valued assets in the LHRCP and DECCW 25 year Biodiversity Investment Layer.

In summary, the Coal & Allied conservation dedications provide outcomes that contribute to meeting the Environmental conservation goals outlined in the Sustainability Criteria contained within the LHRS. Such includes:

- Outcomes consistent with the Lower Hunter Regional Conservation Plan;
- Maintains/improves areas of regionally significant biodiversity;
- Maintains environmental areas for natural air & water quality; and
- Protects areas of Cultural heritage value and European heritage value.

These outcomes:

- Conserve in perpetuity key strategic parcels of land that complete long sought after regional biodiversity conservation corridors and buffer areas;
- Conserve in perpetuity significant areas of vegetation communities for which reservation targets have not been met in the Lower Hunter region;
- Provide large intact areas of conserved habitat that will function as regional biodiversity gene pools;
- Protect an important array of vegetation communities, flora and fauna species, and natural landscape assets, including threatened species and EEC's;
- Contribute significantly to the successful implementation of the Lower Hunter Regional Conservation Plan; and
- Achieve additional conservation benefits within development estates via appropriate urban design and management practices.

5. Offsets must be underpinned by sound ecological principles.

The Environmental Assessment as informed by this EAR has been underpinned by the DEC 2005 Draft Biodiversity Assessment Guidelines coupled with implementation of the precautionary principle of 'assumed presence' to ensure a holistic ecological assessment. Key principles in relation to the offset lands that have been considered include (but are not limited to):

- Issues of connectivity and fragmentation
- Landscape structure, species diversity, floristic composition, habitat type and availability
- Presence or absence of threatened species, population and ecological communities known from the region
- Biodiversity enhancement coupled with long term viability
- Ecosystem structure and function as it relates to patch size and influences of disturbance, fragmentation, isolation and issues surrounding potential island

biogeography.

- Benchmarks of 'like for like' and 'maintain or improve'
- Site and situation of offsets, within the available surplus lands, in order to maximise environmental conservation gains at a landscape scale through to individual species level.

The resultant offset proposal as documented by this ecological assessment being that, based on development estate approval, the offsets will secure a public asset which provides significant conservation benefits overall and positive outcomes for each of the abovementioned key principles.

6. Offsets should aim to result in a net improvement in biodiversity over time.

The Lower Hunter Region's vegetation is of bio-geographic significance as it supports a transition between the northern and southern plant and animal assemblages. This north-south link is not evident elsewhere in the Hunter Valley. The Region also forms an east-west migratory pathway and a drought refuge for inland species.

The preservation of large vegetated areas that are linked to other similar areas has been recognised as fundamentally important to achieving long term regional biodiversity outcomes in the Lower Hunter region. The Coal & Allied lands to be dedicated form large vegetated areas in their own right, and complete linkages of identified regional corridors in key areas being the green corridor that links the Watagans and Yengo National Parks with the coastal plains of the Tomago Sandbeds, Stockton Bight and Port Stephens

In addition to their important strategic location in a wider landscape context, the Conservation Estates contain valuable biodiversity resources. They contain and will conserve a range of important vegetation communities, including areas of Endangered Ecological Communities (EEC) and other vegetation types that have been depleted in the region. Several threatened plant species have been recorded within the Conservation Estates, including *Arthropteris palisotii, Tetratheca juncea* (Black-eyed Susan), *Grevillea parviflora* subsp. *parviflora*, *Rutidosis heterogama* and *Callistemon linearifolius*. Refer to Table 5-1. Given patch size of each individual Conservation Estate, issues generally associated with smaller conservation patches such as edge effects, fragmentation, corridor viability, maintenance of biodiversity etc are not considered to be major deleterious factors to be associated with this proposal. Furthermore the offsets will be managed under a Statement of Interim Management Intent (SIMI) and the NSW NPWS thereafter.

The diverse nature of both the landform settings, varying from coastal ranges forests and woodlands to coastal heath to wetlands, provides a diverse array of habitats and resources for native fauna. The Conservation Estates are known to contain important populations of numerous threatened fauna species, including birds, mammals and herpetofauna. The conservation of these lands will provide secure regional biodiversity gene pools, and also through linkages facilitate valuable genetic material exchange and other key processes associated with sustainable ecological population dynamics.

7. Offsets must be enduring – they must offset the impact of the development for at least the period that the impact occurs.

The offset lands (Conservation Estates) will be dedicated to the NSW Government under the terms of a Voluntary Planning Agreement (VPA) that is legally enforceable and managed thereafter under NPWS Estate in perpetuity.

8. Offsets should be agreed prior to the impact occurring.

The nature and extent of the proposed offsets for all of the Coal & Allied Lower Hunter Land holdings have been subject to rigorous debate and assessment with the NSW Government, Community, Stakeholder Groups, Federal and NSW Government environmental agencies, independent hearings under the EP&A Act, urban design charrettes and public exhibition.

The offsets encompassed by the proposal will be formally agreed upon through the Part 3A process and form part of the overall approval. Thereafter the offsets will be dedicated to the NSW Government to become a public conservation asset under NPWS Estate. The offset land dedication will occur following registration of the Subdivision Plan which will occur three months after the SSS listing and Concept Plan approval.

9. Offsets must be quantifiable – the impacts and benefits must be reliably estimated.

- The ecological assessment has quantified the nature and extent of vegetation communities and floristic structures over the conservation estates notwithstanding the presence and/or potential presence of threatened species, populations and endangered ecological communities that will become a public conservation asset if the current proposal is approved.
- The offsets make a significant contribution to the achievement of conservation objectives sought under the LHRS and LHRCP.
- At Stockrington and Tank Paddock, 2106 ha (being 1561 ha offset for Minmi-Link Rd and 545ha offset for Black Hill) of high biodiversity offset lands (Conservation Estates) will be dedicated to the NSW Government through a voluntary planning agreement that is legally enforceable and managed thereafter under NPWS Estate in perpetuity. Development lands at Minmi/Link Rd will be confined to 520ha.
- The common edges of the development /conservation estates will be managed under a SIMI following land dedication for a period of up to 5 years prior to management hand over to the NSW NPWS who will have carriage of the lands thereafter.
- The conservation estates have been subject to an environmental audit that will along with the SIMI guide rehabilitation efforts over the offset.

10. Offsets must be targeted – they must offset impacts on a like-for-like or better basis.

The proposed conservation offsets:

- provide a like for like environmental outcome at a minimum (refer to Table 5-1 and Table 5-2);
- are situated within areas and contain vegetation communities that are identified by the LHRCP as extant having a reservation target that is not met;
- provide the single largest contribution to the 'Watagan Ranges to Stockton corridor' sought by the LHRS and LHRCP;
- contain and will conserve a range of important vegetation communities, including areas of EECs and other vegetation types that have been depleted in the region;
- contain known threatened flora and fauna species of significance at the state and national level;
- provide a diverse array of habitats and resources for native fauna including coastal range forests, woodlands, heathlands and wetlands; and
- will provide secure regional biodiversity gene pools, and through linkages facilitate valuable genetic material exchange and other key processes associated with sustainable ecological population dynamics.

11. Offsets must be located appropriately – they must offset the impact in the same region.

The proposed offsets are:

- located within adjacent areas to the Development Estates;
- within the same IBRA Bio-region and sub-region as the Development Estate occurs;
- large patches of vegetated land contiguous with large vegetated areas extant from the locality;
- representative of the impact areas, hence providing a valuable biodiversity resource. They contain and will conserve a range of important vegetation communities, including areas of Endangered Ecological Communities (EEC) and other vegetation types that have been depleted in the region; and
- not subject to edge effects, fragmentation, issues of corridor viability, maintenance of biodiversity realted to disturbance due to their individual patch size.

12. Offsets must be supplementary – they must be beyond existing requirements and not already be funded under another scheme.

The offsets represented by the Conservation Estates are currently private freehold lands that are not part of any existing NSW Government or other scheme. As stated in point 4 above the lands have been identified under several NSW Government conservation initiatives.

13. Offsets and their actions must be enforceable – through development consent conditions, licence conditions, conservation agreements or a contract.

The offset lands (Conservation Estates) will be dedicated to the NSW Government through a voluntary planning agreement that is legally enforceable and managed thereafter under NPWS Estate in perpetuity.

The dedication will be supported by a SIMI (Statement of Interim Management Intent) that will focus on the mitigation and rehabilitation of existing edge effects and internal fragmentation for a period the lesser of 5 years form commencement of works or until all lots are sold relative to each development area precinct.

8 Recommendations

The following recommendations have been outlined to ensure that the ecological impact of the proposed Development Estate is minimised as far as possible.

- Foremost, the management of the proposed Development Estate is critical to ensure that no direct or indirect impacts occur in the short and long term on dedicated Conservation Estates. As such, appropriate management plans should be prepared and implemented within the development framework in consultation with the NSW NPWS.
- The minimum amount of clearing necessary to facilitate the development should take place as a general objective of the project, particularly within those areas that currently contain identified native vegetation communities. These areas have been described within this report. This is especially important within or near those areas identified as containing vegetation consistent with EEC's or riparian areas.
- It is recommended that a *Tetratheca juncea* management plan be prepared to ensure the conservation and long term survival of this threatened species within the Conservation Estates.
- Mature and / or hollow-bearing trees should be retained wherever feasible within the development framework.
- Pre-clearing inspections should be undertaken by an ecologist in wooded areas where threatened fauna species have been recorded or are considered likely to occur. This is particularly important in areas where threatened fauna have been noted during recent surveys either breeding or nest-building. No breeding attempts should be disrupted during the course of the project, particularly by threatened fauna.
- During the construction phase, for any tree removal within forested areas, and in particular where hollow-bearing trees may be removed, all works should be supervised by an ecologist to recover any native fauna that are potentially displaced. Furthermore, where such risks occur, site-specific ecological advice should be sought to minimise impacts during the entire process. A clearing protocol should be adopted for the removal of trees containing suitable habitat hollows as follows (this is considered as a guideline, variations on the methods employed may be required to accommodate site specific factors):
  - » All hollow-bearing trees are to be flagged by an ecologist prior to the commencement of works on Development Estate.
  - » Underscrubbing of the entire site should be carried out by a 4x4 tractor with a slashing deck, this will minimise the establishment of degradation processes and leave a layer of mulch to aid in soil retention in the event of adverse weather. At this time felling of non habitat trees can take place, however a matrix of trees *must* be maintained to allow animal movement into the designated refuge area.
  - » After a period of two weeks, clearing of habitat trees should commence. Clearing must be carried out moving from the fringe of the matrix towards the refuge area. Trees should be 'soft felled' and inspected immediately by an ecologist for

displaced fauna. All trees must be left for a minimum of two nights prior to being moved to a stockpile, to allow resident fauna to vacate tree hollows.

Note: Clearing should ideally take place outside of the dominant breeding seasons of resident fauna, preferably during late autumn and winter.

- Species selection for future landscaping works and seed stock for revegetation should be limited to locally occurring native species to maintain local genetic diversity. This should include regionally significant species and preferred Swift Parrot / Koala foraging habitat trees should be incorporated into future landscaping design where possible.
- Appropriate vegetation, habitat and bushfire management plans should be included under an overarching Environmental Management Plan for the retained natural features within the Development Estate.
- Where possible, earthworks (and certainly all works in the vicinity of drainage lines) should be undertaken during appropriate (i.e. dry) weather conditions. This will ensure that any potential erosion events will be intercepted and that downstream impacts are minimised within any of the drainage lines. This will help to maintain existing habitat characteristics for native fauna in those areas, including those for threatened species.
- Nutrient and sediment control devices should be erected pre-clearing and post-construction works in sensitive areas where degradation processes may be triggered such as areas adjacent to watercourses until suitable rehabilitation has occurred to maintain surface integrity. Furthermore, stockpiles should be subject to individual sediment and nutrient control devices.

9 Conclusion

The detailed studies undertaken herewith have confirmed that development of a small portion of the site as a whole will provide a mechanism for adequate ecological outcomes within the proposed conservation lands for the vast majority of species and communities contained therein. The quantum of the offset lands, when viewed holistically with proximate existing and proposed conservation reserve areas, provides a robust long-term outcome for all species and communities. Furthermore, suitable actions are proposed to minimise potentially deleterious permanent and ongoing impacts to the conservation lands.

The field and desktop studies have recorded the following parameters of ecological significance within both the Conservation and the Development Estates:

- native vegetation commensurate with those listed as EEC's;
- threatened flora species recorded within and adjacent to the proposed development;
- threatened fauna species recorded within and adjacent to the proposed development;
- habitat for threatened flora and fauna species known from within and adjacent to the proposed development; and
- other areas containing native vegetation with varying degrees of modification / degradation.

With these potential ecological issues noted, a series of recommendations have been outlined previously in this report, to aid in the reduction of potential impacts associated with the proposal.

Given that measures have been taken to avoid ecological impacts and that where native vegetation may be affected, efforts have been made to avoid particularly sensitive areas where practical, it is considered unlikely that any significant impacts would occur upon threatened species, communities or populations. The large areas of Conservation Estates at Stockrington and Tank Paddock that will be set aside as part of the Coal & Allied development proposals provide sound ecological outcomes across the site. The Stockrington Conservation Estates will contribute a large portion of land to conservation in perpetuity, which will in essence formalise the Watagan to Stockton Corridor. The importance of the conservation of Tank Paddock as part of the Conservation Estates will result in maintaining a vegetation corridor from Hexham Swamp and the Hunter Estuary to the Watagan Mountains and the Sugarloaf Range. This large tract of native vegetation will provide protected habitat for a wide variety of native flora and fauna.

Therefore, due to the location of the proposed Development Estate within more disturbed portions of the Northern Estates and the dedication of much larger tracts of vegetation within strategic regional corridors, it has been concluded that the proposed development should not significantly impact upon threatened or regionally significant flora and fauna, ecological communities or populations. The implementation of operative environmental

management practices and the detailed design phase of the project should also ensure that the ecological impact of the project is minimised.

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Appendix 1

DGEAR's

CONCEPT PLAN – MINMI, NEWCASTLE LINK ROAD, AND STOCKRINGTON (MP10_0090)
ENVIRONMENTAL ASSESSMENT REQUIREMENTS UNDER PART 3A OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Project Description	Concept Plan for Minmi, Newcastle Link Road and Stockrington including the: • Development of 520 hectares at Minmi, Newcastle Link Road comprising: o 3,300 residential dwellings; o 2 mixed use village centres; o associated infrastructure and facilities; o indicative lot and road layouts; and o indicative development staging. • Dedication of approximately 1,964 hectares for conservation.
Site	The site comprises land surrounding the existing Minmi village and to the north and south of Newcastle Link Road, and land on the western side of the F3 Freeway at Stockrington.
Proponent	Coal and Allied Industries Pty Ltd.
Date of Issue	19 August 2010
Date of Expiration	(2 years from date of issue)
General requirements	The Environmental Assessment (EA) for the Concept Plan must include: (1) An executive summary. (2) A description of the project including: (a) need for the project; (b) alternatives considered; (c) various components and staging of the project (including relevant maps); and (d) a map indicating the proposed development footprint and conservation lands. (3) A thorough site analysis and description of the existing environment. (4) Justification of the project, taking into consideration the environmental impacts of the proposal, the suitability of the site and whether or not the project is in the public interest. (5) A consideration of all relevant statutory and non-statutory provisions and identification of any non-compliance with such provisions, especially the *SEPP (Major Development) 2005, SEPP 44, SEPP 55, SEPP (Infrastructure) 2007, SEPP (Mining, Petroleum Production & Extractive Industries) 2007, Newcastle LEP 2003, Lake Macquarie LEP 2004, Hunter Regional Environmental Plan 1989 (Heritage), Lower Hunter Regional Strategy, Lower Hunter Regional Conservation Plan*, *Western Corridor Planning Strategy* (2010), and *Planning for Bushfire Protection 2006*. (6) A draft Statement of Commitments outlining specific commitments to public benefits, environmental management, mitigation and monitoring measures to be established on site and clear identification of the timing and responsibility for these measures. (7) A signed statement from the author of the EA certifying that the information contained in the report is neither false nor misleading. (8) The likely scope of developer contributions between: (a) the proponent and Newcastle City Council and Lake Macquarie City Council; (b) the proponent and State Government agencies for provision of State infrastructure in accordance with *Planning Circular PS 07-018 (Infrastructure Contributions);* and (c) if relevant, any public benefits to be provided with the development. (9) A report from a quantity surveyor identifying the capital investment value of the Concept Plan including the estimated cost of future development.

Key Assessment Requirements	**Urban Design, development controls and land uses** (1) Propose suitable land uses and development controls for the site based on a comprehensive analysis of the site constraints and opportunities, and consideration of development controls outlined in councils' existing and draft local environmental plans and development control plans. (2) Demonstrate how the proposed land uses and development controls will complement surrounding existing land uses and the proposed conservation lands. (3) Identify opportunities to integrate and link the proposal with surrounding urban areas, both existing and planned, including through appropriate pedestrian and cycle access connections. (4) Identify proposed treatment and landscaping of all public domain areas. (5) Outline strategies for retention of trees both within individual lots and the public domain. (6) Address the principles of Crime Prevention Through Environmental Design. **Staging of Development** (1) Provide details of and justification for the proposed staging and indicative time frames for the development including a staging plan that sets out the sequencing of land release. Include relevant maps. (2) Identify the staging process for infrastructure provision commensurate with proposed staging of development, through consultation with relevant agencies. **Commercial / retail development** (1) Identify and justify the configuration, extent and likely floor space yield of any commercial / retail uses, and consider its impact on nearby existing and proposed retail / commercial centres. **Topography and site preparation** (1) Provide a detailed contour plan and slope analysis. Demonstrate the suitability the site for the proposed development, and associated infrastructure, having particular regard to areas with steep topography. Identify the extent of cut and fill required to achieve the proposed development, and outline strategies to minimise excavation works, both for site preparation works and individual dwellings. (2) Provide an assessment of the impacts of site preparation works required to accommodate the proposed development and associated infrastructure. (3) Demonstrate that development controls and public domain controls respond to the topographical constraints of the site. **Conservation lands** (1) Identify the extent, locations, and timing of dedication of proposed conservation lands. (2) Discuss any edge effects between the development area, and the conservational and surrounding lands. Outline commitments to ongoing management of edge effects and consider the need for a buffer zone. **Biodiversity** (1) Assess the impacts of the proposal on existing native flora and fauna. The assessment must be conducted in accordance with the *draft Guidelines for Threatened Species Assessment* (DEC July 2005) and include a field study. (2) Demonstrate that biodiversity impacts can be appropriately offset in accordance with the NSW Government's policy for 'improvement or maintenance' of biodiversity values. (3) Describe the actions that would be taken to avoid or mitigate impacts on biodiversity, threatened species and their habitat. This should include identification of opportunities to maintain local biodiversity corridors, through consultation with DECCW, to ensure to ongoing viability of threatened species. (4) Assess the impact of the proposal on existing reserves in the locality including Blue Gum Hills Regional Park, Pambalong Nature Reserve, and Hunter Wetlands National Park. Identify options to mitigate and manage impacts on reserves, in particular edge effects on Blue Gum Hills Regional Park. Indentify access arrangements between the proposed development and the Blue Gums Hills Regional Park in consultation with DECCW. This assessment should be

carried out in accordance with *Guidelines for Developments Adjoining Land and Water Managed by DECCW* (DECCW 2010).

(5) Provide an assessment of the cumulative impacts on biodiversity of the proposed development, and other development proposed in the area.

Geotechnical and mining activities

(1) Assess the capability of the land for the proposed development including with respect to erosion potential, slope stability, salinity and the presence of potential and actual acid sulphate soils if any.

(2) Provide a risk analysis examining the risk factors associated with the former mining use of the site and what effects it may have on future development, including mine subsidence and hazards associated with subterranean gases.

(3) Identify measures that would be implemented to avoid or remediate potential subsidence issues encountered on the site.

(4) Identify the impacts of the development of the proposal and conservation offsets on the future recovery of resources of coal and coal-seam methane below the site.

(5) Outline actions, management and mitigation measures required and address contamination issues associated with the project (if any) in accordance with *SEPP 55* and other relevant legislation and guidelines.

Transport and accessibility

(1) Provide a traffic study in accordance with the *RTA Guide to Traffic Generating Developments*, which includes:

- (a) all relevant vehicular traffic routes and intersections for access to/from the area;
- (b) current traffic counts for all the above traffic routes and intersections;
- (c) the additional vehicular traffic generated from the proposed development and associated trip distribution on the road network;
- (d) consideration of the traffic impacts on existing and proposed intersections and the capacity of the local and classified road network to safely and efficiently cater for additional vehicular traffic generated by the proposed development. The assessment should also include the cumulative traffic impact of other proposed development in the area;
- (e) consideration of the impact of the planned Hunter Expressway;
- (f) details of necessary road network infrastructure upgrades required to maintain existing levels of service both on the local and classified road network;
- (g) intersection analysis, as well as a micro simulation model to determine the need for intersection and mid block capacity upgrades, as well as to ensure traffic signal co-ordination;
- (h) details on the efficiency of emergency vehicle access/egress;
- (i) measures to introduce and promote public transport usage and mode share, including identification of bus routes;
- (j) proposed pedestrian and cycle access within and to the site that connects to all relevant transport services, existing and proposed adjoining suburbs and other key off-site locations (for example schools, shops, parks recreation and community facilities) having regard to the *NSW Planning Guidelines for Walking and Cycling* (2004), and the *NSW Bike Plan* (2010);
- (k) timing of delivery of proposed transport infrastructure including road and intersection upgrades, pedestrian and cycle paths, and public transport infrastructure; and
- (l) consideration of impact on existing property access.

(2) Identify road design that is responsive to the proposed land use and associated urban form including proposed transport linkages between the subject land and surrounding key destination points such as existing centres, recreational areas and employment/industrial centres. Road design should be in accordance with any requirements of the relevant agency that will have responsibility for its ongoing ownership and management.

(3) Assess the proposal against the objectives of the Integrating Land Use and Transport policy package.

	(4) Assess the impact of the proposal on future access arrangements to the Summerhill Waste Management Centre. **Noise** (1) Assess the impact of increased traffic generated by the proposal on existing and future residents, in accordance with the *Environmental Criteria for Road Traffic Noise* (EPA, 1999 and *Development Near Rail Corridors and Busy Roads – Interim Guideline* (Department of Planning). (2) Identify the extent of any necessary noise attenuation works, including noise barriers and/or treatment and design of dwellings within individual lots. **Air Quality** (3) Assess the odour and air quality impacts of the nearby existing development and any proposed development and in light of potential coal mining and coal-bed methane extraction on the subject land. The assessment must be consistent with the *Technical Framework Assessment and management of odour from stationary sources in NSW (DECC November 2006)* and the *Technical Notes Assessment and management of odour from stationary sources in NSW (DECC November 2006)*. **Heritage** (1) Provide an archaeological assessment and heritage impact statement in accordance with the NSW Heritage Office Guidelines. The statement should assess the impacts of the application on the area and any significant elements of the site including indigenous heritage. (2) Provide detail of how the development will incorporate and not negatively impact on site setting, landscapes, landmark elements, heritage items, views and vistas. (3) Assess the impact of potential development on the historic setting and visual catchment of Minmi and demonstrate how proposed development is to be integrated with the existing development in Minmi. (4) Provide an assessment in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005)*. **Water quality, groundwater and riparian corridors** (1) Assess any potential impact of proposed development on hydrology and hydrogeology of the site and adjacent areas in terms of impact on water quality, including groundwater, in keeping with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).* (2) Identify drainage and stormwater management infrastructure, including: on site detention of stormwater; water sensitive urban design (WSUD); and drainage infrastructure. Demonstrate that stormwater infrastructure is appropriate in the context of the site topography. Identify future management arrangements for stormwater infrastructure, in consultation with the relevant council. (3) Identify riparian corridors and associated buffers and assess against the Guidelines for Controlled Activities – Riparian Corridors (Department of Water and Energy 2008). Infrastructure including roads, pathways, drainage and stormwater structures, and asset protection zones, should be located outside the identified riparian corridors and buffers. This should be demonstrated through provision of plans and cross sections. (4) Provide details in relation to the short and long term management of water quality and ecosystem health during construction and the life of the development, including the formation of buffer zones. **Flooding** (1) Develop suitable Flood Planning Levels for the development and demonstrate consistency with the *NSW Floodplain Development Manual: the management of flood liable land (2005), and* the *DECCW Floodplain Risk Management Guideline – Practical Consideration of Climate Change*. **Visual impact** (7) Assess the visual impact of the proposal, when viewed from the surrounding areas (including surrounding roads, the Blue Gum Hills Regional Park, proposed conservation lands, the existing Minmi village, and other nearby suburbs).

	Bushfire Risk Assessment (1) Provide an assessment against the current version of *Planning for Bush Fire Protection 2006*. (2) Identify the ongoing management arrangements of proposed Asset Protection Zones (APZs), including through negotiation with relevant agencies where APZs are proposed on land to be transferred to public ownership. **Future public land** (1) Provide details of the proposed ownership, intended future use and management arrangements for publicly accessible land including roads, parks, and riparian areas, through negotiation with State and local government agencies where relevant. **Utilities** (1) Prepare a utility and infrastructure servicing report and plan for the site – This must: (a) identify existing utilities and infrastructure such as the supply of water, sewerage, stormwater, gas, electricity and telephone services; (b) assess the capacity of utility infrastructure to service the proposed development in conjunction with existing uses, proposed uses and potential future uses (including fire suppression); (c) demonstrate compliance with the requirements of any public authorities in regard to the connection to, relocation and/or adjustment of services affected by the development proposal; and (d) Detail technologies which may reduce the demand or need for servicing or provide for the supply of sustainable services (such as water sensitive urban design measures and sediment control measures. **Ecologically Sustainable Development (ESD)** (1) The EA should demonstrate that all aspects of the concept plan satisfy the principles of ESD including compliance with BASIX. (2) The EA should outline commitments to sustainability including water reuse, waste minimisation, the minimisation of energy use and car dependency etc. **Social Impact and social infrastructure** (1) Assess the social impact of the proposal on surrounding communities. (2) Identify additional demand created by the proposal for services and infrastructure including public transport, open space, recreation facilities, retail facilities and social and community facilities, based on an analysis of the existing and projected demographic profile of the locality. Demonstrate that an appropriate level of social infrastructure is provided to meet the needs of the future population arising from the development, including through identification of appropriate services and facilities. Where relevant this should be through negotiation with State or local government agencies and should inform the scope of infrastructure contributions. (3) Identify opportunities to meet demand for a range of housing types including seniors and affordable housing. **Subdivision** (1) Provide a subdivision plan to identify all covenants, easements and notations proposed for each title, for the proposed subdivision to facilitate transfer of lands to Government agencies.
Consultation Requirements	An appropriate and justified level of consultation should be undertaken. Where consultation has already been undertaken this should be documented. Consultation must be undertaken with the following relevant agencies and mineral resource titleholders: • Newcastle City Council • Lake Macquarie City Council • Department of Environment, Climate Change and Water • NSW Office of Water

	• Roads and Traffic Authority • NSW Transport • Department of Industry and Investment • Mine Subsidence Board • NSW Heritage Council • Department of Health • Department of Education and Training • Hunter-Central Rivers Catchment Management Authority • Hunter Water • Local Aboriginal Land Councils • Utility and infrastructure providers • Emergency Services, including the Ambulance Service of NSW, the State Emergency Services, Rural Fire Service and NSW Fire Brigades. • Donaldson Coal Pty Ltd • Newcastle Coal Company Pty Ltd • Oceanic Coal Australia Limited • AGL (SG) Operations Pty Ltd. • Daracon Engineering Pty Ltd.
Deemed refusal period	60 days

Appendix 2

Conservation Estate Ecological Inventory Report

Ecological Inventory Report – Lower Hunter Lands

Northern Lands Conservation Estates

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(REF: Coal & Allied-LHL-001)

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Disclaimers

Executive Summary

INTRODUCTION

RPS Australia East Pty Ltd (RPS) has been commissioned by Coal & Allied Industries Limited (Coal & Allied) to undertake an *Ecological Inventory Report* (EIR) over land within Stockrington and Tank Paddock, for conservation offsets for proposed developments at Minmi/Link Road and Black Hill Development Estates as outlined within the Lower Hunter Regional Strategy. This report provides the results of field investigations made during this study as well as considering the results of studies undertaken in the immediate vicinity and other available information such as NSW NPWS Atlas data and Hunter Bird Observer Club (HBOC) records.

BACKGROUND

Harper Somers O'Sullivan (2005) has previously undertaken Preliminary Vegetation Mapping over various holdings administered by Coal & Allied in the Lower Hunter Valley / Central Coast Region. This preliminary mapping was undertaken to provide a baseline dataset pertaining to the broad-scale distribution of ecological communities throughout the land holdings. This assessment was largely undertaken at a desktop level relying on aerial photography combined with existing regional mapping datasets and limited ground-truthing.

Between January 2007 – April 2010 ecological investigations were undertaken to inform the urban design and NSWG assessment process.

These investigations were intended to provide a brief assessment of the conservation status of previously delineated vegetation communities.

Although not restricted to such parameters, some emphasis has been placed upon locally and/or regionally significant species or ecological communities known from the vicinity of the site. These species or communities include those listed under the various schedules of the *Threatened Species Conservation (TSC) Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999.*

At the state level, the proposal is to be assessed pursuant to Part 3A of the EPA Act. To this end, in August 2010, the DGEAR's were issued for the site. To ensure completeness, ecological fieldwork and assessment has covered the full extent of the Coal & Allied surplus lands, including all development and Conservation Estates.

METHODS

The methodology employed to survey the proposed Conservation Estates does not comply with DECCW Guidelines. However, the vegetation mapping was to provide baseline knowledge pertaining to the broad scale distribution of ecological communities throughout these proposed conservation areas. This mapping has been based upon both aerial photograph interpretation and ground truthing. The ground truthing involved random meanders and driving over the site for approximately 6 days. The survey effort then consisted of detailed quadrats to sample the vegetation and provide data for non-parametric statistical analysis (PATN Ver. 3.11, Belbin 2006). This data was used within cluster analysis to assist in the delineation of the vegetation communities.

The fauna assessments within the Stockrington and Tank Paddock Conservation Estates consisted of mainly habitat assessment and opportunistic surveys throughout. No trapping was performed within the Conservation Estate. Targeted Swift Parrot surveys were undertaken within

the Conservation Estates. This survey effort was performed due to the strategic location of this portion for a native corridor which links Hexham Swamp to the proposed Conservation Estates to the west of Tank Paddock. In brief the methods employed to assess the ecological merit of the site involved the following:

- Literature Review
- Preliminary (Desktop) Assessments
- Flora Assessment
  - » Plant Identification and Vegetation Mapping
  - » Floristic Structure Information
  - » Targeted and Significant Flora Surveys
- Fauna Assessment
- Habitat Assessment and Mapping

Results

Flora

A total of 516 flora species were identified during the survey period over the Conservation Estates within the quadrats, transects and random meander surveys, including seven threatened flora species, two ROTAP species (Briggs & Leigh, 1996) and six Endangered Ecological Communities.

Threatened species include:

- *Arthropteris palisotii*

This species was recorded by EcoBiological (2006) when surveying the Subtropical Rainforest for the proposed Abel Underground Mine Operations. This species was tentatively identified within that report and this species is considered to be significant as sightings are extremely rare.

- *Eucalyptus nicholii*

Four (4) individuals of this species were recorded within the site. This species distribution has been recorded on shallow infertile soils such as slate, shales, granite and porphyrite from Niangala to Glen Innes on the northern tableland of NSW. As the distribution of this species is not naturally occurring in the Hunter Region it is most probable that this species has been introduced from land fill as it was recorded on a road edge.

- *Callistemon linearifolius*

At least 355 individuals of this species were located within the Lower Hunter Spotted Gum Ironbark Forest within the Conservation Estates. The counts of this species involved counting above ground stems, therefore the genetic individuals which may be present could be below this amount. This species is scattered throughout the main ridge top within the north western portion of the site. Targeted surveys to gauge the extent of the population have not been completed and it is expected that the population may be considerably larger than what has been reported here.

- *Rutidosis heterogama*

It is estimated that 1000-1500 individual plants were recorded during field visits and the actual extant population is expected to be far greater. It should be noted that this species appeared to be more common within disturbed areas such as along track sides, near railway verges and amongst dumped refuse. There was also a large population within a power easement just outside of the site on the western slopes of the Sugarloaf Range. This species was recorded predominately within the Lower Hunter Spotted Gum Ironbark Forest vegetation community.

- *Syzygium paniculatum*

One (1) plant was found within the Conservation Estates. Examination of the fruit of this plant found it to be 3 locular which is a distinguishing feature of this plant from other similar species (i.e. *Acmena smithii)*. This plant was growing in an area of high disturbance, adjoining Alluvial Tall Moist Forest and may have been brought in from another site in land fill. The plant is located near Blue Gum Creek and it is possible, however, that it has come from upstream in Alluvial Tall Moist Forest or Subtropical Rainforest. Whichever is the case it is considered that this species is significant as it is growing in suitable habitat (albeit disturbed). A search of this area was performed with no further specimens located within the vicinity.

- *Tetratheca juncea*

Approximately 352 *Tetratheca juncea* plant clumps were located during field visits in 2005, late 2007 and 2008. The population is estimated to be considerably larger as the majority of the surveys were performed outside of the flowering period for this species. It is estimated that 256 ha of suitable habitat, within the Conservation Estates, remains to be surveyed. Thus, it is considered that this population will be significantly larger than what has been recorded during the vegetation surveys.

A further fourteen threatened flora species were considered to have potential habitat. No targeted surveys for any of these species have been undertaken within the Conservation Estates, however all threatened flora have been recorded which were found during the Random Meanders and Quadrat surveys throughout the Conservation Estate.

Twelve vegetation communities have been delineated and described within the LHCCREMS framework for the Conservation Estates, including six EECs. These communities have been delineated utilising a combination of groundtruthing, aerial photography interpretation and the use of Cluster analysis (PATN statistical program). Variations occurred from the LHCCREMS descriptions in many of the vegetation communities and these are described within the description of each community.

- *Coastal Foothills Spotted Gum - Ironbark Forest*

This community occupies the majority of the Conservation Estates and covers approximately 1,047 ha. This vegetation community is commensurate with MU 15 Coastal Foothills Spotted Gum – Ironbark Forest as described by LHCCREMS (NPWS 2000; House 2003). This community is associated with the steep or south facing slopes across the site and was generally evident between Lower Hunter Spotted Gum Iron-bark Forest (LHSGIF) and Hunter Valley Moist Forest (HVMF). Two sub-variants were recorded within this community, namely a Moist Sheltered variant and a Dry Exposed variant.

- *Coastal Plains Smooth-barked Apple Woodland*

This vegetation community occupies several patches throughout the Conservation Estates. This vegetation community encompasses 204 ha and occurs on the slopes and within the ridge top in the north-eastern portion of the Conservation Estates. It is commensurate with MU 30 Coastal Plains Smooth-barked Apple Woodland as described by LHCCREMS (NPWS 2000; House 2003). The threatened flora species *Tetratheca juncea* and *Grevillea parviflora subsp. parviflora* were recorded within this community. One sub variant dry exposed, dominated by *Eucalyptus fibrosa* was recorded within this community.

- *Lower Hunter Spotted Gum Ironbark Forest (EEC – Lower Hunter Spotted Gum Ironbark Forest)*

This community occupies the western portion of the site and covers approximately 313 ha. This vegetation community is commensurate with MU 17 Lower Hunter Spotted Gum – Ironbark Forest (LHSGIF) as described by LHCCREMS (NPWS 2000; House 2003). This community varied in some areas with a dense shrub layer of *Melaleuca nodosa* and other areas a dense understorey of *Daviesia ulicifolia*. The remaining areas of the site have a grassy understorey dominated by *Joycea pallidea, Themeda australis, Entolasia stricta* and *Imperata cylindrica.*

- *Hunter Valley Moist Forest*

This vegetation community occurs within slopes above creeklines particularly on southern aspects, or where moisture retention occurs. This vegetation community covers approximately 129 ha and is commensurate with MU 12 Hunter Valley Moist Forest (HVMF) as described by LHCCREMS (NPWS 2000; House 2003). This community occurs on sheltered gullies and south facing slopes below steep sandstone outcrops. Often this community develops in the head drainage lines at a slightly elevated level. This vegetation community has a high diversity of natives and was at times difficult to delineate from the Alluvial Tall Moist Forest.

- *Alluvial Tall Moist Forest*

This vegetation community occurs within the creeklines within the Conservation Estates, these creeklines include Blue Gum Creek, Long Gully and Minmi Creek. Whilst weed infestations are present there are a number of natives still present throughout this vegetation community. This vegetation community covers approximately 166 ha and is commensurate with MU 5 Alluvial Tall Moist as described by LHCCREMS (NPWS 2000; House 2003). This community is very similar to HVMF across the site and is often hard to delineate. It was noted that in the ATMF within the site, tall thick stands of *Melaleuca styphelioides* often dominated the upper-mid stratum with species including *Eucalyptus saligna* and *Eucalyptus grandis* as the dominant canopy species. Whilst *Melaleuca styphelioides* occasionally occurred in HVMF it was not nearly as dense and not as tall as the stands in ATM. The dominant tree cover varied throughout this vegetation community. Two variants of this community were recorded within the site. Firstly, a broad-leaf understorey variant in which upper stratum included *Toona ciliata* (Red Cedar), *Alphitonia excelsa* (Red Ash) and *Eucalyptus salinga* (Blue Gum). Small *Dendroscnide excelsa* (Giant Stinging Tree), *Cryptocarya microneura* and *Commersonia fraserii* dominate the mid storey with a sparse understorey. The second variant *M. styphelioides/E. acmenoides* variant which occurs in drainage lines where the canopy is more open.

- *Subtropical Rainforest (EEC – Lowland Rainforest of the NSW North Coast and Sydney Basin Bioregion)*

This rainforest covers approximately 21 ha and occurs in the deep gullies of Long Gully and another one to the west of Long Gully. This community is commensurate with MU 1a Coastal Warm Temperate – Sub Tropical Rainforest as described by LHCCREMS (NPWS 2000; House 2003). EcoBiological (2006) have previously analysed this community in detail and concluded that this community is best described as Subtropical Rainforest and was closely related to *Ficus* spp. – *Dysoxylum fraserianum* – *Toonia* – *Dendrocnide* sub alliance 15 of Floyd (1990). The results of this survey concur with the EcoBiological (2006) due to the dominance of *Toonia ciliata*, *Dendrocnide excelsa, Dendrocnide photinophylla* and *Ficus* species which were identified within this community.

- *Hunter Lowland Redgum Forest (EEC – Hunter Lowland Redgum Forest in the Sydney Basin and the North Coast Bioregion)*

This vegetation community occurs in two small areas on the western side of the conservation area and in small patches of Tank paddock. This vegetation encompasses approximately 14 ha. The largest portion of this community follows a north – south drainage flat on the western side of the Conservation Estates and is depicted by a dominance of large *Eucalyptus tereticornis* (Forest Red Gum) in the upper stratum. Two variants of this community were delineated, firstly a disturbed variant which was sampled in highly degraded areas in which the canopy was intact but the understorey was disturbed by weed infestation and clearing. The remaining variant is a *Melaleuca decora* variant in which this species is dominant in the understorey.

- *Swamp Oak Rushland Forest (EEC – Swamp Oak Floodplain Forest on Coastal Floodplains)*

This vegetation community occurs in two small areas within the low lying areas adjoining Hexham Swamp within Tank Paddock. This vegetation community encompasses approximately 0.57 ha and is commensurate MU 40 Swamp Oak Rushland Forest as described by LHCCREMS (NPWS 2000; House 2003). This community had a high incursion of *Lantana camara* and it was difficult to gain access.

- *Swamp Mahogany – Paperbark Forest (EEC – Swamp Sclerophyll Forest on Coastal Floodplains)*

This vegetation community in a small area in the northern portion of Tank Paddock, and is linked to a swamp which is located on the adjoining property. This vegetation community encompasses 0.23 ha. This vegetation community is commensurate with MU 37 Swamp Mahogany – Paperbark Forest as described by LHCCREMS (NPWS 2000; House 2003). This vegetation community fringes a swamp that occurs offsite and flows into Pambalong Swamp to the north west of the site.

- *Freshwater Wetland Complex (EEC – Freshwater Wetlands on Coastal Floodplains)*

This vegetation community occurs as two areas in the north east of Tank Paddock. These areas are connected to and drain into Hexham Swamp. This community is floristically diverse and provides habitat for a range of native flora and fauna. This vegetation community covers approximately 11 ha and is commensurate with MU 46 Freshwater Wetland Complex as described by LHCCREMS (NPWS 2000; House 2003).

- *Weeds and Cleared Areas*

This vegetation community occurs within the central area of the site and exists as a quarry. Smaller

areas on the eastern and western side of the site are the result of clearing for the mining operations. The remaining areas are either unformed tracks or electricity easements. This community encompasses approximately 196 ha and is not commensurate with any vegetation communities that have been described by LHCCREMS (NPWS 2000; House 2003). These areas are highly disturbed and have high weed incursions.

- *Dams*

This vegetation community occurs as manmade dams within the cleared areas of the site, with the large dams in the north east of the site were utilised as water reservoirs for the mining operations. This community encompasses approximately 0.43 ha and is not commensurate with any vegetation communities that have been described by LHCCREMS (NWPS 2000; House 2003).

Fauna

A total of fifty-eight (58) threatened fauna species have been previously recorded within 10km (DECCW Atlas of NSW Wildlife Data 2010) of the Conservation Estate (as per existing records). A total of 13 of these species are highly unlikely to occur within the Stockrington and Tank Paddock Conservation Estates due to the absence of suitable habitat. Of the remaining 45 species, four were recorded during fauna surveys or previous surveys (Atlas of NSW Wildlife data 2008). Assessment of habitat potential within Conservation Estates found that a further 24 species have a moderate or greater opportunity of occurring within the Conservation Estates.

Swift Parrot Target Survey Results

Although no Swift Parrots or Regent Honeyeaters were observed within the Coal & Allied lands during the 2008 survey these results are not considered to be a faithful indication of the capacity of these lands to support the Swift Parrot or Regent Honeyeaters. Overall the Conservation Estates exhibit greater habitat opportunities for these species, due to the greater extent of widespread habitat, predominantly Spotted Gum-Ironbark assemblages, ATMF, and the inclusion of riparian Forest Red Gum communities, which are likely to represent focal habitat points for these species during seasons when they occur within the locality. The absence of both of these species from the Conservation Estates during the winter of 2008 is consistent with the paucity of coastal and Lower Hunter records for both of these species during the 2008 season. There have been few Swift Parrot records within the region compared with previous years and no Regent Honeyeaters during the 2008 winter period. Evaluation of potential habitats within Conservation Estates suggests that there is a good probability that both of these species would use the Conservation Estates during favourable years within the region. However, the same assumptions are not considered to apply to the Development Estates, due to the smaller amounts of suitable habitat, lack of Forest Red Gum habitats and the somewhat isolated and to some extent fragmented nature of these lands in comparison with the extent of the Conservation Estates and their continuity to large significant forest areas in the regional context.

Flora Habitat

The vegetation communities present throughout the Conservation Estates at Stockrington and Tank Paddock offer a number of suitable habitat types for a relatively diverse representation of native flora communities and species occurring in the Lower Hunter Region. A number of geomorphologic factors contribute to those vegetation communities present within these lands. These factors include the geology, soils, elevation and rainfall patterns, and are further diversified by topological context in relation to slope, aspect and substrate permeability. The geomorphologic influences underlying these sites provide suitable conditions for ten native vegetation communities, being Coastal Foothills Spotted Gum - Ironbark Forest (CFSGIF), Coastal Plains Smooth-barked Apple Woodland (CPSBAW), Lower Hunter Spotted Gum Ironbark Forest (LHSGIF), Hunter Valley Moist Forest (HVMF), Alluvial Tall Moist Forest (ATMF), Subtropical Rainforest (STRF), Hunter Lowland Redgum Forest (HLRF), Swamp Oak Rushland Forest (SORF), Swamp Mahogany-Paperbark Forest (SMPF), and Freshwater Wetland Complex. Apart from these naturally occurring

vegetation communities there are areas within the site that have been cleared to facilitate energy and transport infrastructure and road works material quarrying and associated maintenance and accessibility requirements. These cleared areas are characterised by disturbed substrates and high levels of light, which provide opportunities for exotic weeds and colonists from adjacent native vegetation communities.

A number of threatened flora species and ROTAP listed flora are known to occur regionally within vegetation communities occurring within Conservation Estates at Stockrington and Tank Paddock.

The condition of the vegetation communities varies across the site with some areas exhibiting degradation with proximity to tracks, infrastructure easements and lands cleared for previous land-use practices. The edges of ATMF and HVMF offer opportunities for mesic vegetation, including serious introduced weeds like *Lantana camara* (Lantana). Other than those opportunities for weeds occurring within cleared easements, vegetation community disturbances within the site are by and large limited to edge effects associated with access tracks and small occasional incidences of rubbish dumping.

Fauna Habitat

Fauna potentially occurring within the site varies with respect to vegetation quality, density and community form. The site encompasses vegetation communities encompassing both wet and dry sclerophyll vegetation associations as well as rainforest community associations. The variation in vegetation within the site provides habitat for a diversity of common fauna species and opportunities for a moderate – high number of threatened fauna species.

The Open Forest communities within the site provide suitable habitat for a number of common terrestrial mammals, including small marsupials, rodents and the Echidna. General understorey density variations within the site largely follow a pattern of more open understoreys on dry or north facing ridges and slopes and higher densities on south facing and lower slopes where dry communities merge with riparian and wet forest communities in the gullies and flats. Open forest habitats offer grazing opportunities for herbivorous fauna, such as Macropods and Wombats.

Habitats for terrestrial mammals within the Conservation Estates (particularly Stockrington) are of considerably greater quality than those occurring within the Development Estates at Black Hill and Minmi/Link Road. This is due to a number of factors not the least of which is the large and continuous stand of vegetation these lands represent and the broad continuous linkages they possess to more southerly areas of the Sugarloaf Range and as a consequence the Watagans further to the south.

There are extensive areas of dry and mesic forest within the proposed Conservation Estates that exhibit a diversity of age cohort within canopy tree species, suggesting that these areas of the site have not been cleared in the recent past. Consequently large areas of these lands are covered in forests containing trees of sufficient maturity to develop hollows, which provide shelter and nesting opportunities for arboreal mammals.

The wooded and adjacent open areas within the site provide extensive insectivorous foraging habitat for Microchiropteran bat species. Furthermore, there are substantial areas of both wet and dry forest communities offering a wide diversity of hunting niche for the majority of Microchiropteran species that have been recorded within the Lower Hunter Valley. The Stockrington Conservation Estate offers roosting opportunities for both hollow-dwelling and cave-dwelling bats and is adjacent to cave-dwelling opportunities of the Sugarloaf Range.

Canopy trees within the site offer abundant blossom foraging opportunities for Grey-headed Flying-foxes and rainforest trees occurring in the gullies provide seasonal fruit resources for this species. No roosting camps were observed but some of the rainforest gullies appear to offer suitable roosting sites for this species.

Stockrington Conservation Estates encompass the headwaters of Buttai and Surveyors Creeks in the west and the western tributaries of Blue Gum Creek in the east including Long Gully. These creek heads represent relatively steep and relatively small catchments offering largely ephemeral water flows, although there are flat areas where more permanent pools persist. The wet nature of these gullies would make them highly suitable sites for frog species including potential habitat for locally occurring threatened frog species. The Tank Paddock Conservation Estate occurs on the south western fringe of the Hexham floodplain with areas of wetland habitat entering the site where mesic forested drainage lines interface with floodplain habitats. Floodplain habitats and lower mesic drainage lines are likely to provide a diversity of habitat niches for common frog species.

Habitat within the site has potential for representing significant shelter and foraging opportunities for a diversity of reptile species. This can be attributed to the complexity of understorey strata and the high incidence of forest debris in the ground cover layer.

A diversity of continuous dry forest and woodland habitats interspersed with wet gullies containing mesic vegetation and at times well-developed rainforest offer abundant habitat opportunities for a wide range of common bird species within the Stockrington Conservation Estate. The occurrence of wetland habitat adjacent to dry and alluvial forests at Tank Paddock also offers a diverse suite of habitat opportunities for a wide range of bird species.

Key Habitat and Corridors

The Conservation Estates represent important components of a number of regional and sub-regional corridors, such that their integrity is important to fauna movements within the wider locality. The Stockrington Conservation Estate also represents areas of Key Habitat in the southwest and southeast with small areas also represented in the east and south as mapped within KHC. Locally the site has relatively unbroken linkages with lands to the north and northwest and tentative linkages to larger areas of vegetation broadly continuous with the Sugarloaf Range to the southwest. Vegetation within the site represents the most significant bushland linkages between forests to the south and remnant bushlands to its east across the F3 Freeway. Corridor mapping for the area is currently under review within the “Draft Western Corridor Planning Strategy”, although this work is limited to desktop assessments by the DoP of work already undertaken and results have not been released at the time of writing this report.

CONSERVATION OUTCOMES

The Lower Hunter Region’s vegetation is of bio-geographic significance as it supports a transition between the northern and southern plant and animal assemblages. This north-south link is not evident elsewhere in the Hunter Valley. The Region also forms an east-west migratory pathway and a drought refuge for inland species.

The preservation of large vegetated areas that are linked to other similar areas has been recognised as fundamentally important to achieving long term regional biodiversity outcomes in the Lower Hunter region. The two most valued of these areas in the Lower Hunter contain large land areas owned and controlled by Coal & Allied. The first is the green corridor that links the Watagans and Yengo National Parks with the coastal plains of the Tomago Sandbeds, Stockton Bight and Port Stephens and secondly, the Wallarah Peninsula lands provide a regionally significant break between urban areas, and contain areas of high biodiversity, scenic amenity and heritage value.

The Coal & Allied lands to be dedicated form both large areas of vegetation in their own right, and complete linkage of identified regional corridors in key areas.

In addition to their important strategic location in a wider landscape context, the Conservation

Estates contain valuable biodiversity resources. They contain and will conserve a range of important vegetation communities, including areas of Endangered Ecological Communities (EEC) and other vegetation types that have been depleted in the region. Several threatened plant species have been recorded within the Conservation Estates, including *Arthropteris palisotii, Tetratheca juncea* (Black-eyed Susan), *Grevillea parviflora* subsp. *parviflora*, *Eucalyptus nicholii, Rutidosis heterogama, Syzygium paniculatum* and *Callistemon linearifolius*. Two of the threatened flora species recorded in the Conservation Estates are considered to be planted specimens and not naturally occurring, being *Eucalyptus nicholii* and *Syzygium paniculatum*, although *S. paniculatum* may have been transported to its position in a disturbed area by natural means. In addition to these threatened species two rare (ROTAP) species *Callistemon shiressii* and *Eucalyptus fergusonii* subsp. *dorsiventralis* were also identified within the Conservation Estates.

The diverse nature of both the landform settings, varying from coastal ranges forests and woodlands to wetlands, provides a diverse array of habitats and resources for native fauna. The Conservation Estates are known to contain important populations of numerous threatened fauna species, including birds, mammals and herpetofauna. The conservation of these lands will provide secure regional biodiversity gene pools, and also through linkages facilitate valuable genetic material exchange and other key processes associated with sustainable ecological population dynamics.

In summary, the Coal & Allied conservation dedications provide outcomes that contribute to meeting the Environmental Protection goals outlined in the Sustainability Criteria contained within the Lower Hunter Regional Strategy. Such includes:

- Outcomes consistent with the Lower Hunter Regional Conservation Plan;
- Maintains/improves areas of regionally significant biodiversity;
- Maintains environmental areas for air & water quality; and
- Protects areas of Aboriginal cultural heritage value and historical heritage value.

These outcomes:

- Conserve in perpetuity key strategic parcels of land that complete long sought after regional biodiversity conservation corridors and buffer areas;
- Provide large intact areas of conserved habitat that will function as regional biodiversity gene pools;
- Protect an important array of vegetation communities, flora and fauna species, and natural landscape assets, including threatened species and EEC's and
- Contribute significantly to the successful implementation of the Lower Hunter Regional Conservation Plan.

CONCLUSION

This ecological inventory of the Stockrington and Tank Paddock Conservation Estates has been undertaken to support the Minmi/Link Rd and Black Hill Development Estates as part of the proposal for Coal & Allied surplus Northern Estates. The Stockrington and Tank Paddock Conservation Estates are an integral part of the Watagan to Stockton Corridor which will achieve regional conservation outcomes. Furthermore, suitable actions are proposed to minimise potentially deleterious permanent and ongoing impacts to the conservation lands.

The field and desktop studies have recorded the following parameters of ecological significance within the Conservation Estates:

- native vegetation commensurate with those listed as EEC's;
- threatened flora species recorded within and adjacent to the proposed development;
- threatened fauna species recorded within and adjacent to the proposed development;
- habitat for threatened flora and fauna species known from within and adjacent to the proposed development; and
- other areas containing native vegetation with varying degrees of modification / degradation.

The large areas of Conservation Estates at Stockrington and Tank Paddock that will be set aside as part of the proposed developments provide excellent ecological outcomes across the sites. The Stockrington Conservation Estate will contribute a large portion of land to conservation in perpetuity, which will in essence formalise the Watagan to Stockton Corridor. The importance of the conservation of Tank Paddock as part of the Conservation Estates will result in maintaining a vegetation corridor from Hexham Swamp and the Hunter Estuary to the Watagan Mountains and the Sugarloaf Range. This large tract of native vegetation will provide habitat for a wide variety of native flora and fauna.

Terms & Abbreviations

Abbreviation	Meaning
aff.	Affinity
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Authority
Coal & Allied	Coal & Allied Industries Ltd
Conservation OR Offset Lands	Land proposed for dedication to NSW Government
Development Estate	Proposed Development Lands
DBH	Diameter (centimetres) at Breast Height
DECCW	NSW Department of Environment, Climate Change and Water
DEWHA	Commonwealth Department of Environment, Hertiage and the Arts
DGEAR's	Director General's Environmental Assessment Requirements
DoP	NSW Department of Planning
EAR	Ecological Assessment Report
EEC	Endangered Ecological Community
EIR	Ecological Inventory Report
EMP	Environmental Management Plan
EPA Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act1994*
ha	hectare
HBOC	Hunter Bird Observers Club
Hwy	Highway
LGA	Local Government Area
LHCCREMS	Lower Hunter and Central Coast Regional Biodiversity Strategy(NPWS 2000; House 2003)
LHRCP	Lower Hunter Regional Conservation Plan
LHRS	Lower Hunter Regional Strategy
NPWS	NSW National Parks and Wildlife Service
NSWG	NSW Government
PFC	Projected Foliage Cover
RPS	RPS Australia East Pty Ltd
ROTAP	Rare or Threatened Australian Plants (Briggs & Leigh 1995) ROTAP Codes are as follows:- 2 = Geographic Range in Australia is less than 100 km R = Rare C = Conserved - = Reserved population unknown
SEPP 14	State Environmental Planning Policy 14 "Coastal wetlands"
SEPP 44	State Environmental Planning Policy 44 "Koala Habitat Protection"
Ssp. or subsp.	Subspecies
Sp	Singular Species
Spp	Multiple Species
SSS	State Significant Site
TSC Act	NSW *Threatened Species Conservation Act 1995*
Var.	Variety

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Qualifications of Personnel

1 Introduction

RPS has been commissioned by Coal & Allied Industries Limited (Coal & Allied) to undertake an *Ecological Inventory Report* (EIR) over land within Stockrington and Tank Paddock, as a component of the Lower Hunter Lands Project where these lands will be utilised as conservation offsets for proposed greenfield developments at Minmi/Link Road and Black Hill as outlined within the Lower Hunter Regional Strategy. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. Due recognition and consideration of the *Threatened Species Conservation Act 1995*, *Environmental Protection, Biodiversity and Conservation Act 1999*, *Water Management Act 2000* and the *Fisheries Management Act 1994* have been made throughout this assessment.

This report specifically provides an inventory of the field investigation results made during this study as well as considering the results of studies undertaken in the immediate vicinity and other available information such as NSW NPWS Atlas data and Hunter Bird Observer Club (HBOC) records.

This *Ecological Inventory Report* aims to document the flora, fauna and habitat characteristics of the Conservation Estates. It is envisaged that the results of this study will supply detailed baseline data on the ecological characteristics of the Conservation Estate at Stockrington and Tank Paddock. This data will be utilised to assess the relative merits of the sites as conservation offsets and to inform the future end user management.

1.1 Background

Harper Somers O'Sullivan (2005) has previously undertaken Preliminary Vegetation Mapping over various holdings administered by Coal & Allied in the Lower Hunter Valley / Central Coast Region. This preliminary mapping was undertaken to provide a baseline dataset pertaining to the broad-scale distribution of ecological communities throughout the land holdings. This assessment was largely undertaken at a desktop level relying on aerial photography combined with existing regional mapping datasets and limited ground-truthing.

Between January 2007 – April 2010 ecological investigations were undertaken to inform the urban design and NSWG assessment process.

These investigations were intended to provide a brief assessment of the conservation status of previously delineated vegetation communities.

Although not restricted to such parameters, some emphasis has been placed upon locally and/or regionally significant species or ecological communities known from the vicinity of the site. These species or communities include those listed under the various schedules of the *Threatened Species Conservation (TSC) Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999.*

At the state level, the proposal is to be assessed pursuant to Part 3A of the EPA Act. To this end, in August 2010, the DGEAR's were issued for the site. To ensure completeness, ecological fieldwork and assessment has covered the full extent of the Coal & Allied surplus lands, including all development and Conservation Estates.

1.2 Site Particulars

Locality – The site is on the eastern side of the F3 freeway to the north of Minmi and to the west of the F3 freeway which include lands surrounding Stockrington and George Booth Drive to the east of Mt Sugarloaf.

LGA – Cessnock City Council, Newcastle City Council and Lake Macquarie City Council.

Title(s) –
Stockrington –

83//DP755260	Part 71//DP1065169
84//DP755260	2//DP250339
8//DP755260	2//DP124209
51//DP1095513	1//DP155446
89//DP755260	1//DP503566
13//DP1078246	3//DP977096
72//DP755260	2//DP877416
125//DP755260	1//DP1039968
1//DP124209	9//DP1078246
83//DP755260	4//DP977096
84//DP755260	1//DP119630
8//DP755260	101//DP881099
51//DP1095513	Part 71//DP1065169
89//DP755260	2//DP250339
13//DP1078246	2//DP124209
72//DP755260	1//DP155446
125//DP755260	1//DP503566
1//DP124209	3//DP977096
1//DP119630	2//DP877416
4//DP977096	1//DP1039968
9//DP1078246	

Tank Paddock – Lot 1 DP 1007615

Area – The area of the Conservation Estate is approximately 2411 hectares.

Zoning – Stockrington – 1(a) Rural "A" Zone, 5(6) Special Uses (Railways) Zone, 7(2) Conservation (Secondary) and 5 Infrastructure
Tank Paddock – 7(b) Environmental Protection Zone.

Boundaries – The site is bounded to the North by the Black Hill and extends as far south as Seahampton. To the west by Mount Sugarloaf and to the north-east by Hexham Swamp and bounded by the F3 freeway to the south east, and Seahampton to the south.

Current Land Use – The majority of the site is natural bushland with weed infestations evident, particularly in the drainage lines and gullies. A quarry is currently being operated at Stockrington to extract gravel. The remainder of the site is criss crossed with various easements and unformed tracks which are illegally used by 4WD vehicles and Motorbikes.

Topography – The Conservation Estates occur across undulating topography ranging in elevation from 210m on the footslopes of Mt Sugarloaf to 10m in Blue Gum Creek. In the south the lands straddle the eastern foothills of the Sugarloaf Range and encompass the watersheds of south-western feeder creeks of the Hexham flood plain, including Blue Gum Creek. The lands to the north west flow into Surveyors Creek, while the land to the north flows into Buttai Creek. Both of these creeks are part of the Wallis Creek Catchment.

Soils and Geology - There are at least 10 different categories of soils across the site according to Soils Landscapes of the Newcastle region (Matthei 2005).

The majority of the soil across the site is classified as erosional soil landscape of Killingworth. This soil type is typical across the rolling hills around Minmi and Stockrington. This type of soil has low to very low fertility and high erosion potential. The topsoils of this classification are typically brownish black sand or silt loams and the subsoils are usually sand or silt clays. Other erosional soil landscapes which have been mapped by Matthei (2005) include Bolwarra Heights. The coalluival soil landscapes include Cedar Hill, Stockrington and Sugarloaf. Residual landscape of Beresfield has also been mapped within the conservation estate.

Surveyors Creek and Blue Gum Creek have been mapped as alluival soil landscapes of Wyong and Cockle Creek. The remainder of the conservation estate has been mapped as a mixture of Coalluival and Alluival soil Landscapes.

The majority of the Conservation is underlain by the Newcastle Coal Measures of Permian Age with the northern section including Tank Paddock underlain by the Tomago Coal Measures of Permian Age.

1.3 Description of the Proposal

It is proposed that the entire Coal & Allied owned Minmi/Link Road, Black Hill, Stockrington and Tank Paddock sites be rezoned/listed as a ‘State Significant Site’ (SSS) in Schedule 3 of State Environmental Planning Policy (Major Development). A draft Schedule 3 listing will be prepared with the Concept Plan Application.

The development and conservation of the Coal & Allied land holdings in the Lower Hunter, has been collectively classified into ‘Southern Lands’ and ‘Northern Lands’ (Refer to Figure 1-1). The Northern Lands encompass the Minmi/Link Road and Black Hill Development Estates and the Stockrington and Tank Paddock Conservation Estates. Refer to Figure 1-2, Figure 1-3 and figure 1-4.

The Concept Plan for a residential subdivision of the Minmi/Link Road site will apply to the entire 525ha Minmi/Link Road and 1561ha Stockrington site. Similarly the entire 183ha Black Hill and the 545ha Stockrington/ Tank Paddock sites. The key environmental parameters for the proposed development of the sites are as follows:

- Dedication of 2,106ha of conservation land at Stockrington and Tank Paddock to the New South Wales Government (NSWG) that is identified in the Lower Hunter Regional Strategy and Lower Hunter Regional Conservation Plan.

It is proposed to dedicate land for conservation purposes as part of the Major Project Application via a Voluntary Planning Agreement (VPA) between Coal & Allied and the NSWG in accordance with s.93F of the Environmental Planning & Assessment Act, 1979 (EP&A Act). Notably the Conservation Estates are identified in the LHRCP prepared by the DECCW and make significant contributions toward meeting conservation goals indentified in the LHRCP. Refer to Figure 1-4.

1.4 Definitions

The definitions given below are relevant to the Director-General's requirements:

'development' has the same meaning as in the *NSW Environmental Planning and Assessment Act 1979.*

'activity' has the same meaning as in the *NSW Environmental Planning and Assessment Act 1979.*

'proposal' is the development, activity or action proposed. Other terminology used for the 'proposal' includes the **'current proposal'** or **'development proposal'**.

The **'Site'** refers to the entire land holding, inclusive of development and conservation areas.

The **'Development Estate'** refers to the area(s) scheduled for development.

The **'Conservation Estates'** refers to the area(s) scheduled for dedication to the NSW Government. Other terminology used for the 'Conservation Lands' includes the **'Offset Lands'** or **'Dedication Lands'.**

Due to the size and separation of land holdings proposed for development and conservation, they have been broken down into two distinct geographical components. As such the sites have been condensed into the '**Southern Lands'** and **'Northern Lands'**.

All other definitions are the same as those contained in the *NSW TSC Act, 1995*.

1.5 Qualifications & Licensing

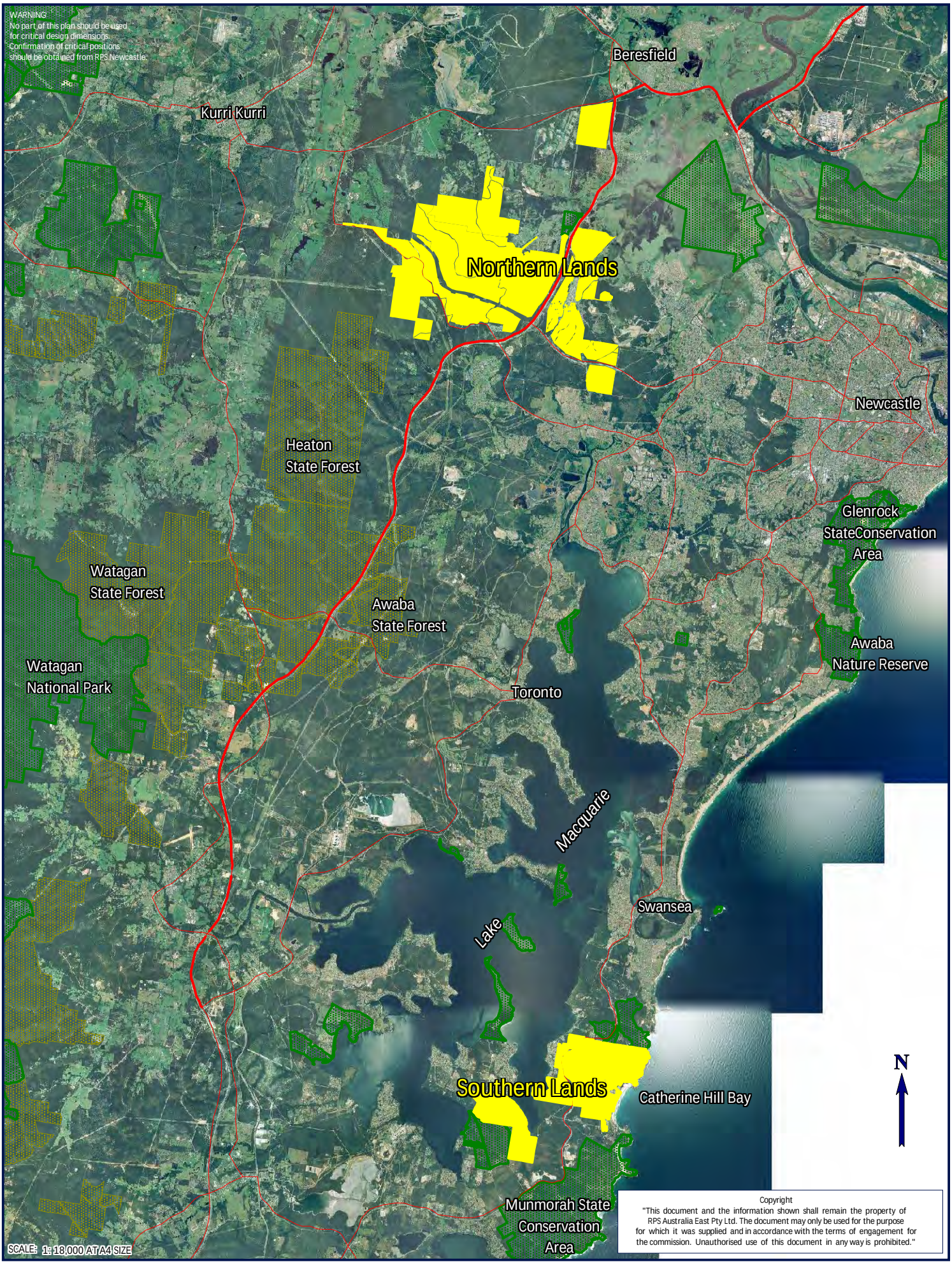
1.5.1 Qualifications

The principal author of this report was Matthew Doherty BLMC of RPS Pty Ltd, with additional input from Craig Anderson BAppSc (EAM), Deborah Landenberger BSc (Hons), Allan Richardson BEnvSc (Hons), Sam Bishop BEnvSc, Alex Saddington BAppSc, Shaun Corry DipCons&LndMgt, and Anna McConville BEnvSc. The academic qualifications and professional experience of all RPS ecologists involved in the project are documented in Appendix 5.

1.5.2 Licensing

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence S10300 (Valid 30 November 2011);
- Animal Research Authority (Trim File No: 01/1142) issued by NSW Agriculture (Valid 12 March 2011);
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 01/1142) issued by NSW Agriculture (Valid 12 March 2013); and
- Certificate of Accreditation of a Corporation as an Animal Research Establishment (Trim File No: 01/1522 & Ref No: AW2001/014) issued by NSW Agriculture (Valid 22 May 2011).



TITLE: FIGURE 1-1 COAL & ALLIED SURPLUS LANDS	LOCATION: HUNTER REGION	DATUM: N/A PROJECTION: MGA ZONE 56 (GDA 94)	DATE: 7/02/2011 PURPOSE: EAR	LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\2010 Works\Drafting VERSION (PLAN BY): C (A.P-M.D)

CLIENT: COAL & ALLIED INDUSTRIES PTY LTD
JOB REF: 24530-2

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
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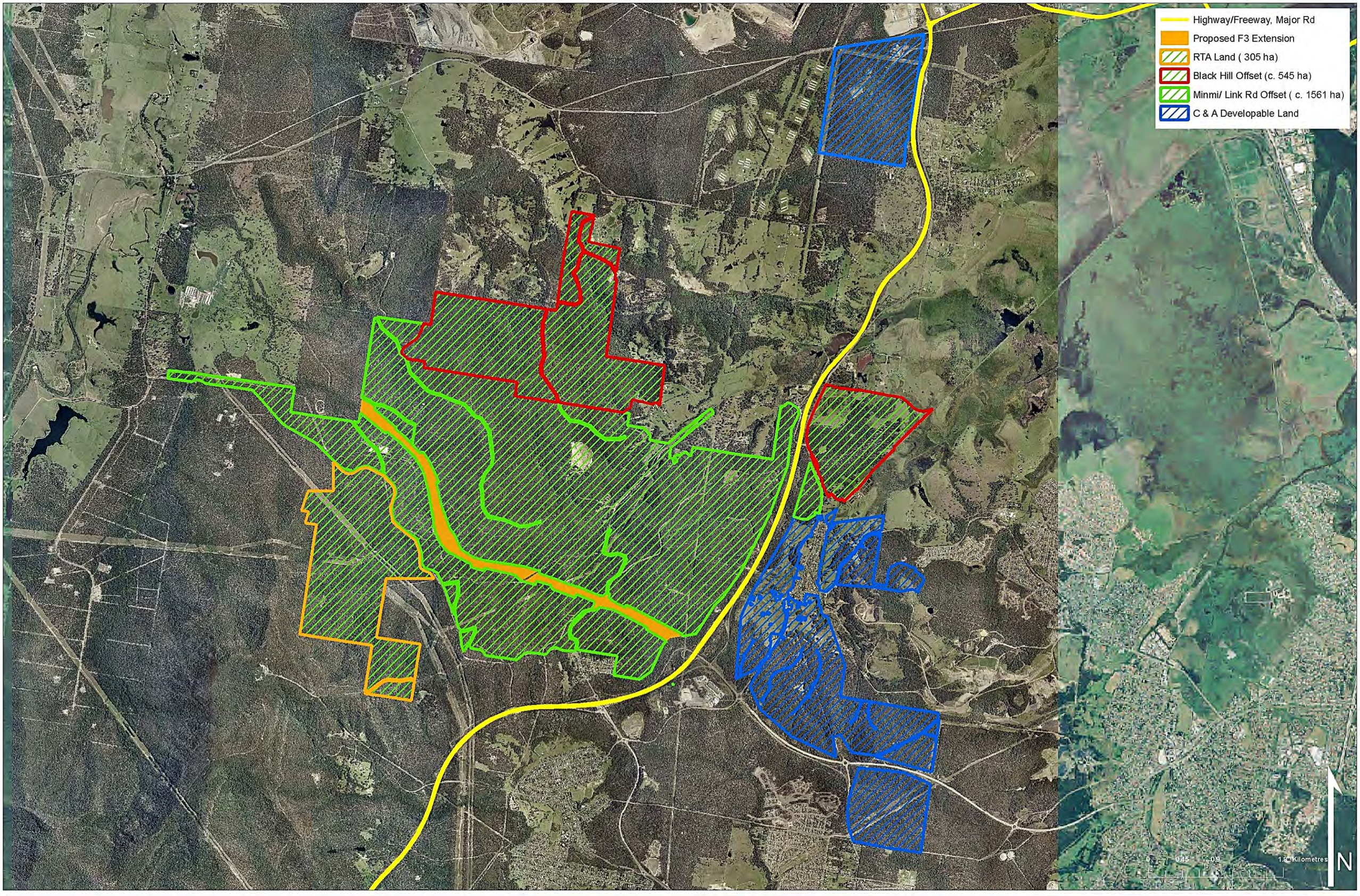

NORTHERN AREA- FINAL DEVELOPMENT AND CONSERVATION AREAS

COAL & ALLIED

urbis

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Legend

- Minmi-Link Road Consevation Estate
- Black Hill Consevation Estate
- Conservation Reserves
- RTA Land

N

BLACK HILL

BLACK HILL
CONSERVATION LANDS

PAMBALONG
NATURE RESERVE

HEXHAM SWAMP
NATURE RESERVE

MINMI LINK ROAD
CONSERVATION LANDS

FLETCHER

MINMI

SUGARLOAF
STATE CONSERVATION AREA

BLUE GUM HILLS
REGIONAL PARK

WEST
WALLSEND

0 1.5 3km

SCALE: 1: 40000 AT A3 SIZE

TITLE: FIGURE 1-3 SITE LOCATION

LOCATION: CONSERVATION ESTATES

DATUM: N/A
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 7/02/2011
PURPOSE: EAR

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\2010 Works\Drafting\Ecology\Northern Lands\Cons Estate\24530-2 Figure 1-3 Site Location D A3
VERSION (PLAN BY): D (A.P-M.D-N.W)

CLIENT: Coal & Allied Industries Ltd
JOB REF: 24530-2

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