MAJOR PROJECT ASSESSMENT
Tasman Extension Project
(SSD 4962)

Environmental Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979
March 2013

Cover Photo: The current pit-top at the Tasman Underground Coal Mine

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NSW Department of Planning and Infrastructure
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EXECUTIVE SUMMARY

The Tasman Underground Mine is located approximately 20 kilometres (km) west of Newcastle within the Cessnock City and Lake Macquarie City local government areas. The mine is owned and operated by Newcastle Coal Company Pty Limited (NCC) - a wholly owned subsidiary of Yancoal Australia Limited.

The mine currently operates under a 2006 Ministerial consent that allows NCC to extract up to 975,000 tonnes of run-of-mine (ROM) coal using underground mining methods, and transport this by public roads to the Bloomfield Coal Handling and Preparation Plant until 2015. NCC is now proposing an extension to the west of the existing underground operations for the next 17 years. The proposed development (known as the *Tasman Extension Project*) would increase the rate of coal extraction to 1.5 million tonnes of ROM coal a year, and involve construction of new surface facilities approximately 3 kilometres north of the existing surface facilities.

The Department received 21 submissions on the proposal: 16 from public authorities, 3 from special interest groups, 1 from the Community Consultative Committee, and 1 from a local resident. None of the government authorities objected to the proposal, and only 2 submissions objected to the proposal. The key concerns raised in submissions related to continued transport of coal on public roads, and the impacts of subsidence on biodiversity and Aboriginal heritage.

The proposal is "State Significant Development" under Section 89C of the *Environmental Planning & Assessment Act 1979* (EP&A Act), and the Department has carried out a detailed assessment of the merits of the proposed development in accordance with the requirements of Section 79C of the EP&A Act.

The proposed development would increase coal transport on public roads from 4,000 to 6,200 tonnes a day. The traffic assessment indicates that there is sufficient capacity in the existing road network to cater for the proposed increase. The Department recognises that road transportation of coal is a sensitive issue for the general public. However, it is important to note that the total volume of traffic along the coal haulage route would reduce significantly after the opening of the Hunter Expressway later in 2013. The Department accepts that coal transport by public road is the only economically viable method to deliver coal to the Bloomfield CHPP, but has recommended a range of measures to minimise traffic and road noise impacts, including 6 monthly audits to assess the safety and performance of the local road network.

The mining extension area is largely located beneath the Sugarloaf State Conservation Area and the Heaton State Forest. There are a range of sensitive natural and built features within the extension area, including extensive cliff lines, steep slopes, a number of houses, transmission lines and other public infrastructure. To protect these features, NCC is proposing to apply subsidence control zones which would avoid or limit subsidence impacts on sensitive surface features. This approach has been successfully applied at the existing Tasman Underground Mine and the nearby Abel Underground Mine. With the application of the subsidence control zones, the Department is satisfied that any subsidence impacts would be minor and could be readily repaired or remediated if necessary.

The proposed development would result in the removal of 11.2 hectares of native vegetation, including 8.9 hectares of an Endangered Ecological Community (EEC) and 417 individual plants of Heath Wrinklewort which is listed as "vulnerable" under the *Threatened Species Conservation Act 1995*. The assessment indicates that the clearing of the EEC and the Heath Wrinklewort plants would *not* result in a significant impact as both are well represented in the region. NCC is proposing a biodiversity offset strategy to compensate for the impacts of the development, including a 42 hectare area of good quality native woodland approximately 20 km west of the mine. With the implementation of the proposed biodiversity offset measures, the Department believes that the proposal has the potential to enhance regional biodiversity values in the medium to long term.

The Department has assessed the potential impacts of the proposed development on other matters, including Aboriginal heritage, surface water, groundwater, aquatic ecology, visual amenity and air quality. The Department is satisfied that any impacts relating to these matters would not be significant.

Overall, the Department is satisfied that the proposed development would not result in any significant additional environmental impacts when compared to the current operations at the mine, and that any residual impacts can be managed, mitigated or offset through appropriate conditions of consent.

To this end, the Department has reviewed the current development consent for the Tasman Underground Mine, and has strengthened and updated the conditions to be consistent with other recently approved underground coal mining operations in NSW. Particular regard has been given to the protection of natural and built features from potential subsidence impacts, strict management and monitoring of road transportation of coal, and minimising traffic noise.

The proposed development would also result in a range of ongoing social and economic benefits including:

- employment of 150 employees for another 15 years;
- additional capital investment of $61 million; and
- provision of $41 million of royalties to the NSW Government.

The Department is satisfied that these benefits can be realised without any significant adverse environmental impacts, and hence the proposed development is in the public interest, and should be approved subject to the recommended conditions of consent.

1. BACKGROUND

1.1 Introduction

The Tasman Underground Coal Mine (Tasman Mine) is located approximately 20 km west of Newcastle, in the local government areas (LGAs) of Cessnock and Lake Macquarie (see Figure 1). The mine is owned and operated by Newcastle Coal Company Pty Limited (NCC) - a wholly owned subsidiary of Yancoal Australia Limited.

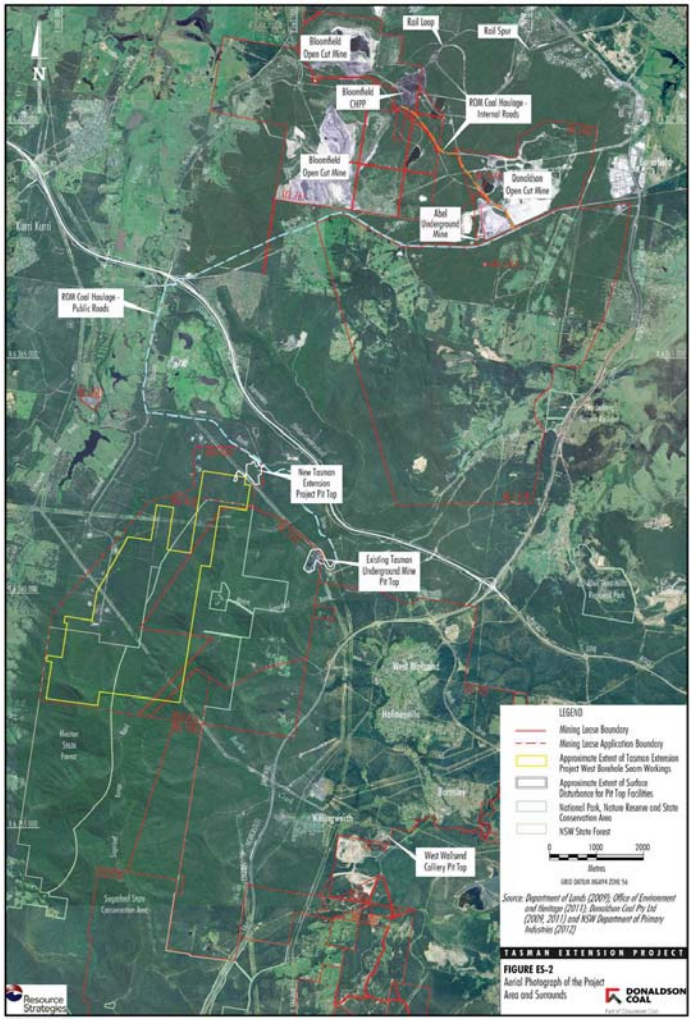

Figure 1: *Location of the Tasman Mine*

1.2 Existing Operations

The Tasman Mine was granted development consent by the then Minister for Planning in May 2006 (DA-274-9-2002), and underground mining commenced in September 2006. The extent of the approved underground mining footprint and associated pit top facilities are shown in Figure 2.

The existing consent allows NCC to:

- extract up to 975,000 million tonnes per annum (Mtpa) of ROM coal using “bord and pillar” underground mining methods until 2015;
- stockpile ROM coal at the pit top facilities; and
- transport the coal on public roads (George Booth Drive and John Renshaw Drive) to the Bloomfield Coal Handling and Preparation Plant (CHPP) via the Abel Underground Mine approximately 16 km north of the mine.

The subsequent receipt, processing and the transportation of product coal by rail to the Port of Newcastle is approved under the project approval for the Abel Underground Mine (05_0136).

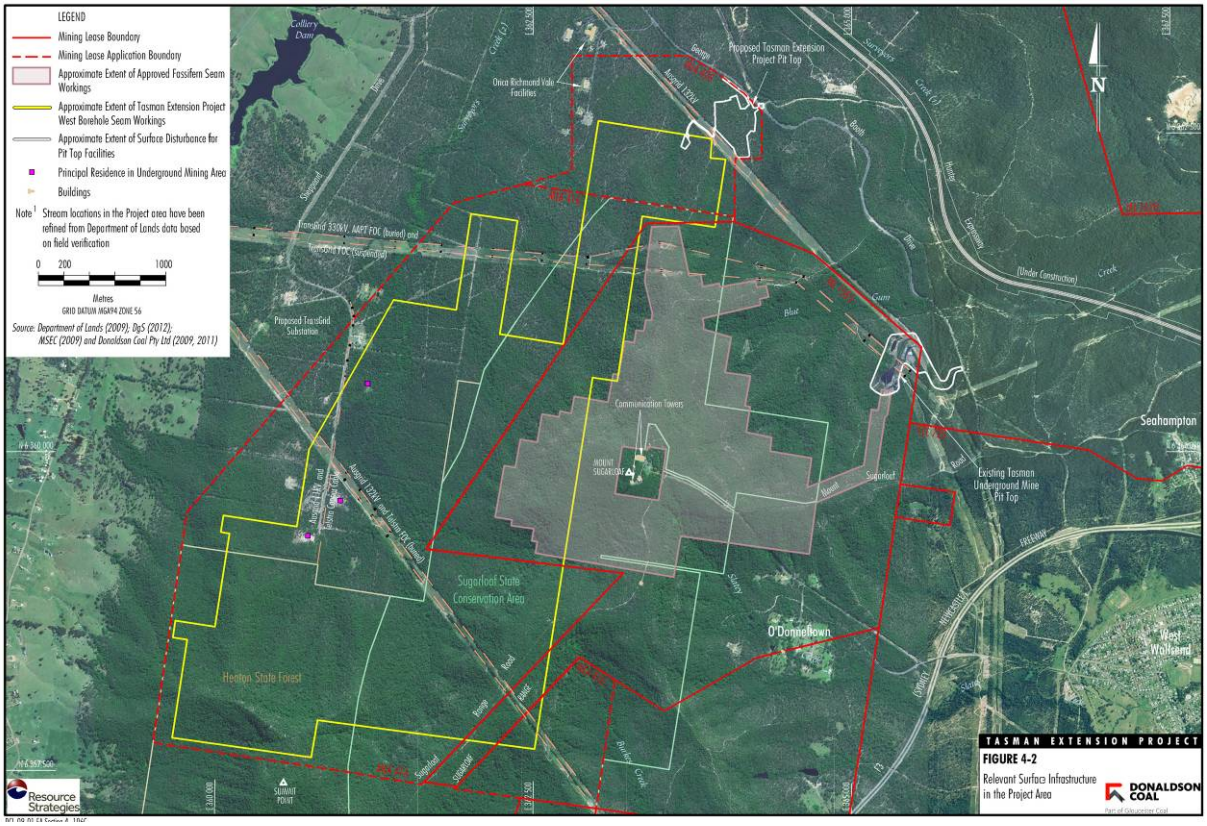

Figure 2: *Existing and Proposed Underground Mining Footprint*

2. PROPOSED DEVELOPMENT

2.1 Tasman Extension Project

NCC is now proposing to expand the existing Tasman Underground Mine and develop new pit-top facilities. The proposed development (known as the *Tasman Extension Project*) involves (see Figures 3 and 4):

- continuing the existing mining, stockpiling and transportation activities at the mine until the end of 2014;
- expanding the underground operations of the Tasman Mine to extract up to a combined total of 1.5 million tonnes of ROM coal a year (Mtpa) from the Fassifern and West Borehole Coal Seams using bord and pillar extraction methods;
- extending the life of the mine until 2029 (an additional 17 years of operations);
- developing new pit-top facilities 3 km north of the existing pit-top facilities;
- increasing the ROM coal transportation rate on public roads to the Bloomfield CHPP from 4000 to 6,200 tonnes per day;
- decommissioning the existing pit-top facilities; and
- rehabilitating the site.

Extraction of coal from the Fassifern Coal Seam would continue in the existing approved mine footprint until the end of 2014. The existing surface facilities would then be decommissioned and rehabilitated, and the new pit top facilities used for the stockpiling and loading of coal extracted from the West Borehole Coal Seam. However, the mine plan indicates that there would be simultaneous operations at both pit-tops during the 2nd year of operations (i.e. 2014).

The existing operations at the Tasman Mine would continue to be regulated under the existing Ministerial development consent (DA-274-9-2002) until the construction of the new pit-top commences. At this time, NCC would be required to surrender its existing consent, and operations at both sites would be regulated under the new development consent until mining in the Fassifern Coal Seam ceases at the end of 2014. Obligations associated with the decommissioning, rehabilitation and revegetation of the existing pit-top would be transferred to the new consent.

A separate application to modify the Abel project approval to cater for handling, processing and transportation of the increased production at the Tasman Mine has been lodged with the Department (05_0136 MOD 3), and is currently on public exhibition.

The proposed extension would employ 150 full time workers (an increase of 40 compared to existing operations) and involve an additional capital investment of $61 million.

The key components of the proposed extension are summarised in Table 1 (see below), and fully described in NCC's Environmental Impact Statement (EIS) (see Appendix E).

2.2 Location and Setting

The Tasman Mine is located approximately 1 km west of the Sydney-Newcastle Freeway, and about 2 km west of the urban area of West Wallsend (see Figure 1). The mine is located in the Newcastle Coalfield, where a number of open cut and underground mines exist to the north and south of the mine (e.g. West Wallsend Colliery, Abel Underground Mine, Bloomfield and Donaldson Open Cut Mines). An old underground mine (the Stockrington Colliery) is located in the eastern portion of the extension area that is being considered under this application. This Colliery closed in the early 1980's, but would be used by NCC for groundwater storage.

The proposed underground extension covers approximately 940 hectares predominantly beneath the Sugarloaf State Conservation Area (SCA) (which was declared by the NSW Government in 2007) and to a lesser extent beneath the Heaton State Forest. Some of the natural features that occur in the extension area include:

- extensive rocky cliff lines and associated steep "talus" slopes;
- various minor ephemeral tributaries of Surveyors Creek (which eventually flows into the Hunter River); and
- 5 endangered ecological communities (EECs), including 2 EECs that are considered groundwater dependent ecosystems (GDEs).

Parts of the proposed extension are located beneath privately owned land, including 3 privately owned residences to the west of the extension area (see Figure 2). There are also a number of rural-residential properties in O'Donneltown to the southeast of the Tasman Mine and along the coal haulage route, particularly George Booth Drive. Two major electricity transmission lines (Transgrid 330kV and Ausgrid 132kV) traverse the proposed extension area.

Access to the existing surface facilities at the Tasman Underground Mine is via George Booth Drive. The Hunter Expressway, which runs parallel to George Booth Drive, is currently under construction and due for completion in late 2013.

The existing surface facilities and the land proposed for the new surface facilities are located on land owned by the Newcastle Coal Company, except for a small area that is owned by Orica Australia. The development area is almost entirely comprised of native forest, and there are no areas of high value agricultural land in the immediate vicinity of the development.

Table 1: *Key Component of the Tasman Extension Project*

Component	***Tasman Extension Project***
Mine Life	• 17 years (i.e. until 2029)
Coal Production	• 1.5 Mtpa of ROM coal
Mining and Reserves	• Continued mining in the Fassifern Coal Seam until the end of 2014. • Extraction of 18.7 Mt of coal from the West Borehole Coal Seam
Mining Method	• Bord and pillar mining (with a combination of total and partial pillar extraction)
Coal transportation	• Transportation of coal via George Booth Drive and John Renshaw Drive to the Bloomfield CHPP • Transportation of up to 4,000 tonnes of ROM coal per day (prior to the opening of the Hunter Expressway) • Transportation of up to 6,200 tonnes of ROM coal per day (following the opening of the Hunter Expressway)
Infrastructure	• Continued use of infrastructure at the existing pit-top until the completion of mining in the Fassifern Coal Seam at the end of 2014 • Construction of a range of infrastructure at the new pit-top facility including: - administration and workshop buildings - conveyor and ROM coal handling infrastructure - ROM coal stockpile - upcast ventilation shaft - water drainage infrastructure, including a 5 megalitre (ML) mine water storage dam and 4 ML surface runoff storage dam - visual bund adjacent to George Booth Drive - access road and roundabout on George Booth Drive - washdown area and wheelwash
Hours of Operation	• Mining – 24 hours a day, 7 days a week • Transportation of Coal – - 7.00 am to 10.00 pm Monday to Friday - No coal transport on weekends or public holidays
Biodiversity Offsets	• 42 hectare offset located approximately 20 km west of the mine. The offset comprises remnant native vegetation, including 20 hectares of *Lower Hunter Spotted Gum-Ironbark Forest* Endangered Ecological Community (EEC). • $25,000 annual contribution to Office of Environment and Heritage during the life of the development for vegetation management, revegetation and rehabilitation works in the Sugarloaf State Conservation Area. • Translocation and research program for Heath Wrinklewort (*Rutidosis heterogama*)
Rehabilitation	• Following the completion of underground mining in the Fassifern Coal Seam, the existing pit-top would be decommissioned and rehabilitated to a nil maintenance, geotechnically stable, free draining landform consistent with the surrounding landscape that would vegetated with native woodland for conservation purposes. • Following the completion of underground mining in the West Borehole Coal Seam (i.e. by 2029), the new pit-top facilities would be decommissioned, rehabilitated and revegetated with native woodland. • Any surface subsidence impacts on built and natural features would be progressively repaired, rehabilitated and/or restored to meet applicable completion criteria in approved Extraction Plans.
Operational Workforce	• 150 employees
Capital Investment Value	• $61 million

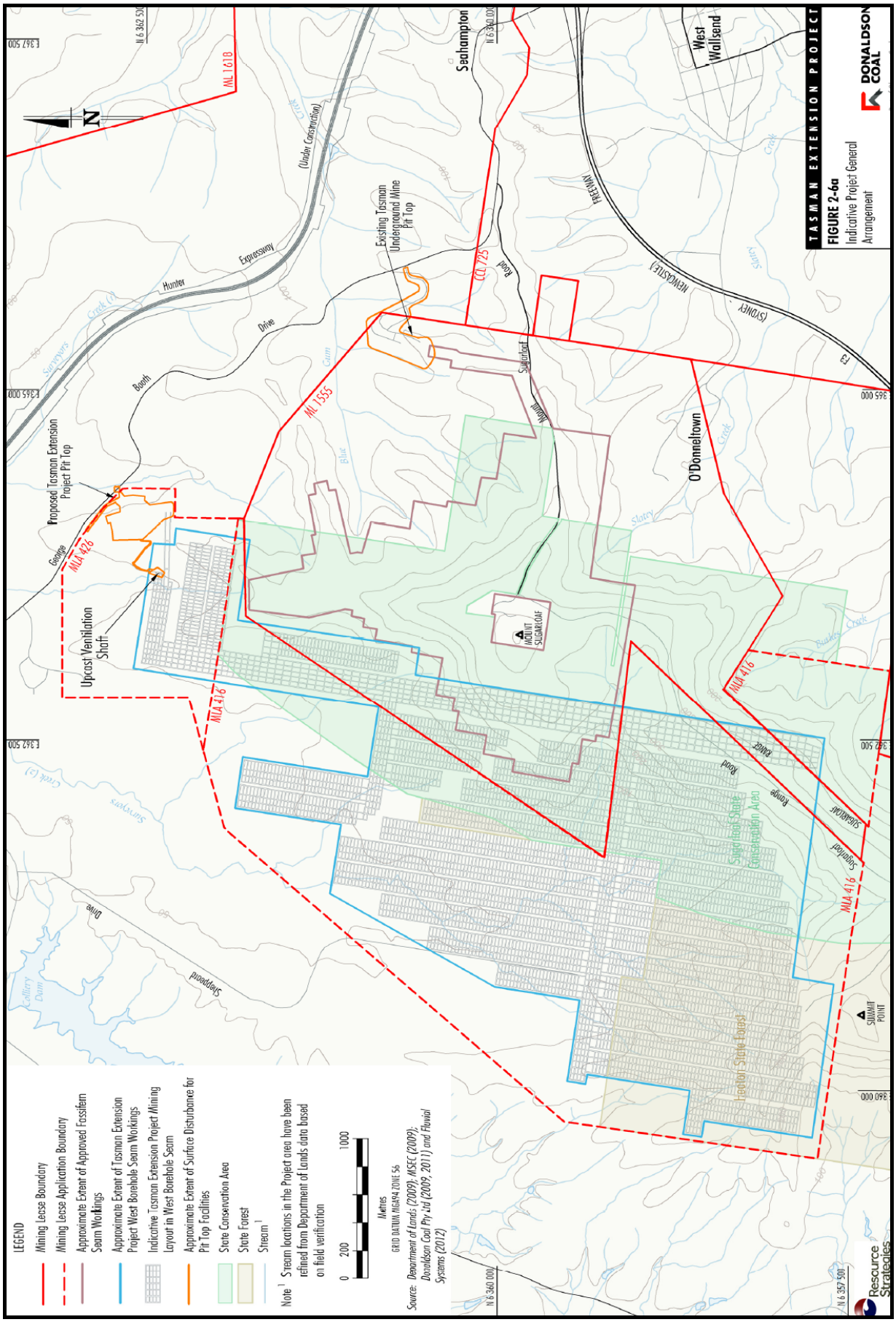

Figure 3: *Tasman Extension Project Layout*

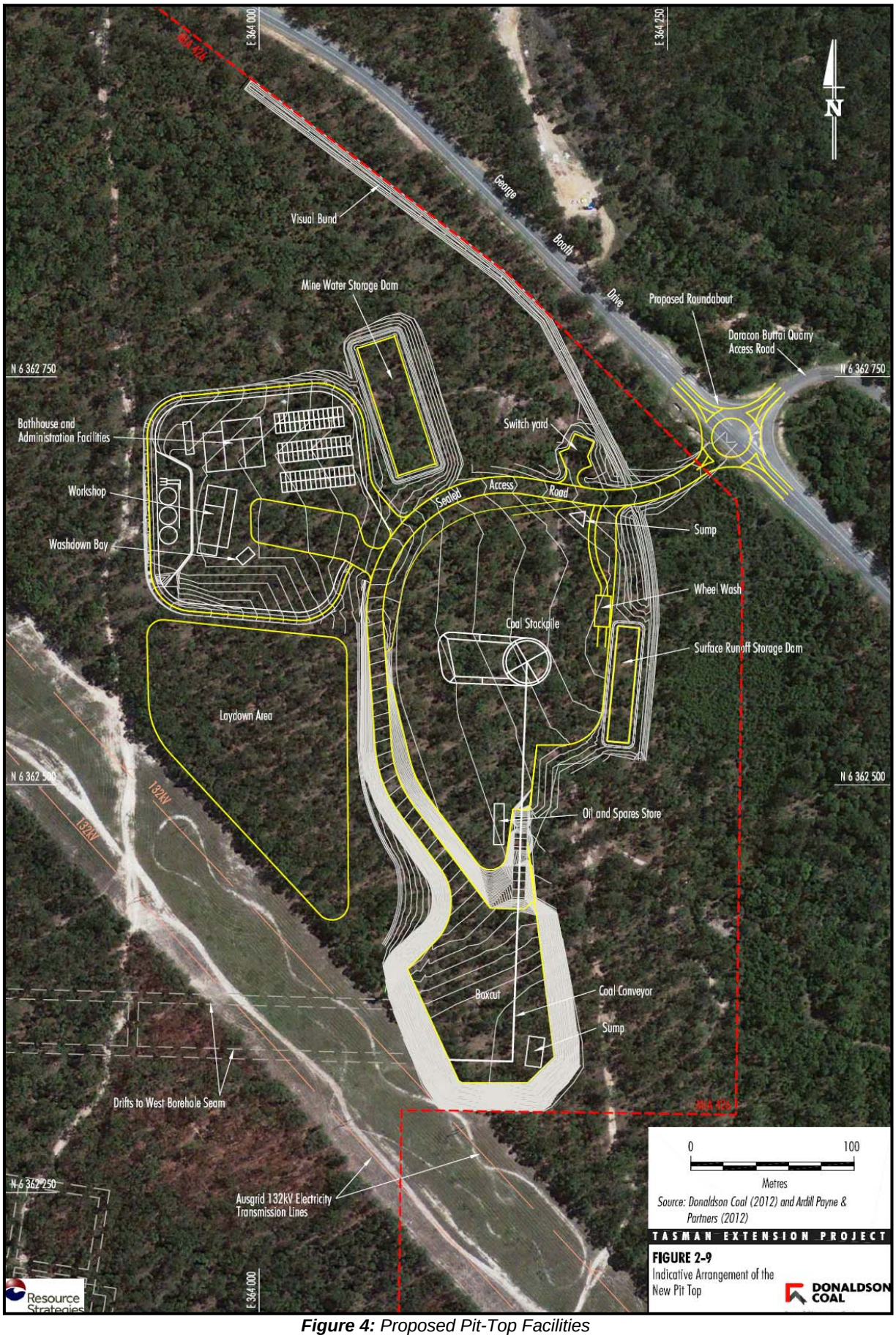

Figure 4: *Proposed Pit-Top Facilities*

3. STATUTORY CONTEXT

3.1 State Significant Development

The proposed development is declared to be "State Significant Development" under Section 89C of the *Environmental Planning & Assessment Act 1979* (EP&A Act) as it is "development for the purposes of coal mining", which is specified in Clause 5 of Schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011.*

Consequently, the Minister for Planning and Infrastructure is the consent authority for the development. However, the development application falls under the Minister's delegation to the Department dated 27 February 2013 as the relevant Councils have not objected to the proposed development, a political disclosure statement in regard to donations has not been made, and there were less than 25 public submissions. Consequently, the Executive Director, Development Assessment Systems and Approvals, may determine the development application under delegation.

3.2 Permissibility

The proposed development is located in the Cessnock and Lake Macquarie LGAs. The applicable zoning of the land within the development boundary is shown in Figure 5, and the permissibility of the various components of the development under the *Cessnock Local Environmental Plan 2011* (Cessnock LEP) and the *Lake Macquarie Local Environmental Plan 2004* (Lake Macquarie LEP) are summarised in Table 2.

Table 2: *Permissibility of Project Components*

Zone	Project Component	Permissible
Cessnock LEP		
RU2 (Rural Landscape)	• New Pit-Top	*Yes*
"Deferred matter"	• New Pit-Top and Ventilation Shaft • Underground mining	*Yes*
RU3 (Forestry)	• Underground Mining	*No*
SP2 (Infrastructure)	• Roundabout on George Booth Drive	*Yes*
E1 (National Parks and Nature Reserves)	• Underground Mining	*No*
Lake Macquarie LEP		
1(1) (Rural Production)	• Underground Mining	*Yes*
7(2) (Conservation (Secondary)	• Existing Pit-Top	*No*
7(2) (Environmental (General))	• Underground Mining	*No*
8 (National Park)	• Underground Mining	*No*

Table 2 shows that under the Cessnock LEP, the proposed development is permissible in the RU2 (Rural Landscape) zone, SP2 (Infrastructure) zone, and in the areas to which the "Deferred Matter" applies, but is prohibited in the other applicable zones. Under the Lake Macquarie LEP, the proposed development is permissible with consent in the 1(1) (Rural Production) zone, but is prohibited in the other zones.

However, the *State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007* (Mining SEPP) applies to all land within NSW, and Clause 5(3) gives the Mining SEPP primacy where there is any inconsistency between the provisions of the SEPP and the provisions of other EPIs (subject to limited exceptions), including the Cessnock LEP and the Lake Macquarie LEP.

Clause 7 of the Mining SEPP sets out the types of mining activities that are permissible with development consent despite any provisions to the contrary in the applicant LEPs. Under Clause 7(1)(a), development for the purposes of *underground mining* may be carried out on any land with development consent. The Department considers that the entire development (including the existing and proposed surface facilities) would be carried out for the purposes *underground mining*. Consequently, all components of the proposed development are permissible with consent.

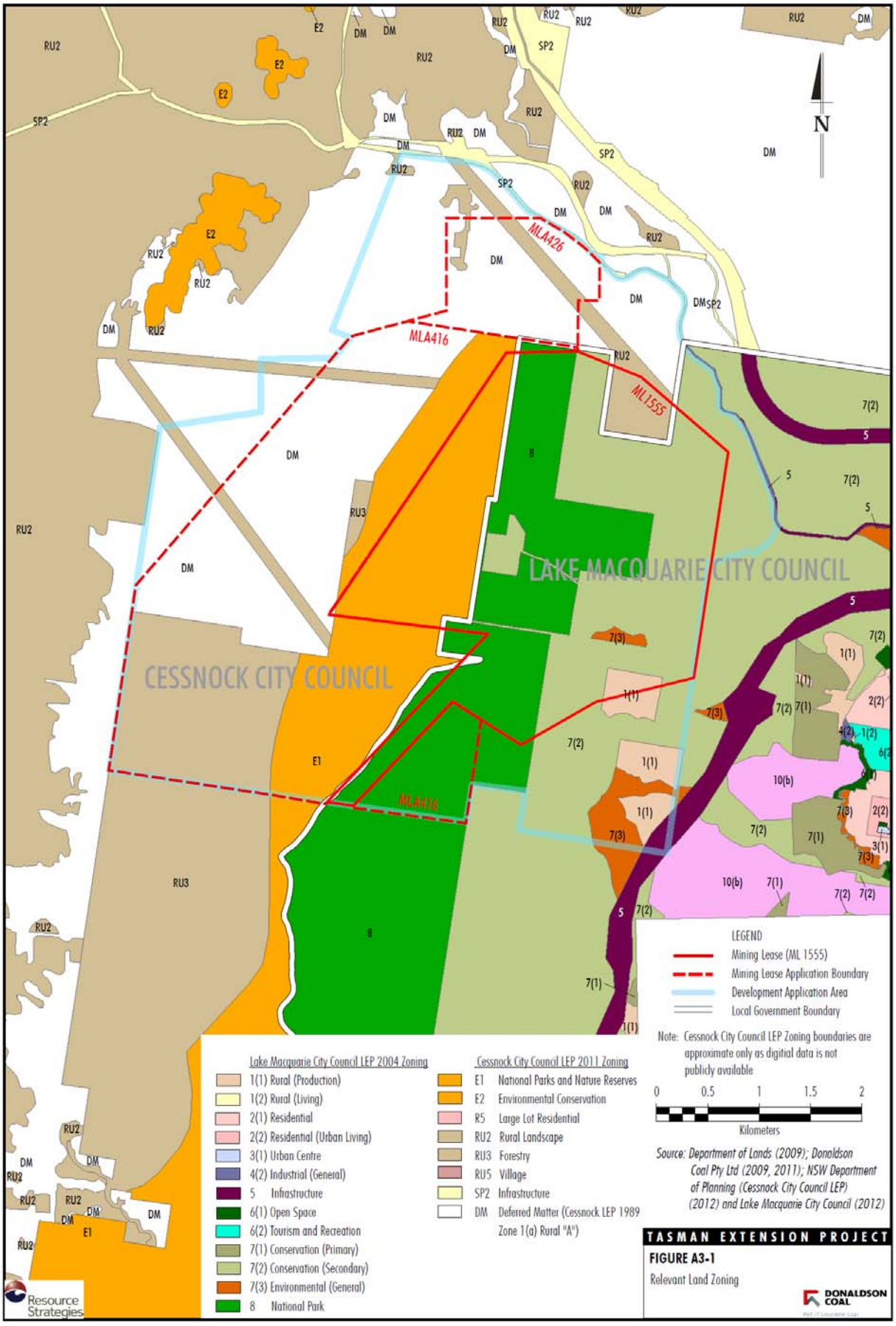

***Figure 5**: Land Use Zoning*

3.3 Environmental Planning Instruments

NCC has undertaken a full and thorough review of the relevant provisions of the various Environmental Planning Instruments (EPIs) that apply to the proposed development (see Attachment 3 of the EIS), including:

- *Cessnock LEP* and *Lake Macquarie LEP*;
- *SEPP (State and Regional Development) 2011*;
- *SEPP No.33 – Hazardous and Offensive Development*;
- *SEPP No.44 – Koala Habitat Protection*;
- *SEPP No.55 – Remediation of Land*;
- *SEPP (Infrastructure) 2007*; and
- *SEPP (Mining, Petroleum and Extractive Industries) 2007*.

The Department has considered NCC's review and undertaken its own assessment of these matters (see Section 5 and Appendix B). Based on this assessment, the Department considers that the proposed development can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of these instruments, subject to a range of mitigation, monitoring and management measures that have been incorporated in the recommended conditions of consent (see Appendix A).

3.4 Landowner's Consent

The development application also includes land within the Sugarloaf SCA which is reserved under the *National Parks and Wildlife Act 1974*. Consequently, in accordance with Clause 49 of the *Environmental Planning and Assessment Regulation 2000*, the consent of the Minister for the Environment is required prior to the determination of the application. The Minister for Environment provided landowner's consent on 21 December 2012.

3.5 Integrated Approvals

Under Section 89J(1) of the EP&A Act, a number of approvals are not required to be separately obtained for the proposal. These include:

- various approvals relating to heritage required under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1997*;
- an authorisation under the *Native Vegetation Act 2003* for the clearing of native vegetation; and
- certain water approvals under the *Water Management Act 2000.*

Under Section 89K of the EP&A Act, a number of further approvals are required, but must be substantially consistent with any development consent for the proposal. These include:

- variations to the existing mining lease under the *Mining Act 1992*;
- variations to the existing environment protection licence under the *Protection of the Environment Operations Act 1997*;
- a permit under Section 144 of the *Fisheries Management Act 1994;*
- an approval under Section 15 of the *Mine Subsidence Compensation Act 1961*; and
- an approval for road intersection construction under Section 138 of the *Roads Act 1993*.

3.6 Other Approvals

NCC currently holds an existing groundwater licence under the *Water Act 1912*. A variation to this licence or an additional licence would be required under Part 5 of the *Water Act 1912* for groundwater make in the underground workings.

NCC has advised that the proposed development has not been declared a *controlled action* under the *Environment Protection and Biodiversity Conservation Act 1999*, and therefore does *not* require approval from the Commonwealth Minister for the Environment.

4. CONSULTATION

Under Section 89F of the EP&A Act, the Director-General is required to publicly exhibit the development application and the Environmental Impact Statement (EIS) for at least 30 days. The Department:

- publicly exhibited the EIS for the Tasman Extension Project from 3 July 2012 to 16 August 2012;
- advertised the exhibition of the EIS in the Newcastle Herald and the Cessnock Advertiser newspapers;
- notified relevant State government authorities and Councils;
- notified relevant electricity supply and transmission authorities, in accordance with *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP);
- notified relevant road authorities, in accordance with the Mining SEPP; and
- notified registered Aboriginal stakeholder groups, in accordance with the Lake Macquarie LEP.

In undertaking these processes, the Department satisfied the notification requirements of Section 89F of the EP&A Act, the Mining SEPP, the Infrastructure SEPP and the Lake Macquarie LEP.

The Department received a total of 21 submissions during the exhibition period:

- 16 from public authorities, including Cessnock and Lake Macquarie Councils;
- 3 from special interest groups;
- 1 from the chairman of the mine's Community Consultative Committee (CCC); and
- 1 submission from a local resident.

None of the government authorities objected to the proposal, but raised concerns about the potential environmental impacts, and recommended a number of conditions be imposed should the proposal be approved. One of the interest groups (Awabakal Descendents Traditional Owners Aboriginal Corporation) and the local resident objected to the proposal. The chairman of the Community Consultative Committee and one of the special interest groups (CFMEU) supported the proposal. A summary of the issues raised in submissions is provided below. A copy of the submissions is provided in Appendix C.

The key concerns raised in public submissions related to:

- traffic and transport impacts including, the effect of the proposed increase in coal truck movements on the local road network, safety of access to properties on the coal haulage route, and ongoing maintenance of public roads along the coal haulage route;
- potential subsidence impacts on natural features (including watercourses and cliff lines) and built infrastructure (including houses and transmission lines);
- biodiversity impacts associated with the proposed clearing of 11.2 hectares of native woodland, including 8.9 hectares of an EEC, and the adequacy of the proposed biodiversity offset strategy; and
- potential impacts on Aboriginal cultural heritage.

NCC provided a detailed response to the issues raised in submissions in September 2012 (see Appendix D), which has been considered in the Department's assessment of the development in Section 5 below.

5. ASSESSMENT

In assessing the merits of the proposed development, the Department is required to consider:
- the provisions of all relevant EPIs;
- issues raised in submissions;
- the likely impacts of the development;
- the suitability of the site;
- the public interest;
- the objects of the EP&A Act, including Ecologically Sustainable Development (ESD).

To address these matters, the Department has considered a range of documentation, including:
- the EIS for the proposed development;
- conditions of consent for the existing Tasman Underground Mine;
- the submissions made on the proposed development, and NCC's response to theses submissions;
- additional information provided by NCC during the assessment process; and
- relevant EPIs, policies and guidelines.

The findings of the Department's assessment are summarised below.

5.1 TRAFFIC

A Road Transport Assessment was undertaken for the proposed development by Halcrow in accordance with the *Guide to Traffic Generating Developments* (Appendix H of the EIS). The assessment focuses on the existing and future performance of the road network along the approved coal haulage route to the Abel Underground Mine.

The existing 16 km coal haulage route follows George Booth Drive north from the existing pit-top to John Renshaw Drive, and west along John Renshaw Drive to the Abel Underground Mine access road. George Booth Drive and John Renshaw Drive are currently both classified as State Roads, and the intersection between these roads is governed by a roundabout. There are also 16 driveways along George Booth Drive that provide access to rural-residential properties (see Figure 6).

Alternatives to Road Transport

The EIS incorporates a detailed cost benefit analysis of alternatives to road transport of coal undertaken by Gillespie Economics (Appendix M of the EIS). This analysis focused on the installation of a coal conveyor from the pit-top to the Bloomfield CHPP, and restriction of coal transportation to the existing approved rate (i.e. 4,000 tonnes of ROM coal per day). Alternative transport routes to the Bloomfield CHPP on public roads were also considered, although not as part of the detailed cost benefit analysis.

When compared to the proposed base case, the findings of the cost benefit analysis indicate:
- a coal conveyor would impose at least an additional $29 million to the cost on the development; and
- capping road transport to current levels would result in a net cost to the development of $18 million due to lower annual production rates and delays in recovering capital costs.

These additional costs would have significant implications for the viability of the development given the total net production benefit of the development is $87 million.

Two alternative coal haulage routes were considered qualitatively in the EIS - turning south along George Booth Drive and using either the Hunter Expressway or the F3 Freeway north to John Renshaw Drive. These alternatives were not considered viable because they would increase the overall length of the trip to the Bloomfield CHPP considerably, and hence the haulage costs of transporting coal to markets. They would also have the potential to adversely affect other local residents in the area who are currently unaffected by the mine (e.g. residents in Seahampton).

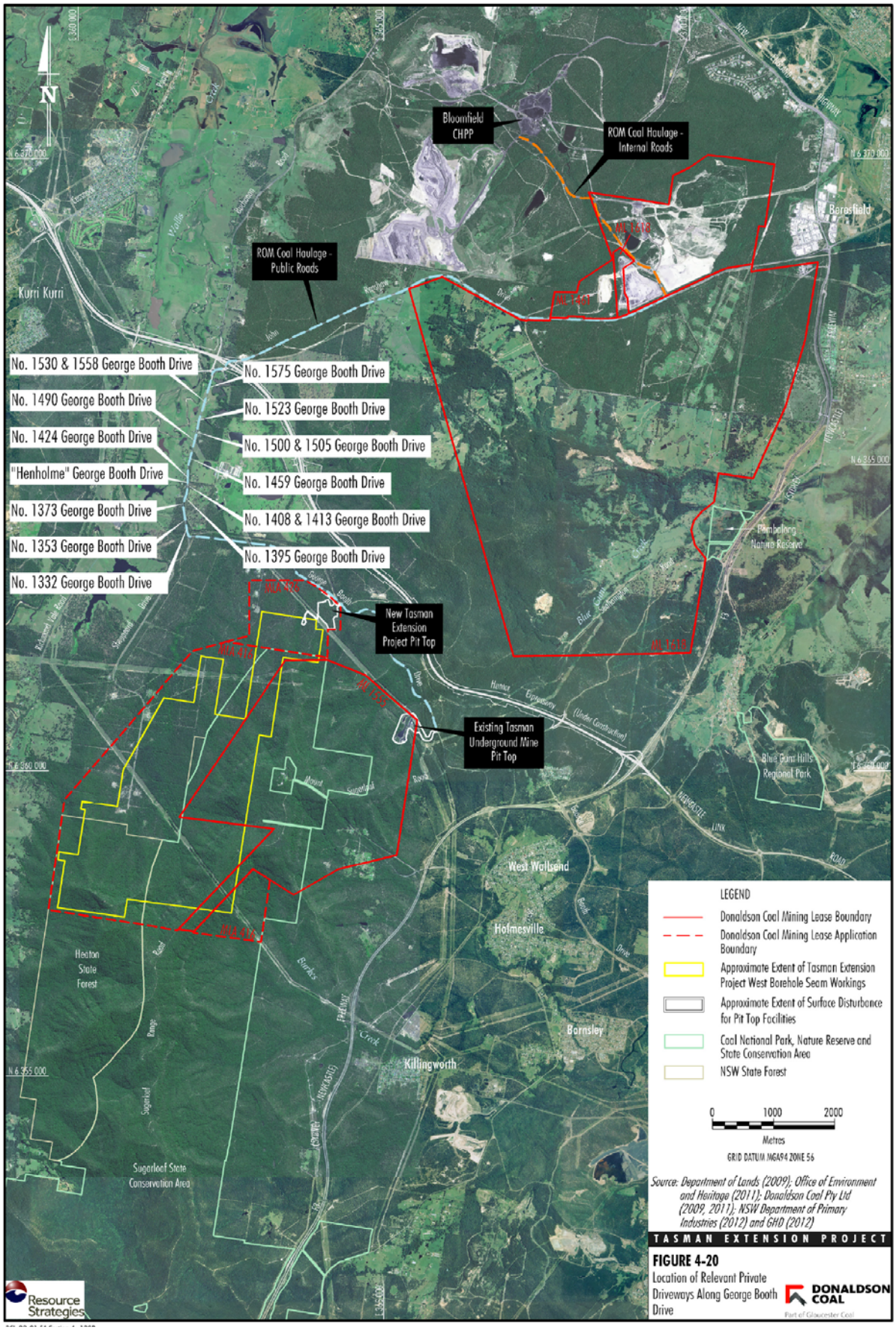

Figure 6: *Coal Haulage Route & Private Driveways*

The Department accepts the arguments made by NCC. While it acknowledges that coal haulage on public roads is not the preferred option from an amenity, safety and environmental perspective, it is satisfied that in this case, there are no other feasible alternatives if the development is to proceed on a financially viable basis. The Department also notes that NCC has already invested in a range of road improvements to facilitate coal haulage along the existing route, and that the proposed route is the shortest available to access the Bloomfield CHPP (which is adjacent to the nearest rail loading facility with access to the Port of Newcastle).

Traffic Generation

During the construction of the new pit-top facilities, waste rock would be removed and transported along the coal haulage route for emplacement at the Donaldson Open Cut Mine. The construction of the new pit-top facilities would be completed in the first year of the development, but the development has been designed to ensure that the total number of truck movements along the haulage route for this period would not increase (i.e. no more than a total of 236 truck movements per day).

NCC is also proposing an alternative for the emplacement of waste rock at the nearby Daracon Quarry. Under this proposal, waste rock would be transported from the new pit-top across George Booth Drive via the newly constructed roundabout to the adjacent quarry access road. The advantage of this proposal is that it avoids the need to transport the waste rock on public roads. It would also allow the transportation of the full allocation of coal during the construction period (i.e. up to 4,000 tonnes per day).

For these reasons, the Department supports this alternative and has provided flexibility in the development consent to allow this to occur. However, the Department notes that Daracon would also be required to modify its development consent with Cessnock City Council to accept the waste rock from the Tasman Mine. Regardless of which option is implemented, the Department notes that there would be no increase in traffic above the existing approved levels at the Tasman Underground Mine, and hence there would be no significant additional impacts on the road network during the construction period.

In regard to operations, the existing and proposed traffic generation is summarised in Table 3.

Table 3: *Heavy Vehicle Traffic Generation – Existing and Proposed (excludes Saturdays)*

	Existing	***Proposed***
Annual Tonnage of ROM Coal (Mtpa)	0.975	1.5
Daily Tonnage of ROM Coal (t)	4,000	6,200
Daily Trucks Movements	236	356
Maximum Hourly Truck Departures	12	20
Daily Heavy Vehicles Movements on George Booth Drive	972	439*
Proportion of Heavy Vehicles from Tasman Underground Mine	24%	81%

**Predicted decrease in heavy traffic volumes of George Booth Drive once Hunter Expressway commences*

As can be seen from Table 1, the existing approval for the Tasman Underground Mine allows NCC to transport up to 4000 tonnes of ROM coal per day along the coal haulage route. This equates to a maximum of 236 coal truck movements each day (and up to a maximum of 12 truck departures per hour). This represents about 24% of the heavy vehicle traffic on George Booth Drive and about 12% on John Renshaw Drive.

Following completion of the construction work for the new facilities, and the opening of the Hunter Expressway (expected by the end of 2013), the transport of coal would increase to 6,200 tonnes per day (equivalent to 356 truck movements a day and up to 20 truck departures per hour). During Year 2 and 3 of the development, these truck movements would be generated from both the existing and new pit-top facilities. From Year 3 of the development onwards, coal would only be transported from the new pit-top facilities, which would reduce the total length of the return trip to the Bloomfield CHPP by about 6 km.

In assessing the traffic impacts of the proposal, it is important to recognise that NCC is only proposing to increase production at the mine once the nearby Hunter Expressway is completed. The opening of the Hunter Expressway would significantly alter the distribution of traffic on the road network. In particular, the Hunter Expressway would remove a significant proportion of the traffic volumes on George Booth Drive (about 90%) and a smaller proportion from John Renshaw Drive (about 5%).

Consequently, the impact of the proposed increase in truck movements generated by the proposal must be considered in this context.

Currently, there are 972 heavy vehicle movements per day on George Booth Drive (north of the development), of which 236 are associated with coal trucks from the Tasman Underground Mine. In 2017, when production at the mine would be at its maximum, George Booth Drive is predicted to carry around 439 heavy vehicles per day, of which 356 would be transporting coal from the development. So while the proposal would increase the total number of coal trucks on the road network by about 50% (from 236 to 356 movements per day), the total number of heavy vehicles on George Booth Drive would be less than half the existing number of heavy vehicles (i.e. 439 compared with 972).

In addition to the coal trucks, the development would also generate an increase in the volume of traffic associated with employees and deliveries to the mine. The workforce would increase from 110 to 150 which would generate an additional 80 light vehicle movements a day. Deliveries and visitors would also increase by about 50% over existing operations generating an additional 90 movements a day, of which, about 20% would be heavy vehicles.

Performance of the Road Network

The Road Transport Assessment considered the performance of 3 key intersections on the coal haulage route taking into consideration both heavy and light vehicles associated with the proposed development:

- *George Booth Drive & John Renshaw Drive* – the roundabout at this intersection would be upgraded as part of the construction of the Hunter Expressway. This intersection currently operates at a good level of service (LOS B). However, the assessment was undertaken during the construction period of the Hunter Expressway when traffic volumes were significantly higher than usual, and it is expected that once the upgrade to the intersection is completed, the capacity of the intersection during would increase significantly (by at least 400 vehicles per hour) and the LOS would be maintained or improved. The development would contribute a maximum of 40 vehicles per hour during peak hours in 2017. Consequently, there would be sufficient capacity to easily cater for the proposed increase in project-related traffic, and the intersection would continue to provide good levels of service to road users.
- *George Booth Drive & New Access Road* – this intersection would provide access to the new pit-top facilities and also the existing Daracon Quarry on the eastern side of George Booth Drive. A single-lane roundabout would be constructed at this intersection in consultation with RMS. The assessment indicates that with peak movements from the mine, the quarry, and future increased traffic volumes on the public road network, the proposed design would provide a good level of service (LOS B) throughout the life of the development. The assessment also indicates that an LOS B would be maintained if the alternative of emplacing waste rock at the Daracon Quarry eventuates.
- *John Renshaw Drive & Abel Underground Mine Access Road* – this intersection would have sufficient capacity to cater for the increase in traffic associated with the development in the short to medium term. However, if background volumes of traffic continue to increase in line with the high growth scenario in the assessment, the level of service of this intersection would deteriorate to unacceptable levels during peak hours. NCC is proposing to monitor the performance of this intersection every 5 years in consultation with RMS.

The capacity of George Booth Drive and John Renshaw Drive to cater for the increase in mine-related traffic was also assessed (known as “mid-block” level of service). This assessment indicated that the development would have no impact on the future levels of service of these roads, and the mid-block level of service would remain good (LOS A). The assessment also highlighted that following the completion of the Hunter Expressway, the mid-block level of service on George Booth Drive would improve, as total traffic movements would fall by about 90%.

The Department is generally satisfied that the additional traffic generated by the proposed development can be accommodated while maintaining the performance of the road network to an acceptable level. However, the Department believes that in addition to undertaking performance monitoring of the *John Renshaw Drive & Abel Underground Mine Access Road* intersection, NCC should be required to report on the findings of the performance monitoring, and implement any necessary upgrades in consultation with RMS if the level of service becomes unacceptable (i.e. LOS D or less). The Department has recommended a condition accordingly.

Road Safety

Road safety concerns were raised in submissions by Cessnock City Council and a local resident. These concerns related to general safety issues associated with heavy vehicles and access to residential driveways along George Booth Drive.

The assessment examined 5 years of RMS validated crash data from 2005 until 2010, and more recent information from the road safety audits at the mine. This information indicated that there has been only one serious incident involving coal haulage trucks. This incident occurred in May 2012 on George Booth Drive, and involved a motorcycle reportedly losing control and colliding with a coal haulage truck, resulting in the death of the motorcyclist. There have also been a number of complaints from motorists and local residents regarding coal falling from trucks and damage to private vehicles from rocks lifted from the road pavement.

The existing development consent for the mine requires NCC to implement a Road Transport Protocol to manage and monitor the potential impacts of coal haulage on the road network. The consent also requires NCC to commission 6 monthly independent traffic audits that must be prepared in consultation with Cessnock City Council and RMS.

The independent audit reports have been a robust mechanism to improve the performance and address issues of concern to the community. In particular, as a result of recommendations made in an independent audit report, coal loading and unloading procedures have been modified and incidents regarding coal falling onto public roads have reduced. Random independent inspections are also undertaken as part of the Road Transport Protocol, and have been effective in encouraging compliance from coal truck drivers with the code of conduct for the mine.

NCC has previously undertaken a range of upgrade works to private driveways along George Booth Drive in accordance with the existing consent, including road shoulder widening and sealing. However, as a result of safety concerns raised by residents along George Booth Drive, NCC commissioned a safety review of 16 driveways as part of the EIS (Appendix Q of the EIS). The review indicated that a range of additional improvements were warranted. NCC has committed to implement these improvements within 12 months, and has committed to review and upgrade any additional driveways that are constructed along the relevant section of George Booth Drive during the operation of the proposed development. These commitments have been incorporated in the recommended conditions of consent.

The Department acknowledges that transporting coal on public roads inherently increases the risk of traffic incidents and accidents. However, in the absence of feasible and viable alternatives to road haulage of coal (see below), the Department believes that NCC is doing everything that is reasonable and feasible to minimise the risk to road users and local residents. Nonetheless, the Department has recommended that NCC be required to review and update the Road Transport Protocol for the development to ensure changes associated with the new pit-top facilities are incorporated. The requirement for 6 monthly independent road audits has also been incorporated in the recommended conditions, along with a condition that requires NCC to implement any audit recommendations within 6 months of the audit being undertaken. With the implementation of these conditions, the Department believes that any risks to other road users would be minimised.

Transportation Hours

Under the existing consent, coal may be transported by road from Monday to Friday between 7am and 10pm. NCC is proposing to extend the coal transportation hours to include 26 Saturdays per year between 7am and 6pm.

NCC has argued that the extension of the trucking hours to include Saturdays is reasonable, and is unlikely to significantly increase the impacts on the road network or the amenity of local residents given that:

- overall traffic volumes are significantly lower on Saturdays compared with weekdays;
- the proposed coal haulage on Saturdays would represent only 1% of total Saturday traffic on George Booth Drive;
- Saturday haulage would only occur during the day (i.e. between 7am to 6pm) and be limited to 26 Saturdays each year; and
- maximum coal production is not proposed until Year 7 of the development.

However, the Department does not accept this assessment and believes that the mine should be restricted to the current trucking hours which exclude weekends and public holidays. In particular, the Department notes that the project would generate up to 100 truck movements and 100 light vehicle movements on Saturdays, and while the total volume traffic would decrease on George Booth Drive due to the opening of the Hunter Expressway, the relative contribution of traffic from the mine on Saturdays would increase from almost zero to around 18% of the total volume of traffic on George Booth Drive. The Department understands that proposed maximum production rates can be achieved without trucking coal on public roads on Saturdays, and that local residents (particularly along George Booth Drive) should be allowed to enjoy a respite period from unnecessary truck noise over the weekend. NCC has accepted the Department's proposed restriction on coal haulage hours.

Road Maintenance

Currently, both George Booth Drive and John Renshaw Drive are State Roads. However, following the commissioning of the Hunter Expressway, George Booth Drive would be designated as a regional road under the control of Cessnock City Council.

NCC has made a letter of offer to Cessnock City Council to cover road maintenance contributions. The key components of the offer are:

- Council must submit its actual costs for the maintenance of George Booth Drive along the coal haulage route to NCC each year; and
- NCC agrees to pay Council the proportion of the actual annual maintenance costs attributable to the proposed development to a maximum of $8,000 per kilometre. The proportion payable would be calculated in accordance with the ratio of heavy vehicles generated by the proposed development with the total number of heavy vehicles on George Booth Drive (i.e. if NCC generates 20% of heavy vehicles on George Booth Drive, it would be liable for 20% of Council's actual maintenance costs for that year).

The offer is contingent on the funds being expended on the maintenance of the portion of George Booth Drive used for the road transportation of coal from the proposed Tasman Extension Project to a standard suitable for use by coal road haulage trucks associated with the Tasman Extension Project.

The offer also specifies that Cessnock City Council would also maintain sealed shoulders along this portion of George Booth Drive, particularly in the vicinity of private driveways.

Both Cessnock City Council and the Department are generally satisfied with the NCC's offer in regard to road maintenance contributions. The Department notes that the current maintenance costs for this portion of George Booth Drive are around $96,000 a year, and it is likely that this would fall as a result of the reduced traffic volumes following the commencement of the Hunter Expressway. Given that the section of George Booth Drive in question is approximately 12 km in length, the maximum annual contribution from NCC of $8,000 per kilometre is reasonable. However, the Department remains concerned about the potential for disagreements about the proportion of heavy vehicles on George Booth Drive attributable to the proposed development. Consequently, a condition has been recommended that requires NCC to commission an independent traffic count each year following the commencement of the Hunter Expressway.

Both Cessnock City Council and the Department are satisfied that the proposed offer by NCC for maintenance of George Booth Drive is reasonable, and would ensure that the road pavement would remain safe and serviceable for other road users throughout the life of the development. A condition of consent has been recommended by the Department which has incorporated the terms of the road maintenance offer to Cessnock City Council and the associated annual traffic count.

Conclusion

Overall, the Department considers that the additional traffic generated by the proposed development can be managed in a manner that would not have a significant impact on the performance and safety of the road network or the amenity of local residents from Monday to Friday. Nonetheless, the Department believes that the ongoing performance of the development in regard to traffic must be carefully managed and monitored.

A summary of the measures recommended by the Department to achieve this outcome is as follows:

- restrict road transport of coal to the currently approved rate of 4,000 tonnes of ROM coal per day *until* the Hunter Expressway and the new pit-top are operational;
- restrict road transport of coal to 6,200 tonnes per day *after* the Hunter Expressway and the new pit-top facilities are operational;
- restrict weekday coal haulage hours to 7am to 10pm (in line with the existing consent);
- prohibit any coal haulage on weekends and public holidays;
- construct a roundabout at the access to the new pit-top facilities to the satisfaction of RMS and Cessnock City Council;
- implement improvements to driveways of affected residents along George Booth Drive in consultation with landowners in accordance with the works proposed in the EIS;
- pay the agreed annual road maintenance contributions to Cessnock City Council to ensure adequate maintenance of George Booth Drive;
- update the Road Transport Protocol for the mine; and
- undertake 6 monthly independent traffic audits and implement recommendations resulting from these audits.

5.2 NOISE

A detailed noise assessment was undertaken for the proposed development by SLR Consulting in accordance with the *NSW Industrial Noise Policy* and other relevant guidelines (Appendix I of the EIS). The assessment considered the noise and vibration impacts of the proposal associated with:

- road traffic noise along the coal haulage route;
- noise from the operation of the surface facilities;
- the construction of the new pit-top facilities; and
- vibration associated with underground blasting and mining activities.

Road Traffic Noise

Road noise and vibration associated with the development is one of the key issues that has the potential to affect the amenity of local residents. As can be seen from Figure 7 below, a total of 24 residents are located along the coal haulage route (19 on George Booth Drive and 5 on John Renshaw Drive).

The assessment indicates that road noise on George Booth Drive and John Renshaw Drive (without the existing development) already exceeds the relevant road noise assessment criteria at the closest residents by up to 9 dB(A) during the day (see Table 4).

Table 4: *Worst Case Traffic Noise Assessment in 2017 - dB(A) LAeq (period)*

Location	Period	Existing Traffic Noise	Predicted Traffic Noise (2017) – *Without Project*	Predicted Traffic Noise (2017) – *With Project*	Road Traffic Noise Criteria
George Booth Drive (north of project)	*Day*	**69.0**	**61.2**	**62.2**	**60**
John Renshaw Drive	*Day*	**64.6**	**65.8**	**66.0**	**60**

* *Note that under the NSW Road Noise Policy day includes the 15 hour day and evening and night period (i.e. from 7am to 10pm)*

During the first year of the development (i.e. prior to the opening of the Hunter Expressway) the contribution of additional traffic from the development would only result in a marginal increase in total traffic noise of between 0.1 and 0.5 dB(A) along the coal haulage route. Increases of up to 2 dB(A) are generally not perceptible and consequently the Department is satisfied that the development would not appreciably increase noise levels in the short term.

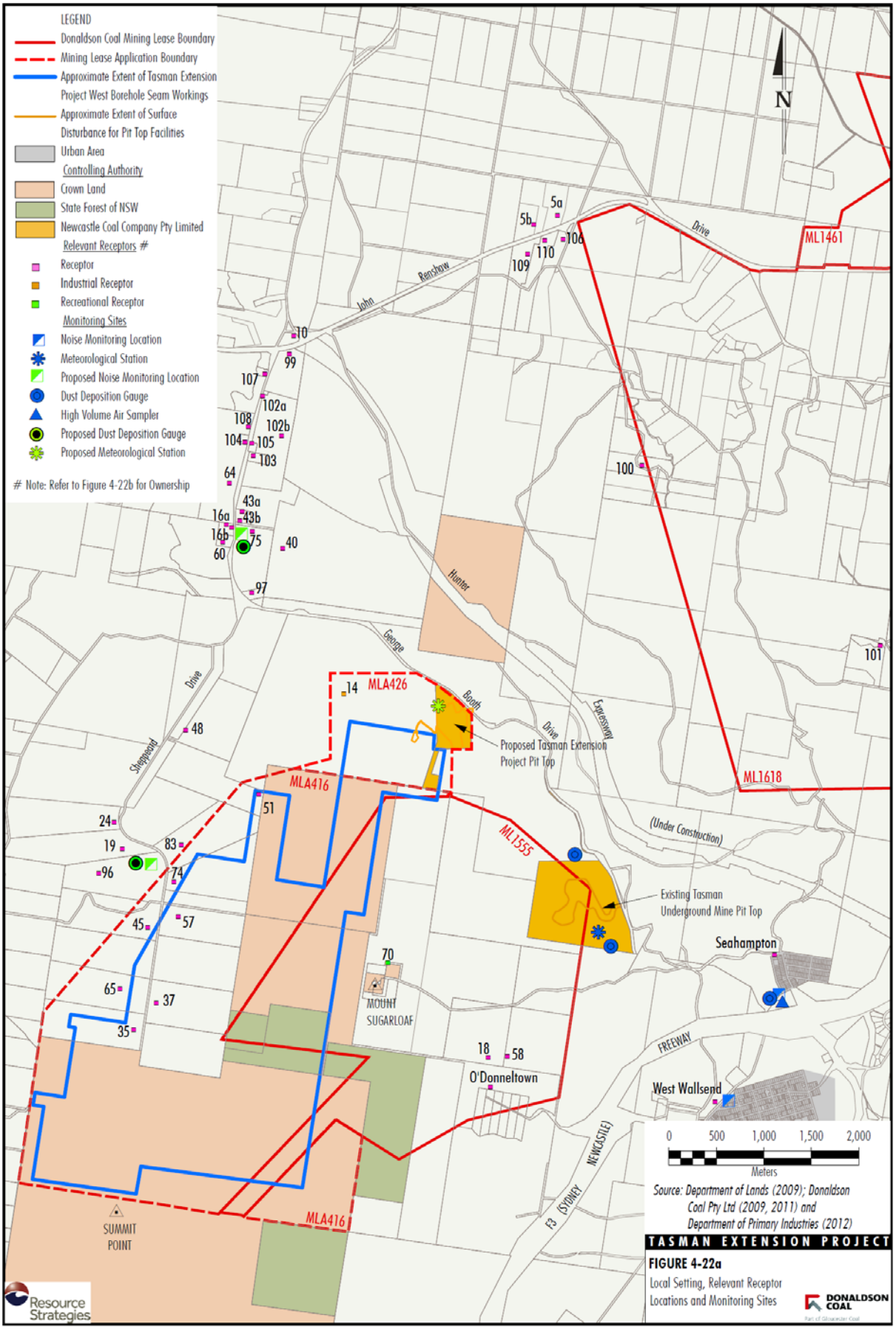

Figure 7: *Noise Receptors*

As shown in Table 4 above, once the Hunter Expressway is opened later in 2013, the total road noise on George Booth Drive would reduce significantly as most vehicles would use the Expressway. However, due to the significant decrease in traffic on George Booth Drive the relative contribution to traffic volumes (and hence traffic noise) from the mine would increase significantly (traffic from the mine would constitute 37% of total weekday traffic volumes on George Booth Drive following the commencement of the Hunter Expressway). In this situation the relative contribution to road noise by coal trucks from the development would be far more noticeable to local residents.

Under this scenario, the assessment indicates that the traffic generated by the development would increase road noise levels on George Booth Drive during the day by up to 1 dB(A) (from 61.2 to 62.2 dB(A)). This would result in an exceedance of the road noise assessment levels of up to 2.2 dB(A) during the day. No exceedances are predicted during the night as coal haulage would cease at 10pm on weekdays, and consequently there would be no impacts associated with sleep disturbance along the coal haulage route.

In assessing the noise impacts on local residents on George Booth Drive, it is important to consider that total road noise would decrease by around 7 dB(A) during the day when compared with current levels once the Hunter Expressway opens. In this context, the relative increase of 1 dB(A) would mean that the total road noise would remain well below the noise levels that residents currently experience. Overall, the Department believes that the dominant factor for the 19 local residents on George Booth Drive would be the reduction in total traffic noise following the commencement of the Hunter Expressway, and the additional road noise impacts from the development would be relatively minor in this context. The Department notes that the *NSW Road Noise Policy* allows an increase of 2 dB(A) above the "no build option" for additional traffic generated on existing roads by new developments where the relevant noise criteria are already being exceeded. In this case, the road noise criteria are predicted to exceed the criteria, but the relative increase from the project compared to the predicted noise without the project is 1 dB(A) (i.e. less than 2 dB(A)) (see Table 4 above).

There are 5 residents on John Renshaw Drive that may be affected by road noise from coal trucks associated with the development. However, the situation on John Renshaw Drive is different to George Booth Drive. Traffic on John Renshaw Drive is expected to slowly increase over the life of the mine in line with background increases in regional traffic volumes. Consequently, total road noise levels would remain above the relevant assessment criteria regardless of whether the development proceeds or not. And the additional mine-related traffic is only expected to increase road noise by a maximum of 0.5 dB(A) during the day which would not be noticeable for local residents.

NCC is also proposing a range of operational management measures to limit traffic noise including:
- undertaking driver education programs about noise awareness;
- minimising truck trips by ensuring trucks are fully loaded;
- limiting hourly truck movements to avoid congestion; and
- regular maintenance of the mine's haulage fleet.

Operational Noise

As the proposal comprises an underground mine, the key sources of operational noise relate to the existing and proposed surface facilities. In terms of sensitive receivers, the areas surrounding the site comprise mostly native woodland associated with the Sugarloaf SCA. The nearest residential receivers are more than 2 km from both the existing and new surface facilities. The location of sensitive noise receivers is shown on Figure 7.

Operational noise was assessed under 2 worst case scenarios:
- during simultaneous operation of the existing and the new pit-top facilities in Year 2; and
- during operations at peak production rates at the new pit-top facilities in Year 7.

This assessment indicates that even during both worst case operational scenarios that the development would comply with project specific noise levels at *all* receivers at *all* times. Table 5 compares the highest predicted noise levels at each receiver with the project specific noise levels.

Table 5: *Worst Case Operational Noise Levels dB(A)*

Location	Period	Noise Level $L_{Aeq(15\ minute)}$	Project Specific Noise Levels
West Wallsend	Day	<20	**43**
	Evening	<20	**43**
	Night	27	**40**
Residences on George Booth Drive	Day	23	**43**
	Evening	36	**43**
	Night	34	**37**
Sugarloaf SCA	Day	32	**50 dB(A) period**
	Evening	39	
	Night	32	
Orica Research Facility	Day	31	**70 dB(A) period**
	Evening	42	
	Night	43	

In setting appropriate recommended noise limits for the development, the Department considered the existing noise criteria in the consent which apply a limit of 38dB(A) to West Wallsend, and Background + 5 dB(A) for other locations (i.e. typically 35 dB(A)). However, the EIS indicates that the noise from the existing and new pit-top facilities would generally *not* be audible above other background noises at nearby residents (including West Wallsend), and could comply with a lower limit as shown in Table 6 below.

Table 6: *Noise Criteria dB(A)*

Location	***Day*** $L_{Aeq\ (15\ min)}$	***Evening*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{A1\ (1\ min)}$
Residences on George Booth Drive	*36*	*36*	*36*	*45*
All other privately-owned residences	*35*	*35*	*35*	*45*
	$L_{Aeq\ (period)}$			-
Sugarloaf State Conservation Area	*50 (when in use)*			-

The Department notes that the noise limits are consistent with the levels that would be generated by the development as predicted in the EIS as opposed to the project specific noise levels derived from the application of the *NSW Industrial Noise Policy*. The EPA is satisfied with this approach as it sets a lower limit than would otherwise be the case. The Department is satisfied that adherence to these noise limits would protect the amenity of local residents and ensure that the environmental performance of the mine is consistent with best practice. It is also noted that NCC has no objections to the application of these noise limits to the development.

The operational noise assessment also considered potential noise impacts on recreational areas (i.e. Sugarloaf SCA), sleep disturbance of local residents, and cumulative impacts (i.e. including the Orica Research Facility). This assessment indicates that the proposed development would comfortably comply with all relevant project-specific and amenity criteria at all times, and hence the Department is satisfied that any impacts would not be significant.

The EIS indicates that the construction of the new pit-top facilities would take approximately 6 months and be conducted during normal construction times (i.e. Monday to Friday – 7am to 6 pm and on Saturdays 7am to 1pm). Construction of the drift and the ventilation shaft to access the underground workings would take several weeks and would occur 24 hours a day 7 days a week. However, the noise of the drift drilling activities would be inaudible once the headers are below the ground surface.

The assessment has assessed construction noise separately from operational noise. However, the Department notes that the *Interim Construction Noise Guideline* does not apply to mining projects, and the noise from construction should be assessed against the operational project specific noise levels.

Notwithstanding, the assessment indicates that the nearest resident to these construction activities is more than 2km from the site, and construction noise is predicted to comfortably comply with the project specific noise levels at all times. The assessment also considered construction noise impacts on the Orica Research Facility which is less than 1 km from the ventilation shaft site (see Industrial Receptor No. 14 on Figure 7). However, noise levels are predicted to comfortably comply with the relevant operational criteria that apply to this commercial facility. NCC is also proposing to enclose the ventilation shaft construction area to reduce noise levels further. Given these considerations, the Department is satisfied that construction activities associated with the proposed development are unlikely to result in any appreciable noise impacts on residents or other land uses.

Blasting and Vibration

Blasting may be required during the construction of the surface facilities at the new pit-top and during the underground mining operations if certain geological structures are encountered. The blasting and vibration assessment in the EIS has considered blasting in locations known to have geological structures that may require blasting. The assessment indicates that surface vibration levels would be well below the *ANZECC Guidelines* for human comfort and potential vibration damage to structures. If unexpected geological conditions are encountered, then additional blasting may be required. To ensure relevant criteria are not exceeded, NCC would adopt minimum setback distances from residences and other built infrastructure.

Vibration associated with coal trucks has also been considered along the coal haulage route. The *NSW Road Noise Policy* states:

Vehicles operating on a roadway are unlikely to cause a perceptible level of vibration unless there are significant road irregularities, particularly if the affected receiver is more than 20 metres from the roadway.

In this case, all residents along the coal haulage routes are more than 20 metres from the roadway.

Given these considerations, the Department is satisfied that the development would not result in any noticeable blasting or vibration impacts on residents and built infrastructure.

Conclusion

In summary, the Department considers that the proposed extension represents a continuation of the existing development, albeit with the surface facilities in a different location. The Department acknowledges that there would be some minor exceedances of relevant road noise assessment criteria along the coal haulage route, but overall the amenity of the majority of local residents (i.e. residents on George Booth Drive) would improve significantly once the Hunter Expressway opens later in 2013. The Department also notes that NCC would contribute to the maintenance of the roads along the coal haulage route which would keep the road pavement in good condition and hence minimise road noise.

The Department is generally satisfied that NCC is proposing all reasonable and feasible measures to minimise road noise from the development, and that there is little scope to reduce road noise further apart from ensuring that NCC adhere to the limits on truck movements and haulage times.

Other aspects of the proposed development would comfortably comply with relevant noise and vibration criteria, and the Department accepts that additional noise mitigation by NCC to further reduce noise levels at the mine is not warranted. Nonetheless, to manage and monitor the residual noise impacts of the development, and ensure that the relevant noise criteria are adhered to, the Department has recommended the following conditions:

- comply with strict noise limits to protect the amenity of local residents;
- update the Noise Management Plan for the development to incorporate the noise mitigation measures proposed in the EIS; and
- monitor, assess and report on the noise performance of the mine (including road noise).

5.3 SUBSIDENCE

This report adopts the approach taken in recent Departmental assessments of underground mining projects where subsidence *effects* describe the subsidence itself, subsidence *impacts* refer to any physical changes to the fabric or structure of the ground or geological strata, and subsidence *consequences* refer to any changes to built or natural features that may result from subsidence impacts.

The EIS includes a detailed subsidence assessment undertaken by Ditton Geological Services in accordance with the *Guideline for Applications for Subsidence Management Approvals* (see Appendix A of the EIS). The assessment predicted the subsidence effects associated with bord and pillar mining in the extension area, including potential cumulative subsidence effects associated with mining in both the Fassifern and West Borehole Coal Seams. Subsidence monitoring results associated with the existing operations were also used to validate the performance of the subsidence prediction methodology.

Subsidence Effects

Thirty-two extraction panels are proposed in the extension area (see Figure 8). The panels would typically be 160 m wide, but the depth below the surface would vary significantly. In the flatter areas to the west of the extension area cover depth would range from 55 to 185 m, and beneath the ridges of the Sugarloaf Range in the eastern portion of the extension area cover depth would range from 155 to 350 m. The predicted maximum vertical subsidence, tilts and strains are shown in Table 7.

Table 7: *Predicted Maximum Subsidence in the West Borehole Coal Seam*

Subsidence Parameter	Range of Subsidence Effect
Maximum Subsidence (mm)	330 to 1270
Maximum Tilts (mm/m)	3 to 40
Maximum Tensile Strain (mm/m)	2 to 19
Maximum Compressive Strain (mm/m)	3 to 25
Maximum Horizontal Displacement (mm)	32 to 401

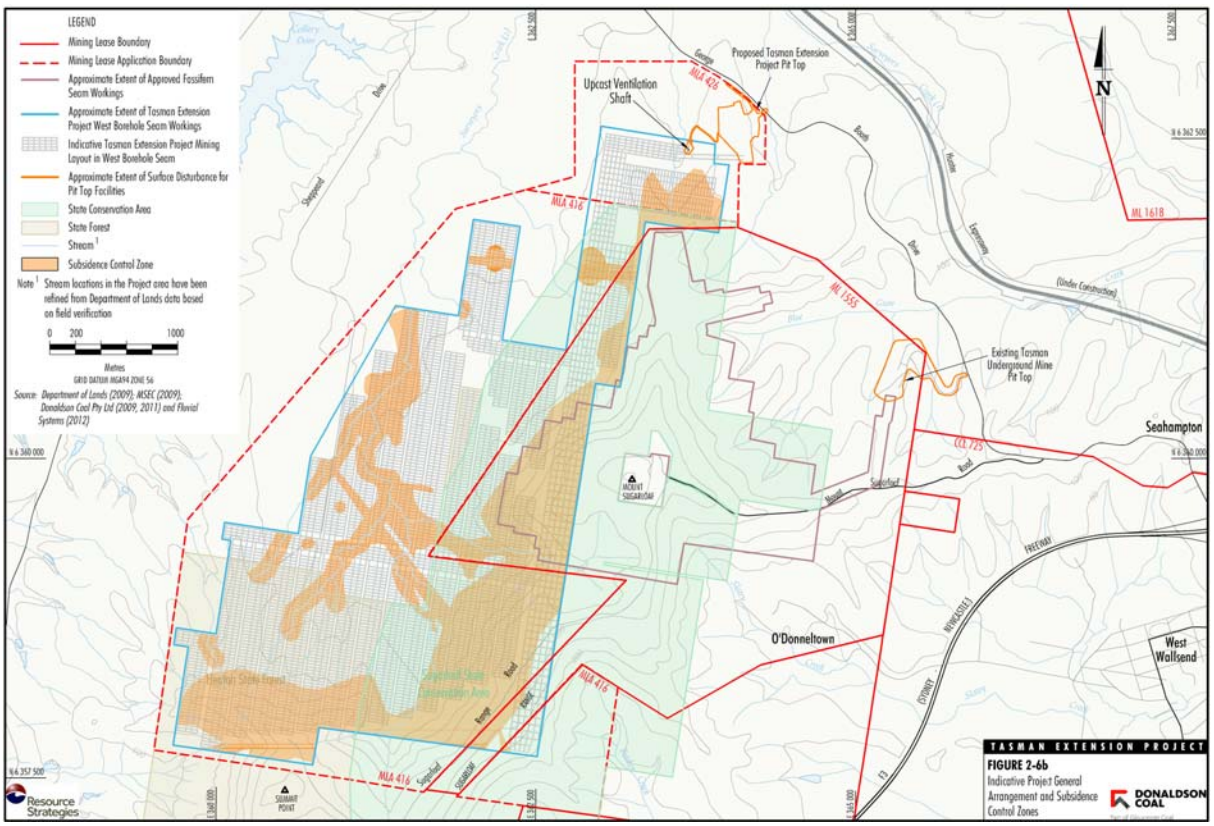

Figure 8: *Panel Layout & Subsidence Control Zones*

As can be seen from Table 7, the predicted maximum subsidence is not uniform across the mining area. This is because the type of extraction (total, partial or first workings), the cover depth of the workings, and the specific geological conditions would all vary across the mining domain.

In assessing the consequences of subsidence, the most important matter to consider is the potential for fracturing or cracking of the surface and underlying geological strata. Surface and sub-surface cracking can result in a range of potential consequences on natural features and built infrastructure, including:

- rock falls and damage to cliff lines;
- slope instability and erosion associated with changes to gradients, particularly on steep slopes;
- changes in streams including cracking of stream beds and associated loss of flow or drainage of pools;
- dewatering of perched groundwater aquifers as a result of sub-surface fracturing and seepage into the underground workings;
- damage to Aboriginal heritage sites, particularly where they are associated with cliff lines; and
- damage to built infrastructure, including privately owned residences.

Table 8 provides a summary of predictions in the EIS about the likelihood of connective cracking to the surface having regard to the different levels of coal recovery and the depth below the surface that the mining would occur.

Table 8: *Likelihood of connective cracking to the surface*

Extraction Level	***Depth of Cover (m)***	***Likelihood of connective cracking to the surface***
First workings only	>50	Not credible (<1%)
Partial pillar extraction	>50	Unlikely (5-10%) to Very unlikely (1-5%)
Total pillar extraction	<50	Likely (25-75%)
	50-80	Possible (10-25%)
	80-100	Unlikely (5-10%)
	>100	Very unlikely (1-5%)

It can be seen from Table 2 that in areas of total pillar extraction (which would occur across the majority of the mining domain), the predicted subsidence effects are likely (25-75% probability) to result in the appearance of surface cracks. The assessment indicates that these cracks would typically be between 50 and 300 mm, but could be up to 600 mm wide if adverse geological conditions exist. In areas where partial pillar extraction is proposed (even with very shallow depths of cover), the assessment indicates that surface cracking is *unlikely* (5-10%) or *very unlikely* (1-5%) to occur. Where first workings are proposed, no connective cracking is predicted.

Subsidence Control Zones

The mining method proposed for this development is “bord and pillar” which allows far more flexibility in mine planning and in controlling subsidence than conventional underground longwall mining. In particular, subsidence can be controlled in two main ways - firstly, by varying the amount of coal recovered (i.e. total extraction, partial extraction or first workings only), and secondly, by modifying the distance between the underground workings and the surface features that require protection (known as the “angle of draw” (AOD)).

NCC has used the flexibility of the bord and pillar mining method and its risk assessment of subsidence impacts (particularly the likelihood of connective cracking at the surface), and designed a mine plan that largely avoids or limits subsidence impacts on significant natural and built features in the development area. It also allows NCC to alter the mine plan in the event that subsidence predictions are exceeded. The areas where the mine plan has been designed to limit subsidence and protect sensitive surface features are known as Subsidence Control Zones (SCZs) (see Table 9 and Figure 8).

In each of the SCZs, an appropriate subsidence limit has been proposed and the mine plan designed to ensure these limits are not exceeded (i.e. the higher the SCZ number the greater the protection):

- *Level 1* – total extraction – no constraints;
- *Level 2A* – partial pillar extraction – maximum 300 mm subsidence;
- *Level 2B* - partial pillar extraction – maximum 150 mm subsidence;
- *Level 3* – first workings only – maximum 20mm subsidence; and
- *Level 4* – first workings only – subsidence not measurable.

The subsidence assessment in the EIS has been conducted assuming that the SCZs are in place to protect sensitive surface features, and NCC has proposed specific control measures and performance indicators for key natural and built surface features as shown in Table 9.

Table 9: *Proposed Subsidence Control Zones (SCZs)*

Surface Feature	SCZ	Performance Indicator	Control Measures
Key Infrastructure			
Communication Towers on Mt Sugarloaf	4	• Maintain safety and serviceability • No damage to structures	• First workings only • Less than **2 mm** subsidence • Less than 10mm horizontal displacement • 45 degree angle of draw
TransGrid Towers[1]	3	• Maintain safety and serviceability • Damage fully repaired or compensated	• First workings • **20 mm** maximum subsidence • 26.5 degree angle of draw • Partial extraction of remnant pillars within 45 degree AOD
Residences[2]	3		• First workings only • **20 mm** maximum subsidence • 5mm/m tilt & 2mm/m strain • 26.5 degree angle of draw
Fibre-optic Cables	2A		• Partial extraction • **300 mm** maximum subsidence • Stable remnant pillars • 26.5 degree angle of draw
Ausgrid Towers[3]	1		• **Maximum extraction**
Key Natural Features			
		•	•
Major Cliff Lines (greater than 10 m in height and 20 m in length)	2B	• Minor impact and negligible environmental consequence • No additional public safety risk	• First workings only • **150 mm** maximum subsidence • 30 m setback from cliff lines
Minor Cliff Lines and Steep Slopes (greater than 1 in 2 or 26.5 degrees)	2A	• Minor impact and negligible environmental consequence • No additional public safety risk	• Partial extraction • **300 mm** maximum subsidence • 26.5 degree angle of draw
3rd order streams or above (i.e. Surveyors Creek)	3	• Negligible impacts	• First workings only • **20 mm** maximum subsidence • 26.5 degree angle of draw • 40 m setback from the centre of stream
1st and 2nd order streams	2A	• Minor environmental consequences • Negligible connective cracking to underground workings	• Partial extraction • **300 mm** maximum subsidence *(applies when less than 80 m depth of cover)*
EECs and GDEs	2A	• Negligible impacts	• Partial extraction • **300 mm** maximum subsidence

Notes:

1. *The subsidence control zone for TransGrid towers may be relaxed if there is an agreement with TransGrid and/or cruciform footings for the towers are installed.*
2. *The subsidence control zone for residences may be relaxed where agreement is reached with the landowner.*
3. *Maximum extraction will occur only where this is agreed with Ausgrid.*

Subsidence Management & Monitoring

NCC is proposing to prepare detailed Extraction Plans prior to the commencement of mining. These plans would provide details of the measures proposed to protect surface features, including SCZs, subsidence monitoring, remediation of subsidence impacts, specific built features management plans, consultation with relevant stakeholders, and specific trigger action response plans. NCC would also be required to prepare detailed Subsidence Management Plans as the mine progresses in consultation with DRE and the Department.

Conclusion

The Department is satisfied that the subsidence assessment used conservative assumptions, and the subsidence predictions provide a sound basis to assess the potential subsidence-induced impacts and consequences of the development. In this regard, the Department notes that the predictions made in the subsidence assessment are based on maximum worst-case scenarios, and empirical data from the current mining operations at the Tasman Mine and at the nearby Abel Underground Mine where an adaptive management approach using subsidence control zones has been successfully applied over a number of years. Consequently, the Department is confident that the proposed SCZs provide a robust mechanism to protect sensitive surface features.

Nevertheless, the Department has recommended conditions of consent which require NCC to:

- ensure it complies with strict subsidence performance measures relative to the features it aims to protect;
- prepare a detailed Extraction Plan prior to undertaking any second workings in the West Borehole Coal Seam; and
- repair/remediate any subsidence impacts (e.g. significant surface cracking) that may occur.

The potential consequences of the predicted subsidence impacts on built infrastructure, water resources, Aboriginal heritage, and flora and fauna are addressed in detail in the following sections.

5.4 BUILT FEATURES

There are a number of key built features in the vicinity of the proposed underground mining domain where the subsidence impacts would need to be carefully managed including (see Figure 9):

- communication towers on the summit of Mount Sugarloaf;
- two electricity transmission lines (330 kV Transgrid and 132 kV Augsrid);
- fibre-optic telecommunication cables;
- George Booth Drive, F3 Freeway, and Hunter Expressway; and
- 3 privately-owned residences.

NCC has assessed the potential systematic and non-conventional subsidence effects on each of the built features, including far-field horizontal displacement on major roads such as George Booth Drive, the F3 Freeway and the Hunter Expressway (which is currently being constructed). Subsidence effects on local sealed roads (i.e. Sheppeard Drive, Mount Sugarloaf Road, Richmond Vale Road) and unsealed roads in the extension area and immediate surrounds have also been assessed.

With the application of the proposed SCZs, the subsidence assessment indicates that systematic and far-field subsidence effects would not exceed applicable thresholds for built infrastructure in the vicinity of the development, including for major roads, houses, and public utilities.

In the unlikely event that subsidence predictions are exceeded, NCC would reduce its coal recovery to meet the relevant SCZs criteria and undertake any necessary repairs to ensure maintenance of relevant safe, serviceable and repairable criteria in accordance with the NSW Mine Subsidence Board requirements.

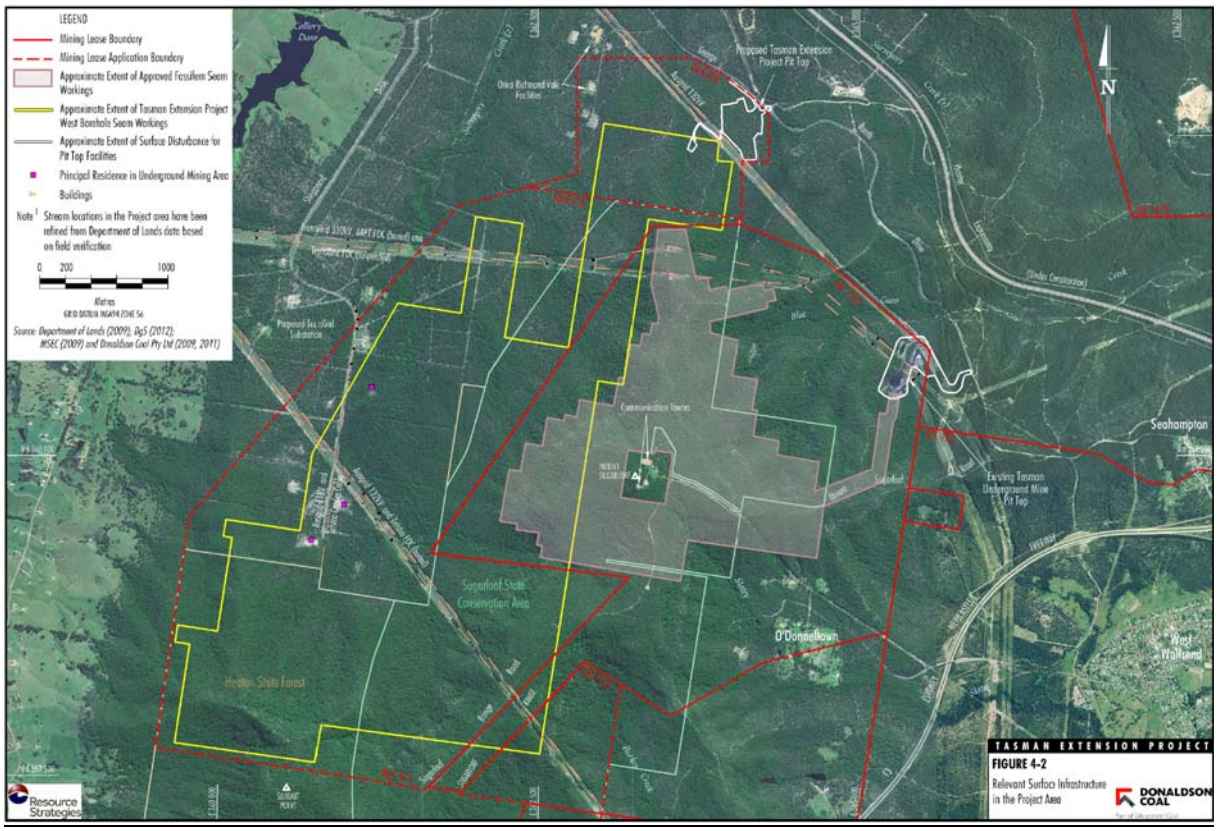

Figure 9: *Built Features in the Development Area*

The assessment also outlines some caveats or exceptions where the SCZs could be relaxed under certain circumstances. This applies particularly to the TransGrid transmission towers and privately owned residences. There are only two TransGrid towers within the proposed limits of pillar extraction, and the assessment notes that NCC may seek agreement from TransGrid to install cruciform footings on these towers which would allow them to withstand higher subsidence impacts, and hence allow greater extraction of the underlying coal. NCC may also seek to reach agreement or acquire potentially affected privately owned residences to allow greater recovery of the coal resource.

The Department has notified RMS, TransGrid and Ausgrid about the proposed development in accordance with Clause 45 of *State Environmental Planning Policy (Infrastructure 2007)*. None of these public authorities raised any objections or concerns about the impacts of the proposed mining on major roads or transmission line assets. The Department also notes that no other utility providers or local residents in the underground mining precinct have raised any concerns about the proposal.

Overall, the Department is satisfied that risks to built infrastructure have been minimised as far as practical by NCC through the application of the SCZs and the Department has recommended subsidence performance measures that are consistent with these zones. In addition, as part of the Extraction Plans, NCC would be required to prepare and implement a Built Features Management Plan in consultation with owner/s of potentially affected infrastructure. The plan would provide details of how the mine would be designed to achieve the subsidence performance measures for built infrastructure, and outline how any unforeseen impacts would be identified, repaired, replaced or compensated. The Department has also recommended that the risk management measures proposed to protect key infrastructure be audited in accordance with international risk management standards (ISO 31000:2009) prior to submission of the Extraction Plans, and that these measures be annually audited to review compliance and effectiveness of applicable subsidence performance measures in the consent.

With the implementation of the recommended conditions, the Department is satisfied that the proposed development would be unlikely to result in any significant impacts on built features in the vicinity of the mine, and that any unforeseen impacts can be appropriately managed.

5.5 CLIFFS AND STEEP SLOPES

The subsidence assessment defines and then separately considers major cliffs, minor cliffs, and steep slopes. *Major cliffs* are defined as continuous cliff lines greater than 10 m in height and 20 m in length. *Minor cliffs* are defined as all other cliff lines, and *steep slopes* are defined as slopes greater than 1 in 2 or 26.5 degrees. The Department broadly supports these definitions and notes that they are generally consistent with definitions used in other recently approved mining projects.

In the development area there are many cliff lines and steep slopes associated with the Mount Sugarloaf Range. This includes 5 km of *major cliff lines* (between 10 and 60 m high) and 4 km of *minor cliff lines* (between 5 and 10 m high). There are also numerous minor rock formations and discontinuous cliffs between 2 and 5 m high, and steep rocky "talus" slopes with large boulders which occur for about 100 m below the cliff lines.

NCC is proposing to protect all cliff lines and steep slopes along the Sugarloaf Range through the application of SCZs (see Figure 10). The specific performance measure proposed by NCC for cliffs and steep slopes is *minor impact resulting in negligible environmental consequences and no additional risk to public safety*. However, to achieve this, NCC is proposing slightly different mining controls as seen in Table 10.

Table 10: *Mining Controls in Cliffs and Steep Slopes SCZs*

Feature	Control Measures
Major Cliff Lines *(greater than 10 m in height and 20 m in length)*	• First workings only • **150 mm** maximum subsidence • 30 m setback from cliff lines
Minor Cliff Lines & Steep Slopes *(greater than 1 in 2 or 26.5 degrees)*	• Partial extraction • **300 mm** maximum subsidence • 26.5 degree angle of draw

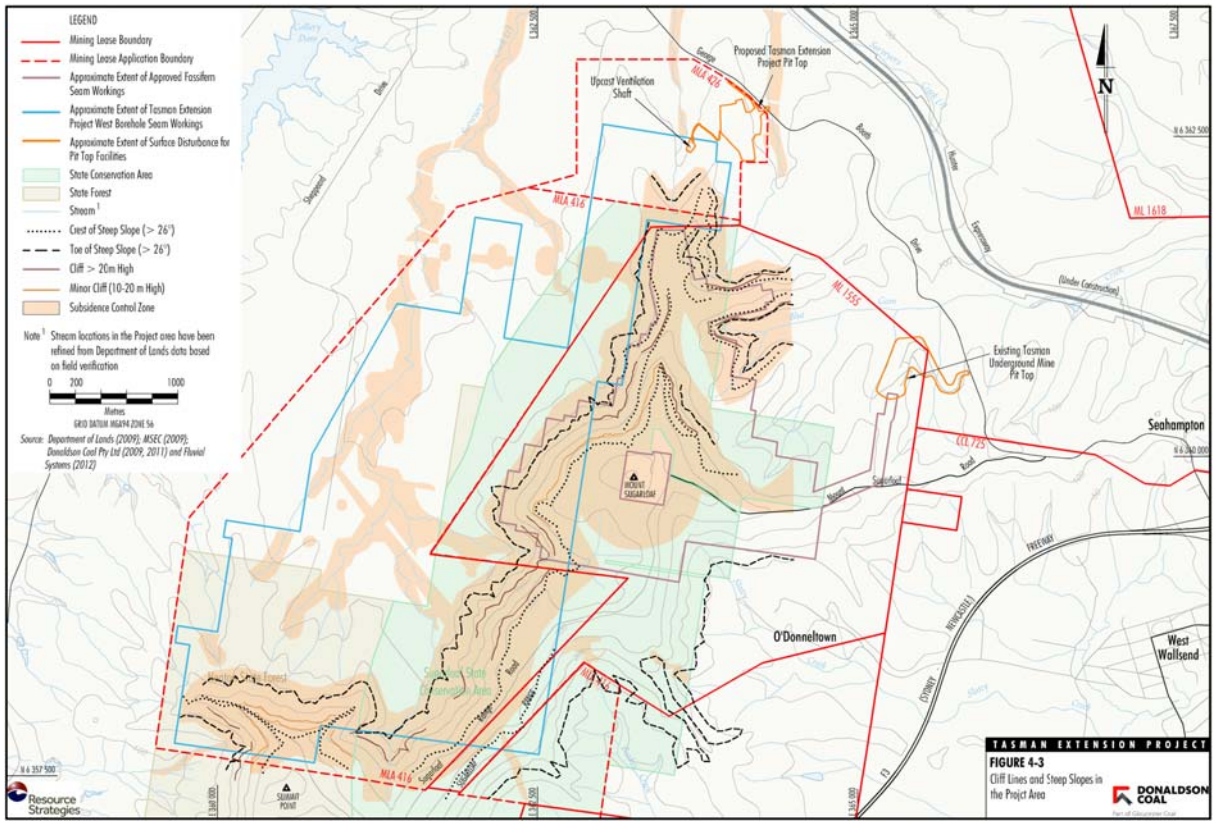

Figure 10: *Cliffs and Steep Slopes and Subsidence Control Zones*

With the application of appropriate SCZs, the assessment indicates that the predicted subsidence would be *unlikely* to result in cracking or instability of cliff lines and steep slopes in the development area. However, the possibility remains that subsidence associated with the development may occasionally result in minor impacts such as rock falls, displacement or dislodgement of boulders or slabs, or fracturing. NCC claims that these impacts would be difficult to distinguish from natural processes, and together with potential subsidence impacts, may result in between 3 to 5% of cliff lines and steep slopes exhibiting signs of instability and/or cracking.

To address these potential impacts, NCC would implement an adaptive management approach involving monitoring of cliff lines and steep slopes during (and following) mining to validate that the subsidence performance measures are being achieved. Monitoring would include observations of any evidence of surface cracking and stability of cliffs and rocky talus slopes. Trigger action response plans would be prepared which detail the measures that would be implemented in the unlikely event of slope instability, including infilling of any surface cracks, removal of unstable boulders, erosion and sediment controls, and various measures to protect public safety.

The Sugarloaf SCA is zoned as *E1 (National Parks and Nature Reserves)* and *8 (National Park)* under the applicable LEPs. The objectives of the zones focus on maintaining the conservation, recreational and cultural values of the SCA in accordance with the objectives for this type of reservation under the *National Parks and Wildlife Act 1974*. The Department considers that the cliff lines in the development area can be considered as a regionally significant landscape feature that contributes to the overall scenic and recreational values of the Sugarloaf SCA. Consequently, while mining in permissible in the SCA (see Section 3 above), the Department believes that the cliff lines must be afforded a high level of protection.

Subsidence monitoring above the existing underground workings in the Fassifern Coal Seam indicates that the magnitude of the subsidence has been significantly less than was originally predicted, except for one panel where adverse geological conditions resulted in a 4-fold increase in vertical subsidence compared to the original predictions. However, the increased subsidence occurred in an area of total extraction. In the SCZs, subsidence has been less than predicted, and there have been no noticeable adverse impacts on cliff lines and steep slopes.

Under the existing consent for the Tasman Underground Mine, NCC must ensure that mining does not result in any impacts on cliff lines and steep slopes. The Department considers that this performance measure must be maintained in the conditions for the extension to the mine. The Department's recommended conditions therefore include subsidence performance measures to ensure that the project causes no more than "negligible environmental consequences" on all cliffs and steep slopes (as defined) within the proposed mining area.

It is noted that it is not possible to apply a standard of "nil environmental consequences" due to the limitations in subsidence monitoring and the difficulty of distinguishing subsidence impacts from natural processes. The use of the performance objective of "negligible environmental consequences" is consistent with the findings of the Southern Coalfields Inquiry and recent assessments for other underground coal mines in NSW.

With the implementation of the proposed performance measure of "negligible environmental consequences", the Department is satisfied that cliff lines and steep slopes in the development area would be adequately protected, and that any impacts that may occur would be minor and localised. To ensure that this is the case, the Department has recommended that NCC be required to prepare a Land Management Plan as part of the Extraction Plan, in consultation with OEH and NSW Forests. The plan would provide for the management of potential impacts and consequences of the proposed development on cliffs and steep slopes, and be the mechanism by which NCC demonstrates to relevant authorities that the proposed mining layout is able to achieve the performance measures in the development consent.

5.6 SURFACE WATER

The EIS incorporates a comprehensive assessment of the potential impacts of the proposed development on stream geomorphology (Appendix D of the EIS) and surface water resources (Appendix C of the EIS). Watercourses in the extension area generally consist of ephemeral unnamed streams that drain in a northerly direction into Surveyors Creek, which subsequently drains into Wallis Creek and then into the Hunter River (approximately 15 km north of the site). As the site is located primarily on the slopes of the Mount Sugarloaf Range, there are no alluvial floodplains in the vicinity of the site.

Subsidence-Related Impacts

The assessment considered a range of potential subsidence-related impacts on streams in the extension area including:

- cracking of bedrock sections of stream beds;
- sinking and/or cracking of stream beds and banks;
- connective cracking resulting in loss of surface flows;
- reduction in the baseflow contribution of groundwater into surface stream flows; and
- changes in stream geomorphology resulting in pooling, reversal of flow, or migration of knickpoints (i.e. vertical drop in channel bed).

The application of the proposed SCZs in the extension area is the primary mitigation measure proposed by NCC to limit subsidence impacts on streams. However, the subsidence assessment indicates that even with the application of the SCZs, that minor surface cracking along streams is possible. This could potentially result in localised reduction in stream flows, loss of water held in pools, and localised impacts on water quality.

In regard to stream geomorphology, the assessment used a risk-based methodology that examined steam fragility and the relative levels of subsidence. The assessment found that there would be an *insignificant* risk to the geomorphology of streams in the extension area in 99% of stream sections. There were only a few isolated sections of 1st and 2nd order streams where the risk of changes to the stream geomorphology was assessed as moderate or high. The key subsidence-related risk in these areas was determined to be upward migration of knickpoints within the stream channel. The SCZs for 3rd order stream limit subsidence to no more than 20mm and hence no significant impacts are expected for Surveyors Creek itself.

To address these potential impacts, NCC is proposing an adaptive management approach to identify subsidence impacts on streams, assess the potential consequences of the identified impacts, and implementation of appropriate control/remediation techniques to address any identified impacts as required on a case specific basis (e.g. sealing of cracks, creation of artificial knickpoints). A flow gauging station and two water quality monitoring sites would also be established on Surveyors Creek to monitor any potential changes to surface water flow characteristics and water quality. NCC has also proposed an investigation trigger level – 10% deviation from the predicted annual flow from the catchment using pre-mining model parameters. If this trigger level is exceeded, and investigation would be undertaken and appropriate mitigation works implemented.

Surface Water Management

Other surface water impacts include those associated with the construction and operation of the surface facilities. Operations at the existing pit-top facilities would continue in accordance with the approved water management system. There would be no interaction with the water management system at the new pit-top facilities.

At the new pit-top the surface water management system has been designed as nil discharge and would include clean water diversion banks and two dams – 4 ML surface runoff storage dam and a 5 ML mine water storage dam – which have been designed to cater for a 1 in 20 year storm. Water from the surface runoff storage dam would be used for dust suppression and excess water would be pumped into the former underground workings at the Stockrington Colliery. A range of standard sediment and erosion control measures would be put in place to minimise any impacts on local watercourses. Groundwater inflows in the underground workings would be pumped to the mine water storage dam, and either used for dust suppression or pumped into the abandoned workings of the

Stockrington Colliery. The water balance for the mine indicates that there would be ample storage in these old underground workings, and consequently, there is little risk of off-site discharges to the surrounding catchment.

The *Hunter Unregulated and Alluvial Water Sources Sharing Plan* applies to the development. However, an unregulated river access licence under the *Water Management Act 2000* would not be required for the proposed development because there is no extraction of water from an unregulated stream proposed, there is no alluvium in the development area, the purpose of the existing and proposed water storages at the two pit-top facilities is for pollution control, and no water from undisturbed areas would be captured by the onsite water storages. Furthermore, based on the groundwater assessment (see below), the proposed development would only result in a total loss of baseflow of 1.9 ML per year to unregulated streams as a result of subsidence, and recent advice from NOW indicates that a licence under the *Water Management Act 2000* is only required where there is extraction of more than 3 ML a year.

Conclusion

The Department is satisfied that NCC has adequately assessed the development's potential impacts on surface water resources. Following its assessment, the Department is satisfied that the proposed SCZs provide a robust means to avoid any significant impacts on surface water resources, and that NCC's proposed adaptive management approach would ensure that any impacts would be temporary and minor in nature and extent.

The Department has recommended conditions requiring NCC to develop a comprehensive Water Management Plan, in consultation with relevant authorities, which includes:

- subsidence performance measures;
- surface water assessment criteria and trigger levels;
- a surface water monitoring program;
- a site water balance and erosion and sediment control plan; and
- a contingency plan that provides for adaptive management of the mining operations if impacts exceed those predicted.

5.7 GROUNDWATER

The Groundwater Assessment for the development (Appendix B of the EIS) indicates that there are essentially 2 main aquifers in the extension area. A shallow aquifer system associated with local watercourses, and a deeper rock aquifer in the various coal measures. Predictive regional modelling was conducted for the life of the project, including consideration of existing and historical mines in the area.

The modelling indicates that mining in the West Borehole Seam would result in the dewatering of the coal measures, and inflows of groundwater from the deep aquifer into the underground workings of between 0.2 and 1.35 ML/day. Inflows would be transferred to proposed the mine water storage dam and then used for dust suppression. Any excess inflows would be managed by storage in the former Stockrington Colliery underground workings, which have sufficient capacity to cater for any excess groundwater from the extension area.

The depressurization and dewatering of the coal measures would result in groundwater drawdown in the deep aquifer system of around 5 m up to 2 km. The groundwater levels would recover within about 30 years after mining is completed. Due to the steep nature of the terrain, the groundwater in the area is relatively deep, and there are no useable aquifers in the vicinity of the development. There are 9 registered bores within 5 km of the site. Four of these are monitoring bores associated with the existing Tasman Underground Mine, and the remaining 5 are not located in aquifers connected hydraulically to those that may be affected by the proposed development. Consequently, the proposed development would not adversely affect other groundwater users in the vicinity of the project.

Two Groundwater Dependent Ecosystems (GDEs) have been identified along some of the creek lines in the underground mining area (see Figure 13 in Section 5.9 below). These vegetation communities are reliant on localised shallow perched aquifers, and the assessment indicates that connective cracking between the mine workings and the shallow aquifers is *very unlikely* with the application of the proposed SCZs. Furthermore, the majority of streams in the extension area are ephemeral, and

there is little contribution of groundwater to baseflows in these watercourses. For higher order streams (e.g. Surveyors Creek), the assessment indicates that there may be a very small loss in baseflow of 4,500 litres a day. This amounts to a total of approximately 1.9 ML per year which represents a negligible proportion of overall stream flows in the local catchment.

At this stage, NCC would not require an aquifer interference approval under Section 91 of the *Water Management Act 2000* as the *NSW Aquifer Interference Policy* has not yet commenced. Nonetheless, the Department has considered the requirements of the draft policy and is satisfied that the proposed development would have a minimal impact on local and regional groundwater resources. In particular, the Department is satisfied that the proposed development would not result in any adverse impacts on groundwater quality, GDEs or the long term viability of any water supply works in the vicinity. The Department notes that this is consistent with empirical data from the existing Tasman Underground Mine immediately to the east of the proposed extension area where groundwater impacts have been minimal.

NCC would however require a groundwater licence under Part 5 of the *Water Act 1912* for groundwater inflow into the underground workings. Currently, NCC holds a groundwater licence to a total of 75 ML per year. Peak inflows into the underground working in the extension area could be as high as 493 ML a year (i.e. up to 1.35 ML/day). Consequently, NCC would require a new licence or a variation to the existing licence under Part 5 of the *Water Act 1912* to cover the additional groundwater inflows.

To monitor, manage and mitigate any impacts on groundwater resources the Department has recommended a number of conditions, including strict subsidence performance criteria to ensure the mine is designed to prevent any connective cracking between the surface and the underground workings near higher order streams (i.e. 3rd order streams), a requirement to obtain a groundwater licence from NOW under the *Water Act 1912*, and the preparation and implementation of a detailed Water Management Plan prepared in consultation with NOW that includes:

- groundwater assessment criteria;
- a groundwater monitoring program to monitor water intake into the mine, and bores in the vicinity of the mine; and
- a trigger action response plan to manage any unforseen groundwater impacts.

5.8 ABORIGINAL CULTURAL HERITAGE

The land within the project area generally consists of rugged terrain and would have most likely been used for hunting and gathering activities rather than continuous occupation. Rock shelters along the Mount Sugarloaf Range would have provided suitable temporary shelters, and food and water sources would have been available particularly along the creek lines within the project area. The spiritual and ceremonial use of Mount Sugarloaf would also have been a significant factor in the occupation of the area.

The findings of the Aboriginal Cultural Heritage Assessment (Appendix K of the EIS) generally support this pattern of occupation with open artefact scatters often located near water sources and rock shelters and grinding grooves confined primarily to the upper slopes of Mount Sugarloaf. Extensive surveys were undertaken in consultation with local Aboriginal stakeholders and in accordance with relevant OEH guidelines. In total, 100 Aboriginal heritage sites were identified during the surveys, including (see Figure 11):

- 38 open artefact sites;
- 35 grinding groove sites; and
- 26 rock shelter sites.

Of the sites within the underground mining area, 3 were determined to have high significance and an additional 4 moderate to high significance. The remaining sites were determined to have significance levels somewhere between low and moderate, with the majority (over 60%) being of low significance. Details of the type and location of these sites is provided in Table 11 below.

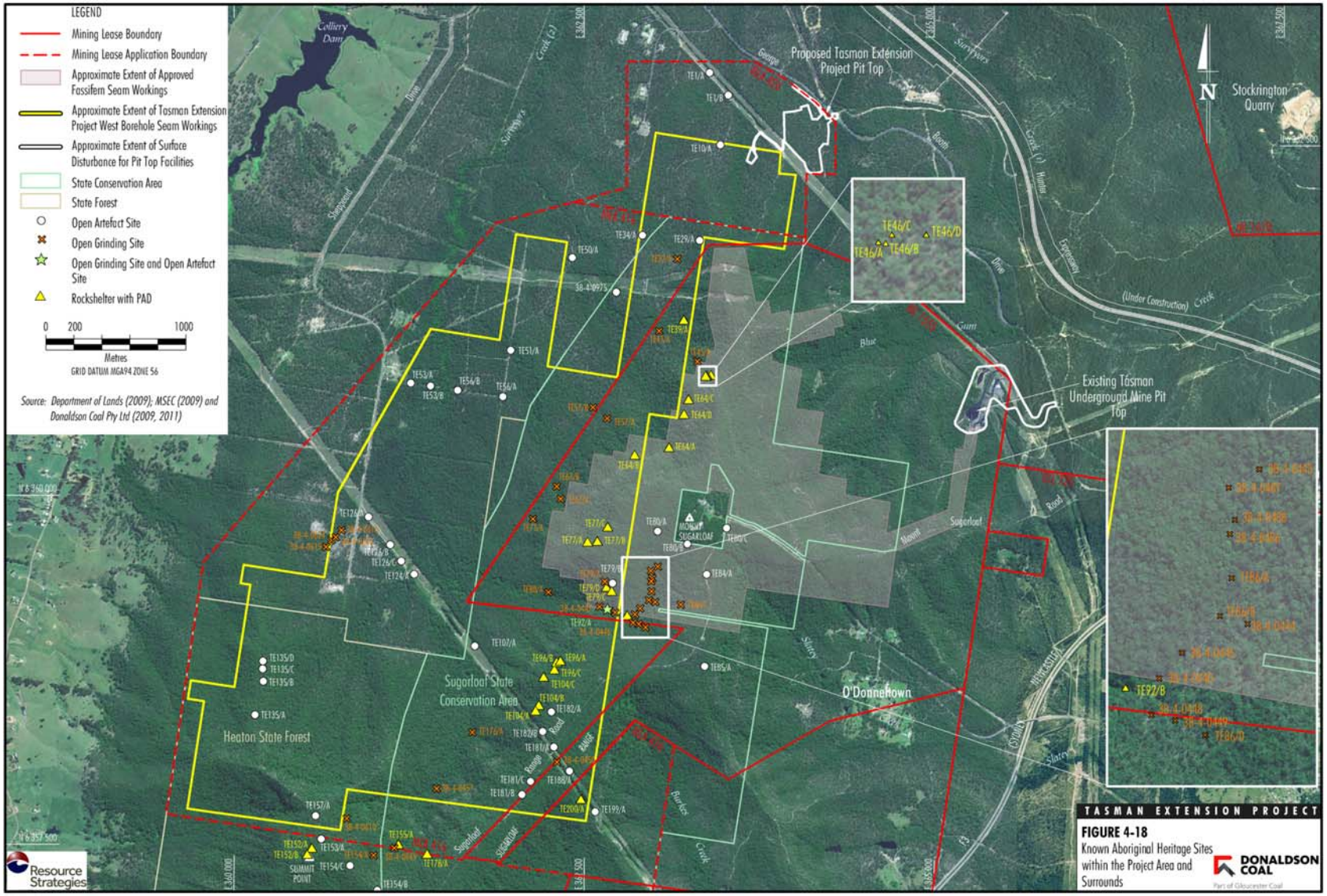

Figure 11: *Aboriginal Heritage Sites*

Table 11: *Aboriginal Heritage Sites of Significance (refer to Figure 11)*

Type of Site	Site Code	Location	Local Archaeological Significance	Risk of Direct Impact
Grinding Grooves	38-4-0447	• High on the Sugarloaf Range to the south-west of the summit of Mount Sugarloaf • Close to the eastern edge of the extension area	High	*Unlikely* (5-10%)
	TE92/A	• High on the Sugarloaf Range to the south-west of the summit of Mount Sugarloaf • Close to the eastern edge of the extension area	High	*Very Unlikely* (less than 5%)
	38-4-0440	• High on the sugarloaf range to the south of the summit of Mount Sugarloaf • Outside existing and proposed underground mining area	High	
	38-4-0445	• High on the sugarloaf range to the south of the summit of Mount Sugarloaf • Outside existing and proposed underground mining area	Moderate to High	
Rock Shelters	TE64/C	• Sugarloaf Range north of the summit of Mount Sugarloaf • Outside extension area, but inside the footprint for the existing operations	Moderate to High	
	TE200/A	• South-east corner of the development area • In the Ausgrid 132kV transmission line easement near the edge of the extension area	Moderate to High	
Open Artefact Scatter	TE157/A	• South-west corner of the development area in the Heaton State Forest • Near the edge of the extension area	Moderate to High	N/A (not a rock-based site)

No Aboriginal heritage sites were identified within the new pit-top facility and upcast ventilation areas. Consequently, potential impacts on Aboriginal heritage sites are confined to those that may occur as a result of subsidence in the extension area.

Open artefact scatters (which make up the majority of the sites) are not particularly susceptible to subsidence impacts. Any effects on these sites are likely to be confined to minor impacts on the ground surface, rather than any direct damage to the artefacts themselves. However, for grinding grooves and rock shelters it is possible for subsidence impacts (such as cracking or rock falls) to occur.

The likelihood of impacts on rock-based sites were assessed as follows:
- 1 rock shelter and 5 grinding grooves - greater than 10% probability of noticeable impacts;
- 2 rock shelters and 4 grinding grooves - 5 to 10% probability of noticeable impacts; and
- remaining 23 rock shelters and 27 grinding grooves - less than 5% probability of noticeable impacts.

The assessment shows that subsidence effects on the vast majority of the rock-based sites are *very unlikely* to result in any noticeable impacts (i.e. less than 5% probability), and that risks to sites of high and moderate/high significance are *unlikely* (5 -10% probability) or *very unlikely* (less than 5%). However, there are 6 rock-based sites with low or low to moderate significance where there is a reasonable prospect of noticeable impacts occurring. The assessment indicates that this represents less than 10% of the Potential Archaeological Deposits and grinding grooves in the investigation area, and therefore the consequence on Aboriginal heritage values of any subsidence-induced impacts on these sites would be minimal.

To manage the potential impacts of the proposed development on Aboriginal sites, NCC is proposing to prepare and implement an Aboriginal Cultural Heritage Management Plan in consultation with registered Aboriginal stakeholders. The plan would incorporate a range of measures to investigate, manage and monitor the potential impacts of the development including:

- baseline recording and salvage of open artefact scatters that may be impacted by subsidence;
- detailed monitoring of potential impacts on grinding grooves and rock shelters within the development area that have a moderate to high or high significance;
- modification of the mine plan to reduce the risk of perceptible subsidence impacts of the development on the grinding groove site of high significance (i.e. site 38-4-0447) from *unlikely* to *very unlikely*; and
- a protocol for management of unrecorded sites that are identified during the subsidence monitoring program.

A range of other significant traditional and contemporary Aboriginal cultural heritage values were identified by Aboriginal stakeholder groups. These values were mostly associated with the Sugarloaf Range and an area to the south of the development area associated with the access route from the lowlands to the west and the Sugarloaf Range (see Figure 12).

The Keepa Keepa Area and the Sugarloaf Pathways comprise general areas of significance for Aboriginal communities, whereas the Grinding Groove Area and the Men's Area also contain rock-based sites and geological structures of cultural heritage significance. The subsidence assessment indicates that the majority of the areas of special cultural significance are located in the SCZs for the proposed development, and hence there would be little risk of significant impacts on the features or values associated with these areas. Nevertheless, there are some rock formations in the Men's Area that are potentially vulnerable to subsidence impacts. To address this residual risk, NCC is proposing to undertake a detailed geotechnical assessment of 3 culturally significant stone features in the Men's Area to inform the mine layout and avoid any impacts on these features. The Department considers this to be a reasonable approach to protect these rock formations, and that the application of the SCZs provides an appropriate level of protection to preserve Aboriginal cultural heritage values in other areas.

The Department notes that concerns have been raised by the registered Native Title Claimants (Awabakal Descendents Traditional Owners Aboriginal Corporation) about the lack of consultation by NCC during the preparation of the EIS. The Corporation also questioned the adequacy of the Aboriginal heritage impact assessment.

In its response to submissions, NCC has stated that the Aboriginal Cultural Heritage Assessment was conducted in accordance with the requirements of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010). It has also committed to facilitate and fund an Aboriginal cultural heritage educational documentation program, and to undertake further investigations of rock-based sites of high Aboriginal cultural heritage significance. NCC has also prepared a draft of its Aboriginal Cultural Heritage Management Plan, which has been circulated to the registered Aboriginal stakeholders for comment.

OEH has stated in its submission that it is satisfied with NCC's assessment and level of consultation with Aboriginal stakeholders. The Department is also satisfied that NCC has done everything that is reasonable and feasible to consult with all relevant Aboriginal stakeholders during the assessment of the proposal.

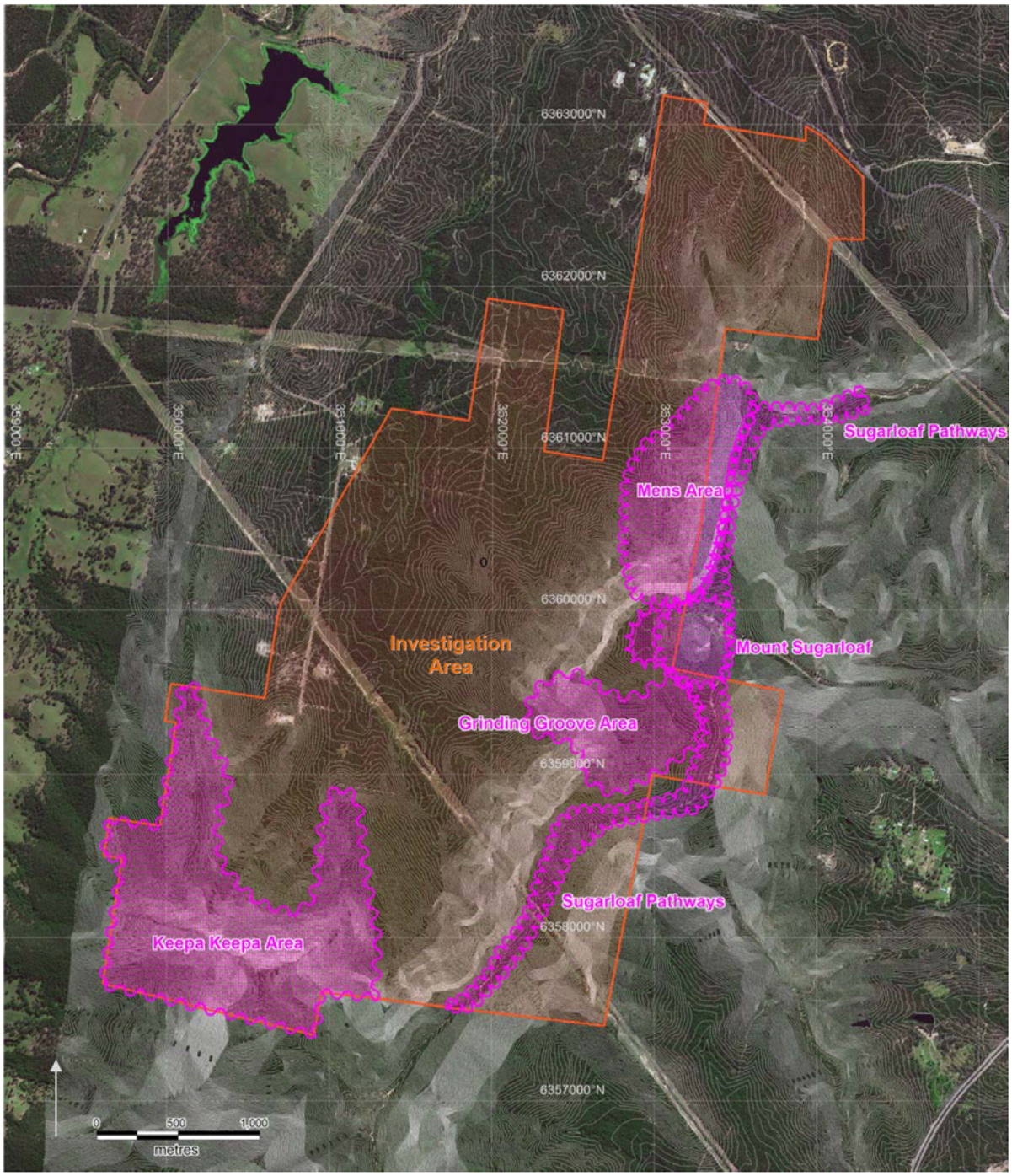

Figure 12: *Areas of High Aboriginal Cultural Heritage Value*

In summary, the Department is generally satisfied with NCC's risk-based approach to managing impacts on Aboriginal heritage, and notes that it is consistent with the approach taken at other recently approved underground mining projects in the Newcastle and Southern Coalfields. Notwithstanding, the approach places a heavy reliance on the successful application of SCZs which include performance measures for cliff lines and steep slopes, but do not specifically set out performance criteria for Aboriginal heritage.

Consequently, in addition to the measures proposed by NCC, the Department has recommended that NCC be required to:

- comply with the following subsidence performance measures for Aboriginal heritage:
  - no more than "negligible impacts and environmental consequences" on all Aboriginal heritage sites of high or moderate to high significance and the rock formations of cultural heritage significance within the Men's Area; and

  - no more than “minor impacts and environmental consequences” for all other rock-based sites and areas of cultural heritage significance;
  - no more than “minor impacts and environmental consequences” for 90% of all other Aboriginal sites (i.e. open artefact scatters); and
- prepare and implement a trigger action response plan as part of the Aboriginal Cultural Heritage Management Plan that details the protocols and procedures for identifying, responding and remediating any unforseen impacts on Aboriginal heritage sites.

The Department is satisfied that with the application these performance and management measures and the various measures proposed by NCC, the development would be unlikely to result in a significant impact on Aboriginal cultural heritage values in the local area.

5.9 FLORA & FAUNA

Flora

NCC has sought to minimise the biodiversity impacts of the proposed development on native vegetation by avoiding threatened species and EECs as far as practicable in the layout of the new pit-top facilities, and through the application of SCZs in areas where EECs occur in the mining extension area.

Nonetheless, the proposed design of the new pit-top facilities would result in the removal of 11.2 hectares of native vegetation, including 8.9 hectares of *Lower Hunter Spotted Gum Ironbark Forest* EEC and 417 individual plants of Heath Wrinklewort *(Rutidosis heterogama)*, which is listed as “vulnerable” under the *Threatened Species Conservation Act 1995* (TSC Act).

The flora assessment in the EIS (Appendix F) indicates that the clearing of the EEC and the Heath Wrinklewort plants would *not* result in a significant impact as both are well represented in the region and the development would not result in any significant habitat fragmentation.

The 8.9 hectares of EEC that would be removed is part of a larger community that covers around 700 hectares, and the Heath Wrinklewort plants that would be removed represent less than 4% of the local population of this species (417 compared with up to 11,000 individuals in the immediate vicinity).

NCC is proposing to translocate the Heath Wrinklewort plants to a site owned by NCC about 70 m to the south of the site. This site would then be protected in perpetuity as part of the biodiversity offset strategy as discussed below. This translocation program, along with a research program proposed by NCC to determine the level of genetic exchange between patches of Heath Wrinklewort, would provide a better scientific understanding of how to conserve and manage this species in the future.

The flora assessment also examined the potential impacts of the development in the underground mining extension area, particularly the impacts of subsidence. The assessment identified 5 EECs, (including 2 GDEs) and 3 threatened flora species in the extension area (see Table 12). The EECs are predominantly located along creek line or the Sugarloaf Range where the proposed SCZs would apply (see Figure 13). However, there are areas of EEC and other vegetation communities that occur outside the SCZs, but within the subsidence impact zone.

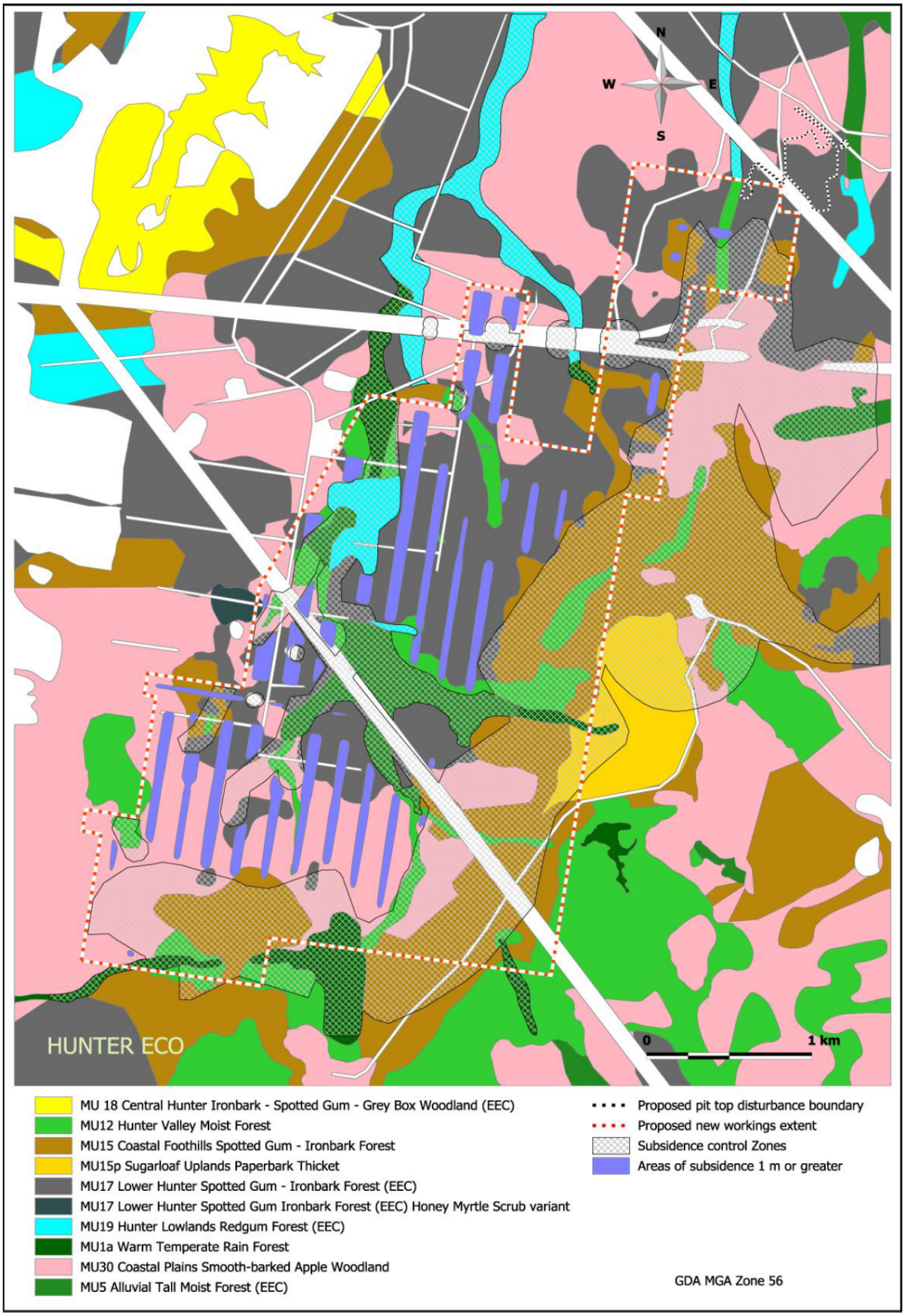

***Figure 13**: Vegetation Communities in the Development Area & Subsidence Control Zones*

Table 12: *Endangered Ecological Communities in the Development Area (see Figure 13)*

EEC	Area (ha)	Consideration
MU1a – Coastal Warm Temperate – Sub Tropical Rain Forest (Groundwater Dependent Ecosystem)	19	• Creek lines and gullies • Entirely within SCZ 2A • Partial Extraction • 300mm maximum subsidence • **Negligible impacts**
MU5 – Alluvial Tall Moist Forest (Groundwater Dependent Ecosystem)	43	• Creek lines and gullies • Entirely within SCZ 2A • Partial Extraction • 300mm maximum subsidence • **Negligible impacts**
MU17 - Lower Hunter Spotted Gum – Ironbark Forest	285	• Predominant vegetation community in the mining extension area. •
MU17(iv) - Lower Hunter Spotted Gum – Ironbark Forest (Honey Myrtle Scrub variant)	<1	• Entirely within SCZ 2A • Partial Extraction • 300mm maximum subsidence • **Negligible impacts**
MU19 - Hunter Lowlands Redgum Forest	113	• Creek lines and gullies • Entirely within SCZ 2A • Partial Extraction • 300mm maximum subsidence • **Negligible impacts**

Potential impacts of underground mining on flora include drawdown of groundwater aquifers, alterations to stream flows, ponding of surface water, connective cracking that drains surface water, and destabilization of slopes and cliffs that may result in localised landslides or rock falls.

However, as outlined in the subsidence assessment (see Section 5.3 above), the mine plan has been designed to protect environmentally sensitive areas such as streams, steep slopes, cliff lines and EECs through the application of subsidence control zones. With the application of these controls, the Department is satisfied that underground mining is unlikely to have a significant impact on native vegetation located within the control zones.

In areas outside the SCZs (i.e. areas with greatest potential subsidence) the vegetation consists largely of *Lower Hunter Spotted Gum Ironbark Forest* EEC and *Coastal Plains Smooth-barked Apple Woodland* (not an EEC). Neither of these communities are groundwater dependent and can tolerate a range of soil moisture conditions. Hence the Department is satisfied that any impacts on these communities would be isolated to localised loss of individual plants. NCC would undertake subsidence monitoring, and has committed to repairing or rehabilitating any subsidence impacts that have the potential to affect native vegetation.

Fauna

Six threatened fauna species were recorded within the proposed development area (Glossy-Black Cockatoo, Little Lorikeet, Yellow-bellied Glider, Grey-headed Flying-fox, Large-eared Pied Bat and Eastern False Pipistrelle). However, only the Yellow-bellied Glider was recorded in the vicinity of the new pit-top area.

The design of the new pit-top facility was altered to protect the roost tree for the indentified Yellow-bellied Glider, and the assessment indicates that the proposed development would not significantly impact this species as there would be limited clearing and similar habitat for this species is represented throughout the local area. Other Yellow-bellied Gliders were also recorded at other locations during the fauna surveys within the proposed development area.

In the underground mining areas, the Department is satisfied that the level of subsidence predicted would not result in any significant impacts on fauna, or lead to any material loss of habitat or foraging resources in the development area. Similarly, the Department is satisfied that the proposed development would not appreciably increase adverse impacts on fauna associated with noise, increased traffic, lighting, pest species and bush fire.

Aquatic Ecology

The EIS incorporates an Aquatic Ecology Assessment (Appendix E of the EIS). The aquatic ecology surveys found no threatened aquatic flora or fauna within the development area. The assessment found that because the subsidence levels would not appreciably alter stream baseflows, and no significant changes to aquatic habitat or water quality in local streams would occur, the proposed development would not result in any significant impacts on aquatic ecology.

NCC is proposing to prepare and implement a Water Management Plan that would include:

- a site water management system to ensure that there are no offsite dirty water discharges;
- monitoring of stream flow characteristics and water quality; and
- trigger levels for investigation and/or adaptive management of aquatic ecosystems.

The Department is satisfied with the aquatic ecology assessment, and believes the proposed development would not result in significant impacts on aquatic ecology in the development area. The Department is also satisfied with the proposed mitigation, management and monitoring measures proposed, and has incorporated these measures in the recommended conditions of consent.

Offset Strategy

To offset and compensate for the residual biodiversity impacts of the proposed development (particularly the removal of the EEC and threatened Heath Wrinklewort), NCC is proposing to implement a biodiversity offset strategy. To this end, NCC has identified an area about 20 km to the west of the site that is owned by Yancoal (NCC is a wholly owned subsidiary of Yancoal). The area comprises 42 hectares of remnant vegetation (including 20 hectares of *Lower Hunter Spotted-Gum Ironbark Forest* EEC and over 7,000 Health Wrinklewort plants) adjacent to the Werakata State Conservation Area (Figure 14).

NCC is also proposing a $25,000 annual contribution to OEH during the life of the development for vegetation management, revegetation and rehabilitation works in the Sugarloaf SCA.

Both the Department and OEH are generally satisfied that the proposed offset strategy would adequately offset and compensate for the biodiversity impacts of the proposed development, and would likely result in a net improvement in regional biodiversity values in the medium to long-term. The Department believes that the proposed offset strategy has a number of advantages, including:

- the vegetation communities in the offset areas are similar to those in the new pit-top area (i.e. “like for like”);
- the offset area would protect more than twice the area of EEC than would be removed (i.e. 20 ha compared with 8.9 ha);
- the offset area has the potential to enhance regional habitat connectivity with the Werakata SCA (and facilitates future incorporation into the SCA).

However, NCC is now proposing that the location and arrangements for any offsite biodiversity offset area be finalised only after the development is approved, and prior to the construction of the new pit-top facility. The Department believes this fails to provide adequate certainty to the assessment process and puts at risk the beneficial outcomes that could be achieved through the long term protection of the area proposed near the Werakata SCA. Consequently, the Department has recommended a condition that requires the offsite offset area identified by NCC to form part of the biodiversity offset package for the development. NCC has accepted this condition.

In addition to the biodiversity offset strategy, NCC is proposing to rehabilitate the areas disturbed at the existing and new-pit top facilities to native woodland. There is also an existing 10 hectare biodiversity offset area adjacent to the existing pit-top facilities required under the current approval for the mine. While the long term land use goal for these areas is conservation, there are currently no mechanisms in place to protect these areas in the long term. Consequently, in addition to requiring the long term protection of the offsite biodiversity offset strategy, the Department has recommended that NCC be required to protect the existing offset area at the existing pit-top site, to the satisfaction of the Department and OEH.

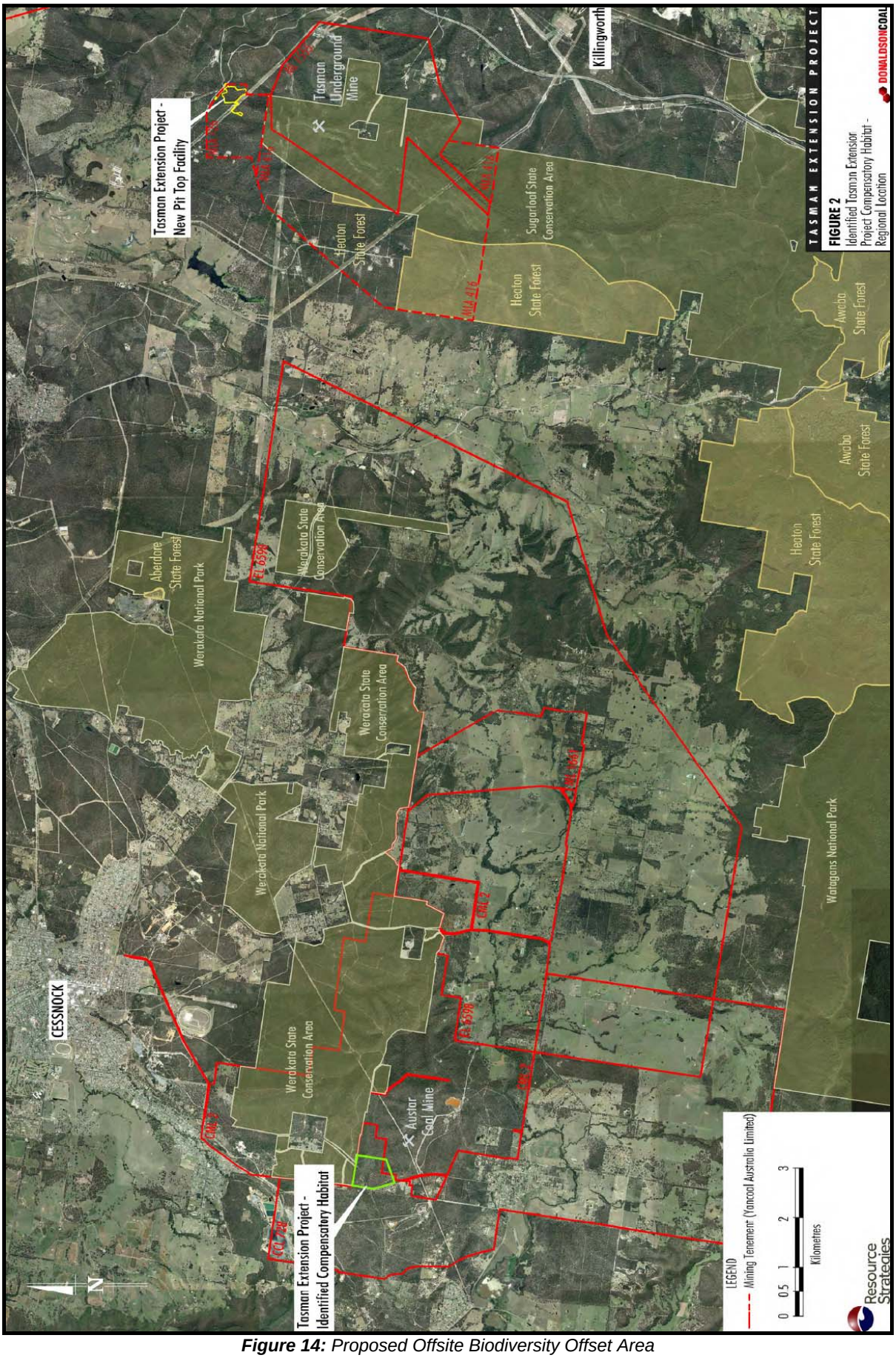

Figure 14: *Proposed Offsite Biodiversity Offset Area*

Conclusion

In summary, the Department is satisfied that the proposed development would not result in any significant impacts on EECs, threatened species, or on regional biodiversity values. In fact, with the implementation of the onsite and offsite biodiversity offset measures, the proposal has the potential to enhance regional biodiversity values in the medium to long term.

To ensure the impacts of the proposal on flora and fauna are minimised, managed, monitored, and the long term beneficial biodiversity outcomes are realised, the Department has recommended that NCC be required to:

- secure and make arrangements for the long term conservation of the 42 hectare offsite biodiversity offset area near Werakata SCA and the 10 hectare offset at the existing pit-top;
- rehabilitate the existing and new-pit top areas to native woodland;
- establish completion criteria for the biodiversity offsets, and assess the performance of the biodiversity offsets against these criteria;
- lodge a conservation bond with the Department to ensure the biodiversity offset strategy in implemented in accordance with the completion criteria;
- contribute $25,000 each year to OEH (while mining under the SCA) for the management and protection of the Sugarloaf SCA;
- translocate the Heath Wrinklewort plants from the new pit-top area and conduct a research program to improve scientific knowledge about how to conserve and manage this species, and publish the findings of this research in a peer reviewed scientific journal; and
- prepare and implement a detailed Biodiversity Management Plan to mitigate, manage, and monitor the potential impacts of the development on flora and fauna.

5.10 LAND USE

The majority of the proposed extension area is located beneath the Sugarloaf State Conservation Area and the Heaton State Forest. These areas are used by bushwalkers, off-road vehicles and trail bikes. It is not anticipated that the proposal would require closure of any areas to public access. In the event that subsidence impacts require remediation (e.g. surface cracking) there may be temporary closure of some areas to maintain public safety. Public Safety Management Plans would be prepared by NCC in consultation with OEH and NSW Forests, and it is not anticipated that the remediation would require anything but localised closures that would not significantly alter the recreational uses of the SCA or State Forest.

There are no significant agricultural enterprises within the proposed mining area, and there is no land identified as “regionally significant agricultural land” in the *Lower Hunter Regional Strategy*. Orica Australia owns a parcel of land to the north of the site. This land is used by Orica for explosives research and testing, and there is an existing approval for an Ammonium Nitrate Emulsion Plant granted by the NSW Minister for Planning in 2012. The proposed upcast ventilation shaft for the development would be located on the Orica site, but the proposed underground working would be located at least 200m from the approved Ammonium Plant, and any subsidence in this area has been assessed as negligible.

Given these considerations, the Department is satisfied that subsidence associated with the proposal would not adversely affect other land uses in the area, and that the proposed development can be undertaken in a manner that is generally consistent with the applicable zoning objectives.

5.11 REHABILITATION

The EIS includes a conceptual rehabilitation strategy for the mine that involves a range of short term and long term components and completion criteria. The key components of the strategy include:

- progressive rehabilitation of areas of minor disturbance during mining operations, including any subsidence impacts;
- rehabilitation of areas disturbed by the surface facilities at the cessation of the project with native vegetation, including the existing pit-top and new pit-top, ventilation shaft, and access roads.

NCC's proposed completion criteria for the final landform and rehabilitation broadly reflect the existing obligations in the current consent for the Tasman Underground Mine:

- to create a nil maintenance, geotechnically stable, safe and vegetated landform which blends with the surrounding landscape; and
- revegetate disturbed areas to integrate with surrounding undisturbed vegetation to provide consolidated areas and wildlife corridors where possible.

The Department is generally satisfied with these broad rehabilitation goals, and is confident that it can be achieved as the existing and new pit-top sites are relatively flat, and the nature and extent of the disturbance is not significant when compared to open cut mining projects. Furthermore, the Department supports the goal of revegetating disturbed areas to native woodland as it is consistent with the character of surrounding land uses (i.e. the Sugarloaf SCA).

To ensure these broad rehabilitation outcomes are achieved, the Department has also recommended that NCC be required to meet specific rehabilitation objectives for identified natural and built features within the development area (i.e. cliff lines, streams, infrastructure, etc) and prepare and implement a detailed Rehabilitation Management Plan in consultation with relevant stakeholders. The plan would include:

- a description of how the performance of the rehabilitation would be monitored and assessed against the rehabilitation objectives;
- a description of the process that whereby additional measures would be indentified and implemented to ensure these objectives were achieved; and
- a detailed mine closure plan.

With the implementation of these measures, the Department is satisfied that the areas disturbed by the proposed development can be successfully rehabilitated to meet appropriate long term final land use objectives that are consistent with the surrounding area.

5.12 OTHER ENVIRONMENTAL IMPACTS

Other potential environmental impacts associated with the proposed development are assessed in Table 13.

Table 13: *Environmental Assessment of Other Issues*

Issue	*Assessment*	*Conclusion/Recommended Conditions*
Air Quality	▪ The dust emissions from the proposed development were modeled and assessed by PAE Holmes (Appendix J of the EIS). ▪ The assessment indicated that background concentrations of dust in the area are relatively low, and would remain well below the relevant project-specific and cumulative air quality criteria at all residential receivers during both construction and operation of the mine. ▪ A range of mitigation measures would be implemented by NCC during construction and operation of the mine to minimise the dust generated by the development, including watering of haul roads, a wheel wash and covering of coal trucks on public roads. ▪ The existing air quality monitoring network at the mine would be augmented by NCC, including the installation of new dust deposition gauges on George Booth Drive and Sheppeard Drive.	▪ The Department is satisfied that the dust generated by the proposed development would comfortably comply with relevant criteria, and would not significantly affect the amenity of local residents. ▪ The Department is also satisfied with the proposed mitigation, management and monitoring measures proposed, and has incorporated these measures in the recommended conditions of consent, including updating the existing Air Quality Management Plan for the mine.
Green-house Gas	▪ Scope 1, 2 and 3 greenhouse gas emissions generated by the proposed development have been estimated in accordance with the emission factors in the *National Greenhouse Accounts Factors* (July 2011) ▪ The total emissions (Scope 1, 2 and 3) over the life of the development would be 33.64 Mt CO_2-e or approximately 2.25 Mt CO_2-e each year. ▪ This represents 0.3 % of Australia's annual	▪ The Department is satisfied with the assessment of greenhouse gases, and recognises that the development would generate a large volume of greenhouse gases, especially if Scope 3 emissions are considered. ▪ The Department believes that these emissions are largely unavoidable,

Issue	*Assessment*	*Conclusion/Recommended Conditions*
	emissions, and 0.0045 % of annual global emissions. ▪ The greenhouse intensity of the mine is 0.02 t CO_2-e/t ROM coal which is less than the average for coal mines in Australia of 0.05 t CO_2-e/t ROM coal. ▪ A range of greenhouse minimisation and reduction measures are proposed by NCC, including energy efficiencies measures, regular maintenance of equipment, and rehabilitation of disturbed areas. ▪ The greenhouse emissions from the mine may exceed the Commonwealth Carbon Pricing Mechanism threshold of 25,000 t CO_2-e per annum. Hence NCC may be required to contribute towards the revenue generated through this mechanism which is used for initiatives designed to reduce Australia's greenhouse emissions.	and that it is in NCC's economic interest to minimise its greenhouse emissions. ▪ In the context of national and global emissions the impacts of the development are not significant. Nonetheless, the Department has recommended a condition that requires NCC to demonstrate that it is minimising the greenhouse emissions generated by the proposed development.
Visual	▪ Any additional visual impacts of the proposed development would be associated with the new pit-top facilities. ▪ However, the visibility of these facilities would be limited by its relatively remote location and the shielding afforded by the dense vegetation which surrounds the site. ▪ Views of the facilities would be further reduced by the construction of 2m bund adjacent to George Booth Drive. ▪ Views of the new pit-top and ventilation shaft are likely from the access road to the Orica facility. However, the visual impact and viewer sensitivity would be low given the commercial/ industrial use of this site. ▪ Extensive vegetation and intervening topography are likely to restrict views to the new pit-top from the Sugarloaf SCA. ▪ All lighting at the new pit-top would be installed to avoid visual impacts, and interference with any traffic on George Booth Drive. ▪ All buildings at the new pit-top would be constructed with materials coloured in shades to merge with the surrounding landscape. ▪ Both the existing pit-top and new pit-top facilities would be rehabilitated to native woodland, so there would be no significant long term visual impacts.	▪ The Department is satisfied that the proposed development would have a minimal visual impact on surrounding land uses and local residents. ▪ Nonetheless, the Department has recommended that NCC be required to: implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts; construct the visual bund in the easement at George Booth Drive; and blend the visual appearance of all buildings, as far as possible with the surrounding landscape.

Issue	*Assessment*	*Conclusion/Recommended Conditions*
Socio-Economic	▪ A socio-economic analysis for the project was undertaken by Gillespie Economics (Appendix M of the EIS). The analysis indicated that the project would deliver benefits to the local, regional and State economy, including: - continuing employment for up to 150 people (including the creation of 40 new jobs); - 20 temporary jobs during the 12 month construction period; - capital investment of $61 million; - $41 million in royalties to the NSW Government; and - $13.6 million in company tax to the Commonwealth Government. ▪ Overall, the cost benefit analysis calculated a net benefit of between $57 million and $94 million would be foregone if the proposed development does not proceed. ▪ In regard to pubic infrastructure and community services, the additional demand created by the proposed extension would be very small and be easily catered for in the broader Newcastle region – with the exception of roads. ▪ In regard to roads, NCC has agreed to pay up to $8,000 per km per year to Cessnock City Council for maintenance of the George Booth Drive.	▪ The Department is satisfied that the proposed development would provide a range of significant social and economic benefits to the region and the State of NSW. ▪ The Department is also satisfied that these benefits can be realised without any significant additional strain on public infrastructure or community services, apart from the road network, which would be addressed through appropriate contributions to Cessnock City Council.
Historic Heritage	▪ A Historic Heritage Assessment was undertaken for the project (see Appendix L of the EIS). The assessment was undertaken in accordance with the *NSW Heritage Manual* and in consideration of the *Burra Charter* (ICOMOS 1999). No items of historic heritage were identified during the surveys, and hence no specific mitigation, monitoring or management measures have been proposed by NCC.	▪ The Department is satisfied with the assessment undertaken in relation to historic heritage. ▪ The Department considers that the area has a very low risk of unidentified sites being found during operations as the area predominantly comprises dense native woodland, and consequently agrees that no specific mitigation measures are warranted.
Bushfire Hazard	▪ The new pit-top facilities would be located within a bushfire prone area. ▪ The proposed development itself is unlikely to increase the bushfire hazard as the West Borehole Coal Seam has low spontaneous combustion properties, and coal would only be stockpiled on a temporary basis with appropriate management of spontaneous combustion and other fire hazards. ▪ In the event of a bush fire, the pit-top facilities would be equipped with fire-fighting equipment, and staff would be trained in the emergency procedures appropriate for a bush fire situation.	▪ The Department is satisfied that the proposed development does not pose a significant additional bushfire hazard, and has recommended conditions that require NCC to ensure that: the surface facilities are designed in accordance with relevant Rural Fire Service guidelines in respect of bushfire buffer zones; the development is suitably equipped to respond to any fires on site; and NCC assists the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.

6. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of consent for the proposed development (see Appendix A). These conditions are required to:

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

The recommended conditions strengthen the existing conditions of consent for the Tasman Underground Mine, and reflect current best practice for the regulation of underground coal mines in NSW.

7. CONCLUSION

The Department has thoroughly assessed the proposed development in accordance with Section 79C and the objects of the EP&A Act, including:

- the environmental, social and economic impacts of the proposed development;
- relevant environmental planning instruments;
- submissions on the proposed development;
- the suitability of the site; and
- the public interest.

The Department considers that the proposed development would not significantly increase the environmental impacts of the mine. In particular, the Department notes that the proposed underground mining would occur in areas dominated by native vegetation and using mining methods that can be readily adapted to reduce or avoid any unforeseen impacts that may emerge as the mine progresses in the extension area.

The Department also considers that the subsidence control zones would provide adequate protection to sensitive natural and built features in the mining domain, and notes that subsidence control zones have been successfully applied to underground mining at the existing operations which lie beneath very similar terrain. The Department is confident that any impacts that may occur as a result of subsidence would be minor, identified by subsidence monitoring, and could be appropriately repaired or restored using standard remediation techniques.

Notwithstanding, the Department acknowledges that the proposed development would increase some of the environmental impacts of the existing mine, particularly impacts on EECs and threatened species, and increases in traffic and associated road noise along the coal haulage route. However, the Department believes that these impacts would not be significant, and can be minimised, managed and offset through appropriate conditions of consent.

It is also important to note that only 1 public submission was received from the local community, and that none of the residents in the underground mining precinct made a submission. The NSW Minister for the Environment has also provided landowners consent for the areas of the mine that occur in the Sugarloaf SCA.

Finally, the proposed development would result in a range of significant beneficial social and economic impacts, including continuation of 150 jobs for another 17 years, $61 million of additional capital investment, and $41 million in contributions to the State through royalties.

On balance, the Department believes that the proposed development represents a logical progression of existing mining operations at the Tasman Underground Mine, that the site proposed for the development is suitable, and that the benefits of the proposed extension significantly outweigh any potential costs. Consequently, the Department believes that the Tasman Extension Project is consistent with the objects of the EP&A Act, is in the public interest, and should be approved subject to conditions.

8. RECOMMENDATION

It is RECOMMENDED that the Executive Director, Development Assessment Systems and Approvals, as delegate of the Minister for Planning and Infrastructure:

- **considers** the findings and recommendations of this report;
- **approves** the development application, subject to conditions; and
- **signs** the attached instrument of consent (Appendix A).

11/3/2013

Director
Mining & Industry Projects

Executive Director
Development Assessment Systems and Approvals

APPENDIX A:
RECOMMENDED CONDITIONS OF CONSENT

Development Consent

Section 89E of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, I approve the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 6.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

Chris Wilson
Executive Director
Development Assessment Systems and Approvals

Sydney 2013

SCHEDULE 1

Application Number:	SSD-4962
Applicant:	Newcastle Coal Company Pty Limited
Consent Authority:	Minister for Planning and Infrastructure
Land:	See Appendix 1
Development:	Tasman Extension Project

TABLE OF CONTENTS

DEFINITIONS

Adaptive management	Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and designated ranges and in compliance with the conditions of this consent
Annual Review	The review required by Condition 4 of Schedule 6
Applicant	Newcastle Coal Company Pty Limited, or any other person or persons who rely on this consent to carry out the development that is subject to this consent
BCA	Building Code of Australia
Built features	Any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk, or driveway; any pipeline, water, sewer, telephone, gas or other service main
CCC	Community Consultative Committee
Coal haulage route	The route proposed in the EIS for haulage of coal by trucks between the site and the Bloomfield Coal Handling and Preparation Plant via George Booth Drive and John Renshaw Drive
Conditions of this consent	Conditions contained in Schedules 2 to 6 inclusive
Construction	The demolition of buildings or works, carrying out of works and erection of buildings covered by this consent
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Infrastructure
Development	The development described in the EIS
Development area	All land to which the development application applies, including the underground mining domains and the Existing and New Pit-Top, as listed in Appendix 1 and shown in Appendix 2
Director-General	Director-General of the Department, or delegate
DRE	Division of Resources and Energy, within the Department of Trade & Investment, Regional Infrastructure & Services
EIS	Environmental Impact Statement
Environmental consequences	The environmental consequences of subsidence impacts, including: damage to built features; loss of surface water flows to the subsurface; loss of standing pools; slope changes to streams; adverse water quality impacts; development of iron bacterial mats; cliff falls; rock falls; landslides; damage to Aboriginal heritage sites; impacts on aquatic ecology; and ponding.
EPA	Environment Protection Authority, or its successor
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the POEO Act
Executive Director Mineral Resources	Executive Director Mineral Resources within DRE, or the equivalent role
Existing Pit-Top	The existing Tasman Underground Mine surface infrastructure site in operation at the date of this consent, as shown in Figure 1 of Appendix 4
Evening	The period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build or to implement
First workings	Development of main headings, related cut throughs and the like
Ha	Hectare
Heritage item	An item as defined under the *Heritage Act 1977* and/or an Aboriginal object or Aboriginal place as defined under the *National Parks and Wildlife Act 1974*
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedule 4 of this consent where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent

Level of Service	A quantitative measure of the traffic conditions on a road or at an intersection as defined in the *Guide to Traffic Management Part 3: Traffic Studies and Analysis (Austroads 2009)*
Major Cliff	Continuous rock face, including overhangs, having a minimum length of 20 metres, a minimum height of 10 metres and a minimum slope of 2 to 1
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mining operations	Includes all extraction, processing, handling and storage of coal carried out on the site
Minister	Minister for Planning and Infrastructure, or delegate
Minor	Not very large, important or serious
Minor cliff	A continuous rock face, including overhangs, having a minimum length of 20 metres, heights between 5 metres and 10 metres and a minimum slope of 2 to 1 (>63.4º); or a rock face having a maximum length of 20 metres and a minimum height of 10 metres
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring
MSB	Mine Subsidence Board
Negligible	Small and unimportant, such as to be not worth considering
New Pit-Top	The new surface infrastructure site for the proposed development (including the upcast ventilation shaft) as shown in Figure 2 of Appendix 4
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary)
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Reasonable costs	The costs agreed between the Department and the Applicant for obtaining independent experts to review the adequacy of any aspects of the Extraction Plan, or where such costs cannot be agreed, the costs determined by a dispute resolution process
Rehabilitation	The treatment or management of land disturbed by the development for the purpose of establishing a safe, stable and non-polluting environment
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact
ROM coal	Run-of-mine coal
RMS	Roads and Maritime Services
Safe, serviceable & repairable	Safe means no danger to users who are present; serviceable means available for its intended use; and repairable means damaged components can be repaired economically
Second workings	Extraction of coal from panels or pillars
Site	All land within the Development Area (see Appendices 1 and 2)
SMP	Subsidence Management Plan
Steep slopes	An area of land having a gradient between 1 in 3 (33% or 18.3º) and 2 to 1 (200% or 63.4º)
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts
Subsidence effects	Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature
Subsidence impacts	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs
Underground mining domain	The area outlined in a solid blue edge and solid salmon edge in Figure 1 in Appendix 3
VENM	*Virgin Excavated Natural Material* as defined under the POEO Act

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this consent, the Applicant shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

TERMS OF CONSENT

2. The Applicant shall carry out the development generally in accordance with the:
   (a) EIS titled *Tasman Extension Project, Environmental Impact Statement* (3 volumes) dated June 2012, as modified by the response to submissions, dated 28 September 2012, and the letter to the Office of Environment and Heritage, dated 22 October 2012; and
   (b) conditions of this consent.

   Note: The general layout of the development is shown in Appendices 2 to 4

3. If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these documents.

LIMITS ON CONSENT

Mining Operations

5. The Applicant may carry out mining operations on the site until 31 December 2029.

   Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of either the Director-General or the Executive Director Mineral Resources. Consequently this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Production and Transportation

6. The Applicant shall not extract more than 1.5 million tonnes of ROM coal from the site in any calendar year.

7. The Applicant shall transport all ROM coal from the site to the Bloomfield Coal Handling and Preparation Plant via the coal haulage route.

8. *Prior* to the commissioning of the Hunter Expressway and completion of the New Pit-Top, the Applicant shall not transport more than 4,000 tonnes of ROM coal a day from the site.

9. *Following* the commissioning of the Hunter Expressway and completion of the New Pit-Top, the Applicant may transport up to 6,200 tonnes of ROM coal a day from the site.

Hours of Operation

10. The Applicant shall comply with the operating hours in Table 1.

Table 1: Operating hours

Activity	***Operating Hours***
Coal extraction and operation of surface facilities	24 hours, 7 days per week
Transportation of coal or VENM by road	7.00 am to 10.00 pm - Monday to Friday At no time on Weekends or Public Holidays

Note: The Applicant may transport coal outside these hours in an emergency, and only with the written approval of the Director-General.

Construction

11. During the construction of the New Pit-Top, the Applicant may transport VENM from the site via public roads to the Donaldson Open Cut Coal Mine or the Daracon Buttai Quarry.

12. During the construction of the New Pit-Top, the Applicant shall not transport more than a combined total of 4,000 tonnes a day of ROM coal and VENM from the site.

SURRENDER OF EXISTING DEVELOPMENT CONSENT

13. Within 6 months of completing underground mining in the Fassifern Coal Seam as approved under DA 274-9-2002, or as otherwise agreed by the Director-General, the Applicant shall surrender the existing development consent (DA 274-9-2002) for the mine in accordance with Section 104A of the EP&A Act.

    Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrender of a consent or approval should not be understood as implying that works legally constructed under a valid consent or approval can no longer be legally maintained or used.

14. Prior to the surrender of the existing development consent, the conditions of this consent (including any notes) shall prevail to the extent of any inconsistency with the conditions of the existing development consent (DA 274-9-2002).

STRUCTURAL ADEQUACY

15. The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structure, that are part of the development are constructed in accordance with:
    (a) the relevant requirements of the BCA; and
    (b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.

    Notes:
    - *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.*
    - *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*
    - *Under Section 15 of the Mine Subsidence Compensation Act 1961, the Applicant is required to obtain the MSB's approval before constructing any improvements in a Mine Subsidence District.*

DEMOLITION

16. The Applicant shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.

OPERATION OF PLANT AND EQUIPMENT

17. The Applicant shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS

18. With the approval of the Director-General, the Applicant may submit any strategies, plans or programs required by this consent on a progressive basis.

    Notes:
    - *While any strategy, plan or program may be submitted on a progressive basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.*
    - *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

ROAD MAINTENANCE CONTRIBUTION

19. *Following* the commissioning of the Hunter Expressway and completion of construction of the New Pit-Top, unless otherwise agreed by the Director-General, the Applicant shall pay Cessnock City Council annual contributions for the maintenance of the section of George Booth Drive on the coal haulage route in accordance with the terms of the Applicant's offer to Cessnock City Council in Appendix 8.

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

SUBSIDENCE

Performance Measures – Natural and Heritage Features

1. For all underground mining in the West Borehole Coal Seam, the Applicant shall ensure that the development does not cause any exceedances of the performance measures in Table 2, to the satisfaction of the Director-General.

Table 2: Subsidence Impact Performance Measures – Natural and Heritage Features

Water Resources	***Performance Measure***
1st and 2nd order streams	• *Minor* environmental consequences • *Negligible* connective cracking between the surface and the underground workings
3rd order streams and above	• *Negligible* environmental consequences • No connective cracking between the surface and the underground workings
Land	
Major cliffs, minor cliffs, and steep slopes	• *Negligible* environmental consequences (including rock falls, displacement or dislodgement of boulders or slabs, or fracturing)
Biodiversity	
Threatened species, threatened populations, endangered ecological communities, groundwater dependent ecosystems	• *Negligible* environmental consequences
Aboriginal Heritage	
Aboriginal cultural heritage rock formations of significance in the Men's Area shown in Appendix 6	• *Negligible* impact or environmental consequences
Aboriginal heritage sites of high and high/moderate significance identified Appendix 6	• *Negligible* impact or environmental consequences
Other Aboriginal heritage sites	• *Less than 10%* of Aboriginal heritage sites identified in Appendix 6 are to be affected by subsidence impacts (other than *minor* impacts or environmental consequences)

Notes:

- *Classification of streams in accordance with Strahler stream order system.*
- *The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see Condition 4 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Director-General will be the final arbiter.*
- *The requirements of this condition only apply to the impacts and consequences of mining operations undertaken in the West Borehole Coal Seam. The Applicant must comply with existing subsidence management and monitoring measures required under the existing development consent (DA 274-9-2002) and any approved SMP for underground mining in the Fassifern Coal Seam.*

Performance Measures – Built Features

2. For all mining in the West Borehole Coal Seam, The Applicant shall ensure that the development does not cause any exceedances of the performance measures in Table 3, to the satisfaction of the Director-General.

Table 3: Subsidence Impact Performance Measures – Built Features

Built Features	***Performance Measure***
Communications Towers on Mount Sugarloaf	• Always safe and serviceable • No damage
Fibre-Optic Cables	• Always safe, serviceable and repairable, unless otherwise agreed with the owner
TransGrid Towers	
Ausgrid Power Poles	
Privately-owned residences	
Other built features	

Notes:

- *The Applicant will be required to define more detailed performance indicators for each of these performance measures in Built Features Management Plans or a Public Safety Management Plan (see Condition 4 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Director-General will be the final arbiter.*
- *The requirements of this condition only apply to the impacts and consequences of mining operations undertaken in the West Borehole Coal Seam. The Applicant must comply with existing subsidence management and monitoring measures required under the existing development consent (DA 274-9-2002) and any approved SMP for underground mining in the Fassifern Coal Seam.*
- *Requirements regarding safety or serviceability do not preclude preventative actions or mitigation being taken prior to or during mining in order to achieve or maintain these outcomes.*
- *Requirements under this condition may be met by measures undertaken in accordance with the Mine Subsidence Compensation Act 1961.*

3. Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the subsidence performance measures in Table 3 is to be settled by the Director-General, following consultation with the MSB and the Executive Director Mineral Resources. Any decision by the Director-General shall be final and not subject to further dispute resolution under this consent.

Extraction Plan

4. The Applicant shall prepare and implement an Extraction Plan for all second workings in the West Borehole Coal Seam, to the satisfaction of the Director-General. Each Extraction Plan must:
   (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Director-General;
   (b) be approved by the Director-General before the Applicant carries out any second workings in the West Borehole Seam that is covered by the Extraction Plan;
   (c) include detailed plans of existing and proposed underground workings and any associated surface development, including any applicable adaptive management measures;
   (d) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed mining covered by the Extraction Plan, incorporating any relevant information obtained since this consent;
   (e) describe in detail the performance indicators and the measures that would be implemented to ensure compliance with the performance measures in Tables 2 and 3, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in Condition 29 of Schedule 4;
   (f) include a:
      - *Subsidence Monitoring Program* to assist with the management of the risks associated with subsidence, and which:
        - validates the subsidence predictions;
        - analyses the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and
        - informs the contingency plan and adaptive management process;
      - *Built Features Management Plan* to manage the potential subsidence impacts of the proposed underground workings on built features, and which
        - has been prepared in consultation with the owner/s of potentially affected feature/s;
        - addresses in appropriate detail all items of key public infrastructure and other public infrastructure and all classes of other built features;
        - recommends appropriate pre-mining mitigation measures to reduce subsidence impacts; and
        - recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate predicted impacts on potentially affected built features in a timely manner;
      - *Land Management Plan*, which has been prepared in consultation with any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed underground workings on land in general, with a specific focus on major cliffs, minor cliffs and steep slopes;
      - *Aboriginal Cultural Heritage Management Plan*, which has been prepared in consultation with OEH and relevant Aboriginal stakeholders, to manage the potential environmental consequences of the proposed second workings on Aboriginal cultural heritage and includes all requirements under Condition 25 of Schedule 4;

- *Water Management Plan*, which has been prepared in consultation with OEH and NOW, which provides for the management of the potential impacts and/or environmental consequences of the proposed underground workings on watercourses and aquifers, including:
  - surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources or water quality;
  - a program to monitor and report stream flows, assess any changes resulting from subsidence impacts;
  - a program to monitor and report groundwater inflows to underground workings; and
  - a program to predict, manage and monitor impacts on groundwater bores on privately-owned land; and
- *Biodiversity Management Plan*, which has been prepared in consultation with OEH, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on aquatic and terrestrial flora and fauna, with a specific focus on threatened species populations and their habitats; endangered ecological communities; and groundwater water dependent ecosystems;
- *Public Safety Management Plan* to ensure public safety on the site;
- include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 2 and 3, or where any such exceedance appears likely;

- include appropriate revisions to the Rehabilitation Management Plan required under Condition 31 of Schedule 4; and
- include a program to collect sufficient baseline data for future Extraction Plans.

Notes:

- *In accordance with Condition 18 of Schedule 2, the preparation and implementation of Extraction Plans may be staged, with each plan covering a defined area of underground workings. In addition, these plans are only required to contain management plans that are relevant to the specific underground workings that are being carried out.*

First Workings

5. The Applicant may carry out first workings within the West Borehole Coal Seam without an approved Extraction Plan, provided that first workings are designed to remain stable and non-subsiding, except insofar as they may be impacted by approved second workings.

Payment of Reasonable Costs

6. The Applicant shall pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to review the adequacy of any aspect of an Extraction Plan.

SCHEDULE 4
SPECIFIC ENVIRONMENTAL CONDITIONS – GENERAL

TRANSPORT

Monitoring of Coal Transport

1. The Applicant shall:
   (a) keep accurate records of the amount of coal transported from the New Pit-Top (on a daily basis); and
   (b) make these records publicly available on its website at the end of each financial year.

Road Works

2. The Applicant shall:
   (a) construct an appropriate site access intersection and roundabout from George Booth Drive to the New Pit-Top, prior to the transportation of coal from the New Pit-Top, in consultation with Cessnock City Council, and to the satisfaction of RMS;
   (b) undertake the driveway treatments listed in Appendix 7 prior to commencement of construction of the New Pit-Top, in consultation with Cessnock City Council and the relevant landowner, and to the satisfaction of RMS; and
   (c) upgrade the Abel Underground Mine Access Road intersection with John Renshaw Drive if the results of the performance monitoring program in Condition 4 of Schedule 4 demonstrates that the performance of this intersection is equal to or less than Level of Service D, in consultation with the RMS and to the satisfaction of the Director-General.

Independent Traffic Count

3. Within 6 months of the commencement of the construction of the New Pit-Top, and every 12 months thereafter, unless the Director-General directs otherwise, the Applicant shall commission an independent traffic count to calculate the proportion of loaded heavy vehicles generated by the development to total heavy vehicles on George Booth Drive to inform the calculation of the annual road maintenance contribution by the Applicant to Cessnock City Council in accordance with Condition 19 of Schedule 2 and Appendix 8, to the satisfaction of Cessnock City Council.

Performance Monitoring Program

4. Within 6 months of the commencement of the construction of the New Pit-Top, and every 12 months thereafter, unless the Director-General directs otherwise, the Applicant shall commission a suitably qualified person, to monitor and assess the performance of the following intersections:
   (a) New Pit-Top Access Road – George Booth Drive;
   (b) the George Booth Drive - John Renshaw Drive; and
   (c) the Abel Underground Mine Access Road - John Renshaw Drive,
   to the satisfaction of the Director-General.

   Note: Monitoring of the listed intersections may be discontinued with the agreement of the Director-General.

Road Transport Protocol

5. The Applicant shall update the Road Transport Protocol for the development, to the satisfaction of the Director-General. The updated protocol must be prepared in consultation with the RMS, Cessnock City Council and Lake Macquarie City Council. The plan must be submitted to the Director-General for approval prior to commencement of construction of the New Pit-Top.

Independent Traffic Audit

6. Within 6 months of the commencement of construction of the New Pit-Top, and every 12 months thereafter, unless the Director-General directs otherwise, the Applicant shall commission a suitably qualified person, whose appointment has been approved by the Director-General, to conduct an Independent Traffic Audit of the development. This audit must:
   (a) be undertaken without prior notice to the Applicant, and in consultation with RMS, Cessnock City Council and Lake Macquarie City Council (where applicable);
   (b) assess the impact of the development on the performance and safety of the road network, including:
      - the results of the performance monitoring program of key intersections;
      - any potential safety issues associated with new driveways on the section of George Booth Drive used for coal haulage;

(c) review coal haulage and accident records on the coal haulage route, and investigate any incidents involving haulage vehicles from the development;
(d) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts.

7. Within 1 month of receiving the audit report, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the report to the Director-General, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report. Any road works recommended in the Independent Traffic Audit must be undertaken within 6 months of the audit to the satisfaction of the relevant road authority, unless otherwise agreed with the Director-General.

NOISE

Noise Impact Assessment Criteria

8. The Applicant shall ensure that the noise generated by the development on the site does not exceed the criteria in Table 4 at any residence on privately-owned land.

Table 4: Noise Criteria dB(A)

Location	***Day*** $L_{Aeq\ (15\ min)}$	***Evening*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{Aeq\ (15\ min)}$	***Night*** $L_{A1\ (1\ min)}$
Residences on George Booth Drive	*36*	*36*	*36*	*45*
All other privately-owned residences	*35*	*35*	*35*	*45*
	$L_{Aeq\ (period)}$			-
Sugarloaf State Conservation Area	*50 (when in use)*			-

Note: After the first review of any EPL granted for this project under Section 78 of the POEO Act, nothing in this approval prevents the EPA from imposing stricter noise limits on the mining operations on site under the EPL.

Appendix 9 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

9. The Applicant shall:
(a) implement best management practice, including all reasonable and feasible noise mitigation measures to minimise the construction, operational and road traffic noise generated by the development; and
(b) regularly assess the results of noise monitoring to ensure compliance with the relevant conditions of this approval,
to the satisfaction of the Director-General.

Noise Management Plan

10. The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Director-General. This plan must:
(c) be submitted to the Director-General for approval prior to the commencement of the construction of the New Pit-Top;
(d) describe the mitigation measures that would be implemented to minimise noise during construction and operations, including road noise generated by vehicles associated with the development;
(e) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent; and
(f) include a noise monitoring program that:
- uses attended monitoring to evaluate the performance of the development; and
- includes a protocol for determining exceedances of the relevant conditions of this consent.

AIR QUALITY & GREENHOUSE GAS

Air Quality Criteria

11. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the development do not exceed the criteria listed in Tables 5, 6 and 7 at any residence on privately-owned land.

Table 5: Long term criteria for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 6: Short term criterion for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 7: Long term criteria for deposited dust

Pollutant	***Averaging period***	***Maximum increase in deposited dust level***	***Maximum total deposited dust level***
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes for Tables 5 to 7:

- *[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources);*
- *[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own);*
- *[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and*
- *[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Director-General.*

Greenhouse Gas Emissions

12. The Applicant shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.

Operating Conditions

13. The Applicant shall:
    (a) implement best management practice on site, including all reasonable and feasible air quality mitigation measures to minimise the off-site odour, fume and dust emissions generated by the development;
    (b) minimise any visible air pollution generated by the development;
    (c) minimise the surface disturbance of the site generated by the development; and
    (d) regularly assess the air quality monitoring data, and modify operations on site to ensure compliance with the relevant conditions of this consent,

    to the satisfaction of the Director-General.

Air Quality & Greenhouse Gas Management Plan

14. The Applicant shall prepare and implement a detailed Air Quality & Greenhouse Gas Management Plan for the development to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with the EPA, and submitted to the Director-General for approval prior to commencement of construction of the New Pit-Top;
    (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent;
    (c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site; and
    (d) include an air quality monitoring program to evaluate the performance of the development.

METEOROLOGICAL MONITORING

15. During the life of the development, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South* Wales guideline; and
    (b) is capable of calculating temperature lapse rates from measurements made at 2 and 10 metres in accordance with the *NSW Industrial Noise Policy*.

WATER

Note: Under the Water Act 1912, the Applicant is required to obtain necessary water licences for the development.

Water Supply

16. The Applicant shall ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of mining operations to match its available water supply, to the satisfaction of the Director-General.

Surface Water Discharges

17. Except as may be expressly provided by an EPL, the Applicant shall comply with Section 120 of the POEO Act during the carrying out of the development.

Water Management Plan

18. The Applicant shall prepare and implement a Water Management Plan for the development to the satisfaction of the Director-General. This plan must be prepared in consultation with NOW and the EPA, by suitably qualified and experienced persons, and submitted to the Director-General for approval prior to commencement of construction of the New Pit-Top. This plan must include:
    (a) a comprehensive water balance for the development, that includes details of:
        - sources and security of water supply;
        - water make in the underground workings;
        - water storage volumes in the Stockrington Colliery workings;
        - water use; and
        - any water discharges;
    (b) management plans for the surface facilities sites, that include:
        - a detailed description of water management systems for each site, including:
            - clean water diversion systems;
            - erosion and sediment controls; and
            - any water storages;
        - measures to minimise potable water use and to reuse and recycle water; and
        - monitoring and reporting procedures.

BIODIVERSITY

Biodiversity Offset Strategy

19. The Applicant shall implement the biodiversity offset strategy described in the EIS and summarised in Table 8, to the satisfaction of the Director-General.

Table 8: *Summary of the Biodiversity Offset Strategy*

Area	***Offset Type***	***Minimum Size/Amount***
Offsite Biodiversity Offset Area (as shown in Appendix 5)	Lower Hunter Spotted Gum-Ironbark Forest EEC	20 ha
	Remnant native vegetation	22 ha
Existing Pit-Top	Remnant native vegetation	10 ha
New Pit-Top	Remnant native vegetation	12 ha
Sugarloaf SCA	Funding to OEH for conservation projects in Sugarloaf SCA	$25,000 per annum while coal is being extracted beneath Sugarloaf SCA

Note: To identify the areas referred to in Table 8 refer to the applicable figures in Appendix 4 and Appendix 5.

Long Term Security of Offsets

20. Within 12 months of the commencement of construction of the New Pit-Top, unless the Director-General agrees otherwise, the Applicant shall make suitable arrangements to provide appropriate long term security for the land within the Biodiversity Offset Strategy identified in Table 8, to the satisfaction of the Director-General.

Note: In order of preference, mechanisms to provide appropriate long term security to the land within the Biodiversity Offset Strategy include incorporation into the nearby State Conservation Areas, Biobanking Agreement, or Voluntary Conservation Agreement.

Research Program

21. Prior to the commencement of construction of the New Pit-Top, the Applicant shall:
    (a) translocate as many *Rutidosis heterogama* plants from the New Pit-Top disturbance footprint as practicable to the land approximately 70 m south of the New Pit-Top; and
    (b) conduct or fund a research program into the translocation program,
    to the satisfaction of OEH.

    Within 1 year of translocating the *Rutidosis heterogama,* unless otherwise agreed with the Director-General, the Applicant shall publish the findings of the research program in a peer reviewed scientific journal

Biodiversity Management Plan

22. The Applicant shall prepare and implement a Biodiversity Management Plan for the development to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with OEH, and be submitted to the Director-General for approval prior to the commencement of construction of the New Pit-Top;
    (b) describe how the implementation of the biodiversity offset strategy would be integrated with the overall rehabilitation of the site;
    (c) establish baseline data for the existing habitat in the offsite biodiversity offset area and on the site;
    (d) describe the short, medium, and long term measures that would be implemented to:
        - manage the impacts of clearing vegetation, including pre-clearance surveys;
        - manage the remnant vegetation and habitat in the offsite biodiversity offset area and on the site; and
        - implement the biodiversity offset strategy, including detailed performance and completion criteria;
    (e) include a seasonally-based program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;
    (f) identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate these risks;
    (g) provide details about the research and translocation program for *Rutidosis heteroga*;
    (h) include a mechanism for the payment of the conservation funding component of the biodiversity offset strategy, to the satisfaction of OEH; and
    (j) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

Conservation Bond

23. Within 6 months of the commencement of construction of the New-Pit Top, the Applicant shall lodge a conservation bond with the Department to ensure that the biodiversity offset strategy is implemented in accordance with the performance and completion criteria described in the Biodiversity Management Plan. The sum of the bond shall be determined by:
    (a) calculating the full cost of implementing the offset strategy (other than land acquisition costs); and
    (b) employing a suitably qualified quantity surveyor to verify the calculated costs.

    If the offset strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Director-General, the Director-General will release the bond.

    If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Director-General will call in all or part of the conservation bond, and arrange for the satisfactory completion of the relevant works.

    With the agreement of the Director-General, this bond may be combined with the rehabilitation security deposit administered by DRE.

ABORIGINAL HERITAGE

Geotechnical Investigations

24. Prior to commencement of mining in the West Borehole Seam, the Applicant shall undertake a geotechnical investigation of the three culturally significant rock formations within the Men's Area on the Mount Sugarloaf Range, in consultation with relevant Aboriginal stakeholders, and to the satisfaction of OEH.

Aboriginal Cultural Heritage Management Plan

25. The Applicant shall prepare and implement an Aboriginal Cultural Heritage Management Plan for the development to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with OEH, the Aboriginal community, and relevant landowners;
    (b) be submitted to the Director-General for approval prior to commencement of construction of the New Pit-Top;
    (c) include the results of additional investigations (such as geotechnical assessments, surveys and current register searches) for Aboriginal heritage items (including previously known sites), sufficient to identify the significance of all sites which may be impacted by subsidence (including the three culturally significant rock formations within the Men's Area), and to identify any actions required to ensure that the performance measures in Table 2 are met;
    (d) include the following program/procedures for Aboriginal cultural heritage management within the development area:
        - trigger action response plans, including details of how unexpected subsidence impacts would be identified, notified and remediated/repaired;
        - recording, salvaging, excavating and/or otherwise managing the Aboriginal sites and potential archaeological deposits within the underground mining domain, the Existing Pit-Top and New Pit-Top;
        - managing the discovery of any new Aboriginal objects or skeletal remains during the development;
        - maintaining and managing access to Aboriginal heritage sites by the Aboriginal community; and
        - ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage within the development area;
    (e) include appropriate payment and reporting mechanisms for the provision of up to $20,000 for an Aboriginal heritage educational documentation program for the Mount Sugarloaf area, and for the provision of up to $10,000 to further investigate selected grinding groove sites in the underground mining domain.

Note: Relevant sections of this plan that relate to managing subsidence impacts must be suitably integrated with the Extraction Plan prepared in accordance with Condition 4 of Schedule 3.

VISUAL

Visual Amenity and Lighting

26. The Applicant shall minimise the visual impacts of the development, including constructing a visual bund adjacent to George Booth Drive and ensuring all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*, to the satisfaction of the Director-General.

BUSHFIRE MANAGEMENT

27. The Applicant shall:
    (a) ensure the design of the New Pit-Top complies with the requirements of the NSW Rural Fire Service;
    (b) ensure that the development is suitably equipped to respond to any fires on site; and
    (c) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.

WASTE

28. The Applicant shall:
    (a) implement all reasonable and feasible measures to minimise the waste generated by the development;
    (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and
    (c) monitor and report on effectiveness of the waste minimisation and management measures in the Annual Review,

    to the satisfaction of the Director-General.

REHABILITATION

Rehabilitation Objectives

29. The Applicant shall rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS, and comply with the objectives in Table 9.

Table 9: *Rehabilitation Objectives*

Feature	***Objective***
Mine site (as a whole)	• Safe, stable and non-polluting
Existing Pit-Top and New Pit-Top (and any other surface infrastructure)	• Infrastructure to be decommissioned and removed • Site to be made safe, and hydraulically and geotechnically stable • Site to be revegetated with suitable local native plant species, and a landform consistent with the surrounding environment
Built features damaged by mining operations	• Repair to pre-mining condition or equivalent unless the owner agrees otherwise, or the damage is fully restored, repaired or compensated for under the *Mine Subsidence Compensation Act 1961*
Major Cliffs/Minor Cliffs/Steep Slopes	• Any subsidence impacts (e.g. cracks, instability, etc) have been remediated and stabilised • No additional risk to public safety, compared to pre-mining conditions
Aboriginal heritage sites	• Any subsidence impacts (e.g. cracks, instability, etc) have been remediated and stabilised
3rd order watercourses subject to subsidence impacts	• Restore pre-mining surface flow and pool holding capacity • Hydraulically and geomorphologically stable, with riparian vegetation that is the same condition or better than prior to mining
Other watercourses subject to subsidence impacts	• Hydraulically and geomorphologically stable, with riparian vegetation that is the same condition or better than that which existed prior to mining
Community	• Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure

Notes:

- *These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by underground mining in the West Borehole Coal Seam, and to all surface infrastructure in the development area, whether constructed prior to or following the date of this consent.*
- *Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of this consent may be subject to the requirements of the existing development consent (DA 274-9-2002), the conditions of relevant mining lease/s, or a relevant SMP approval.*

Progressive Rehabilitation

30. The Applicant shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.

Rehabilitation Management Plan

31. The Applicant shall prepare and implement a Rehabilitation Management Plan for the development, in consultation with OEH, NOW, Cessnock City Council, Lake Macquarie City Council, and the CCC, and to the satisfaction of the Director-General and the Executive Director Mineral Resources. This plan must:
    (a) be submitted to the Director-General and the Executive Director Mineral Resources for approval within 12 months of the commencement of the construction of the New Pit-Top;
    (b) be prepared in accordance with any relevant DRE guideline and be consistent with the rehabilitation objectives in the EIS and in Table 9;
    (c) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 9;
    (d) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved;
    (e) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and
    (f) be integrated with the other management plans required under this consent.

Note: The Rehabilitation Management Plan should address all land impacted by the development (including the Existing Pit-Top and New Pit-Top) whether prior to, or following, the date of this consent.

SCHEDULE 5
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results showing:
   (a) an exceedance of any relevant criteria in Schedule 4, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and
   (b) an exceedance of any relevant air quality criteria in Schedule 4, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the development to be exceeding the relevant criteria in Schedule 4, then he/she may ask the Director-General in writing for an independent review of the impacts of the development on his/her land.

   If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision the Applicant shall:
   (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to:
      (i) consult with the landowner to determine his/her concerns;
      (ii) conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 4; and
      (iii) if the development is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
   (b) give the Director-General and landowner a copy of the independent review.

SCHEDULE 6
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant shall prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Director-General. This strategy must:
   (a) be submitted to the Director-General for approval prior to the commencement of the construction of the New Pit-Top;
   (b) provide the strategic framework for environmental management of the development;
   (c) identify the statutory approvals that apply to the development;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
   (e) describe the procedures that would be implemented to:
      (i) keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      (ii) receive, handle, respond to, and record complaints;
      (iii) resolve any disputes that may arise during the course of the development;
      (iv) respond to any non-compliance;
      (v) respond to emergencies; and
   (f) include:
      (i) copies of any strategies, plans and programs approved under the conditions of this consent; and
      (ii) a clear plan depicting all the monitoring required to be carried out under the conditions of this consent.

Management Plan Requirements

2. The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      (ii) any relevant limits or performance measures/criteria;
      (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      (i) impacts and environmental performance of the development;
      (ii) effectiveness of any management measures (see c above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
   (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
   (g) a protocol for managing and reporting any:
      (i) incidents;
      (ii) complaints;
      (iii) non-compliances with statutory requirements; and
      (iv) exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

   Note: The Director-General may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Adaptive Management

3. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:

(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;
(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
(c) implement remediation measures as directed by the Director-General,

to the satisfaction of the Director-General.

Annual Review

4. By the end of March each year, or other timing as may be agreed by the Director-General, the Applicant shall review the environmental performance of the development to the satisfaction of the Director-General. This review must:
   (a) describe the development (including any rehabilitation) that was carried out in the past financial year, and the development that is proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the development over the past financial year, which includes a comparison of these results against the:
      (i) relevant statutory requirements, limits or performance measures/criteria;
      (ii) requirements of any plan or program required under this consent;
      (iii) monitoring results of previous years; and
      (iv) relevant predictions in the EIS;
   (c) identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the development;
   (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this consent, (unless the conditions require otherwise),

   the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Director-General.

   Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.

Community Consultative Committee

6. The Applicant shall continue to operate a Community Consultative Committee (CCC) for the development to the satisfaction of the Director-General. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Developments* (Department of Planning, 2007, or its latest version).

   Notes:
   - *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.*
   - *In accordance with the guideline, the Committee should be comprised of an independent chair and appropriate representation from the Applicant, Council, recognised environmental groups and the local community.*
   - *In operating the CCC, the Department will accept the continued representation from existing CCC members.*

REPORTING

Incident Reporting

7. The Applicant shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Director-General and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

INDEPENDENT ENVIRONMENTAL AUDIT

9. Within 12 months of the commencement of construction of the New Pit-Top, and every 3 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
   (e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under the abovementioned approvals.

   Note: This audit team must be led by a suitably qualified auditor and include experts in any field specified by the Director-General.

10. Within 6 weeks of the completion of this audit, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

11. Within 6 months of the date of this consent, the Applicant shall:
   (a) make copies of the following publicly available on its website:
      (i) the documents referred to in Condition 2 of Schedule 2;
      (ii) all current statutory approvals for the development;
      (iii) all approved strategies, plans and programs required under the conditions of this consent;
      (iv) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
      (v) a complaints register, updated monthly;
      (vi) minutes of CCC meetings;
      (vii) the annual reviews of the development;
      (viii) any independent environmental audit of the development, and the Applicant's response to the recommendations in any audit;
      (ix) any other matter required by the Director-General; and
   (b) keep this information up-to-date,

   to the satisfaction of the Director-General.

APPENDIX 1
SCHEDULE OF LAND

Tenure Type	Lot Number	Deposited Plan Number
Freehold	101	1164569
Freehold	102	1164569
Freehold	103	1164569
Freehold	2	809377
Freehold	3	1061633
Freehold	4	1061633
Freehold	5	1061633
Freehold	6	1061633
Freehold	7	1061633
Freehold	8	1061633
Freehold	9	1061633
Freehold	10	1061633
Freehold	11	1061633
Freehold	12	1061633
Freehold	13	1061633
Freehold	14	1061633
Freehold	15	1061633
Freehold	1	207238
Freehold	1	960528
Freehold	1	960529
Freehold	4	960529
Freehold	1	960530
Freehold	95	755262
Freehold	124	755262
Freehold	125	755262
Freehold	126	755262
Freehold	221	1034182
Freehold	222	1034182
Freehold	52	706484
Freehold	22	223395
Freehold	1	175522
Freehold	21	624214
Freehold	1	231108
Freehold	51	706484
Freehold	1	923509
Freehold	1	1050996
Freehold	2	1050996
Freehold	7	813135
Freehold	2	551917

Freehold	1	1046942
Freehold	2	1039968
Tenure Type	**Lot Number**	**Deposited Plan Number**
Freehold	Part 1	1039968
Crown	121	755262
Crown	1	551918
Crown	21	223395
Crown	1	338999
Crown	7021	1075979
Crown	7022	1075973
Crown	7023	1075973
National Parks and Wildlife Service	104	755262
National Parks and Wildlife Service	2	231108
National Parks and Wildlife Service	1	551917
State Forests of NSW	94	755262
State Forests of NSW	76	755244
State Forests of NSW	108	755244
Cessnock City Council or Crown	Other roads located within, between or adjacent to the above parcels of land	
Part NSW State Forest (Heaton State Forest)	Crown land forming part Heaton State Forest No 122 dedicated 27 May 1914 and subsequent extensions	
Part State Conservation Area (Sugarloaf State Conservation Area)	Crown land forming part Sugarloaf State Conservation Area	

APPENDIX 2
DEVELOPMENT AREA

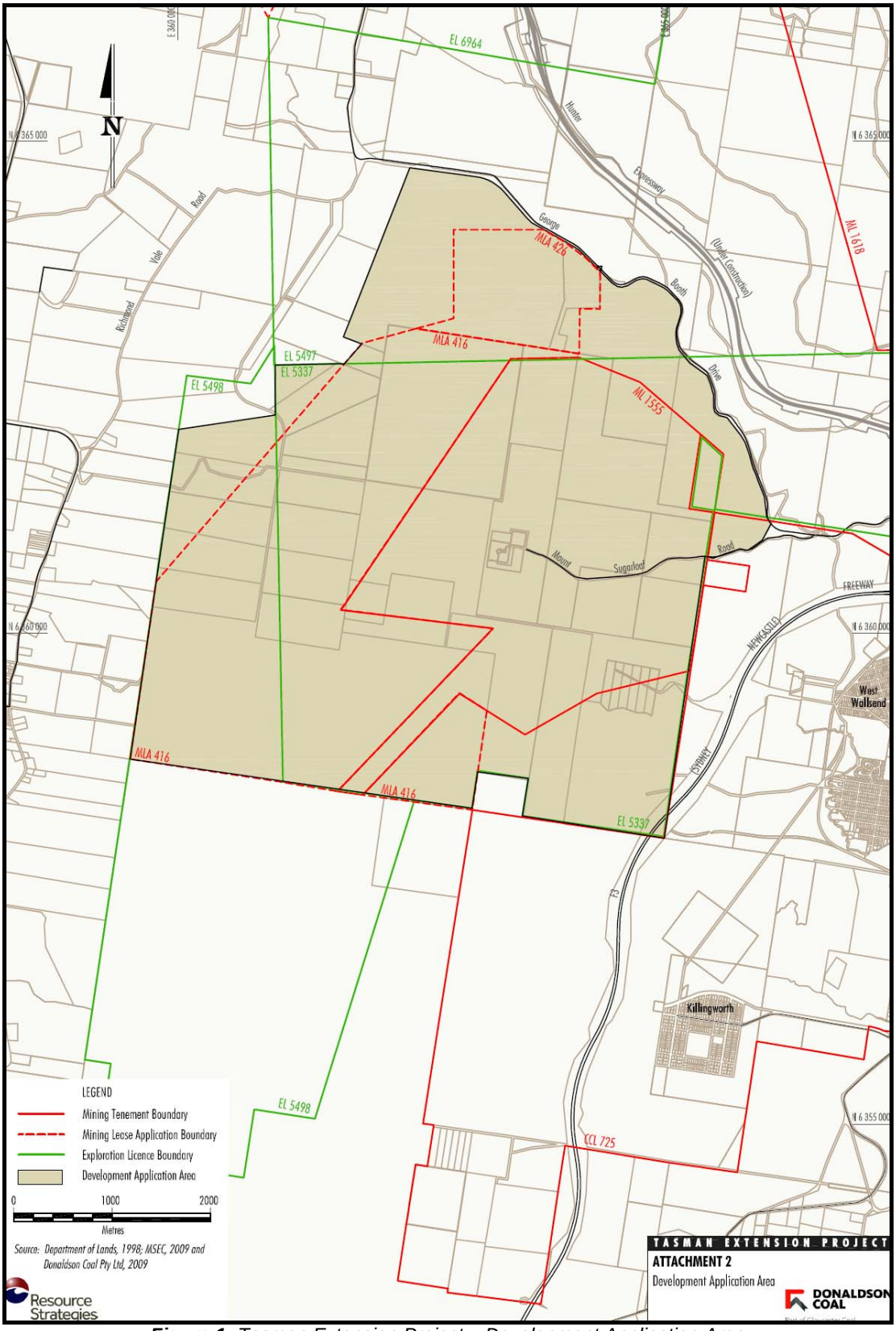

Figure 1: *Tasman Extension Project – Development Application Area*

APPENDIX 3
DEVELOPMENT LAYOUT

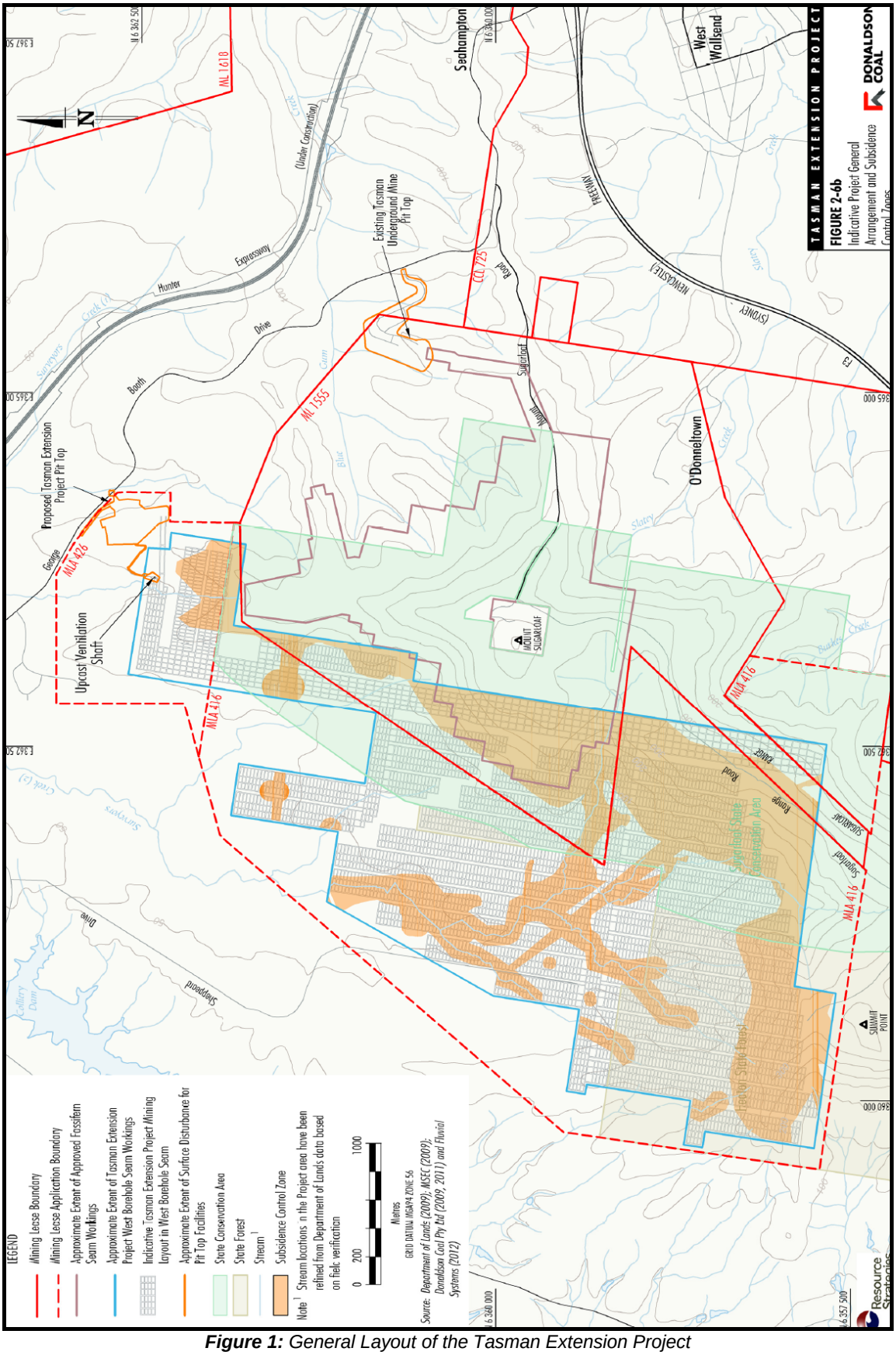

Figure 1: *General Layout of the Tasman Extension Project*

APPENDIX 4
KEY SURFACE FACILITIES SITES

Figure 1: *General Arrangement of the Existing Pit-Top site*

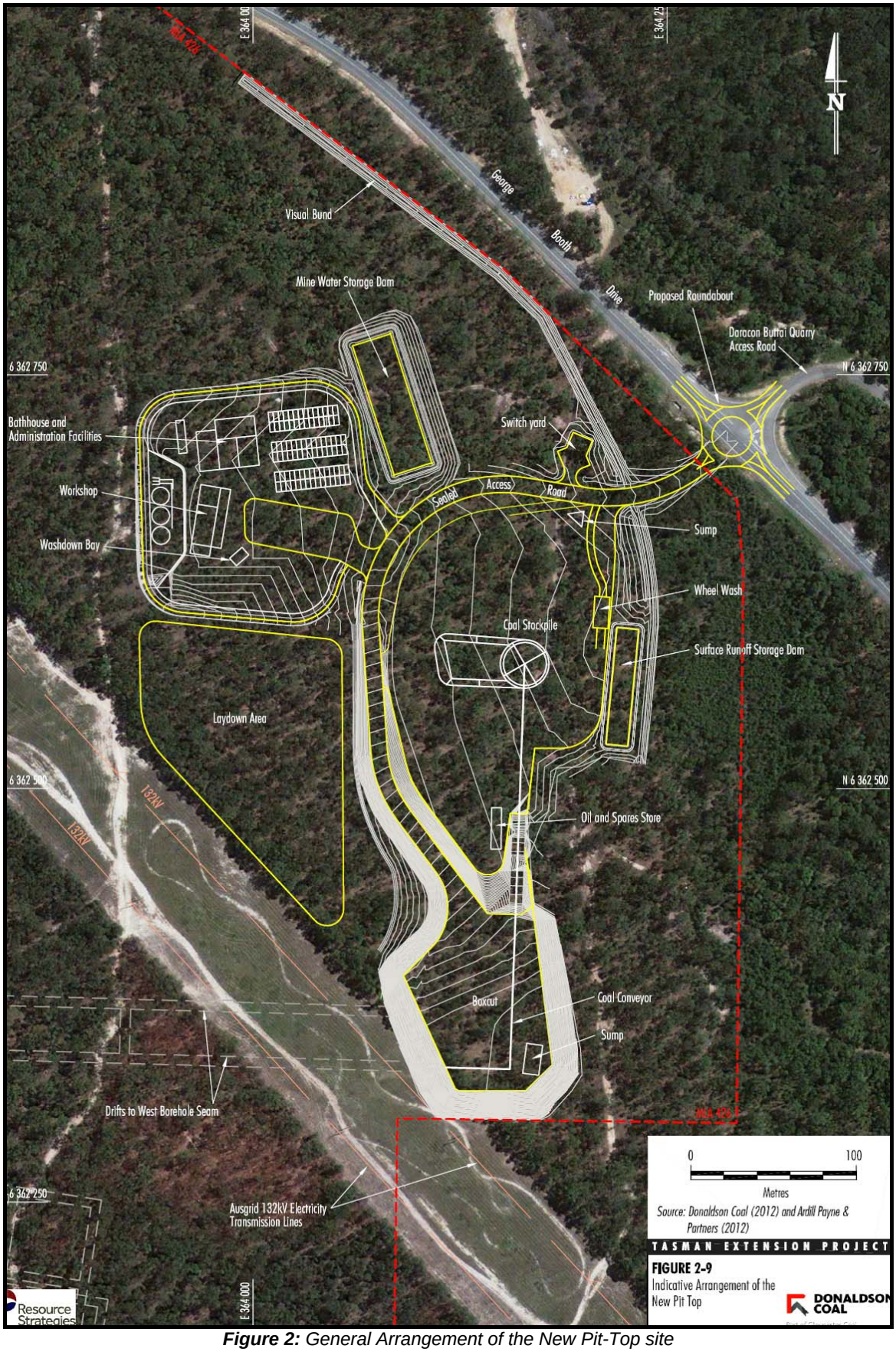

Figure 2: *General Arrangement of the New Pit-Top site*

APPENDIX 5
OFFSITE BIODIVERSITY OFFSET AREA

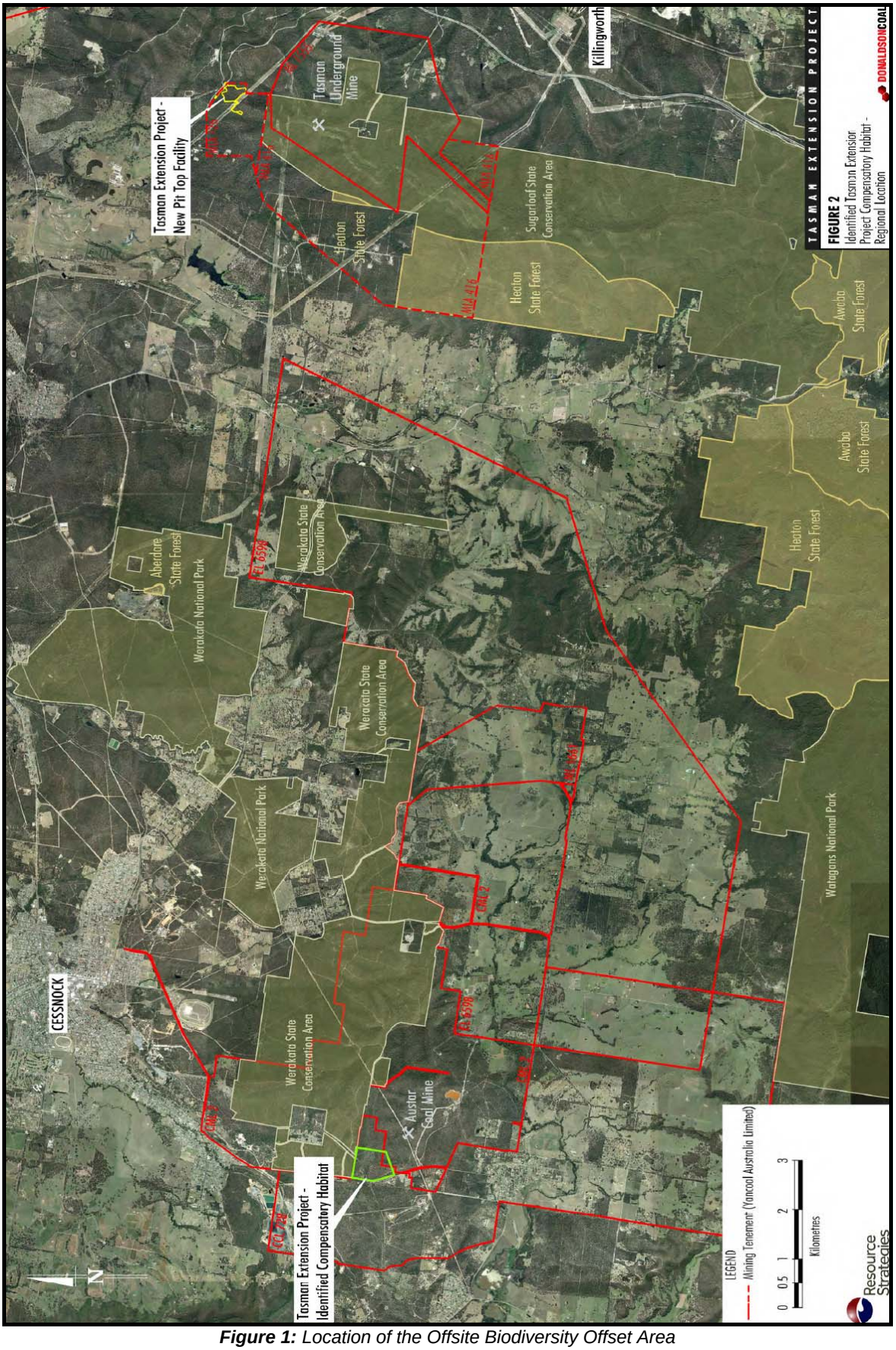

Figure 1: *Location of the Offsite Biodiversity Offset Area*

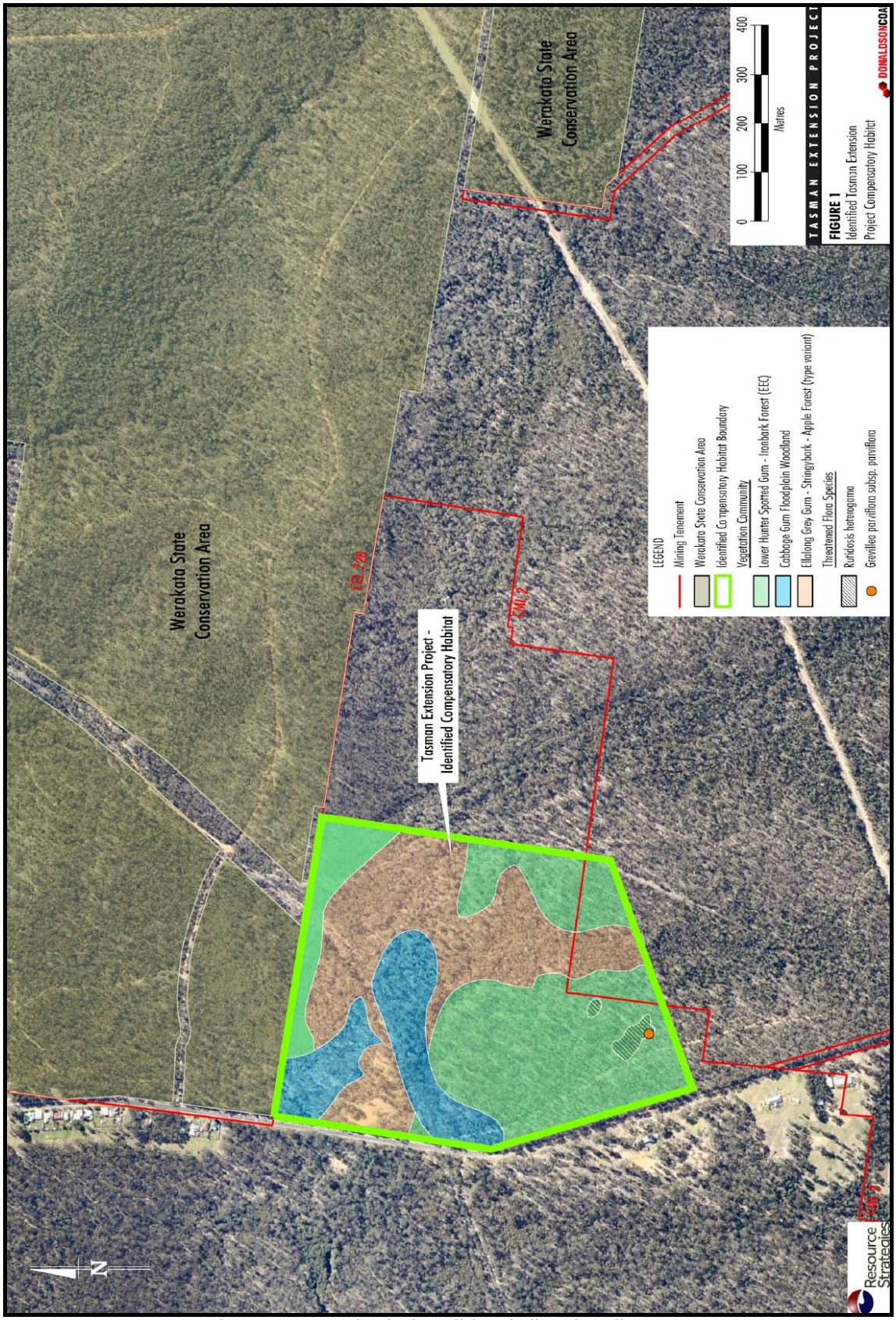

Figure 2: *Vegetation in the Offsite Biodiversity Offset Area*

APPENDIX 6
ABORIGINAL CULTURAL HERITAGE SITES

Overall Local Archaeological Significance Ranking	Aboriginal Heritage Site Code	Number of Sites
High	38-4-0440, 38-4-0447, TE92/A.	3
Moderate to High	38-4-0445, TE64/C, TE157/A, TE200/A.	4
Moderate	38-4-0444, 38-4-0446, 38-4-0449, TE46/A, TE46/B, TE46/C, TE46/D, TE85/A, TE104/C.	9
Low to Moderate	38-4-0448, 38-4-0450, 38-4-0457, 38-4-0486, 38-4-0488, 38-4-0610, 38-4-619, 38-4-0869, TE32/A, TE39/A, TE57/A, TE57/B, TE64/D, TE67/A, TE67/B, TE79/A, TE86/A, TE86/B, TE88/A, TE135/A, TE176/A.	21
Low	38-4-0443, 38-4-0487, 38-4-618, 38-4-0623, 38-4-0624, 38-4-0975, TE1/A, TE1/B, TE10/A, TE29/A, TE34/A, TE41/A, TE45/A, TE50/A, TE51/A, TE53/A, TE53/B, TE56/A, TE56/B, TE64/A, TE64/B, TE71/A, TE77/A, TE77/B, TE77/C, TE79/B, TE79/C, TE79/D, TE80/A, TE80/B, TE80/C, TE84/A, TE86/C, TE86/D, TE92/B, TE96/A,TE96/B, TE96/C, TE104/A, TE104/B, TE107/A, TE124/A, TE126/A, TE126/B, TE126/C, TE135/B, TE135/C, TE135/D, TE152/A, TE152/B, TE153/A, TE154/A, TE154/B, TE154/C, TE155/A, TE178/A, TE181/A, TE181/B, TE181/C, TE182/A, TE182/B, TE188/A, TE199/A.	63

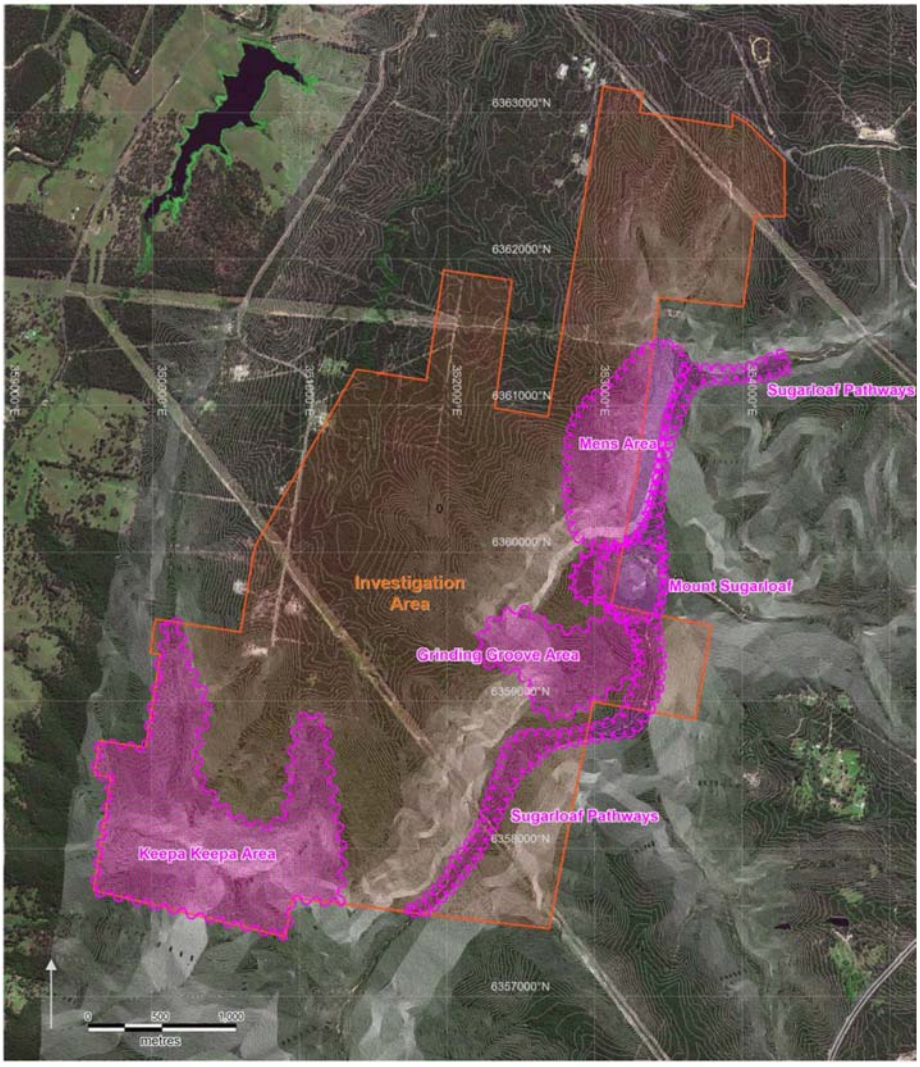

Figure 1: *Aboriginal Cultural Heritage Areas of Significance, including Men's Area*

APPENDIX 7
GEORGE BOOTH DRIVE PROPERTY ACCESS TREATMENTS

Property	***Proposed Treatment***
No. 1332 George Booth Drive	Provide sealed shoulder widening for the left turn into the property. Replace the Telstra pit with a trafficable pit and lid.
No. 1353 George Booth Drive	Provide sealed shoulder widening for the left turn into the property.
No. 1373 George Booth Drive	No improvements or modifications are proposed at this driveway.
No. 1395 George Booth Drive	Provide additional widening for the right turn shoulder. Guide posts to be relocated outside the sealed pavement.
No. 1408 & 1413 George Booth Drive	Trim or remove vegetation on the southbound side of the road, north of the driveway into No.1408, to improve sightlines out of the driveway to approaching vehicles. Relocate the power poles outside of the clear zone for the road.
"Henholme" – George Booth Drive	Provide sealed shoulder widening for the left turn into the property.
No. 1424 George Booth Drive	Provide a sealed widened shoulder for the left turn into the property. Extend the existing widened sealed shoulder to approximately 20m past the driveway prior to tapering back to the existing shoulder.
No. 1459 George Booth Drive – "County Downs"	Provide sealed shoulder widening for the left turn into the property. Relocate the power pole outside of the clear zone.
No. 1490 George Booth Drive	Provide a sealed widened shoulder for the left turn into the property. Relocate Hunter Expressway sign to outside of the clear zone for the road. Provide additional widening for the right turn shoulder.
No. 1523 George Booth Drive	Provide sealed shoulder widening for the left turn into the property.
No. 1530 & 1558 George Booth Drive	Extend the northbound shoulder widening to the south of property No. 1530, to allow the safe overtaking of a vehicle turning right into the property. Provide sealed shoulder widening for the left turn into the property.

APPENDIX 8
ROAD MAINTENANCE CONTRIBUTIONS

Purpose of Monetary Contribution	Funds will contribute to the maintenance of the portion George Booth Drive used for the road transportation of run-of-mine coal from the proposed Tasman Extension Project. Cessnock City Council agrees to maintain this portion of George Booth Drive to a standard suitable for use by coal road haulage trucks associated with the Tasman Extension Project. Cessnock City Council agrees to maintain sealed shoulders along this portion of George Booth Drive, particularly in the vicinity of private property driveways. Cessnock City Council agrees to provide satisfactory evidence of money expended on maintaining this portion of road each year prior to the annual monetary contribution being made by Donaldson Coal.
Maximum Monetary Contribution	Up to $8,000 per kilometre of transport distance in the Cessnock local government area (indexed to the Consumer Price Index) multiplied by the ratio of loaded heavy vehicles for the calendar year from the Tasman Underground Mine to total heavy vehicles on George Booth Drive, and paid in arrears. The ratio of loaded heavy vehicles will be based on actual number of Tasman coal road haulage trucks transporting run-of-mine coal during the calendar year. The monetary contribution would be calculated as outlined below.
Calculation of Monetary Contribution	Prior to each annual monetary contribution for road maintenance, Cessnock City Council agrees to provide a statement of costs expended on road maintenance works by Cessnock City Council on the subject portion of George Booth Drive during the calendar year. Donaldson Coal will make a monetary contribution to the road maintenance works based on the funds expended by Cessnock City Council during the calendar year multiplied by the ratio of loaded heavy vehicles for the calendar year from the Tasman Underground Mine to total heavy vehicles on George Booth Drive, capped at the maximum monetary contribution. The ratio of loaded heavy vehicles will be based on actual number of Tasman coal road haulage trucks transporting run-of-mine coal during the calendar year to total truck traffic as measured by the independent traffic count required under the development consent over a representative sample period. Any disagreement between Donaldson Coal and the Cessnock City Council would be subject to dispute resolution procedures under the development consent.
Timeline for Payment	Payment annually in arrears following the satisfaction of both of the following conditions: - the formal transfer of maintenance responsibility for George Booth Drive from the NSW Roads and Maritime Services to the Cessnock City Council; and - the commencement of road haulage from the Tasman Extension Project New Pit-Top facility.
Maintenance Responsibility	In the circumstance that Cessnock City Council does not acquire full maintenance responsibility for George Booth Drive within the Cessnock local government area (i.e. if the NSW Roads and Maritime Services retains some maintenance responsibility), the monetary contribution would apply *pro rata* to Cessnock City Council's portion of road maintenance responsibility.

APPENDIX 9
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 4 of the conditions are to apply under all meteorological conditions except the following:
   (a) during periods of rain or hail;
   (b) average wind speed at microphone height exceeds 5 m/s;
   (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or
   (d) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.

4. Unless otherwise agreed with the Director-General, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

APPENDIX B: CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

SEPP (State and Regional Development) 2011
The proposed development is "State Significant Development" as it meets the classification "development for the purpose of coal mining" under Clause 5 of Schedule 1 of the *SEPP (State and Regional Development) 2011,* and therefore requires development consent from the Minister for Planning and Infrastructure.

SEPP No.33 – Hazardous and Offensive Development
NCC undertook a preliminary hazard analysis in accordance with *SEPP No.33 – Hazardous and Offensive Development*. The analysis indicates that the offsite societal risks of the proposed development would be negligible. Consequently, the Department is satisfied that the proposed development does not pose a credible risk to surrounding land uses, and is therefore consistent with the aims, objectives, and requirements of SEPP 33.

SEPP No.44 – Koala Habitat Protection
SEPP 44 does not apply to land reserved under the *National Parks and Wildlife Act 1974* (i.e. the Sugarloaf State Conservation Area). However, for areas outside the State Conservation Area, SEPP 44 applies to the proposed development. The SEPP requires a consent authority to consider the presence of any core or potential koala habitat. The EIS includes a detailed fauna assessment which found that there are no koalas in the development area, and therefore there is no "core koala habitat". However, there is potential Koala habitat within the project area due to the presence of feed tree species. SEPP 44 does not prevent a consent authority granting consent to a development that is located in potential koala habitat. In this case, the Department notes that the proposed development would not result in any significant impacts on potential koala habitat, and consequently the proposed development is not inconsistent with the aims, objectives, and requirements of SEPP 44.

SEPP No.55 – Remediation of Land
The EIS incorporates a Preliminary Investigation carried out in accordance with SEPP 55. The findings of this investigation indicate that there are no significant contamination issues on the site, and no remediation is warranted. The Department is satisfied that the project is generally consistent with the aims, objectives, and provisions of SEPP 55.

SEPP (Infrastructure) 2007
SEPP (Infrastructure) 2007 requires the consent authority to notify relevant public authorities about developments that may affect public infrastructure or public land. The Department has notified the Roads and Maritime Authority (RMS), relevant electricity authorities (TransGrid and Ausgrid), and the Office of Environment and Heritage (OEH) in regard to the Sugaloaf State Conservation Area. None of these authorities objected to the proposed development, and any recommendations made by these authorities have been considered by the Department, and incorporated into the conditions of consent where appropriate. This satisfies the requirements of *SEPP (Infrastructure) 2007*.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007
Under *State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007* (Mining SEPP), there are a number of matters that must be considered by the consent authority prior to granting development consent:

1. Clause 7 (1) (a) of the Mining SEPP makes underground mining permissible with consent on any land. Consequently, the proposed development is permissible with consent, and the Deputy Director-General may determine the application.
2. Part 3 of the Mining SEPP requires the consent authority to consider the following:
    a. compatibility of the proposal with other land uses;
    b. natural resource management and environmental management;
    c. resource recovery;
    d. transport; and
    e. rehabilitation.

The Department has fully considered all of these matters in its merit assessment (see Section 5 and Section 7 of this report). Having considered these matters in detail, the Department is generally satisfied that the proposed development can be undertaken in a manner that is generally consistent with the matters for consideration under Part 3 of the Mining SEPP.

The Department is satisfied that the proposed development is generally consistent with the provisions of Part 3 of the Mining SEPP.

Hunter Regional Environmental Plan 1989 (Heritage)

This REP requires consideration of the potential impacts of proposed developments on various heritage items and values in the Hunter Region. However, there are no items identified by the REP in the vicinity of the proposed development, and the assessment did not identify any items of significant heritage value that would require further investigation within the development area. Consequently, the Department is satisfied that the proposed development is consistent with the aims, objectives and provisions of this REP.

Cessnock Local Environmental Plan 2011 & Cessnock Local Environmental Plan 1989

The Department has considered NCC's detailed review of the relevant provisions of *Cessnock Local Environmental Plan 2011 & Cessnock Local Environmental Plan 1989* in Attachment 3 of the EIS. The Department has also considered the compatibility of the proposed development with the zoning objectives that apply to the land within the development area (see Section 3 and Section 5 of this report). The Department is satisfied that the proposed development can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of these instruments, subject to adherence to the recommended conditions of consent.

Lake Macquarie Local Environmental Plan 2004

The Department has considered NCC's detailed review of the relevant provisions of *Lake Macquarie Local Environmental Plan 2004* in Attachment 3 of the EIS. The Department has also considered the compatibility of the proposed development with the zoning objectives that apply to the land within the development area (see Section 3 and Section 5 of this report). The Department is satisfied that the proposed development can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of these instruments, subject to adherence to the recommended conditions of consent.

APPENDIX C: SUBMISSIONS

(see attached CD)

APPENDIX D:
RESPONSE TO SUBMISSIONS

(see attached CD)

APPENDIX E: ENVIRONMENTAL IMPACT STATEMENT

(see attached CD)