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North Mining Limited

Northparkes Mines Section 75W Modification

Biodiversity Offset Strategy

August 2009

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

Contents

Table Index

Figure Index

1. Introduction

1.1 Background

GHD Pty Ltd (GHD) have been engaged by NPM to identify a suitable offset strategy associated with the Section 75W modification application to their existing development consent (DC 06-0026). This Report has been prepared as a technical document to support the Environment Assessment (EA), and addresses the Director General's Requirements (DGRs) issued by the Department of Planning in September 2008. The DGR's state that the ecological impact assessment must take into account the NSW Department of Environment, Climate Change and Water (DECCW) and Department of Primary Industries (DPI) *Guidelines for Threatened Species Assessment* under Part 3A of the Environmental Planning and Assessment (EP&A) Act 1979.

The DEC/DPI (2005) guidelines identify important factors and/or heads of consideration that must be considered when assessing potential impacts on threatened species, populations, or ecological communities, or their habitats for development applications assessed under Part 3A. These guiding principles include the requirement that the proposed activity must 'maintain or improve' biodiversity values (i.e. there is no net impact on threatened species or native vegetation).

The ecological impact assessment, detailed in Appendix D of the EA report, describes the potential impacts of the proposed activity on native biota, including measures to avoid or mitigate those impacts. The proposed activity would result in residual impacts on native flora and fauna, including:

- Clearing of approximately 14.3 ha of native vegetation including threatened fauna habitat;
- Clearing of Threatened Species Conservation Act 1995 (TSC Act) listed Endangered Ecological Communities (EECs);
- Removal of important habitat resources including remnant native vegetation and approximately 45 hollow bearing trees;
- Disruption of a locally important wildlife corridor into the site; and
- 'Likely' significant negative effects on local populations of the TSC Act listed Grey-crowned Babbler.

Therefore a biodiversity offset is required to accompany the Section 75W modification application in order to satisfy the requirements of the DEC/DPI (2005) guidelines and Part 3A of the EP&A Act, with regards to achieving an 'improve or maintain' outcome. A commitment to develop an appropriate offsets strategy forms part of the Draft Statement of Commitments for the proposed activity and would be included in the Conditions of Consent.

A biodiversity offset comprises one or more appropriate actions that are put in place to counterbalance specific impacts on biodiversity. Appropriate actions are considered to be long-term management activities that aim to improve biodiversity conservation. This can include legal protection of land (i.e. an offset site) to ensure security of management actions and remove threats (DECC, 2008). The biodiversity offset strategy outlined in this report includes the identification of:

- An offset site;
- Appropriate management actions to improve the biodiversity value of the site; and
- Titling options to ensure legal protection of the site.

The biodiversity offset strategy presented involves the titling and management of NPM-owned lands for biodiversity conservation i.e. the identification of an offset site. The locations of the development site and offset site are shown on Figure 1. The offset strategy recognises and respects the importance of NPM's ability to continue its mining operations viably into the future, coupled with the need to protect and maintain biodiversity within and surrounding the proposed development footprint.

A draft offset strategy was presented to DECCW for discussion during a site visit and meeting on 3 August 2009. This Final offset strategy report incorporates recommendations arising from DECCW review and discussions with NPM and GHD.

The biodiversity offset strategy presented in this report aims to:

- Comply with the *Principles for the Use of Biodiversity Offsets in NSW* (DECC 2008), and
- 'Maintain or improve' biodiversity values in accordance with the DEC/DPI (2005) guidelines for Part 3A developments.

1.2 Purpose of Report

The aims of this report are to:

- Describe the residual impacts on native biota associated with the proposed activity and quantify the requirements for biodiversity offsets;
- Identify and describe an offset site to suitably compensate for the impact, considering:
  - The need to maintain access to the potential future mining resource;
  - The need to comply with the DECC (2008) principals for offsetting with regards to the location, size and composition of the offset site; and
  - The need to deliver an offset that improves or maintains biodiversity values associated with the Section 75 modification area modification area;
- Provide a justification for the preferred offset site;
- Describe the native vegetation and habitat within the offset site;
- Identify environmental management measures for the offset site;
- Identify a suitable titling option for the offset site to ensure that it is conserved in perpetuity; and
- Clearly define the program required to implement the preferred 'offset'.

1.3 Relationship with Existing Reports

The offset strategy has been prepared giving consideration to information contained in a variety of reports, resources and documentation pertaining to the site. Those reports and resources of particular importance include:

- Ecological values and impacts referred to in this report are referenced from the ecological impact assessment (GHD, 2009) for the proposed modifications. The report contains information relevant to the offset strategy including vegetation characteristics, legislative requirements and proposed mitigation measures. It is recommended that the ecological assessment be read in conjunction with this report.

- Aerial photographs obtained from Google Earth software application, showing vegetation cover and extent of both clearing within lands of interest and suitable offset locations;
- Parkes Local Environment Plan (LEP) 1990 showing the zoning within lands of interest; and
- Vegetation mapping provided by the Lachlan Rivers Catchment Management Authority (CMA).

1.4 List of Abbreviations

CMA	Catchment Management Authority (Lachlan Rivers)
DECC	Department of Environment & Climate Change (formerly DEC – Department of Conservation)
DoP	Department of Planning
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EPBC	*Environmental Protection and Biodiversity Conservation Act 1999*
LEP	Local Environment Plan
LGA	Local Government Area (Parkes Shire Council)
NPM	Northparkes Mines (Proponent)
PSC	Parkes Shire Council
TSC Act	*Threatened Species Conservation Act 1995*

65 Ha

14.3 Ha

Adavale Lane

Bogan Road

Northparkes Lane

LEGEND

- Offset Site
- Surface Disturbance Area
- Existing, Approved Vegetation Disturbance
- Native Vegetation to be Removed

0 75 150 300 450 600

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

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NorthParkes Mines
Section 75W Modification for NPM

Job Number	21-17903
Revision	A
Date	17 JUL 2009

Study Area

Figure 1

G:\21\17903\CADD\GIS\MapDocument\Z013_Study_Area.mxd

10 Bond Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data Source: NSW Department of Lands: Topoweb2_wms - 2008; Navigate, Navteq: StreetMap - 2008; NorthParkes Mines: Aerial Photography - 18 July 2007; DEC (2006): Reconstructed and Extant vegetation of Central west NSW - 28/11/2008. Created by: RCJOHNSON, bahambly

2. Identification of Offset Site

2.1 Methodology

An ecological impact assessment of the proposed modification area was conducted according to the methodology described in the GHD (2009) Report. This provided:

- A detailed description of flora species and vegetation communities within the modification area;
- An assessment of fauna habitats and conservation significance;
- A quantitative assessment of impacts upon threatened species and native vegetation; and
- Proposed measures to mitigate impacts on native biota.

The ecological impact assessment (GHD, 2009) quantified residual impacts on native biota that would require biodiversity offsets, as summarised in Section 2.3.1.

GHD reviewed the DECC (2008) offsetting principles and compared a range of comparable offset strategies applicable to the proposed development (i.e. mining projects) (GHD, unpub.). NPM determined that the most practicable offset strategy for the proposed activity would be to identify NPM-owned lands, containing existing remnant vegetation, in order to secure conservation in perpetuity. The criteria used to identify a suitable offset site are presented in Section 2.2.

Potential offset sites within the vicinity of the NPM site were identified with reference to aerial photography and DEC (2006) vegetation mapping. A field ecologist conducted a preliminary assessment of potential sites noting vegetation type and condition and landscape context. Potential sites were presented to NPM to determine if they were feasible from a socioeconomic perspective – i.e. to balance conservation outcomes with future mining or agricultural operations in the locality.

GHD ecologists then conducted a detailed field assessment of the preferred offset site. A vegetation and habitat assessment was conducted using the Biometric field methodology to record parameters including native plant species richness, vegetation structure, numbers of tree hollows and degree of weed infestation. Additional quantitative habitat data was also collected from the development site to allow for more direct comparison with the offset site. GHD ecologists also performed a general, qualitative habitat assessment noting habitat features and resources that are important to local populations of threatened species. A random meander survey for threatened plants was conducted across both the offset site and modification site. Opportunistic fauna observations were recorded at all stages of the field survey and the locations of threatened species captured with a handheld GPS. A description of the offset site, incorporating the field survey results, is provided in Section 2.4.

2.2 Offset Site Criteria

The proposed biodiversity offset strategy required the identification of an offset site, containing existing remnant vegetation, in order to secure conservation in perpetuity. These lands would be titled appropriately to ensure the offset was secured and that biodiversity values are improved through an appropriately funded rehabilitation program.

Potential offset sites were identified using the following criteria:

- Lands that are owned by NPM;

- Lands that are not significantly constrained by socioeconomic considerations (for instance NPM lands which contain important mineral resources or viable agricultural lands);
- Lands containing native vegetation of similar type to that being removed (satisfying the 'like for like' principle);
- Lands containing larger patches of remnant vegetation either connected to or with the potential to be connected to other remnant vegetation;
- Lands containing vegetation in better condition than that being removed as part of the mine expansion and/or which has the potential for improvement in biodiversity values as a result of conservation and management;
- Remnant vegetation with a low perimeter-to-area ratio which therefore reduces the potential for edge effects and maintenance requirements;
- Lands suitably located to facilitate ongoing administration, maintenance and evaluation by either the proponent or DECC and with relatively easy access;
- Lands which are likely to be viable in the longer term, with respect to the above-listed measures of vegetation condition, patch size and practicality of management; and
- Lands which are appropriate to offset impacts associated with the modification and ensure that the proposed activity 'improves or maintains' biodiversity values.

The DECC (2008) principles for the use of biodiversity offsets in NSW were used as the basis of the offset strategy outlined in this Report. Review of provisional guidelines and case studies suggests that the proposed package outlined below constitutes an acceptable offset. A specific comparison of the proposed offset strategy with the DECC (2008) principles is provided in Table 5.

2.3 Determination of Offset Requirement

2.3.1 Impact Description

Specific impact mitigation and environmental management measures have been recommended in the Environmental Assessment report, to increase the certainty of the long term maintenance of the biodiversity values of the site during construction and operation. This would substantially avert offsite impacts on surface waters, native vegetation and fauna habitats. The proposed activity will not mitigate all impacts on native flora and fauna within the proposed surface disturbance area. There are residual impacts on native biota, including threatened species and EECs.

Implementation of the proposed works will remove approximately 14.3 ha of native vegetation, consisting of vegetation communities including Yellow Box Woodland (1.14 ha), Grey Box Woodland (5.82 ha), Bimble Box Woodland (4.72 ha) and Native grassland (2.68 ha). All of these communities are listed as endangered ecological communities (EEC's) under the *Threatened Species Conservation (TSC) Act 1995*. In addition, the proposal will also contribute to the loss of fauna habitat features (habitat trees, diverse vegetation structure etc) and a reduction in habitat for local populations of the Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis).* This species is listed as vulnerable under the TSC Act.

The proposed modification area contains a further 86 ha of highly disturbed areas (road verges, table drains, road embankments, ploughed paddocks etc.). These areas have minimal conservation value and do not require offsetting.

The comparison of ecological impacts, mitigation and offsets associated with the application of the "improve or maintain" test to the proposed activity are summarised in Table 1.

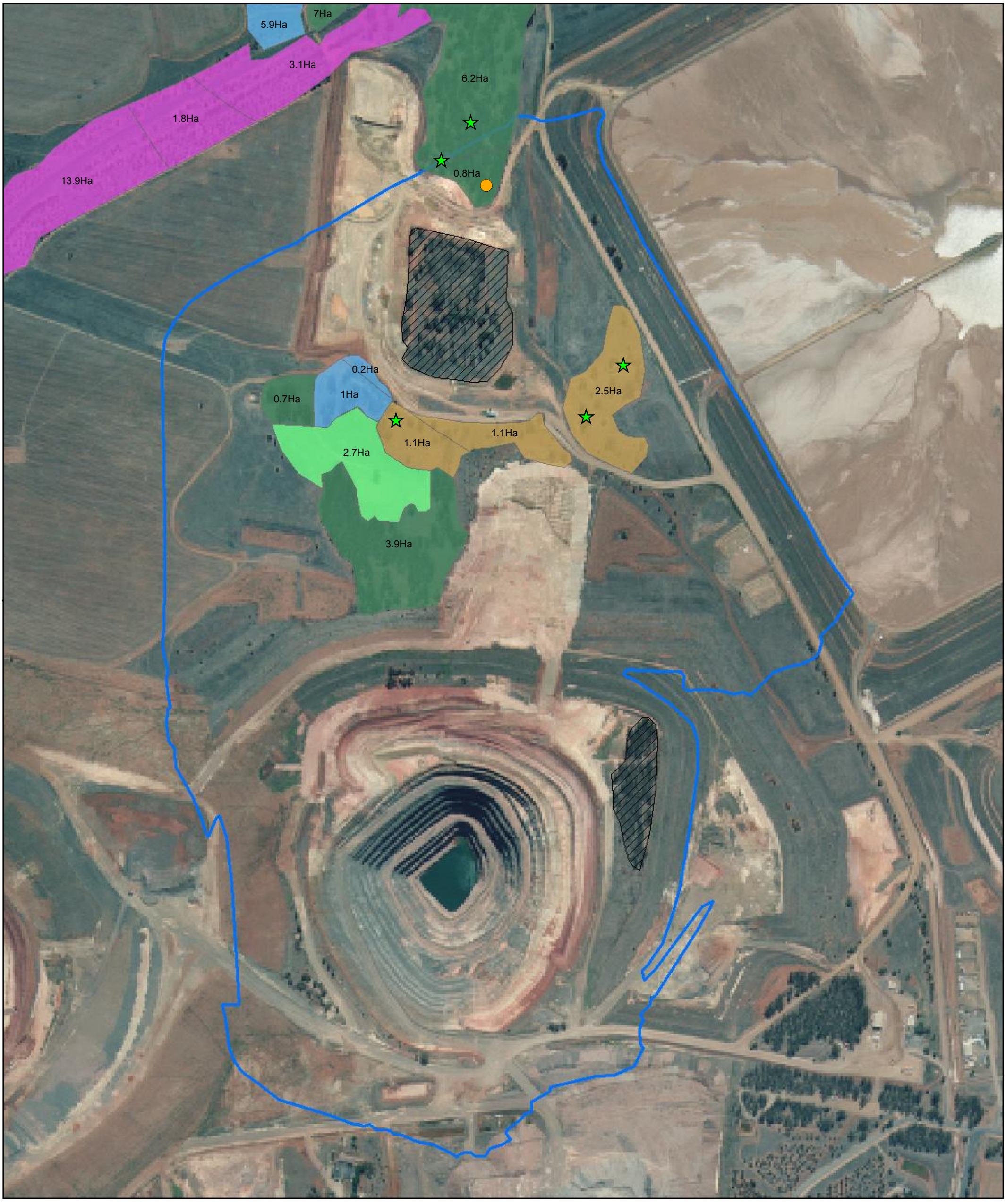
2.3.2 Impact Mitigation

Mitigation measures are included in the statement of commitments for the proposed modification and would be detailed in a Construction and Environmental Management Plan (CEMP). The CEMP will include provisions for pre-clearing surveys for resident native fauna, including contingencies for threatened fauna roosts. The NPM Landscape Management Plan (Northparkes Mines, 2008) states that pre-clearing survey must be undertaken by a relevantly trained person to target particular threatened species known or potentially occurring in the area and identify any important habitat resources for these species within the clearing areas. Should any important habitat resources be located, appropriate impact management measures will be undertaken in accordance with the Flora and Fauna Management Plan (A216136) and Site Disturbance SOP (A164522) (Northparkes Mines, 2008). The CEMP for the proposed modification will build upon the Landscape Management Plan and include specific measures for threatened fauna known or suspected to occur in the modification area, including:

- Targeted surveys for Grey-crowned Babblers and their nests, and relocation of active nests to adjacent areas of suitable habitat;
- Targeted surveys for Squirrel Gliders (*Petaurus norfolcensis*) and potential roosting hollows. Salvage of suitable hollow bearing timber and repositioning in suitable locations in adjacent areas of suitable habitat; and
- Post-clearing monitoring to assess the success of fauna salvage and relocation efforts.

Table 1 Comparison of Ecological Impacts, Mitigation and Offsets

Impact	Mitigation	Offset
◗ Removal of approximately 14.3 ha of native vegetation including: – Yellow Box Woodland (Box-gum Woodland EEC) 1.13 ha; – Grey Box Woodland and Native Grassland (Inland Grey Box Woodland EEC) 8.5 ha; – Bimble Box Woodland (Inland Grey Box Woodland EEC) 4.71 ha; ◗ Removal of 139 ha of low value habitat in disturbed / cleared land; ◗ Significant negative effect on local populations of the Grey-crowned Babbler; ◗ Removal of 45 hollow-bearing habitat trees; and ◗ Long-term loss of fauna habitat features (habitat trees, diverse vegetation structure etc).	◗ Remediation and revegetation of the NPM area following mine closure; ◗ Habitat enhancement in remediated areas through improvements in habitat connectivity; ◗ Retention of fallen timber and salvage of felled trees in modification footprint and reinstatement in remediated areas; ◗ Presence of similar woodland in the locality; ◗ Pre-clearing surveys for (and salvage of) resident native fauna, including contingencies for specific threatened fauna resources (e.g. occupied hollows, nests) , detailed in a CEMP; ◗ Surface water management, and avoidance of off site impacts; and ◗ Soil management and avoidance of erosion and sedimentation impacts.	◗ Develop a biodiversity offset strategy that would identify an offset site containing appropriate vegetation communities and habitats and manage for conservation, under secure tenure, in perpetuity.



LEGEND

- Grey-crowned Babbler
- Petaurus sp. (potential Squirrel Glider)
- Existing, Approved Vegetation Disturbance
- Disturbance Area
- Derived Tussock Grassland (Benson 250)
- Derived Tussock Grassland - Low Condition (Benson 250)
- Remnant Native Vegetation
- Inland Grey Box / White Cypress Woodland (Benson 80)
- Inland Grey Box Woodland (Benson 81)
- Mixed Box Woodland (Benson 248)
- Regrowth / Planted Native Vegetation
- Yellow Box Woodland (Benson 276)
- Highly Disturbed Areas

0 25 50 100 150 200
Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

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Section 75W Modification for NPM

Job Number	21-17903
Revision	A
Date	16 JUL 2009

Development Site

Figure 2

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10 Bond Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data Source: NSW Department of Lands: Topoweb2_wms - 2008; Navigate, Navteq: StreetMap - 2008; NorthParkes Mines: Aerial Photography - 18 July 2007. Created by: RCJOHNSON, bahambly

Some patches of remnant vegetation visible on Figure 2 and within the Section 75W modification area had been previously approved for clearing or disturbance. One area 'Anna's Island' was assessed in the E48 EA (Corkery 2006) and approved for clearing in DC 06-0026. This vegetation was removed in September 2008 (GHD, unpub. b) prior to the current assessment.

2.3.3 Offset Comparisons

The offset strategy would aim to conserve and rehabilitate 65 ha of native vegetation to compensate for the loss of 14.3 ha of native vegetation associated with the modification (or an offset ratio of 4.5:1) .

The strategy was developed through an analysis of previously approved development projects incorporating offset strategies. The offset strategies reviewed encompass residential, commercial, industrial and mining projects and were accessed through the NSW Department of Planning (DoP) website. Offsetting actions reviewed have included conservation, restoration, the payment of financial contributions and combinations of the three.

It is clear that with regards to biodiversity offsets:

- There is limited consistency in offsets approved (revegetation offset ratios range from 2.1 – 4.5:1, conservation ratios have ranged from 1 - 6.5:1 and financial contributions from $34,290 – $80,000 /ha); and
- The proposed offset for NPM is comparable to, or greater than previous offsets strategies accepted by the DoP.

Examples of projects relevant to the s.75 modification have been summarised in Table 2, below.

Table 2 Offset Ratios Promoted in Various Biodiversity Offset Strategies (GHD, unpub.).

Offset Policy	Conservation	Revegetation/Restoration
Glennies Creek Open Cut Coal Mine	No detail provided	3.83:1 (through conservation and rehabilitation of 254 ha on site & 33 ha off site). Proponent to manage the biodiversity offset areas for the purpose of conservation while ever it retains ownership of these areas
Mount Arthur Coal Mine - South Pit Extension	1.23:1 (loss of 50 ha of woodland and 280 ha of highly disturbed grassland, to be offset by conservation of 395 ha)	Not applicable.
East Boggabri Coal Mine	6.4:1 (loss of 78 ha, including 0.5 ha endangered vegetation offset by conservation of 500 ha)	Not applicable.
Mount Owen Coal Mine	1:1 (334 ha conserved based on 'like for like' compensatory habitat. Impacted habitat included 18 threatened species listed under the TSC Act)	5.2:1 (334 ha conservation plus 1400 ha through direct seeding and revegetation of some areas as well as management to promote natural regeneration on the balance)

2.4 Offset Site Description

The offset site is comprised of 65 ha in the northern portion of Lot 3, DP 830291 in the Parkes Local Government Area. It is located approximately 2 km to the north east of the NPM site, situated within the Southwest Slopes Bioregion on the western slopes and plains of the Great Dividing Range. The property is owned by NPM and managed under lease arrangements. Current land uses include remnant vegetation and agriculture (cropping and grazing with sheep).

The offset site borders agricultural land with patchy native vegetation to the north and west of Adavale Lane, to the south is more agricultural land and to the west is native vegetation in the travelling stock route along Bogan Road.

The offset site is shown on Figure 3 along with native vegetation communities.

2.4.1 Vegetation Communities

The proposed offset contains approximately 42 ha of native grassy woodland vegetation communities which are similar to those within the modification site. Vegetation types were identified according to the classifications of Keith (2004) for within the Lachlan CMA (DECC, 2009). Those vegetation types that would be cleared at the modification site are summarised in Table 3. The offset site contains 38.8 ha of Inland Grey Box - White Cypress Pine tall woodland and 3.3 ha of Yellow Box tall grassy woodland. These areas feature moderate disturbance by historical selective timber harvesting and ongoing grazing. The understorey is in relatively poor condition and is heavily grazed, but native plant species richness is good (20 -28 native species per 20m by 20m vegetation survey quadrat). It is likely that this relatively diverse assemblage of native plants persists in the soil seed bank and that in the absence of grazing the offset site would exhibit good capacity for regeneration. The entire offset site features moderate infestation with exotic weeds, including Pattersons Curse (*Echium plantagineum*) and Dandelion (*Taraxacum officianale*).

Inland Grey Box - White Cypress Pine tall woodland occupies the majority of the offset site. Canopy species vary across the site, with areas dominated by Inland Grey Box (*Eucalyptus microcarpa*) and White Cypress Pine (*Callitris glaucophylla*) with scattered Bimble Box (*Eucalyptus populnea*). This community is in moderate to good condition across the site. The majority of canopy trees are mature regrowth (30-60cm DBH) with few pre-European age trees. The mid storey and shrub layers are virtually absent apart from occasional chenopod species and White Cypress regrowth. The groundcover is patchy and intensely grazed and comprises native tussock grasses (*Austrostipa* and *Austrodanthonia* spp.), native herbs including Kidney Weed (*Dichondra repens*) and various native daisies (*Vittadenia* spp. and *Calotis* spp.). Bare ground and leaf litter make up a large proportion of the ground cover.

Inland Grey Box - White Cypress Pine tall woodland at the site is consistent with the TSC Act listed EEC Inland Grey Box Woodland.

Yellow Box Woodland at the site features a canopy of *Eucalyptus melliodora* (Yellow Box) with a very sparse shrub layer and a grassy understorey. The canopy is dominated by mature regrowth trees (30cm – 80cm DBH) with a limited number of mature trees (>80cm DBH) and few saplings (<10cm DBH). Grey Box (*Eucalyptus microcarpa*) and White Cypress Pine (*Callitris glaucophylla*) are sub dominant. There is a low (<1m height), sparse layer of native shrubs including *Enchylaena tomentose (*Ruby Saltbush). The ground cover is predominantly native, dominated by Speargrasses (*Austrostipa* spp.) along with the scrambler Amulla (*Eremophila debilis*) and herbs including Fuzzweed (*Vittadenia cuneata*). This woodland would meet the NSW TSC Act definition of the EEC “White Box- Yellow Box- Blakely’s Red

Gum Woodland" (Box-gum Woodland). The present study did not include a formal assessment of this patches status as the EPBC act listed Critically Endangered Ecological Community "White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland".

The small patch of Yellow Box tall grassy woodland surrounds an abandoned quarry. This area features good regeneration with Yellow Box (*Eucalyptus melliodora*) seedlings and contains a wetland with good growth of native macrophytes.

The offset site contains a further 23 ha of derived tussock grassland with the occasional paddock tree. This area would formerly have supported Inland Grey Box - White Cypress Pine tall woodland but has been extensively cleared. The understorey has also been extensively modified including some areas which have been ploughed. However it contains moderate native species richness (11 -12 native species per 20m by 20m vegetation survey quadrat) particularly in less heavily disturbed portions adjacent to remnant woodland. It is likely that a moderately diverse assemblage of native plants persists in the soil seed bank and that in the absence of grazing the offset site would exhibit some capacity for native regeneration. Active rehabilitation of this area through tree planting is also recommended, as described in Section 3.2.4.

38.8Ha
0.9Ha
2.4Ha
8.8Ha
114.8Ha
1.8Ha
1.4Ha
2.5Ha
0.3Ha
2.7Ha
1.7Ha
28.5Ha
15.3Ha
3Ha
4.5Ha
0.8Ha
4.2Ha
1.7Ha
10.6Ha
7Ha
3.2Ha
6.2Ha

LEGEND

- Offset Site
- Surface Disturbance Area
- Existing, Approved Vegetation Disturbance
- Superb Parrot
- Grey-crowned Babbler

Native Vegetation

- Derived Tussock Grassland (Benson 250)
- Derived Tussock Grassland - Low Condition (Benson 250)
- Remnant Native Vegetation
- Inland Grey Box / White Cypress Woodland (Benson 80)
- Inland Grey Box Woodland (Benson 81)
- Mixed Box Woodland (Benson 248)
- Regrowth / Planted Native Vegetation
- Yellow Box Woodland (Benson 276)
- Highly Disturbed Areas

0 37.5 75 150 225 300
Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

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NorthParkes Mines
Section 75W Modification for NPM

Job Number 21-17903
Revision A
Date 17 JUL 2009

Offset Site

Figure 3

G:\21\17903\CADD\GIS\MapDocument\Z015_Offset_Site.mxd

10 Bond Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data Source: NSW Department of Lands: Topoweb2_wms - 2008; Navigate, Navteq: StreetMap - 2008; NorthParkes Mines: Aerial Photography - 18 July 2007; DEC (2006): Reconstructed and Extant vegetation of Central west NSW - 28/11/2008. Created by: RCJOHNSON, bahambly

Table 3 Comparison of Vegetation Types in Development Site and Offset Site

Vegetation type[1] in s.75 modification area	Area to be cleared (ha)	'Like for like' vegetation types in offset site	Area to be conserved (ha)
Yellow Box Woodland (Yellow Box tall grassy woodland on alluvial flats mainly in the NSW South Western Slopes Bioregion (Benson 276[2]))	1.1	Yellow Box tall grassy woodland on alluvial flats mainly in the NSW South Western Slopes Bioregion (Benson 276)	3.3
Grey Box Woodland and Native Grassland (Inland Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions) (Benson 76))	5.8	Inland Grey Box - White Cypress Pine tall woodland on sandy loam soil on alluvial plains of NSW South-western Slopes and Riverina Bioregions (Benson 80)	38.8
Bimble Box Woodland (Mixed box woodland on low sandy-loam rises on alluvial plains in central western NSW (Benson 248)	4.7		
Derived tussock grasslands of the central western plains and lower slopes of NSW (Benson 250)	2.7	Derived tussock grasslands of the central western plains and lower slopes of NSW (Benson 250)	23
Total	**14.3**		**65**

[1] = Keith (2004) vegetation type.

[2] = Benson (2008) vegetation community.

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2.4.2 Fauna and Habitats

Two threatened bird species were observed during the June 2009 field surveys of the offset site: the TSC Act listed Vulnerable Grey-crowned Babbler (*Pomastomus temporalis temporalis)* and Superb Parrot (*Polytelis swainsonii*). Threatened species records are shown on Figure 3, however all woodland vegetation in the study area would provide habitat for local populations of the species.

Woodland within the offset site is in moderate to good condition. It contains healthy, mature trees forming a canopy with a woodland or tall woodland structure equivalent to undisturbed examples of these vegetation communities. It contains some hollow-bearing trees and stags and moderate recruitment of juveniles and seedlings. Based on these structural attributes woodland at the site would be expected to support a moderate diversity of native birds, microbats and arboreal mammals.

The remainder of the offset site comprises derived grassland with isolated remnant trees and would support open country bird species and a limited suite of native reptiles and mammals.

2.4.3 Patch Size and Connectivity

The offset site is surrounded to the north, east and south by extensively cleared lands. These disturbed areas would constitute a barrier for many native fauna species. However, in the context of the Parkes LGA the 42 ha patch of woodland within the offset site is a relatively large and significant remnant. It would support local populations of a range of native birds, mammals and reptiles including less mobile and patch-size dependant species. The size and shape of the offset site affords a low perimeter to interior area ratio which would increase its long term viability as habitat for native biota.

The offset site has strong connectivity with a travelling stock route (TSR) to the east. The TSR is a very large patch (> 200 ha) in excellent condition, with intact understorey and small tree layers and many hollow-bearing trees. The TSR is likely to comprise a regionally significant wildlife corridor. The offset site is contiguous with this wildlife corridor and once it is fenced and managed for biodiversity conservation would increase its overall size and viability. Supplementary tree planting would increase the overall woodland patch size and further improve habitat connectivity, as described in Section 3.2.4 below.

3. Management of Offset Site

3.1 Titling of Offset Site

The DECC (2008) offsetting principles state that offset areas must be 'enduring' and they must be enforceable; that is, the offset area must be protected in perpetuity by a planning instrument and/or by changes to the title of the property. In the current legislative context, three titling options are available:

1. A restriction on use of land under Section 88D of the NSW *Conveyancing Act*;
2. A Voluntary Conservation Agreement; or
3. Acquisition of the land by the National Parks and Wildlife Service (NPWS).

These three titling options are outlined below along with the relevant sections of the legislation that describe how they comply with the DECC (2008) offsetting principles.

3.1.1 Restriction on Title

Section 88 of the NSW *Conveyancing Act 1919* provides mechanisms for placing restrictions on the use of land. These restrictions are often used by local government to ensure new developments comply with consent conditions, such as restrictions on pet ownership, water use or garbage collection.

In the case of the proposed site, NPM are the land owner within the meaning of the Act. Under Section 88E, land not held by a prescribed authority can be regulated. In this section prescribed authority means:

(a) the Crown,

(b) a public or local authority constituted by an Act, or

(c) a corporation prescribed for the purposes of this section.

Section 88E(2) states that a prescribed authority may, by an order, impose restrictions on the use of land. To ensure an appropriate biodiversity offset, NPM would have to commit to a Section 88E instrument that restricts the use of the land to all activities but those associated with environmental management and conservation activities.

Subsection (3) states that a restriction or public positive covenant referred to in subsection (2) may be imposed in relation to land under the provisions of the *Real Property Act 1900* by a memorandum of restriction or public positive covenant in the form approved under that Act that:

(a) specifies the prescribed authority that is imposing the restriction or public positive covenant,

(b) is executed by that prescribed authority, by the registered proprietor of the land and by each other person who has a registered estate or interest in the land and is to be bound by the restriction or public positive covenant, and

(c) is lodged in the office of the Registrar-General.'

Once this order is lodged in the General Register of Deeds kept under Division 1 of Part 23 of the *Conveyancing Act 1919* it has force and effect over the land covered in the order.

3.1.2 Voluntary Conservation Agreement

Offset sites can be identified and preserved through a Voluntary Conservation Agreement (VCA) under Part 4, Division 12 of the NSW *National Parks and Wildlife Act 1974* (NPW Act). The following sections of the NPW Act relate to the use of a VCA in offsetting:

- **s.69B** (1) 'The Minister may enter into a conservation agreement relating to land with the owner of the land'.
- **s.69C** (1) 'A conservation agreement may be entered into: (e) for the purpose of the study, preservation, protection, care or propagation of fauna or native plants or other flora'.

(2) 'A conservation agreement may contain terms, binding on the owner from time to time of the conservation area: (a) restricting the use of the area, (c) requiring the owner to carry out specified activities or do specified things'.

- **s.69D** (3) 'An agreement shall have effect until it is terminated by consent of all parties to the agreement…'.
- **s.69 E** Agreements to run with land.
- **s.69 G** (1) 'Proceedings relating to the enforcement of conservation agreements shall be taken in the Land and Environment Court'.

(2) 'Damages shall not be awarded against the owner of a conservation area for breach of a conservation agreement unless the breach arose from an intentional or reckless act or omission by the owner or a previous owner of the land (being an act or omission of which the owner had notice)'.

- **s.69I** (1) 'A statutory authority shall not carry out development in a conservation area unless': (b) it has received written notice from the Minister consenting to the development.
- **s.69KA** (1) 'For the purposes of section 28 of the *Environmental Planning and Assessment Act 1979*: (a) a conservation agreement is taken to be a regulatory instrument, and(b) the Minister is responsible for the administration of such a regulatory instrument'.

In the case of the proposed offset site, NPM, as the land owner, would enter into an agreement with the NSW Minister for the Environment. The VCA would be attached to the title of the land (and hence is transferred from owner to owner, if any sale of the land occurs in the future), would be legally binding and would require NPM to undertake such actions as required to maintain the biodiversity and general condition of the land whilst under NPM tenure. The annual management budget for maintaining a VCA is therefore an important consideration for the land owner.

Section 69C (3) states that a VCA may contain terms binding DECC to provide financial assistance, technical or practical assistance in managing the land. These terms are specified in negotiating the agreement and generally would only apply to land owners entering VCAs on a charitable basis. Since the site is an offset for a development DECC would not provide financial assistance.

For the purposes of the EA the statement of commitments would include a set of the terms, conditions and management actions that the proponent proposes for the agreement with the NSW Minister for the Environment.

3.1.3 Acquisition of the Land by the NPWS

Acquisition of land by the NPWS for reservation in a National Park is described in Part 11 of the NPW Act – 'Acquisition and disposal of property'. With regards to offset sites, the proponent would divest the

land within the proposed offset to the NSW Minster for the Environment. This transaction forfeits any revenue possible under a normal land sale (if the proponent saw fit to sell the land) but avoids the annual management and administrative costs payable under a VCA or s.88D instrument. The portion of land would be subdivided from the current Lot and donated to DECC. Donations to the National Parks estate are preferred when the site adjoins a National Park or other conservation land, or if the site has exceptional conservation value. The offset site does not adjoin land within the National Parks estate and does not have exceptional conservation value and so DECC are unlikely to accept such an offer.

3.2 Environmental Management of Offset Site

Ongoing management of the offset area will be required to comply with the DECC (2008) guidelines and to maintain or improve biodiversity values. Ongoing environmental management would be conducted under a Vegetation Management Plan (VMP). A framework for the management actions that will be applied to the offset site is provided below.

3.2.1 Planning

A VMP will be prepared to clearly outline the works required on conservation lands, recommended implementation time frames, rehabilitation and management cost estimates and other associated information. The offset site will be split into two functional management zones based on the level of environmental management activities required:

1. Rehabilitation zone, incorporating the intact grassy woodland areas, which would be subject to natural regeneration of native vegetation; and
2. Revegetation Zone, incorporating the derived tussock grassland, which would be subject to replanting with native vegetation.

Management zones at the proposed offset site are shown on Figure 4.

Management actions that would be undertaken in each zone are summarised below.

The VMP will be prepared according to DWE guidelines "*How to Prepare a Vegetation Management Plan, WMA Guidelines (Feb 2008*) and other relevant policies, and will address:

- Site assessment and determination of constraints (e.g. flora and fauna, habitat and corridor values, hydrology, fire issues, services, drainage, topography, weeds, etc);
- Definition of project tasks (description of all tasks necessary to implement the plan);
- Preparation of a program of works;
- Liaison with stakeholder groups (government agencies) and external specialists as required;
- Preparation of plant species lists, including maps and diagrams;
- Details on site preparation (protection of existing plants, erosion control, site works, weed control, soil amelioration, seed collection, etc);
- Description of planting program and methodology;
- Description of maintenance program;
- Description of monitoring and review process;
- Other potential issues (signage, other relevant legislation, other site areas, public relations, community involvement, etc); and

- Preparation of costings for implementation of the plan.

The VMP for the offset site will be integrated with the current Landscape Management Plan (LMP) (Northparkes Mines, 2008) prepared in accordance with EA 06-0026.

Ongoing revegetation conducted under the LMP aims to provide linkages between areas of remnant vegetation adjoining NPM. Wildlife corridors have been established or improved along fence lines, road verges, creeks and drainage lines through an annual revegetation program. This program involves the planting of approximately 10,000 trees per annum, if conditions are suitable, and concentrates on areas adjoining intact remnants to increase their size and viability over time and where increased connectivity between remnants can be achieved. In excess of 150,000 trees have been planted to date within the NPM landholdings (Northparkes Mines, 2008).

The proposed offset site will be incorporated into the NPM rehabilitation strategy. The annual planting of 10, 000 trees would be conducted in and adjacent to the revegetation zone of the offset site, to improve connectivity with the TSR and other wildlife corridors. The annual tree plantings are not the subject of any offset or statement of commitments connected to a previous approval (Morphett, R. pers. comm.).

All revegetation activities will utilise local provenance seed, with works being undertaken in accordance with Florabank *Seed Collection and Management Guidelines*, updated July 2007 and *Management Principles to Guide the Restoration and Rehabilitation of Indigenous Vegetation* (Greening Australia 1999).

The offset site is dominated by Inland Grey Box - White Cypress Pine tall woodland, which is not a precise match for the Inland Grey Box woodland that would be removed in the modification area. Therefore the revegetation program will involve planting of species representative of the Inland Grey Box woodland with the aim of reconstructing this community in the revegetation zone.

The VMP will be in place, and the offset site will be actively managed by NPM, for a minimum period of five years. It is likely that this would be sufficient time for the revegetation zone to become established as a predominantly native woodland environment requiring less intensive management. After this period NPM would consider options for the ongoing ownership and management of the offset site. Options assessed may include gifting the offset land to interested public authorities.

3.2.2 Site Preparation

The offset areas will be fenced to exclude domestic stock, however tactical grazing systems may form a viable part of the environmental management of the site.

An assessment of available habitat will occur before rehabilitation works commence based on Biometric habitat assessment data collected as part of the current assessment. Results will be summarised in a simple report. This will enable the proposed monitoring program to have baseline reference data to assess if management objectives are being achieved.

3.2.3 Rehabilitation Zone

The rehabilitation zone covers approximately 42 ha of the offset site, including areas of Inland Grey Box - White Cypress Pine tall woodland and Yellow Box tall grassy woodland. These areas are likely to contain a relatively intact and diverse assemblage of native plants in the soil seed bank and would respond to assisted natural regeneration. Management actions in the rehabilitation zone would include:

- Exclusion of grazing through fencing;

- Control of feral animals, where appropriate and practical;
- Weed removal and control;
- If the zone does not respond to assisted natural regeneration, supplementary plantings with native tree and understorey species of local provenance; .
- Fire monitoring and management;
- Erosion control;
- Maintenance and monitoring of natural surface water quality and flows; and
- Annual monitoring and reporting on biodiversity, results of management actions undertaken and general condition of the site.

3.2.4 Revegetation Zone

The revegetation zone covers approximately 23 ha of the offset site, including areas of derived tussock grassland. These areas contain very sparse overstorey species and a very sparse native understorey. The soil seed bank has been extensively disturbed by ploughing and sowing with improved pasture and would not respond to assisted natural regeneration. Planting with native species, and ongoing intensive removal of exotic species would be required to establish native woodland vegetation in this area.

Management actions in the revegetation zone will include:

- Exclusion of grazing through fencing;
- Intensive weed management, focussing on removing improved pasture and environmental weed species from the soil seedbank to permit successful revegetation, and ongoing weed control;
- Revegetation with native tree and understorey species of local provenance and representative of Inland Grey Box Woodland;
- Control of feral animals, where appropriate and practical;
- Fire monitoring and management, potentially including ecological burns;
- Erosion control;
- Maintenance and monitoring of natural surface water quality and flows; and
- Annual monitoring and reporting on biodiversity, results of management actions undertaken and general condition of the site.

LEGEND

Maintainance of existing habitat connectivity

Creation of additional habitat connectivity

Rehabilitation Zone (assisted natural regeneration)

Revegetation Zone (active remediation and planting)

0 37.5 75 150 225 300

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

N

CLIENTS | PEOPLE | PERFORMANCE

NorthParkes Mines
Section 75W Modification for NPM

Job Number	21-17903
Revision	A
Date	17 JUL 2009

Offset Site Management Zones Figure 4

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Data Source: NSW Department of Lands: Topoweb2_wms - 2008; Navigate, Navteq: StreetMap - 2008; NorthParkes Mines: Aerial Photography - 18 July 2007; DEC (2006): Reconstructed and Extant vegetation of Central west NSW - 28/11/2008. Created by: RCJOHNSON, bahambly

4. Implementation of Offset Strategy

Table 4, below, summarises the actions required to implement the proposed offset strategy and targets.

Table 4 Breakdown of Activities for Implementation of Offset Strategy

Activity	Target	Timing
Formal identification of the offset site. Renegotiation of relevant leases to exclude agricultural activities. Appropriate titling of the offset site (via a VCA or Section 88E restriction) for conservation.	Security of the offset site for conservation purposes in perpetuity.	Initiated within 3 months of approval and finalised within 12 months of approval.
Preparation of vegetation management plan (VMP) including detailed costings. Also include description of management actions required in perpetuity. The majority of works would involve stock fencing, vegetation rehabilitation and management, feral animal control and general maintenance activities .	Agreed conservation and funding arrangements	Within 3 months of approval.
Tender contracts to complete those actions in the rehabilitation plan that are unable to be completed by NPM: such actions may include fencing, targeted weed control, bush regeneration, revegetation, fire management, assisted regeneration etc.	Contractual obligations for the five-year program would lie with NPM with implementation in consultation with the landowner.	Within 12 months of approval.
Site preparation phase (fencing etc)	Site secured and delineated for conservation purposes.	Within 12 months of approval.
Revegetation phase (intensive weed control, tree planting etc)	Active establishment of native vegetation in the revegetation zone. Ongoing assisted natural regeneration.	Over the period two – five years after approval.
Remediation / management phase (ongoing weed control, soil and water management etc).	Site managed for conservation purposes in accordance with VMP and any legislative requirements. Ongoing assisted natural regeneration.	From five years after approval, and ongoing as required.
Monitoring and reporting.	Effective delivery of the project appropriately recorded and reported via the NPM Annual Environmental Management Review.	Within 12 months of approval, and ongoing as required.
Project management.	Management of interested stakeholders and designating a Project Manager to complete the rehabilitation program satisfactorily.	Within 12 months of approval, and ongoing as required.
Assess the option to gift the offset land to interested public authorities.	Offset rehabilitation program meets agreed success criteria.	From five years after approval, and dependent upon success of rehabilitation.

The indicative activities and time frames outlined above would be refined in the VMP for the offset site.

5. Conclusion

5.1 Alignment with Offsetting Principles

Table 5 summarises the alignment of the proposed offset site and biodiversity offset strategy against the DECC 2008 offsetting principles.

Table 5 Comparison of the Biodiversity Offset Strategy with DECC (2008) Offsetting Principals

DECC (2008) Principles for the use of biodiversity offsets in NSW	
1. Impacts must be avoided first by using prevention and mitigation measures.	Impacts avoided and mitigated as far as practicable. Unavoidable impacts on 14.3 ha of native vegetation due to the position of mineral resources and existing mine infrastructure (GHD, 2009).
2. All regulatory requirements must be met.	An Ecological Impact Assessment was prepared for the proposed modification in accordance with all regulatory requirements and appropriate guidelines (GHD, 2009).
3. Offsets must never reward ongoing poor performance.	The proposed offset site has been managed for agriculture and has not been deliberately degraded or mismanaged.
4. Offsets will complement other government programs.	The proposed offset site generally complements other government programs and biodiversity conservation initiatives by contributing to regional habitat connectivity. Notably the strategy will complement the *Parkes Shire Council's Roadside Management Plan* (1997) by improving habitat connectivity with the TSR.
5. Offsets must be underpinned by sound ecological principles.	The identification of the offset site was underpinned by a quantitative habitat assessment, consideration of local populations of threatened species and identification of appropriate vegetation types.
6. Offsets should aim to result in a net improvement in biodiversity over time.	The proposed offset site would result in a net improvement in biodiversity values over time through assisted natural regeneration, revegetation and improvements in habitat connectivity.
7. Offsets must be enduring - they must offset the impact of the development for the period that the impact occurs.	The proposed offset site will be appropriately titled to ensure conservation in perpetuity and thus would continue to provide habitat value well beyond the period that the impact occurs.
8. Offsets should be agreed prior to the impact occurring.	The offset site would be identified and agreed with DECC and DoP prior to Modification

DECC (2008) Principles for the use of biodiversity offsets in NSW	
	Approval.
9. Offsets must be quantifiable - the impacts and benefits must be reliably estimated.	Impacts and benefits were quantified with reference to areas of vegetation types cleared and habitat attributes using the Biometric field methodology.
10. Offsets must be targeted.	The offset site was targeted to achieve: like for like conservation of vegetation types to be removed; conservation of EECs; conservation of Grey-crowned Babbler, Superb Parrot and other local threatened species habitat; conservation of remnant vegetation in the immediate locality of the development site; a relatively large, viable patch of habitat; and improvements in habitat connectivity in the immediate locality of the development site.
11. Offsets must be located appropriately.	The offset site has very similar vegetation types as the development site and would support a similar suite of native flora and fauna, potentially including local populations of some more mobile threatened fauna also occupying the development site. The offset site is also a relatively large, viable patch of habitat and would improve habitat connectivity between the TSR and other habitat remnants in the locality of the development site.
12. Offsets must be supplementary.	The proposed offset strategy is beyond existing requirements of earlier approvals for NPM activities. Conservation of the offset site is not funded by any other scheme. The proposed offset strategy will include revegetation that will be undertaken as part of ongoing NPM landscape management strategies (Northparkes, 2008). Annual tree plantings are part of the broader landscape management strategy and are not the subject of any legislative commitment (Morphett, R. pers. comm.).
13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.	The offset strategy would be presented as a Draft Condition of Consent included in the s.75 Modification Application. Conservation and management of the offset site would be enforced through appropriate restrictions on title.

5.2 The Improve or Maintain Test

The proposed offset strategy includes a 65 ha offset site that would be managed for conservation under secure tenure, in perpetuity, under a VCA, or equivalent. The offset site contains 42 ha of appropriate 'like for like' vegetation communities, comprising grassy woodland EECs similar to those in the

modification site. The offset site is known to provide habitat for local populations of the Grey-crowned Babbler and Superb Parrot and would also provide resources for other threatened species potentially affected by the removal of habitat at the development site. Remnant native vegetation in the offset site is likely to respond to assisted regeneration, particularly through the exclusion of grazing. This would improve the biodiversity value of these areas over time.

The offset site contains a further 23 ha of derived native grassland that would be revegetated to form a native woodland community. This would increase the biodiversity value of the offset site by increasing the habitat value of the revegetation area and improving connectivity between remnant native vegetation in the offset site and the TSR to the east.

Based on the above considerations the proposed offset strategy would offset impacts associated with the Section 75W modification and improve or maintain biodiversity values in the local area over time.

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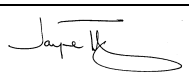
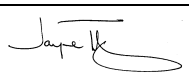
Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	B Harrington	Not reviewed – preliminary draft only				
1	B Harrington	J Tipping		J Tipping		16/7/09
2	B Harrington	D Chubb		D Chubb		17/7/07
3	B Harrington	B Ryan	*B Ryan*	D Chubb		56/8/09