Ravensworth Operations Pty Limited

Ravensworth Operations Project
Response to Submissions

May 2010

Umwelt
Environmental Consultants

Ravensworth Operations Project
Response to Submissions

Prepared by

Umwelt (Australia) Pty Limited

on behalf of

Ravensworth Operations Pty Limited

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1.0 Introduction

This document has been prepared in response to a request from the Director-General in accordance with section 75H(6) of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) that Ravensworth Operations Pty Limited (Ravensworth Operations) prepare a response to the issues raised during the public exhibition period for the Ravensworth Operations Project (the Project). This report outlines Ravensworth Operations' Response to Submissions and focuses on the issues raised during the public exhibition period.

1.1 Ravensworth Operations Project

The Project has been designed through an integrated multi-disciplined and risk-based approach that aims to maximise resource extraction efficiency whilst minimising impacts on the environment and surrounding community. Ravensworth Operations has undertaken detailed concept, pre-feasibility and environmental studies as part of the Project's development in order to identify potential environmental impacts, and impacts to other mining operations and surrounding land users. As part of this process, numerous alternate mine and infrastructure plans were considered.

A key feature of conceptual mine planning was a decision made early in the Project design process to limit mining operations to the south of Davis Creek, despite the presence of viable coal resources within this area. The decision to limit the mining operations to the south of Davis Creek was in response to identified significant ecological and archaeological features to the north and within the creek line, and effectively reduced the overall area of disturbance associated with mining area and out of pit overburden emplacement areas by approximately 490 hectares.

The key features of the Project are outlined **Table 1.1** below.

Table 1.1 – Overview of the Ravensworth Operations Project

Major Project Components/Aspects	Proposed Operations
Limits on Extraction	Up to 16 Mtpa ROM coal.
Capital Expenditure	$900 million
Mine Life	Up to 29 years from granting of approval.
Operating Hours	24 hours per day, 7 days per week.
Number of Employees	Approximately 550 Full Time Equivalents.
Mining Methods	Open cut mining using dragline and truck and shovel.
Mining Areas	Extension of existing operations and additional open cut mine and out of pit dump areas.

Table 1.1 – Overview of the Ravensworth Operations Project (cont)

Major Project Components/Aspects	Proposed Operations
Infrastructure	• Upgrade/expansion of existing Ravensworth Operations mine infrastructure area. • new surface infrastructure facilities and workshop building north of Davis Creek (where required). • new ROM coal conveyor system and raw coal stockpile. • construction of temporary employee, maintenance and equipment storage facilities for existing Narama mining facilities. • expansion and upgrade of the RCHPP/RCT to process up to 20 Mtpa ROM coal from the Project and other existing approved operations. • expansion of rail load out infrastructure and capacity at RCHPP/RCT to enable transport of up to 20 Mtpa product coal. • realignment of an existing 330 kV transmission line and other ancillary services. • upgrade/expansion of RUM surface infrastructure. • construction of a mine access road to service existing and proposed mine infrastructure areas.
Tailings and Rejects Strategy	• Tailings emplacement in former Cumnock open cut, Ravensworth South and Narama voids. • co-disposal of tailings and rejects with overburden.
External Coal Transport	• Use of RCHPP/RCT and transport of up to 20 Mtpa product coal via the Ravensworth Rail Loop and the Main Northern Railway line. • de-linking of the Ravensworth Rail Loop from the Newdell Rail Loop. • use of existing conveyor system for transport of coal to domestic power generators. • construction of a new conveyor and access bridge over the New England Highway.
Road Diversions	Realignment of Lemington Road requiring the upgrade of the existing intersection with the New England Highway approximately 6 kilometres south-east of the current Lemington Road intersection.
Water Management	• Construction of a new mine water storage dam. • construction of clean water diversions and management controls, including the diversion of Emu Creek around the proposed mining area. • construction of mine water management controls, including drains, pipelines and water storages.

It is proposed that Project Approval pursuant to Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) will provide for a single approval that covers all of the existing development consents and approvals held by Ravensworth Operations and other Xstrata Coal operations for open cut mining and surface facilities within the Project area. A single Project Approval will allow for the integration of operational aspects of existing and planned mining operations within the Project area, allowing for a consistent and integrated approach to be taken to environmental management and mine planning. Through this approach, Ravensworth Operations has committed to implementing continued mining operations in the context of updated and contemporary environmental management requirements. In effect, this means that the Project Approval process assesses continued

open cut mining and surface infrastructure against current expectations and impact assessment criteria.

1.2 Summary of Submissions

A total of 22 submissions were received during the public exhibition period of the EA which finished on 29 March 2010. Six of the submissions were from government agencies including the Department of Environment, Climate Change and Water (DECCW), Department of Industry and Innovation (DI&I), NSW Office of Water (NOW), Hunter-Central Rivers Catchment Management Authority (CMA), NSW Land and Property Management Authority (LPMA) and the Heritage Branch of the Department of Planning (Heritage Branch) Issues raised in these submissions are addressed in detail in **Sections 2.1** to **2.6** of this report.. In addition a submissions was received from the NSW Dam Safety Committee (DSC) did not raise any issues to be addressed as part of this report

Three submissions were received from surrounding operations including Macquarie Generation, Ashton Coal Operations Limited (ACOL) and Coal & Allied. The submission from Coal & Allied, a key landholder within the Project area, did not raise any specific issues to be addressed in this report and was generally supportive of the Project and included the following statement:

> Coal & Allied also notes to the Department that Xstrata's pre-EA engagement with Coal & Allied in this matter was of the highest standard, indicative of the mutual commitment of the corporate to maintain a strong working relationship to support our respective adjoining mines.

The issues raised in the Macquarie Generation and ACOL submissions are addressed in **Section 2.7** of this report.

Submissions were received from the Construction, Forestry, Mining and Energy Union (CFMEU), and Chubb Fire Safety, which did not raise any issues to be addressed as part of the Project and did not specifically object to the Project.

Another ten community submissions were received including a regional environmental group and nine residents from the area surrounding the Project and from other parts of upper Hunter Valley, such as Singleton.

Generally, the community submissions were concerned with regional issues associated with coal mining, such as cumulative air quality and noise impacts, regional biodiversity and water management impacts, health impacts associated with elevated dust levels and the consideration of community concerns by the government as part of the approval and regulation of mines in the area. Several submissions raised specific issues with the Project, including the potential for noise and ecological impacts; and issues associated with site rehabilitation. One submission from a local resident was supportive of the Project.

1.3 Structure of this Report

This response to submissions report has been prepared by Umwelt (Australia) Pty Limited on behalf of Ravensworth Operations to address the key issues raised through the submissions received on the EA through the public exhibition period. Matters raised by each submission are addressed individually for submissions received from organisations and grouped by issue for those received from individuals. For each issue, the theme of the issue raised is noted in

bold, followed by a response in normal type. For each primary issue, the theme of the matters raised is noted in bold, followed by a response in normal type.

2.0 Agency Submissions

2.1 Department of Environment, Climate Change and Water

2.1.1 Biodiversity Offset Strategy

The proposed offset areas do not fully meet the 'like for like' requirements of DECCW's offsetting principles.

Based on an assessment of characteristic species and the wording of the NSW Scientific Committee determinations, DECCW does not accept that Barrington Footslopes Dry Spotted Gum Forest is similar enough to the central Hunter Valley EEC's to be considered the same. Therefore the proponent has not met the offsetting requirement of offering sufficient 'like for like' vegetation in the offset area.

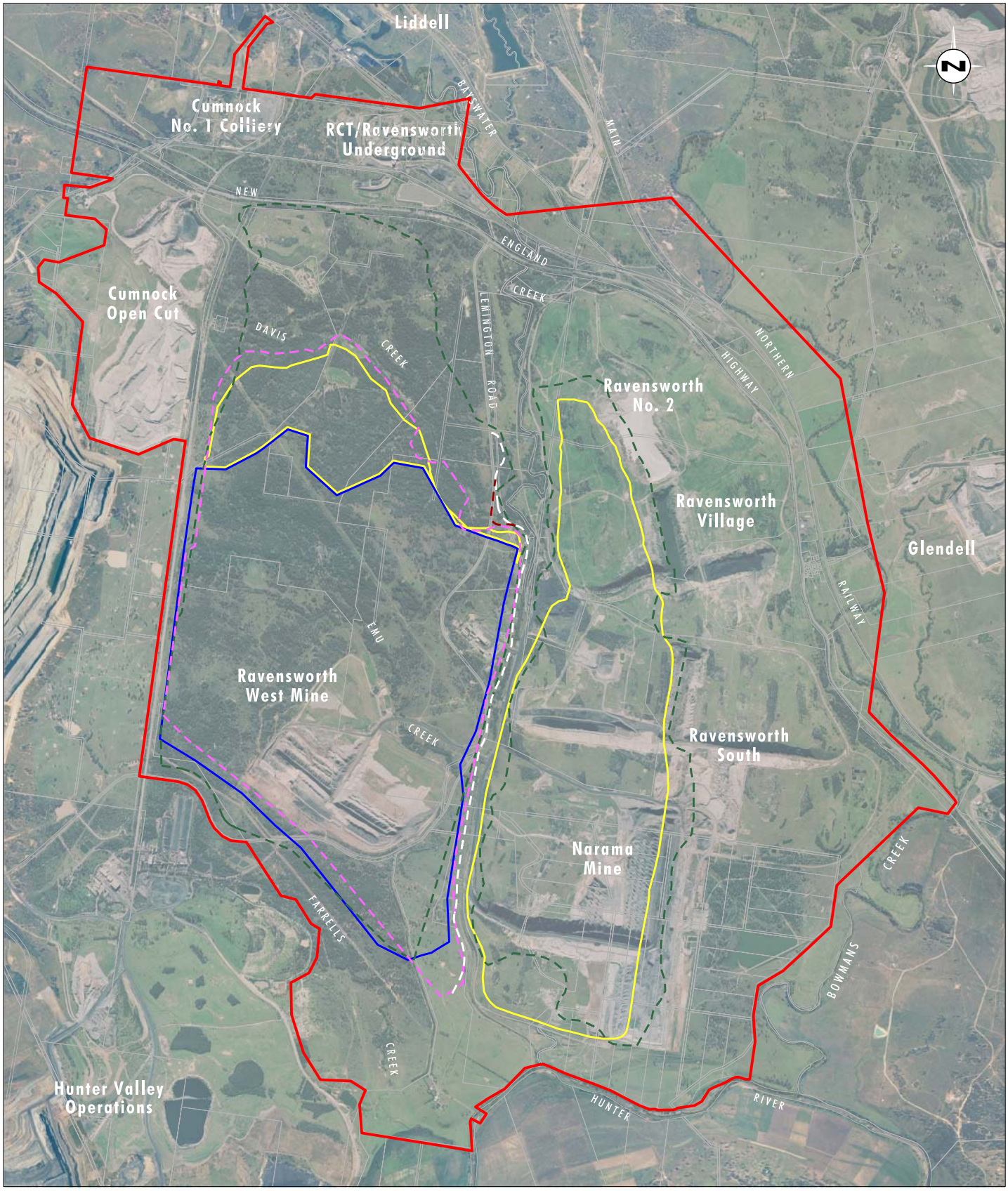
Ravensworth Operations has sought to avoid and minimise potential impacts on the ecological values of the Project area throughout the project planning process. This has included a substantial reduction in the overall disturbance area of the Project by approximately 490 hectares, the avoidance of direct disturbance of Davis Creek, a known endangered ecological community (EEC) habitat, and further reduction in disturbance to minimise impacts on identified threats to species including the green and golden bell frog, and other threatened species habitat (refer to **Figure 2.1**).

Despite the extensive reduction in the overall disturbance area and resultant avoidance and minimisation of impacts to significant ecological features of the Project area, the Project does result in potentially significant ecological impacts. Ravensworth Operations has committed to a package of extensive measures that aim to further mitigate the identified ecological impacts, including a comprehensive Biodiversity Offset and Rehabilitation Strategy for the Project.

An integral aspect of the proposed Biodiversity Offset and Rehabilitation Strategy is the establishment, protection and enhancement of the Ravensworth North Offset Area (RNOA) and the Hillcrest Offset Area, which will provide for the long term conservation of a range of significant ecological features (refer to **Figure 2.2**). As shown on **Figure 2.2**, the offset areas include a mixture of on-site conservation provided through the 262 hectares RNOA, and off-site conservation provided through the 1,392 hectares Hillcrest Offset Area.

The valley floor of the Central Hunter now supports highly fragmented woodlands that predominantly comprise native vegetation communities that have re-grown since previous clearing and disturbance over the past 150 years. Peake (2006) found that approximately 20% of the Central Hunter supports remnant native vegetation. The Project area includes part of one of the larger remaining patches of remnant vegetation. The RNOA includes part of this large remnant, and will provide security for the future regeneration and recovery of this remnant, particularly the endangered ecological communities it supports. It is dominated by the same vegetation types that would be removed in the Project area, and provides the same types of fauna habitats for threatened species.

The RNOA is situated at a location in the central Hunter Valley floor where there is a significant opportunity to create a cross-valley corridor (refer to **Figure 2.3**). This is possible based on the presence of several sizeable remnants, including the RNOA itself, and the substantial opportunity provided by planned or scheduled mine rehabilitation works associated with the Project and surrounding mining operations. In the long term with appropriate rehabilitation and revegetation focus, and the implementation of appropriate protection and management, these areas together could form a large, regional habitat



Source: Ravensworth Operations 2009

0 1.0 2.0 3km
1:50 000

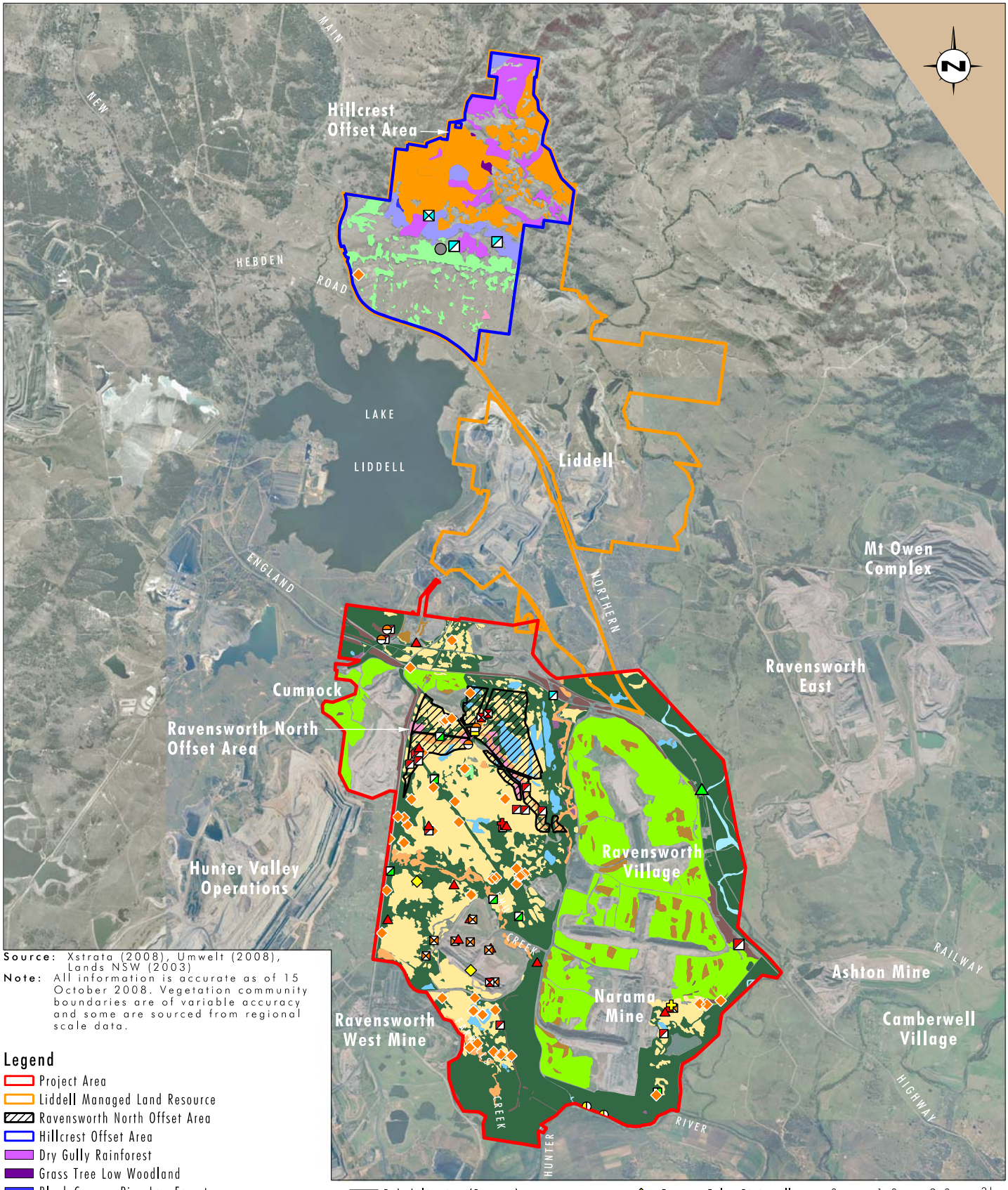
Legend

- Project Area
- Final Ravensworth North Pit
- Final Out of Pit Overburden Emplacement
- Proposed Mining and Overburden Emplacement Area Option 1
- Proposed Mining and Overburden Emplacement Area Option 2
- Proposed Mine Access Road
- Proposed Mine Access Road Option

FIGURE 2.1

Mine Plan Changes to Minimise Impacts

File Name (A4): R15_V1/2383_700.dgn



Source: Xstrata (2008), Umwelt (2008), Lands NSW (2003)

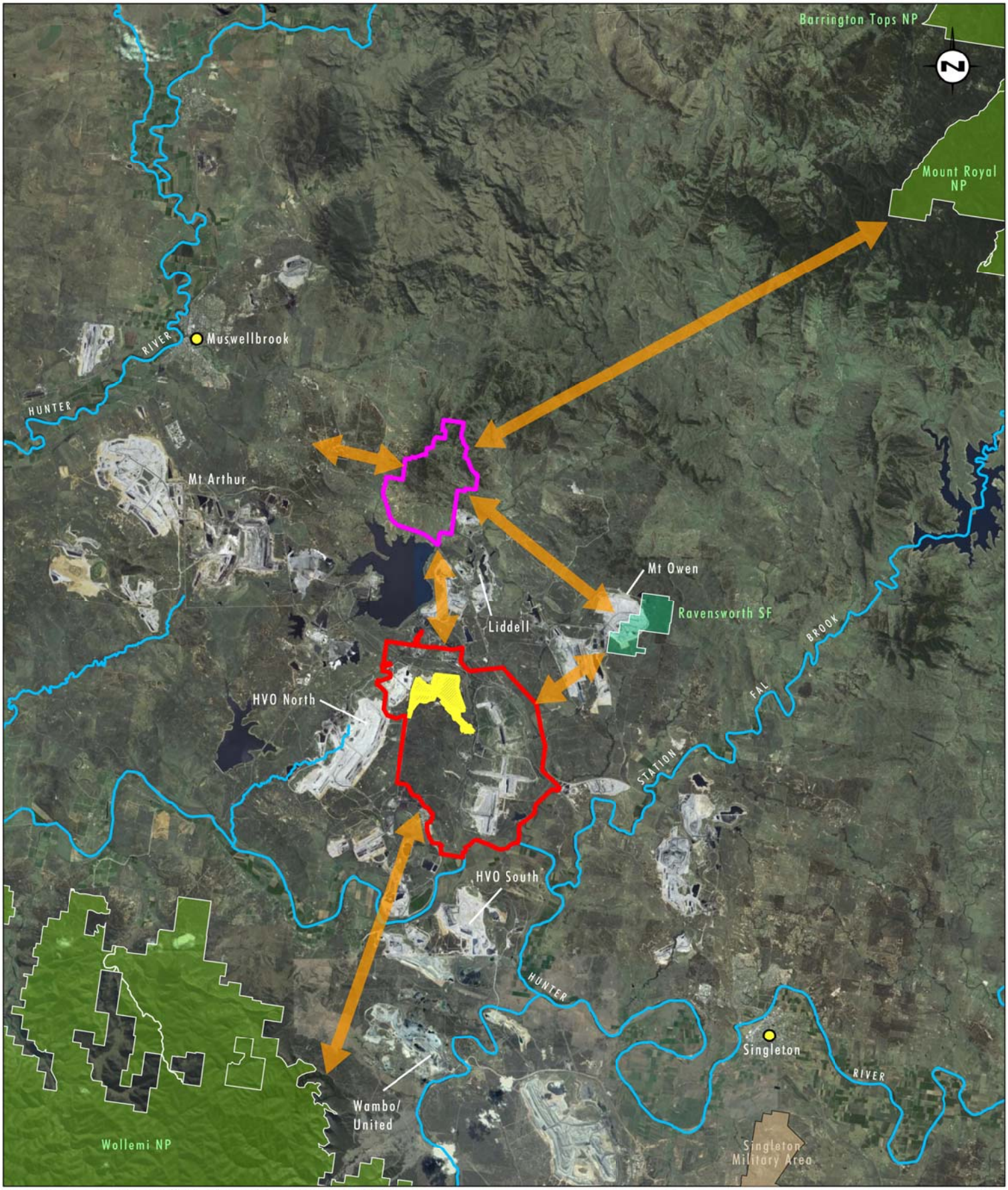
Note: All information is accurate as of 15 October 2008. Vegetation community boundaries are of variable accuracy and some are sourced from regional scale data.

Legend

- Project Area
- Liddell Managed Land Resource
- Ravensworth North Offset Area
- Hillcrest Offset Area
- Dry Gully Rainforest
- Grass Tree Low Woodland
- Black Cypress Pine Low Forest
- Central Hunter Swamp Oak Forest
- Central Hunter Box-Ironbark Woodland
- Hunter Valley River Oak Forest
- Central Hunter Ironbark-Spotted Gum-Grey Box Forest
- Barrington Footslopes Dry Spotted Gum Forest
- Central Hunter Bulloak Forest Regeneration
- Rough-barked Apple Forest on Sheltered Slopes
- Hunter Flood Plain Red Gum Woodland
- Derived Grassland
- River-flat Eucalypt Forest
- Planted Areas
- Rehabilitation (Pasture)
- Rehabilitation (Woody Vegetation)
- Brown Treecreeper (eastern subspecies)
- Grey-crowned Babbler (eastern subspecies)
- Hooded Robin (south-eastern form)
- Eastern Freetail-bat
- Freckled Duck
- Green and Golden Bell Frog
- Masked Owl
- Spotted-tailed Quoll
- Squirrel Glider
- Eastern Bentwing-bat
- Eastern False Pipistrelle
- Grey-headed Flying-fox
- Large-footed Myotis
- Little Bentwing-bat
- Scarlet Robin
- Speckled Warbler
- *Acacia pendula*
- *Eucalyptus camaldulensis*
- *Bothriochloa biloba*

FIGURE 2.2

Proposed Biodiversity Offset Areas



Source: Google Earth 2009, Department of Lands 2003

0 5 10 15km
1:250 000

Legend

- Project Area
- National Park/Nature Reserve (NP/NR)
- State Forest (SF)
- Crown Reserve
- Hillcrest Offset Area
- Ravensworth North Offset Area
- Regional Corridor Potential

FIGURE 2.3

Regional Connectivity Opportunities

corridor extending from Wollemi National Park in the south, through Wambo, United, HVO South, HVO North, Ravensworth (including RNOA) and Liddell Mines north to the Hillcrest Offset Area. From this location to the north, there is a reasonable habitat connection to Mount Royal and Barrington Tops National Parks, approximately 30 to 40 kilometres to the north-east of the Project area (refer to **Figure 2.3**). In addition to this, the location of the Hillcrest Offset Area also provides potential for the development of corridor linkages to the north west through to the areas around Mt Arthur (refer to **Figure 2.3**).

The Hillcrest Offset Area covers both valley-floor Permian landscapes, and the more rugged Carboniferous landscapes typical of the foothills of the Barrington Tops. The Hillcrest Offset Area provides a unique link between these two geological provinces and will protect this connection and implement appropriate management of its vegetation communities and threatened fauna habitat. Although the fauna habitats and vegetation communities of the northern part of the Hillcrest Offset Area are less similar to valley floor types, they are still comparable, and support a similar suite of threatened fauna species. These habitats and vegetation communities are also very poorly represented in the NSW reserve system, and the Hillcrest Offset Area would provide an opportunity to protect and appropriately manage these ecosystems. Further to this, the location of the Hillcrest Offset Area predominately off the valley floor also provides a marked separation from surrounding active mining areas with the Upper Hunter Valley.

As discussed in Appendix 7 of the EA, Section 5.9.2.1, various options to biodiversity offsetting were investigated for the Project. The most preferable option is the use of on-site biodiversity offsets which contain 'like for like' vegetation. As outlined above, the disturbance footprint was reduced to the minimum that is practicable for the Project (as discussed in Section 2.5.1 of the EA (p 2.16)) to minimise the environmental impacts of the Project and to maximise the size of the proposed Ravensworth North Offset Area (RNOA) (refer to **Figure 2.2**). This resulted in a substantial reduction in the project's footprint of approximately 490 hectares, and most importantly minimisation of ecological impacts and, flowing from this, increased opportunities for on-site biodiversity offsetting.

The RNOA contains approximately 194 hectares of native vegetation, as detailed in Table 5.18 of the EA (p 5.66), which has been reproduced as **Table 2.1** below. As outlined in **Table 2.1**, the RNOA provides for on-site 'like for like' vegetation communities consistent with the requirements of the DECCW's offsetting principles in relation to the nature of vegetation offset communities.

Table 2.1 - (Table 5.18 of EA) – Summary of the area of each Vegetation Community that Provides a Direct Ecological Offset for Vegetation Communities Proposed to be Removed as a Result of the Project

Vegetation Community to be Offset	Area in Proposed Disturbance Area (ha)	Area of Vegetation Community Offset (ha)		
		Ravensworth North Offset Area	Hillcrest Offset Area	Total
Central Hunter Box – Ironbark Woodland EEC (PD)	473	120	523*	643
Central Hunter Bulloak Forest Regeneration	35	34	0	34
Central Hunter Ironbark – Spotted Gum – Grey Box Forest EEC (PD)	4	0	4	4
Central Hunter Swamp Oak Forest	38	21	0	21**

Table 2.1 - (Table 5.18 of EA) – Summary of the area of each Vegetation Community that Provides a Direct Ecological Offset for Vegetation Communities Proposed to be Removed as a Result of the Project (cont)

Vegetation Community to be Offset	Area in Proposed Disturbance Area (ha)	Area of Vegetation Community Offset (ha)		
		Ravensworth North Offset Area	Hillcrest Offset Area	Total
Hunter Valley River Oak Forest	4	0	0	0
River-flat Eucalypt Forest EEC	5	19	1.6	20.6**
Hunter Floodplain Red Gum Woodland EEC (PD)	0.2	0	0	0
Totals	559.2	194	528.6	722.6

Notes: EEC = endangered ecological community

PD = preliminary determination

* 523 hectares includes 383 hectares of Barrington Footslopes Dry Spotted Gum Forest; and 140 hectares of Central Hunter Ironbark – Spotted Gum – Grey Box Forest EEC (PD) which are structurally and floristically similar vegetation communities.

**A total of 47 hectares of riparian vegetation is proposed to be offset by 40 hectares of riparian vegetation within offset areas. An additional 48 hectares of Central Hunter Swamp Oak Forest will remain undisturbed in the Project area along with 23 hectares of Hunter Valley River Oak Forest

During the detailed design phase for the Project since the lodgement of the EA, further refinement of the RNOA has been achieved as described in **Section 2.1.4**. This refinement relates to the identification of the opportunity for minor expansion of the RNOA area to incorporate significant Aboriginal archaeological sites. These refinements increase the RNOA by 11ha, to a total of 273ha.

As outlined in Section 5.5.8.1 of the EA (p 5.63)., a range of other offsetting options were investigated including the use of biodiversity offsetting on alternative Xstrata sites, the purchase of large woodland remnants on private land to provide a 'like for like' offset and the use of BioBanking to broadly inform likely offsetting requirements. None of the currently available Xstrata NSW landholdings, were found to provide appropriate areas of 'like for like' vegetation communities. The proposed Hillcrest Offset Area was found to contain extensive areas of similar but not 'like for like' vegetation (refer to **Table 2.1**). The investigation for purchase of large woodland remnants on private land to provide a 'like for like' offset did not identify suitable large remnants currently available for purchase. It was recognised, however, that the there are no credits available for purchase for the Project and, therefore, this option is not currently a viable pathway. Despite this, the principles underpinning the BioBanking scheme were considered in the development of the proposed Biodiversity and Rehabilitation Strategy for the Project. As a result of the investigation of potential biodiversity offsetting options, the use of similar vegetation located near to the Project area was considered the most feasible option in the preparation of the Biodiversity Offset and Rehabilitation Strategy for the Project.

The establishment protection and enhancement of the RNOA and Hillcrest Offset Area represents a substantial economic commitment through the process of formalising land transfer for these areas to provide for single ownership and the ongoing resources required for enhancement and management of these areas for the long term.

Notwithstanding the above, it is recognised that the inclusion of the Hillcrest Offset Area in the Strategy does not meet the 'like for like' requirement of DECCW's offsetting principles. As detailed above, the Project has aimed to obtain as much 'like for like' offset areas as possible for the Project. In order to address the residual offsetting requirements, Ravensworth Operations have committed to a comprehensive package as part of the Biodiversity Offset and Rehabilitation Strategy in order to offset the identified impacts on the significant

ecological values of the Project area. As outlined in Section 5.5.8.1 of the EA (p 6.64), the key features of the Biodiversity and Rehabilitation Strategy for the Project include:

- immediate establishment, protection and enhancement of the Ravensworth North Offset Area and the Hillcrest Offset Area, which will provide for the long term conservation of a range of significant ecological features including:
    - allow for the conservation of large areas of existing vegetation within the Project area and nearby to the Project area including the key vegetation communities impacted by the Project and other significant communities that are floristically related to the key vegetation communities within the proposed disturbance area;
    - enable direct offsetting of the impact of the Project on the green and golden bell frog (*Litoria aurea*), threatened woodland birds and micro-bats, within the Project area and nearby to the Project area; and
    - allow for the conservation and management of other significant ecological values for the region, including the protection and management of a range of EECs, regionally significant vegetation and the protection of habitat for a variety of significant fauna species;
- development and implementation of biodiversity enhancement strategy for the proposed offset areas that aims to enhance the ecological value of these areas through enhancement of existing vegetation, habitat for threatened species, and the improvement of the biodiversity of the region;
- development of a comprehensive rehabilitation strategy for the proposed disturbance area, and existing disturbed areas within the Project, to maximise the ecological value of rehabilitated areas; and
- the development of an appropriate ecological monitoring program to assess the success of the Biodiversity Offset and Rehabilitation Strategy in counter-balancing the impacts of the Project on ecological values.

As outlined above, the appropriate conservation and management of the Hillcrest Offset Area is an integral aspect of the Biodiversity Offset and Rehabilitation Strategy for the Project, this includes the presence of large areas of structurally and floristically similar vegetation communities to those proposed to be disturbed by the Project (refer to **Table 2.1**).

Central Hunter Ironbark – Spotted Gum – Grey Box Forest (EEC), present in the Hillcrest Offset Area, was identified as being closely related to the Central Hunter Box – Ironbark Woodland occurring in the Project area, as these communities intergrade in many areas and share similarities in terms of species assemblages, structure and habitat quality. Both communities also occur on Permian sediments on the Hunter Valley floor and it is considered reasonable that Central Hunter Ironbark – Spotted Gum – Grey Box Forest has sufficient similarities to the Central Hunter Box – Ironbark Woodland to comprise a reasonable offset for the proposed disturbance of this community.

Similarly, the Barrington Footslopes Dry Spotted Gum Forest was considered for inclusion in the Biodiversity Offset and Rehabilitation Strategy because it is geographically proximate to the Project area, has a number of species in common with Central Hunter Box – Ironbark Woodland and shares similar structure and habitat quality. Although one community comprises a 'forest' community and the other comprises a 'woodland' community, based on the data of Peake (2006) the height and canopy cover of each stratum are not very dissimilar. The greatest structural differences occur in the upper tree and mid tree strata, which are generally of a greater density in the Barrington Footslopes Dry Spotted Gum Forest, although there is overlap between the two communities. In this regard, the

Barrington Footslopes Dry Spotted Gum Forest was considered to be 'similar' in structure to the vegetation occurring in the Project Area, and therefore it also contains similar habitat quality. Based on the extensive survey of the Hillcrest Offset Area, it is a highly variable community.

Further to providing for extensive areas of floristically and structurally similar vegetation communities, the Hillcrest Offset Area contains a number of significant ecological features some of which are not present in the Project area. Table 5.19 of the EA (p 5.67), which has been included as **Table 2.2** below, provides a summary of the comparison between the ecological values of Project area relative to the two Biodiversity Offset Areas for the Project.

Table 2.2 – Ecological Values in the Biodiversity Offset Areas

Ecological Values of the Project Area	Ravensworth North Offset Area	Hillcrest Offset Area
Large remnant (1200 ha)	Contiguous with the proposed disturbance area (>250 ha).	Greater than 1000 ha.
Presence of Threatened Woodland EECs	120 ha Central Hunter Box - Ironbark Woodland.	383 ha[1] of floristically similar valley floor vegetation. 140 ha of Central Hunter Ironbark Spotted Gum Grey Box Forest EEC.
Presence of Threatened Floodplain EECs	19 ha River-flat Eucalypt Forest EEC	1.6 ha River-flat Eucalypt Forest EEC.
Presence of significant vegetation communities	34 ha Central Hunter Bulloak Forest Regeneration. 21 ha Central Hunter Swamp Oak Forest.	144 ha Dry Gully Rainforest. 120 ha Grey Gum - Rough Barked Apple Forest. 1.2 ha Black Cypress Pine Low Forest. 3.6 ha Grass Tree Low Woodland.
Green and golden bell frog habitat	Yes	Enhancement of existing habitat and creation of habitat.
Threatened woodland bird habitat	Yes – for all species affected.	Yes
Threatened micro-bat habitat	Yes	Yes

As outlined in **Table 2.2**, the Hillcrest Offset Area includes the presence of the Lower Hunter Valley Dry Rainforest Vulnerable Ecological Community (VEC), masked owl (*Tyto novaehollandiae*), large-eared pied bat (*Chalinolobus dwyeri*), squirrel glider (*Petaurus norfolcensis*), koala (*Phascolarctos cinereus*), and spotted tailed quoll (*Dasyurus maculatus*). Some of these species are poorly represented in the NSW reserve system, and it is understood that the Lower Hunter Valley Dry Rainforest VEC is either not represented or extremely poorly represented in the NSW reserve system. Despite the inclusion of communities and species which are not present in the Project area, these features are of conservation significance and the inclusion of these features within the Hillcrest Offset Area is considered to be of value.

As outlined Section 5.5.8.3 of the EA (p 5.68), Ravensworth Operations have committed to the enhancement of both the Hillcrest and Ravensworth North Offset Areas, through a range of regeneration and remediation activities in order to maintain and improve ecological value and threatened species habitat potential. The detailed requirements of the regeneration and remediation of the Biodiversity Offset Area will be further developed as part of the

development of a detailed management plan, in consultation with DECCW and to the satisfaction of DoP.

The location of the proposed biodiversity offset areas provides for the development of broad regional vegetation linkages across the Hunter Valley Floor. To facilitate the development of future regional biodiversity corridors, the Biodiversity Offset and Rehabilitation Strategy has been designed to facilitate linkages with existing conservation areas within the region, and biodiversity offset areas established for the surrounding mining operations within the Greater Ravensworth area. In addition, Ravensworth Operations will investigate potential opportunities for the provision of contributions to the development of regional biodiversity initiatives, in consultation with DECCW and DoP.

The proposed biodiversity offset areas will provide for the conservation of significant biodiversity values within the Hunter Region. Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP.

Ravensworth Operations have undertaken an extensive program of engagement with the DECCW and DoP throughout the preparation of the EA to discuss the proposed Biodiversity Offset and Rehabilitation Strategy. This consultation commenced in August 2009 and will be ongoing throughout the assessment and approval process with the view to obtain in principle support for the proposed Biodiversity Offset and Rehabilitation Strategy for the Project.

2.1.2 Security of Offsets

The EA does not specify which mechanism or mechanisms will be used to achieve 'long-term protection' of the offset areas. DECCW requires that the offset land is set aside for conservation and managed for conservation in perpetuity.

DECCW strongly recommends to Planning NSW that the mechanism(s) to ensure the tenure of the offset land are agreed to prior to any consent being granted and that finalisation of those mechanisms is achieved within no more than 12 months.

Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP. Ravensworth Operations have updated the commitment to the long term protection of these areas in accordance with appropriate mechanism(s) to clarify the intent of this commitment (refer to **Appendix 1**).

2.1.3 Revegetation

While DECCW encourages the revegetation of disturbed areas, DECCW policy does not support revegetation as a primary biodiversity offset mechanism.

While the proposed revegetation of vegetation communities within the Project area are discussed in terms of impact mitigation (Appendix 7 of the EA, Section 8.2.3) and conceptual plans for vegetation rehabilitation within the disturbance area are provided (Appendix 7 of the EA, Section 5.2.3), the use of revegetation of disturbed areas has not been proposed as a primary immediate biodiversity offset mechanism for the Project. The mechanisms for biodiversity offsetting are provided in the Biodiversity Offset and Rehabilitation Strategy (Appendix 7 of the EA, Section 5.9). Revegetation is proposed as a supplementary long term measure rather than as a primary up front biodiversity offset mechanism for the Project.

The proposed rehabilitation works within the Project area will ensure that the area of native vegetation established is consistent with the pre-mining extent of native vegetation. Native vegetation species consistent with the Central Hunter Box-Ironbark Woodland vegetation community will be established at a minimum ratio of 1:1 to replace the area of this vegetation community cleared as a result of the Project, with Central Hunter Bulloak Forest Regeneration replaced at the same ratio to ensure that there is no net loss of this community. Native grasses will also be used in grassland areas established as part of the rehabilitated landform.

Table 5.16 of the EA, reproduced as **Table 2.3** below, presents an analysis of the age structure of the vegetation within the area proposed for disturbance for the Project.

Table 2.3 (Table 5.16 of EA) - Age Classes of Woodland Vegetation Occurring in the Disturbance Area

Age Class	Area of Vegetation in Proposed Disturbance Area (Hectares)	Proportion of Proposed Disturbance Area (per cent)
Pre 1967	20	3.5
35-42 years	20	3.5
26-35 years	306	55
16-26 years	69	12
<16 years	144	26

As outlined in **Table 2.3**, the majority of the existing vegetation within the proposed disturbance area exists as a result of the extensive re-growth over the past 35 years. A relatively small proportion of the existing native vegetation is (approximately 3.5 per cent) that will be cleared in the Project area is at least 42 years old. Approximately 90 per cent of the existing native vegetation has regenerated since 1974, of which 38 per cent comprises regrowth that has regenerated since 1983.

Based on the progressive achievement of the preliminary closure criteria (refer to Section 5.1.3 of the EA) over the life of the Project, at the completion of mining in Year 29 it is anticipated that this vegetation will be approximately 24 years old. With rehabilitation undertaken in accordance with the strategies provided in Section 5.8 of Appendix 7 of the EA and with the aims and objectives of the Interim Rehabilitation Criteria (refer to Table 5.3 of Appendix 7 of the EA), it is anticipated that this rehabilitation is likely to provide significant ecological values in a local and regional context.

As outlined Section 5.5.8.3 of the EA (p 5.68), Ravensworth Operations have committed to the enhancement of both the Hillcrest and Ravensworth North Offset Areas, through a range of regeneration and remediation activities in order to maintain and improve ecological value and threatened species habitat potential. Table 5.20 of the EA, reproduced as **Table 2.4** provides an overview of areas potentially available for the regeneration and revegetation activities within the Biodiversity Offset Areas.

Table 2.4 (Table 5.20 of EA) – Available Areas for Regeneration and Revegetation Activities in Biodiversity Offset Areas

Vegetation Community	Approximate Area Available for Regeneration/Revegetation		Total (ha)
	Ravensworth North Offset Area (ha)	Hillcrest Offset Area (ha)	
Central Hunter Box-Ironbark Woodland (PD) EEC	70	-	70
Barrington Footslopes Dry Spotted Gum Forest		250	250
Central Hunter Ironbark – Spotted Gum – Grey Box Forest (PD) EEC		340	340
Dry Gully Rainforest		70	70
River-flat Eucalypt Forest EEC		20	20
Total	**70**	**750**	**820**

Ravensworth Operations will undertake a staged approach to the regeneration and revegetation activities based on a planning horizon of approximately 5 to 10 years. Using a 5-10 year planning horizon for the regeneration of vegetation communities, regenerated woodland and forest communities are expected to be approximately 20-25 years old over the life of the Project. Based on the age class of the areas of regrowth vegetation characteristic of the Project area, regenerated communities of a 20-25 year age class are considered likely to provide significant ecological values in a regional context.

A key principle underpinning the BioBanking scheme is the additional value placed on the enhancement of areas committed to conservation. The significant commitment to the extensive enhancement and management actions within the proposed RNOA and Hillcrest Offset areas is consistent with this principle and will seek to improve the ecological values of these areas.

Xstrata has a proven track record for excellence in ecological rehabilitation and restoration in the Hunter Valley. At Mount Owen Mine, ecological rehabilitation and restoration in the Ravensworth State Forest Vegetation Complex (RSFVC) has been undertaken in cooperation with the University of Newcastle's Centre for Sustainable Ecosystem Restoration for over a decade. The forest is today an important habitat for flora, microbes and fauna. The RSFVC includes 415 hectares of biodiversity offsets, which have provided considerable information on different techniques for planting and seeding to the broader research initiative. The RSFVC was recently listed as a 'Highly Commended' site on the Global Restoration Network (GRN) of the Society of Ecosystem Restoration, International.

The detailed requirements of the regeneration and remediation of the Biodiversity Offset Area will be further developed as part of the development of a detailed management plan, in consultation with DECCW and to the satisfaction of DoP.

2.1.4 Conservation of Aboriginal Cultural Heritage

It is important that any area proposed as an offset in response to the proposed mines' impact on Aboriginal cultural heritage values, conserves values which are representative of those to be impacted. The current proposal does not appear to deliver such an outcome.

As outlined in Section 5.8.7 of the EA (p 5.115) an Aboriginal heritage and archaeological management strategy has been proposed for the Project in order to mitigate the impacts of

the Project. The need for a robust and comprehensive mitigation package of the Project, was recognised early in the Project design process, and was a key determinant in the proposed Project layout and design.

Early conceptual mine plans for the Project included mining and out of pit overburden emplacement areas extending to the northern extent of the Project area, requiring removal of Davis Creek. In response to the identification of a number of ecological and archaeological constraints along Davis Creek, including the presence of significant archaeological and Aboriginal heritage locations, a decision was made early in the Project design process to limit mining operations to the south of Davis Creek, despite the presence of viable coal resources within this area. The decision to limit the mining operations to the south of Davis Creek effectively reduced the overall area of disturbance associated with mining area and out of pit overburden emplacement areas by approximately 490 hectares.

The aim of the management strategy is to provide for the long term management and/or long term conservation of all known Aboriginal archaeological sites that will remain within the Project area; and to further offset for the loss of Aboriginal cultural heritage and archaeological sites and values arising from the Project. The key features of the Aboriginal heritage and archaeological mitigation package for the Project include:

- long term conservation of 41 Aboriginal heritage and archaeological sites within the 262 hectare RNOA and will have no direct or indirect impact from mining activities. This area includes the REA86 site comprising of grinding grooves, scarred tree and an extensive artefact scatter. This site has been assessed as having high Aboriginal heritage and archaeological significance. The 41 sites within the RNOA will be managed under the ACHMP to be prepared in consultation with the Aboriginal stakeholders, an archaeologist and the DECCW;

- 156 sites are proposed for management under the ACHMP for their protection within the Project area boundary for the 29 year life of the mine;

- a further 12 sites located within the proposed 330 kV line easement are proposed to be protected for the 29 year life of the mine under the ACHMP, if detailed planning of the 330 kV transmission line enables the sites to be avoided. If not, these sites are proposed for surface collection;

- 150 sites are proposed for surface collection in accordance with a salvage process developed in consultation with registered Aboriginal stakeholders and DECCW. This salvage process will be undertaken on a staged basis to reflect specific stages of the Project;

- 11 sites are proposed for subsurface testing, broad area manual excavation (if warranted) and/or mechanical scrapes (if warranted);

- two landforms are proposed for subsurface testing, manual excavation (if warranted) and/or mechanical scrapes (if warranted);

- all salvage will be undertaken in accordance with the research and salvage design methodology outlined in Appendix 11B of the EA and further detailed in the ACHMP to be prepared in consultation with the Aboriginal stakeholders, an archaeologist and the DECCW; and

- two scarred trees are proposed for relocation following the preparation of a scarred tree removal and conservation methodology prepared by a suitably qualified arboriculturalist and a conservator in consultation with the Aboriginal stakeholders and DECCW and in accordance with the ACHMP. The scarred trees will be placed within a Keeping/Teaching

Place chosen by the majority of the Aboriginal stakeholders and approved by the DECCW (or placed within the RNOA if this is the desire of the majority of the Aboriginal stakeholders).

An integral component of the Aboriginal heritage and archaeological mitigation strategy is the long term protection and conservation of identified archaeological sites within the RNOA, including REA 86, a site assessed as having high Aboriginal heritage and archaeological value within the Project area. The location of the RNOA adjacent to the proposed disturbance areas provides value in relation to offsetting for the loss Project's impact on Aboriginal cultural heritage values, conserves values which are representative of those to be impacted. Ravensworth Operations has committed to the long term management of the 41 identified sites within the RNOA as part of the Project (refer to Commitment 6.10.2 of the EA (6.12)) and in accordance with the ACHMP to be prepared in consultation with the Aboriginal stakeholders, an archaeologist and the DECCW. Inherent in this commitment is the development of appropriate mechanisms to ensure the long term conservation of this area in consultation with Aboriginal Stakeholders and DECCW to the satisfaction of DoP.

The Project is located within an established and active mining region and as such the identification of suitable long term conservation areas within this landscape is increasingly difficult for large scale coal mining Projects. Ravensworth Operations have recognised this and have committed to the management of over 150 sites for their protection within the Project area boundary for the 29 year life of the mine. These sites are located within areas that contain potential coal resources or in areas with potential for future use for activities ancillary to coal mining. Whilst this Project does not seek to impact these sites, their future cannot be guaranteed beyond the life of the mine.

As outlined in Section 11.5.1 of the Aboriginal Archaeological Assessment (p.11.13) it is acknowledged that the RNOA 'does offset the loss of sites of low significance within the stream and slope landform' however, it is also stated that it 'does not have the capacity to offset the loss of sites of higher archaeological significance and research potential'. It also acknowledges that it does not offset the loss of 'sites in other landforms that will be lost due to impacts proposed under the current mine plan'. In recognition of this Ravensworth Operations made a number of additional commitments relating the management Aboriginal heritage and archaeological resources, (refer to Commitment 6.10.3 of the EA (p 6.12)), including:

- to more actively manage the site within the existing Farrells Creek 1 Aboriginal Artefact Management Area and the area of the Ravensworth Underground Mine Dam Conservation Area by undertaking culturally sensitive works to improve management of ongoing erosion of the site/area;

- manage the sites that fall within their Project area but outside of the impact areas and designated conservation areas for the 29 year life of the mine by undertaking culturally sensitive works to improve management of ongoing erosion of the sites where monitoring of the sites indicates this is necessary; and

- to undertake the above in accordance with an ACHMP to be prepared in consultation with registered Aboriginal stakeholders, an archaeologist and the DECCW. In addition, Ravensworth Operations also made the following commitments for further consideration of Aboriginal stakeholders (refer to Commitment 6.10.3 of the EA (p 6.12));

- funding for the purchase of display cabinets and for the establishment of a display of artefacts salvaged from the Project area that incorporates a visual display of the salvage of the artefacts and of the interpretation of the evidence derived by their analysis from an Aboriginal and archaeological perspective:

  - suitable venues for this would be the Broke Teaching/Keeping Place currently in the planning stage by XCN in association with Beltana Highwall Mining and other interested parties; or
  - the Keeping Place currently in planning by the Wanaruah Local Aboriginal Land Council;

- funding to support the establishment of IT systems for the Keeping/Teaching place; and
- funding to support training for Aboriginal community members to provide skills to allow them to work within the Keeping/Teaching Place (e.g. archival training, book keeping training, computer skills, hospitality training); and
- training in stone artefact attribute recording and basic analysis; or
- another suitable option put forward by the Aboriginal stakeholders during the comment period for the draft report.

Funding will also be provided to undertake non-invasive 3D scanning of the Bowmans Creek 16 Engraving Site. Even though there is no proposal to impact this site from mining, the engraving will continue to be worn away by natural weathering processes. Thus obtaining a 3D scan of the engraving while it is still in reasonable condition would allow for a replica to be made that could be placed within one of the Keeping/Teaching Places mentioned above, or another venue thought appropriate by the registered Aboriginal stakeholders.

As part of this process, Ravensworth Operations has committed to further consultation with the relevant Aboriginal stakeholders during the EA assessment process, to seek more meaningful feedback on the appropriateness of the above management outcomes. In accordance with this commitment, Ravensworth Operations has continued to seek comment from the registered Aboriginal stakeholder groups in relation to the Project through an extensive range of mechanisms including an ongoing offer for individual meetings and phone liaison with Aboriginal stakeholders. A full and complete record of all consultation with registered Aboriginal Stakeholders since the lodgement of the EA is provided in **Appendix 2**.

Despite further extensive efforts to engage with the registered Aboriginal Stakeholder groups in relation to the Project since the lodgement of the EA (refer to **Appendix 2**), there has been a paucity of further response from Aboriginal stakeholder in relation to the Project. As provided in **Appendix 2**, written comment on the Aboriginal Archaeological Assessment has been received from one registered Aboriginal stakeholder groups, bringing the total number of written submissions received to 4 of the 29 stakeholder groups who registered an interest in the Project. In addition to this, Wanaruah Local Aboriginal Land Council (WLALC) indicated that the written comment on the Project, to be developed in consultation with a number of the other registered Aboriginal stakeholder groups, would be provided in the week beginning 19 April 2010 (refer to **Appendix 2**), which to date has not been received.

Based on the responses to date from registered Aboriginal stakeholder groups there was only one clear request from Cacatua Cultural Consultants for a substantial increase in land based conservation associated with the RNOA, with general support for the options provided by Ravensworth Operations for alternative conservation measures. Specifically, the submission from Cacatua Cultural Consultants, requested that the RNOA be enlarged to include the sites that are currently in the area proposed for the office complex and extending down to include REA88. As outlined further below, Ravensworth Operations have reviewed the extent of the RNOA and have committed to extension of this area to provide for the long term protection and conservation of additional significant archaeological sites, REA 88 and REA 40, not impacted by the Project.

In addition, Xstrata Coal NSW (XCN) have undertaken further specific consultation with a number of Aboriginal stakeholder groups to address a number of issues raised during the consultation process for the Project in relation to broader social and community issues raised by the Aboriginal community. This consultation is currently ongoing as part of XCN's Social Involvement Program.

A number of additional suggestions for other appropriate cultural heritage initiatives such as training and teaching resources for Aboriginal cultural heritage assessment processes were provided through submissions from registered Aboriginal stakeholder groups. Ravensworth Operations will commit to the further refinement of these initiatives through the development of the ACHMP.

As outlined in commitment 6.10.1 of the EA (p 6.11), Ravensworth Operations proposes to undertake the Management Strategy in compliance with an ACHMP. The ACHMP will be prepared in consultation with the registered Aboriginal stakeholders, an archaeologist and the DECCW. The ACHMP may be prepared on a staged basis to address specific stages of the Project. As part of the development of the ACHMP, Ravensworth will undertake ongoing consultation with registered Aboriginal stakeholder groups, with the view of confirming and developing management strategy through the ACHMP process.

Based on DECCW feedback and further to the Aboriginal heritage and archaeological management strategy proposed in the EA, Ravensworth Operations is willing to consider further investigations of the Aboriginal heritage and archaeological values of the Hillcrest Offset Area, which has been proposed as part of the comprehensive Biodiversity Offset and Rehabilitation Strategy for the Project. This investigation would aim to identify any areas of Aboriginal heritage and/or archaeological significance that would contribute to the offset of the Project's impact on Aboriginal heritage and archaeological values within the Project area.

Ravensworth Operations has committed to conserving the Hillcrest Offset for biodiversity consideration. Preliminary landform analysis and geomorphic investigations indicate that this property has some areas/landforms that have comparable cultural landscape values to the proposed disturbance area and also the steep landscape in the north of the area offers potential for other site types such as rockshelters. If considered of value by DECCW, Ravensworth Operations will commit to further detailed investigations of the Aboriginal heritage and archaeological values of the Hillcrest Offset Area in consultation with registered Aboriginal stakeholder groups and all relevant assessment guidelines, as part of the development of ACHMP for the Project (refer to **Appendix 1**). As this stage, this would enable conservation management of this area to maximise opportunities for integrated biodiversity and cultural heritage outcomes.

The proponent should demonstrate their commitment to provide quality cultural heritage offset areas by altering the boundaries of the proposed conservation areas to include sites of higher value than those presently proposed.

The proponent could consider extending the western boundary to protect the scarred tree (REA40) and moving access paths currently proposed through the middle of the RNOA (on a NW-SE axis) to the northern edge of the overburden emplacement area, to protect more sites and ensure connectivity with the RNOA sections.

As outlined above, an integral component of the Aboriginal heritage and archaeological mitigation strategy is the long term protection and conservation of identified archaeological sites within the RNOA, including REA 86, a site assessed as being of high Aboriginal heritage and archaeological value within the Project area.

Ravensworth Operations have undertaken a review the boundaries of the RNOA to maximise this area and include sites assessed as being of high significance. This review has been

undertaken in the context of the further detailed design of the proposed infrastructure for the Project, which has enabled the extension of the RNOA in a number of areas. The revised boundary of the RNOA is provided on **Figure 2.4**, and consists of a total area of 273 hectares, an increase of 11 hectares.

The revised RNOA includes REA 40, which is a scarred tree located on the western boundary of the Project area, which has been assessed as being of high cultural significance and moderate archaeological value. In addition, the RNOA boundary has been extended to include the areas of REA 88 that will not be directly impacted by the Project. REA 88 is adjacent to REA 86. The haul road to the proposed Mine Infrastructure Area (MIA) was relocated during the EA preparation to ensure protection of REA 86, which incorporates the grinding grooves along Davis Creek. Whilst the proposed haul road bisects portion of REA 88, there is an opportunity for the long term conservation of the remainder of this site, and for this reason has been incorporated into the RNOA (refer to **Figure 2.4**) REA 88 has been identified within the Bayswater Creek floodplain landform, which has been assessed as being of high significance

2.1.5 Protection of Conservation Areas

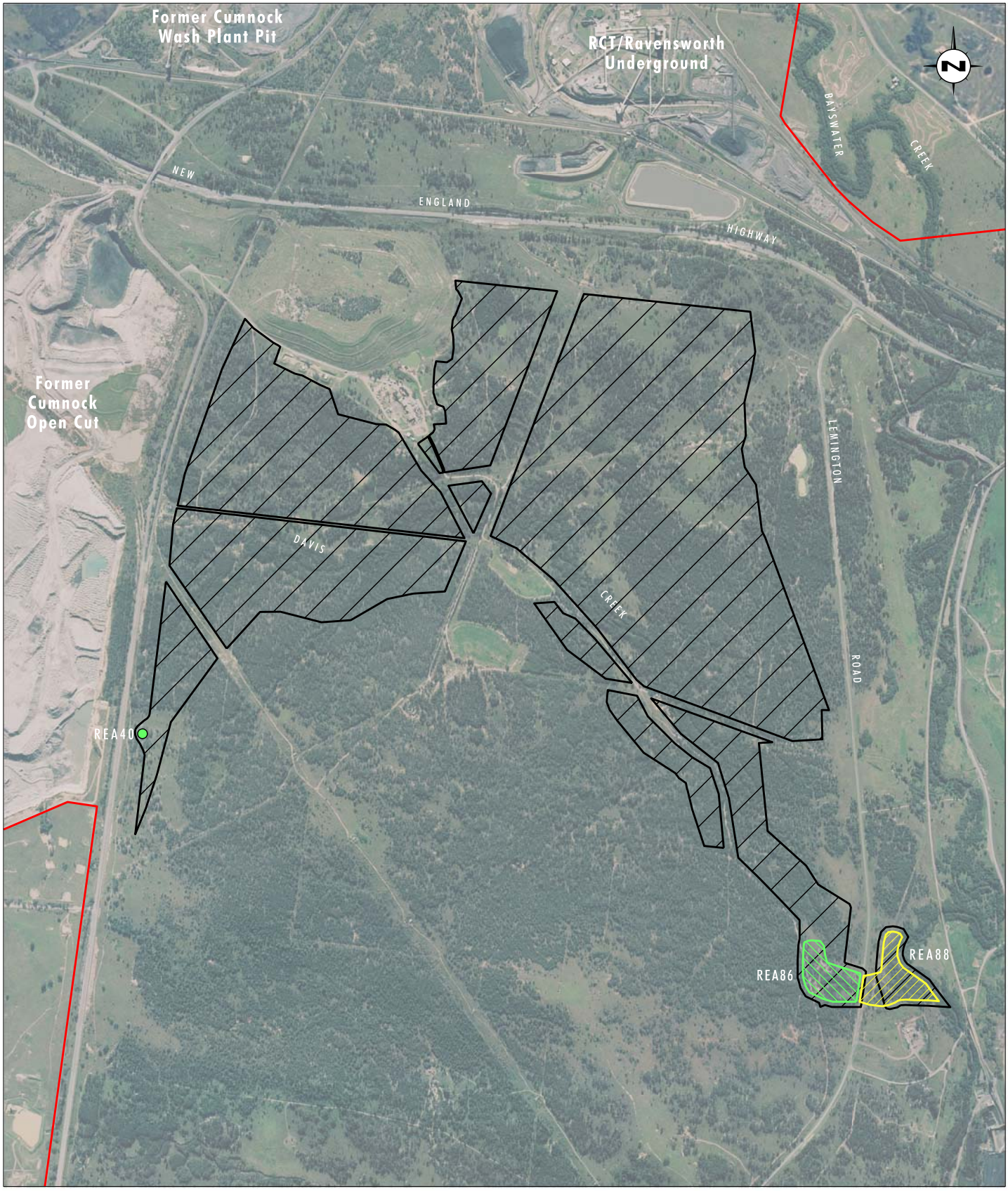
DECCW notes that the EA alludes to the possibility of future mining within the proposed conservation areas. DECCW recommends that the proponent confirms whether these areas are likely to be mined in the future so the community can make informed decisions regarding the adequacy of cultural heritage outcomes for this Project. The importance of this information is reinforced by historical decisions, which have seen a number of previously agreed conservation areas subsequently mined, at a number of mines in the Hunter Valley.

Details of the mechanisms to ensure either long term management or management in perpetuity should also be provided.

Ravensworth Operations has committed to the long term management of the 41 identified Aboriginal archaeology sites within the RNOA as part of the Project (refer to Commitment 6.10.2 of the EA (6.12)). Inherent in this commitment is the development of appropriate mechanisms to ensure the long term conservation of this area in consultation with Aboriginal Stakeholders and DECCW to the satisfaction of DoP. Ravensworth Operations have updated the commitment to the long term protection of these areas in accordance with appropriate mechanism(s) to clarify the intent of this commitment (refer to **Appendix 1**).

6.10.3 Ravensworth Operations will consult with the DECCW and Department of Planning determine the appropriate mechanism to provide for the long term protection of the Ravensworth North Offset Area, as noted in Commitment 6.7.8.

6.7.8 Ravensworth Operations will consult with the DECCW and Department of Planning determine the appropriate mechanism to provide for the long term protection of the Ravensworth North Offset Area and Hillcrest Offset area, and agree on the mechanism to achieve long term security of these areas, to the satisfaction of the Director-General, within 12 months of Project Approval. Unless otherwise agreed with the Director-General, within three years of Project Approval such mechanism will be implemented to ensure long term security of these areas.



Source: Ravensworth Operations 2009

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Ravensworth North Offset Area
- Archaeological Site (Not Impacted)
- Archaeological Site (Access Road)

FIGURE 2.4

Revised Ravensworth North Offset Area Boundary

2.1.6 Aboriginal Stakeholder Consultation

The Aboriginal stakeholders must be involved with discussions of how long and short term offsets should occur for the offset areas, and DECCW suggest that the establishment of an Aboriginal committee to work with the proponent is the best way to ensure the views and concerns of the community area are adequately incorporated into the Project.

DECCW strongly recommends that the proponent continues to make concerted efforts to consult with the stakeholders and address the issues relevant to this Project in order to inform the Project process. In particular, the community has very strong views regarding the scale of impact on their cultural heritage, therefore, conservation outcomes devised for this Project need to demonstrate a commitment to providing quality cultural heritage outcomes.

Ravensworth Operations support the use of effective and appropriate methods for ongoing engagement and consultation Aboriginal stakeholders over the life of the Project. Accordingly, Ravensworth Operations have included a specific commitment in the revised Statement of Commitments in **Appendix 1**, to the review of the current Ravensworth Operations Aboriginal Monitoring Committee to determine the most appropriate model for the ongoing use of the an Aboriginal stakeholder committee over the life of the Project, as part of the development of the ACHMP for the Project.

Given the importance of the ACHMP, DECCW recommends that the ACHMP is prepared in full consultation with the registered Aboriginal stakeholders preferably prior to any approval being issued.

As outlined in Commitment 6.10.1 of the Statement of Commitments provided in the EA, the ACHMP will be prepared in consultation with relevant Aboriginal stakeholders and the DECCW. The EA and this Response to Submissions report provides detailed and adequate information for cultural heritage to be appropriately considered by the Minister and prior to making any decision in relation to the Project. Aboriginal Stakeholders, who registered an interest in the Project, have been involved in all stages of the assessment process and all comments received have been considered in the cultural heritage assessment and management planning. In relation to the Aboriginal Heritage and Archaeological in the EA, registered stakeholder groups were provided with a 31 day period for comment on the draft report and have been repeatedly consulted and encouraged to provide comment on the EA since lodgement four months ago.

The ACHMP will be prepared in consultation with relevant Aboriginal stakeholders and DECCW, prior to submission with DoP for approval. Preparation of the ACHMP will commence as early as possible to provide for ongoing consultation with registered stakeholder groups throughout this process.

Given the ACHMP needs to cover management planning for the life of the Project, it is considered appropriate that the ACHMP process reflect staging of the Project. For this reason, it is proposed that the ACHMP be prepared as follows:

- Construction ACHMP – to address all up front cultural heritage management prior to the commencement of construction, including the associated salvage process;

- ACHMP for mining operations – to be prepared prior to the commencement of mining operations to address the first 10 years of mining, including the associated salvage process. This revision of the ACHMP will address management planning for the offset areas; and

- revision of the ACHMP, prior to each stage of the salvage process or every 5 years, whichever is earlier.

2.1.7 Potential Risks to Aboriginal Sites

The Aboriginal community expressed strong concerns regarding the potential indirect impact to the site of highest cultural value (REA86). These concerns have not been adequately addressed and an Aboriginal Cultural Heritage Management Plan (ACHMP) should be prepared which clearly details management strategies which address these potential impacts.

As described in Section 5.8.7 of the EA, REA86 is proposed for long term conservation in the RNOA. However, this site could be subject to indirect impact from blast vibration and will require protection through the preparation and implementation of a blast vibration management strategy. This strategy will be prepared in consultation with relevant Aboriginal stakeholders, an archaeologist and DECCW and will be prepared in accordance with the proposed Aboriginal Cultural Heritage Management Plan (ACHMP).

2.1.8 Proposed Salvage and Collection of Aboriginal Sites

A basic outline of a salvage program has been provided, but this methodology needs to be revised to address the cultural sensitivities of the Project area.

Appendix K of the Aboriginal Archaeology Assessment (Appendix 11B of the EA) provides a very detailed research design and methodology for the proposed salvage of sites within the Project area. As outlined in Section 5.8.1 of the EA (p 5.108), a key objective of the continued consultation with registered Aboriginal stakeholder groups is to maintain continued dialogue regarding key issues such as: appropriateness of proposed management outcomes, including the archaeological research design and methodology

Despite further extensive efforts to engage with the registered Aboriginal Stakeholder groups in relation to the Project since the lodgement of the EA (refer to **Appendix 2**), there has been a paucity of response from Aboriginal stakeholder in relation to the Project. As outlined in commitment 6.10.1 of the EA (p 6.11), Ravensworth Operations proposes to undertake the Management Strategy in compliance with an ACHMP. The ACHMP will be prepared in consultation with the registered Aboriginal stakeholders, an archaeologist and the DECCW. As noted in **Section 2.1.6**, the ACHMP will be prepared and implemented on a staged basis to address specific stages of the Project. As part of the development of the ACHMP, Ravensworth will undertake ongoing consultation with registered Aboriginal stakeholder groups, with the view of refining the management strategy, including confirming the proposed salvage program, through the ACHMP process.

The proponent should consider a staged approach for the salvage, where only sites within the immediately impacted footprint (e.g. for the next 3 years) are salvaged, and all other sites remain *in situ* until such time as it is determined that impact is required. In this way, if development does not proceed as presently planned, the impact to sites is limited.

As outlined in Section 12.1 of Appendix 11A of the EA (the Aboriginal Archaeological Assessment), Ravensworth Operations agree that a staged approach to the proposed salvage of artefacts is appropriate, reflecting the staging of the key components of the Project. Salvage programs that focus on a construction and operational timeframe of approximately 10 years will be developed as part of the ACHMP process (refer to Appendix 11A of the EA) and in consultation with Aboriginal stakeholders and DECCW. This approach will enable Ravensworth Operations to focus on relevant salvage programs to

specific aspects as the Project progresses. All other sites within the disturbance area will be managed *in situ* in the interim prior to the proposed salvage of these sites.

2.1.9 Care and Control of Objects

The proponent shall plan and consider the care and control of objects. Further details should be prepared and referred to DECCW for consideration.

As described in Section 12.4 of Appendix 11A of the EA, Aboriginal stakeholder consultation to date has not identified the preferred outcome for the care of salvaged stone artefacts and scarred trees. Ravensworth Operations commits to an ongoing dialogue with the Aboriginal stakeholders during the preparation of the ACHMP to identify option/options that are accepted as appropriate by the majority of Aboriginal stakeholders and DECCW.

A methodology proposed for the salvage, recording and analysis of the stone artefacts and the removal and preservation of scarred trees is detailed in Appendix K of Appendix 11B of the EA. This will be further developed through ongoing consultation with Aboriginal stakeholders and the DECCW through the preparation of the ACHMP.

2.1.10 Train Movements

The proponent states that the Ravensworth Loop and Newdell Loop are considered as part of the mine infrastructure and have been included in the noise modelling as industrial noise sources. While no existing movements are reported for the current Ravensworth Operations (DECCW understands that all product coal is conveyed to Macquarie Generation), the proposed average 6 movements per day account for approximately 14 Mtpa. It is not clear if there are a number of other train movements that have not been reported in accounting for the maximum output of 20 Mtpa or if this difference accounts for coal conveyed directly to Macquarie Generation.

At full capacity it is proposed that the up to 20Mtpa product coal will be transported from the Ravensworth Coal Handling and Preparation Plant (RCHPP)/Ravensworth Coal Terminal (RCT) to the export market via the Main Northern Railway line. As outlined in Section 2.5.9.2 of the EA (p 2.22), the proposed upgrades to the RCHPP/RCT to transport up to 20Mtpa product coal will provide for proposed additional coal production from the Project and the existing users of this facility.

In order to service coal production associated with the additional production associated with the Project, an average of 6 trains per day servicing the RCHPP/RCT will be required. The remaining capacity of the RCHPP/RCT will be required for the ongoing operation of the approved Ravensworth Underground Mine (RUM), which accounts for up to three train movements per day. The train movements associated with the approved RUM operations has been included in the existing train movements in Table 5.26 of the EA (p 5.104)

The EA also indicates that Ashton Coal Mine averages 4 coal train movements per day on the Newdell Loop. No explanation is provided as to why this is the case.

Ashton Coal Operations Limited (ACOL) utilises the Newdell and Ravensworth Loop to allow trains that have loaded at their rail loading facility to change directions for travel to the Port of Newcastle, as there is currently no dedicated rail loop servicing ACOL operations. ACOL does not utilise the RCHPP/RCT for any processing of coal. ACOL utilise the Ravensworth Loop in accordance with an existing commercial agreement with the owners of the RCT.

2.1.11 Rail Noise

The impact assessment for increased rail movements indicates a 1.8 dB(A) increase in rail noise at Camberwell Village some 1 km from the Main Northern Railway Line. Whilst DECCW is aware that existing traffic on the Main Northern Railway Line will have a significant diluting effect on impacts associated with increased trains from the Ravensworth Operations Project, train noise impacts are not explained well in the EA.

An assessment of rail noise impacts was undertaken for the noise assessment undertaken for the Project (refer to Appendix 5 of the EA) and is summarised in Section 5.3.7 of the EA (p 5.41). As outlined in Section 5.3.1.7 of the EA (p 5.41), the Ravensworth Rail Loop that services the RCHPP/RCT forms part of the mining infrastructure of the Project. As a result, the noise impacts from trains on the Ravensworth Rail Loop were assessed as operational noise sources as part of the noise impact assessment.

In addition, the noise impact assessment included an assessment of the contribution of additional rail movements associated with the Project along the Main Northern Railway (refer to Section 5.3.7.2 o the EA (p 5.41)). The assessment was based on train noise associated with additional trains movements associated with the Project at the proposed connection to the Main Northern Railway. The proposed connection to the Main Northern Railway is located approximately 6 kilometres to the north of Camberwell Village.

As noted in Section 5.3.7.2 of the EA (p 5.41) the assessment determined that an increase of approximately 1.8 dB ($L_{Aeq\ period}$) would occur at the Newdell Junction due to the increased train movements. Given the distance of the Newdell Junction to the nearest potentially affected residences at Camberwell Village and topographic considerations, this increase in rail noise that would result from the Project would not be perceptible at Camberwell Village.

The assessment also determined that train movements are predicted to increase on the Main Northern Line to 265 Mtpa by 2018 which represents an increase of approximately 170 per cent over current movements. This would result in generation of an additional 6 dB at the Main Northern Rail Line. If approved, the Project would contribute approximately 1.2 dB to the overall noise increase.

The purpose of this assessment was to provide an indication of the contribution of trains as a result of the Project would have to the noise levels associated with the Main Northern Railway. The ARTC controls and operates the Hunter Valley Coal Rail Network in NSW. Noise emissions from the railway are regulated via ARTC's Environmental Protection Licence (EPL No 3142).

Based on published briefings, the following points can be made in relation to the ARTC's improvement strategy for the Main Northern Railway:

- ARTC has already engaged in the process of planning and statutory approvals for rail capacity upgrade Projects. Noise impacts resulting from rail capacity upgrades will be assessed by ARTC as part of the assessment and approval of these Projects.

- The upgrades referred to in the ARTC publications would be subject to a public environmental assessment process under the *Environmental Planning and Assessment Act* 1979 and ultimately regulation by the DEC via an EPL.

- The environmental assessment for each phase of physical upgrade in the rail network would provide the ARTC with the opportunity to develop noise mitigation works, as required.

2.1.12 Blasting

All blasts will need careful design not to exceed the listed criteria at all non-mine owned residences. DECCW supports the listed blast emission control measures and blast recording provision in the BEIA and, providing the blast design is effectively managed, blast related impacts will be limited.

Noted.

2.1.13 Greenhouse Gas Offsets

Included in the EA is a statement regarding the carbon sequestration benefits of the proposed Biodiversity Offsets commitment described in the EA. DECCW considers that any sequestration will be minor, particularly in terms of the total emissions from the Project. Any greenhouse gas offsets offered by the proponent must not detract from the proponents Biodiversity Offset obligations.

Carbon sequestration from the proposed biodiversity offsets developed for the Project was not considered in the Greenhouse Gas Assessment prepared for the Project. It was noted in the EA as providing an additional benefit of the comprehensive Biodiversity Offset areas associated with the Project, and was not proposed in any way to detract from the primary purpose of these areas.

2.2 Department of Industry and Investment

2.2.1 Mining Titles

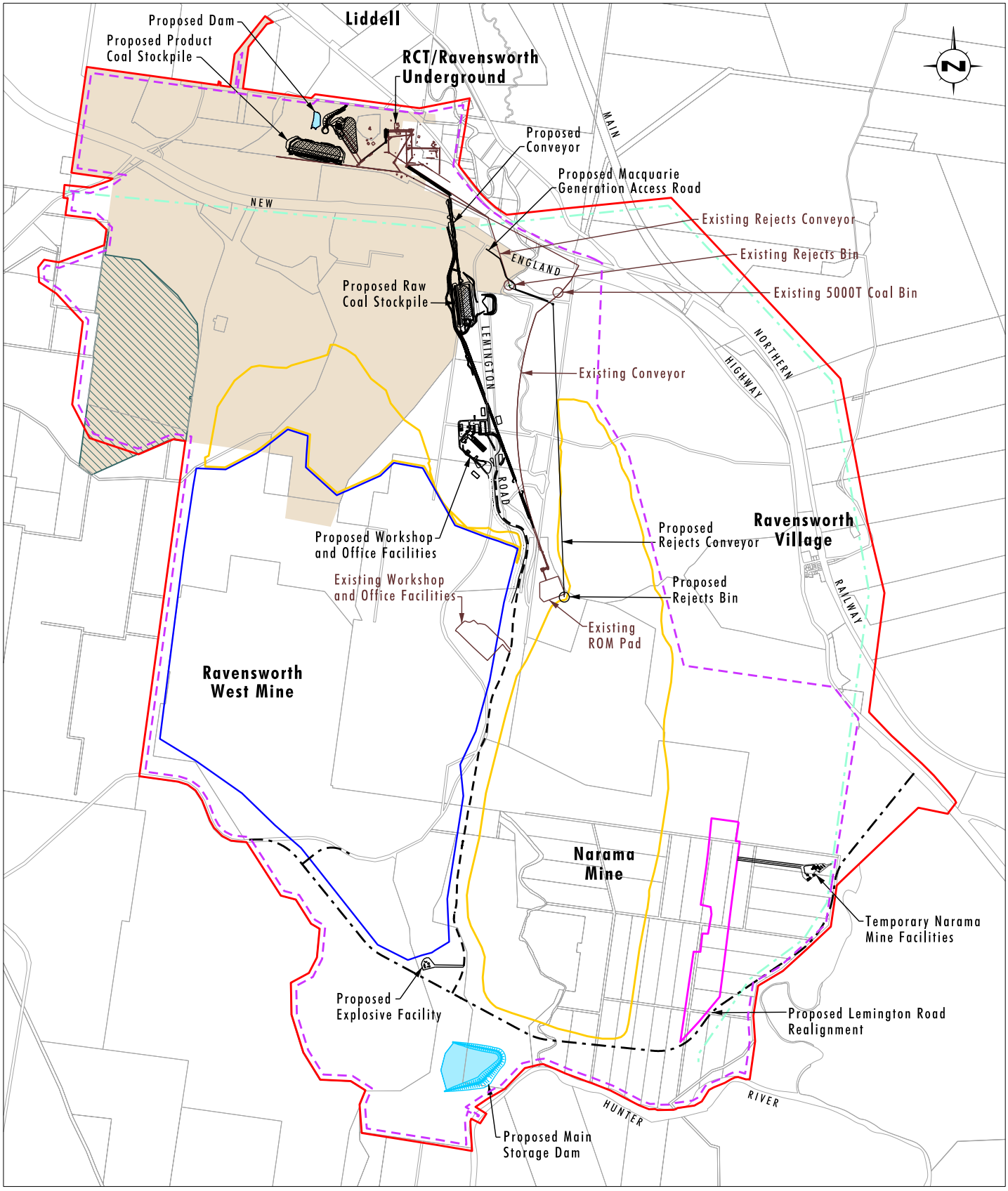
Figure 2.4 of the EA shows a small portion of CL378 and ML1526 are outside the Project area. The same figure shows that part of Project area covers CML 4 held by Novacoal. A mining lease could not be granted over this area without the consent of the current holder.

A simplified version of Figure 2.4 of the EA, which depicted all mining leases within the Project area has been provided as **Figure 2.5**. **Figure 2.5** identifies the location of CL378 and ML1526 in relation to the Project area. As shown on **Figure 2.5**, these mining authorities extend into the neighbouring Coal and Allied's Hunter Valley Operations. In addition, Ravensworth Operations understands that CML 4, held by Novacoal, applies to Coal and Allied's Hunter Valley Operations. As outlined in Section 1.1, Ravensworth Operations have undertaken extensive and ongoing consultation with Coal and Allied in relation to the potential interactions between the Project and neighbouring mining operations, including mining authorities within this area. Ravensworth Operations will undertake ongoing consultation with Coal and Allied in relation to the Project, including any future mining lease consolidation processes for the Project.

2.2.2 Rehabilitation Objectives and Closure Criteria

A considerable effort has been undertaken by Ravensworth Operations in assessing rehabilitation and mine closure issues. While the general foundation of rehabilitation planning has been comprehensively developed in the EA, I&I NSW requires the following issues to be addressed:

- **domain specific objectives – identify functional domains of the project and describe the rehabilitation objectives for each domain.**



Source: Ravensworth Operations 2009

0 1.0 2.0 3km
1:50 000

Legend

- Project Area
- Ravensworth North Pit
- Out of Pit Overburden Emplacement
- Narama Extended (subject to separate approval)
- Proposed 330kV Transmission Line
- Proposed Lemington Road Realignment
- Proposed Mine Access Road
- CL378
- ML1526
- Mine Lease Consolidation Area

FIGURE 2.5

Mining Lease CL378 and ML1526 in Project Area

File Name (A4): R15_V1/2383_698.dgn

- **completion criteria – propose strategic completion criteria for each domain having regard to the various phases of rehabilitation (i.e. Decommissioning, Landform Establishment, Growth Medium Development, Ecosystem Establishment, Ecosystem Development) and outline the proponent's commitment to progressive rehabilitation.**

[Note: Detailed completion criteria for each phase of rehabilitation will be developed through the Rehabilitation and Environmental Plan (REMP) process].

As noted within Section 5.1.3 of the EA, a mine closure and rehabilitation strategy has been developed for the Ravensworth Operations. The strategy has been developed in accordance with the Xstrata Coal New South Wales (XCN) requirements. In particular, XCN Standard 5.12 *Mine Closure Planning* which provides specific guidance for developing, implementing and reviewing mine closure plans taking into consideration economic, social and environmental factors so that each of XCN's operations meet statutory requirements and achieves a sustainable post-closure land use.

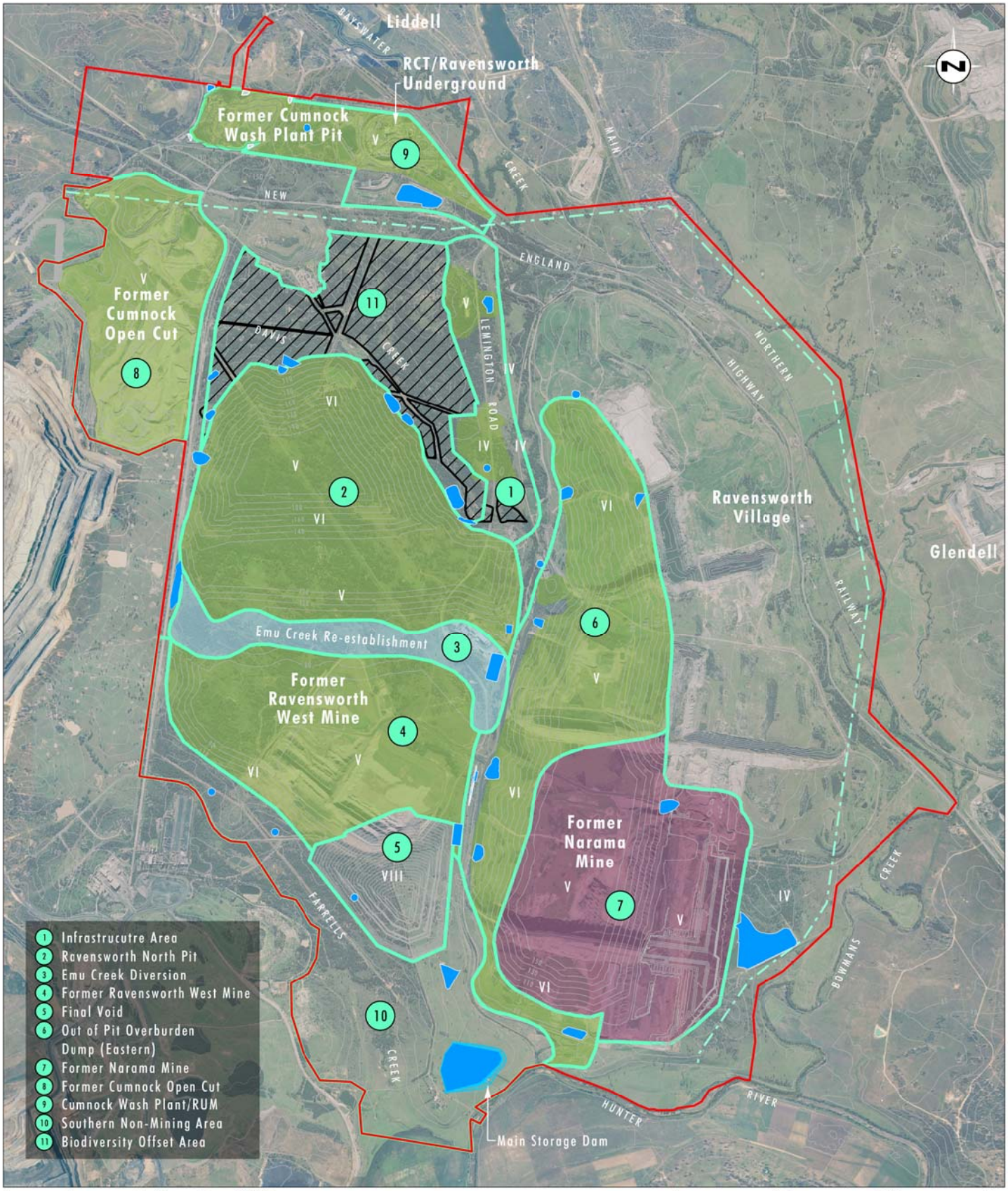
As detailed within Section 5.1.3.5 of the EA, preliminary closure and rehabilitation criteria have been developed for the Ravensworth Operations. The criteria have been developed to meet the mine closure and rehabilitation objectives outlined in the EA, and to meet the specific rehabilitation requirements of each domain. These criteria will be used as the basis for further refinement following the commencement of rehabilitation as well as the implementation of rehabilitation and biodiversity monitoring programs.

As part of the mine closure planning process, Ravensworth Operations have identified mine closure domains to assist with the scoping of closure activities required to ensure that the land is suitable for the intended final land use. The domains have been established based on various operational areas within the project area whilst also considering the current conceptual final landform. A list of the closure domains for Ravensworth Operations is included in **Table 2.5** and are also displayed on **Figure 2.6**.

Table 2.5 – Ravensworth Operations Mine Closure Domains

Domain Number	Domain Description
1	Infrastructure Area
2	Ravensworth North Pit
3	Emu Creek Diversion
4	Former Ravensworth West Mine
5	Final Void
6	Eastern Out of Pit Overburden Dump
7	Former Narama Mine
8	Former Cumnock Open Cut
9	Cumnock Wash Plant/RUM
10	Southern Non-Mining Area
11	Biodiversity Offset Areas

In addition, preliminary closure criteria have been developed for each mine closure domain within Ravensworth Operations. These domain specific preliminary criteria are outlined in **Table 2.6**.



Source: Ravensworth Operations 2009

0 1.0 2.0 3km
1:50 000

Legend

- Project Area
- Final Void
- Sediment Dam
- Ravensworth North Offset Area
- Proposed 330kV Transmission Line

Conceptual Final Landform Areas
- Grazing
- Woodland
- Riparian / Wetland

Land Capability
- IV Suitable for Grazing with Occasional Cultivation
- V Suitable for Grazing with Occasional Cultivation
- VI Suitable for Grazing with No Cultivation
- VIII Unsuitable for Agriculture or Pastoral Uses

FIGURE 2.6

Rehabilitation Domains

File Name (A4): R15_V1/2383_696.dgn

Table 2.6 – Preliminary Closure Criteria

Domain	Conceptual Final Landform	Feature	Preliminary Closure Criteria
Domains 1, 2, 4, 6, 8, 9	Woodland	Landform	• Rehabilitated slopes are generally less than 10 degrees with a maximum of 14 degrees (subject to DI&I approval); • No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use; • Contour banks are stable and there is no evidence of overtopping or significant scouring as a result of runoff; and • Surface layer to be free of any hazardous materials.
		Soil	• Topsoil or a suitable soil treatment / ameliorant has been spread uniformly over the rehabilitation surface; and • Soil pH to be in the range of analogue sites in 5-10 years. Monitoring demonstrates soil profile development in rehabilitated areas (e.g. development of organic layer, litter layer).
		Water	• Runoff water quality from rehabilitation areas is within the range of water quality data recorded from analogue sites and does not pose a threat to downstream water quality.
		Vegetation	• Re-vegetation areas contain an appropriate diversity of flora species that are characteristic of the desired native vegetation community; • Second generation tree seedlings are present or likely to be, based on monitoring in comparable older rehabilitation sites; • More than 75% of trees are healthy and growing as indicated by Long Term Monitoring; and • There is no significant weed infestation such that weeds do not compromise a significant proportion of species in any stratum.
		Fauna	• Rehabilitated areas provide a range of vegetation structural habitats (e.g. eucalypts, shrubs, ground cover, developing litter layer etc.).
		Bushfire Hazard	• Appropriate bushfire hazard controls have been implemented on the advice from the NSW Rural Fire Service.
		Heritage	• Potential items of European or Aboriginal Heritage are managed in accordance with the approved heritage management plans for Ravensworth Operations.

Table 2.6 – Preliminary Closure Criteria (cont)

Domain	Conceptual Final Landform	Feature	Preliminary Closure Criteria
Domain 3	Riparian/Wetland	Landform	• No significant erosion is present that would constitute a safety hazard or impact adversely on water quality within the creek; • Creek banks are stable and there is no evidence of significant scouring as a result of natural creek flow or runoff; and • In-stream features such as meanders, pools and pool and riffle sequences have been included (where appropriate) in the design of the creek.
		Soil	• Topsoil or a suitable soil treatment / ameliorant has been spread uniformly over the rehabilitation surface; and • Soil pH to be in the range of analogue sites in 5-10 years.
		Water	• Runoff water quality from rehabilitation areas is within the range of water quality data recorded from analogue sites and does not pose a threat to downstream water quality.
		Vegetation	• Re-vegetation areas contain an appropriate diversity of flora species that are characteristic of the desired native vegetation community; • Native vegetation to be planted along the drainage channels to maximise the long term stability of the drainage system; • Second generation tree seedlings are present or likely to be, based on monitoring in comparable older rehabilitation sites; • More than 75% of trees are healthy and growing as indicated by Long Term Monitoring; and • There is no significant weed infestation such that weeds do not compromise a significant proportion of species.
		Fauna	• In-stream features have been incorporated where appropriate in the design of the creek, in particular riparian habitat.
Domain 5	Final Void	Landform	• Highwall and other batters into the final void have been stabilised; • Where possible, slopes are less than 18º; • Coal seams and other carbonaceous materials have been sealed and covered; and • Final void has been made safe by the installation of safety fences and/or berms.

Table 2.6 – Preliminary Closure Criteria (cont)

Domain	Conceptual Final Landform	Feature	Preliminary Closure Criteria
Domain 7	Grazing	Landform	• Rehabilitated slopes are generally less than 10 degrees with a maximum of 14 degrees (subject to DI&I approval); • No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use; • Contour banks are stable and there is no evidence of overtopping or significant scouring as a result of runoff; • Surface layer to be free of any hazardous materials; and • Appropriate fencing and other infrastructure (e.g. stock yards) for managing stock and controlling stock movements are constructed.
		Soil	• Topsoil or a suitable soil treatment / ameliorant has been spread uniformly over the rehabilitation surface; • Soil pH to be in the range of analogue sites in 5 to 10 years; • Monitoring demonstrates soil profile development in rehabilitated areas (e.g. development of organic layer, litter layer); and • No visible evidence of accelerated soil erosion.
		Water	• Runoff water quality from rehabilitation areas is within the range of water quality data recorded from analogue sites and does not pose a threat to downstream water quality; and • Sufficient water storage facilities to support grazing activities are available. This may include a specified number of dams per paddock or hectare.
		Vegetation	• Pasture species consist of grasses and legumes appropriate to the district and recognised as suitable for a specific type of grazing (e.g. beef, sheep or other); and • Demonstrated carrying capacity of a specified head of stock per hectare accounting for a range of climatic conditions has been achieved, e.g. drought, average rainfall etc. Weed species to be controlled such that pasture cover is not significantly impaired.

Table 2.6 – Preliminary Closure Criteria (cont)

Domain	Conceptual Final Landform	Feature	Preliminary Closure Criteria
Domain 10	Retained Vegetation	Landform	• No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use.
		Vegetation	• Retained vegetation is managed to improve condition and existing flora and fauna habitat values; and • There are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum.
		Bushfire Hazard	• Appropriate bushfire hazard controls have been implemented on the advice from the NSW Rural Fire Service.
		Heritage	• Potential items of European or Aboriginal Heritage are managed in accordance with the approved heritage management plans for Ravensworth Operations.
Domain 11	Offset Areas	Landform	• No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use.
		Remnant Vegetation Areas	• Retained vegetation is managed to improve condition and existing flora and fauna habitat values; • There are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum; and • Re-vegetation areas contain an appropriate diversity of flora species that are characteristic of the desired native vegetation community.
		Bushfire	• Appropriate bushfire hazard controls have been implemented on the advice from the NSW Rural Fire Service.
		Heritage	• Potential items of European or Aboriginal Heritage are managed in accordance with the approved heritage management plans for Ravensworth Operations.

As noted within the DI&I submission, detailed mine closure completion criteria will be developed through the REMP process.

2.3 NSW Office of Water

2.3.1 Site Water Management Plan

NOW requires Xstrata Ravensworth Operations to revise its Site Water Management Plan, to provide specific response actions to depressurisation and displacement of groundwater contained in the Hunter River alluvium. The trigger levels and response actions to be specified in the Site Water Management Plan must be developed in consultation with and to the satisfaction of NOW.

Ravensworth Operations must nominate trigger thresholds to changes in groundwater level and quality in the alluvium in order to determine appropriate mitigation actions to the connected alluvium in consultation with NOW. In addition, Ravensworth Operations must nominate trigger thresholds to changes in groundwater level and quality in the alluvium will be determine mitigation actions, should reversal of groundwater gradient toward the mining operation occur, as well as groundwater quality changes indicating loss of connected alluvial groundwater associated with mining operations.

The Statement of Commitments for the Project provides for the following:

6.8.4 Within 12 months of Project Approval, Ravensworth Operations will submit for the approval of the Director-General a Groundwater Monitoring Program for the Project. The program will be prepared in consultation with DECCW (NSW Office of Water) and will include the development of relevant trigger levels and response procedures to manage identified monitoring and/or predicted trends.

6.8.5 Ravensworth Operations will undertake two-monthly assessments of any departures from identified monitoring or predicted data trends. Departures from identified monitoring trends are taken to be consecutive data over a period of 6 months (minimum of three consecutive readings) exhibiting an increasing divergence in a negative impact sense from the previous data or from established or predicted trends. Any identified issues will be the subject of further investigation, in accordance with the relevant response procedures developed under the Groundwater Monitoring Program for the Project.

The existing commitments in relation to the development of the Groundwater Monitoring Program are consistent with NOW's submission.

As part of the revised Site Water Management Plan, Xstrata Ravensworth Operations is required to develop remedial and recovery plans with regard to groundwater dependent ecosystems located in depressurised alluvial groundwater systems, including the Hunter River, Bowmans Creek and Davis Creek. This should be coordinated with other recovery plans for groundwater dependent ecosystems in the Hunter Valley, such as Rio Tinto Coal and Allied Hunter Valley Operations South and Carrington Sites.

The comprehensive groundwater impact assessment for the Project (refer to Appendix 9 of the EA), has found that depressurisation has already occurred beneath the Hunter river and associated alluvial lands has occurred as a result of historical and current mining operations in proximity to the river. Further depressurisation is expected to occur as a result of current and future mining; however the impacts from Ravensworth North pit and the Narama Extended Pit is predicted to be negligible.

Accordingly, Ravensworth Operations have committed to the development of trigger levels and management and mitigation measures to mange potential impacts on groundwater systems, including alluvial groundwater systems associated with Hunter River (refer to Commitment 6.8.5 of the EA). Should the potential for significant impacts on the alluvial groundwater systems within the vicinity of the Project area, and any associated identified groundwater dependent ecosystems, be identified through the Groundwater Monitoring Program, Ravensworth Operations will investigate all reasonable and feasible mitigation measures as part of the relevant response processes. This may include the development of recovery plans for identified groundwater dependent ecosystems located within the Project area that may be potentially impacted by groundwater depressurisation as a result of the Project.

Despite the prediction of negligible depressurisation of alluvial groundwater systems associated with the Project, in recognition of the importance of this issue, Ravensworth Operations will commit to the development of remedial and recovery plans for identified stands of *Eucalyptus camaldulensis* along the Hunter River in the southern extent of the Project area (refer to Figure 5.23 of the EA), on land controlled by Ravensworth Operations (refer to **Appendix 1**). The development of these plans will seek to be consistent with the other recovery plans for groundwater dependent ecosystems in the Hunter Valley, such as Rio Tinto Coal and Allied Hunter Valley Operations South and Carrington Sites.

2.3.2 Groundwater Monitoring

To properly account for the lateral displacement of alluvial groundwater under the HUAWS, the groundwater monitoring programme currently conducted by Ravensworth Operations must be reviewed and extended. NOW has discussed this situation with Xstrata Ravensworth Operations and has agreed the revised groundwater management plan will include extension to the groundwater monitoring programme, in order to quantify the lateral displacement volumes from the monitoring network to be installed by the end of May 2010. NOW will require Ravensworth Operations to provide evidence of alluvial and regulated river accounting under water access licences (for both regulated river and alluvial take by the mining operation) by 30 June 2010.

In accordance with recent consultation with NOW, Ravensworth Operations have committed to the implementation of an extensive groundwater monitoring program specifically targeting surrounding alluvial groundwater systems, including Bowmans Creek. Whilst all efforts are being made to install additional groundwater monitoring locations to enable appropriate accounting of any lateral displacement of alluvial groundwater into the Project area, there are a number of relevant issues that will influence the timing of installation.

Chief among these issues is land ownership details around the identified extent of Bowmans Creek alluvium to the south east of the Project area. As outlined on Figure 5.31 of the EA, the identified alluvial boundary associated with Bowmans Creek is located outside of the Project area boundary, and on land owned by ACOL. To date, ACOL have not provided permission for Ravensworth Operations to access this land for any survey and assessments associated with the Project, including access to these lands for the installation of groundwater monitoring. In addition, Ravensworth Operations understands that ACOL have extensive groundwater monitoring information for this area of Bowmans Creek alluvium. To date, ACOL have not provided Ravensworth Operations access to the extensive groundwater monitoring data collected in the Bowmans Creek alluvial area. Ravensworth Operations will continue to seek access to this monitoring data to enable further interrogation and verification of modelled impacts on this alluvial system associated with the Project.

Notwithstanding the above limitations, Ravensworth Operations have committed to the installation of two vibrating wire piezometers into coal seam strata within the south eastern

extent of the Project area as soon as possible. At this stage, it is anticipated that drill rigs will be available to undertake the work in late May 2010. Ravensworth Operations will undertake all reporting required in accordance with relevant licences for these boreholes, and will be provided to NOW in accordance with the relevant licence.

Whilst the installation of these monitoring locations will provide some benefit in relation to the monitoring and accounting of displacement of alluvial groundwater into the Project area from Bowmans Creek, this will be limited as direct measurement within the Bowmans Creek alluvium is not available at this stage.

NOW advises DoP that the collation of piezometric data between Ravensworth Operations, Rio Tinto Hunter Valley Operations and ACOL is the most effective means to clarify the extent and severity of groundwater depressurisation occurring from both sides of the Hunter River and Bowmans Creek alluvium. Therefore, NOW recommends that a consolidation of piezometric data from both Ravensworth Operations (Narama), Ravensworth Underground Mine, Rio Tinto Hunter Valley South Operations and ACOL should occur, leading to development of trigger response actions should further depressurisation impact upon remnant river red gum and other groundwater dependent ecosystems on the Bowmans Creek alluvium.

Ravensworth Operations agrees that the collation of piezometric data between itself and surrounding operations including Hunter Valley Operations and ACOL will effectively clarify groundwater conditions in the area to allow for effective ongoing groundwater management. Ravensworth Operations will seek to enter into a co-operative, transparent, data sharing agreement with surrounding operations, including Hunter Valley Operations and ACOL, for the sharing of relevant piezometric data (refer to **Appendix 1**).

2.4 Hunter-Central Rivers Catchment Management Authority

The submission from the Hunter-Central Rivers Catchment Management Authority (CMA) raises a number of issues in relation the key targets of the NSW State Plan (as updated, 2010), and HCRCMA Catchment Action Plan (CAP), endorsed by NSW government in 2007. In addition to providing a response to the specific issues raised by the HCRCMA in its submission, a review of the Project in relation to the relevant targets of the NSW State Plan and the HCRCMA CAP is provided in **Appendix 3**.

The project will have a significant detrimental impact on the achievement of catchment targets outlined in the Hunter-Central Rivers Catchment Action Plan (CAP). Specifically, the biodiversity resource condition target *'by 2016 improve or maintain the biodiversity of the Hunter-Central Rivers region'.*

Section 5.8.1.2 of Appendix 7 of the EA lists the specific actions included in the Project that are designed to actively improve habitat features and quality within the Biodiversity Offset Areas (refer to **Section 2.1.1**). This includes the revegetation and regeneration actions to increase the extent of target native vegetation communities in the Ravensworth North and Hillcrest Offset Areas; removal or control of existing impacts such as disturbance and grazing to allow natural regeneration to occur; erosion remediation works in the Hillcrest Offset Area to improve native vegetation cover and habitat enhancement such as provision of nest boxes, salvaged hollows, etc.

By Year 5 of the Project, approximately 460 hectares of woody vegetation is expected to be cleared, in addition to approximately 451 hectares of derived grassland. By Year 5 approximately 967 hectares of existing woody vegetation and 683 hectares of existing grassland will be secured and protected in the Ravensworth North and Hillcrest Offset Areas.

Approximately 107 hectares in the Hillcrest Offset Area (south) is proposed for active remediation of degraded areas subject to severe erosion, including the planting of local indigenous species, and it is expected to have been completed by Year 5.

The regeneration of vegetation communities in the Ravensworth North Offset Area is proposed for up to 65 hectares of derived grassland, with some areas of open grassland being retained. Much of the Hillcrest Offset Area is expected to naturally regenerate following the removal of grazing. Natural regeneration of native woody vegetation communities will be encouraged and assisted for approximately 300 hectares of the Hillcrest Offset Area (south) and approximately 228 hectares of Hillcrest Offset Area (north). The expected extent of natural regeneration in the Ravensworth North and Hillcrest Offset Areas by Year 5 cannot be accurately predicted at this stage, however based on the management plan and intervention proposed in the EA it is anticipated that a minimum of approximately 20 per cent, or 119 hectares, of the proposed regeneration areas will have regenerated by Year 5.

At Year 5, approximately 415 hectares of shaped final landform is also expected to be available for rehabilitation in the Project Area. Ravensworth Operations' commitment to the establishment, protection and enhancement of the Ravensworth North Offset Area and the Hillcrest Offset Area, and the development and implementation of biodiversity enhancement strategy for the proposed offset areas is consistent with the 2016 CAP target. In addition to this, a number of specific management targets of the CAP will also be met by the establishment of the Ravensworth North and Hillcrest Offset Areas, including:

- protect native vegetation;
- regenerate native vegetation;
- revegetate highly erodible soils;
- treat weeds; and
- treat animal pests.

Of the CAP guiding principles regarding mining and extractive operations and surface water, the following are those not well addressed by the report:

1. **Every precaution should be taken to ensure that surface water flows are not lost or diverted due to subsidence or geological cracking caused by extraction. Where surface water is lost or diverted, offsets or mitigating actions should be provided.**

2. **Mining should not occur where the alteration of hydrological regimes adversely impacts significant threatened species habitat and where the impact cannot be managed or offset.**

The mining Project does not address the loss of stream biodiversity during the construction, diversion and eventual re-engineering of [Emu Creek]. There is a lack of detail about the rehabilitation for the reinstated creek. It is suggested that minimum width riparian zones for native vegetation planting be committed to. In the case of a 4th order stream like Emu Creek this would be 20 metres both sides of the top of the bank.

There is no potential for impact by the Project on surface water flows due to subsidence as these impacts are associated with multi seam underground mining operations, as opposed to open cut mining.. Notwithstanding this, Ravensworth Operations have sought to minimise impacts on surface water flows within the Project area, including the substantial reduction of

approximately 490 hectares of the proposed disturbance area, which included the avoidance of the removal of Davis Creek.

In addition, Project planning has also sought to minimise impacts as far as practicable on the existing catchments within and surrounding the Project area. As outlined in Section 5.6.1.8 of the EA (p 5.90), the Surface Water Assessment (refer to Appendix 8 of the EA), included a detailed analysis of existing flooding and flow characteristics in the catchments within and surrounding the Project area. In order to determine the potential for these activities to cause flooding both within and downstream of the Project area, an XP-Storm hydrodynamic model was constructed to examine flooding of potentially affected water courses under the 100 year ARI and 5 year ARI critical duration storm events under the following scenarios:

- pre-mining or existing conditions;
- the Year 5 conceptual operational scenario; and
- the proposed final landform based on the conceptual mine plans.

This modelling indicates that the Project will not adversely impact on flood flows, velocities and levels in the Bowmans Creek, Davis Creek or Bayswater Creek catchments. Therefore, environmental flows in these creeks will not be adversely affected by the Project.

The proposed open cut pit will mine through the entire catchment of Emu Creek within the Project area during approximately Year 5 of the Project. As a result of this, approximately 200 hectares of the upper catchment of Emu Creek will need to be diverted around the proposed Ravensworth North Pit into Davis Creek to the north.

As outlined in Section 5.6.1.6 (p 5.80) and Appendix 8 of the EA, the proposed Emu Creek diversion will be implemented before mining reaches the natural creek line and will capture upstream runoff at the western boundary of the Project area in a series of water management dams prior to release into Davis Creek. The system has been designed to manage water from the upstream Emu Creek catchment, to replicate natural flow patterns in Davis Creek to minimise potential impacts on this creek system, including potential impacts on significant archaeological features. The system has been designed to accommodate a 20 year Annual Recurrence Interval (ARI) 24 hour storm event. If the design capacity of this water management structure is exceeded, the system is designed to capture excess water within the proposed Ravensworth North Pit and incorporated into the proposed Ravensworth water management system.

Once the proposed mining operation and overburden emplacement has advanced past the original alignment of Emu Creek, the creek line will be reinstated. Appropriate erosion and sedimentation controls will be installed and runoff from the catchment upstream of the open cut pit and rehabilitated overburden emplacement areas will be returned to Emu Creek. Emu Creek will be reinstated by approximately Year 19 of the conceptual mine progression.

As outlined in Commitment 6.4.4 of the EA (p 6.5) Ravensworth Operations will re-establish Emu Creek within the rehabilitated landscape. The reinstated Emu Creek will be designed in accordance with relevant guidelines and in consultation with the NSW Office of Water. The reinstated Emu Creek will be re-established within a suitable substrate within the rehabilitated landform and will resemble a natural creek system with native vegetation planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system and to enhance the in-stream and riparian habitat created. The detailed design of the proposed reinstatement of Emu Creek will be undertaken in accordance with all relevant approvals from NOW. In its submission, NOW did not raise any specific issues in relation to the proposed diversion and reinstatement of Emu Creek as part of the Project.

Riparian vegetation communities that will be removed within the Project Area include 38 hectares of Central Hunter Swamp Oak Forest, 4 hectares of Hunter Valley River Oak Forest, 5 hectares of River-flat Eucalypt Forest and less than 1 hectare of Hunter Floodplain Red Gum Woodland.

Riparian vegetation communities present in the Ravensworth North and Hillcrest Offset Areas include 21 hectares of Central Hunter Swamp Oak Forest and 20.6 hectares of River-flat Eucalypt Forest. The active remediation to be undertaken in the Hillcrest Offset Area (south) will be undertaken in areas subject to severe erosion and degradation in creeks and gullies. Creeks and gullies will be planted with species characteristic of the species composition and diversity known to occur in the River-flat Eucalypt Forest EEC in the central Hunter Valley.

Potential habitat of the threatened green and golden bell frog (*Litoria aurea*) will also be removed from the Project Area. Significant re-design and minimisation of the disturbance footprint was undertaken during project planning, resulting in a considerable decrease in the impact on the green and golden bell frog, and this allows for the inclusion and buffering of significant breeding, dispersal and foraging habitat in the Ravensworth North Offset Area. Supplementary habitat creation, funding for population studies, weed management in riparian and aquatic areas and implementation of an annual monitoring program are proposed in order to minimise the impacts of the Project on the green and golden bell frog.

As outlined above, the CMA does not consider the proposed offset strategy adequate for offsetting loss of native vegetation, endangered ecological communities and threatened species.

As outlined in **Section 2.1.1**, the Biodiversity Offset and Rehabilitation Strategy was designed to achieve the maximum possible 'like for like' on-site offsetting achievable. To this end, the disturbance footprint was contracted to maximise biodiversity offsetting opportunities for the green and golden bell frog and for River-flat Eucalypt Forest EEC. Recognising that, despite contractions in the Project Area boundary, resulting in an overall reduction of the proposed disturbance area by approximately 490 hectares, and the proposed establishment of the Ravensworth North Biodiversity Offset Area, there was still a substantial residual ecological impact, the Hillcrest Biodiversity Offset Area is proposed to provide significant biodiversity offsetting and protection opportunities.

Further to providing for extensive areas floristically and structurally similar vegetation communities, the Hillcrest Offset Area contains a number of significant ecological features. Table 5.16 in Section 5.9.5.5 of Appendix 7 (also shown in **Table 2.2** in Section 2.1.1.1 of this report) of the EA documents the key ecological features of the proposed offset areas in comparison to the ecological features that would be impacted by the proposed mining operation. This includes substantial areas of vegetation communities that are of significance for their under-representation in the NSW reserve system, for their vulnerable status (in the case of the Lower Hunter Valley Dry Rainforest VEC) and for the threatened species habitat they support.

Table 2.7 below lists the threatened species that will be affected by the proposal, together with the threatened species that will be protected and managed in the proposed biodiversity offset areas.

Table 2.7 – Threatened Species Potentially impacted by the Project and a Comparison of Potential Habitat in the Ravensworth North Offset Area and Hillcrest Offset Area

Threatened Species Significantly Affected by Project	Ravensworth North Offset Area	Hillcrest Offset Area	Does the Biodiversity Offset Strategy Provide Adequate Offset?
Green and golden bell frog (*Litoria aurea*)	recorded	compensatory habitat to be constructed	yes
grey-crowned babbler (*Pomatostomus temporalis temporalis*)	recorded	recorded	yes
hooded robin (*Melanodryas cucullata cucullata*)	recorded	potential habitat	yes
scarlet robin (*Petroica boodang*)	recorded	potential habitat	yes
speckled warbler (*Chthonicola sagittata*)	recorded	recorded	yes
brown treecreeper (*Climacteris picumnus victoriae*)	recorded	recorded	yes
eastern bentwing-bat (*Miniopterus schreibersii oceanensis*)	recorded	recorded	yes
eastern freetail-bat (*Mormopterus norfolkensis*)	likely habitat	recorded	yes
little bentwing-bat (*Miniopterus australis*)	likely habitat	likely habitat	yes
eastern false pipistrelle (*Falsistrellus tasmaniensis*)	likely habitat	likely habitat	yes
large-footed myotis (*Myotis adversus*);	likely habitat	recorded	yes
Central Hunter Box–Ironbark Woodland EEC (PD)*	recorded	Central Hunter Ironbark–Spotted Gum– Grey Box Forest EEC (PD)*	yes

*Note: both of these communities have been recently listed as EECs by the NSW Scientific Committee.

Ravensworth Operations is currently undertaking ongoing consultation with DoP and DECCW regarding the biodiversity offsets strategy and is committed to appropriately offsetting the residual biodiversity impacts of the Project.

The project will not support Priority E4 targets of the State Plan. In particular, it is likely to have a significant detrimental impact on the following:
'By 2015 there is:

- ***An increase in native vegetation extent and an improvement in native vegetation condition.***

- ***An increase in the number of sustainable populations of a range of native fauna species***

- ***An increase in the recovery of threatened species, populations and ecological communities'***

The CMA acknowledges the intention of the mining proposal to revegetate and rehabilitate, but this is a long-term aim which is not without risk and will not occur by 2016 or 2015, which is within the timeframe of the CAP and State targets.

As discussed earlier, Ravensworth Operations has taken significant steps to reduce the impacts of the proposed project and to establish substantial and appropriate biodiversity offset areas. The Biodiversity Offset Areas will be managed to ensure the recovery and improved status of native vegetation extent and condition, sustainable populations of native fauna species and in the recovery of threatened species, populations and ecological communities. Specifically, the Project aims to, over time, increase the extent of Central Hunter Grey Box – Ironbark Woodland EEC, Central Hunter Ironbark – Spotted Gum – Grey Box Woodland EEC, River-flat Eucalypt Forest EEC, Hunter Floodplain Red Gum Woodland EEC, Lower Hunter Valley Dry Rainforest VEC, the state and federally listed green and golden bell frog and a range of other threatened fauna species, through regeneration, revegetation, rehabilitation and significant management of all of these to achieve successful outcomes.

Xstrata has a proven track record for excellence in ecological rehabilitation and restoration in the Hunter Valley. At Mount Owen Mine, ecological rehabilitation and restoration in the Ravensworth State Forest Vegetation Complex (RSFVC) has been undertaken in cooperation with the University of Newcastle's Centre for Sustainable Ecosystem Restoration for over a decade. The forest is today an important habitat for flora, microbes and fauna. The RSFVC includes 415 hectares of biodiversity offsets, which have provided considerable information on different techniques for planting and seeding to the broader research initiative. The RSFVC was recently listed as a 'Highly Commended' site on the Global Restoration Network (GRN) of the Society of Ecosystem Restoration, International.

The CMA acknowledges the effort by the proponent to find offsets for the loss of native vegetation. Unfortunately, the high level of significance of the vegetation to be cleared makes it very difficult to implement adequate offsets.

As discussed earlier, Ravensworth Operations has taken significant steps to reduce the impacts of the proposed project and to establish substantial and appropriate biodiversity offset areas (refer to **Figure 2.2**). Ravensworth Operations acknowledges the difficulty associated with, firstly, removing or mitigating all ecological impacts in a project of this nature, and, secondly, the limitations in locating 'like for like' offsets close to the site of impact to address residual ecological impacts.

Notwithstanding the above, the proposed Biodiversity Offset Areas contain a number of significant ecological features. As outlined in **Section 2.1.1**, the ecological features of the Biodiversity Offset Areas include:

- large remnants of native vegetation communities within the Upper Hunter Valley;
- presence of Threatened Woodland EECs;
- presence of Threatened Floodplain EECs;
- presence of other significant vegetation communities, including those of significance for their under-representation in the NSW reserve system, for their vulnerable status (in the case of the Lower Hunter Valley Dry Rainforest VEC) and for the threatened species habitat they support;

- presence of threatened species habitat representative of the Project area, including habitat for Green and golden bell frog (*Litoria aurea*), threatened bird and micro-bat habitat; and

- presence of other significant ecological features, including spotted tail quoll, koala, and squirrel glider habitat.

The location of the proposed biodiversity offset areas provides for the development of broad regional vegetation linkages across the Hunter Valley Floor. To facilitate the development of future regional biodiversity corridors, the Biodiversity Offset and Rehabilitation Strategy has been designed to facilitate linkages with existing conservation areas within the region, and biodiversity offset areas established for the surrounding mining operations within the Greater Ravensworth area. In addition, Ravensworth Operations will investigate potential opportunities for the provision of contributions to the development of regional biodiversity initiatives, in consultation with DECCW and DoP.

It is noted that the BioBanking Calculator was used for this project, but that the results were not published. As such, the assessment of appropriate offsets has relied on the '*Principles for the use of biodiversity offsets in NSW*' (DECCW, 2008). Of these principles, the proposal does not appear to meet the following:

The BioBanking Calculator was used as part of a case study being conducted by DoP and DECCW in relation to its applicability to large scale Part 3A mining projects. There are significant limitations in relation to the use of the calculator for such projects. These have been communicated to DoP and DECCW through the extensive consultation with the agencies undertaken for this Project. Despite this, many of the principles used in the BioBanking process are relevant and appropriate, and these were taken into consideration during the project's assessment, as outlined below.

4. Complement other government programs the report only mentions the "Synoptic plan: integrated landscapes for coal mine rehabilitation in the Hunter Valley of NSW". Whilst this is an important plan, there are other relevant plans that should be considered such as the State Plan and the Hunter-Central Rivers Catchment Action Plan. An assessment of the impacts against targets in these plans should been incorporated in the determination.

The location of the proposed biodiversity offset areas provides for the development of broad regional vegetation linkages across the Hunter Valley Floor. To facilitate the development of future regional biodiversity corridors, the Biodiversity Offset and Rehabilitation Strategy has been designed to facilitate linkages with existing conservation areas within the region, and biodiversity offset areas established for the surrounding mining operations within the Greater Ravensworth area. In addition, Ravensworth Operations will investigate potential opportunities for the provision of contributions to the development of regional biodiversity initiatives, in consultation with DECCW and DoP.

5. Underpinned by sound ecological principles Appendix 7 states that the proposed "…strategies are commonly employed in projects of this type and magnitude and are well tested and accepted in relation to their ability to address impacts". As most of these "commonly" employed strategies have only been used in the past 5 - 10 years it is not clear how they have been "tested".

The mitigation and offsetting strategies proposed in the EA have all been successfully employed elsewhere in the Hunter Valley or NSW in the past 10 years. Ravensworth Operations does not propose to commit to any strategies or approaches that have not been successfully tried and tested elsewhere. Specifically, the approaches to biodiversity

offsetting, flora and fauna impact mitigation, revegetation, rehabilitation and habitat creation have all been successfully undertaken in the upper Hunter Valley during the past 5-10 years.

These mitigation and offset strategies have been incorporated into the development consent/project approval requirements for a range of large scale mining projects over the past 5-10 years. It is expected that these requirements will be reflected in the Project approval for this Project, should it be approved.

These requirements specify that the proponent is to develop detailed management strategies to be developed in consultation with relevant stakeholders, including government agencies, that provide the detail for the proponent to achieve relative outcomes committed to as part of the assessment and approval process. These strategies and plans are provided for the formal approval of the Department of Planning for ongoing implementation over the life of a project. These plans and strategies are subject to regular review, and where necessary revision, with the approval of the DoP, and are subject to regular independent audits, required by DoP, over the life of a Project.

As outlined above, Xstrata has a proven track record for excellence in ecological rehabilitation and restoration in the Hunter Valley. Ecological rehabilitation and restoration in the Ravensworth State Forest Vegetation Complex (RSFVC) at Mount Owen Mine was recently listed as a 'Highly Commended' site on the Global Restoration Network (GRN) of the Society of Ecosystem Restoration, International.

9. Offsets must be quantifiable, the impacts and benefits must be reliably estimated. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset.

The results from using the BioBanking methodology would help address this principle. As they have not been made available it is not possible to conclude that the best available science has been used for calculating loss and gain of biodiversity.

As stated above, the BioBanking Calculator was used as part of this assessment as part of a case study being conducted by DoP and DECCW in relation to its applicability to large scale Part 3A mining projects. There are significant limitations in relation to the use of the calculator for such projects. These have been communicated to DoP and DECCW through the consultation for this project. Despite this, many of the principles used in the BioBanking process are relevant and appropriate, and these were taken into consideration during the project's assessment.

The assessment of the vegetation within the project area refers to "extensive areas of regrowth (20 – 30 years old) with few tree hollows" (section 5.5.2). However, the legislated definition of regrowth is that which has regrown since 1990, making most (at least 70%) of the vegetation to be cleared remnant.

The use of the term 'regrowth' in Section 5.5.2 of the Environmental Assessment, as used in relation to vegetation in the Project area, refers to the relatively young age of the vegetation from an ecological perspective and was not used to refer to the legislated definition of 'regrowth' under the *Native Vegetation Act 2003*. It is acknowledged that most of the vegetation to be cleared within the Project area comprises remnant vegetation in that it is native vegetation, it has re-grown since previous clearing and disturbance. It is agreed that the majority of the woody vegetation in the Project area is unlikely to be 'regrowth' as defined by the *Native Vegetation Act 2003*. Notwithstanding this, the *Native Vegetation Act 2003* does not apply to Part 3A mining developments.

As quoted above, the report refers to "few tree hollows", yet Appendix 7 indicates that previous sampling in the area resulted in 7.9 hollows per hectare, which is very high.

In regard to tree hollow density in the Project Area, 7.9 tree hollows per hectare is regarded as low. This average number of tree hollows may represent an average of only two or three hollow-bearing trees per hectare, as hollow-bearing trees generally contain multiple hollows rather than a single hollow. In the key threatening process determination for the loss of hollow-bearing trees (Scientific Committee 2008) it is stated that 7-17 hollow-bearing trees per hectare were documented in relatively undisturbed woodland in an inventory by Gibbons and Lindenmayer (2002).

The loss of native derived grassland has not been included in the offset proposal. The area of native grassland is stated as 527 ha. Including this area in the calculation results in an offset to clearing area ratio of 1731:1087 or 1.6:1

As part of the Project, 527 hectares of Derived Grassland will be removed and there is currently a total of 683 hectares of Derived Grassland in the Ravensworth North and Hillcrest Offset Areas. As outlined in Section 5.5.8.3 of the EA (p5.68), the Ravensworth North and Hillcrest Offset Areas both contain relatively high quality derived native grassland, which will be managed to promote regeneration of native woody vegetation communities as part of the Project. Through this process, Ravensworth Operations will manage these areas to ensure an adequate area of Derived Grassland is retained and enhanced to ensure that the habitat values of these areas exist in these areas. The detailed requirements of the regeneration and remediation of the Biodiversity Offset Area will be further developed as part of the development of a detailed management plan, in consultation with DECCW and to the satisfaction of DoP.

10. Offsets must be targeted they must offset impacts on the basis of like for like or better conservation outcomes… only ecological communities that are equal or greater in conservation types of ecological community lost can be used for offsets

As discussed in Appendix 7 of the EA, Section 5.9.2.1, various options to biodiversity offsetting were investigated for the Project. The most preferable option is the use of on-site biodiversity offsets which contain 'like for like' vegetation. The disturbance footprint was reduced to the minimum that is practicable for the Project (as discussed in Section 5.1) to minimise the environmental impacts of the Project and to maximise the size of the Ravensworth North Offset Area. This resulted in a substantial reduction in the project's footprint (approximately 490 hectares), and subsequent important minimisation of ecological impacts and, flowing from this, increased opportunities for on-site biodiversity offsetting.

Other options investigated included the use of biodiversity offsetting on alternative Xstrata sites, the purchase of large woodland remnants on private land to provide a 'like for like' offset and the use of BioBanking to broadly inform likely offsetting requirements. None of the Xstrata NSW landholdings, except for the Hillcrest site, were found to provide appropriate areas of 'like for like' vegetation communities. The proposed Hillcrest Biodiversity Offset Area was found to contain extensive areas of similar but not 'like for like' vegetation. The investigation for purchase of large woodland remnants on private land to provide a 'like for like' offset did not identify suitable large remnants currently available for purchase. BioBanking was used to broadly inform the offset requirement. It was recognised, however, that the there are no credits available for purchase for the Project and, therefore, this option is not currently a viable pathway. As a result of the investigation of potential biodiversity offsetting options, the use of similar vegetation located near to the Project area was considered the most feasible option in the preparation of the Biodiversity Offset and Rehabilitation Strategy.

Notwithstanding the above, it is recognised that the inclusion of the Hillcrest Biodiversity Area in the Strategy does not meet the 'like for like' requirement of DECCW's offsetting principles. As detailed above, the Project has aimed to obtain as much 'like for like' offset areas as

possible, and it seeks to address the residual offsetting requirements through the appropriate securing and management of the Hillcrest Biodiversity Offset Area.

Central Hunter Ironbark – Spotted Gum – Grey Box Forest, present in the Hillcrest Biodiversity Offset Area, was identified as being closely related to the Central Hunter Box – Ironbark Woodland occurring in the Project area, as these communities intergrade in many areas and share similarities in terms of species assemblages, structure and habitat quality. Both communities also occur on Permian sediments on the Hunter Valley floor and it is considered reasonable that Central Hunter Ironbark – Spotted Gum – Grey Box Forest has sufficient similarities to the Central Hunter Box – Ironbark Woodland to comprise a reasonable offset.

Similarly, the Barrington Footslopes Dry Spotted Gum Forest was considered for inclusion in the Biodiversity Offset and Rehabilitation Strategy because it is geographically proximate to the Project area, has a number of species in common with Central Hunter Box – Ironbark Woodland and shares similar structure and habitat quality. Although one community comprises a 'forest' community and the other comprises a 'woodland' community, based on the data of Peake (2006) the height and canopy cover of each stratum are not very dissimilar. The greatest structural differences occur in the upper tree and mid tree strata, which are generally of a greater density in the Barrington Footslopes Dry Spotted Gum Forest, although there is overlap between the two communities. In this regard, the Barrington Footslopes Dry Spotted Gum Forest was considered to be 'similar' in structure to the vegetation occurring in the Project Area, and therefore it also contains similar habitat quality. Based on our observations at Hillcrest it is a highly variable community.

Further to providing for extensive areas floristically structural similar vegetation communities, the Hillcrest Offset Area contains a number of significant ecological features (, some of which are not present in the Project area. Table 5.19 of the EA (p 5.67), which has been included as **Table 2.2**, provides a summary of the comparison between the ecological values of Project area relative to the two Biodiversity Offset Areas for the Project.

12. Offsets must be supplementary they must be beyond existing requirements and not already funded under another scheme. Existing protected land on private land cannot be used for offsets unless additional security or management actions are implemented

The Report states that 115ha of the proposed North Ravensworth Offset is already under a draft Voluntary Conservation Agreement for Cumnock Operations since 2003. In line with this principle it is not appropriate to use this for offsets for this proposal.

The proposed biodiversity offset areas will provide for the conservation of significant biodiversity values within the Hunter Region. Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP.

The proposed Biodiversity Offset areas will provide for protection and conservation of significant areas of native vegetation within the Hunter Valley. Ravensworth Operations have committed to the long term conservation of these areas, despite the presence of coal resources in these areas. This includes the development and implementation of biodiversity enhancement strategy for the proposed offset areas that aims to enhance the ecological value of these areas through enhancement of existing vegetation, and habitat for threatened species. All works undertaken as part of this enhancement program will be funded and managed by Ravensworth Operations over the life of the Project.

The establishment protection and enhancement of the RNOA and Hillcrest Offset Area represents a substantial economic commitment from the process of formalising land transfer for these areas to provide for single ownership through to the ongoing resources required for enhancement and management of these areas for the long term.

As outlined in Section 2.1.3.2 of the EA (p 2.9), this draft Voluntary Conservation Agreement was proposed as part of the approval process for the Cumnock Stage 3 mining expansion. During preparation of a Section 90 Consent application in 1997, a proposed conservation area, to be known as the Murrin Gundi Conservation Area, was nominated to the north of Davis Creek to offset the impact of the Stage 3 expansion. Despite extensive consultation between the relevant parties, the agreement has remained in draft form since 2003, and has not been ratified by any parties.

The proposed conservation area shared similar values to the Stage 3 impact area, being approximately the same size (115 hectares) and containing a similar number and range of Aboriginal archaeological sites. Whilst the proposed conservation area was also of recognised ecological value, and contained potential historical archaeological items, the focus of the proposed conservation area was to conserve and manage the identified cultural heritage values of this area.

This area will be included as part of the proposed Ravensworth North Offset Area that will be established for the Project. As the draft VCA was not ratified by all relevant parties, Ravensworth Operations have committed to the long term management and conservation of the ecological and archaeological values of this area as part of the RNOA On this basis, it is clear that there is no 'double dipping' in relation to offsets.

An assessment of the effect of depressurisation on groundwater dependent ecosystems has not been included and it is suggested this should be addressed.

As outlined in Section 5.5 of the EA a comprehensive assessment of potential flora and fauna impacts associated with the Project has been undertaken as part of the EA (refer to Appendix 7 of the EA). The purpose of this assessment was to determine the existing natural environment of the study area and potential impacts to flora and fauna as a result of the Project.

This assessment encompassed an area of approximately 1,600 hectares and was undertaken over a number of seasons since 2007. As part of these surveys two River Red gums were identified on the Hunter River over 500 metres to the south-west of the proposed Narama Extended Pit and over a kilometres to the south-east of the proposed Ravensworth North Pit. The assessment concluded that this area would not be significantly impacted by the Project.

While it is acknowledged that there is potential that River Red Gums to occur at Bowmans Creek, due to the minimal potential for the Project to impact the alluvial groundwater system associated with Bowmans Creek, these areas have not been surveyed as they were not identified as being potentially affected by the Project.

As outlined in **Section 2.3.1**, as part of the Site Water Management Plan for the Project, Ravensworth Operations will augment the existing groundwater monitoring program as part of the Project and develop appropriate trigger levels to identify potentially significant impacts on surrounding groundwater systems, and the development of protocols to effectively manage and mitigate any identified groundwater impacts. The development of the site water management plan will be prepared in consultation with NOW to the satisfaction of the Director-General.

Despite the prediction of negligible depressurisation of alluvial groundwater systems associated with the Project, in recognition of the importance of this issue, Ravensworth Operations will commit to the development of remedial and recovery plans for identified stands of *Eucalyptus camaldulensis* along the Hunter River in the southern extent of the Project area (refer to Figure 5.23 of the EA), on land controlled by Ravensworth Operations (refer to **Appendix 1**). The development of these plans will seek to be consistent with the other recovery plans for groundwater dependent ecosystems in the Hunter Valley, such as Rio Tinto Coal and Allied Hunter Valley Operations South and Carrington Sites.

This should include the final predicted groundwater level and quality to support rehabilitation of the final post-mine landform, in particular its ability to support the intended vegetation communities.

As shown on Figure 5.7 of the EA, a key feature of the proposed final land form for the Project is the re-instatement of Emu Creek. Emu Creek will be reinstated by approximately Year 19 of the conceptual mine progression.

The reinstated Emu Creek will resemble a natural creek system and will be designed according to relevant design guidelines and in accordance with relevant approvals. Native vegetation will be planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system that will be constructed on filled and reshaped material. In-stream features such as meanders, pools and pool and riffle sequences can be designed into this drainage pathway, as necessary, to enhance the in-stream and riparian habitat created.

2.5 NSW Land and Property Management Authority

2.5.1 Crown Land

If consultation with the Crown Lands Division of the NSW Land and Property Management Authority hasn't been conducted already, the proponent is advised to conduct a status search for Crown Land and Aboriginal Land Claims as soon as is practical.

A search of Crown Land and Aboriginal Land Claims was undertaken during preparation of the EA. As described in Section 1.3.2 of the EA, a number of parcels of Crown Land were identified within the Project area which is associated with Crown Road reserves. Ravensworth Operations will apply to close these reserves in consultation with the NSW Land and Property Management Authority.

2.6 Heritage Branch of Department of Planning

2.6.1 Blasting Assessment

The blasting assessment does not consider Oaklands heritage site

The Historical Heritage Assessment undertaken for the Project (refer to Section 5.9 and Appendix 12 of the EA) identified the Oaklands site as an item of historic heritage within the Project area, and identified as site HH11. The Oaklands residence is not listed on any of the following relevant heritage databases searched as part of this assessment including:

- the Australian Heritage Database maintained by the Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA);

- the State Heritage Register (SHR) and State Heritage Inventory maintained by the NSW Heritage Council;
- the Register of the National Trust (NSW);
- the Singleton Local Environmental Plan 1996; and
- the Register of the National Estate (RNE).

Accordingly the Historic Heritage Assessment identified that the Oaklands site is of local heritage significance and low research potential.

As outlined in Commitment 6.11.1 of the EA (p 6.13), Ravensworth Operations will implement the following historical heritage management measures:

- manage blasting practices to meet relevant blast impact assessment criteria at listed heritage sites/items within the vicinity of the Project area; and
- Undertake archival recording of historic heritage sites directly or indirectly impacted by the Project (HH1, HH4, HH5, HH11, HH14, HH15, HH16, HH17, and HH18) by a qualified heritage consultant to NSW Heritage Office's standards of local significance prior to the commencement of mining.

In accordance with Commitment 6.11.1, Ravensworth Operations will undertake archival recording of the Oaklands historic heritage site (HH11) due to the potential indirect impact associated with blasting practices as part of the Project. The archival recording will be undertaken by a qualified heritage consultant to NSW Heritage Office's standards of local significance prior to the commencement of mining.

2.6.2 Vibration Monitoring

The EA provides no methodology for vibration monitoring at identified heritage structures. No plan to record the buildings prior to and after blasting to determine what the impacts were has been outlined. Nor is there any undertaking to repair any damage which might be caused by the works within the Project area. Given the highly significant nature of some of this heritage, the Heritage branch would like specific monitoring and mitigation strategies undertaken prior to any works commencing. The Heritage Branch would like to review these strategies.

The review of relevant heritage databases searched as part of the Historic Heritage Assessment identified the following heritage listing within the Project area:

- Singleton Local Environmental Plan 1996 (LEP) Schedule 3 Heritage Items, Part 3 Items classified as being of local significance – Ravensworth Public School, New England Highway.

Several other heritage items were identified in the vicinity of the Project area, including:

- State Heritage Register Listing No. 00242 – Inn & Outbuildings (former) Old New England Highway, Chain of Ponds, NSW. Singleton Local Environmental Plan 1996 (LEP) Schedule 3 Heritage Items, Part 1 Items classified as being of state significance – Former Chain of Ponds Hotel, Old Singleton Road, Liddell.
- Register of the National Estate (RNE) Place ID: 1400 – Chain of Ponds Hotel and Outbuildings, Old Singleton Rd, Liddell, NSW, Australia.

- National Trust of Australia (NSW) register - Chain of Ponds Hotel and Outbuildings, Liddell NSW.

- Singleton Local Environmental Plan 1996 (LEP) Schedule 3 Heritage Items, Part 2 Items classified as being of regional significance – Ravensworth Homestead, Ravensworth.

- Register of the National Estate (RNE) Place ID: 101927 – Ravensworth Homestead, Hebden Rd, Ravensworth, NSW, Australia.

- Singleton Local Environmental Plan 1996 (LEP) Schedule 3 Heritage Items, Part 3 Items classified as being of local significance – St. Clements Anglican Church, Camberwell.

- Singleton Local Environmental Plan 1996 (LEP) Schedule 3 Heritage Items, Part 3 Items classified as being of local significance – Community Hall (C.I.), Camberwell.

Ravensworth Operations have committed to managing blasting practices to meet relevant blast impact assessment criteria at listed heritage sites/items within the vicinity of the Project area (refer to Commitment 6.11.1 o the EA (p 6.13)). Central to the management of blast impacts is the commitment to the development and implementation of a blast management plan which will incorporate the continued implementation of blast management and monitoring procedures outlined in Section 5.4.4 of the EA (refer to Commitment 6.6.12 of the EA (6.8)).

Specifically, Section 5.4.4 of the EA (p 5.51) describes a range of management measures that Ravensworth Operations would implement to ensure blasting impacts of the Project are minimised. This includes the continued detailed monitoring of blasts at relevant blast sensitive locations, including real time monitoring at Camberwell Church (a listed heritage structure) to inform the detailed design of blasts and modification of blast designs as necessary.

As outlined in Section 6.6 of the EA, Ravensworth Operations have committed to achieving relevant blast vibration and air blast criteria over the life of the Project, including listed heritage items (refer to Commitment 6.6.9 of the EA (p 6.8)). The Chain of Ponds Hotel and Ravensworth Homestead are located approximately 3 kilometres to the north and north east of the proposed Ravensworth North Pit. The blasting practices associated with the Project will be constrained to relatively low levels given the location of other blast sensitive infrastructure over the life of the Project (refer to Table 5.15 of the EA (p 5.50)). Accordingly, there will low risk of impact on the Chain of Ponds Hotel and Ravensworth Homestead over the life of the Project.

It is noted that surrounding Xstrata mining operations, including Liddell (DA 305-11-01) and the Mt Owen Complex (Ravensworth East Mine DA 52-03-99), undertake extensive monitoring and management of potential blasting impacts at the Chain of Ponds Hotel and Ravensworth Homestead, in accordance with the requirements of the respective development consents for these operations. Ravensworth Operations will integrate the proposed continuation of blast monitoring and management into these established management systems of the surrounding Xstrata operations, as part of the development and implementation the blast management plan for the Project. If the established monitoring and management systems cease during the life of the Project, then Ravensworth Operations will review its blast management and monitoring system to specifically address these locations. .

2.7 Adjoining Operations

2.7.1 Macquarie Generation

The submission provided by Macquarie Generation on the Project related to a number of potential interactions between the Project and Macquarie Generation infrastructure located within the Project area. As outlined in Section 4.2.4 of the EA (p4.5) Ravensworth Operations have undertaken ongoing consultation with existing land holders within the Project area, including Macquarie Generation, throughout the Project design process and the preparation of the EA.

As part of this ongoing consultation Ravensworth Operations and Macquarie Generation have agreed to terms of a commercial agreement to provide for ongoing interactions between Project, where approved, and Macquarie Generation infrastructure within the Project area. To this end, both Ravensworth Operations and Macquarie Generation have signed a term sheet that is the basis of the formal agreements that will be entered into in the near future. These commercial agreements will provide for the formalisation of land transfers and land access agreements to provide for mining operations associated with the Project, and the ongoing management of Macquarie Generation infrastructure within the Project area. Accordingly, the agreed terms of the commercial agreement address the majority of potential interaction issues raised in the Macquarie Generation submission. Subsequent consultation with Macquarie Generation has confirmed that the majority of issues raised in their submission will be managed in accordance with the agreed terms of the commercial agreement.

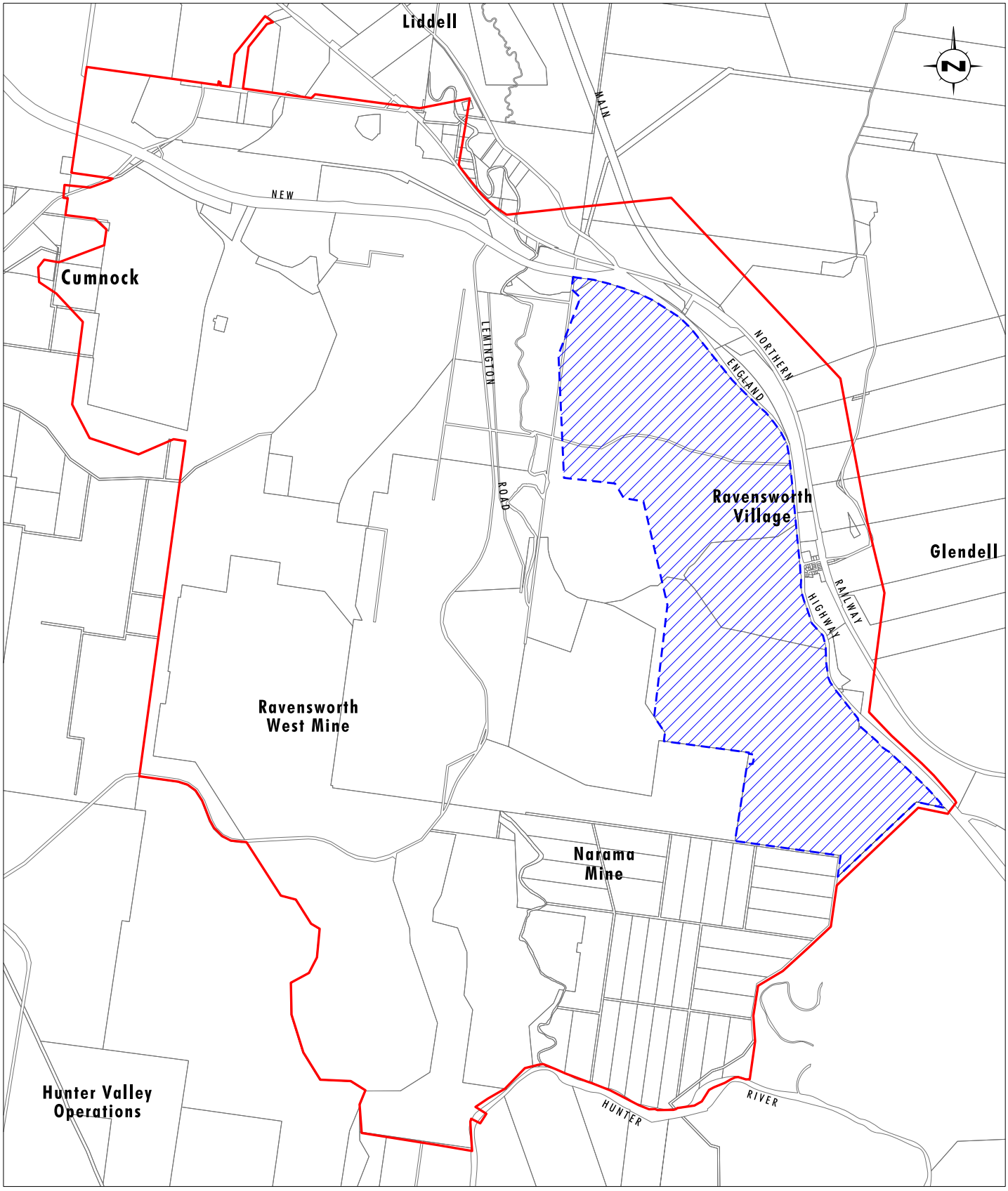
A number of additional issues raised in the Macquarie Generation submission are not specifically provided for by the agreed terms of the commercial agreement and a formal response to these issues is provided in the following sections. Macquarie Generation have been consulted with regard to the following responses the issues raised within their submission, and have provided their support for the following responses, which will be reflected in the finalisation of the commercial agreement between the parties.

2.7.1.1 Project Area

Not all land within the Project area is required for the Project, the Project area should be redefined so that it only includes land required for mining purposes. Mac Gen land should be specifically excluded from the Project area.

As outlined above, the agreed terms of the commercial agreement between Ravensworth Operations and Macquarie Generation provide for the formalisation of land transfers and land access agreements to provide for the Project, where Project approval is granted.

Under the term sheet Ravensworth Operations have committed to undertaking relocation works for ancillary Macquarie Generation infrastructure in the Project area, such as water transfer and electricity infrastructure. In order to provide for these minor works as part of this Project, Ravensworth Operations have maintained the Project area boundary as presented in the EA, which is provided as **Figure 2.7**. As outlined on **Figure 2.7**, Ravensworth Operations have nominated the location for these minor works on Macquarie Generation ancillary infrastructure within the Project area (nominated as 'Ancillary Infrastructure'). Apart from the major infrastructure shown on Figure 1.3 of the EA, all ancillary works located on Macquarie Generation land will be undertaken in previously disturbed areas and in accordance with relevant commercial agreements with Macquarie Generation.



Source: Ravensworth Operations (2009), LPI (2008)

0 1 2 2.5km
1:50 000

Legend

Current Approved Project Area

Macquarie Generation Land subject to minor Ancilliary Infrastructure Works Boundary

FIGURE 2.7

Project Area Boundary

2.7.1.2 Eastern Overburden Emplacement Area

Additionally, the overburden emplacement area proposed in the EA is substantially different to that which negotiations with Mac Gen were based on. Any agreement entered into between Ravensworth Operations and Mac Gen should incorporate the final design of the Project.

As outlined above, the agreed terms of the commercial agreement between Ravensworth Operations and Macquarie Generation provide for the formalisation of land transfers to provide for the Project, where Project approval is granted. Accordingly, Ravensworth Operations have amended the northern boundary of the eastern out of pit overburden emplacement area to reflect the agreed land transfers between the parties. The revision of this boundary has been reflected on **Figure 2.8**.

The amended northern boundary of the eastern out of pit overburden emplacement area has been designed to ensure that there are no significant changes to the overall profile, including dump heights and landform, presented as part of the conceptual mine plan stages provided in Section 2.0 of the EA. As such, the amendments to the northern boundary of the eastern out of pit overburden emplacement area will be consistent with the predicted impacts associated with the Project and detailed in Section 5.0 of the EA.

2.7.1.3 Blast Assessment

The blasting assessment does not consider the Ravensworth void 3 and void 5 dams which are prescribed dams, and other infrastructure owned by Mac Gen

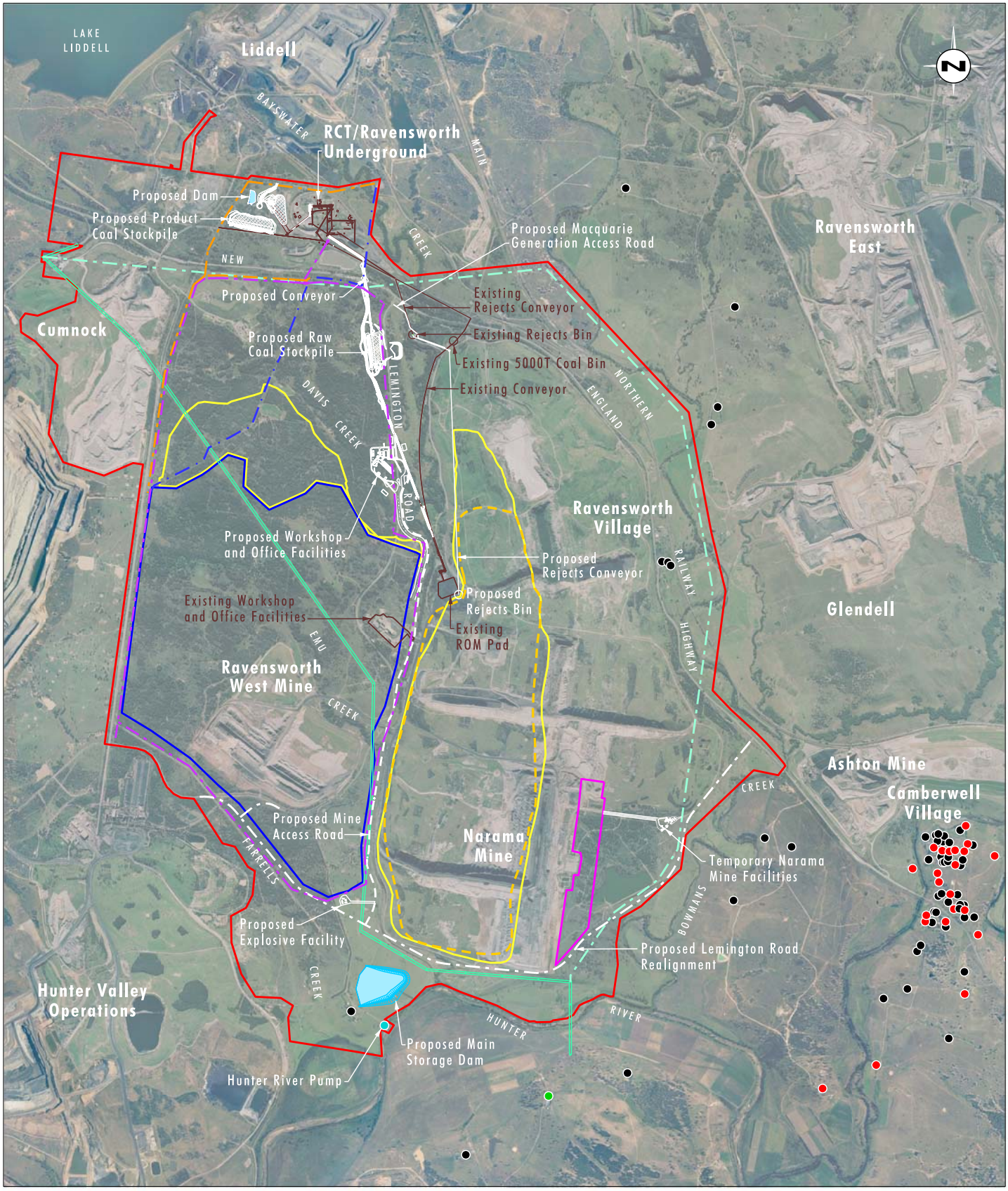
As outlined in Commitment 6.6.13 of the EA (p 6.8) Ravensworth Operations have committed to the development a blasting protocol in consultation with relevant service providers and infrastructure owners prior to the commencement of blasting within 500 metres of the infrastructure specified in Table 6.2 of the EA (p 6.7). This may include revising blasting criteria from that indicated in this EA developed in consultation with the relevant service provider or infrastructure owner. The process to develop the blast protocol with relevant service providers and infrastructure owners will be outlined in the Blast Management Plan for the Project developed to satisfaction of the Director-General, as outlined in Commitment 6.6.12 of the EA (p 6.8).

Ravensworth Operations have revised the Statement of Commitments for the Project (refer to **Appendix 1**) to include relevant Macquarie Generation infrastructure as part of Commitment 6.6.13.

2.7.1.4 Erosion and Sediment Control

The EA has not considered potential impacts from silt and run-off from the proposed emplacement areas. The emplacement area designs do not include silt traps and erosion from the eastern emplacement area could affect the Ravensworth void 3 and void 4 ash disposal dams operated by Mac Gen. Sediment from the eastern emplacement area could reduce the capacity of the ash dams and the emplacement area should therefore be designed to ensure no sediment reaches the Ravensworth voids.

Uncontrolled run-off from the eastern emplacement area could have a dramatic impact on water levels in the voids used by Mac Gen for ash disposal. The emplacement area should therefore be designed to ensure that no sediment reaches the Ravensworth voids.



Source: Ravensworth Operations 2009

0 1.0 2.0 3km
1:60 000

Legend

- Project Area
- Ravensworth North Pit
- Out of Pit Overburden Emplacement (EA)
- Revised Eastern Emplacement Area Boundary
- Narama Extension (subject to separate approval)
- Existing 330kV Transmission Line
- Proposed 330kV Transmission Line
- Proposed Lemington Road Realignment
- Proposed Mine Access Road
- Existing Infrastructure
- Proposed Infrastructure
- Existing EnergyAustralia 66kV Powerline
- Proposed EnergyAustralia 66kV Powerline
- Ravensworth Operations 66kV Realignment
- Mine Owned Residence
- Private Residence
- Private Residence with Agreement

FIGURE 2.8

Revised Eastern Emplacement Area Boundary

File Name (A4): R15_V1/2383_686.dgn

Section 5.6.1.6 of the EA describes the components of the proposed Ravensworth Operations Water Management System. This system will manage water associated with all mining, overburden emplacement and infrastructure areas located within the Project area, including the eastern emplacement area.

The key functions of this system include:

- minimising the potential for contamination of clean water resources;
- reducing the discharge of pollutants from disturbed areas to the environment;
- minimising the potential for adverse effects to local watercourses (i.e. hydraulic and water quality impacts);
- controlling the diversion of non-mine impacted waters away from mining activities to reduce the volume of mine impacted water; and
- segregating mine impacted water from better quality water to minimise mine water management requirements, and consequently minimising the volume of water both imported to and discharged from the site.

A detailed description of the proposed water management controls is provided in the Surface Water Assessment for the Project and a summary of this is provided in Section 5.6.1.6 of the EA. The Surface Water Assessment provides figures showing majors components of the proposed Ravensworth Operations Water Management System, which include drainage systems located between the eastern emplacement area and the former Ravensworth No. 2 voids (refer to Figures 4.2 to 4.8 of Appendix 8 of the EA). Representative examples of these figures are provides as Figures 5.29 and 5.30 of the EA. These figures show a toe drain between the base of the proposed eastern emplacement area and the former Ravensworth No. 2 voids. This drain will ensure any run-off from the eastern emplacement area is captured and incorporated into the water management system for the Project.

2.7.1.5 Surface Water Impacts

The proposed tailings pipelines to service the Cumnock voids require the crossing of Mac Gen land. These pipelines could fail and tailings could enter water courses or the environment. Mac Gen require information on the measures to be put in place to ensure that tailings cannot discharge onto Mac Gen property or the environment in the event of a pipeline failure.

Ravensworth Operations have an ongoing obligation to ensure that all current and future operations do not pose a risk of significant environmental impact. As outlined in Section 2.1.4 of the EA (p 2.9), potential environmental impacts are managed through the implementation of environmental management and monitoring strategies associated with existing approved operations within the Project area. Being an Xstrata Coal NSW (XCN) operation, the environmental management and monitoring programs are implemented in accordance with relevant Health, Safety, Environment and Community (HSEC) standards. These standards specify the process for the design, management and monitoring of surface pipelines to:

- minimise the risk of pipeline failure; and
- provide that contingencies for containment and remediation are in place to minimise environmental impacts if pipeline failure occurs.

Ravensworth Operations will develop and implemented environmental management systems and processes to provide for all open cut operations and surface infrastructure in accordance with the requirements of the Project approval, if granted (refer to Section 1.2.1 of the EA (p 1.4)). This will be developed and implemented to reflect all relevant environmental protection and management requirements, including those specific to the design, management and monitoring of surface pipelines in the Project area. Where pipelines are constructed on land owned by Macquarie Generation, all works will be undertaken in accordance with relevant commercial agreements.

2.7.1.6 Rail de-link

The Project seeks to relocate the Mac Gen rail junction. Preliminary negotiations have been held with Mac Gen regarding this and Mac Gen agrees in principal to the works. However, further negotiations are required to reach a binding agreement to allow these works to take place. Mac Gen will only reach this agreement if no or minimal impacts to Mac Gen's rail unloading activities will occur.

Ravensworth Operations notes the commitment for obtaining the consent and approval of all relevant landowners, being ARTC and Macquarie Generation, prior to undertaking the proposed rail de-link works (refer to Commitment 6.3.10 of the EA (p 6.2)). This will be undertaken through further consultation with these landholders, including Macquarie Generation, throughout the detailed design process for the proposed rail de-link.

2.7.2 Ashton Coal Operations Limited

The submission provided by Ashton Coal Operations Limited (ACOL) on the Project related to a number of potential interactions between the Project and existing ACOL operations. As outlined in Section 4.2.4 of the EA (p4.5) Ravensworth Operations have undertaken ongoing consultation with an extensive range of stakeholders surrounding the Project area, including ACOL, throughout the Project design process and the preparation of the EA.

Formal responses to the issues raised in the ACOL submission are provided in the following sections. ACOL have been consulted with regard to the following responses the issues raised within their submission.

2.7.2.1 Project Area Boundary

The Project boundary extends over Ashton Coal Operations Limited (ACOL) development consent boundary (DA 309-11-2001), mining lease boundary (ML 1533) and underground mine area to encompass Mac Gen owned land and Brunkers Lane.

ACOL does not support the extension of the Project over any part of its existing development consent, mining lease or approved underground mining area.

As outlined in Section 1.2.1 of the EA (p 1.4) it is proposed that the Project Approval will provide for a single approval that covers all of the existing development consents and approvals for open cut mining surface facilities within the Project area. Figure 2.1 of the EA provides an overview of the major development consent boundaries relating to the existing mining operations within the Project area. This includes the development consent boundary for the existing Narama Mine (DA135-90) granted in 1991, which predates the existing ACOL development consent boundary (DA309-11-2001).

To provide for consolidation of the existing open mining and surface facility consents and approvals, the Project area boundary has been proposed to cover all of the relevant parcels of land that apply to the existing development consents. Ravensworth Operations notes that

the Project area is note located on any land owned by ACOL (refer to Figure 1.4 of the EA). The lands within the Project area and in the vicinity of ACOL's approved mining operations are owned by Xstrata and its subsidiaries and Macquarie Generation. As outlined in **Section 2.7.1**, the commercial agreement with Macquarie Generation will provide for the use of this parcel of land for the Project.

2.7.2.2 Surface Infrastructure

ACOL does not support Xstrata's proposal to realign surface infrastructure, particularly Lemington Road, over an area of approved multi-seam longwall mining

As outlined in Section 2.6.5 of the EA (p 2.28) the northern extent of the existing Lemington Road is proposed to be realigned to the south of the Project area. The initial 1 kilometre of the proposed realigned Lemington Road from the existing intersection with the New England Highway is consistent with the former alignment of Lemington Road prior to the commencement of the Narama mine operations in the mid 1990s. The location of the former alignment of Lemington Road with the proposed realignment is detailed on Figure 2.22 of the EA, which has been reproduced as **Figure 2.9**.

The sections of the former Lemington Road that still exist are currently known as Brunkers Lane. It is a requirement of the current Narama development consent (DA 135/90), granted in 1991, for Ravensworth Operations to reinstate Lemington Road to its pre-mining alignment. Accordingly, the proposed initial 1 kilometre of the proposed Lemington Road realignment will provide be reinstated in accordance with the existing requirements of the Narama development consent (DA135/90) granted in 1991.

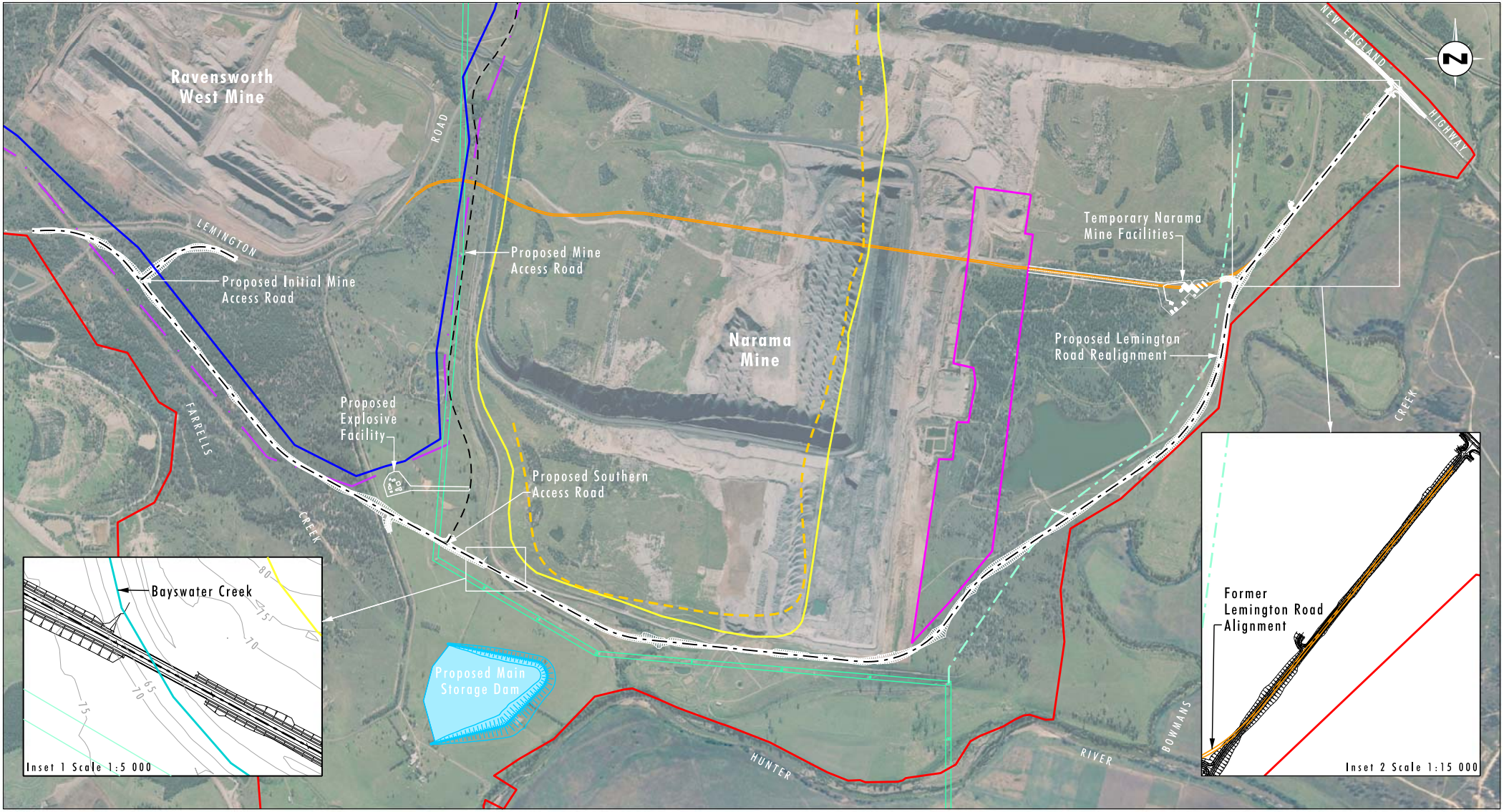
As outlined in Section 2.6.5 of the EA (p 2.28), from the initial 1 kilometre from the existing intersection with the New England Highway, it is proposed that the realigned Lemington Road be constructed further south of the former alignment in order to provide for the proposed out-of-pit overburden emplacement over the Narama mining area as part of the Project. Ravensworth Operations acknowledges that this portion of the proposed Lemington Road realignment is not specifically covered by the existing requirement to reinstate the former alignment of Lemington Road in accordance with DA135/90.

In addition the proposed realignment of Lemington Road, Ravensworth Operations propose to relocate a 330kV transmission line during the early stages of the Project (refer to Section 2.6.6 of the EA (p 2.30)). As outlined on Figure 1.3 of the EA, the proposed relocated transmission line crosses the south eastern portion of the Project area, prior to reconnecting to the existing transmission line to the south of the Project area. The proposed 330kV transmission line has been located outside of the approved ACOL mining operational area, and accordingly, Ravensworth Operations consider there will be minimal risks of interaction with approved ACOL operations.

ACOL require that Xstrata be required to cover the full cost of establishing and maintaining this infrastructure, and accept liability for damages that may arise from use of this infrastructure, for the life of the Ashton Coal Project. The Statement of Commitments included in the EA should be amended to reflect this and should also include a commitment to consult with ACOL over the development on any such surface improvements.

Currently Brunkers Lane is a private access road supporting minimal traffic and is not a public road. This area will be undermined by ACOL and will be impacted by subsidence.

ACOL has approved plans in place to manage subsidence impacts on Brunkers Lane in its current state as a private access. These plans were developed in consultation



Source: Ravensworth Operations 2009
Note: Contour Interval 5m

0 0.25 0.5 1km
1:25 000

0 50 100 200m
Inset 1 Scale 1:5 000

0 200 400 600m
Inset 2 Scale 1:15 000

Legend

- Project Area
- Ravensworth North Pit
- Out of Pit Overburden Emplacement
- Revised Eastern Emplacement Area Boundary
- Narama Extended (subject to separate approval)
- Existing 330kV Transmission Line
- Proposed 330kV Transmission Line
- Proposed Lemington Road Realignment
- Proposed Mine Access Road
- Ravensworth Operations 66kV Realignment
- Former Lemington Road Alignment (1992)

FIGURE 2.9

Proposed Lemington Road Realignment

File Name (A4): R15_V1/2383_685.dgn

with the affected parties. ACOL has no plans for the management of cumulative subsidence effects on a public road.

As outlined above, the initial 1 kilometre of the proposed Lemington Road realignment is required as part of the reinstatement of the former Lemington Road realignment obligations under the existing Narama development consent (DA135-90), granted in 1991. The requirement for the reinstatement of the former alignment of Lemington Road predates the existing approved ACOL mining operations, which were originally approved in 2001.

Ravensworth Operation notes previous consultation with ACOL, where commitments have been provided by ACOL to manage predicted subsidence impacts on the reinstated Lemington Road. Reference is made to the approved *'Ashton Coal Underground Volume 2 – Subsidence Management Plan, Longwall and Miniwall Panels 5 to 9, 31 October 2008'*, in which ACOL acknowledge the existing obligation of Ravensworth Operations to reinstate Lemington Road and the commitment provided to Ravensworth Operations to mitigate and manage predicted subsidence impacts on the reinstated Lemington Road. Table 21 of this report acknowledges consultation with Ravensworth Operations on 3 July 2008, with the following specific comment included:

> 'Upgrading of Brunkers Lane is a condition of consent for Ravensworth (timeframes approx. 2 years). Ashton will remediate any subsidence damage'

As such, ACOL's request for Ravensworth Operations to accept the liability for damages that may arise from the use of Lemington Road as a public road, over the life of Ashton Coal Project, do not reflect the existing consent requirements for the reinstatement of Lemington Road, and the previous commitments provided to Ravensworth Operations in relation to management of subsidence impacts on the reinstated Lemington Road.

As outlined above, Ravensworth Operations acknowledges that the portion of the proposed Lemington Road realignment from the initial 1 kilometre from the existing intersection with the New England Highway is not specifically covered by the existing requirement to reinstate the former alignment of Lemington Road in accordance with DA135/90 (refer to **Figure 2.9**). Whilst this portion of the proposed Lemington Road realignment is not located directly over the approved ACOL underground mining operations, Ravensworth Operations acknowledges the potential for subsidence impacts along this portion of the proposed Lemington Road realignment.

Accordingly, Ravensworth Operations will accept responsibility for the management of subsidence impacts, caused by the approved ACOL underground mining operations, for this portion of the proposed Lemington Road realignment. Accordingly, the Statement of Commitments for the Project (refer to **Appendix 1**) have been revised as follows:

6.3.13 Ravensworth Operations will undertake monitoring and management of subsidence impacts resulting from ACOL underground mining operations approved under DA309-11-2001 as modified and in force at the granting of Project Approval, for the portion of the Lemington Road realignment from the initial 1 kilometre from the existing intersection with the New England Highway.

In the event that the Project is approved, ACOL requests that any realigned surface infrastructure, or other surface improvements associated with the Project, be designed to withstand the full effects of subsidence from ACOL's approved multi-seam longwall mine. ACOL expects that the design and construction of surface improvements over its approved multi-seam longwall mine will be done in accordance with appropriate standards and guidelines (including compliance with Mine Subsidence Board guidelines).

As outlined in Section 3.2.1 of the EA (p 3.3) Ravensworth Operations will require the approval of the Mine Subsidence Board (MSB) for development within a declared mine subsidence district in accordance with Section 15 of the *Mine Subsidence Compensation Act 1961* (MSC Act). Ravensworth Operations will design all relevant aspects of the Project in accordance with all relevant requirements of the MSB with regard to subsidence impacts. As noted in Section 3.2.1 of the EA (p 3.3) if the Project is granted Project approval under Part 3A of the EP&A Act, the Section 15 approval under the MSC Act must not be refused by the relevant approval authority and must be substantially consistent with the terms of the Project approval, pursuant to Section 75V of the EP&A Act.

2.7.2.3 Brunkers Lane

ACOL notes that it proposes to use Brunkers Lane for construction traffic egress for its proposed Bowmans Creek Project. Pending approval and timing of the Bowmans Creek Diversion Project and the Project, site access and construction by ACOL could be significantly impeded if works are undertaken at the same time by Xstrata on Brunkers Lane and its intersection with the New England Highway.

Ravensworth Operations will undertake ongoing consultation with ACOL with regard to the management of traffic access along the existing Brunkers Lane should ACOL's Bowmans Creek Project be approved. This consultation will seek to provide for mutual access to Brunkers Lane should the construction timeframes for the proposed Lemington Road realignment and ACOL's Bowmans Creek Project significantly overlap.

2.7.2.4 Tailings Emplacement

ACOL currently disposes of tailings within one of the existing Ravensworth mine voids. This agreement includes ACOL taking over management of the mine void. The EA indicates that tailings from the Project will be emplaced within existing Ravensworth mine voids. ACOL should be provided with alternative void space for its tailings disposal, if so required, and Xstrata should share in the costs of rehabilitating the void, once tailings emplacement is complete.

As described in Section 2.5.10 (p 2.24) and shown on Figure 2.19 of the EA, Ravensworth Operations proposes only to utilise voids areas associated with the existing Xstrata operations within the Project area and/or undertaken in accordance with existing private agreements with Macquarie Generation, for tailings emplacement associated with the Project. These tailings emplacement areas include:

- Cumnock Stage 1/2 void;
- RUM 7 South Tailings Dam;
- Cumnock Stage 3 void;
- Cumnock Wash Plant Pit;
- Narama 9 south ramp; and
- Narama final void.

Ravensworth Operations understands that ACOL utilise the eastern proportion of the former Ravensworth No.2 mine voids for tailings emplacement in accordance with a private agreement with Macquarie Generation. Figure 2.19 of the EA clearly shows that the proposed tailings emplacement areas associated with the Project will not directly impact current ACOL tailings emplacement within the Project area. Accordingly, Ravensworth

Operations will not commit to the replacement, management and rehabilitation of existing ACOL tailings emplacement areas within the Project area as a result of this Project.

If Xstrata damage ACOL's tailings and decant water transfer infrastructure then Xstrata should be required to pay for the repair or replacement of this infrastructure, or compensate ACOL accordingly.

The proposed tailings emplacement area, including water management, will be designed to minimise any impacts on ACOL's tailings and decant water infrastructure over the life of the Project. It is noted that the terms of the commercial agreement between Ravensworth Operations and Macquarie Generation (refer to **Section 2.7.1**) provides for the ongoing management of existing ACOL tailings emplacement areas covered by existing agreements between ACOL and Macquarie Generation.

2.7.2.5 Blasting

Ravensworth Operations should design blasts to limit any adverse effect on Ashton underground mine and ACOL owned surface infrastructure and houses, and this should be done in consultation with ACOL. Ravensworth Operations should compensate ACOL for any loss of production.

As outlined in commitment 6.6.14 of the EA (p 6.8), Ravensworth Operations is currently working through a process to manage potential interactions between current blasting practices on the surrounding underground mining operations in consultation with Ashton Coal. The outcomes of this process will be incorporated into the blast management plan for the Project. Consultation between Ravensworth Operations and ACOL with regard to the management of potential blast impacts on ACOL's approved operations is currently ongoing.

As outlined in Commitment 6.6.13 of the EA (p 6.8) Ravensworth Operations have committed to the development a blasting protocol in consultation with relevant service providers and infrastructure owners prior to the commencement of blasting within 500 metres of the infrastructure specified in Table 6.2 of the EA (p 6.7). This may include revising blasting criteria from that indicated in this EA developed in consultation with the relevant service provider or infrastructure owner. The process to develop the blast protocol with relevant service providers and infrastructure owners will be outlined in the Blast Management Plan for the Project developed to satisfaction of the Director-General, as outlined in Commitment 6.6.12 of the EA (p 6.8).

Ravensworth Operations have revised the Statement of Commitments for the Project (refer to **Appendix 1**) to include relevant ACOL infrastructure as part of Commitment 6.6.13.

The EA uses a 5 mm/s vibration criteria for Camberwell Church. ACOL's development consent (DA 309-11-2001-i) requires a 2 mm/s limit. Ravensworth Operations should be required to meet the 2 mm/s limit, unless ACOL receive approval for its proposed South East Open Cut Project, which proposes to raise the limit to 5 mm/s.

The comprehensive blast impact assessment undertaken for the Project (refer to Appendix 6 of the EA) identifies the relevant blast impact assessment criteria applicable to the Project. The Director-General signed off on the adequacy of the Environmental Assessment, including the blasting assessment in addressing the Director-General's Requirements for the Project, on 9 February 2010.

It is noted that the recent approved Modification 3 for Narama Mine (DA125-90) has specified a blast impact assessment criterion of 5 mm/s at Camberwell Church, except where an agreement between Ravensworth Operations and the property owner is reached to provide

for a higher level of vibration impact. These specific blast impact assessment criteria will be incorporated into the consolidated Project approval for the Project.

2.7.2.6 Rail Interactions

As an existing user of the RCT rail loop, ACOL believes that is should be kept informed of any works associated with the Ravensworth Operations Project that would disrupt its scheduling of train movements through the rail loop. ACOL believes that the Statement of Commitments should be strengthened to include a commitment to this effect.

Ravensworth Operations understands that ACOL utilise the RCT rail loop in accordance with the requirements of an existing commercial agreement between ACOL and the owners of the RCT facility. The ongoing use of the rail loop by ACOL will continue to be managed in accordance with the requirements of the existing commercial agreement with the owner of the RCT.

2.7.2.7 Noise Assessment

The EA uses an inversion scenarios of 3^0C/100 m which is a standard measure under the INP. ACOL used a tenth percentile inversion strength of 4.7^0C/100 m. ACOL believes the noise assessment may underestimate potential noise emissions at Camberwell Village.

ACOL notes that its South East Open Cut Project application proposes a noise impact assessment criteria of 41 dB(A) ($L_{Aeq\ 15\ min}$) at Camberwell residences, based on night-time background noise levels, and proposes 24 hour operations. Until ACOL's conditions of consent are altered, Ravensworth Operations should be required to meet the same noise impact assessment criteria to that imposed on ACOL it is development consent at Camberwell.

The comprehensive noise impact assessment undertaken for the Project (refer to Appendix 5 of the EA) has been undertaken in accordance with the requirements of the Industrial Noise Policy (INP) (DECCW 2000). Accordingly, the comprehensive noise impact assessment has:

- identified any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches and hospitals and determine existing background noise levels at noise sensitive locations in accordance with the INP;

- identified all noise sources from the Project (including both construction and operational phases. Determined the expected noise levels and noise characteristics (e.g. tonality, impulsiveness, vibration, etc) likely to be generated from the noise sources;

- identified the times of operation for the construction and operational phases of the development and for all noise producing activities;

- determined the noise levels likely to be received at the most sensitive locations under both prevailing and adverse meteorological conditions;

- provided noise contours for day time, evening and night-time periods predicted under prevailing as well as 'worst case' scenarios during adverse meteorological conditions of wind and temperature inversions;

- considered the influence of existing meteorological conditions such as wind and temperature inversions in the prediction models so as to provide a true representation of actual noise levels;

- assessed the effect of relevant noise mitigation measures incorporated into the predictive modelling ;

- compared the predicted noise levels with the appropriate noise criteria for the phase of development or activity being considered;

- discussed the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures;

- quantified the residual level of noise impact where relevant noise criteria cannot be met after application of all feasible and cost effective mitigation measures, where relevant;

- determined the most appropriate noise mitigation measures including both noise controls and management of impacts. This included equipment selection, noise barriers, location of equipment and plant, scheduling of activities, community consultation, and complaints handling; and

- provided details of a noise monitoring program with monitoring to be undertaken at noise sensitive locations subject to the agreement of the owners/occupiers of those properties.

ACOL believe that under adverse meteorological conditions, mobile plant operating on the eastern out of pit dump may contribute to noise emissions in Camberwell Village.

As outlined in Section 5.3.3.3 of the EA (p 5.37) the results of noise impact indicate that the operational noise levels from the Project are predicted to be lower than the relevant Project-specific noise levels for all receivers within Camberwell Village for all of the representative meteorological conditions modelled. In addition, the cumulative noise impact assessment of the Project (refer to Section 5.3.8.2 (p 5.42) and Appendix 5 of the EA) determined that the Project will not have a discernable impact on the existing noise amenity of the central part of Camberwell Village under adverse meteorological conditions.

The results in Appendix 5 of the EA indicate the cumulative noise level in the central part of Camberwell Village could exceed the acceptable night time amenity noise level of 40 dB(A) under a north-westerly wind of 3 m/s during a number of the stages of the conceptual mine plan by up to 3 dB. The corresponding predicted $L_{Aeq, night}$ contribution from the Project is estimated to be a maximum of 36 dB(A).

2.7.2.8 Groundwater

ACOL believes that the Project's statement of commitments should include a commitment to protect any River Red Gums located on Bowmans Creek from impacts from the Project.

As outlined in Section 5.5 of the EA a comprehensive assessment of potential flora and fauna impacts associated with the Project has been undertaken as part of the EA (refer to Appendix 7 of the EA). The purpose of this assessment was to determine the existing natural environment of the study area and potential impacts to flora and fauna as a result of the Project.

This assessment encompassed an area of approximately 1,600 hectares and was undertaken over a number of seasons since 2007. As part of these surveys two River Red gums were identified on the Hunter River over 500 metres to the south-west of the proposed Narama Extended Pit and over a kilometre to the south-east of the proposed Ravensworth North Pit. The assessment concluded that this area would not be significantly impacted by the Project.

While it is acknowledged that there is potential that River Red Gums to occur at Bowmans Creek, due to the minimal potential for the Project to impact the alluvial groundwater system associated with Bowmans Creek, these areas have not been surveyed as they were not identified as being potentially affected by the Project.

As outlined in **Section 2.3.1**, as part of the Site Water Management Plan for the Project, Ravensworth Operations will augment the existing groundwater monitoring program as part of the Project and develop appropriate trigger levels to identify potentially significant impacts on surrounding groundwater systems, and the development of protocols to effectively manage and mitigate any identified groundwater impacts. The development of the site water management plan will be prepared in consultation with NOW to the satisfaction of the Director-General.

Despite the prediction of negligible depressurisation of alluvial groundwater systems associated with the Project, in recognition of the importance of this issue, Ravensworth Operations will commit to the development of remedial and recovery plans for identified stands of *Eucalyptus camldulensis* along the Hunter River in the southern extent of the Project area (refer to Figure 5.23 of the EA), on land controlled by Ravensworth Operations. The development of these plans will seek to be consistent with the other recovery plans for groundwater dependent ecosystems in the Hunter Valley, such as Rio Tinto Coal and Allied Hunter Valley Operations South and Carrington Sites.

ACOL notes that the EA predicts that the Project will not cause additional drawdown in the Bowmans Creek alluvial aquifer. This is contrary to the predictions made in ACOL's groundwater assessment for the Bowmans Creek Diversion Project (DA 309-11-2001 MOD 6).

A comprehensive assessment of potential groundwater impacts associated with the Project was prepared by Mackie Environmental Research as is presented as Appendix 9 of the EA. The assessment of potential groundwater impacts was prepared in accordance with the DGR's and relevant water planning policies and utilised a computer based model of regional groundwater systems over a total area of 240 square kilometres. The model incorporated properties such as the permeability of geological strata, surface drainage networks (including Bowmans Creek) and existing approved mining operations that occur in the region. Model simulations were completed for the proposed 29 year mining period.

The groundwater impact assessment found that drawdown impacts to Bowmans Creek have already occurred as a result of historical and other regional mining operations within the vicinity of the Project area. The groundwater model predicts that, with the Project occurring, baseflows in Bowmans Creek will be virtually identical to the current situation, and that the impacts of the Project on this creek will be negligible.

Ravensworth Operations has not undertaken a detailed review of the groundwater assessment prepared for ACOL's Bowmans Creek Diversion Project (Bowmans Creek Diversion: Groundwater Impact Assessment Report prepared by Aquaterra 21 October 2009). However, it is noted that Section 6.2.1 of that assessment states that the model includes *'existing open cut mines such as the Narama pit and the former Ravensworth open cut'* as part of this assessment. The assessment has not specifically included the potential contributions drawdown associated with the Narama Extended and Ravensworth North Pits associated with the Project. This assessment concludes that baseflows in Bowmans Creek have been reduced by existing operations. As outlined above, this is consistent with the findings of the groundwater assessment prepared for the Project.

2.7.2.9 Cumulative Impacts

ACOL believes that Ravensworth Operations should be required to establish an appropriate monitoring network so that a distinction can be made in the source of dust, noise and vibration emissions from the two mines.

As described in Section 2.1.4.1 of the EA Ravensworth Operations has an established Environmental Management System (EMS) which provides for the environmental management and monitoring of air quality, noise, water and blast overpressure and vibration impacts. The existing environmental monitoring network utilised by this system includes:

- air quality monitoring network including 17 dust depositional gauges, five directional dust gauges, five High Volume Air Samplers (HVAS) and one continuous dust monitor (TEOM);

- water quality monitoring network including 41 surface water monitoring locations and seven peizometers to monitor groundwater;

- blast monitoring network comprising six blast monitoring units including two on-site blast monitors for both Narama mine and Ravensworth West mine; and

- attended and unattended noise monitoring undertaken at four receivers on a six-monthly basis over a 72 hour period, and one continuous noise monitoring location.

The EA describes how Ravensworth Operations existing monitoring network would be expanded for the Project. Section 6.0 of the EA (the Statement of Commitments) describes Ravensworth Operations commitments to expanding its existing environmental monitoring network to include, in addition to the monitors described above:

- use of real-time air quality monitor/s (TEOM) incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising dust impacts by modifying operations when monitoring indicates that dust levels in the surrounding area are approaching relevant criteria;

- use of a real-time directional noise monitor, incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising noise impacts by modifying operations when monitoring indicates that potential impacts may occur;

- Ravensworth Operations will install a continuous noise monitoring unit between the Project and Camberwell Village that is capable of discerning the direction from which a noise emanates and the contribution the noise source makes to the cumulative noise level;

- Ravensworth Operations will investigate any reported exceedances of noise criteria at private residences on a case by case basis. Should site specific monitoring or real-time monitors indicate adverse noise impacts from the Project, Ravensworth Operations will investigate reasonable and feasible measures to mitigate noise at the affected receiver;

- detailed monitoring of blasts over the life of the mine at relevant blast sensitive locations including real time monitoring at Coal & Allied's Hunter Valley Operations overland conveyor and Camberwell Church;

- development of a blast protocol to consider the interaction of the Project with Ashton Coal's underground mine, which is being undertaken as part of the Narama Extended Project. This protocol will apply, as relevant, to the Project;

- establishment of additional surface water quality monitoring points at Davis Creek;

- integration of groundwater monitoring with the existing Ravensworth Underground Mine groundwater monitoring program;

- installation of new monitoring piezometers at locations adjacent to Bowmans Creek and the Hunter River and

- construction of piezometers in rehabilitated spoils emplaced within the pit during the course of mining to monitor water level recovery and water quality post-mining. These piezometers would be constructed in shallower parts of the pit due to technical difficulties associated with bore construction on spoils.

Through the continued implementation of Ravensworth Operation's EMS and the implementation of the additional environmental monitoring activities described in the EA, Ravensworth Operations will be able to continue to monitor its environmental performance and determine its level of compliance with regulatory requirements such as its Environmental Protection Licence.

2.8 Other Submissions

2.8.1 Overview

As outlined in **Section 1.1**, ten submissions were received from other sources including a regional environmental group and nine residents from the area surrounding the Project and from other parts of upper Hunter Valley, such as Singleton. Consultation activities with local residents commenced in 2008 and continued throughout the preparation of the EA. Consultation activities undertaken with local residents during preparation of the EA included:

- circulation of community information sheets and brochures, including Ravensworth Operations bi-annual newsletter *Face to Face*;

- individual meetings with surrounding landholders in close proximity to the Project and meetings with the Ravensworth Operations Community Consultative Committee;

- Community Information Days held at Ravensworth Homestead and Glennies Creek Hall in March and December 2009 respectively to provide local community members with an opportunity to discuss the Project and the results of the EA. Feedback sheets were issued to all participants at these days; and

- circulation of the *Environmental Assessment Update* during the December 2009 Community Information Day to provide a summary of key findings of the EA.

Generally, the submissions received from these sources were generally concerned with regional issues associated with coal mining, such as cumulative air quality and noise impacts, regional biodiversity and water management impacts, health impacts associated with elevated dust levels and the consideration of community concerns by the government as part of the approval and regulation of mines in the area. Several submissions raised specific issues with the Project, including the potential for noise and ecological impacts; and issues associated with site rehabilitation. One submission from a local resident was supportive of the Project.

Ravensworth Operations recognise that the cumulative impacts from the simultaneous operation of a number of coal mines are a significant issue for the community of the upper Hunter Valley. Ravensworth Operations also recognises that the role it plays in contributing to these impacts and as such has developed the Project so that potential environmental impacts on local residents and the surrounding environment are minimised as far as practicable.

The measures Ravensworth Operations has implemented during the design of the Project to minimise the potential for offsite impacts include:

- the integration of a number of existing approvals for open cut mining and infrastructure within the Project area to allow for a consistent and integrated approach to be taken to environmental management within the Project area;

- integration of the Project and existing infrastructure, thereby reducing the need to disturb land for additional infrastructure. Existing infrastructure that will be utilised for the Project includes: electricity, water, water and tailings management and coal handling infrastructure;

- limitation of mining operations to the south of Davis Creek despite the presence of viable coal resources within this area This has resulted in the conservation of significant ecological and archaeological features within the creek and to the north, and has reduced the overall planned area of disturbance by approximately 490 hectares;

- maximising the use of previously disturbed land, including locating the major overburden dump associated with the Project on voids and disturbed areas associated with the former Ravensworth South, Ravensworth No. 2 and Narama operations, despite this resulting in additional costs due to longer haulage distances;

- designing the eastern overburden emplacement area to progress in front of the proposed open-cut mining operations, to provide a substantial barrier to limit potential air quality, noise and visual impacts to receivers located to the south-east and east of the Project area;

- commitment to maximising the progressive rehabilitation of disturbed areas associated with the Project to minimise air quality impacts and provide for an improved final landform across all existing and proposed disturbed areas within the Project area; and

- The design of the eastern out of pit overburden emplacement area has been undertaken in the context of balancing potential air quality, noise and visual impacts for this area to receiver areas located to the east and south-east of the Project area. This has been achieved through the restriction of overburden emplacement on the western extent of an existing ridgeline formed from the rehabilitation of the former mining operations, and the limitation on the height of this out of pit overburden emplacement area to minimise potential air quality and noise impacts.

In addition to these measures, Ravensworth Operations is committed to retain and extend its existing Environmental Management System (EMS). This system provides for the environmental management and monitoring of the potential environmental impacts associated with the Project. Section 6.0 of the EA describes the commitments Ravensworth Operations has made to extending their EMS to effectively manage potential environmental impacts from the Project, these include:

- use of real-time air quality monitor/s (TEOM) incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising dust impacts by

modifying operations when monitoring indicates that dust levels in the surrounding area are approaching relevant criteria;

- use of a real-time directional noise monitor, incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising noise impacts by modifying operations when monitoring indicates that potential impacts may occur;

- installation of a continuous noise monitoring unit between the Project and Camberwell Village that is capable of discerning the direction from which a noise emanates and the contribution the noise source makes to the cumulative noise level;

- investigation of any reported exceedances of noise criteria at private residences on a case by case basis. Should site specific monitoring or real-time monitors indicate adverse noise impacts from the Project, Ravensworth Operations will investigate reasonable and feasible measures to mitigate noise at the affected receiver;

- detailed monitoring of blasts over the life of the mine at relevant blast sensitive locations;;

The following sections provide details of the issues raised in submissions received from local residents and Ravensworth Operations response to these issues.

2.8.2 Environmental Assessment and Approval Process

2.8.2.1 Adequacy of the Environmental Assessment

The EA inadequately considers the regional significance/context of the proposal in all but a few specific aspects. Issues of regional scale such as visual impacts, night lighting effects on biodiversity, environmental monitoring, and threatened species and biodiversity considerations have not been taken into account at the appropriate regional/landscape scale to allow for meaningful decision making.

The overview of cumulative impacts considers impacts only from a site specific perspective, and provides an inadequate assessment of cumulative impacts at the appropriate scales. In particular, greenhouse, biodiversity and water quality impacts are not appropriately considered because for a cumulative assessment these must be considered at the national, regional and catchment scales respectively.

Section 75F of the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides requirements for the preparation of Environmental Assessments for major Projects in NSW. Clause 3 of this section states *'The Director-General is to notify the proponent of the environmental requirements'.* The Director-General of the Department of Planning provided EA requirements (DGRs) for the Project on 5 October 2009 and these are provided in Appendix 2 of the EA. The DGRs for the Project require Ravensworth Operations to undertake an assessment of the potential impacts of all stages of the Project, including cumulative impacts. As noted above, cumulative impacts associated with the Project have been comprehensively assessed as part of the preparation of the EA for the Project in accordance with the DGRs.

The EA does not comply with the Environmental Planning and Assessment Regulation 2000 in that it does not analyse feasible alternatives adequately, and does not adequately assess the proposal in accordance with ESD principles.

Section 75F of the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides requirements for the preparation of Environmental Assessments for major Projects in NSW. Clause 3 of this section states *'The Director-General is to notify the proponent of the*

environmental requirements'. The Director-General of the Department of Planning provided EA requirements for the Project on 5 October 2009 and these are provided in Appendix 2 of the EA. These requirements state:

'The Environmental Assessment of the Project must include:

- *a detailed description of the Project, including: alternatives considered, including justification of the proposed mine plan; and*

- *a conclusion justifying the Project, taking into consideration: the suitability of the site; the economic, social and environmental impacts of the Project as a whole; and whether the Project is consistent with the objects of the Environmental Planning and Assessment Act 1979*.

Section 5 of the EP&A Act provides the objects of the Act, which include: *To encourage: ecologically sustainable development* (ESD). As such, an assessment of the Project against the principles of ESD was undertaken and is provided in Section 7.4 of the EA. The definition of the principles of ESD was taken from the definition provided in Section 6 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

Section 2.10 of the EA provides a detailed assessment of alternatives that were considered to the Project, including:

- alternative mine plans and mining methods, including the potential for underground mining operations within the Project area;

- alternative coal handling and processing infrastructure;

- alternative mine infrastructure locations, including a range of considerations for the proposed Lemington Road realignment; and

- various options for environmental management controls and offsets.

The assessment of the Project in the context of the principles of Ecologically Sustainable Development and an assessment of Project alternatives have been undertaken as part of the EA in accordance with DGRs.

Carrying out of the mine does not comply with one of the principal aims of the Singleton Local Environmental Plan 1996 (LEP). Clause 2(g) of the LEP seeks 'to encourage adoption of land management practices which are sustainable over long periods of time without degradation of natural environmental systems'. This proposal is clearly contrary to that aim. Similarly, the development does not conform with the zone objectives outlined in Clause 10b of the LEP.

As outlined in Section 3.2.1 of the EA (p 3.2), the Project is located wholly within the area to which the Singleton Local Environmental Plan 1996 (Singleton LEP) applies. However, Section 75R of the EP&A Act provides that environmental planning instruments, other than SEPPs, do not apply to projects approved under Part 3A of the Act, other than as detailed below.

Under Section 75J(3) of the EP&A Act and clause 8O of the EP&A Regulation, the Minister cannot approve the carrying out of a project that would be wholly prohibited under an environmental planning instrument and is not the subject of an authorisation or requirement under section 75M to apply for approval of a concept plan.

The land which is the subject of the Project Application is located wholly within Singleton LEP zoning Rural 1(a). Coal mining is a permissible land use within zone 1(a) with development consent. As mining is permissible in the whole of the Project area, the Minister can approve the Project pursuant to Section 75J(3) of the EP&A Act and clause 8O of the EP&A Regulation and the Project does not require the approval of a concept plan.

Notwithstanding the above, the Project area is zoned Rural 1 (a) under the Singleton LEP. The primary objectives of zone Rural 1(a) relevant to the post mining land use of the Project area include:

- to protect and conserve agricultural land and to encourage continuing viable and sustainable agricultural land use;
- to promote the protection and preservation of natural ecological systems and processes; and
- to maintain the scenic amenity and landscape quality of the area.

As outlined in Section 5.1.3.2 of the EA (p 5.10), the proposed post mining land use (refer to Figure 5.7 of the EA) is consistent with the objectives of the Rural 1(a) zone under the Singleton LEP. The rehabilitation of the site for use as woodland and pasture land is consistent with the objective to protect and conserve agricultural land, and to promote the protection and preservation of natural ecological systems and processes. The proposed habitat corridors will link existing areas of vegetation in surrounding areas. The rehabilitation strategy for the site is also consistent with the objective of maintaining scenic amenity and landscape quality of the area, through the strategic plantings of vegetation.

2.8.2.2 Regulation

Should any breaches of relevant regulatory requirements occur, the mines should incur a payment to the victims each time but has to be multiple thousands because ultimately they deserve it.

Penalties for pollution of the environment are administered by DECCW under the *Protection of the Environment Operations Act 1997*. As outlined in Table 3.3 of the EA (p 3.3) an Environment Protection Licence, to include the increased coal mining production, processing rates, water discharge and monitoring points will be required for the Project. Ravensworth Operations will continue to manage all operations in compliance with relevant statutory provisions including compliance with relevant EPL requirements.

2.8.2.3 Land Acquisition Process

Land values in the Camberwell/Ravensworth area are already severely affected by the surrounding mining operations. Valuations given by the mining companies are often far below relocation costs. Properties should be valued as though surrounding lands are still rural and not surrounded by numerous coal mines.

The comprehensive environmental assessments undertaken for the Project have identified one residence that will be significantly impacted by the Project. As outlined in the EA, Ravensworth Operations are undertaking ongoing consultation with this landholder with regards to the most appropriate mechanism for the management of the predicted significant impacts associated with the Project, including the potential acquisition of this land.

In addition, the comprehensive air quality impact assessment has identified the potential for the exceedence of relevant short term DECCW air quality criteria to at three residences to the south east of the Project area, under worst case meteorological conditions. Ravensworth

Operations have committed to minimising air quality impacts on surrounding areas over the life of the Project through the implementation of a range of management strategies and to minimise the potential for noise emissions from the Project. An integral aspect of the management of potential noise impacts is the implementation of an extensive noise monitoring program, which incorporates the use of a continuous noise monitor within the area surrounding the Project.

Ravensworth Operations maintains a network of 17 dust deposition gauges, five directional gauges and five High Volume Air Samplers (HVASs) to monitor dust levels surrounding their existing operations. In addition to this, Ravensworth Operations has recently installed a continuous dust monitor (TEOM) at a private residence to the south-east of the Project area. This array of monitors measures the existing dust deposition and TSP and PM_{10} concentration levels in the air from all sources. The TEOM is fitted with an alarm to notify the operation when relevant criteria is being approached to enable proactive management of the operation to ensure compliance with the relevant criteria in surrounding areas.

Ravensworth Operations is currently required to undertake land acquisition in accordance with the procedures specified in the relevant development consents applying to its operations. Any land acquisition required for the Project will be undertaken in accordance with any requirements specified by the Department of Planning in the Project approval.

2.8.3 Air Quality

2.8.3.1 Cumulative Dust Impacts

A number of community submissions raised concerns in relation to the contribution of the Project to cumulative air quality impacts within the surrounding areas. The key issues raised within the submission in relation to this issue include:

We live slightly south east of the Project area and could expect dust carried by north westerly winds. Dust is already a problem from existing mines i.e. Mt Owen, Ravensworth East, Glendell, Ashton and Integra. All these mines have dust and noise systems in place and yet we still receive significant effects.

The accumulative effect of any extra dust and noise is just becoming unbearable.

As outlined above, Ravensworth Operations recognise that the cumulative impacts from the simultaneous operation of a number of coal mines are a significant issue for the community of the upper Hunter Valley. Ravensworth Operations also recognises that the role it plays in contributing to these impacts and as such has developed the Project so that potential environmental impacts on local residents and the surrounding environment are minimised as far as practicable.

A comprehensive air quality assessment was prepared for the Project following the procedures outlined in the *'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'* (DEC, 2005). The comprehensive air quality assessment is provided as Appendix 4 of the EA. A summary of this assessment is provided in Section 5.2 of the EA.

The assessment used a modified version of the US EPA ISCST3 model, referred to as ISCMOD. ISCMOD is a computer-based dispersion model that predicts ground-level dust concentration and dust deposition levels, due to the potential dust generating activities associated with the Project. The dispersion modelling takes account of local meteorology and terrain information, and uses dust emission estimates to predict air quality impacts for six conceptual years of operation (Years 3, 5, 10, 15, 20 and 25). Dust emissions estimated for mining operations at Narama Mine were included in the Year 3 scenario. The modelling of dust emissions associated with the Project also considers the cumulative effect of the Project

with other sources of dust including approved mining operations and other sources of dust associated with activities such as agricultural land uses and transport.

The air quality assessment indicates that dust emissions from the Project will make only a marginal contribution to dust levels at Camberwell Village, located approximately 5 kilometres to the south-east of the Project area. In addition, Project specific dust emissions are predicted to meet all relevant long term DECCW air quality criteria at the nearest private residences.

The air quality assessment has indicated that during periods of worst case meteorological conditions, dust concentration levels associated with the Project are predicted to exceed the relevant short term maximum DECCW air quality criteria for PM_{10} (24 hour maximum) at up to three private residences surrounding the Project area.

As described in Section 5.2.7 of the EA, minimising the potential air quality impacts of the Project on the surrounding area has been a key consideration throughout the development of the conceptual Project design. In addition to the dust minimisation strategies built into the design of the Project, specific dust suppression measures that have been incorporated into the Project design and include:

- enclosures on top of overland conveyors;
- spray systems for permanent raw and product coal stockpiles;
- design and implementation of procedures to control dust emissions which may be generated from trafficable areas, coal preparation and handling, dragline operations, pre-strip operations, blasting, drilling and stemming;
- progressive site rehabilitation and revegetation, including undertaking progressive rehabilitation as close as possible to mining operations to minimise disturbed areas; and
- haul road and raw coal dust suppression.

In addition to the controls incorporated in the design of the mine, Ravensworth Operations will continue to implement current air quality controls to provide ongoing management of potential air quality impacts associated with the Project. These include

In addition to dust suppression controls, Ravensworth Operations has committed to implementation of an extensive air quality monitoring system, which will build on the extensive air quality monitoring network associated with its existing operations. This includes an extensive array of dust deposition, directional dust deposition, High Volume Air Samplers (HVAS)_and a recently installed continuous dust monitor (TEOM). An integral aspect of the air quality monitoring program that will be developed for the Project is the installation of an automatic alarm system to the continuous monitor. This will send a message to key mine personnel to indicate measured dust levels are approaching relevant DECCW air quality criteria limits in the surrounding area. This will enable mine operators to review mining operations during periods of elevated dust levels to minimise potential dust emissions from the Project.

The continuous monitor (TEOM) has been located on the ridgeline to the south-east of the Project area, which will provide a reference point for the proactive management of potential air quality impacts for the life of the Project.

2.8.3.2 Air Quality Monitoring

In addition to the concerns raised by surrounding landholders in relation to the contribution of the Project to cumulative dust impacts, a number of community submissions requested a review of accepted air quality monitoring practices as part of the Project. These concerns included:

We fully support any investigative research and monitoring of the dangerous pollutants that exist in our environment caused by the industrialisation of our valley. We request that all possible dust suppression and monitoring be initiated to reduce dust emissions.

There must be a stop to any new mines or extensions to present mines until a number of PM 1 and PM 2.5 monitors are set up, namely in Camberwell, Jerry's Plains and Singleton township.

We have to measure all the air pollutants, not just the PM10 sized dust. There are 37 identified pollutants including: hydrochloric acid, sulphuric acid, mercury, formaldehyde and cadmium. What damage to human health do these cause? What about the orange haze that hangs over the valley? Full of chemical pollutants.

Ravensworth Operations uses a TEOM to monitor PM_{10} levels. At present, there is no applicable monitoring criterion for $PM_{2.5}$, therefore analysis and interpretation of any data collected is not possible within the current statutory requirements for coal mining operations within NSW. As outlined in Section 5.2.7 of the EA, Ravensworth Operations is committed to maintaining and enhancing its existing air quality monitoring network, including the use of continuous PM_{10} monitors (TEOMs), to ensure that air quality impacts caused by the Project are identified and mitigated in as short a timeframe as possible.

Ravensworth Operations recognise that cumulative dust impacts are a significant issue for the community of the upper Hunter Valley. However, a comprehensive air quality assessment prepared for the Project (refer to Section 5.2 and Appendix 4 of the EA) has found that the Project will not cause exceedances of relevant long-term DECCW PM_{10} air quality criteria at all nearby private residences, with the exception of one residence that has an existing private agreement with Ravensworth Operations. Whilst the potential for the exceedence of short term (24hr) DECCW PM_{10} air quality criteria during worst case meteorological conditions has been indentified, Ravensworth Operations have committed to minimising air quality impacts on surrounding areas over the life of the Project.

When the Project is considered as operating in conjunction with other nearby mines, and other sources of airborne dust within the region, the assessment determined that the Project would only make a marginal contribution to dust levels at Camberwell Village.

2.8.3.3 Health Effects of Dust

In addition to the concerns raised by surrounding landholders in relation to the contribution of the Project to cumulative dust impacts, a number of community submissions raised concerns regarding potential health impacts from dust. These concerns included:

Surely the government has a 'duty of care' to the next generation growing up here. Asthma, sinusitis, coughs, allergies, cancer, motor neurone and other disease numbers are way above the average of other regions.

The Upper Hunter Air Quality Monitoring Network Advisory Committee is being set up in the near future, but when will this happen?

We are requesting a health study to be done for the village before any more mining is approved.

The health study of Camberwell and the accumulative effect of the area has to be done first, and this needs to be discussed with all parties first, but the priority is Camberwell.

As described in Section 3.3.4.1, a comprehensive air quality study was prepared for the Project by PAE Holmes and is provided as Appendix 4 of the EA. The assessment determined that the Project will only make a marginal contribution to dust levels at Camberwell Village, and is unlikely to cause exceedances of relevant long term DECCW air quality criteria at any privately owned residence in the local area, with the exception of one residence to the south of the Project area. Whilst the potential for the exceedence of short term (24hr) DECCW PM_{10} air quality criteria during worst case meteorological conditions has been indentified, Ravensworth Operations have committed to minimising air quality impacts on surrounding areas over the life of the Project.

DECCW's criteria have been developed in accordance with the standards developed by the National Environment Protection Council (NEPC) for the National Environment Protection Measure for Ambient Air Quality (NEPM) (1998). The NEPM was developed to provide ambient air quality standards that allow for the adequate protection of human health and well being.

Ravensworth Operations recognise that cumulative dust impacts are a significant issue for the community of the upper Hunter Valley. Ravensworth Operations are committed to the continued implementation of an extensive network of air quality monitors, including continuous monitors equipped with an automatic alarming system, to enable its operations to be proactively managed so that impacts to the surrounding area are minimised.

Air quality monitoring will be undertaken in accordance with air quality criteria specified by DECCW and enforced through Ravensworth Operations' Environmental Protection License (EPL), and any criteria specified in the Project approval. Ravensworth Operations will formally report the results of its air quality monitoring program to DECCW and DoP annually in its Annual Environment Management Report (AEMR).

As discussed in **Section 2.8.3.2** and Section 5.2 of the EA, Ravensworth Operations will continue to implement a range of specific management strategies and procedures to minimise the potential for dust emissions from the Project.

Ravensworth Operations is supportive of programs that seek to share environmental monitoring data in the upper Hunter Region and is an active participant, as an Xstrata Coal NSW operation, in the Upper Hunter Air Quality Monitoring Network (refer to Section 2.1.4.4. of the EA). Ravensworth Operations, and XCN, will continue to work with the government in the development of these regional monitoring systems.

2.8.3.4 Water Storage Impacts

All water tanks, whether they are domestic or for livestock use should be tested for harmful pollutants on a regular basis. The government should shoulder these costs performed by an independent company.

A comprehensive air quality assessment prepared for the Project determined that the Project would only make a marginal contribution to airborne dust at the majority of privately owned residences in the local area. It is therefore considered that the Project is unlikely to significantly contribute to dust and other pollutants which may settle in local water storages.

Ravensworth Operations is supportive however, of any program which may be implemented to protect water tanks and potable water storages at private residences in the local area. Ravensworth Operations considers it imperative that such a program be independently facilitated to ensure an equitable distribution of costs is shared with other mining companies in the local area who may also contribute to airborne dust.

2.8.4 Noise

Noise will increase due to larger and more powerful equipment being used in this larger, expanding operation. Mining operation hours need to be restricted. This will restrict noise and dust levels whist still providing employment. Other mining operations have had production hours restricted without ill effect.

A key aspect of Project design was the minimisation of environmental impacts, including noise emissions, where practicable. This included restrictions on the location and height of the proposed eastern out of pit emplacement area, and appropriate noise attenuation of selected mine plant and equipment.

In addition, a detailed noise assessment was prepared for the Project in accordance with the DECCW Industrial Noise Policy (INP) (refer to Section 5.3 and Appendix 5 of the EA). This assessment examined potential noise impacts specifically associated with the Project and cumulative impacts that may occur from the simultaneous operation of the Project and other existing mines in the area. The noise impact assessment has considered the proposed operation of the Project on a 24hour, 7 days per week basis.

The noise assessment has indicated that the operational noise levels from the Project will be lower than relevant noise criteria within Camberwell Village. Under worst-case weather conditions, exceedences of noise criteria were predicted at one residence to the south and another to the south-east of the Project area. Ravensworth Operations has consulted with these residents regarding these impacts and will continue over the life of the Project to mitigate potential noise impacts

Ravensworth Operations will continue to implement a range of management strategies and to minimise the potential for noise emissions from the Project. An integral aspect of the management of potential noise impacts is the implementation of an extensive noise monitoring program, which incorporates the use of a continuous noise monitor within the area surrounding the Project. The continuous noise monitor will be equipped with an automatic alarming system to enable Ravensworth Operations to proactively manage noise emission levels from the Project. The noise monitoring program will be based on the use of continuous noise monitors and will include noise monitoring at locations representative of the surrounding area. The monitoring program will integrate with existing monitoring programs associated with surrounding XCN operations operating in the area with strategically placed equipment designed to complement the coverage provided by existing systems

2.8.4.1 Health Effects of Noise

The noise on human health has never been taken into account; otherwise there would have been consistent conditions to meet the Australian Standard on building structures in rural areas and the noise levels, and outside conditions in which the victim has no control over the noise environment. Until the removal of mines within close proximity to Camberwell and surrounding district, this will not be achieved, the amount of homes own by mining companies should not be a factor, and the factor is health and the responsibility to protect any individual.

A detailed assessment of noise impacts was undertaken for the Project, which predicts that the Project will not cause perceptible noise impacts to any private residences, with the

exception of two properties that may be impacted during worst-case noise enhancing weather conditions.

The characteristic noise levels predicted at these residences are not considered to have the potential to cause physical or annoyance impacts, as the predicted noise levels would only be perceptible above background noise levels, would not exhibit any tonal properties and would occur infrequently, only during worst-case noise enhancing conditions which generally occur during night-time at winter.

Ravensworth Operations will continue to implement a range of management strategies and to minimise the potential for noise emissions from the Project. An integral aspect of the management of potential noise impacts is the implementation of an extensive noise monitoring program, which incorporates the use of a continuous noise monitor within the area surrounding the Project. The continuous noise monitor will be equipped with an automatic alarming system to enable Ravensworth Operations to proactively manage noise emission levels from the Project. As outlined above, the noise monitoring system will be integrated with existing monitoring programs associated with surrounding XCN operations operating in the area with strategically placed equipment designed to complement the coverage provided by existing systems.

2.8.5 Blasting

Blasting causes damage to our homes. Fallout from blasting also settles onto our home. These effects are exacerbated by cumulative effects.

Blasting in the area of Camberwell has got out of control, gaining dust from all four directions, and sometimes two blasts could happen at the same time and not once has our homes been repaired because it always comes back within the mines guidelines and the house is built on certain soils etc. but the bottom line is the homes are damaged due to un-natural movement and this also contributed to the stress placed on the owner and their health.

A comprehensive blasting assessment was prepared for the Project (refer to Section 5.5 and Appendix 6 of the EA) which identified and considered blast sensitive locations relevant to the Project and predicted the ability of the Project to operate while maintaining relevant ground vibration and blast noise levels at these residences.

As described in Section 5.4.4 of the EA, Ravensworth Operations will undertake detailed design of blasting to ensure that relevant blast vibration and air blast limits are met over the life of the Project. An integral aspect of this process is the continued implementation of blast monitoring systems, including the use of real-time blast monitoring and detailed pre-blast monitoring and review of meteorological conditions. This includes the continued implementation of the Ravensworth Operations Pre-Blasting Environment and Community Assessment Procedure, which includes the notification of neighbouring mines, relevant authorities, neighbouring properties and internal contacts prior to blasting.

2.8.6 Ecology

2.8.6.1 Flora and Fauna Impacts

What are they planning to do with the nocturnal species? Possums will be sleeping during daylight and brushtails cannot be relocated. Some species cannot be relocated and will die. When the trees have been removed no-one will know what has been killed.

As discussed in Section 5.5.7 of the EA, Ravensworth Operations has sought to avoid and minimise potential impacts on the ecological values of the Project area throughout the Project planning process.

A detailed ecological assessment was also prepared for the Project (refer to Appendix 7 of the EA), which included the development of flora and fauna management commitments for the Project. These commitments incorporate ecological management and monitoring strategies Ravensworth Operations have implemented for its existing operations and include management of remnant vegetation, pre-clearance surveys, fauna habitat creation and ecological monitoring.

In relation to clearance activities, Section 5.8.7 of Appendix 7 of the EA specifies impact mitigation strategies that would be employed to protect and manage animal species and their habitat. These include:

- development of a tree felling procedure which will consider a number of factors, including:
    - seasonal considerations such as the avoidance of large scale clearing during breeding seasons of target threatened fauna species;
    - maximising the salvage and re-use of cleared tree hollows; and
    - the salvage of specific habitat features such as hollow logs, fallen timber and rocks.

The tree felling procedure will include:

- comprehensive pre-clearing surveys, including detailed searches for threatened flora and fauna species, including micro-bats;
- removal of non hollow-bearing trees/vegetation as close to the hollow-bearing tree felling date as possible (in order to discourage fauna usage of the area);
- detailed hollow-bearing tree felling procedures, including (but not limited to):
    - supervision of all hollow-bearing tree felling works by a suitably experienced and licensed person;
    - visual canopy inspections on the day of felling of hollow bearing trees;
    - shaking of hollow-bearing trees (with heavy machinery) for at least 30 seconds to encourage resident animals to abandon the tree prior to felling;
    - lowering of hollow-bearing trees as gently as possible with heavy machinery;
    - inspection of hollows in felled trees;
    - capture of any displaced/injured animals;
    - release of unharmed animals into nearby secure habitats;
    - injured animals to be assessed and taken to a wildlife carer, if necessary;
    - placement of felled trees so that the number of hollows blocked against the ground are minimised;
    - leaving any felled trees in place overnight to allow any unidentified animals to escape; and
    - salvage of suitable hollows for treatment and installation within rehabilitation and revegetation areas as compensatory habitat, where practicable.

All personnel who will capture/handle/house and/or transport native fauna species (injured or uninjured) will be appropriately licensed under the requirements of the NSW Animal Ethics Committee.

The loss of 871 ha of vegetation, including old growth trees and threatened species is just not on. The removal of these trees does not comply with the laws in regards to their removal.

The flora and fauna once there will be gone – we have many endangered animals and if their homes are destroyed where are they supposed to live? How are they expected to survive?

A comprehensive ecological assessment was prepared for the Project and is presented as Appendix 7 of the EA. Section 5.5 of the EA provides a summary of this assessment, which included detailed surveys of the Project area undertaken over a period over multiple years and seasons, and the development of a Biodiversity Offset and Rehabilitation Strategy.

The Project is located within a large area of native vegetation on the central Hunter Valley floor, a landscape that has been heavily cleared and disturbed over a long period of time. As a result, vegetation remnants of the type and size occurring in the Project area are significant at local and regional scales.

Ravensworth Operations has sought to avoid and minimise potential impacts on the ecological values of the Project area throughout the Project planning process. This has included a substantial reduction in the overall disturbance area by approximately 490 hectares, the avoidance of direct disturbance of Davis Creek, a known endangered ecological community (EEC) habitat, and further reduction in disturbance to minimise impacts on identified threats to species including the green and golden bell frog (*Litoria aurea*).

Despite the extensive reduction in the overall disturbance area and resultant avoidance and minimisation of impacts to significant ecological features of the Project area, the Project does result in potentially significant ecological impacts. Ravensworth Operations has committed to a package of extensive measures that aim to further mitigate the identified ecological impacts associated with the Project, including a comprehensive Biodiversity Offset and Rehabilitation Strategy for the Project.

The Biodiversity Offset and Rehabilitation Strategy consists of a number of key components designed to address the impacts on EEC's and threatened species identified in the Project area. The key components of this strategy include:

- establishment, protection and enhancement of the Ravensworth North Offset Area and the Hillcrest Offset Area which will provide for the long term conservation of a range of significant ecological features including;
    - conservation of large areas of existing vegetation including a range of EECs and regionally significant vegetation, including the native vegetation communities to be disturbed by the Project;
    - enable direct offsetting of the impact of the Project on the green and golden bell frog (*Litoria aurea*), threatened woodland birds and micro-bats;
- development and implementation of biodiversity enhancement strategy for the proposed offset areas that aims to enhance the ecological value of these areas through enhancement of existing vegetation, habitat for threatened species, and the improvement of the biodiversity of the region;

- development of a comprehensive rehabilitation strategy for the proposed disturbance area, and existing disturbance areas within the Project area, to maximise the ecological value of rehabilitated areas; and

- the development of an appropriate ecological monitoring program to assess the success of the Biodiversity Offset and Rehabilitation Strategy in counterbalancing the impacts of the Project on ecological values.

Ravensworth Operations is currently negotiating with DoP and DECCW regarding finalisation of the Biodiversity Offset and Rehabilitation Strategy. Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP.

2.8.6.2 Regional Habitat Connectivity

The native vegetation on the site contributes to regional scale habitat connectivity. This issue has not been reviewed in the EA, nor has any quantitative assessment been made of the threatened species populations and the impact further fragmentation of habitat will have on these. A further review of these issues needs to be undertaken, including an update to the former Department of Mineral Resources synoptic plan for rehabilitation and habitat restoration for this site.

Section 2.0 of the Ecological Assessment for the Project (refer to Appendix 8 of the EA) describes the regional setting of the Project area, in order to adequately identify these values for consideration as part of the impact assessment and mitigation process. **Figure 2.1** provides an overview of the regional location of the Project area in relation to existing conservation areas within the broader Hunter Valley region and surrounds.

Section 2.7 of the Ecological Assessment prepared for the Project (refer to Appendix 7 of the EA) identifies location of the Project area in relation to connectivity of native vegetation within the Central Hunter Valley. Specifically, Figure 2.5 of the Ecological Assessment provides an overview of this, with a focus on the identification of connectivity with surrounding conservation areas and currently approved final landforms of surrounding mining operations.

The Ecological Impact Assessment (refer to Section 5.0 of Appendix 8 of the EA) considers a range of factors in assessing and identifying the ecological impacts of the Projects. This included the quantification of the areas of vegetation clearance and relation to these to documented records of regional distribution of the identified vegetation communities within the Hunter Valley (refer to Section 5.4 of Appendix 8 of the EA). In addition, the comprehensive assessment of impacts in relation to threatened species within the Project considers the quantified vegetation clearance aspects of the Project (Section 5.4) and the quantified loss of identified habitat (Section 5.5).

In addition Appendix E of the Ecological Assessment (refer to Appendix 8 of the EA), outlines the significance assessment completed for threatened species occurring or potentially occurring within the Project area. This assessment is undertaken in accordance with relevant considerations, which include the regional distribution of the species and its identified habitat, whether the species is adequately represented in conservation reserves and whether the species is at the know limit of its distribution.

As outlined in **Section 2.1.1**, the location of the proposed biodiversity offset areas provides for the development of broad regional vegetation linkages across the Hunter Valley Floor. To facilitate the development of future regional biodiversity corridors, the Biodiversity Offset and Rehabilitation Strategy has been designed to facilitate linkages with existing conservation areas within the region, and biodiversity offset areas established for the surrounding mining

operations within the Greater Ravensworth area. **Figure 2.3** provides an overview of the regional connectivity of the proposed Biodiversity Offset Areas and existing conservation areas in the broader region.

In addition, Ravensworth Operations will investigate potential opportunities for the provision of contributions to the development of regional biodiversity initiatives, in consultation with DECCW and DoP.

2.8.6.3 Rehabilitation

The Project involves 'rehabilitating all disturbed areas'. We have seen the mining version of 'rehabilitation' and short-term life trees planted in rows is not an attempt at restoring our environment for future generations.

One of the primary rehabilitation objectives of the Project is to *predominantly re-establish those vegetation communities and fauna habitats currently occurring in the Project area and connect as far as reasonably practical, the habitat areas to the north and south of the disturbance areas with a vegetated corridor.*

Section 5.1.3.3 of the EA describes strategies that will be implemented to achieve the rehabilitation objectives of the Project and maximise the visual and ecological benefits of rehabilitation. These include:

- locating trees where they will have the greatest visual and corridor continuity benefits, including locations such as slopes facing the New England Highway, and areas where they will form wildlife corridors;
- creating relatively large connecting areas of trees to provide significant habitat areas and wildlife corridors, rather than a larger number of smaller plots;
- positioning treed areas around slopes and across grade changes;
- creating irregular shaped treed areas with undulating edges, straight lines and rectangular areas will be avoided;
- tree species composition and density will be varied in order to create diversity; and
- elements such as drainage paths, contour drains, ridgelines and emplacements will be shaped, where possible, in undulating informal profiles in keeping with natural landforms of the surrounding environment. The diverse topography will provide opportunities for a greater diversity of plant species and communities over time.

Ravensworth Operations has committed to preparing a Rehabilitation and Offset Management Plan for approval by DoP within 12 months of receiving approval for the Project. This plan will provide detailed procedures for the implementation of the proposed rehabilitation objectives and strategies referred to in Section 5.1 of the EA. In addition to this, Ravensworth Operations has developed domain specific rehabilitation objectives and completion criteria for the Project, in response to a submission received by DI&I (refer to **Section 2.2.2**). This criteria form the basis for the rehabilitation planning and implementation over the life of the mine and the demonstrated achievement of these criteria will be required prior to statutory sign off of rehabilitation activities will be provided.

2.8.6.4 Adequacy of Biodiversity Offsets

This proposal continues the loss of important habitat for NSW listed threatened species, and for nationally listed species under the Environment Protection and Biodiversity Conservation Act 1999. The proposed development should be rejected on these grounds alone, unless adequate long term offsets can be provided which will ameliorate these impacts. The proposal contributes to a net loss of habitat and a loss of population of threatened species for at least a period of 50-100 years.

Revegetation should not be able to be used an offset until it has been created, whereas the proposal seeks to use this as an offset long before it even exists. This is clearly contrary to the objective of maintaining or improving the biodiversity conservation value of the region.

As outlined in **Section 2.1.1**, the proposed biodiversity offset areas will provide for the conservation of significant biodiversity values within the Hunter Region. Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP.

Ravensworth Operations have undertaken an extensive program of engagement with the DECCW and DoP throughout the preparation of the EA to discuss the proposed Biodiversity Offset and Rehabilitation Strategy. This consultation will be ongoing throughout the assessment and approval process with the view to obtain in principle support for the proposed Biodiversity Offset and Rehabilitation Strategy for the Project.

When considering the potential impacts of the Project, it is also important to consider its benefits. The EA identifies a range of local, regional and state benefits that will be created by the Project. These include economic benefits and the provision of ongoing domestic electricity supplies through the provision of ongoing coal supply for domestic power generators. These considerations, including the predicted impacts associated greenhouse gas emissions associated with the Project, as part of the assessment of the Project against the principles of ESD in Section 7.4 of the EA. As outlined above, this assessment was undertaken in accordance with the DGRs for the Project.

2.8.6.5 Security of Biodiversity Offsets

The security of the offset areas is not clear and should be an agreement in perpetuity. The commitment of the company to maintain cannot be accepted, given that other Hunter Valley Projects, including Mt Owen Mine and Warkworth have not met their legal commitments to offsets and are not mining, or proposing to mine in areas that have been committed for biodiversity offsets.

As outlined in Section 6.0 of the EA (Commitment 6.7.2 (p6.9)), Ravensworth Operations have committed to the implementation of a comprehensive Biodiversity Offset and Rehabilitation Strategy for the Project. This strategy will include establishment, protection and enhancement of the Ravensworth North Offset Area and the Hillcrest Offset Area, to provide for the long term conservation of a range of significant ecological features Ravensworth Operations has committed to the long term management of these areas for conservation. The specific mechanisms for the protection and management of the proposed offset areas will be developed in consultation with DECCW, to the satisfaction of DoP. Ravensworth Operations have updated the commitment to the long term protection of these areas in accordance with appropriate mechanism(s) to clarify the intent of this commitment (refer to **Appendix 1**).

2.8.7 Water

The development of the mine will continue unsustainable water use within the Upper Hunter Valley.

As stated in Section 5.6.1.7 of the EA, the proposed water management system has been designed to maximise water capture from rainfall yield, storm events and groundwater inflow for treatment and re-use for proposed operations. The additional extraction of water from natural sources, where required, would be undertaken in accordance with the water licensing process prescribed by the relevant Water Sharing Plan (*Water Management Act 2000)* and/or *Water Act 1912* provisions.

As part of the detailed design of the Project, Ravensworth Operations will undertake a detailed review of a range of water supply options for the Project, as outlined in the following order of priority:

1. Optimisation of water use/re-use on site through further investigations throughout the detailed design process for the Project.

2. The beneficial sharing and water use, transfers and storage within in the Xstrata GRWSS.

3. Use of existing entitlements to Hunter River extractions currently held by existing Xstrata operations within the Greater Ravensworth area.

4. Beneficial re-use and sharing of water with other water suppliers.

5. Secure additional water extraction licences in accordance with the water licensing process prescribed by the relevant Water Sharing Plan (*Water Management Act 2000*/*Water Act 1912*) provisions.

These water supply options provide Ravensworth Operations with a range of opportunities to effectively manage the predicted water deficit over the life of the Project, whilst minimising potential impacts to existing surface water resources external to the Project area.

2.8.8 Greenhouse and Energy

There are significant continuing greenhouse gas emissions from the Project. Greenhouse gas issues are given inadequate attention in the environmental assessment, notwithstanding the fact that the direct and indirect contribution of the proposal to greenhouse gas emissions is substantial and is probably the most important single environmental impact of the proposal. These issues should be crucial to the determination of the ecological sustainability of the proposal, and whether or not is should be approved.

A detailed quantitative analysis of greenhouse gas emissions associated with the Project was undertaken (refer to Appendix 13 of the EA), including analysis of the emissions associated with the combustion of end product coal.

When considering the potential impacts of the Project, it is also important to consider its benefits. The EA identifies a range of local, regional and state benefits that will be created by the Project. These include economic benefits and the provision of ongoing domestic electricity supplies through the provision of ongoing coal supply for domestic power generators. These considerations, including the predicted impacts associated greenhouse gas emissions associated with the Project, as part of the assessment of the Project against

the principles of ESD in Section 7.4 of the EA. As outlined above, this assessment was undertaken in accordance with the DGRs for the Project.

2.8.9 Cumulative Impacts

Why has the village of Camberwell been destroyed for a short term profit? On no term should this village be destroyed like Ravensworth, Camberwell is the only area left between Muswellbrook and Singleton, the amount of mining in the area is out of control. These company's will destroy and move on, the small amount of money placed into the area is a joke.

The land area which has now been deemed disturbed and overburden waste dumps in the upper Hunter has now caused a major concern for the community, in what land would be able to support after mining. The towns and villages will not be able to support the incomes of these residents and the value of homes will drop dramatically. There is not enough infrastructure and other industries which can support thousands. Therefore the economy now requires a more stable industry which will be here in 200 years, not one that leaves nothing and has no future after the resources have been removed.

These companies should be made responsible to re-train their workforce for future employment on closure of their mining leases. They have made billions from Australia on coal and there is no just reason why this should not be achieved.

Ravensworth Operations recognises that the local environmental impacts of dust, noise, visual, blasting and water are a primary concern for local residents and the residents of the nearby Camberwell Village. These issues were raised as part of the consultation program undertaken for the EA and were the subject of specific specialist studies as part of the EA. Ravensworth Operations have developed a range of management and monitoring measures to manage potential impacts they may cause. These measures are described in Sections 5.0 and 6.0 of the EA.

Ravensworth Operations is also committed to an ongoing Social Involvement Plan and will continue to engage the community and provide them with information regarding its operations. As outlined in commitments 6.15.3 and 6.15.4 of the Statement of Commitments in the EA, Ravensworth Operations commits to creating a number of benefits for local residents if the Project is approved, these include:

- maximising local employment and providing training and education opportunities through:
    - advertising employment, apprenticeships and traineeships in local or regional media as appropriate;
    - providing an employment pack that allows local residents to register their interest in employment opportunities at the Ravensworth Operations office;
    - sharing information about mining careers at Ravensworth Operations and corporate entity with local schools;
    - offering training opportunities through partnerships with local tertiary education providers;
    - participating in the corporate school scholarship program;
- formalising a policy that gives local residents employment preferences where they have the required skills and experience, and demonstrate a cultural fit with the organisation;

- provide access to the corporate careers centre via the Ravensworth Operations website so that local residents can easily register their interest in employment online;

- develop partnerships with other local organisations to promote employment opportunities in non-mining related sectors to the families of Ravensworth Operations; and

- Ravensworth Operations will continue to give preference to sourcing materials and services from local companies where all other factors are equal.

The Project will result in significant economic benefits to the Hunter Region, contributing approximately $1.1 billion in direct economic benefit due to employee and operating expenditure. The Project is considered to be consistent with Singleton Council's strategic plan, which identifies the need to facilitate economic development and to ensure the establishment of complementary business ventures within the LGA.

2.8.9.1 Regional Environmental Monitoring Program

The consolidation of existing consents should provide for the overall mining operation to contribute to positive sustainability initiatives including a contribution to funding an independent regional environmental monitoring program.

The general development monitoring program the company proposes to implement if the Project is approved is inadequate to be able to assess the development within a regional context, and to link with other regional air quality monitoring programs. This requires a program of regional monitoring undertaken by an independent authority. Ongoing management commitments given by the company are vague and unenforceable.

As outlined above, Ravensworth Operations is committed to retain and extend its existing Environmental Management System (EMS). This system provides for the environmental management and monitoring of the potential environmental impacts associated with the Project. The monitoring and management commitments outlined within the EA will be formalised into a range of statutory management plans and programs that will be developed in consultation with relevant stakeholders, including government agencies, for the approval of the Department of Planning (DoP). These plans and programs will be implemented over the life of the Project.

Ravensworth Operations is supportive of programs that seek to share environmental monitoring data in the upper Hunter Region and is an active participant, as an Xstrata Coal NSW operations, in the Upper Hunter Air Quality Monitoring Network (refer to Section 2.1.4.4. of the EA).

2.8.9.2 Agricultural Landuse Impacts

The mine wants to open cut fertile country and no agricultural land should be touched at all, just because they have bought it, this does not give you the right to deem this land infertile forever. The rehab on these dumps is substandard and there is no evidence to show that the trees will last and the grasses are now been choked out be galena weed that is destroying farm land now, the whole hunter will be taken over by weeds and overburden waste dumps, you should be disgusted what you are leaving for future generations to repair. Weed management programs are not implemented properly, yearly weed control is not managing the problem, and this requires to be inspected weekly.

The land capability within the Project area, as classified by the system according to Emery (undated), is presented on Figure 5.3 of the EA and updated to reflect the current land use within the Project area. The Project area consists of predominantly Class IV, V and VI land, which is suitable for grazing and limited or no cultivation. Large areas of Class VIII land, which is unsuitable for agricultural purposes, also occur throughout the Project area, particularly to the east. These areas are associated with current mining activities and voids associated with former mining operations that are currently actively used. Relatively small areas of Class I and II lands occur within the Project area on floodplains associated with the Hunter River and Bowmans Creek. These areas are associated with the construction of the proposed realigned 330kV transmission line. The relocated 330 kV transmission line will be of a similar design to the existing line. Towers are of single-circuit galvanised steel construction, with base footings include concrete footings of approximately 10 metres by 10 metres for towers on bends, and 8 metres square for the in-line towers, spaced at between 375 and 500 metres. Accordingly there the construction of the relocated 330kV transmission line represents a relatively low level of disturbance of the identified areas of Class I and II land within the Project area.

As described in Section 5.1.3 of the EA, one of the rehabilitation objectives for the Project is to *establish areas for sustainable grazing purposes, commensurate with adjacent land use types in the south-east of the Project area*. This section of the EA also provides preliminary rehabilitation criteria, which includes *no significant weed infestation such that weeds do not comprise a significant proportion of species in any stratum.*

As discussed in **Section 2.1.1**, Ravensworth Operations has committed to preparing a Rehabilitation and Offset Management Plan for approval by DoP within 12 months of receiving approval for the Project. This plan will provide detailed procedures for the implementation of the proposed rehabilitation objectives and strategies including those mentioned above. In addition to this, Ravensworth Operations has developed domain specific rehabilitation objectives and completion criteria for the Project, in response to a submission received by DI&I (refer to **Section 2.2**). This criteria form the basis for the rehabilitation planning and implementation over the life of the mine and the demonstrated achievement of these criteria will be required prior to statutory sign off of rehabilitation activities will be provided.

3.0 Revised Statement of Commitments

As part of the consideration of the issues raised through submissions on the Project, Ravensworth Operations have revised its Statement of Commitments for the Project, included as **Appendix 1**. The Revised Statement of Commitments updates Section 6.0 of the EA to reflect the required revisions of these commitments to address the relevant issues raised in the submissions on the Project.

APPENDIX 1

Revised Statement of Commitments

6.0 Statement of Commitments

The DGRs for the Project require that the EA includes a Statement of Commitments which details the measures proposed by Ravensworth Operations for environmental mitigation, management and monitoring of the Project.

If approval is granted under Part 3A of the EP&A Act for the proposed Project, Ravensworth Operations will commit to the following controls.

6.1 Compliance with the EA

6.1.1 To carry out the development for the Project generally in accordance with the Project Application and this EA report.

6.2 Surrender of Development Consents

6.2.1 Within 12 months of project approval Ravensworth Operations will surrender all other development consents that relate to activities that are adequately covered in the new project approval.

6.3 Life of Operation, Production, Concept Mine Plan and Product Delivery

Project Life

6.3.1 The project approval life will be for 29 years from the date of Project Approval. Closure and rehabilitation activities will be undertaken in accordance with an approved Mining Operations Plan, or other relevant approval under the Mining Act or equivalent, at the time of closure. These works may extend beyond the 29 year operational approval period.

Production Limits

6.3.2 The Project will produce up to 16 Mtpa of ROM coal from open cut mining methods within the Project area.

6.3.3 The Ravensworth Coal Handling and Preparation Plant will process up to 20 Mtpa of ROM coal per year incorporating ROM coal from the Project and other operations including RUM, Cumnock Wash Plant Pit and other potential users.

6.3.4 Up to 20 Mtpa will be loaded via the RCT loading facility, including coal from the Project, RUM, Cumnock Wash Plant Pit, Muswellbrook Coal and potential other users.

Hours of Operation

6.3.5 Mining and associated activities for the Project may be undertaken 24 hours a day, seven days a week.

6.3.6 Construction will generally be undertaken during daylight hours. Construction activities may occur outside these hours when Ravensworth Operations is satisfied

that such activities would meet relevant construction night-time noise criteria at the nearest private residences.

Refinement of Mine Plan

6.3.7 Any refinements to the concept mine plan outlined in this EA report will be detailed and assessed as part of Mining Operations Plans or other relevant process.

Product Delivery

6.3.8 Annual average and maximum daily train movements and tonnages, and tonnages of coal delivered locally by conveyor, will be reported in the Annual Environmental Management Report (refer to commitment 6.16.1).

6.3.9 No product coal will be transported from the Project area by public road transport except in an emergency situation and with the prior agreement of the Director General.

Rail De-linking

6.3.10 Prior to commencing increased loadings at Ravensworth Coal Terminal (RCT) above 8 Mtpa, Ravensworth Operations without contribution to costs by Coal & Allied, will complete design and construction of all related works including rail commissioning that will affect the de-linking of the Newdell Loop and the Ravensworth Loop. The de-linking (parameters defined below) of the loops will achieve separate track lane access onto the mainline known as the Main Northern Railway Line, for each of the Newdell Loop and Ravensworth Loop. The de-linking will be implemented in accordance with all legal and approval requirements. The consent and approval of all relevant landowners, being ARTC and Macquarie Generation, will be obtained prior to undertaking the proposed rail works

The conceptual design for the rail de-link as shown on **Figure 2.18** is the preferred option to complete the de-linking . If the preferred option for rail de-link is determined to be unachievable for reasons outside of Ravensworth Operation's control, then Ravensworth Operations will design, construct and implement an alternative option that will achieve the parameters defining an 'effective de-link', as outlined below.

The parameters for an effective de-link are:

- De-linking works to include the decommissioning of the existing rail that links the existing Ravensworth Loop to the existing bi-directional Newdell Line.

- The de-linking of the Newdell Loop and the Ravensworth Loop will comprise design, construction and rail commissioning works to achieve separated track lane access onto the mainline known as the Main Northern Railway Line, for each of the Newdell Loop and the Ravensworth Loop. The re-linking of the separated Ravensworth Loop to the Main Northern Railway will occur on the mainline itself south of the Newdell Junction.

- The de-linking of the Newdell Loop and the Ravensworth Loop works will be constructed and rail commissioned prior to RCT rail loadings exceeding 8 Mtpa.

Service Relocations

6.3.11 Powerlines will be relocated without interruption of supply to Coal & Allied or Orica, except where interruption of supply has been agreed to by Coal & Allied or Orica and the relevant service provider.

Orica Plant

6.3.12 As described in **Section 5.5.8.1** the protective pillar beneath the Orica explosives plant will be retained to ensure continuous safe operation of the site.

Lemington Road Realignment

6.3.13 Ravensworth Operations will undertake monitoring and management of subsidence impacts resulting from ACOL underground mining operations approved under DA309-11-2001 as modified and in force at the granting of Project Approval, for the portion of the Lemington Road realignment from the initial 1 kilometre from the existing intersection with the New England Highway.

6.4 Closure and Rehabilitation

6.4.1 Within 12 months of Project Approval, Ravensworth Operations will develop and submit to the Director-General for approval, a Rehabilitation and Offset Management Plan (ROMP) for the Project. The Plan will be developed in consultation with I&I, DECCW and Singleton Council. The plan will be revised on at least a five (5) yearly basis and will include:

- development of a rehabilitation and revegetation strategy for the Project to re-establish native vegetation communities consistent with the concept strategy described in this EA, Commitments 6.4 and 6.7;
- a conceptual closure plan developed in accordance with XCN standards for mine closure;
- completion criteria, determined in consultation with relevant agencies, that will be utilised to demonstrate achievement of rehabilitation objectives developed in accordance with the XCN Closure Criteria Development and Rehabilitation Monitoring standard. The achievement of the completion criteria will be monitored and reported within the AEMR; and
- monitoring of rehabilitated areas on at least an annual basis over the life of the Project to assess soil conditions and erosion, drainage and sediment control structures, runoff water quality, revegetation germination rates, plant health and weed infestation. The monitoring findings and resulting actions will be reported in the AEMR.

6.4.2 A detailed mine closure plan will be developed for the Project and submitted to the Director-General for approval at least five years prior to anticipated mine closure, in accordance with XCN standards for mine closure. The plan will be prepared in consultation with relevant stakeholders including DoP, I&I, Singleton Council, other relevant government agencies as agreed with DoP, and the local community.

6.4.3 The rehabilitation strategy for the Project will be integrated with the proposed Biodiversity Offset and Rehabilitation Strategy for the Project (refer to **Section 6.7**)

through creating extensive areas of woodland within rehabilitated areas associated with the Project that target the following vegetation communities:

- Central Hunter Box-Ironbark Woodland;
- Central Hunter Swamp Oak Forest;
- Central Hunter Bulloak Forest Regeneration; and
- Grassland.

~~6.4.4 Ravensworth Operations will re-establish Emu Creek within the rehabilitated landscape, and this will be designed in accordance with relevant guidelines and in consultation with the NSW Office of Water. The reinstated Emu Creek will resemble a natural creek system with native vegetation planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system and to enhance the in-stream and riparian habitat created.~~

6.4.4 Ravensworth Operations will re-establish Emu Creek within the rehabilitated landscape. The reinstated Emu Creek will be designed in accordance with relevant guidelines and in consultation with the NSW Office of Water (NOW). The reinstated Emu Creek will be re-established within a suitable substrate within the rehabilitated landform and will resemble a natural creek system with native vegetation planted along the drainage channels as part of the rehabilitation, to maximise the long term stability of the drainage system and to enhance the in-stream and riparian habitat created. The detailed design of the proposed reinstatement of Emu Creek will be undertaken in accordance with all relevant approvals from NOW.

6.4.5 Recovery and management of any topsoil will be undertaken in accordance with the controls provided in **Section 5.1.1.5**.

6.5 Air Quality

6.5.1 Measures to minimise dust emissions from the Project such as enclosures on top of overland conveyors, spray systems for permanent coal stockpiles, progressive site rehabilitation and revegetation, and haul road dust suppression will be included in the project design.

6.5.2 The Project will progressively rehabilitate disturbed areas, including the use of temporary rehabilitation on disturbed areas as appropriate to limit the potential for wind blown dust;

6.5.3 Ravensworth Operations will continue to implement a range of dust controls as part of the Project, including:

- watering of active mining areas and haul roads that are subject to frequent vehicle movements;
- all drill rigs will be equipped with dust control systems and be regularly maintained for effective use. These controls may include a combination of dust extractors, dust curtains, water injection systems and extraction systems;
- automatic sprays fitted to the dump hopper to minimise dust from coal processing activities;

- minimising the area of disturbance by restricting vegetation clearing ahead of mining operations and rehabilitating mine spoil dumps as soon as practicable after mining;

- restricting blasting activities to acceptable wind speed and direction periods; and

- use of real-time air quality monitor/s (TEOM) incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising dust impacts by modifying operations when monitoring indicates that dust levels in the surrounding area are approaching relevant criteria.

6.5.4 The existing air quality monitoring program, including the ongoing use of continuous air quality monitor/s, will be maintained (or as otherwise agreed with DECCW and DoP). Monitoring results will be compiled and reviewed at least monthly to determine the need for any operational or management change to minimise air quality impacts. Results will also be compiled and analysed annually and reported in the Annual Environmental Management Report (refer to commitment 6.16.1).

6.6 Noise and Blasting

Noise

6.6.1 Unless otherwise agreed with the landowner, Ravensworth Operations will manage operations associated with the Project (the project alone) such that the noise emissions from the Project comply with the noise criteria included in **Table 6.1** at privately owned residences. All reasonable and feasible noise management measures will be implemented as part of the Project with the aim of meeting the project specific noise levels.

Table 6.1 – Project Specific Noise Levels at Receiver Locations, dB(A)

Location	Period	Intrusiveness based PSNL $L_{Aeq, 15\ minute}$	Amenity based PSNL $L_{Aeq, period}$ [1]
R1 Residence 34 (Stapleton)	Daytime	36	-
	Evening	36	-
	Night	36	-
R2 Residence 3 (A Bowman)	Daytime	35	-
	Evening	35	-
	Night	35	-
R3 Camberwell Village (Central)	Daytime	-	46
	Evening	-	46
	Night	-	40
R4 Camberwell Village (North)	Daytime	42	-
	Evening	-	37
	Night	-	39
R5 Private Residence 30 (Smiles)	Daytime	43	-
	Evening	-	39
	Night	38	-

Notes: 1) Day period is 7.00 am – 6.00 pm; Evening is 6.00 pm – 10.00 pm; Night is 10.00 pm – 7.00 am.
2) All measured or predicted noise levels to be rounded to the nearest decibel.

6.6.2 Ravensworth Operations will continue to implement the following controls to manage noise generation:

- use of real-time directional noise monitors incorporating automatic alarms that will enable mine operators to take a proactive approach to minimising noise impacts by modifying operations when monitoring indicates that potential impacts may occur (refer to Commitment 6.5.4).
- mining equipment is maintained to high standards to ensure high availability and to meet noise emission criteria;
- operations on outer dump faces or elevated dumps in sensitive areas are restricted where possible during adverse weather conditions in accordance with the Ravensworth Operations noise performance monitoring system;
- all new equipment is procured against a specification for noise emission to meet noise criteria at the nearest private residences for total operations; and
- the majority of the coal crushing plant and coal handling facilities are enclosed in buildings and protective structures that effectively contain noise generated in these processes to the close proximity of the plants.

6.6.3 Ravensworth Operations will implement mine planning procedures that minimise the potential for adverse noise impacts. Where possible, machinery will be selectively located at lower elevations in the pit during times when noise levels at the receivers are likely to be exacerbated by weather conditions.

6.6.4 Ravensworth Operations will install a continuous noise monitoring unit between the Project and Camberwell Village that is capable of discerning the direction from which a noise emanates and the contribution the noise source makes to the cumulative noise level.

6.6.5 Ravensworth Operations will investigate any reported exceedances of noise criteria at private residences on a case by case basis. Should site specific monitoring or real-time monitors indicate adverse noise impacts from the Project, Ravensworth Operations will investigate reasonable and feasible measures to mitigate noise at the affected receiver.

Blasting

6.6.6 Unless otherwise agreed with the landowner, blast overpressure and vibration levels from blasting undertaken as part of the Project will comply with the following criteria at non-mine owned residential receivers:

Overpressure

The overpressure level from blasting operations on the premises must not:

a) exceed 115 dB (Linear Peak) for more than 5 per cent of the total number of blasts over a period of 12 months; and

b) exceed 120 dB (Linear Peak) at any time,

when measured at any point that is located at least 3.5 metres from any building or structure at any nearby residential property that is non-mine owned or not subject to a private agreement with the landowner.

Ground Vibration (ppv)

Ground vibration peak particle velocity from the blasting operations at the premises must not:

a) exceed 5 mm/s for more than 5 per cent of the total number of blasts over a period of 12 months; and

b) exceed 10 mm/s at any time,

when measured at any point within the grounds of noise sensitive locations and within 30 metres of any residential property that is non-mine owned or not subject to a private agreement with the landowner.

6.6.7 Except where otherwise agreed with the service provider or infrastructure owner, blast overpressure and vibration levels from blasting undertaken as part of the Project will comply with the following criteria at infrastructure (refer to **Table 6.2**).

Table 6.2 - Ground Vibration Limits for Structures

Type of Structure	Ground Vibration Criterion (mm/s)
Electricity transmission lines	100[1]
Conveyors	100[2]
Railway line	25[3]
1000ML Dam wall and proposed main storage dam	25[4]

1. Dependant on condition of potentially affected poles. The specific criteria that apply to the 132 kV line will be determined through consultation with the relevant service provider.
2 Based on findings presented in Effect of Blasting on Infrastructure ACARP Project No C14057 prepared by Terrock Consulting Engineers.
3. Previously confirmed by the ARTC.
4. Established by the Dams Safety Committee

Blast limits at conveyors may be revised by negotiation with infrastructure owners where further research indicates that increased blast limits will not significantly affect this infrastructure unless agreed criteria have already been established with the relevant infrastructure owner.

6.6.8 Blasting will not exceed a ground vibration limit of 100 mm/s at Coal & Allied's Hunter Valley Operations overland conveyor.

6.6.9 Vibration and air blast (where relevant) levels from blasting undertaken as part of the Project will comply with the criteria in **Table 6.3** for the specified heritage and archaeological sites.

Table 6.3 - Ground Vibration Limits for Heritage Structures

Site	Ground Vibration Criterion (mm/s)	Air Blast Criterion (dB Linear Peak)
Camberwell Church	5	-
Chain of Ponds Hotel	10[1]	-
Ravensworth Homestead	10	126 dB[2]
Ravensworth Public School	10	-
Nard 17 (REA 86)	30[3]	-

1. Established by Liddell Colliery for consent DA 305-11-01.
2. Established by Ravensworth East Mine (Consent DA 52-03-99)
3. The criteria used as the basis for the assessment of potential blast impacts at REA86 is based on the achievement of relevant internal blast criteria at the office structures associated with the proposed MIA area, located approximately 700 metres from the proposed mining area relative to REA86. The relevant criteria for the offices is based on relevant confidence criteria, and as such provides a conservative approach to assessing potential structural impacts at REA86. This may be refined over time based on the results of ongoing geotechnical assessments.

6.6.10 Ravensworth Operations will establish relevant blast impact criteria for the protection of archaeological site REA 86, through an assessment by a suitably qualified geotechnical engineer, as part of the Aboriginal Cultural Heritage Management Plan for the Project, prepared in consultation with registered Aboriginal stakeholders and DECCW, and to the satisfaction of DoP (refer to commitment 6.10.1).

6.6.11 Blasting will only take place between 7.00 am and 5.00 pm, Monday to Saturday inclusive unless otherwise approved by DECCW.

6.6.12 Within 12 months of Project approval, Ravensworth Operations will develop and implement a blast management plan for the Project, in consultation with DECCW, and to the satisfaction of DoP. The blast management plan will incorporate the following key components:

- specify the relevant ground vibration and air blast impact assessment criteria to be met at blast sensitive locations surrounding the project, and the processes for revision of relevant criteria, in consultation with relevant stakeholders;
- the continued implementation of blast management and monitoring procedures outlined in **Section 5.4.4** including real-time vibration monitoring at Coal & Allied's Hunter Valley Operations overland conveyor;
- flyrock management, in consultation with Coal & Allied and relevant road closure (proposed Lemington Road) procedures;
- integration with established blast monitoring and management processes of surrounding Xstrata operations in relation to Chain of Ponds Hotel and Ravensworth Homestead;
- reporting requirements and procedures for identified exceedances of relevant criteria to relevant authorities; and
- blast performance monitoring reporting requirements, including the reporting of blast monitoring results on an annual basis in the AEMR for the Project.

6.6.13 Ravensworth Operations will develop a blasting protocol in consultation with relevant service providers and infrastructure owners prior to the commencement of blasting within 500 metres of the infrastructure specified in **Table 6.2** and any relevant surface infrastructure at Macquarie Generation and ACOL. This may include revising blasting criteria from that indicated in this EA developed in consultation with the relevant service provider or infrastructure owner.

6.6.14 Ravensworth Operations is currently working through a process to manage potential interactions between current blasting practices on surrounding underground mining operations in consultation with Ashton Coal. The outcomes of this process will be incorporated into a revised Statement of Commitments for this Project.

6.6.15 Ravensworth Operations will continue its research into the effects of vibration on the 1000 ML dam wall in consultation the DSC. This research may revise the appropriate vibration criteria for this structure, and will be documented as part of the Blast Management Plan for the Project

6.7 Biodiversity

Biodiversity Offset and Rehabilitation Strategy

6.7.1 Ravensworth Operations will prepare a Rehabilitation and Offset Management Plan and submit it for the approval of the Director-General within 12 months of Project Approval. The plan will include the details of completion of the Biodiversity Offset Strategy (refer to commitment 6.7.2) and will outline measures to manage the biodiversity values of the site as part of the Project including specific mitigation measures detailed in **Section 5.5.7** of this EA.

6.7.2 The Biodiversity Offset and Rehabilitation Strategy will include:

- establishment, protection and enhancement of the Ravensworth North Offset Area and the Hillcrest Offset Area, to provide for the long term conservation of a range of significant ecological features (refer to **Section 5.5.8.1**) including:
  - conservation of large areas of existing vegetation within the Project area and nearby to the Project area including the key vegetation communities impacted by the Project and other significant communities that are floristically related to the key vegetation communities within the proposed disturbance area;
  - enable direct offsetting of the impact of the Project on the green and golden bell frog (*Litoria aurea*), threatened woodland birds and micro-bats, within the Project area and nearby to the Project area; and
  - allow for the conservation and management of other significant ecological values for the region, including the protection and management of a range of EECs, regionally significant vegetation and the protection of habitat for a variety of significant fauna species;
- development and implementation of biodiversity enhancement strategy for the proposed offset areas that aims to enhance the ecological value of these areas through enhancement of existing vegetation, and habitat for threatened species, (refer to **Section 5.5.8.2**);
- development of a comprehensive rehabilitation strategy for the proposed disturbance area, and existing disturbed areas within the Project, to maximise the ecological value of rehabilitated areas (refer to **Section 6.3**); and
- the development of an appropriate ecological monitoring program to assess the success of the Biodiversity Offset and Rehabilitation Strategy in counter-balancing the impacts of the Project on ecological values (refer to commitment 6.7.3).

6.7.3 Ravensworth Operations will develop a Biodiversity Monitoring Program as part of the Rehabilitation and Offset Management Plan which will include:

- monitoring of areas of retained vegetation;
- monitoring of rehabilitated areas using appropriate methodologies;

- fauna monitoring;
- monitoring of Emu Creek aquatic habitats (once reinstated as part of the rehabilitation program);
- fauna habitat monitoring including nest box structures;
- green and golden bell frog population surveys in accordance with the Green and Golden Bell Frog Key Population Management Plan (DECC 2007); and
- monitoring of regeneration and revegetation initiatives to be designed and implemented within the proposed offset areas (refer to commitment 6.7.2)

6.7.8 Ravensworth Operations will consult with the DECCW and Department of Planning determine the appropriate mechanism to provide for the long term protection of the Ravensworth North Offset Area and Hillcrest Offset area, and agree on the mechanism to achieve long term security of these areas, to the satisfaction of the Director-General, within 12 months of Project Approval. Unless otherwise agreed with the Director-General, within 3 years of Project Approval such mechanism will be implemented to ensure long term security of these areas.

6.7.9 Ravensworth Operations will investigate potential opportunities for the provision of contributions to the development of regional biodiversity initiatives, in consultation with DECCW and DoP

6.8 Water Resources

Surface Water

6.8.1 Within 12 months of Project Approval, Ravensworth Operations will prepare an integrated water management plan for all aspects of the Project. The Water Management Plan will incorporate the following key components:

- detail relevant water management controls as outlined in **Section 5.6.1**, including erosion and sediment controls, that will be implemented through the construction and operational phases of the Project;
- include the process for the maintenance and annual reporting of an integrated water balance for the Project; and
- detail the ongoing water monitoring program (refer to commitment 6.8.2) and reporting requirements to be implemented over the life of the Project.

6.8.2 Ravensworth Operations will continue to undertake surface water quality monitoring in accordance with its existing program, with additional monitoring points to be established at Davis Creek for the life of the Project except where otherwise agreed with DoP and following consultation with DECCW. All surface water monitoring results will be reported in the AEMR.

6.8.3 At least 12 months prior to the diversion of Emu Creek, Ravensworth Operations and Coal & Allied will review the need to undertake any further studies to inform the detailed design of the diversion to ensure the appropriate integration of the diversion with future mining operations associated with the Project and the adjacent Coal & Allied operations.

As part of the detailed design of the proposed Emu Creek diversion, Ravensworth Operations will obtain all relevant approvals in consultation with Coal & Allied and to the satisfaction of DoP.

Groundwater

6.8.4 Within 12 months of Project Approval, Ravensworth Operations will submit for the approval of the Director-General a Groundwater Monitoring Program for the Project. The program will be prepared in consultation with DECCW (NSW Office of Water) and will include the development of relevant trigger levels and response procedures to manage identified monitoring and/or predicted trends.

6.8.5 Ravensworth Operations will undertake two-monthly assessments of any departures from identified monitoring or predicted data trends. Departures from identified monitoring trends are taken to be consecutive data over a period of 6 months (minimum of three consecutive readings) exhibiting an increasing divergence in a negative impact sense from the previous data or from established or predicted trends. Any identified issues will be the subject of further investigation, in accordance with the relevant response procedures developed under the Groundwater Monitoring Program for the Project.

6.8.6 A formal review of the depressurisation of coal measures and comparison of responses with the aquifer model predictions will be undertaken biennially. Expert review will be undertaken by a suitably qualified hydrogeologist if the measured depressurisation in the coal measures exceeds the predicted depressurisation for the designated period.

6.8.7 Ravensworth Operations will develop appropriate remedial and recovery plans for identified stands of *Eucalyptus camaldulensis* along the Hunter River in the southern extent of the Project area on land controlled by Ravensworth Operations. The plans will be developed in consultation with NOW and DECCW, to the satisfaction of the Director-General.

6.8.8 Ravensworth Operations will seek to enter into a co-operative, transparent, data sharing agreement with surrounding operations, including Hunter Valley Operations and ACOL, for the sharing of relevant peizometric data.

6.9 Traffic and Transport

6.9.1 The proposed Lemington Road Realignment will be designed and constructed in accordance with the RTA's Road Design Guide (1999) and the proposed bridge over Bayswater Creek will be designed in accordance with AS5100.2, AS1700.0 and AS5100.5 (with a 100 year life), in consultation with the RTA and Singleton Council.

6.9.2 Ravensworth Operations will upgrade the intersection of the proposed Lemington Road Realignment and New England Highway in accordance with the RTA's Road Design Guide (1999). The design will be submitted for the approval of the RTA.

6.9.3 To manage any impacts from Project related road traffic, Ravensworth Operations will implement the following traffic management strategies:

- establishing an ongoing management procedure controlling vegetation regrowth at the New England Highway and Lemington Road Realignment intersection; and
- road safety audits to be carried out at appropriate stages of the intersection upgrade and construction of the Lemington Road Realignment.

6.10 Aboriginal Heritage

6.10.1 Prior to commencement of any ground disturbing activities associated with the Project, Ravensworth Operations will submit for the approval of the Director-General an Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP will be prepared in consultation with relevant Aboriginal stakeholders and DECCW, and ~~may~~ will be prepared on a staged basis to reflect key stages of the Project, including:

- Construction ACHMP – to address all up front cultural heritage management prior to the commencement of construction, including the associated salvage process;
- ACHMP for mining operations – to be prepared prior to the commencement of mining operations to address the first 10 years of

mining, including the associated salvage process. This revision of the ACHMP will address management planning for the offset areas (outlined below); and

- Revision of the ACHMP, prior to each stage of the salvage process or every 5 years, whichever is earlier.

~~. It will~~The ACHMP will address:

- management of sites and areas that will not be impacted by the Project;
- monitoring and management of potential blasting impacts on site REA86;
- management of the salvage of any artefacts or archaeological material, including the staged approach to salvage, from impacted areas in compliance with the research design and methodology included in **Appendix 11**;
- management of subsurface testing and further subsurface salvage works in compliance with the research design and methodology included in **Appendix 11**;
- ongoing management of salvaged artefacts and archaeological materials;
- the provision of suitable Aboriginal cultural heritage offsets to balance the loss of Aboriginal and archaeological sites and values that will result from the development of the Project (refer to **Section 5.8.7**);
- outline the process for the investigation of further detailed investigation of the conservation and management of the Hillcrest Offset Area as an Aboriginal heritage and archaeological resource, including:
    - review of additional literature (archaeological, environmental and historical) to provide the required context for the archaeological survey and significance assessment;
    - archaeological survey of the Hillcrest Offset Area in conjunction with Aboriginal stakeholder representatives, in accordance with relevant government agency;
    - archaeological significance assessment, conducted by Umwelt archaeologists in accordance with government agency guidelines (NPWS 1997);
    - cultural values assessment, conducted by registered Aboriginal stakeholders;
    - management strategies, which will formally assess the conservation value of the Hillcrest Offset Area; and
    - reporting, with the aims, methods and results of all above works outlined in an additional Cultural Heritage Assessment report prepared in accordance with relevant government agency requirements (NPWS 1997, DEC 2004).
- the responsibilities of all parties involved - Ravensworth Operations, Aboriginal stakeholders, archaeologists, DECCW; ~~and~~
- specify the mechanism(s) for ongoing engagement with Aboriginal stakeholders, including the use of an Aboriginal stakeholder committee to be implemented over the life of the Project; and

- the timeframes for the required Aboriginal heritage management works.

6.10.2 Ravensworth Operations will manage for long term conservation the 41 sites within the 262 hectare Ravensworth North Offset Area.

6.10.3 Ravensworth Operations will consult with the DECCW and Department of Planning determine the appropriate mechanism to provide for the long term protection of the Ravensworth North Offset Area, as noted in Commitment 6.8.7.

6.10.~~4~~3 In addition to the long term conservation of sites and landforms within the Ravensworth North Offset Area, Ravensworth Operations commits to additional offsets for the loss of Aboriginal cultural heritage and archaeological sites and values that will result from the project. These include:

- to actively manage the site within the existing Farrells Creek 1 Aboriginal Artefact Management Area and the area of the Ravensworth Underground Mine Dam Conservation Area by undertaking culturally sensitive works to improve management of ongoing erosion of the site/area; and

- to manage the sites that fall within the Project area but outside of the impact areas and designated conservation areas for the 29 year life of the mine by undertaking culturally sensitive works to improve management of ongoing erosion of the sites where monitoring of the sites indicates this is necessary.

6.10.~~5~~4 Ravensworth Operations also commits to the following for consideration by Aboriginal stakeholders:

- funding for the purchase of display cabinets and for the establishment of a display of artefacts salvaged from the project area that incorporates a visual display of the salvage of the artefacts and of the interpretation of the evidence derived by their analysis from an Aboriginal and archaeological perspective;

- suitable venues for this would be the Teaching/Keeping Place currently in the planning stage by XCN in association with Beltana Highwall Mining and other interested parties; or the Keeping Place currently in planning by the Wanaruah Local Aboriginal Land Council;

- funding to support the establishment of IT systems at the Keeping/Teaching place;

- funding to support training for Aboriginal community members to provide skills to allow them to work within the Keeping/Teaching Place (e.g. archival training, book keeping training, computer skills, hospitality training);

- training in stone artefact attribute recording and basic analysis;

- Ravensworth Operations will provide funding to undertake non-invasive 3D scanning of the Bowmans Creek 16 Engraving Site even though there is no proposal to impact this site from mining.

6.11 Historical Heritage

6.11.1 Ravensworth Operations will implement the following historical heritage management measures:

- management of blasting practices to meet relevant blast impact assessment criteria at listed heritage sites/items within the vicinity of the Project area;
- a qualified heritage consultant to NSW Heritage Office's standards will undertake archival recording of historic heritage sites of local significance directly or indirectly impacted by the Project (HH1, HH4, HH5, HH11, HH14, HH15, HH16, HH17, and HH18) prior to the commencement of mining.

6.11.2 In the unlikely event that unexpected archaeological remains or potential heritage items not identified in this report are discovered during the Project, all works in the immediate area will cease, the remains and potential impacts will be assessed by a qualified archaeologist or heritage consultant and, if necessary, the Heritage Branch, DoP will be notified in accordance with Section 146 of the Heritage Act 1977.

6.12 Visual Controls

6.12.1 Ravensworth Operations will implement the following measures to mitigate visual impacts from the Project:

- shaping, stabilising and rehabilitation of the out of pit overburden emplacement areas as soon as practicable after mining to minimise the visual impact of these areas on the amenity of the surrounding area;
- additional screening plantings will be utilised in strategically located positions to augment existing plantings and limit views into the Project from the New England Highway and the proposed Lemington Road Realignment;
- ensuring that all external lighting associated with the Project complies with Australian Standard *AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*;
- all buildings potentially visible to the public will be coloured in suitable natural tones.

6.13 Greenhouse Gas and Energy

6.13.1 Ravensworth Operations will develop and implement an Energy Management System that will address all aspects of energy management for the Project.

6.13.2 At an operational level, Ravensworth Operations will aim to improve energy efficiency and reduce greenhouse emissions from the Project via:

- the use of energy management systems;
- seeking continuous improvement in energy efficiency in the mining fleet, stationary equipment, mining processes and coal preparation;

- investigation of energy efficiency opportunities for mobile and fixed plant and equipment through the detailed design of the Project.

6.13.3 Ravensworth Operations will continue to monitor and seek to improve its energy and greenhouse gas performance against performance targets.

6.13.4 Ravensworth Operations will report its greenhouse and energy performance via legislative reporting requirements.

6.14 Waste Management

6.14.1 No waste will be disposed of on site except for inert wastes permissible under the EPL obtained for the Project with all other waste disposed of at appropriately licensed waste management facilities located off site.

6.14.2 Ravensworth Operations will continue to use a bioremediation area located within disturbed areas on site, to treat materials affected by hydrocarbons.

6.14.3 Ravensworth Operations will manage coarse reject and tailings associated with the processing and handling of coal in accordance with the conceptual management strategy outlined in **Section 2.5.10** of this EA

6.15 Social and Economic

6.15.1 Ravensworth Operations will continue to engage the community regarding the Project and operations in general, including use of the following mechanisms:

- circulation of information relating to the commencement of construction and/or mining;
- distribution of a community newsletter as appropriate and on at least a six monthly basis;
- a Community Consultative Committee, as considered appropriate by Department of Planning;
- establishment of a project-specific website; and
- community information days to be held periodically at the Project site.

6.15.2 Ravensworth Operations will continue to operate a 24 hour community hotline for receipt of community complaints. Community complaints will be responded to within 24 hours of receipt. All complaints will be investigated and the results of the investigation reported to the complainant in a timely manner.

Economic Development – Employment, Education and Training

6.15.3 Ravensworth Operations currently aims to maximise local employment and provide training and education opportunities through:

- advertising employment, apprenticeships and traineeships in local or regional media as appropriate;
- providing an employment pack that allows local residents to register their interest in employment opportunities at the Ravensworth Operations office;
- sharing information about mining careers at Ravensworth Operations and corporate entity with local schools;
- offering training opportunities through partnerships with local tertiary education providers;
- participating in the corporate school scholarship program; and
- continued implementation of Corporate and Ravensworth Operations Corporate Social Involvement (CSI) programs.

6.15.4 In addition to current practices, Ravensworth Operations proposes to:

- formalise a policy that gives local residents employment preference where they have the required skills and experience, and demonstrate a cultural fit with the organisation;
- provide access to the corporate careers centre via the Ravensworth Operations website so that local residents can easily register their interest in employment online; and
- develop partnerships with other local organisations to promote employment opportunities in non-mining related sectors to the families of Ravensworth Operations employees.

Economic Development – Business Opportunities

6.15.5 Ravensworth Operations will continue to give preference to sourcing materials and services from local companies where all other factors are equal.

Cumulative Impacts

6.15.6 Ravensworth Operations will continue to work with representatives from neighbouring mines to discuss and address issues of common concern in relation to management of cumulative impacts.

6.16 General Environmental Management, Monitoring, Auditing and Reporting

Annual Environmental Management Report

6.16.1 Ravensworth Operations will prepare an Annual Environmental Management Report (AEMR) for the Project. The AEMR will be distributed to relevant government agencies including DoP, I&I, DECCW and Singleton Council (and other agencies as

directed by DoP) and made available to the public on the Ravensworth Operations web site.

Update of Environmental Management Plans

6.16.2 Within 12 months of approval, Ravensworth Operations will review, update and integrate relevant aspects of the environmental management of the Project in the Ravensworth Operations complex environmental management plans. This work will be undertaken in consultation with the relevant government authorities, as agreed with the Director-General.

Independent Environmental Audit

6.16.3 Three years after commencement of the Project mining operations, and every three years thereafter, Ravensworth Operations will commission and pay the full cost of an Independent Environmental Audit of the Project in consultation with the Director-General. A copy of the audit report will be provided to the Director-General, I&I, DECCW and members of the Community Consultative Committee.

APPENDIX 2

Aboriginal Stakeholder Consultation Log 2010

Appendix 2 – Aboriginal Consultation Log

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
22-12-09	Aboriginal Native Title Consultants	John & Margaret Matthews	Summary of *Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project* report mailed to all Aboriginal stakeholders, in response to comments in late 2009 that original report was too large and too complex for community review. Letter identifies that EA will be on public exhibition in February 2010, and Aboriginal stakeholders urged to provide comment on the project and report by end of February 2010 – providing an additional 14 weeks for review.	Jan Wilson
	Bullen Bullen Heritage Consultants	Lloyd Mathews		
	Cacatua Culture Consultants	George Sampson		
	Culturally Aware	Tracey Skene		
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey		
	Giwiirr Consultants	Rodney Matthews		
	HTO Environmental Management Services	Cara & Rick Coles		
	Hunter Valley Aboriginal Corporation	Barry Stair		
	Hunter Valley Cultural Consultants	Christine Matthews		
	Hunter Valley Cultural Surveying	Luke Hickey		
	Hunter Valley Natural and Cultural Resources Management	David French		
	Lower Hunter Wonnarua Council	Lea-Ann Ball		
	Lower Wonnarua Tribal Consultancy	Barry Anderson		
	Mingga Consultants	Clifford Matthews		
	Muswellbrook Cultural Consultants	Brian Horton		

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	Ungooroo Aboriginal Corporation	The Directors		
	Ungooroo Cultural & Community Services	Rhonda Ward		
	Upper Hunter Heritage Consultants	Darrel Matthews		
	Upper Hunter Wonnarua Council	Victor Perry		
	Valley Culture	Larry Van Vliet		
	Wanaruah Custodians	Barbara Foot		
	Wanaruah Local Aboriginal Land Council	Suzie Worth		
	Wattaka Wonnarua Cultural Consultants Services	Des Hickey		
	Wonn 1 Contracting	Arthur Fletcher		
	Wonnarua Culture Heritage	Gordon Griffiths		
	Wonnarua Elders Council	Rhoda Perry		
	Wonnarua Nation Aboriginal Corporation	Laurie Perry		
	Yarrawalk	Barry McTaggart		
	Yinarr Culture Services	Kathleen Stewart-Kinchella		
08-01-10	Cacatua Culture Consultants	Donna Sampson	Donna rang Umwelt office to confirm end date for comment on the Ravensworth report – Meaghan confirms that end February, in line with exhibition of EA. Donna to review report and ring Meaghan when ready to discuss and make comment, noting that is away for two weeks in January.	Meaghan Russell
12-01-10	Wattaka Wonnarua Cultural Consultants Services	Des Hickey	Draft *Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project* report returned to Umwelt as was not claimed from post office.	

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
14-10-10	Wattaka Wonnarua Cultural Consultants Services	Des Hickey	Draft *Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project* report mailed again to WWCCS (not registered post, so would not have to be claimed from post office).	
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey	Summary of *Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project* report returned to Umwelt as was not claimed from post office (mailed on 22-12-09). Summary of *Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project* report mailed again to all stakeholders (not registered post, so would not have to be claimed from post office).	
	Hunter Valley Cultural Consultants	Christine Matthews		
	Hunter Valley Cultural Surveying	Luke Hickey		
	Upper Hunter Heritage Consultants	Darrel Matthews		
	Valley Culture	Larry Van Vliet		
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey	Ann rang and left message with reception that summary report no longer at office but would like to get a copy – resent.	Reception
16-02-10	Wanaruah Local Aboriginal Land Council	Suzie Worth	Suzie rang to advise Meaghan that she is currently coordinating an Aboriginal stakeholder response to the Ravensworth draft report provided – and has been/will met with registered Aboriginal stakeholders for the project to discuss their comments. Letter to be provided to RavOps and Umwelt in the coming fortnight.	Meaghan Russell
18-02-10	Aboriginal Native Title Consultants	John & Margaret Matthews	Fax/letter/email to all registered Aboriginal stakeholders regarding the Ravensworth project, identifying that comments on the report and proposed cultural heritage management outcomes welcome to 22 March 2010 – coinciding with the end of the public exhibition period for the EA. Letter also identifies that Umwelt archaeologists Meaghan Russell and Julian Travaglia are available to meet with Aboriginal stakeholders in February or March to discuss appropriate cultural heritage management outcomes for the project. Letter also recognised that XCN is now meeting independently with Aboriginal stakeholders to discuss the broader issues raised in 16 Nov 09 meeting; so that the proposed meetings are only to discuss the Ravensworth project.	Meaghan Russell
	Bullen Bullen Heritage Consultants	Lloyd Mathews		
	Cacatua Culture Consultants	George Sampson		
	Culturally Aware	Tracey Skene		
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey		
	Giwiirr Consultants	Rodney Matthews		

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	HTO Environmental Management Services	Cara & Rick Coles	Letter also outlined the current status of the planning/approval process, with the four week public exhibition period to comment in late February 2010. Ongoing Aboriginal involvement in the Ravensworth project was identified to be of fundamental importance, with opportunity for Aboriginal stakeholders to provide input on cultural heritage management outcomes to late March 2010 – effectively four months from draft report distribution.. Contact details provided to discuss the project and its cultural heritage management strategies, or to organise suitable day/time/place to meet with Umwelt. Letter also advised that Umwelt will make contact soon to discuss project.	
	Hunter Valley Aboriginal Corporation	Barry French		
	Hunter Valley Cultural Consultants	Christine Matthews		
	Hunter Valley Cultural Surveying	Luke Hickey		
	Hunter Valley Natural and Cultural Resources Management	David French		
	Lower Hunter Wonnarua Council	Lea-Ann Ball		
	Lower Wonnarua Tribal Consultancy	Barry Anderson		
	Mingga Consultants	Clifford Matthews		
	Muswellbrook Cultural Consultants	Brian Horton		
	Ungooroo Aboriginal Corporation	The Directors		
	Ungooroo Cultural & Community Services	Rhonda Ward		
	Upper Hunter Heritage Consultants	Darrel Matthews		
	Upper Hunter Wonnarua Council	Victor Perry		
	Valley Culture	Larry Van Vliet		
	Wanaruah Custodians	Barbara Foot		
	Wanaruah Local Aboriginal Land Council	Suzie Worth		

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	Wattaka Wonnarua Cultural Consultants Services	Des Hickey		
	Wonn 1 Contracting	Arthur Fletcher		
	Wonnarua Culture Heritage	Gordon Griffiths		
	Wonnarua Elders Council	Rhoda Perry		
	Wonnarua Nation Aboriginal Corporation	Laurie Perry		
	Yarrawalk	Barry McTaggart		
	Yinarr Culture Services	Kathleen Stewart-Kinchella		
19-02-10	Aboriginal Native Title Consultants	John & Margaret Matthews	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	Meaghan Russell
	Cacatua Culture Consultants	Donna Sampson	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – is interested in meeting, but not available early next week – Meaghan to call back and discuss next week.	
	Culturally Aware	Tracey Skene	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Muswellbrook Cultural Consultants	Brian Horton	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Ungooroo Aboriginal Corporation	The Directors	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Ungooroo Cultural & Community Services	Rhonda Ward	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Wonnarua Culture Heritage	Gordon Griffiths	Gordon rang to discuss Ravensworth project, and recent activity. Meaghan advised that Umwelt planned to hold meetings in Feb/March to discuss the cultural heritage management strategies for the project – now that XCN issues raised in Nov 09 meeting were being dealt with through discussions with XCN. Meaghan to call back next week about meeting availability.	

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
22-02-10	Aboriginal Native Title Consultants	John & Margaret Matthews	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – John suggests meeting with a couple of other stakeholders (Matthew's family reps) and will give them a call to find a good day/time to meet in Muswellbrook. Meaghan to call back in a few days to discuss. *Connected stakeholders: Bullen Bullen; Giwiirr; Hunter Valley Cultural Consultants; Mingga; Upper Hunter Heritage Consultants.*	Meaghan Russell
	Cacatua Culture Consultants	George & Donna Sampson	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – organised to meet Friday 26 Feb at East Maitland, with Gordon Griffiths.	
	Culturally Aware	Tracey Skene	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – message left on mobile. Tracey returned call in afternoon – meeting organised Wednesday lunch (at Cessnock café).	
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – is currently preparing response (this week) on the Ravensworth report using the pro-forma provided. Does not feel that a meeting is necessary, but if has any questions will call Meaghan to discuss.	
	HTO Environmental Management Services	Cara Coles	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Hunter Valley Aboriginal Corporation	Barry French	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – would like to meet but is not available this week, requested that Meaghan call back next week.	
	Hunter Valley Cultural Surveying	Luke Hickey	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	David French	Hunter Valley Natural and Cultural Resources Management	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – mobile disconnected.	
	Lower Hunter Wonnarua Council	Tom Miller	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – wrong number.	
	Lower Wonnarua Tribal Consultancy	Barry Anderson	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – asked to call back at 3.30pm. Called back – phone dial tone (not connecting).	

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	Muswellbrook Cultural Consultants	Brian Horton	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – number disconnected.	
	Ungooroo Aboriginal Corporation	Alan Paget	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – available to meet tomorrow. Meeting at 10am at UAC office in Singleton organised.	
	Ungooroo Cultural & Community Services	Rhonda Ward	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – mobile disconnected.	
	Upper Hunter Wonnarua Council / Wonnarua Elders Council	Victor & Rhoda Perry	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Valley Culture	Larry Van Vliet	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Wanaruah Custodians	Barbara Foot	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Wattaka Wonnarua Cultural Consultants Services	Des Hickey	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Wonn1 Contracting	Arthur Fletcher	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – Arthur advises that does not want to meet to discuss Ravensworth project as larger XCN issues raised in November 2009 still not addressed (and makes reference to letter received from SCN in February 2010 that does not support peak Aboriginal body/group for Xstrata). States that key community concerns are that they do not have a voice in this process, that Aboriginal stakeholders are not being listened to and that no-one is considering what is left for future generations.	
	Wonnarua Culture Heritage	Gordon Griffiths	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – organised to meet Friday 26 Feb at East Maitland, with George and Donna Sampson.	
	Wonnarua Nation Aboriginal Corporation	Laurie Perry	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	Yinarr Culture Services	Kathleen Stewart-Kinchella	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer, return number left. Kathy returned call in afternoon – would like to meet, but needs to check diary and will then call back to organise day/time.	
23-02-10	Ungooroo Aboriginal Corporation	Alan Paget	Meeting to discuss Ravensworth project and results/recommendations of draft report provided in October 2009. Key comments: • questioned depth of excavation planned for the project – as in some areas, may not need to dig to clay (only dig upper soil where artefacts could be present); and • questioned whether access path to Nard 17 was still flagged – very visible link to road.	Meaghan Russell & Julian Travaglia
24-02-10	Culturally Aware	Tracey Skene	Meeting to discuss Ravensworth project and results/recommendations of draft report provided in October 2009. Key comments: • Unhappy with assessment process for the Ravensworth project as only archaeological assessment conducted – no assessment of cultural values, or social and economic needs of the Aboriginal community of the Hunter Valley – Xstrata need to address those broader issues as well; • Draft report is not complete as does not have assessment of cultural values by Aboriginal stakeholders and does not manage these values – is only an archaeology assessment; • Ravensworth project represents major impact to landscape at Ravensworth – especially the loss of so many sites and large areas like Emu Creek. This is particularly important as so much has already been lost in the Hunter Valley from past mining projects; • Conservation offsets need to be selected by Aboriginal community – offsets selected by mining companies are only what is convenient for them – does not consider long tern needs of community in use of the area. Conservation offsets also need protection into the future – no mining of existing offsets; and • Has little information about the proposed Keeping Place/Cultural Centre at Broke – not all stakeholders involved in this, so has trouble considering it as part of the Ravensworth offset. Broke option may not represent what the wider community wants (need detail about how will be owned and operated into the future, what level of community involvement).	Meaghan Russell

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	HTO Environmental Management Services	Cara Coles	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer, message left with number for return call.	Meaghan Russell
	Hunter Valley Cultural Surveying	Luke Hickey	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer, return number left.	
	David French	Hunter Valley Natural and Cultural Resources Management	Meaghan emailed to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – request for return email or phone call if interested and available.	
	Lower Wonnarua Tribal Consultancy	Barry Anderson	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – call back at 4pm. Rang back – Barry only available on weekends due to work load. Meaghan happy to come up one weekend – three in Feb/March suggested but not both available on same days. Meaghan to call back in March to discuss late March/early April options.	
	Valley Culture	Larry Van Vliet	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – phone disconnected.	
	Wanaruah Custodians	Barbara Foot	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
	Wattaka Wonnarua Cultural Consultants Services	Des Hickey	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – would like to meet after Aboriginal community meeting/ workshop is held to discuss the Ravensworth project – will probably be in one fortnight.	
	Wonnarua Elders Council / Upper Hunter Wonnarua Council	Rhoda Perry	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – Rhoda noted that there would be a meeting/workshop within Aboriginal community to discuss Ravensworth project in the near future, but would contact Meaghan if would like to meet with Umwelt to discuss project.	
	Wonnarua Nation Aboriginal Corporation	Laurie Perry	Meaghan rang to discuss interest/availability for meeting in Feb/March to discuss the Ravensworth project – no answer.	
26-02-10	Cacatua Culture Consultants	George & Donna Sampson	Meeting to discuss Ravensworth project and results/recommendations of draft report provided in October 2009. Identified concern over site of project and that a better offset package was needed, due to size of project on ongoing mining of valley. Requested that additional small group meetings held so that stakeholders can come together to discuss project.	Meaghan Russell & Julian Travaglia
	Wonnarua Culture Heritage	Gordon Griffiths		

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
18-03-10	Aboriginal Native Title Consultants	John & Margaret Matthews	Fax/letter/email to all registered Aboriginal stakeholders regarding the Ravensworth project, identifying that comments on the report and proposed cultural heritage management outcomes welcome to 29 March 2010 – coinciding with the end of the public exhibition period for the EA. Letter also identifies that Umwelt archaeologists Meaghan Russell and Julian Travaglia are available to meet with Aboriginal stakeholders in March to discuss appropriate cultural heritage management outcomes for the project. Contact details provided to discuss the project and its cultural heritage management strategies, or to organise suitable day/time/place to meet with Umwelt.	Jan Wilson
	Bullen Bullen Heritage Consultants	Lloyd Mathews		
	Cacatua Culture Consultants	George Sampson		
	Culturally Aware	Tracey Skene		
	Gidawaa Walang Cultural Heritage Consultancy	Ann Hickey		
	Giwiirr Consultants	Rodney Matthews		
	HTO Environmental Management Services	Cara & Rick Coles		
	Hunter Valley Aboriginal Corporation	Barry French		
	Hunter Valley Cultural Consultants	Christine Matthews		
	Hunter Valley Cultural Surveying	Luke Hickey		
	Hunter Valley Natural and Cultural Resources Management	David French		
	Lower Hunter Wonnarua Council	Lea-Ann Ball		
	Lower Wonnarua Tribal Consultancy	Barry Anderson		
	Mingga Consultants	Clifford Matthews		
	Muswellbrook Cultural Consultants	Brian Horton		
	Ungooroo Aboriginal Corporation	The Directors		
	Ungooroo Cultural & Community Services	Rhonda Ward		

	Stakeholder	Contact	Summary of Consultation	Umwelt Contact
	Upper Hunter Heritage Consultants	Darrel Matthews		
	Upper Hunter Wonnarua Council	Victor Perry		
	Valley Culture	Larry Van Vliet		
	Wanaruah Custodians	Barbara Foot		
	Wanaruah Local Aboriginal Land Council	Suzie Worth		
	Wattaka Wonnarua Cultural Consultants Services	Des Hickey		
	Wonn 1 Contracting	Arthur Fletcher		
	Wonnarua Culture Heritage	Gordon Griffiths		
	Wonnarua Elders Council	Rhoda Perry		
	Wonnarua Nation Aboriginal Corporation	Laurie Perry		
	Yarrawalk	Barry McTaggart		
	Yinarr Culture Services	Kathleen Stewart-Kinchella		

GROUP NAME: Caeatua Cultural Consultants DATE: 1/4/2010

Comment Pro-forma

Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project

A total of 244 previously unregistered were identified during the survey of the project area. These included 136 artefact scatters, 103 isolated finds, three scarred trees, one scarred tree and associated artefact scatter and one set of grinding grooves associated with a scarred tree and an artefact scatter. Can you please provide a general comment on the Aboriginal cultural heritage significance of these sites and specific comment on the Aboriginal cultural significance of any sites that may hold special significance to you?

Full details of the sites are included in Appendix 7 of the draft report and photographs of all sites were provided in a separate document in November 2009. Photographs of those sites identified as having special Aboriginal cultural heritage value during the survey are included in the summary enclosed.

Comments: All sites are culturally significant. The quantity of sites found show the area is significant and has been used repeatedly in the past.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

During the survey period and in subsequent comments provided by participating Aboriginal stakeholders, landforms closely associated with Bowmans Creek, Bayswater Creek and the Hunter River were identified as having high Aboriginal cultural heritage significance. Do you also support this significance assessment? Are there other landforms/areas within the project area that have special Aboriginal cultural heritage significance to you?

The landforms are discussed in Sections 7.4 and 10 of the draft report and photographs of the Bowmans Creek terrace and Bayswater Creek floodplain are included in the summary enclosed. Photographs of the only sites associated with the Hunter River are (REA222 and REA236) are also included in the summary.

Comments: Bowmans Ck, Bayswater Ck + the Hunter River do hold high Aboriginal cultural heritage significance. Other areas that I hold high Aboriginal cultural heritage significance we believe are the Farrells Ck, Emu Ck and Davis Ck areas.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

Do you support/not support the management strategy proposed on page 6 of the enclosed summary and set out as dot points below? If you would like any part of the management strategy revised/changed could you please indicate how and why in the space provided.
Full details are provided on page 6 of the attached summary and in Sections 11 and 12 of the draft report

- 42 sites, including REA86, are proposed for long term conservation within the 262 hectare Ravensworth North Offset Area (RNOA). These sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: We believe that the sites below the proposed office space and haul road down to site REA88 should be included in the RNOA. The RNOA should be conserved permanently rather than just cared for during the 29 years of the project.
The current proposed RNOA is not enough. There needs to be more land and another piece of land needs to be put aside that is similar or better that will not be destroyed.

Please attach further pages as required.

- 156 sites are proposed for management for their protection within the project area boundary for the 29 year life of the mine. These sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: The sites not to be impacted by the mine should be made into conservation areas
An audit should be undertaken of these sites as soon as possible. The audit should include a detailed recording of the sites.

Please attach further pages as required.

- 12 further sites may be protected for the 29 year life of the mine, if detailed planning of the proposed 330 kV transmission line enables the sites to be avoided. If conservation is possible these sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: Protection of these sites and if not impacted to become conservation areas.

Please attach further pages as required.

- 150 sites, including an artefact scatter associated with a scarred tree, are proposed for surface collection.

Comments: At the tree location should be considered for a grader scrape, once the tree is removed.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

- 11 sites are proposed for subsurface testing, broad area manual excavation (if warranted) and/or mechanical scrapes (if warranted).

Comments: An option for further sites to be subsurface tested that can be selected during the surface collection.

Please attach further pages as required.

- Two landforms are proposed for subsurface testing, manual excavation (if warranted) and/or mechanical scrapes (if warranted).

Comments: Agree but areas less prone to flooding to have priority. More than two areas should be considered.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

- Two scarred trees are proposed for relocation to a Keeping/Teaching Place, in accordance with a scarred tree removal and conservation methodology.

Comments: The scarred trees should remain in country. They should be moved to Nard 17 to remain as close as possible to their original location. Aboriginal Stakeholders should be involved in deciding on the conservation methodology.

Please attach further pages as required.

Appendix 11 of the assessment provides information in relation to a draft Research Design and Methodology for the salvage of sites within the project impact area as indicated in the dot points above. Do you agree/disagree with the methodologies proposed for the site salvage program?

Comments: We don't believe the methodology goes far enough. See above comments. If these were included we believe the methodology assists with the preservation of Aboriginal significant items.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

- Ravensworth Operations has committed to additional offsets for the loss of Aboriginal cultural heritage and archaeological sites and values that will result from the project. These include active management of sites affected by erosion, such as those within the existing Farrells Creek 1 Aboriginal Artefact Management Area and the area of the Ravensworth Underground Mine Dam Conservation Area. Affected sites will be protected by undertaking culturally sensitive works to improve management of erosion.

Comments: Aboriginal stakeholders to be contacted prior to any work being done and provided with a draft methodology and to decide if works are appropriate. If appropriate, Aboriginal stakeholders should be present during works. If not involved.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

Ravensworth Operations has also committed to offering the following offsets for consideration by Aboriginal stakeholders. Do you think these offsets are culturally appropriate?

- funding for a display of artefacts salvaged from the project area, which would be established at a location such as one of the Teaching/Keeping places being planned by XCN and the Wanaruah LALC;
- funding to support the establishment of IT systems for the Keeping/Teaching place;
- funding to support training for Aboriginal community members for skills that would enable them to work within the Keeping/Teaching Place; and
- training in stone artefact recording and basic analysis.

Comments: No comment in regards to first 3 points; however, with regards to stone artefact recording and basic analysis we would like to see this undertaken in conjuction with the on-site works.

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

Ravensworth Operations will consider any other suitable offset option put forward by the Aboriginal stakeholders. Please provide suggestions for cultural heritage offset options appropriate to the Project.

Comments: No Comment

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

In response to comments provided by the Aboriginal stakeholder groups, Ravensworth Operations has agreed to commit to a number of offsets including the following. Do you think these offsets are culturally appropriate?

- funding for the preparation of a video of the salvage program undertaken for the project, including footage of Aboriginal stakeholders describing the cultural heritage significance of the project area and the artefacts recovered;
- providing for supervised access to the RNOA;
- funding for information panels to be developed for a number of sites within the RNOA;
- funding for non-invasive 3D scanning of the Bowmans Creek 16 Engraving Site.

Comments: - Agree with video and 3D scanning of Bowmans Ck 16 Engraving site
- We agree with supervision on entry and exit to the RNOA, but, ~~do not agree wi~~ do not believe it is appropriate for constant supervision on a cultural level
- Do not feel that the information panels are necessary in the RNOA

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

Two scarred trees and large numbers of stone artefacts are proposed for recovery from the project area by the impact mitigation works outlined above, and management strategies for all recovered archaeological materials will be included in the Research Design and Methodology for the works.

Feedback from the Aboriginal stakeholders regarding the care of scarred trees and stone artefacts recovered during the proposed salvage program identified the following options. Do you think these options are culturally appropriate?

- salvaged items to remain at Ravensworth and not be moved to Broke, to keep close to Country; and/or
- the salvaged artefacts and scarred trees to be transported to the proposed Broke Keeping/Teaching Place; and/or
- scarred trees could be mounted on concrete blocks and protected within a small shelter; and/or
- some artefacts to be displayed at the proposed Teaching/Keeping places, and in the entry to the offices at Ravensworth. The rest to be placed on the ground in the RNOA or in a facility within the RNOA.

Comments: We believe all collected items should remain on country. The scarred tree within the impact area which are to be removed should be laid to rest within the RNOA area to degrade naturally with the dignity they deserve.

The majority of stone artefacts to be put back to country with the exception of selected artefacts that can be used for teaching purposes and displayed in the Ravensworth office (some to be stored in the Ravensworth office and some stored for teaching purposes) - Must stored on country.

Thank you for providing your comments.
Please complete the section below for our records.

Name of group/corporation: Cacatua Culture Consultants

Name of person authorised to complete pro-forma: Donna Sampson

Signature of person completing pro-forma: D Sampson

Position: Administration

Date: 19-02-2010

Please fax your comments to Umwelt (Australia) Pty Limited on **49505737** or post them to Umwelt (Australia) Pty Limited, PO Box 838, Toronto, NSW, 2283 prior to close of business on 19 February 2010.

Barkuma Neighbourhood Centre Trading as... ABN: 58 290 659 800

Gidawaa Walang

Cultural Heritage Consultancy

...To keep our Culture...

Fax Cover

To: MEAGHAN RUSSELL

From: SENIOR ARCHAEOLOGIST UMWELT

Date: 11.3.2010

No. of Pages: 12 (INCLUDING HEADER)

COMMENTS ON PRO-FORMA

ABORIGINAL HERITAGE AND ARCHAEOLOGICAL ASSESSMENT RAVENSWORTH OPERATIONS PROJECT

THANK YOU

ANNIE

76 Lang Street
Kurri Kurri
NSW 2327

Phone: 49371094
Fax: 49364449
Mob: 0411196991

GROUP NAME: GIDAWAA WALANG DATE: 11-3-2010

Comment Pro-forma

Aboriginal Heritage and Archaeological Assessment: Ravensworth Operations Project

A total of 244 previously unregistered were identified during the survey of the project area. These included 136 artefact scatters, 103 isolated finds, three scarred trees, one scarred tree and associated artefact scatter and one set of grinding grooves associated with a scarred tree and an artefact scatter. Can you please provide a general comment on the Aboriginal cultural heritage significance of these sites and specific comment on the Aboriginal cultural significance of any sites that may hold special significance to you?

Full details of the sites are included in Appendix 7 of the draft report and photographs of all sites were provided in a separate document in November 2009. Photographs of those sites identified as having special Aboriginal cultural heritage value during the survey are included in the summary enclosed.

Comments: WE FEEL ALL OF THE ABOVE SITES HOLD CULTURAL HERITAGE SIGNIFICANCE, AS MOST SITES IN THE UPPER HUNTER ARE QUICKLY DISAPPEARING DUE TO MINE EXPANSION AND DEVELOPMENT

Please attach further pages as required.

GROUP NAME: CAIDAWAA WALANG DATE: 25·2·2010

During the survey period and in subsequent comments provided by participating Aboriginal stakeholders, landforms closely associated with Bowmans Creek, Bayswater Creek and the Hunter River were identified as having high Aboriginal cultural heritage significance. Do you also support this significance assessment? Are there other landforms/areas within the project area that have special Aboriginal cultural heritage significance to you?

The landforms are discussed in Sections 7.4 and 10 of the draft report and photographs of the Bowmans Creek terrace and Bayswater Creek floodplain are included in the summary enclosed. Photographs of the only sites associated with the Hunter River are (REA222 and REA236) are also included in the summary.

Comments: WE SUPPORT THIS ASSESSMENT

Please attach further pages as required.

GROUP NAME: GIDAWAA WAGANG DATE: 26.2.2010

Do you support/not support the management strategy proposed on page 6 of the enclosed summary and set out as dot points below? If you would like any part of the management strategy revised/changed could you please indicate how and why in the space provided.
Full details are provided on page 6 of the attached summary and in Sections 11 and 12 of the draft report

- 42 sites, including REAB6, are proposed for long term conservation within the 262 hectare Ravensworth North Offset Area (RNOA). These sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: WE SUPPORT THE MANAGEMENT STRATEGY

Please attach further pages as required.

- 156 sites are proposed for management for their protection within the project area boundary for the 29 year life of the mine. These sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: WE SUPPORT THE PROPOSED MANAGEMENT FOR THEIR PROTECTION.

Please attach further pages as required.

GROUP NAME: GIDAWAA WALANG DATE: 11.3.2010

- 12 further sites may be protected for the 29 year life of the mine, if detailed planning of the proposed 330 kV transmission line enables the sites to be avoided. If conservation is possible these sites will be managed under an Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders, an archaeologist and the DECCW.

Comments: WE AGREE WITH THIS PROPOSAL.

Please attach further pages as required.

- 150 sites, including an artefact scatter associated with a scarred tree, are proposed for surface collection.

Comments: WE AGREE WITH PROPOSAL THIS PROPOSAL

Please attach further pages as required.

GROUP NAME: GUDAWAA WAUANG DATE: 26.2.2010.

- 11 sites are proposed for subsurface testing, broad area manual excavation (if warranted) and/or mechanical scrapes (if warranted).

Comments: WE SUPPORT THIS PROPOSAL

Please attach further pages as required.

- Two landforms are proposed for subsurface testing, manual excavation (if warranted) and/or mechanical scrapes (if warranted)

Comments: WE SUPPORT THIS PROPOSAL.

Please attach further pages as required.

GROUP NAME: GUDAWAA WALANG DATE: 1·3·2010

- Two scarred trees are proposed for relocation to a Keeping/Teaching Place, in accordance with a scarred tree removal and conservation methodology.

Comments: WE AGREE WITH THIS PROPOSAL, BUT FEEL THE SCARRED TREES SHOULD BE KEPT IN COUNTRY (THE SAME AS THE ARTEFACTS)

Please attach further pages as required.

Appendix 11 of the assessment provides information in relation to a draft Research Design and Methodology for the salvage of sites within the project impact area as indicated in the dot points above. Do you agree/disagree with the methodologies proposed for the site salvage program?

Comments: WE AGREE WITH ALL THE METHODOLOGIES

Please attach further pages as required.

GROUP NAME: GIDAWAA WALANG DATE: 11.3.2010

- Ravensworth Operations has committed to additional offsets for the loss of Aboriginal cultural heritage and archaeological sites and values that will result from the project. These include active management of sites affected by erosion, such as those within the existing Farrells Creek 1 Aboriginal Artefact Management Area and the area of the Ravensworth Underground Mine Dam Conservation Area. Affected sites will be protected by undertaking culturally sensitive works to improve management of erosion.

Comments: WE AGREE WITH THESE COMMITTMENTS

Please attach further pages as required.

GROUP NAME:_____ DATE:_____

Ravensworth Operations has also committed to offering the following offsets for consideration by Aboriginal stakeholders. Do you think these offsets are culturally appropriate?

- funding for a display of artefacts salvaged from the project area, which would be established at a location such as one of the Teaching/Keeping places being planned by XCN and the Wanaruah LALC;
- funding to support the establishment of IT systems for the Keeping/Teaching place;
- funding to support training for Aboriginal community members for skills that would enable them to work within the Keeping/Teaching Place; and
- training in stone artefact recording and basic analysis.

Comments: "FUNDING FOR A DISPLAY OF ARTEFACTS SALVAGED FROM WARKWORTH THE PROJECT AREA SHOULD BE KEPT IN COUNTRY.

THE OTHER OFFSETS WE SUPPORT.

Please attach further pages as required.

GROUP NAME: GIDAWAA WALANG DATE: 25-2-2010

Ravensworth Operations will consider any other suitable offset option put forward by the Aboriginal stakeholders. Please provide suggestions for cultural heritage offset options appropriate to the Project.

Comments: YOUTH TRAINEESHIPS TO ENCOMPASS ALL FACETS OF ABORIGINAL HERITAGE ASSESSMENTS. POSITIONS TO BE CREATED IN A COMMUNITY BASED ORGANISATIONS WHO HAVE AN EXISTING RAPPORT WITH SEVERAL PROPONENTS

Please attach further pages as required.

GROUP NAME: GIDAWAA WALANG DATE: 24.2.2010.

In response to comments provided by the Aboriginal stakeholder groups, Ravensworth Operations has agreed to commit to a number of offsets including the following. Do you think these offsets are culturally appropriate?

- funding for the preparation of a video of the salvage program undertaken for the project, including footage of Aboriginal stakeholders describing the cultural heritage significance of the project area and the artefacts recovered;
- providing for supervised access to the RNOA;
- funding for information panels to be developed for a number of sites within the RNOA;
- funding for non-invasive 3D scanning of the Bowmans Creek 16 Engraving Site.

Comments:

WE AGREE THESE OFFSETS ARE CULTURALLY APPROPRIATE.

* FUNDING FOR THE PREPARATION OF A VIDEO OF THE SALVAGE PROGRAM - SHOULD BE MADE AVAILABLE TO COMMUNITY TO BE USED AS A TEACHING AID FOR INDIGENOUS ORGANISATIONS IN THE AREA FOR TRAINING AND ABORIGINAL TOURISM

Please attach further pages as required.

GROUP NAME: GIDAWAA WALANG DATE: 24·2·2010

Two scarred trees and large numbers of stone artefacts are proposed for recovery from the project area by the impact mitigation works outlined above, and management strategies for all recovered archaeological materials will be included in the Research Design and Methodology for the works.

Feedback from the Aboriginal stakeholders regarding the care of scarred trees and stone artefacts recovered during the proposed salvage program identified the following options. Do you think these options are culturally appropriate?

- salvaged items to remain at Ravensworth and not be moved to Broke, to keep close to Country; and/or
- the salvaged artefacts and scarred trees to be transported to the proposed Broke Keeping/Teaching Place; and/or
- scarred trees could be mounted on concrete blocks and protected within a small shelter; and/or
- some artefacts to be displayed at the proposed Teaching/Keeping places, and in the entry to the offices at Ravensworth. The rest to be placed on the ground in the RNOA or in a facility within the RNOA.

Comments:

* SALVAGED ITEMS TO REMAIN AT RAVENSWORTH AND NOT BE MOVED TO BROKE, TO KEEP CLOSE TO COUNTRY.

* SCARRED TREES COULD WE MOUNTED UNDER SHELTER AT RNOA'S NEW OFFICE PREMISES

Thank you for providing your comments.
Please complete the section below for our records.

Name of group/corporation: GIDAWAA WALANG CULTURAL HERITAGE CONSULTANC

Name of person authorised to complete pro-forma: ANNIE HICKEY

Signature of person completing pro-forma: A M Q

Position: PROJECT OFFICER

Date:

Please fax your comments to Umwelt (Australia) Pty Limited on **49505737** or post them to Umwelt (Australia) Pty Limited, PO Box 838, Toronto, NSW, 2283 prior to close of business on 19 February 2010.

LOCAL ABORIGINAL LAND COUNCIL

WANARUAH

P.O. BOX 127
19 MAITLAND STREET,
MUSWELLBROOK 2333
ABN 33 251 730 169

PH: (02) 6543 1288
(02) 6543 1962
FAX: (02) 6542 5377
EMAIL: wanarua@bigpond.net.au

Meaghan Russell
Umwelt (Australia) Pty Ltd
P.O. Box 838
Toronto 2283

Re: 2383F/Ravensworth EA Draft report extension number 2

Dear Meaghan,

Further to our letter 11-12-2009 to Jan Wilson requesting an extension of 12 weeks, Wanaruah LALC requests a further extension of time to respond to this draft report. I realise that 10 weeks has already elapsed since we requested this extension and that a further two weeks yet to come but as we initially stated the sheer size and volume of information to go through and consider as well as the oral information to check is making the task far slower than we had hoped. It will be at least a further 5 weeks before our consultation and reporting is complete and we expect to have a response to you by mid April 2010.

At this point in time the only response we can give is a rejection of the plan of management and reject any move to destroy or relocate further sites and/ or heritage areas as the Aboriginal Community hold the remaining untouched areas as significant to their wellbeing.

Wanaruah Local Aboriginal Land Council considers all Aboriginal sites and cultural landscapes within its constituted boundaries important to the local Aboriginal community. Aboriginal Cultural Heritage is not limited to the relics and art that have survived the impact of European settlement. It is a living culture and includes landforms, water holes vegetation zones, habitats, and peoples.

Before considering any consents, Wanaruah Local Aboriginal Land Council has a duty to fully explore and compare all the negative impacts that such action will have against the benefits of the development, to the Land, Aboriginal Culture and the Community.

Thank you for this opportunity for input,

Noel Downs
CEO
23-2-2010

LOCAL ABORIGINAL LAND COUNCIL
WANARUAH

P.O. BOX 127
19 MAITLAND STREET,
MUSWELLBROOK 2333
ABN 33 251 730 169

PH: (02) 6543 1288
(02) 6543 1962
FAX: (02) 6542 5377
EMAIL: wanarua@bigpond.net.au

Meaghan Russell
Umwelt (Australia) Pty Ltd
P.O. Box 838
Toronto 2283

Re: 2383P/Ravensworth FA Draft report extension number 2

Dear Meaghan.

Further to our letter 23-2-2010 to yourself requesting an extension to end April 2010. I would like to keep you updated on where we are currently at. Our draft community cultural significance report is nearing completion and we have set a date of Wednesday 14th April 2010 to present it to the Aboriginal Community. Not withstanding any changes by the community we should have the report to you sometime the week beginning Monday 19th April 2010.

Further than that at this point in time the only response we can give is a rejection of the plan of management and reject any moves to destroy or relocate further sites and/ or heritage areas as the Aboriginal Community hold the remaining unscathed areas as significant to their wellbeing.

Wanaruah Local Aboriginal Land Council considers all Aboriginal sites and cultural landscapes within its constructed boundaries important to the local Aboriginal community. Aboriginal Cultural Heritage is not limited to the relics and art that have survived the impact of European settlement. It is a living culture and includes landforms, water holes vegetation zones, habitats, and peoples

Before considering any consents, Wanaruah Local Aboriginal Land Council has a duty to fully explore and compare all the negative impacts that such action will have against the benefits of the development to the Land, Aboriginal Culture and the Community

Thank you for this opportunity for input

Noel Downs
CEO

26.3.2010

APPENDIX 3

Assessment of NSW State Plan and HCRCMA Catchment Action Plan Targets

Appendix 3 - Ravensworth Operations Project – HCRCMA Catchment Action Plan Context

1.0 Introduction, purpose and commitment

This briefing considers the natural resource management context of the Ravensworth Operations Project and the contribution that the project outcomes can make to the achievement of the NSW State-wide natural resource management targets of Priority E4 of the NSW State Plan, as given effect in the Hunter Central Rivers Catchment Management Authority's (HCRCMA) Catchment Action Plan (CAP) relating to biodiversity conservation.

Ravensworth Operations agrees that the natural resource and biodiversity targets of Priority E4 of the State Plan, and the supporting management targets in the HCRCMA Catchment Action Plan are relevant to planning for the Ravensworth Operations Project, in terms of immediate impacts on biodiversity values, but more importantly, in terms of planning, implementing and monitoring, sustainable rehabilitation, restoration and enhancement of ecological communities on the valley floor mine site and in biodiversity offset areas.

These State-wide and regional targets have been taken into account in developing the conservation and rehabilitation components of the biodiversity management strategy in the EA for the Project.

Many of the principles set out in the CAP for mining and extractive operations, for terrestrial biodiversity and for related natural resource values such as soil condition and invasive species control, are also reflected in Xstrata best practice standards and approaches to mine rehabilitation and offset planning and management.

Although time frames for biodiversity management associated with the Ravensworth Operations Project are clearly much longer than the current time frame of the State Plan and CAP – at 30 years from now rather than five years from now, Ravensworth Operations is committed to delivering a post mining landscape that supports enhanced and resilient biodiversity values, when compared to the current situation.

The Project involves a number of substantial commitments to conservation management of the biodiversity values of areas of the valley floor and valleys slopes of the central Hunter lowlands, which will take within the initial timeframes for the implementation of CAP targets, if the Project is approved. Detailed management plans for offset conservation areas will be prepared and implementation will commence within the first five years of the Project, equivalent to the target life of the HCRCMA CAP.

The combination of long term conservation management of biodiversity offsets, ecological function enhancement in biodiversity offset areas and progressive, best practice restoration and maintenance of high value ecological communities within the mine disturbance area, is consistent with **long term** improvements to biodiversity values in the region. These conservation outcomes and improvements would not be achieved with the current, 'business as usual' land management in the central lowlands of the Hunter Valley.

2.0 Natural Resource Management: Strategic Planning Context

In preparing this briefing, the following documents, and the targets, achievements and needs identified therein have been referenced:

- NSW State Plan (as updated, 2010).
- The Standards and Targets – NSW Natural Resources Commission.
- Standard for Quality Natural Resource Management – NSW Natural Resources Commission 2005.
- HCRCMA CAP, endorsed by NSW government in 2007.
- HCRCMA Annual Reports (to June 2009).
- NSW Catchment Management Authorities, Celebrating 5 years of Achievements.
- NSW Natural Resources Commission 2009. Native Vegetation Extent and Condition, Technical Report – in relation to State NRM Target '*by 2015, there is an increase in native vegetation extent and an improvement in native vegetation condition'*.
- DPI (Mineral Resources) Synoptic Plan 1999.
- 2005 ACARP study '*Development and rehabilitation completion criteria for native ecosystems on coal mines in the Hunter Valley*.'

The thirteen State-wide natural resource management targets are summarised in **Table 1**. Where the activities of the Ravensworth Operations Project are relevant to the delivery of the Management Target of the HCRCMA CAP, the CAP Management Targets are listed individually in **Table 1**.

The HCRCMA CAP also includes a large number of Guiding Principles for aspects of natural resource management and for key land uses in its catchment areas. The Guiding Principles set out for the mining and extractive industries and for biodiversity management are noted after **Table 1**.

Table 1 - NSW natural resource targets and HCRCMA Management Targets

State Plan Priority E4 targets	HCRCMA CAP Management Targets
Biodiversity	
By 2015 there is an increase in native vegetation extent and an improvement in native vegetation condition.	**Regenerate native vegetation** MT2: regenerate 25,000 hectares of native vegetation. **Protect native vegetation** MT1: Protect an additional 31,000 hectares of native vegetation. **Protect native riparian vegetation** MT17: Protect an additional 1,100 kilometres of native riparian vegetation by 2016. **Regenerate native riparian vegetation** MT18: By 2016 regenerate 25,500 hectares of native vegetation.

Table 1 - NSW natural resource targets and HCRCMA Management Targets

State Plan Priority E4 targets	HCRCMA CAP Management Targets
	Restore instream habitat MT21: By 2016, improve habitat on 200 kilometres of stream channels.
By 2015 there is an increase in the number of sustainable populations of a range of native fauna species.	Regenerate native vegetation (as above). Regenerate native riparian vegetation (as above). Treat weeds and animal pests (as below).
By 2015 there is an increase in the recovery of threatened species, populations and ecological communities.	**Threatened species work**: MT 4 Implement priority recovery actions on 800 hectares.
By 2015 there is a reduction in the impact of invasive species.	**Invasive species work** MT03: Treat 2,400 hectares of weed affected lands. MT04: Implement priority recovery actions on 800 hectares. MT08: Treat animal pests over 31,000 hectares.
Water	
By 2015 there is an improvement in the condition of riverine systems.	**Instream and foreshore stabilisation** MT20: by 2016 stabilise 125 kilometres of unstable or degraded stream channels and estuarine shorelines (estuaries not relevant to the current project). **Wetlands** MT06 and MT07: Protect and enhance wetlands (partially relevant to this project, for instance in terms of habitat for green and golden bell frog). **Biodiversity** See also MT17, MT18 and MT21 above.
By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.	There are no specific targets under the HCRCMA CAP that give effect to this State wide target.
Land	
By 2015 there is an improvement in soil condition.	**Stabilise actively eroding soils** MT10: By 2016, revegetate 8,400 hectares of actively eroding soils. MT11: By 2016, stabilise 800 hectares of actively eroding soils.
By 2015 there is an increase in the area of land managed within its capability.	**Salinity revegetation** MT12: By 2016, revegetate 1,200 hectares of salinity recharge areas with deep rooted vegetation. **Sustainable grazing management** MT15: By 2016, implement sustainable grazing management practices on an additional 19,000 hectares of grazing land. **Property Planning** MT16: By 2016, develop and implement property plans for an additional 25,000 hectares of agricultural land.

Table 1 - NSW natural resource targets and HCRCMA Management Targets

State Plan Priority E4 targets	HCRCMA CAP Management Targets
Community	
Natural resource decisions contribute to improving or maintaining economic sustainability and social well being.	**Manage Aboriginal Cultural and Heritage Landscapes** MT05: By 2016, manage an additional 52,000 hectares of landscapes having physical, cultural or spiritual significance to Aboriginal people.
There is an increase in the capacity of natural resource managers to contribute to regionally relevant natural resource management.	There are no specific targets under the HCRCMA CAP that give effect to this State wide target.

2.1.1 HCRCMA CAP – Guiding Principles

In addition to the Management Targets the CAP provides a wide range of strategic guidance on diverse aspects of natural resource management, using a series of 'guiding principles'. These principles are organised by natural resource value and by industry. The guiding principles also indicate the CMA's position on a range of issues; for instance the CMA's priorities and policies in relation to residual stands of native vegetation and offsetting.

Examples of CMA Guiding Principles (from the 2007 CAP) that are of relevance to the Ravensworth Operation Project are noted below. These principles have contributed to the development of a framework for natural resource management in the Project.

Guiding Principle: Maintain or improve terrestrial biodiversity (note some of these guiding principles are also identified under land use planning).

- The CMA will support in principle planning measures which reduce or avoid impacts of development on threatened species and communities, such as regional Conservation Plans and the Biodiversity Offsets and Banking Scheme.

- Regionally significant vegetation should be protected and all representative vegetation communities retained.

- The habitat of threatened species, communities and populations should be protected and where possible improved.

- Key threatening processes should be considered in planning land use change.

- Where practical, future development should be restricted to primarily cleared land. Where loss of vegetation is unavoidable, native vegetation offsets should be used.

- Landscapes should be manage to improve (or at least not threaten) biodiversity – see also Guiding Principles on land management.

- Planning for biodiversity should improve the health of ecosystems by increasing the connectivity and the size of habitat remnants.

- The method of native vegetation regeneration should be specific to each site and species. Regenerate plants from local sources to preserve genetic diversity.

Support the development and use of innovative economic tools to provide natural resource benefits.

In relation to offset schemes:

- Offsets should be used to benefit natural resources.

- Offsets should result in a net environmental improvement to soil, biodiversity, water quality or salinity.

- Offsets should occur on high priority conservation land identified in the CAP, such as regionally significant vegetation (specific sites are listed).

- Offset sites should be legally protected for the duration of the impact.

Mining and extractive operations: *Minimise the impacts of mining and extractive operations on natural resources and ensure appropriate rehabilitation of affected land.*

- Mining should not occur where the alteration of hydrological regimes adversely impacts significant threatened species habitat and where the impact cannot be managed or offset.

- The CAP should be considered in any decisions about post mining rehabilitation.

- Rehabilitation of sites should occur progressively and before environmental degradation of temporary landforms develops.

- Current best practice of mine rehabilitation should ensure that land affected by mining is progressively returned to at least its former productive condition, healthy native vegetation community structure and sustainable ecosystem that is consistent with pre European historical vegetation in the area should be achieved.

- Landscape plans (synoptic plans) should be used to guide rehabilitation of the biodiversity values and ecosystem services that can be provided for former mine sites.

- When mining significantly impacts on natural resources, offsets should be considered with the intention of improving or maintaining environmental outcomes.

Overall, these Guiding Principles (and others listed in the CAP) position the CMA to support:

- Protection of remnant areas of high conservation value native vegetation and habitat (by direct conservation or offset driven by development assessment processes), using identified priority conservation values as a guide.

- Ongoing and adaptive rehabilitation and restoration of native vegetation and habitat to enhance ecological connectivity and ecological function.

- Best practice assessment and management techniques, including both on ground rehabilitation activities, monitoring and knowledge management.

- Strategic partnerships with a range of landholders and land managers to achieve its objectives.

2.1.2 NSW standard for quality natural resource management

The NRC released the State-wide standard for quality natural resource management in 2005. Its purpose is to guide efficient and effective progress towards achieving the State-wide natural resource management targets. The Standard follows a similar form to other quality standards, incorporating a framework of planning processes (including knowledge management and risk management), implementation, audit and adaptive improvement.

Use of the Standard is mandatory for CMAs, but the NRC also notes that it is relevant to any organisation that seeks to manage natural resources in an efficient and effective manner, or in a way that can be compared meaningfully with other managers. Application of the standard by all organisations with a role in natural resource management in a region is therefore a significant advantage for being able to assess and enhance progress towards agreed targets.

The key elements of the Standard are noted below, together with a brief comment about how they are demonstrated in the Ravensworth Operations Project. Importantly, the design and management of the Project follows the Xstrata Coal NSW (2009) HSEC Standard 5.12 Mine Closure Planning (XCN Closure Standard). This means that all aspects of mine closure planning and landscape rehabilitation are taken into account during the planning phase and from the commencement of operations. This includes the post mining land use (incorporating the biodiversity considerations of the DPI Synoptic Plan), post mining landform and hydrology, and rehabilitation principles, objectives, processes, criteria and sustainability.

NRM Standard	**Ravensworth Operations Project**
Determination of scale	The Ravensworth Operations Project EA considers biodiversity issues at the scale of the Hunter valley, and particularly the central lowlands landscape unit of the Hunter catchment. It recognises the contribution that institutions such as major mining organisations can make to regional conservation values, because of the scale of their development, rehabilitation and enhancement activities. The Ravensworth Operations Project has a time scale of 29 years, i.e. medium term landscape change. The time frame for the Project is approximately the same as the current age of regenerated native vegetation over parts of the site. The potential scale of impact of the Project has been modified by excluding the Davis Creek area (490 hectares EEC) and by establishing offset areas in diverse ecological communities (approximately 1,600 hectares) , including an area of regionally significant vegetation.
Collection and use of knowledge	The EA presents a comprehensive review of existing information about the environment and natural resources context of the project area, and adds to this with properly designed survey and assessment of flora and fauna values, soil condition and a range of other natural resource values.
Information management	The Project is managed within the overall Xstrata information management system and quality systems, which include full records of key environmental values for the site, management commitments, development consent, licence and management plan requirements; monitoring programs and results, audit timeframes and improvement plans.
Monitoring and evaluation	The Xstrata mine closure and rehabilitation standard requires ongoing monitoring and review of the implementation of hydrology, soil and biodiversity restoration, and adaptive adjustments to management to ensure that objectives are met.

NRM Standard	Ravensworth Operations Project
Risk assessment	Strategic planning for the Project is based on risk assessment across environmental, social and economic issues. Loss of biodiversity is recognised as a key risk. Risk reduction measures include immediate conservation offset of more than 1,000 hectares of native vegetation, habitat enhancement (terrestrial, riparian and in-stream) in the offset areas and controlled regeneration of significant ecological communities commencing within three years and continuing over the life of the mine until key rehabilitation objectives are met.
Community engagement	The EA documents a wide range of engagement activities with local communities, land holders, Aboriginal groups, agencies and others.
Opportunities for collaboration	Ravensworth Operations recognises the potential for its land and vegetation management activities to support the broader regional initiatives of other stakeholders.

2.1.3 State and regional progress in relation to biodiversity targets

A key theme from the State-wide natural resource management documents is that for woody vegetation, there has been no net change in extent across the State between 2002 and 2008. Clearing of woody vegetation has been offset by increases in cover in other areas. For the period 2006 (when a baseline for the whole state was established) to 2008, approved clearing under the NVA 2003 was 'offset' by more than 3.5 million hectares of new conservation.

The NSW government (2010) states that it is *'now investing heavily in **repairing and restoring** the health of our landscapes*.' In addition, the NSW Government will introduce a new Biodiversity Strategy which addresses, amongst other things, the impacts of climate change. It will raise awareness of the importance of soil health and will enhance opportunities for Aboriginal people to take part on land management.

No data is yet available to assess trends in the extent of non woody vegetation at the state wide scale. It is also not possible, with existing data, to report a trend in native vegetation **condition** at the state scale. HCRCMA suggests that the condition of the Hunter region's natural resources and the activities of the mining industry are strongly linked. However, HCRCMA is also not in a position at this stage to report on trends in vegetation condition across its region, other than to report (2009) that approximately 12,000 hectares of terrestrial vegetation has been regenerated. Full compliance with the CMA's target requires that the regenerated vegetation is maintained for a minimum of fifteen years, i.e. full compliance will not be demonstrated until well after 2016.

In the HCRCMA region, the 2016 targets for reducing weed and animal pest impacts on biodiversity have already been met. The CMA has also already exceeded its 2016 CAP target for managing threatened species. The 'regenerate riparian vegetation' target has also been met (HCRCMA Annual Report 2009). Other biodiversity targets, such as protecting terrestrial and riparian vegetation and regenerating native vegetation and in-stream habitats are only approximately 50% achieved.

3.0 Ravensworth Operations Project consideration of biodiversity targets

Several of the State-wide natural resource management targets are relevant to sustainable management of the Ravensworth Operations Project.

This section reviews, in particular, the extent to which the Ravensworth Operations Project is consistent with or gives effect to the NSW State-wide **biodiversity** targets (in Priority E4 of the NSW State Plan, 2010) and the management targets and principles set out in the HCRCMA CAP (2007), as implemented to date. In contributing to the achievement of biodiversity targets, the Project will also to varying degrees, contribute to long term achievement of other State-wide and regional targets, acknowledging that the life of the Project is approximately 30 years.

In this context, biodiversity management in the Ravensworth Operations Project is considered to include the following processes, actions and assessments:

- Assessment of the extent and significance of vegetation remnants occurring within the project area and in potential offset areas. The assessment is based on best practice flora and fauna survey, delineation of vegetation communities and habitat assessment, as set out in Section 3 of Appendix 7 of the EA.

- Decision making processes for calculating and evaluating offset areas. The assessment process has carefully considered offsetting calculation and evaluation options and techniques, consistent with the Guiding Principle set out in the CAP. Issues associated with the direct application of the Biobanking tool have been discussed with DECCW and DoP, to arrive at the offset development and evaluation process described in the EA.

  Page 5.64 of the EA explains why the results of the Biobanking calculator (referred to by HCRCMA) have not been reported in the EA. The Biobanking credit calculator was applied to determine the feasibility of using this tool to inform the development of offset strategies for major projects such as the Ravensworth Operations Project. The preliminary application of the Biobanking tool highlighted a number of practical limitations to the use of the Biobanking tool in its current form, in evaluating the offsetting requirements for a major project. The outcomes of the Biobanking tool evaluation of offsetting requirements were presented to DoP and DECCW during consultation during 2009. On the basis of these presentations and discussions, the Biobanking tool has not been used to determine the offsetting and rehabilitation strategy for the project. However, the offsetting strategy does take into account the principles underpinning the Biobanking scheme.

  In relation to the Cumnock offset, this area was previously proposed as an archaeological offset, not a biodiversity offset. Provided ecological enhancement activities can be carried out without compromising the cultural heritage values of this area, it is appropriate to include it as new biodiversity offset. Management activities such as control of invasive species, revegetation and habitat enhancement and ongoing monitoring and maintenance are intended to provide improved biodiversity outcomes, above what would be achieved under the current management arrangements in the offset area.

  The Project area currently includes a range of derived native grassland habitats. Parts of the offset areas also contain derived native grassland and these habitats will be enhanced by rehabilitation programs in the early years of the Project. Over the life of the Project, there is significant potential to reinstate native grassland habitat, complementing

the Project's priority restoration of woodland and forest habitats, including EECs. The focus on restoration and enhancement of EEC vegetation (regionally significant ecological communities) is consistent with the principles set out in the CAP.

- A combination of offset and rehabilitation/restoration actions to enhance biodiversity values in the medium to long term. Rehabilitation and/or enhancement activities are proposed for both offset areas and for the post mining landscape. Regeneration and habitat enhancement in biodiversity offset areas, provides a total of 1,654 hectares of vegetation and/or habitat enhancement. These areas of existing native vegetation (party cleared and partly intact) will be managed for biodiversity enhancement from the commencement of the project. They will be placed in long term (in perpetuity) conservation management. The area of these immediate and long term conservation and habitat enhancement areas is 5.3% of the HCRCMA target of protecting an additional 31,000 hectares of native vegetation by 2015.

  Ravensworth Operations acknowledges that the conservation offset areas are not entirely like for like in relation to the native vegetation communities within the proposed disturbance area. Approximately 120 hectares of this community are included in the Ravensworth North Offset Area. The species represented in the EEC will be targeted for rehabilitation works in the mining area progressively over the life of the Project.

- Application of the best practice Xstrata rehabilitation Principles, Objectives and Criteria (e.g. see table 5.2 on p5.13 of the EA) to all rehabilitation work. These criteria draw on the 2005 ACARP study '*Development and rehabilitation completion criteria for native ecosystems on coal mines in the Hunter Valley*.' Criteria include ongoing regeneration capacity, healthy soil condition, 75% healthy and growing trees as indicated by long term monitoring, no significant weed infestation. These principles and criteria are very similar to those identified in the HCRCMA guiding principles for mining and extractive industry. The HCRCMA Guiding Principles cross reference the Mine Synoptic Plans that are considered in the EA, to guide biodiversity values and ecosystem services on mine sites.

- Overall biodiversity targets for the post mining landscape, and interim targets during the mining activity, contributing to the achievement of the State-wide and CAP targets. Ravensworth Operations acknowledges that the longer term (post mining) rehabilitation activities are outside the time frames of the current State-wide and CAP targets (generally 2015 or 2016). However, it must also be acknowledged that sustainable natural resource management in the Hunter region will require ongoing initiatives and vigilant maintenance of previous achievements, long after 2015/2016. Contributions to regional biodiversity post 2016 are still valuable; in fact, investment in ongoing restoration and rehabilitation work that is adaptive and carefully targeted to enhance the resilience of regional biodiversity values to climate change, in time frames of 50 years, 100 years and beyond, is essential. Xstrata's mine closure process is designed, amongst other things, to enhance biodiversity by restoring ecological communities and enhancing connectivity between remnants over these longer time frames.

- Staged clearing and rehabilitation of the mining area. Section 5.5 of Appendix 7 outlines progressive clearing, reshaping and revegetation activities. This staging of clearing and rehabilitation means that at the end of the project (30 years), 415 hectares will have rehabilitation of 25 years duration and 800 hectares will have rehabilitation of approximately 20 years duration. Currently some 375 hectares of the disturbance area for the project, or 67% of the disturbance area, has vegetation within the age range of 16 to 35 years. On this basis, at the end of the mine life, the age of the vegetation communities will be within the same range as now, and will have similar or better habitat value to now, with best practice rehabilitation measures and monitoring in place.

- Ongoing monitoring and reporting of the biodiversity offset and rehabilitation strategy, against the progressive ecological impacts of the project. This is a requirement of the Xstrata standard, but also is consistent with the NSW standard for quality natural resource management and with the HCRCMA Guiding Principles for best management practice and CMA Management Target 2 (regenerate 25,000 hectares of native vegetation).

- Management of soils and restructured landscapes to maintain the biological viability of remnants of topsoil and to restore biological viability (e.g. with biosolids and other organic materials). Biologically active soil contributes not only to agricultural land capability but to ongoing biodiversity values, providing the biological activity is not the seed of invasive species. Previous soil assessments in the Central Lowlands, including in the Project area, have identified poor remnant topsoil health including a significant risk of invasive species competing with re-establishing native species, communities and habitats. Enhancing soil health is consistent with the key biodiversity directions of the NSW State Plan (2010) and the statewide natural resource management targets (NRC 2005).

- Restoration and rehabilitation of riparian and instream habitats. This includes the protection and enhancement of Davis Creek (Ravensworth North Offset Area), the reinstatement of Emu Creek and habitat enhancement works in riparian and in-stream habitats in the Hillcrest offset area. It is accepted that (as the CMA states), in general, aquatic/in-stream (and all other) ecological communities have developed and adapted over many thousands of years, adjusting to the rainfall, surface water and groundwater regimes of specific landscapes. This is not to say that the existing in-stream ecological communities are not adapted to a range of flow conditions, nor that they are the same as those which would have been encountered 100, 200 or 2000 years ago. The aim and scope of in-stream habitat management proposed as part of the Project is to provide for long term functioning ecological communities, which deliver ecosystem services such as habitat for threatened and non threatened fauna, but also water supply for human land uses and transfer of nutrients and organic matter through the landscape.

- Where feasible, use of habitat enhancement structures in both protected and rehabilitated ecological communities. This includes tree stags and construction of habitat ponds for threatened species such as green and gold bell frogs, consistent with the DECC(W) Management Plan 2007. This supports the CMA management target MT4 – Implement priority recovery actions on 800 hectares.

- Ongoing management of animal pests and invasive plant species on offset areas and rehabilitation areas during and post mining. This activity supports the CMA biodiversity management targets MT3 (treat weed affected lands) and MT 8 (treat animal pests on 31,000 hectares).

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