the project, since it commenced after the final issue of the DGRs for the project's EIS. During the policy's transitional period, interim options are available for securing offsets for projects approved prior to final implementation of the policy or that were in a late stage of their planning approval process.

The Department has considered OEH's views and considers it appropriate that a direct offset is required, according to the interim options under the policy and that a Biodiversity Offset Strategy (BOS) be prepared. This position has been accepted by Centennial. Biobanking agreements (conservation covenants attached to a land title) are OEH's preferred mechanism for securing offsets for projects approved prior to the formal commencement of the Policy. A BioBanking agreement establishes a biobank site and specifies management actions required to be undertaken in order for biobank credits to be created. The Department supports Centennial's request to allow flexibility in the timing for preparation of the BOS, aligned with the timing of construction works and associated clearing of native vegetation.

The Department considers that the 341 affected clumps of Black-eyed Susan plants should be relocated, and that this is a substantial and effective mitigation measure, providing that the translocation is effective. The success of relocation should be monitored. There is also value in integrating this monitoring with the results of previous translocation efforts and publishing an overarching paper so that this knowledge is more accessible to the scientific community and general public. The proposal to fund a research program into the genetic diversity of Black-eyed Susan also has merit, having been sourced from the species' Recovery Plan.

Tree hollows should also be conserved, re-used and replaced and supplementary nest boxes provided. The Department views this action as a mitigation measure, not an offset. The Department considers that, based on an extensive nest-box monitoring and research program undertaken by Centennial over the last 5 years, nest boxes should be provided to replace tree hollows in a ratio of 2:1, ie 10 nest boxes.

The Department notes that, under current depressed coal prices, it may be quite some time before Centennial reaches a 5.5 Mtpa threshold of coal railed from NCSS that would lead to construction works and vegetation clearing that would require offsetting. The Department therefore supports Centennial's request that the preparation of the BOS is aligned with the timing of clearing of native vegetation associated with its proposed construction works and recommends a condition of consent that requires the BOS to be in place before any vegetation clearing occurs. This means that the exact composition of the BOS in terms of what parcel of land would be used for direct offsets and the nature and quantum of indirect offsets has not been included in the recommended conditions of consent. However, no matter the exact mix of elements within this BOS, it must compensate for (ie offset) the area and type of vegetation that would be cleared (2.13 ha of Coastal Foothills Spotted Gum – Ironbark Forest and 5.06 ha of Coastal Plains Smooth-barked Apple Woodland). The proposed condition requires that OEH be consulted during preparation of the BOS.

### Conclusion

The Department considers that the clearing of 7.29 ha of native vegetation for the project should be offset. The offset should include a combination of direct and indirect offsets to conserve native vegetation and also lead to increased understanding of the threatened species, Black-eyed Susan. The Department considers that Centennial's proposed translocation program is an appropriate mitigation strategy for the clearing of Black-eyed Susan and is recommending that this action be required by conditions of consent.

In relation to potential impacts from changes to hydrology and water chemistry upon terrestrial flora and fauna that inhabit the affected riparian environments, the Department considers it appropriate that Centennial investigate the specific nature of potential environmental damage that may be caused by increased discharges. The condition requiring the development of site-specific in-stream water quality and aquatic ecology (macroinvertebrate health and ecotoxicity assessment) objectives includes a requirement to address riparian features. Centennial should consult with OEH regarding the design of the program and ongoing reporting of results.

## **6.5 Noise**

The EIS's Noise Impact Assessment (NIA) conducted noise modelling for NCSS and CES in order to identify potential noise impacts from existing and proposed operations. New noise sources include duplication of the CPP at NCSS, together with increased coal handling and train loading operations.

Project Specific Noise Levels (PSNLs) were developed for sensitive receivers based on the procedures of the *NSW Industrial noise Policy* (INP). Six operational scenarios were modelled for NCSS. Modelling included noise mitigation measures proposed under each scenario. Scenario 1 reflects existing operations. Scenarios 2 and 3 were not considered by the Department, since the maximum tonnage (ie 'worst-case') scenarios are represented by Scenarios 4, 5 and 6.

Under Scenario 4, mitigation measures on the existing CPP and transfer tower are installed but the new CPP is constructed with sheet metal cladding only. Under this scenario, noise levels would exceed the PSNLs. The Department therefore considers that only Scenarios 5 and 6 would meet best practice. Scenarios 5 and 6 assume that the mitigation measures on the existing CPP and transfer tower have been completed and that the new CPP includes noise attenuation cladding. Scenario 6 includes the addition of automated train loading.

The impacts of increased coal haulage on private haul roads are represented by receivers NC7-NC11 in **Table 8**. As impacts at these receivers are generated solely by truck noise, the predicted values for Scenarios 5 and 6 are identical. The impacts are within PSNLS and predicted to reduce over time as the noise performance for trucks continues to improve.

The other sensitive receivers in **Table 8** are located in the vicinity of CES. The NIA predicts that the noise climate in the vicinity of CES would remain unchanged as the result of the proposal. Other than setting noise criteria for noise impacts at NC7 - NC11, sensitive receivers in the vicinity of CES are not further considered.

Sensitive receiver NC6 differs from other receivers in that it represents Fassifern Public School. The important noise parameter for schools is whether noise impacts interfere with the learning environment *within* the classroom. The criterion is set as 35 dB(A) (internal) in the INP. The Department prefers to consider an equivalent level of 45 dB(A) (external), as this criterion is able to be measured for compliance purposes without creating any disturbance to school classes. The equivalence of these two ways of expressing the same acoustic outcome is due to the walls of a normal building, such as a residence or school, causing the inside of that building to be conservatively 10 dB(A) quieter than the noise levels received outside.

During consideration of submissions the Department was made aware that *residences* close to the school were neither represented by NC6, as only the classroom criterion had been assessed, nor by the next closest sensitive receiver location NC3. Centennial addresses this gap by providing predictions of noise impacts for 'all residences in proximity to NC6' in its RTS. These predictions are incorporated into **Table 8**.

**Table 8** below shows the outcomes of the modelling under Scenarios 1, 5 and 6. Included in **Table 8** are predictions of noise levels within a Morning Shoulder period of 6 am to 7 am, when noise levels are higher than the remainder of the night-time noise assessment period. The Department supports the use of the Morning Shoulder period as being a fair representation of the noise environment in and around NCSS.

**Table 8: Existing and predicted noise levels**

| Locations Represented | Time Period | Leq <sub>(15 min)</sub> dB(A) |                     |            |            |
|-----------------------|-------------|-------------------------------|---------------------|------------|------------|
|                       |             | PSNL                          | Existing Operations | Scenario 5 | Scenario 6 |
| NC1                   | Morning     | 39                            | 35                  | 35         | 35         |
|                       | Day         | 41                            | <35                 | <35        | <35        |
|                       | Evening     | 41                            | <35                 | <35        | <35        |
|                       | Night       | 36                            | <35                 | <35        | <35        |
| NC2                   | Morning     | 39                            | 36                  | 35         | 35         |
|                       | Day         | 41                            | <35                 | <35        | <35        |
|                       | Evening     | 41                            | <35                 | <35        | <35        |
|                       | Night       | 36                            | <35                 | <35        | <35        |
| NC3                   | Morning     | 40                            | 40                  | 38         | 37         |
|                       | Day         | 44                            | 36                  | <35        | <35        |
|                       | Evening     | 44                            | 36                  | <35        | <35        |
|                       | Night       | 35                            | <b>39</b>           | <b>37</b>  | <b>36</b>  |
| NC4                   | Morning     | 40                            | 36                  | <35        | <35        |



|                                    |         |                                |           |           |           |
|------------------------------------|---------|--------------------------------|-----------|-----------|-----------|
|                                    | Day     | 44                             | <35       | <35       | <35       |
|                                    | Evening | 44                             | <35       | <35       | <35       |
|                                    | Night   | 35                             | 35        | <35       | <35       |
| NC5                                | Morning | 40                             | 35        | 35        | <35       |
|                                    | Day     | 44                             | <35       | <35       | <35       |
|                                    | Evening | 44                             | <35       | <35       | <35       |
|                                    | Night   | 35                             | <35       | <35       | <35       |
| All residences in proximity to NC6 | Morning | 40                             | <b>41</b> | 39        | 38        |
|                                    | Day     | 44                             | 37        | 35        | 35        |
|                                    | Evening | 44                             | 37        | 35        | 35        |
|                                    | Night   | 35                             | <b>40</b> | <b>38</b> | <b>37</b> |
| NC7 – NC11                         | Day     | 38                             | <35       | <35       | <35       |
|                                    | Evening | 38                             | <35       | <35       | <35       |
|                                    | Night   | 36                             | <35       | <35       | <35       |
| 23                                 | Day     | 42                             | <35       | <35       | <35       |
|                                    | Evening | 42                             | <35       | <35       | <35       |
|                                    | Night   | 41                             | 37        | 37        | 37        |
| 26                                 | Day     | 42                             | <35       | <35       | <35       |
|                                    | Evening | 42                             | <35       | <35       | <35       |
|                                    | Night   | 41                             | 36        | 36        | 36        |
| 22, 28,30, 31,32,33, 35            | Day     | 45                             | <35       | <35       | <35       |
|                                    | Evening | 45                             | <35       | <35       | <35       |
|                                    | Night   | 45                             | <35       | <35       | <35       |
| NC6 (School) when in use           | Day     | 35 (internal)<br>45 (external) |           |           |           |

Note: Exceedances of PSNLs shown in **bold italics**.

**Table 8** shows that proposed future operations of the development comfortably meet PSNLs in all noise catchments except for limited exceedances in the vicinity of NC3 and NC6 where the night time levels would be exceeded by 3 dB for Scenario 5 and 2 dB for Scenario 6. The results show the benefits of Centennial's proposed noise attenuation measures. Reductions in noise impacts are expected to be achieved when compared to current levels, even with more than a 100% increase in coal volumes. Notably, the introduction of automated train loading is predicted to provide only a marginal (1 dB(A)) additional noise attenuation benefit.

In summary, Centennial proposes to increase coal throughput while reducing noise impacts by introducing a range of noise mitigation measures, using real-time noise monitoring and adaptively managing noisy activities. There are no locations where noise impacts are predicted to increase as a result of this development.

The Department's recommended noise impact assessment criteria are provided in **Tables 9** and **10**. Most criteria are at the lowest level provided in the INP of 35 dB(A). These criteria will allow Centennial to conduct its existing operations (see **Table 9**). However, as coal throughput increases to 5.5 Mtpa, it must improve noise control in order to meet lower criteria (see **Table 10**) once the coal handling and train loading operations are automated.

**Table 9: Proposed Operational Noise Criteria (prior to automation of coal handling and train loading)**

| Receiver                                              | Noise Limit (dB(A))                                    |                                           |                                               |                                             |                                          |
|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------------|-----------------------------------------------|---------------------------------------------|------------------------------------------|
|                                                       | Morning Shoulder<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Day<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Evening<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Night<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Night<br>( <i>L<sub>A1</sub></i> (1min)) |
| NC2                                                   | 36                                                     | 36                                        | 35                                            | 35                                          | 45                                       |
| NC3,<br>Residences<br>around NC6                      | 40                                                     | 40                                        | 39                                            | 39                                          | 45                                       |
| 22, 23, 26, 28,<br>32                                 |                                                        | 37                                        | 37                                            | 37                                          | 45                                       |
| All other<br>residences on<br>privately-owned<br>land |                                                        | 35                                        | 35                                            | 35                                          | 45                                       |
|                                                       |                                                        | ( <i>L<sub>Aeq</sub></i> (1 hour))        |                                               |                                             |                                          |
| NC6 (school),<br>when in use                          |                                                        | 45 (external to<br>school building)       |                                               |                                             |                                          |

**Table 10: Proposed Operational Noise Criteria (following automation of coal handling and train loading)**

| Receiver                                              | Noise Limit (dB(A))                                    |                                           |                                               |                                             |                                          |
|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------------|-----------------------------------------------|---------------------------------------------|------------------------------------------|
|                                                       | Morning Shoulder<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Day<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Evening<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Night<br>( <i>L<sub>Aeq</sub></i> (15 min)) | Night<br>( <i>L<sub>A1</sub></i> (1min)) |
| NC2                                                   | 35                                                     | 35                                        | 35                                            | 35                                          | 45                                       |
| NC3,<br>Residences<br>around NC6                      | 38                                                     | 38                                        | 37                                            | 37                                          | 45                                       |
| 22, 23, 26, 28,<br>32                                 |                                                        | 37                                        | 37                                            | 37                                          | 45                                       |
| All other<br>residences on<br>privately-owned<br>land |                                                        | 35                                        | 35                                            | 35                                          | 45                                       |
|                                                       |                                                        | ( <i>L<sub>Aeq</sub></i> (1 hour))        |                                               |                                             |                                          |
| NC6 (school),<br>when in use                          |                                                        | 45 (external to<br>school building)       |                                               |                                             |                                          |

The Department has paid particular attention to the night-time noise predictions as it is important to have noise criteria as low as possible to reduce impacts during the time that most people sleep. Recommended 'Sleep Disturbance Criteria' are shown in **Tables 9** and **10**. These criteria are equivalent to 'Maximum Noise' and are provided to control short, sharp and loud noises that may be emitted by a development. Such noises are more likely to wake people from their sleep. However, it is only the highest 1% of noises emitted, and over a 1 minute assessment period, to which these criteria apply. In practice, if the other noise criteria in **Tables 9** and **10** are met, the Department would expect that the Sleep Disturbance Criteria would also be met.

The EPA has recommended that all Sleep Disturbance Criteria are 45 dB(A), the lowest level that can be set under the INP, for all sensitive receivers. The Department accepts this recommendation and all residences have been afforded this criterion for the night-time period.

EPA requested a condition requiring the use of only best practice rolling stock for rail transport. Centennial has implemented a range of measures to minimise rail and road traffic noise, including new generation locomotives, restricting use of locomotive horns to emergency use, reduced rail speed to 10 km per hour on the rail loop and use of air bag suspension on haul trucks for braking. Noise impacts from trains on the NCSS rail loop must meet the operational noise criteria for the site. While the Department supports the use of best practice in rail transport, it considers that controls on rolling stock are best controlled under EPLs either for the rail transport providers or the rail track owners/operators.

### Construction Noise Impacts

Construction works related to the development are limited to the proposed upgrade of NCSS, and the construction of a REA at Hawkmount Quarry. No blasting is proposed for the project.

At NCSS, the following works would occur:

- extensions to the existing coal stockpile areas and installation of new coal stockpile areas;
- installation (and operation) of an additional CPP; and
- installation (and operation) of CHP infrastructure, including conveyors to support train loading, bins, settlement ponds and ancillary infrastructure.

The closest receivers to NCSS are five dwellings (NC1 to NC5, with NC2 being the closest at 300 m) and the Fassifern Public School located immediately east of NCSS. There are no sensitive receivers located in close proximity to Hawkmount Quarry, with the closest being approximately 3 km north (receiver NC11) and 3 km south (receiver 23).

The *Interim Construction Noise Guideline* (ICNG) sets out management levels for construction noise at residences, which distinguishes between the Noise Affected Level, which is the point where there may be some community reaction to noise (being the Rating Background Level plus 10 dB(A)) and the Highly Noise Affected Level, which is the point above which there may be strong community reaction to noise (being 75dBA)). The noise management level for classrooms is set at 45 dB(A).

Construction noise is predicted to meet the relevant noise criteria and is likely to be intermittent as works would be undertaken at different parts of NCSS for varying periods. Centennial's predicted construction noise levels at all six receivers near NCSS were found to be below the noise management criteria. Predictions at the residential receivers were below criteria by at least 11 dB(A), and at the school, were below criteria by 9 dB(A).

To ensure avoidance of potential construction noise impacts, the Department has recommended conditions which stipulate that Centennial must manage noise from construction activities in accordance with the ICNG's requirements and prepare a Construction Traffic Management Plan which must include details on the measures to be applied to limit noise and dust impacts. The Department has also recommended a condition restricting construction works, any associated traffic, to standard construction hours, being 7:00 am to 6:00 pm on Mondays to Fridays, and 8:00 am to 1:00 pm on Saturdays only.

### Construction Traffic Noise

For road traffic noise related to construction at NCSS, Centennial assumed a worst case scenario where construction traffic would access NCSS together with traffic associated with the Newstan Extension of Mining Project. However, the application and EIS for this project have not yet been submitted for exhibition.

Road traffic noise at the nearest residential roadside receivers surrounding NCSS was found to meet the criteria under the *NSW Road Noise Policy*, with the highest noise levels being 4.7 dB(A) below the day-time criteria and 5.7 dB(A) below the night-time criteria.

To assess impacts at Fassifern Public School, average hourly traffic volumes were used rather than peak volumes, as construction traffic is unlikely to be entering or leaving the site during school hours. The traffic noise along Miller Road was predicted to be below the relevant criteria by 3.1 dB(A).

### Conclusion

There are no locations where noise impacts are predicted to increase as a result of this development.

The Department has recommended general conditions requiring that operational noise criteria are met under two different operating scenarios – firstly, current operations, and secondly, with lower criteria to be achieved following the introduction of an automated coal handling and train loading system. As well, Centennial would be required to implement best management practice to minimise construction, operational, road and rail noise; and a noise management system, including real-time noise monitoring.

The Department is satisfied that the development would result in acceptable noise impacts, provided Centennial's proposed noise mitigation measures and its adaptive management of noisier activities is implemented and supported by a real-time noise management system.

## 6.6 Traffic and Transport

The EIS includes a Traffic Impact Assessment (TIA) to provide accurate predictions of project road and rail traffic; assessment of potential traffic impacts on capacity, safety and efficiency of the road and rail networks; and details of measures to be implemented to maintain and/or upgrade these networks over the project life.

### Road traffic

The project's primary heavy vehicle road traffic-generating activities are transport of coal, coal rejects and other material among sites. These activities would include an increase in the volume of coal transported from CES to NCSS and from NCSS to Eraring Power Station; and continuing to transport middlings from NCSS to CES and coal and stone material from Awaba to NCSS, via truck using existing private haul roads.

The proposal would cumulatively generate, on average, 32 heavy vehicle movements/hour (ie 16 return trips/hour). The low number of heavy vehicle movements is due primarily to the large capacity of the haulage trucks and the ability to backload. The TIA's key finding was that the project would not have an adverse impact on the local road network, given that most coal transport would occur on existing rail lines, privately owned haul roads or conveyors. Potential impacts to the existing road network would stem primarily from additional employee traffic accessing NCSS via the existing entrance off Miller Road; and construction traffic associated with the proposed upgrade of NCSS.

Miller Road provides access to NCSS from the east through the intersection with Macquarie and Fassifern Roads. The current peak traffic to and from NCSS and Newstan is 91 vehicles per hour (vph). Under a worst case scenario, in terms of additional traffic generation for the maximum NCSS workforce (including Newstan personnel), there is potential to generate up to an additional 186 vph on Miller Road. This would result in the potential for a total of 277 vph. The TIA determined that this equates to a LOS B (for a rural road).

Both Macquarie and Fassifern Roads operate with peak mid-block traffic volumes of 329 vph and 364 vph, respectively which equate to LOS A and LOS B, respectively. The TIA concluded that both these roads have significant capacity to cater for additional traffic. Considering the maximum potential increase in peak traffic from both NCL and NEMP would be 108 vph onto Fassifern Road/Macquarie Road, the highest potential increase of 472 vph would equate to a LOS B (for urban roads).

Intersection capacities were assessed in the TIA using the Sidra 5 intersection modelling software and level of service (delay) model adopted by RMS. The NCSS access road intersection and Miller Road/Fassifern Road/Macquarie Road intersections were modelled for likely traffic (including Newstan) from 2014 to 2024. The modelling shows that both intersections would maintain satisfactory levels of service (LOS C).

CES is accessed via Gradwells Road from the south, leading from Newport Road and Newport Road/Wangi Road intersection. Gradwells Road has a current peak traffic volume of 51 vph which equates to a mid-block LOS A and indicates significant capacity to cater for additional traffic. The proposal would not increase traffic on Gradwells Road during operations. Traffic volumes on Newport Road would remain in the order of 387 vph during peak periods, under proposed conditions which equates to LOS A. Traffic flows on both Gradwells and Newport Roads are below Ausroads thresholds requiring detailed analysis of intersection capacity. Therefore, it can be concluded that there would be adequate capacity at the Newport Rd/Wangi Road intersection, under all proposed conditions.

RMS requested a revised TIA for the Wangi Road/Dora Street intersection, noting it is currently operating at capacity and that it would need to be upgraded to a seagull intersection to handle additional traffic accessing Newport Road. RMS also noted concerns about the low clearance under Dora Creek bridge on Newport Road. Centennial advised in the RTS that this intersection would only be impacted by construction traffic which would be for a short term peak and occur outside the normal peak-hour traffic periods.

Regarding potential construction traffic impacts, modelling results from the TIA show that levels of service for all traffic movements at both the NCSS access/Miller Road intersection and the Miller Road/Macquarie Road/Fassifern Road intersection would continue to be satisfactory during the NCSS upgrade. Similarly, the local road network around CES has sufficient spare mid-block capacity to cater for proposed construction employee traffic. Centennial is also considering assembling employees at CES to be bussed along the private haul road to NCSS, which would reduce the impact of this traffic on the local road network around Fassifern.

In its response to the RTS, RMS advised that issues raised in its submission had been addressed but it remains concerned about potential impacts from construction traffic. RMS recommends a condition of consent to include preparation of a Construction Traffic Management Plan, to be subject to review by RMS, which is supported by Centennial. The Department considers that this would satisfactorily address the potential for impacts at the Wangi Road/Dora Street intersection.

**Rail transport**

Centennial does not propose to increase train movements in excess of its current approval of eight trains per day and would use existing paths on the network to transport coal.

In its submission, TfNSW requested information on predicted rail traffic to the Port of Newcastle, Port Kembla and Vales Pt Power Station, including relative destinations of additional coal tonnages and actual train path requirements. In addition to the six mandatory paths in NCSS's Standard Working Timetable (SWTT), six additional return train paths would be needed. The two flexible paths in the current SWTT would be retained to provide sprint capacity.

Centennial noted that the volume of coal transported by train responds to the changing demand of various domestic and export markets and contractual requirements. Centennial also indicated that capacity constraints in the rail network and coal handling and storage at destinations were limiting factors. Further, timetabling is controlled by RailCorp, the Australian Rail Track Corporation and Hunter Valley Coal Chain Coordinator. The proposal is designed to provide flexibility in distributing coal product, based on these constraints. Consultation with various stakeholders to access additional train paths would be undertaken as required. Changes in coal train configurations would be undertaken to ensure they align with infrastructure capacity. Any future upgrades in infrastructure are the responsibility of infrastructure owners.

TfNSW perceived capacity constraints on the Eraring Balloon Loop/Newstan Balloon Loop. Centennial advised that any trains using the Newstan rail loop would be considered as part of the maximum eight trains per day. TfNSW also raised concerns about potential additional queuing and delay for motorists at the Glebe Road, Adamstown and Clyde Street, Hamilton level crossings. Centennial noted that there are a number of other users of the rail line between NCSS and the Port of Newcastle and, as other coal mining projects come on line, there is likely to be increased rail traffic with potential impacts on the operation of the level crossings. In the RTS, Centennial notes that these intersections have recently been upgraded to the highest levels of protection, such that collision risks are considered to be low. Centennial suggests that, seeing as there are also likely to be increases in the number of coal trains associated with other projects, this issue may require a more strategic planning solution. TfNSW indicated that it had no further comments, following Centennial's RTS.

**Conclusion**

The Department considers that the project's traffic and transport impacts can be adequately managed, as proposed in the EIS. The Department is satisfied that there would be no additional impacts on the rail network since there would be no increase in approved train numbers. The main road traffic impacts would be associated with construction. The Department is recommending a condition for the preparation of a Construction Traffic Management Plan.

**6.7 Socio-Economic Assessment****Economic impacts**

Lake Macquarie LGA hosts a large and diversified regional economy. Mining and related industries have historically been key parts of the regional economy and continue to be important elements. Significant coal-fired electricity generation infrastructure (Eraring and Vales Point power stations) are located in the LGA, which will continue to support the need for local coal production for some time. Mining-related industries range from suppliers of goods and services, to the large and specialised transport and logistics sector that services the coal industry.

The EIS included an Economic Impact Assessment (EIA) which assessed the direct and regional economic benefits and costs of the project, using a combination of qualitative and quantitative methods. The EIA also identified the project's net cost or benefit to the NSW community.

The EIA reports that key benefits of the NCL Project are:

- meeting demands of domestic and export markets for coal products;
- providing key elements of the coal supply chain, servicing domestic electricity generators and coal export customers;
- securing increased employment, including 120 operational and 195 construction contractor employment positions, together with socio-economic flow-on benefits;
- salaries and wages paid to employees and contractors, during construction and operations; and
- providing ongoing revenue to Federal, State and Local governments over the period of operation.

Costs of the project associated with potential economic impacts are estimated to be about \$115 million, covering potential impacts on property values attributed to noise, impacts on land and water resources, loss of biodiversity and visual amenity and increased greenhouse gas emissions.

The EIA estimates the project would provide a total revenue stream of \$26.9 million to the Federal, State and local governments via taxes and rates, over the life of the project. The EIA concludes that there is a net economic benefit of the project for the State and regional communities, at a net present value (NPV) of \$334 million over the life of the project.

### Social impacts

With the long history of mining in the Hunter region and around Lake Macquarie, many families have lived in the area over a number of generations and been dependent on mining for employment. However, there is a progressive change in composition of residents, with people moving into existing residential areas for lifestyle reasons and areas of new residential development which is creating potential for land use conflict.

The location of project infrastructure has potential impacts on residents, including visual, noise, dust and access impacts. Social impact relates to the degree of change that may be brought about by the project. Residents place intrinsic value on an area and the aspects that attracted them to live there, such as residential and rural character, existing land use, access to services and facilities and visual amenity.

A Social Impact Assessment (SIA), including consideration of impacts on the needs, issues, values and aspirations of the surrounding community was included in the EIS. The SIA found that the overall impact of the project is generally contained within the project area and would have minimal social impact, noting that there would be:

- no requirement for property purchase as a means of managing impact on social amenity;
- generally no impact on surrounding land use;
- no change to the social fabric of the area;
- no predicted notable change to the social and economic profile of the community except for the potential for economic benefits via localised spending as a result of construction-related and operational employment; and
- no change to how residents or visitors utilise the area.

### Conclusion

The economic and social analyses have adequately considered potential social and economic impacts of the project, including direct and indirect benefits, costs and benefits to NSW communities and measures to minimise adverse impacts. Socio-economic impacts are generally associated with environmental impacts (ie increased noise and dust emissions, loss of biodiversity and visual amenity and reduced water quality). Appropriate mitigation measures are addressed in Sections 6.1 to 6.6. No additional mitigation measures are considered necessary to offset socio-economic impacts.

## **6.8 Other issues**

The Department's assessment of other impacts is summarised in **Table 11** below.

**Table 11:** Other assessment issues

| <b>Issue</b>          | <b>Potential Impact and Consideration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Recommendation</b>                                                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Visual Impacts</i> | <ul style="list-style-type: none"> <li>• Land in the immediate vicinity of the project area is generally undeveloped bushland. Surrounding land uses include surface operations associated with Newstan, Awaba and Mandalong, residential and rural residential land uses, utility easements and large-scale industrial development, such as Eraring Power Station and transport corridors. Denser urban development is located to the east, fringing Lake Macquarie.</li> <li>• Screening vegetation surrounds NCSS, CES and Hawkmount Quarry, as well as the private haul roads. Key elements would not be significantly visible from urban centres and would be largely contained and visually enclosed by extensive tree cover and a gently undulating landform extending between multiple low ridgelines and gullies.</li> <li>• The M1 Pacific Motorway traverses on a north-south alignment to the west of the project area. There are no views towards the existing surface facilities.</li> <li>• Short distance and mostly indirect views occur along a number of local roads and the transmission line.</li> </ul> | <ul style="list-style-type: none"> <li>• Given the similar nature of existing and proposed activities, the project is not expected to have any significant visual impacts.</li> </ul> |

| <b>Issue</b>                              | <b>Potential Impact and Consideration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Recommendation</b>                                                                                                                                                                                                                                                              |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Agricultural Resources &amp; Soils</i> | <ul style="list-style-type: none"> <li>Soil landscapes found at NCSS are subject to high erosion hazard in drainage lines or on steep slopes. Soil landscapes at CES also typically exhibit moderate to very high erodibility. The generally high erodibility of soils needs to be considered during construction and upgrading of site drainage systems.</li> <li>The project area is disconnected from local agricultural land and set in an area of coal mining, power generation, quarrying and bushland. Cattle grazing, horse agistment and small orchard areas are the main nearby agricultural activities.</li> <li>The project would result in loss of 7.5 ha of Class 3 agricultural suitability land at NCSS. This is moderately productive land, suitable for grazing or pasture improvement. It may be cultivated or cropped in rotation with pasture.</li> <li>There would be an increase of 13.9 ha of Class 4 agricultural suitability land at Hawkmount Quarry. This land is described as marginal, not suitable for cultivation and with low to very low productivity for grazing.</li> </ul> | <ul style="list-style-type: none"> <li>No land would be temporarily or permanently removed from agricultural production as a result of the project.</li> <li>No specific impacts or mitigations need to be considered with respect to agricultural resources and soils.</li> </ul> |
| <i>Rehabilitation</i>                     | <ul style="list-style-type: none"> <li>Due to the nature of the project's operations, the need for progressive rehabilitation, particularly revegetation, is low.</li> <li>Following eventual closure of its Newcastle Coalfield mines, Centennial proposes to redevelop infrastructure areas at NCSS and CES for industrial land use.</li> <li>Post-operational land use for the three REAs would be a combination of native bushland and mixed native grassland, commensurate with pre-disturbance conditions.</li> <li>Given the marginal nature of agricultural land in the project area, these proposed future land uses are appropriate.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Centennial has prepared a <i>Decommissioning and Rehabilitation Strategy</i> that provides recommended methodologies and management strategies for post-operational closure and rehabilitation.</li> </ul>                                  |
| <i>Groundwater resources</i>              | <ul style="list-style-type: none"> <li>CUS has no hydrogeological connections to surrounding groundwater sources. FUS is subject to groundwater inflows and rainfall above old workings which infiltrates into the storage area. No groundwater extraction is proposed, other than pumping from the FUS and CUS.</li> <li>The transfer of water from FUS and CUS is unlikely to adversely affect the groundwater resources available to licensed groundwater users surrounding the project area.</li> <li>NOW would review groundwater licensing requirements during assessment of the Mandalong Southern Extension Project and proposed Newstan Extension of Mining Project.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>There are no impacts expected on regional groundwater resources or licensed groundwater users.</li> </ul>                                                                                                                                   |
| <i>Greenhouse gas emissions (GHGs)</i>    | <ul style="list-style-type: none"> <li>Scope 1 emissions for the project would be derived from combustion of diesel for both stationary and transport purposes and fugitive emissions from coal stockpiles.</li> <li>Scope 2 emissions relate to the use of electricity provided by commercial generators.</li> <li>Predicted Scope 1 and Scope 2 emissions make up just 0.175% of NSW GHGs, resulting in an undetectable effect on global climate change.</li> <li>Scope 3 emissions include 'indirect emissions', such as combustion of coal by Centennial's domestic and overseas customers to produce electricity and off-site product transport.</li> <li>The upgraded NCSS would include an improved level of automation, progressively undertaken over the life of the project. Centennial would continue to employ mitigation measures and management strategies currently in place at Newstan and Mandalong, in order to reduce energy use and minimise Scope 1 and 2 GHGs.</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>The project would not directly generate an appreciable amount of GHGs.</li> <li>The Department notes that Centennial has a number of energy efficiency initiatives in place, which would be applied to the project activities.</li> </ul>   |
| <i>Aboriginal heritage</i>                | <ul style="list-style-type: none"> <li>The project area is within the lands of the Awabakal people, who were people of the coast, estuaries, lakes and wetlands with an attachment to the rugged sandstone country through the Sugarloaf and Watagan Ranges.</li> <li>An Aboriginal cultural heritage assessment and consultation with the local Aboriginal community was undertaken. This identified 37 Aboriginal heritage sites in the general locality.</li> <li>One Aboriginal heritage item, being a scarred tree, was identified within the Hawkmount Quarry REA. The site would be avoided by the proposed surface works and appropriate measures taken to protect the site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Conditions require preparation and implementation of a Heritage Management Plan that would include measures to protect, monitor and/or manage Aboriginal cultural heritage items.</li> </ul>                                                |



| Issue                   | Potential Impact and Consideration                                                                                                                                                                                                                                  | Recommendation                                                                                                          |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Non-indigenous heritage | <ul style="list-style-type: none"> <li>Two heritage items of local significance were identified - the Great Northern Railway / Garden Suburb to Wyee Railway Line and Eraring Power Station. Both are located outside of the proposed disturbance areas.</li> </ul> | <ul style="list-style-type: none"> <li>There are no sites of non-indigenous heritage that would be impacted.</li> </ul> |

## 7. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of consent for the project (see **Appendix G**).

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- ensure standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the effective ongoing environmental management of the coal logistics operations.

The Department's recommended conditions of consent have been accepted by Centennial.

## 8. CONCLUSION

The Department has assessed the development application, EIS, RTS, Response to RTS Submissions Report, and all agency and public submissions on the project. The Department has carefully considered all potential environmental, social and economic impacts, in accordance with the relevant requirements of the EP&A Act. It has also undertaken an extensive consultation process with agencies and other relevant stakeholders.

The project represents a logical extension to the existing mining operations and would result in a range of significant economic benefits.

The Department considers that residual environmental impacts would be able to be effectively managed within acceptable and established regulatory limits. To this end, the Department has recommended that the project is granted consent, conditional on Centennial complying with a strict regulatory regime, which will ensure that the activities of the coal logistics operations do not result in significant environmental harm, particularly regarding water quality and dust management. Conditions of consent have been formulated following close consultation with relevant Government agencies.

## 9. RECOMMENDATION

It is **RECOMMENDED** that the Executive Director Resource Assessments and Compliance, as delegate for the Minister for Planning:

- **consider** the findings and recommendations of this report;
- **approve** the development application, subject to conditions, under section 89E of the EP&A Act; and
- **sign** the attached Development Consent (**Appendix G**).

*Howard Reed*

Howard Reed

**Director**

**Resource Assessments**

10.8.15

*Oliver Holm*

Oliver Holm

**Executive Director**

**Resource Assessments & Compliance**

17/8/15

## **APPENDIX A – Environmental Impact Statement**

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=5145](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5145)

## **APPENDIX B – Consideration of Environmental Planning Instruments**

### ***Lake Macquarie Local Environmental Plan 2014***

Lake Macquarie LEP 2014 is currently in force over the development site. However, the LEP which applied before the commencement of this instrument is the Lake Macquarie LEP 2004. In line with Clause 1.8A of the Lake Macquarie LEP 2014, it is not applicable to the development site (see Section 4.2 of this report).

### ***Lake Macquarie Local Environmental Plan 2004***

See Section 4.2 of this report.

### ***SEPP (State and Regional Development) 2011 (SRD SEPP)***

The project meets the criteria for classification as State significant development as it is development for the purpose of mining related works (including primary processing plants or facilities for storage, loading or transporting any mineral, ore or waste material) that has a capital investment value of more than \$30 million, which is specified in clause 5(1)(c) of Schedule 1 to the SRD SEPP (see Section 4.1 of this report). The Department is satisfied that the development can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of this SEPP.

### ***SEPP (Mining, Petroleum Production and Extractive Industries) 2007***

Under clause 7 of the Mining SEPP, the development is permissible with consent. Part 3 of the Mining SEPP lists a number of matters that a consent authority must consider before determining a development application for the purposes of mining, including:

- significance of the resource;
- compatibility with other land uses;
- natural resource management and environmental management;
- resource recovery;
- transport; and
- rehabilitation.

However, the provision of the Mining SEPP which requires the significance of the resource to be the consent authority's 'principal consideration' under Part 3 of the SEPP (although not under section 79C of the Act) is currently under review. The Government has proposed that clause 12AA of the Mining SEPP is repealed. The Department has considered the proposed changes to clause 12AA to be a 'draft environmental planning instrument'. The Department is satisfied that the proposed repeal of clause 12AA would have no bearing on the outcomes of the Department's assessment of the project or the conclusions reached regarding its net overall benefits.

### ***SEPP (Infrastructure) 2007***

SEPP (Infrastructure) 2007 requires a consent authority to notify relevant public authorities in relation to developments that may affect public infrastructure or public land. The Department has notified RMS, LMCC and TransGrid). None of these authorities objected to the development, and any matters raised by these authorities have been considered by the Department in its assessment of the application (see Section 6 of this report). Therefore the requirements of this SEPP have been satisfied.

### ***SEPP No. 55 – Remediation of Land***

Mandalong, CES, Newstan and NCSS contain areas of land that are potentially contaminated. Centennial's Phase 1 desktop assessment conducted in December 2010 identified potential contamination associated with fuel storage and handling, as well as equipment storage and maintenance. In February 2012, as an outcome of the Phase 1 assessment, Centennial submitted Contamination Notifications to EPA in accordance with section 60 of the *Contaminated Land Management Act 1997*. In line with the commitments made under those Notifications, Centennial has commenced a Phase 2 assessment of the CES site. Upon completion of that assessment, Centennial would develop remediation plans in consultation with EPA and an accredited contaminated land auditor to address any contamination issues. EPA confirmed acceptance of this approach in 2012.

The Department considers that contamination can be managed, in order to ensure the risk of contamination to other areas is not increased as a result of the project. Consequently, subject to appropriate conditions, the Department is satisfied that the development is consistent with the aims, objectives and provisions of this SEPP.

### ***SEPP No. 44 – Koala Habitat Protection (SEPP 44)***

SEPP 44 requires the consent authority to consider the presence of any core, or potential, Koala habitat. The EIS includes a fauna assessment which identified that only the undeveloped land to the north of NCSS was found to comprise 'potential koala habitat' due to the presence of feed tree species, but no local populations of Koalas were found to occur in the development area. The Department is satisfied that the development is unlikely to significantly affect core Koala habitat.

***SEPP No. 33 – Hazardous and Offensive Development (SEPP 33)***

SEPP 33 governs the assessment of development for the purpose of development classified as 'potentially hazardous industry' or 'potentially offensive industry'. The SEPP aims to ensure that in determining whether a development falls under this classification, any measures proposed to be employed to reduce the impact of the development are taken into account, as well as that the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact. The Department is satisfied that the development is not potentially hazardous or offensive and that the development is generally consistent with the aims, objectives and provisions of SEPP 33.

***SEPP No. 14 – Coastal Wetlands (SEPP Coastal Wetlands)***

SEPP 14 aims to ensure the preservation and protection of coastal wetlands. SEPP 14 wetlands occur in areas east and southeast of the development area, at the confluences of watercourses and Lake Macquarie. These include the fringes of Fennel Bay and areas downstream of NCSS (ie Muddy Lake) and CES (See Section 6.1).

***Hunter Regional Environmental Plan (REP) 1989 (Heritage)***

This REP requires the consideration of potential impacts from proposed developments on various heritage items and values within the Hunter Region. However, there are no heritage items or conservation areas identified by this REP that are within the development area. Consequently, the Department is satisfied that the project is consistent with the aims, objectives and provisions of this REP.

## **APPENDIX C – Submissions received in response to EIS exhibition**

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=5145](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5145)

## **APPENDIX D – Response to Submissions**

[https://majorprojects.affinitylive.com/public/a9cd30d1bdc5692a42c048b001c562f1/Northern%20Coal%20Logistics%20Project\\_Response%20to%20Submissions.pdf](https://majorprojects.affinitylive.com/public/a9cd30d1bdc5692a42c048b001c562f1/Northern%20Coal%20Logistics%20Project_Response%20to%20Submissions.pdf)

## **APPENDIX E – Agency Comments on Response to Submissions (RTS)**

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=5145](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5145)

## **APPENDIX F – Applicant's Response to RTS Submissions Report**

[https://majorprojects.affinitylive.com/public/440319ce4d93175669c538fe67391d20/NCLP\\_Response%20to%20Agency%20Review%20of%20RTS.pdf](https://majorprojects.affinitylive.com/public/440319ce4d93175669c538fe67391d20/NCLP_Response%20to%20Agency%20Review%20of%20RTS.pdf)

[https://majorprojects.affinitylive.com/public/17ca5bd9c16ede9aad2810a8b0b2314e/NCLP\\_FBA%20Biodiversity%20Assessment%20Report.pdf](https://majorprojects.affinitylive.com/public/17ca5bd9c16ede9aad2810a8b0b2314e/NCLP_FBA%20Biodiversity%20Assessment%20Report.pdf)

## **APPENDIX G – Recommended Development Consent**