
Newnes Plateau Conservation, Restoration, and Enhancement Project



**A component of the Sydney Construction Materials
Newnes Junction Sand and Kaolin Extraction Proposal**

**Developed under the NSW Government Green Offsets
Policy process**

November 2004

Executive Summary

Sydney Construction Materials is seeking approval for the development of a construction sand, specialty sand, and Kaolin extraction operation at Newnes Junction, near Lithgow.

Consistent with emerging NSW environmental offsets policy, Sydney Construction Materials has prepared a report entitled "Newnes Junction Conservation, Restoration, and Enhancement Project" to provide the basis for ensuring that the net environmental result of the development is positive.

The project involves the adoption of nine offset objectives, designed with the NSW Government's developing offsets policy in mind. This will provide a framework for the execution of the projects described in this paper, and will enable relevant government authorities to gauge the success of this strategy. Sydney Construction Materials intends to work with these government authorities to ensure the final result of this operation is a net gain for the community and the environment.

Sydney Construction Materials intends to mitigate the impact of the Newnes Junction development through the provision of both on-site and off-site offsets. On-site offsets include innovative rehabilitation and final landform design techniques that will be employed to create an area that is aesthetically appealing and consistent with the surrounding landscape. Indeed, the final landform design is based on the nearby Gooches Crater, a picture of which is shown on the front cover of this paper. Off-site, three separate offset projects will be undertaken:

1. The first project involves the rehabilitation of a nearby area of Newnes Plateau Shrub Swamp, an important plant community in the region, and a potential habitat for endangered fauna species.
2. The second project involves the rehabilitation and on-going management of a scenic and historically significant area of vacant Crown land – the Dargan's Creek Reserve.
(The final objective of projects 1 and 2 is to have them classified as Reserve Crown lands to ensure their long-term management and protection.)
3. The third project involves the establishment of a native plant nursery to provide plant stock for the extractive operation's rehabilitation, and to supply the local community with a variety of native flora.

Sydney Construction Materials will provide upfront funding for these offsets, and will continue to fund them for the duration of the development. It is proposed that the Hawkesbury-Nepean Catchment Management Authority (HNCMA) become the Scheme Manager, holding and disbursing the funds, and using its standard project reporting process to report to the Company, DIPNR, NSW EPA, and other relevant stakeholders.

The implementation of this strategy will provide a benchmark for environmentally friendly extractive operations that are capable of delivering significant environmental, economic, and social gains to the wider community.

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1. Introduction

1.1 Project background

Sydney Construction Materials is currently in the process of gaining approval for the development of a multi-commodity friable sandstone resource on the Newnes Plateau, approximately 10km East of Lithgow. The project is unique in many ways and it differs to other conventional quarries/mines in that:

- it will utilise innovative, state-of-the-art surface mining technology;
- there will be no on-site processing – all resource will be processed off-site in the Sydney Metropolitan region;
- all resource will be transported off-site by rail – there will be no off-site truck transport of any resource;
- all components of the resource will be utilised – there will be no waste products;
- the project will employ progressive rehabilitation using terraced landscaping with native species throughout the life of the development.;
- the mine plan has been designed such that all water on the site will drain towards the mine. There will be no uncontrolled discharges of water from the site – all water to be released (max. 1ML/day) be controlled, and will first be treated to ANZECC Code standards; and
- there will be no EPA Industrial Noise Policy exceedances for the life of the project.

This proposal will assist in the provision of sand and other construction materials for Sydney's construction industry, eventually supplying over 1 million tonnes per annum (tpa) to feed the city's 7 million tpa appetite. Construction sand will comprise the bulk of the products from the site at approximately 82.5% of the resource by weight. This will be used for the production of ready mixed concrete, fibre cement, and other pre-made concrete products. Miscellaneous sand markets, including asphalt manufacture, general building and plumbing applications, landscaping applications, and bagged 'hardware' sands, will also be supplied by this development.

The proposal will also supply specialty sands including silica flour, fine silica flour, glass sand (flint and amber grade), and filter and drainage sand, as well as a range of high quality recreational and landscaping sands. This group of products accounts for just under 9.1% of the Newnes Junction resource by weight.

By far the most valuable component of the resource, however, is the kaolin, although only comprising 8.5% of the resource by weight. Products using Kaolin include bricks, pavers, ceramics, refractories, pozzolans (concrete strength enhancer), and high-value calcined kaolin, used for paper coating, paper fillers, paint and plastics fillers, and adhesive fillers.

The specialty sands and kaolin products are currently imported from other States, and, for some products, from overseas. The establishment of this development, therefore, would result in the creation of significant import replacements. Every part of the friable sandstone resource will be utilised – there will be no waste products whatsoever.

The Newnes Junction project will necessitate the progressive clearing of approximately 25ha of sparsely populated regrowth situated on Crown Land. Although there are no rare or threatened species on the project site (see Gunninah Environmental Consultants Flora and Fauna survey), and the mine site will be rehabilitated, Sydney Construction Materials, in conjunction with the Lithgow Landcare department, intends to offset the loss of this habitat through the establishment of environmental restoration projects. The establishment of these

projects will aim to satisfy the objects of the developing NSW Government policy for significant developments – minimal, or zero, net environmental impact.

1.2 Acknowledgements

In developing this Conservation, Restoration, and Enhancement Project, Sydney Construction Materials has made use of the discussion and concept papers produced by the NSW EPA and DIPNR (discussed in section 2 below).

Further, the offset strategy and objectives developed by Umwelt (Australia) Pty Ltd for the Hunter Valley Coal Corporation (HVCC) Mt Owen Operations Environmental Impact Statement, 2003, were used as a basis for this proposal. Particular note is made of the letter in Appendix A of the above EIS from NPWS and DIPNR to Umwelt concerning the Offset Objectives and Assessment Criteria of the HVCC Biodiversity Offset Strategy. This feedback has also been incorporated into the development of Sydney Construction Materials' Newnes Plateau Conservation, Restoration, and Enhancement Project (the Strategy).

The green offset projects described below have been developed in conjunction with the Lithgow office of the Department of Infrastructure, Planning, and Natural Resources (DIPNR) and the Lithgow Landcare office. Matt Grey, Eric Mahony, and Trish Kidd were of particular assistance in the development of this strategy.

2. Current green offset regulatory environment

Current government policy has been considered in the development of the green offset projects proposed in this strategy, which are discussed in detail in Section 3 below. This section summarises the current state of green offset policy.

2.1 Government policy development

The NSW government is in the process of developing a framework for green offsets and in particular, a “native vegetation offset” policy, which will set out:

- cases where offsets may be used,
- whether offset requirements should be set on a case-by-case basis or through ratios common across a region or state,
- how to balance the social, economic and environmental impacts of developments where land clearing is involved,
- practical and robust measurement and prediction methods to assess the current condition of native vegetation to be cleared and the benefits of offset actions; and
- mechanisms to ensure the ongoing management of offset sites over the long term.



Papers relating to green offsets released by the NSW Government include the following:

- *Green Offsets for Sustainable Development: Concept Paper*, NSW Environment Protection Authority (EPA), April 2002, and
- *Offsets, Salinity and Native Vegetation: Discussion Paper*, Department of Land and Water Conservation (DLWC, now DIPNR), July 2001.

An overview of these papers is provided below.

It should be noted that at present, there is no “overarching offsetting policy endorsed by the NSW Government.”¹ Further, while the Concept Paper and Discussion Paper (outlined below) “have provided a useful introduction to the issues associated with offsetting, [they] do not represent an endorsed Government position.”¹ Sydney Construction Materials recognises, therefore, that green offsets policy is currently still in development, that it will continue to develop throughout the course of this project’s development, and that it will most likely be subject to change as more information becomes available. Sydney Construction Materials is committed to ensuring that the environmental integrity of the Newnes Plateau area is maintained well into the future, and will work with relevant government agencies to safeguard the ecological properties of the region.

¹ Quoted from NPWS/DIPNR letter to Umwelt, September 2003.

2.2 Green offsets for sustainable development: concept paper

This paper outlines the principles underlying green offsets. A green offset is defined by the EPA (2002) as an action taken outside a development site (but near to it) that reduces pollution or environmental impacts. Green offset schemes ensure that there is a net environmental improvement as a result of development.

2.2.1 Principles of green offset schemes

The principles of green offset schemes include the following:

- environmental impacts must be avoided first by using all cost-effective prevention and mitigation measures. Offsets are then only used to address remaining environmental impacts;
- all standard regulatory requirements must be met;
- offsets must never reward ongoing poor environmental performance;
- offsets will complement other government programs; and
- offsets must result in a net environmental improvement.

Offsets must be:

- enduring – they must offset the impact for the period that the impact occurs;
- quantifiable – the impacts and benefits must be readily identifiable;
- targeted – offset the impacts on a “like for like” or better basis;
- located appropriately – offset the impact in the same area;
- supplementary – beyond the existing requirements and not already being funded under another scheme;
- enforceable – through development consent conditions, licence conditions, covenants or contract.

All offsets will be based on open and accountable administration, with safeguards, such as advisory panels to oversee offset schemes. Each scheme will be required to produce a public annual report.

The paper also explores the establishment of combined offset funds administered by a scheme manager and overseen by an advisory panel, whereby financial contributions are pooled to allow for larger offset works programs.

2.3 Offsets, salinity and native vegetation: discussion paper

DIPNR proposes the following principles for a native vegetation offset policy.

1. It should be consistent with relevant government policies;
2. It should provide a net gain that improves the condition of the environment, that is:
 - a. based on “like for like” or better;
 - ♦ involving a similar vegetation type or one with higher environmental value;
 - ♦ vegetation to be ranked based on values most relevant to the region.
 - b. clearly defined, measurable units to assess the environmental value of native vegetation and offset sites;
 - c. effective for the period that the clearing has an impact; and

- d. based on the best available science.
3. It should not lead to permanent environmental costs, due to the delay before offset actions yield environmental benefits. Offsets should only be applied where:
 - a. the values lost can be replaced at least as rapidly as they are lost;
 - b. where the loss of values causes no permanent harm; or
 - c. where clearing is postponed until the offset is fully functional.

Where time lags are relatively short and the risk is manageable, it may be possible to compensate for time lag by increasing the number of offset credits required e.g. larger offset.

4. It should only proceed when the offset site is making acceptable progress towards the predicted ecological state, and management arrangements are legally secure.
 - a. This does not mean the offset must be fully mature,
 - b. Achievement of specified standard before clearing proceeds, or
 - c. It may be acceptable to see that certain actions towards implementing the offset have been taken e.g. fences, stock excluded, trees planted.

An offset policy would be based on a system of credits and debits with possible options for



calculating these being the use of regional offset ratios, on a case-by-case basis using a set formula, or monetary contributions to a pool of funds. Environmental variables are identified and measured (such as habitat structural diversity, presences of weeds, topographic complexity and species richness). When determining the required offsets, the following should be considered:

- the area of clearing;
- the negative impact of the clearing, expressed as a set of environmental values lost;
- the area of the offset action;
- the positive impact of the offset action;
- risk of the offset failing;
- the net gain required for environmental improvement; and
- the adjustment (where applicable) for time lag.

Potential offset actions include:

- revegetation of previously cleared area;
- regeneration;
- restoration – quality and extent of native vegetation improved through combination of regeneration and revegetation; and
- enhancement – quality of an area improved through management actions.

Offset actions should only be used where there are good prospects that it will lead to improvement in environmental values.

Given the lack of research and data in this area, an adaptive and precautionary approach is needed until knowledge improves and as such:

- clearing can not be justified if the impact of the clearing or the benefit of the offset cannot be estimated adequately;
- ongoing monitoring is required to assess effectiveness of offsets; and
- offset requirements must be reviewed as knowledge improves.

2.3.1 Developing an offset agreement

DIPNR considers that the five steps in implementing an offset agreement are as follows:

1. determine if clearing with offset is permitted – permissibility may be documented in regional vegetation management plan or catchment management plan;
2. determine baseline conditions – of land to be cleared and offsets, so that offset debits and credits can be calculated;
3. develop proposed offset arrangement;
4. confirm offset arrangement – with relevant stakeholders;
5. monitor compliance – management plan.

3. Objectives

Given the status of current government policy regarding green offsets, the currently available literature on green offsets was considered in the development of objectives and assessment criteria for the Strategy. Table 1 below outlines the specific objectives to be addressed by the Strategy.²

Sydney Construction Materials has reviewed the objectives, and has amended them to address the particular circumstances of the Newnes Junction proposal. Upon granting of Development Approval, Sydney Construction Materials will progress the details for each of the projects (discussed in Section 4.5 below), and prepare criteria for assessing their success.

No.	Objective
1.	Environmental impacts are avoided using all cost effective measures available with offsets used only to address remaining impacts
2.	Regulatory requirements met, and offsets consistent with government policy
3.	Net environmental improvement, i.e. "like for like" or better, in terms of: <ul style="list-style-type: none"> • Quantity: area of community / habitat to be retained, revegetated, rehabilitated. • Quality: species diversity; vegetation density; age / maturity; vegetation health; level of disturbance from weeds and presence/abundance of feral animals; specific habitat details for each key species. • Physical, biological and chemical constraints: erosion; soils; surface and groundwater; topography.
4.	No permanent environmental costs due to time lag in establishing offset
5.	Offset to last for the term of the impact
6.	Impacts and benefits are readily identifiable and quantifiable
7.	Offsets are located appropriately – offsets the impact in the same area
8.	Offset areas are supplementary beyond existing requirements i.e. must be in addition to existing offset areas
9.	Minimise risk and threats: <ul style="list-style-type: none"> • enforceable and legally secure • threats from future development and land use conflicts • adequate resources for management and monitoring, including best practice, adaptive management, open and accountable administration such as advisory panel and public annual report

Table 1: Green offset strategy objectives and criteria

² Adapted from Umwelt (Australia) Pty Ltd in the Hunter Valley Coal Corporation Mt Owen Operations Environmental Impact Statement, 2003.

4. The offsets

4.1 Introduction

Sydney Construction Materials is committed to the improvement and protection of the environment at the proposed development site and on degraded lands near the site. This is demonstrated by the inclusion of a progressive rehabilitation program (with the use of terraced landscaping techniques), in conjunction with this Strategy, which are designed to rehabilitate degraded sites on and near the proposed development.

The Projects outlined here form the structure of a program of investment in environmental projects and related activities, which, it is anticipated, will become part of the conditions of consent for the development. A well planned and managed green offsets strategy will provide a model for future developments in this sector of the Hawkesbury Nepean Catchment and elsewhere.

Three specific projects have been identified that will, over the life of the development, enable the rehabilitation and maintenance of significant areas of public lands with similar, or “like” characteristics to the land affected by the mine. All projects are to be implemented within the Wollangambe River, Lett River, and Farmer’s Creek Catchments. The projects are outlined below. These projects will, in effect, mitigate, or offset the disturbance created by the proposed Newnes Junction development. In addition to these specific projects, Sydney Construction Materials will continue to identify additional areas near the proposed development site that are suitable for rehabilitation.

4.2 Funds

Sydney Construction Materials will make a substantial up-front contribution to establish required infrastructure, materials, and initial project management, and will continue to fund the scheme for the life of the mine. It is estimated that an up-front amount of \$50,000.00 will allow the projects to be adequately resourced from the beginning of the development. Following this, an amount of approximately \$30,000.00 per annum will allow for on-going project management, implementation, and maintenance (the equivalent of a part-time care-taker). More detailed costing of the projects, along with more detailed management plans, will be developed upon approval of the development.

4.3 Scheme manager

It is proposed that the Hawkesbury-Nepean Catchment Management Authority (HNCMA) become the Scheme Manager, holding and disbursing funds provided by Sydney Construction Materials, and using its standard project reporting process to report to the Company, DIPNR, NSW EPA, and other stakeholders.

4.4 On-site offsets

4.4.1 Progressive rehabilitation

Sydney Construction Materials will utilise an innovative site rehabilitation technique, not used anywhere else on the Newnes Plateau – progressive rehabilitation through terraced landscaping. As the surface miner progresses through the resource, 2-metre-wide benches will be left at every 3 metres of depth to provide a horizontal platform on which native flora species will be planted. Irrigation will be provided from mine seepage water. Figure 1 below shows an overview sketch of the rehabilitated site, identifying the terraced landscaping that will be utilised on the walls of the development, and indicating the area of free-draining wetland that will be created at the bottom of the site at the end of the development’s life.

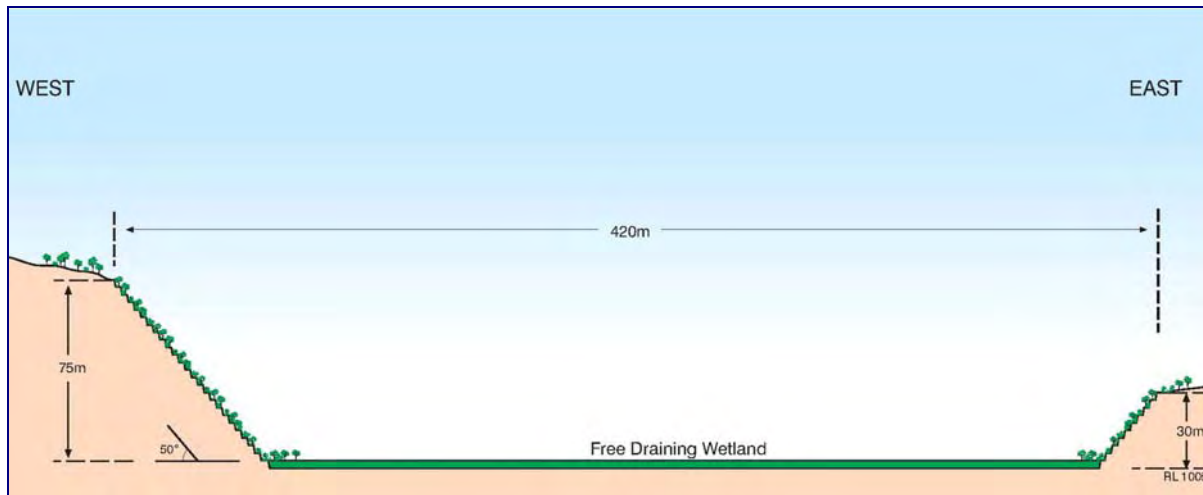


Figure 1: Conceptual design for progressive rehabilitation – overview.

Figure 2 below shows a detailed cross-section of the intended terraced landscaping, indicating batter angles, bench widths, and bench heights.

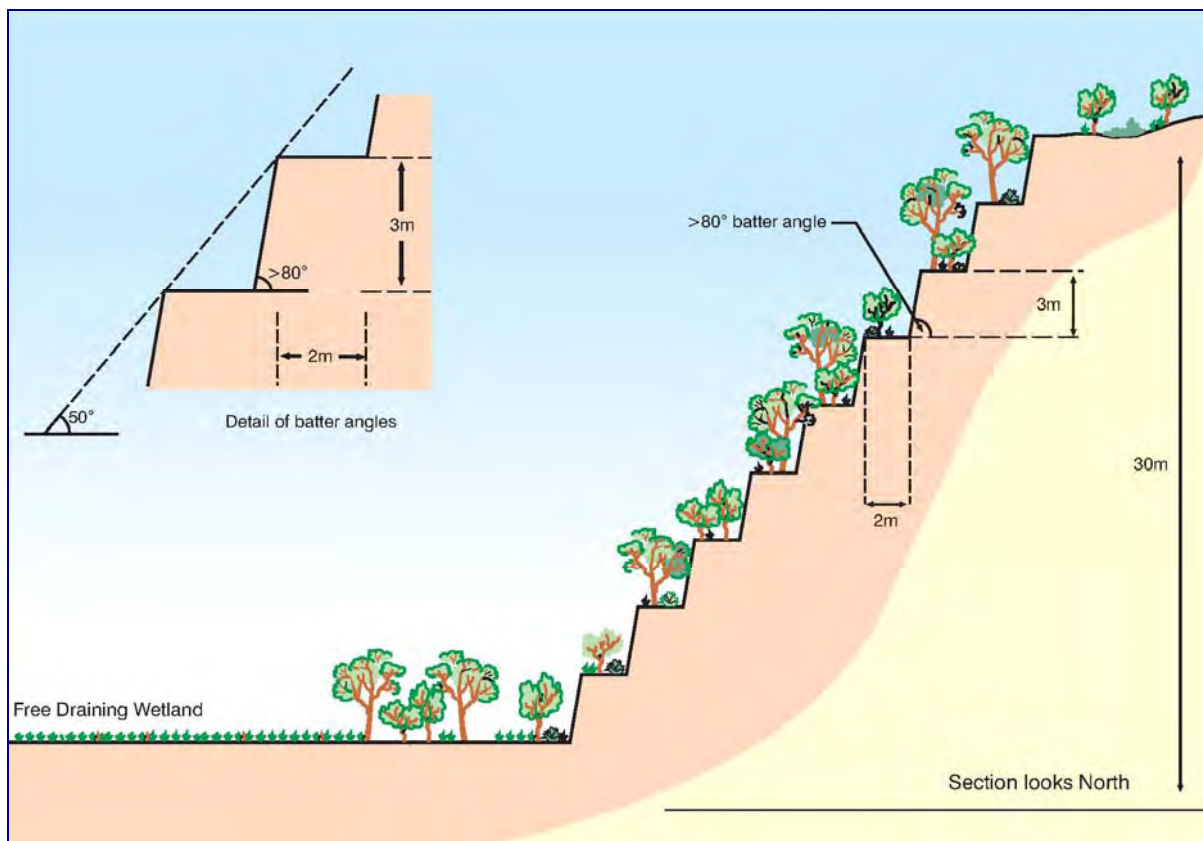


Figure 2: Conceptual design for progressive rehabilitation – detailed cross-section.

Figure 3 and Figure 4 below show how successful this rehabilitation technique has been in the past at other locations. It shows a quarry extracting friable sandstone that is similar to what the Newnes Junction site will look like during the course of mining. This picture is from a Pioneer quarry project on the Somersby Plateau. The top row of vegetation is about 3 years old and the bottom row about 6 months old.



Figure 3: Progressive rehabilitation – top bench: 3 yrs old, bottom bench: 6 mon. old.



Figure 4: Native tree & shrub seeding on sand quarry benches (2 yrs old).

Figure 5 to Figure 8 below show what the visual impact of the development will be at the conclusion of operations on the site.

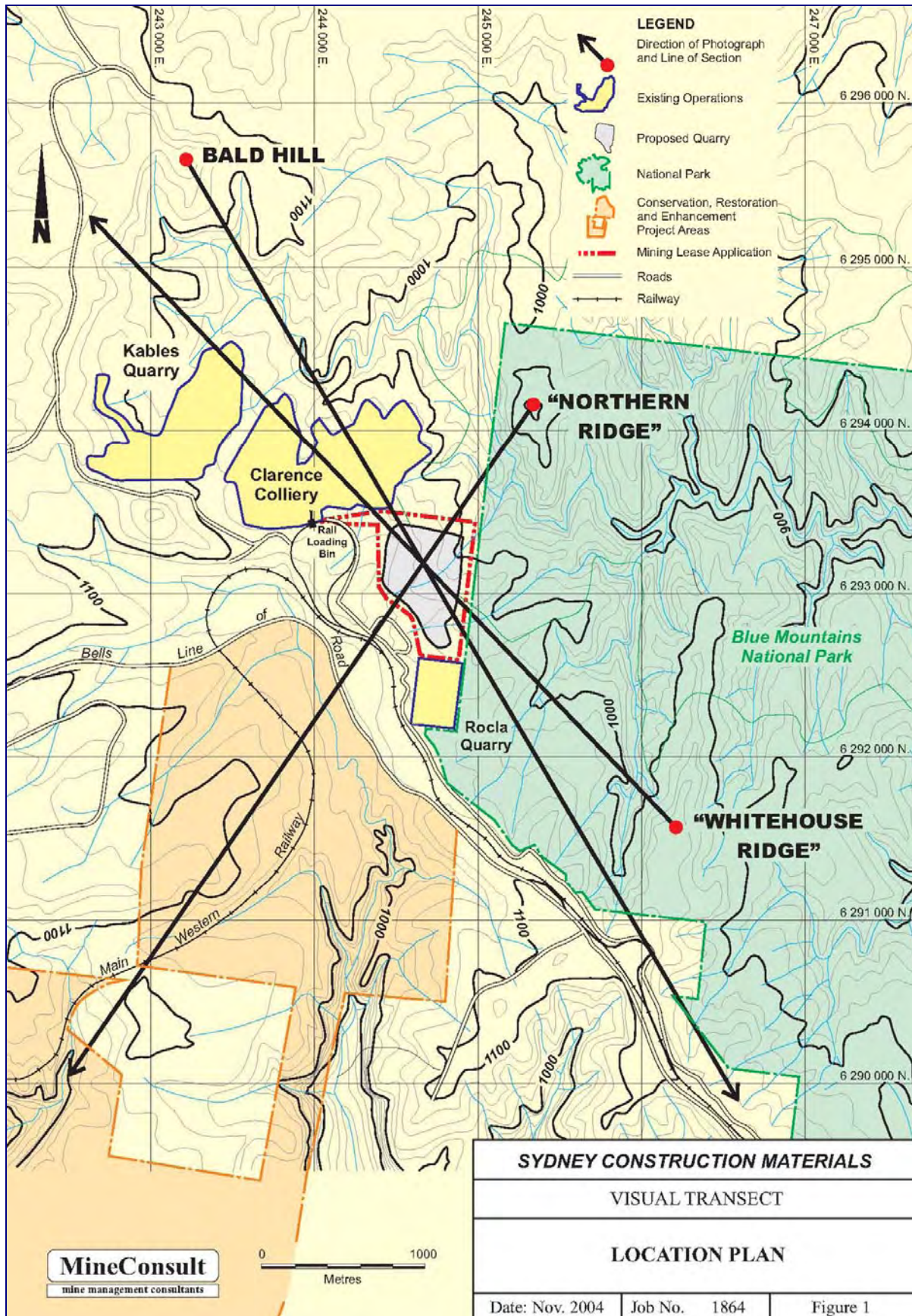


Figure 5: Location map showing location of proposed Sand & Kaolin operation, other existing operations, Blue Mountains National Park, approximate area of Conservation, Restoration, and Enhancement projects, and Visual Transect Lines.

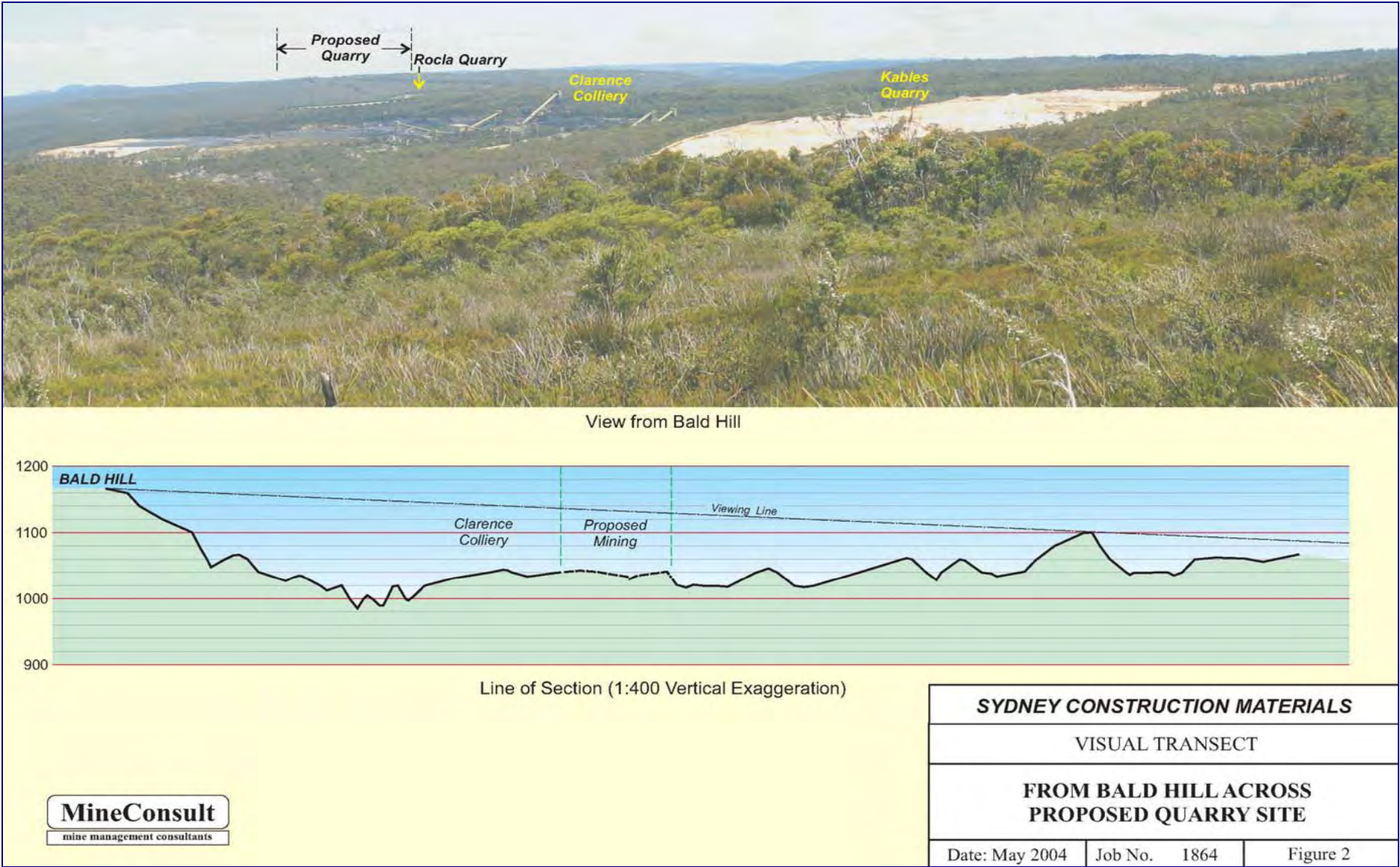


Figure 6: Visual transect from Bald Hill south-east across proposed development.

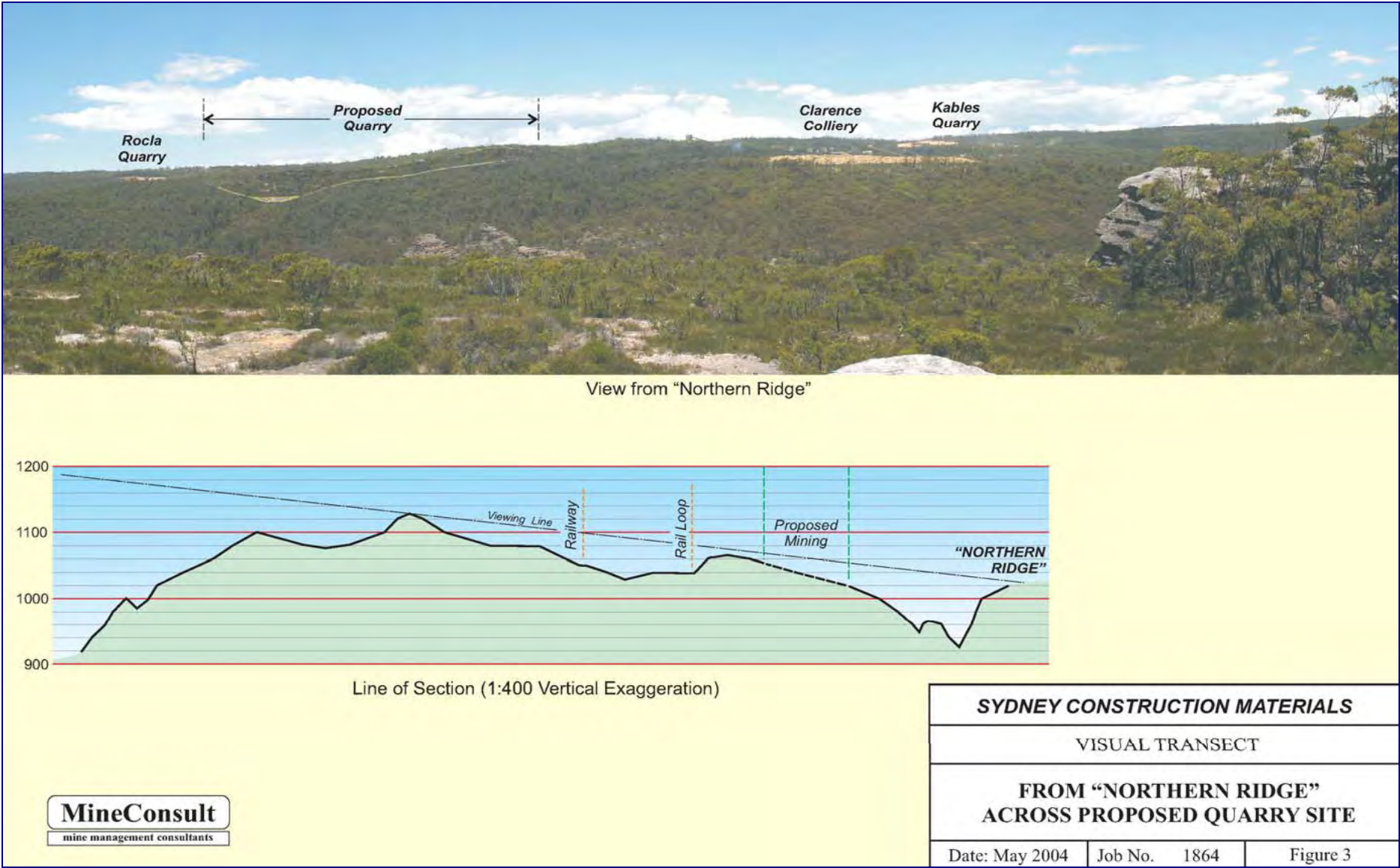


Figure 7: Visual transect from "Northern Ridge" south-west across proposed development.

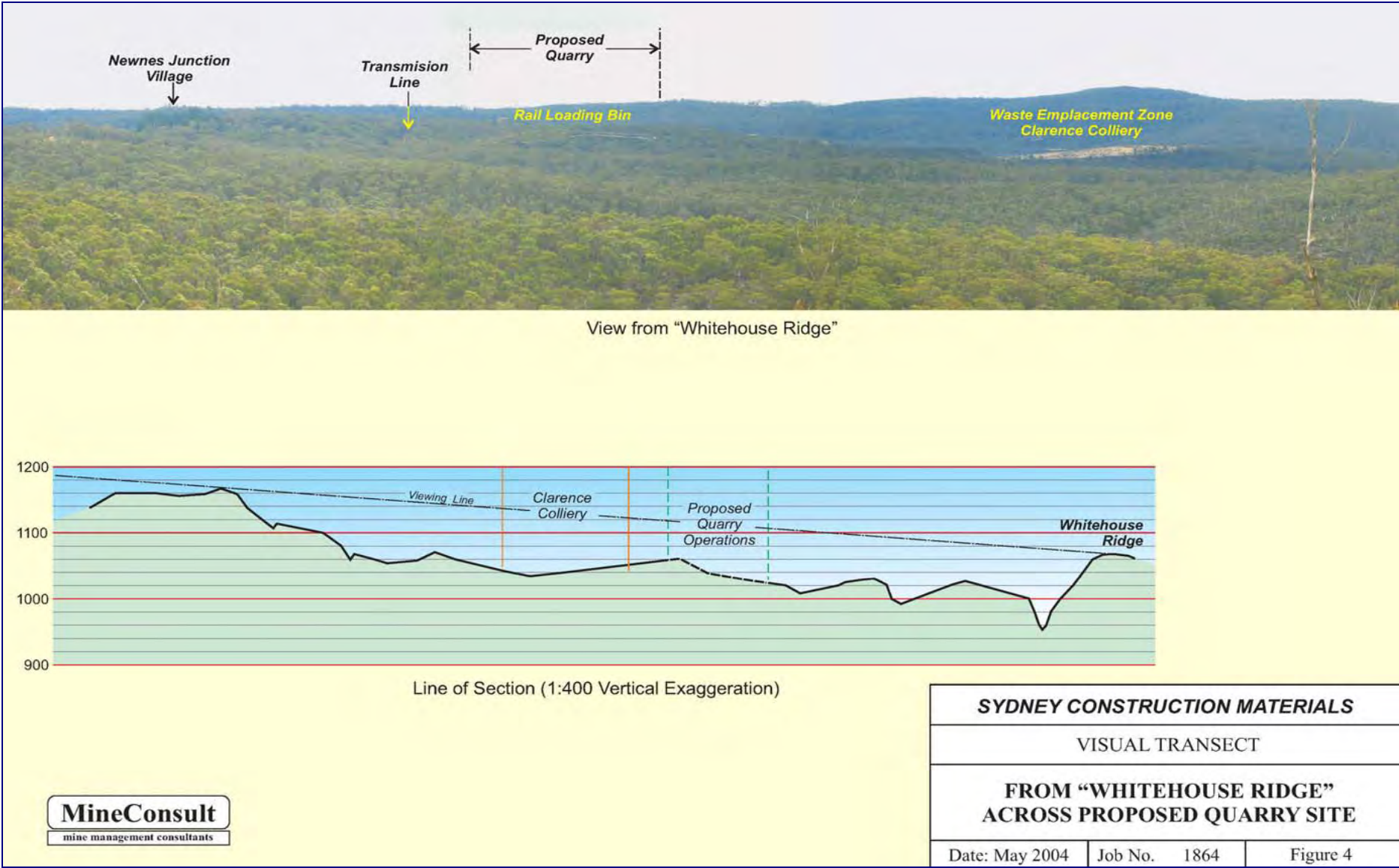


Figure 8: Visual transect from "Whitehouse Ridge" north-west across proposed development.

The reasons for engaging in progressive rehabilitation include:

- to mitigate the visual impact of the mine throughout its life by providing a vegetated wall at all times,
- to reduce the rehabilitation task that would otherwise result at the end of the development's life,
- to allow for enhanced integration into the surrounding vegetation, and
- to minimise erosion and ensure landscape stability.

As is quite clear from the figures above, the progressive terraced landscaping of the walls will ensure that there will be minimal visual impact throughout the life of the development.

Sydney Construction Materials recognises that as site rehabilitation will be a necessary condition of development consent, the terraced landscaping cannot be included as a form of green offset. Nevertheless, its inclusion in this report is tendered as evidence of Sydney Construction Materials' commitment to environmentally sustainable extractive operations.

4.4.2 Diversion of southern drainage

At the beginning of Stage 2, the proposed development will affect the upper reaches of the drainage line that runs across the southern end of the site. This drainage feeds eventually into the Wollongambe River. Sydney Construction Materials is committed to safeguarding the high quality of water that flows into this important river, and has amended the mine plan to ensure that there are no uncontrolled discharges into this drainage. It is proposed that prior to Stage 2 commencement, the flow of water into this drainage be diverted around the southern end of the mine and back into the drainage, ensuring continuity of supply.

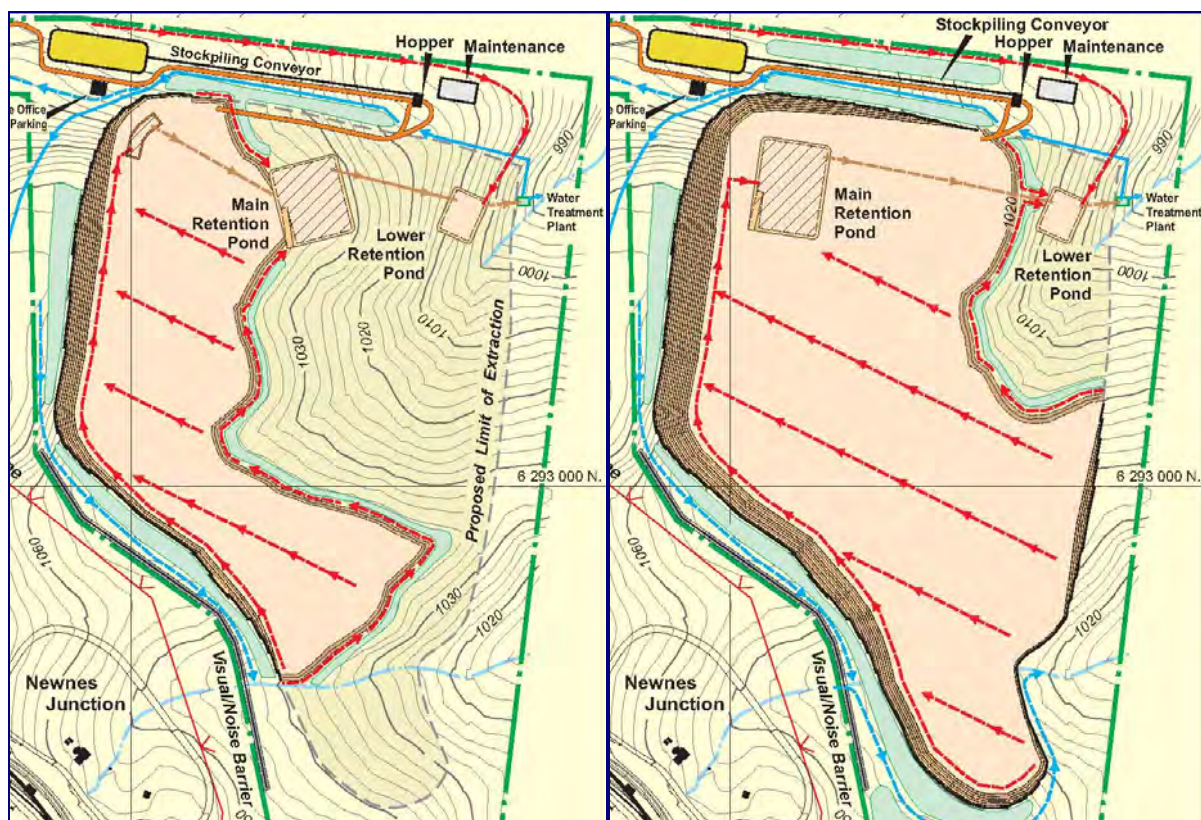


Figure 9: In the left-hand picture, the southern drainage can be seen at the bottom of the picture, cutting across the site from east to west (end of Stage 1 – year 5). In the right-hand picture (end of Stage 2 – year 10), the new course of the southern drainage can be seen diverted around the southern end of the site and back into its original course.

Any surface water outside the area of the development draining towards the western edge will also be directed around the southern end and into this southern drainage. This drainage also contains plant species that show some affinity for the Newnes Plateau Shrub Swamp. Although not true NPSS (it does not contain some of the required dominant species, excluding its classification under this nomenclature), Sydney Construction Materials nevertheless believes that it is an important environment. The measures taken, as described above, will ensure the safety and integrity of this area.

Further details on water management, and in particular the diversion of the southern drainage, can be found in the Surface Water Management Plan (Perrens report) and the Soil and Water Management Plan (GSS Environmental report).

4.4.3 Final landform

The area currently supports open eucalyptus woodland forest. The broad rehabilitation objective for the post-quarrying landform is to establish a similar land use. The topography of the final landform will consist of a large number of small, stepped sandstone benches formed in an amphitheatre configuration, each with a revegetated bench. The amphitheatre void will be some 450m wide and 400m long at its western edge, and 650m long at its eastern edge. Until such time as extraction has ceased, rehabilitation will occur around the edges of the pit only, and will not involve the pit floor. Once operations have been completed, all buildings and infrastructure will be removed from the pit. These areas will be reshaped and ripped where necessary for topsoiling and revegetation. It is proposed that the haul road will remain for use in the ongoing management of the site rehabilitation and for fire fighting purposes. The pit floor will be vegetated with appropriate native species to create a stable, free-draining wetland.

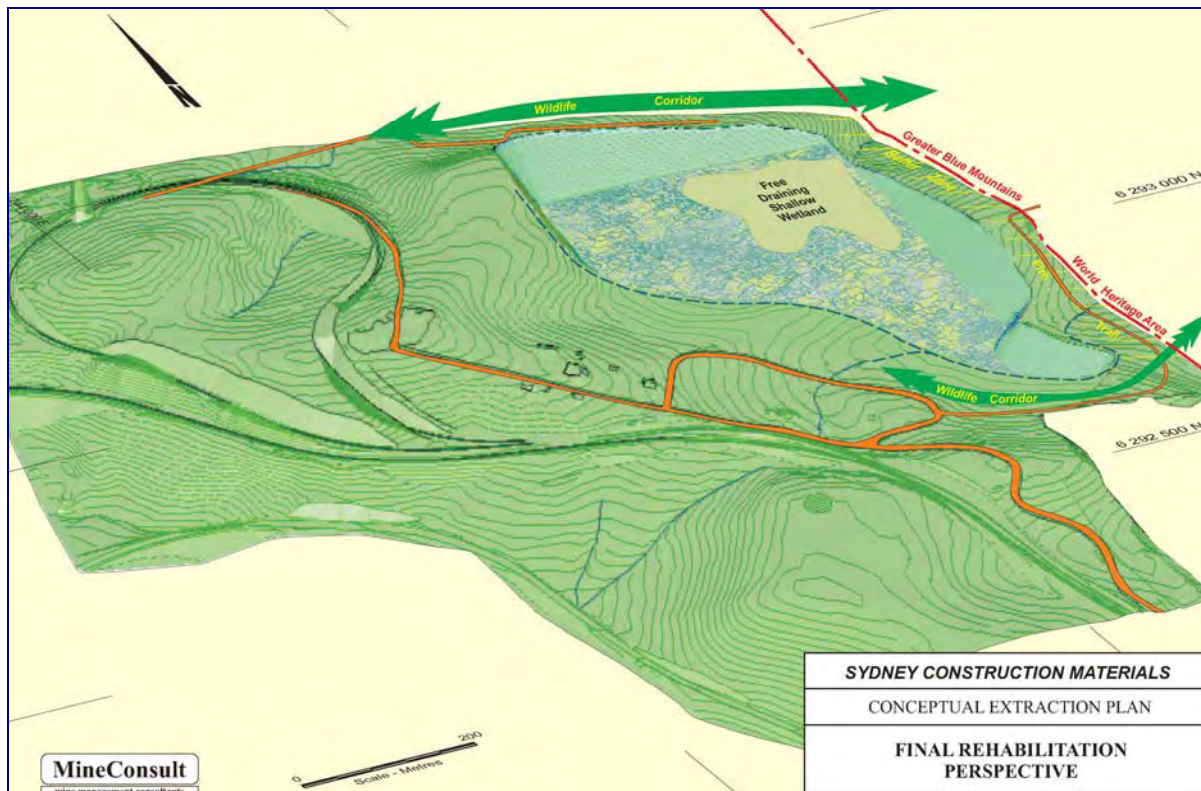


Figure 10: 3D perspective of final rehabilitation layout.

The concept for a functioning wetland in the final void is illustrated in Figure 10 above and Figure 11 below. The wetland will be formed as a shallow depression with the low point in the location of the final retention pond in the north east corner of the pit. It is anticipated

that sedges and other wetland plants endemic to the area will colonise this wetland area to form a swamp ecosystem analogous to that in Gooches Crater shown in Figure 12 below.

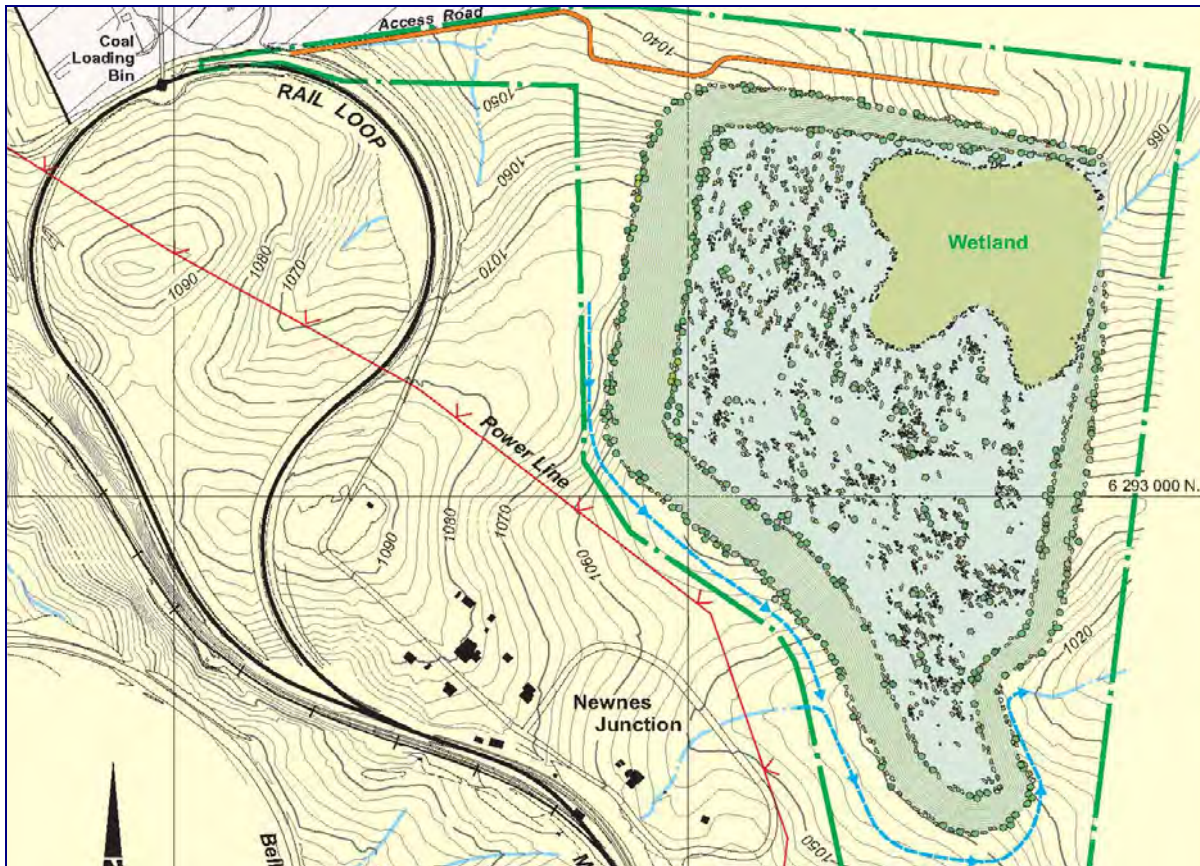


Figure 11: Plan view of final rehabilitation layout.



Figure 12: The final rehabilitation layout is modelled on nearby Gooches Crater.

Further details of the final landform can be found in section 6.2 in the document "Soil and Water Management Plan" prepared by GSS Environmental.

4.5 Off-site offsets

Sydney Construction Materials, in conjunction with the Lithgow office of the Department of Infrastructure, Planning and Natural Resources (DIPNR), and the Lithgow Oberon Landcare Co-ordinator, have developed the following green offset projects. These projects will be conducted in consultation with relevant local government authorities, and other local environmental groups. These projects have been designed to reflect the intent of the NSW government green offsets policy process, based on the concept and discussion papers discussed in Section 2 above, and with reference to the Hunter Valley Coal Corporation Mt Owen Operations EIS.

4.5.1 Project 1 – Newnes Plateau Shrub Swamp rehabilitation

Site Name: Newnes Shrub Swamp – Vacant Crown Land, Newnes Plateau

Site Location: The Newnes Plateau Shrub Swamp (NPSS) site is located on the western edge of the road to the Newnes Glow Worm Tunnel, approximately 6 km north of Lithgow township. It is approximately 5ha in area.

Site Description: This site on Crown land consists of a unique ecological community, known as a Newnes Plateau Shrub Swamp (as described by Keith and Benson 1990). It is dominated by Tea Trees (*Leptospermum juniperinum* and *Leptospermum lanigerum*), Button Grass (*Gymnoschoenus sphaerocephalus*), Razor Sedge (*Lepidosperma limicola*), *Xyris ustulata* and *Baeckea linifolia*.

There are two broad types of these swamp communities – Sedge Swamp and Shrub Swamp, both sharing very similar geology and roles in local hydrology. They are separated by the make up of their vegetative components.

This vegetation type has formed as a result of local geology, which is part of the Banks Wall Sandstone, and the associated hydrology, which results from the sandstone being inter-bedded with narrow layers of claystone, or tightly cemented sandstone that are impervious to groundwater.

The groundwater seeps out over the broad sandstone layer above the impervious layer, which results in the site having a constant supply of water. Organic matter accumulates throughout these swamps in a partly decomposed state as peat. This peat has the capacity to absorb water. The resulting retention of groundwater and surface water is then gradually released into adjoining streams. As a result these streams will continue to run for months after rainfall.

The site provides the potential to be habitat for the Blue Mountains Swamp Skink (*Eulamprus leuraensis*), currently listed on the *Threatened Species Conservation Act (TSC) 1995*. To date, five locations on the Newnes Plateau have had recordings of the Blue Mountains Swamp Skink. Plant species that are recognised as threatened and which occur in the habitat of the Blue Mountains Swamp Skink include the vulnerable species *Pultenaea glabra*.

Regionally significant plant species include *Xyris ustulata* (endemic from Mt Coricudgy to the Budawangs), *Almalaea incurvata* (endemic to Central Tablelands), and *Grevillea acanthifolia* subsp. *acanthifolia* (endemic to Central Tablelands over 450 m) (NPWS Atlas of NSW Wildlife).

The diversity of vegetation contained within the swamp community and

adjoining Eucalypt woodlands has the potential to provide habitat for both common and vulnerable wildlife.

Apart from the Blue Mountains Swamp Skink, other threatened fauna species occurring in the same habitat include the endangered Giant Dragonfly (*Petalura gigantea*) and vulnerable Giant Burrowing Frog (*Heleioporus australiacus*) and Red-crowned Toadlet (*Pseudophryne australis*). The swamps also provide habitat for three regionally significant fauna species, the Southern Emu-wren (*Stipiturus malachurus*), Lewin's Rail (*Dryolimnas pectoralis*) and Buff-banded Rail (*Gallirallus philippensis*) (Washington 1999).

Impacts on Site: This Shrub Swamp community is presently being impacted by Radiata Pine (*Pinus radiata*) wildings, which are spreading into the site from nearby pine forests. These pines have the potential to substantially modify this ecosystem and in turn lead to the displacement of significant local flora and fauna.

Proposed Works: The proposed works would see treatments of these pines through stem injection and cut and paint techniques in order to ensure there is minimal damage to the Shrub Swamp community.

The potential for complete restoration of this site is very high. The works proposed would also see an area of high conservation value within the catchment being targeted.

Once restoration of this area has reached an adequate level, the Company will investigate the feasibility of this land reverting back to Crown land reserve status, or being rezoned under the Lithgow LEP for environmental protection.

4.5.2 Project 2 – Crown land rehabilitation near Clarence

Site Name: Dargan's Creek Crown Lands

Site Location: The site is located on the southern side of the Bells Line of Road at Clarence approximately 10-15km east of the Lithgow township – see Figure 13 below. Specifically, the lots are 266, 239, 234, 250, 251, 82, 248, 235, 246, 244, 261 and adjoining unnumbered crown parcels. The site is located at the most north-eastern extremity of the Cox's River Catchment.

Site Description: The subject site is approximately 864 hectares. It comprises numerous parcels of crown land, which were reserved for public recreation until May 12th 2000. In the Government Gazette of that date, the Reservation status was revoked, with the land becoming vacant crown land, and as such has not been actively managed since that time.

The land slopes significantly towards the Hartley Valley to the south, from the plateau edge at approximately 1100m down to 800m in the valley. Dargan's Creek is one of three main headwaters that drain south into the Hartley Valley into the Lett River. This in turn has an eventual confluence with the Cox's River approximately 20km downstream.

Site characteristics are similar to those at the proposed Mine site. The site flora consists of numerous plant communities ranging from Eucalypt based Woodlands / Open Forest, through to Montane Heathlands and Sedge Swamps. The diversity of vegetation types and their distribution has resulted directly from the varied make up of the local geology, which is part of the Triassic Banks Wall Sandstone, and its associated hydrology.

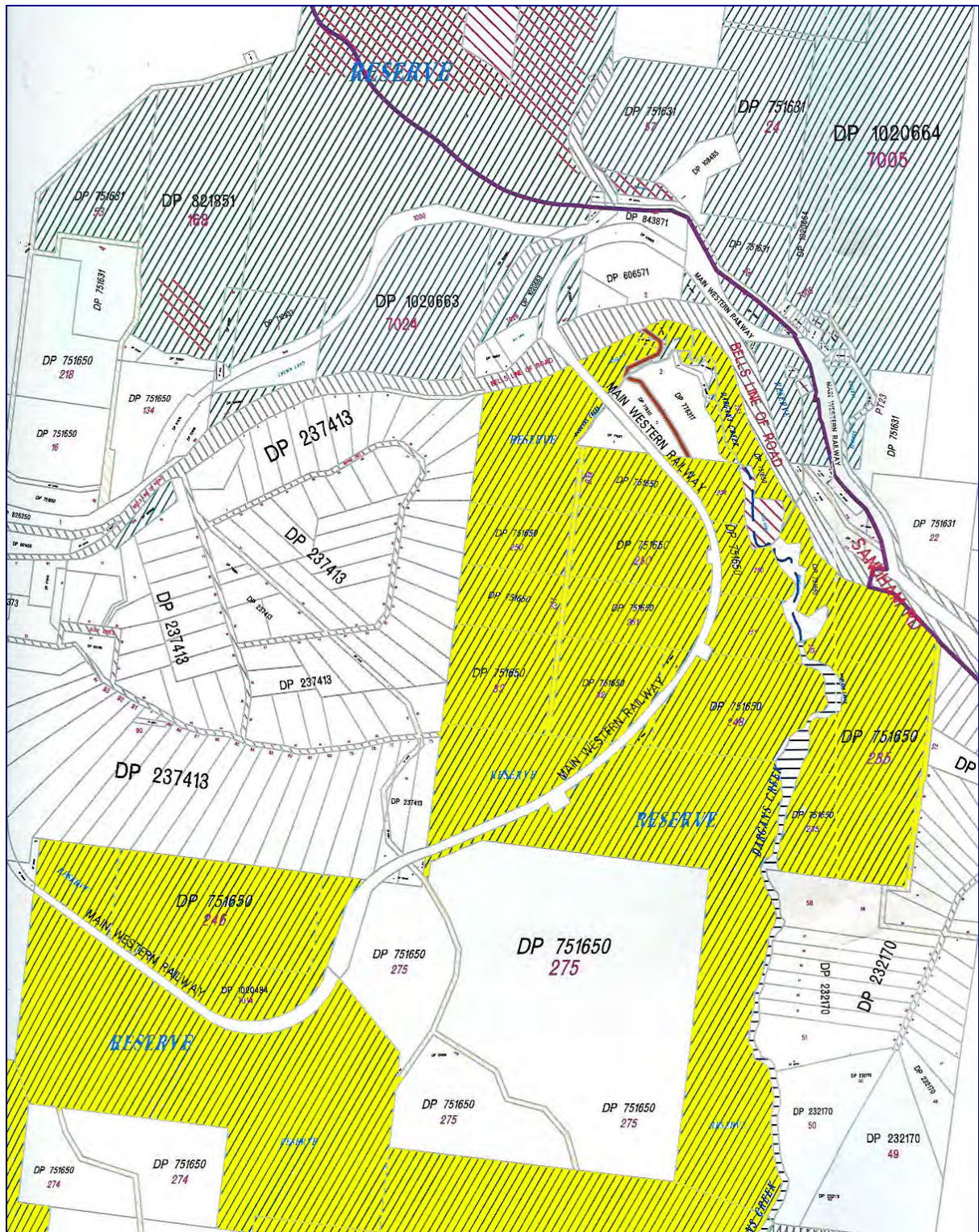


Figure 13: Yellow area denotes location of Green Offset project #2

Benson & Keith (1990) mapped native plant communities of the Dargan Creek area for the Wallerawang 1:100,000 map sheet. They recognise the following plant communities occurring in or close to the Dargan Creek area:

- 9j** "Montane Gully Forest"
Open-forest: *Eucalyptus fastigata*, *E. cypellocarpa*, and *E. dalrympleana*
- 10f** "Newnes Plateau Woodland"
Woodland: *Eucalyptus seeberi*, *E. oreads*, and *E. dives*
- 21c** "Montane Heath"
Open-heath: *Allocasuarina nana*, *Banksia ericifolia*, *Leptospermum attenuatum*, and *Phyllota squarrosa*
- 20a** "Newnes Plateau Shrub Swamp"
Closed Heath: *Leptospermum grandifolium*, *Baeckia linifolia*, and *Grevillea acanthifolia*
Sedgeland: *Gymnoschoenus sphaerocephalus*, and *Xyris ustulata*
- 21d** "Pagoda Rock Complex"
Open-heath: *Allocasuarina nana*, *Leptospermum arachnoides*, and *Lepidosperma viscidum*
Open-Scrub: *Eucalyptus laophila*
Woodland: *E. piperita*, and *E. rossii*

The site, as with that described above in Project 1, has the potential to be habitat for the Blue Mountains Swamp Skink (*Eulamprus leuraensis*). Plant species that are recognised as threatened and occur in this type of habitat include the vulnerable species *Pultenaea glabra*, currently listed as Vulnerable on the *TSC Act 1995*.

Regionally significant plant species include *Xyris ustulata* (endemic from Mt Coricudgy to Budawangs), *Almalaea incurvata* (endemic to Central Tablelands), and *Grevillea acanthifolia* subsp. *acanthifolia* (endemic to Central Tablelands over 450 m) (NPWS Atlas of NSW Wildlife). Further, the site contains other significant plant species such as Snow Daisy (*Celmisia longifolia*), Oak-leaved Daisy (*Olearia quercifolia*), *Acacia meiantha*, *Dillwynia stipulifera*, and *Eriostemon obovalis*.

All plant taxa that are scheduled under the *Threatened Species Conservation Act 1995* and have recorded sightings (NPWS Atlas 2004) from within or adjacent to the study area are listed in Table 2 below. According to Briggs and Leigh (1988), the area accounts for a number of species that are listed as having particular conservation significance. (ROTAP). It is highly likely that additional and comprehensive ground-truthing of the reserve would reveal additional locations of species of significance, of both flora and fauna.

<i>Genus</i>	<i>Species</i>	<i>Location</i>	<i>TSC Act 1995</i>	<i>ROTAP coding 1988</i>	<i>EPBC Act 1999</i>
<i>Acacia</i>	<i>bynoeana</i>	Occurs on the north side of the highway east of the headwaters of Dargan Creek	E1	3VC	V
<i>Boronia</i>	<i>deanei</i>	Occurs in the Dargan swamp creek swamps as well as adjacent Newnes State Forest	V	3VCa	V
<i>Derwentia</i>	<i>blakelyi</i>	Occurs at the base of the hill bordering Dargan's creek swamp to the north. Its distribution is extremely limited and its conservation status in National Parks has not been adequately established.	V		
<i>Persoonia</i>	<i>acerosa</i>	Locally endemic from Valley Heights to Clarence occurs on the north side of the highway to the west of the headwaters of Dargan's Creek.	E1	2VC	V
<i>Acacia</i>	<i>meiantha</i>	Is known to grow beside Chifley road near the Clarence railway underpass. The species has not been found anywhere else and thus has an extremely limited range. Grows in dry sclerophyll forest or woodland, in sandy to clayey soil; in Mullions Ra. and at Clarence; rare.		2RCi	
<i>Almalaea</i>	<i>incurvata</i>	A small moist area swamp shrub endemic to the Blue Mountains with a disjunct population occurring in the Newnes area.		2RCt	
<i>Celmisia</i>	<i>longifolia</i>	Snow Daisy Recorded growing at Newnes plateau. Grows typically at elevations of more than 900-m alt., usually in bogs or seepages, wet soil and swamps; chiefly from Newnes area to Kosciusko N.P.			
<i>Dillwynia</i>	<i>stipulifera</i>	Is a rare swamp-dwelling shrub that occurs at the headwater of Dargan's creek. It is known only from here and the Lithgow Water Supply catchment locally (to the northwest) and in the Budawang Ranges.		3RCa	
<i>Eriostemon</i>	<i>obovalis</i>	Local endemic of the northwestern Blue Mountains plateau occurring in the Dargan creek gorge along cliff lines		3RCa	
<i>Eucalyptus</i>	<i>gregsoniana</i> (<i>pauciflora nana</i>)	Wolgan Snow Gum A mallee that is represented in parts of Clarence and Newnes plateau and recorded growing at the Colliery site. Sporadic and scattered, in mallee heath on sandy soils of limited drainage in elevated areas; from Newnes Plateau to Wadbilliga.		3RCa	
<i>Isopogon</i>	<i>prostratus</i>	Is recorded as a disjunct local population at its northern limit on Newnes Plateau. Mostly in heath and dry sclerophyll forest, often in exposed situations; on the tablelands from Newnes Plateau south to the Tuross R. and on the coast from Eden to Nadgee, rare.			
<i>Olearia</i>	<i>quercifolia</i>	Oak-leaved Daisy. Restricted to the upper Blue Mountains and considered to be "at risk". It occurs only between Wentworth Falls and Clarence. Grows in swampy or moist terrain and has been recorded growing close by to the Clarence colliery site		3RC-	

Table 2: Rare or threatened plant species on or near the green offset site.

Impacts on Site: Two dams were constructed in the early 20th century in the upper section of Dargan's Creek as a water supply for steam trains. Recreation is a major land use in the area and includes swimming at Dargan Creek dams, rock climbing and camping. The area has always been a popular swimming hole in summer for locals, and was once a well-kept secret, ensuring that overuse, rubbish, traffic, and pedestrian and vehicular encounters were not an issue.

The site is being and for some time has been impacted primarily by fragmentation from vehicle tracks, which in some locations is leading to substantial erosion problems.

Swamps are particularly sensitive to impacts created by weeds, vehicles, and access tracks. Roads, which cut across and interrupt areas of subsurface water flow, may lead to drying of swamps if residual water flow is insufficient to sustain the swamp. Tracks can alter the hydrology by redirecting water away from dependent downstream vegetation and fauna species, allowing normally moist areas to dry out. Likewise, rerouted waters can have deleterious impacts on adjacent vegetation communities.

Reduced infiltration may lead to lowering of the water table and drying of swamps. Clearing of areas adjacent to or above swamps may result in water being channelled into creeks rather than infiltrating the soil and recharging the groundwater feeding the swamps. Channelling also results in higher velocity discharge, which may cause erosion.

Vehicular access is contributing to the compaction of soft swamp soils, and effectively dividing vegetation communities on the site. Where boggy patches occur, excavations have been undertaken to empty puddles and drain still standing pools of water, thus channelling water away from its natural course and distribution through vegetation.



Figure 14: Heavily eroded, overused vehicle tracks. The boggy area has occurred where a makeshift track has crossed a swamp's natural path.



Figure 15: Another example of heavily eroded, overused vehicle tracks.

The site is increasingly being used throughout the year, particularly in the warmer months for swimming, picnicking, and camping. Abseiling and adventure companies and schools have also been known to take groups into the area on a regular basis. Trail bike riding and four wheel driving activities are becoming more commonplace.

State Rail has attempted to restrict access with the erection of initially one gate approximately 20m into the area adjacent to the railway line. Repeated vandalism of the gate to gain access, and the establishment of semi-permanent occupation of the site by State Rail staff undertaking railway upgrading, has led to the installation of a series of cyclone gates erected at intervals along the railway line. Access is required by State Rail Authority and Transgrid in order to access powerlines that transverse the site on adjacent lands north of the dams.

Ranges of plant communities are being impacted by Radiata Pine (*Pinus radiata*) wildings, which are spreading into the site from nearby pine forests. These pines have the potential to substantially modify the various ecosystems and in turn lead to the displacement of significant local flora and fauna. There are also minor infestations of Blackberry, Scotch Broom and Gorse.



Figure 16: *Pinus radiata* wildings such as this one are common.

Proposed Works:

The proposed works would see treatment of pines through stem injection and cut and paint techniques to ensure there is minimal damage to the other plant communities. Other weed species will be identified and a weed management plan drawn up and implemented.

In order to resolve the problem of duplicated, heavily eroded access tracks, those required for future access to the land need to be identified in consultation with State Rail, Emergency services, Transgrid and Lithgow City Council. It is proposed that identification and rationalisation of tracks directly necessary for access, maintenance of power lines, firefighting purposes, and railway maintenance be conducted. All duplicated or unnecessary tracks will be machine-ripped and brush-matted to stabilise and revegetate them. The proposed works would see these duplicated tracks reduced to walking track scale where vehicle access was no longer necessary.

The site is also subject to rubbish dumping and these works would also reduce access to these sorts of activities through fencing and public

education. Further, through this Project, the rubbish dumped will be removed and properly discarded.

Once restoration of this area has reached an adequate level, the Company will investigate the feasibility of this land reverting back to Crown land reserve status, or being rezoned under the Lithgow LEP for environmental protection. All of the preceding proposed works would be carried out for the preparation and execution of a Plan of Management for the site that would be required were it to be reclassified as Reserved Crown Land.

4.5.3 Project 3 – Newnes Junction community nursery

Site Name: Newnes Plateau Community Nursery

Site Location: On or immediately adjacent to mining lease at Newnes Plateau.

Project Description: Discussions with Newnes Junction local residents have established a desire to establish and operate a small community nursery in Newnes Junction. Sydney Construction Materials plans to establish such a nursery, and to model it on the Lithgow and District Native Plant Community Nursery in Coalbrook Street, Lithgow.

The nursery will be staffed by the local community of Newnes Junction with supervision and resources provided by Lithgow and District Community Nursery, funded by this strategy.

As well as providing a local source of native flora for Newnes Junction, Bell, and Clarence residents, the nursery will also be used to provide the seed stock and native plants necessary for the rehabilitation of the mine walls as part of the site's progressive rehabilitation, and any flora required for the rehabilitation projects described above.

Proposed Works: The proposed works would involve those activities necessary for the establishment of a native plant nursery. These include site establishment, and construction and maintenance of nursery facilities, such as:

- Polyhouse & Shadehouse
- Watering system
- Seedbank
- Seed storage facilities
- Propagation facilities

4.6 Future rehabilitation prospects

Sydney Construction Materials is committed to promoting the maintenance of environmental integrity on the Newnes Plateau. Progressive rehabilitation through terraced landscaping on the site, the restoration and rehabilitation of surrounding ecologically sensitive areas, and the establishment of a native plant nursery are integral to the Company's vision for the region. These initiatives demonstrate Sydney Construction Materials' desire to see the utilisation of a valuable resource conducted in an environmentally sound manner.

The list of projects described above is by no means exhaustive. Sydney Construction Materials is aware of other sites on or near the plateau potentially suitable for restoration. Further, Sydney Construction Materials recognises the record of previous nearby mine and quarry operators, and is open to the possibility of undertaking or supporting additional restoration projects in the surrounding area, including restoration of commercially forested areas, and quarries and mines no longer in operation.

5. Fulfilment of objectives

The following section details the means by which each of the Objectives detailed in Section 3 above are fulfilled by the design of the mine and the proposed green offset projects.

5.1 Objective 1

Objective 1 (see Section 3 above) outlines the need to ensure that *environmental impacts are avoided using all cost effective measures available with offsets used only to address remaining impacts*.

Chapter 4 of the EIS details the project justification and alternatives.

In determining the design of this development, the Company has engaged in significant investigation to ensure that all cost-effective measures of reducing or eliminating environmental impacts were explored. For example:

- Sydney Construction Materials will utilise state-of-the-art surface mining technology, eliminating potential exceedances of the NSW EPA Industrial Noise Policy, and minimising dust generation,
- all processing will occur off-site, eliminating the need for on-site settling ponds and eliminating the potential for spillage,
- mining will occur in a staged manner, with progressive rehabilitation, lessening the total area disturbed at any one time (see Section 5.3.1 below), which, combined with the point above, mitigates the proposal's visual impact,
- any water to be discharged will first be treated, eliminating any downstream water quality impacts.

The remaining impact is that related to the necessary clearing of the land. As the resource to be mined is approximately one metre at most below surface level, it is not possible to remove it without clearing the vegetation above. Therefore, Sydney Construction Materials has proposed the offset programs described in Section 4.5 above.

5.2 Objective 2

Objective 2 (see Section 3 above) outlines the need for *regulatory requirements to be met, and offsets to be consistent with government policy*. As discussed in Section 2.1, the NSW Government is currently in the process of developing a framework for green offsets, however, there is currently no overarching offset policy.

Nevertheless, the existing discussion and concept papers available, as outlined in Section 2.1 to 2.3, have been reviewed and, in combination with existing industry practice, have provided a benchmark upon which the Strategy objectives have been developed.

5.3 Objective 3

Objective 3 (see Section 3 above) outlines the need for green offsets to provide *net environmental improvement, i.e. "like for like" or better, in terms of quantity, quality and other factors*.

5.3.1 Quantity

The Sydney Construction Materials Newnes Junction project will require the clearing of land for the extraction of friable sandstone. Although the total area of land cleared at the end of the development will be approximately 25ha, clearing will take place in a staged manner.

Figure 17 below displays in graphical form the proportion of the site to be cleared at various stages of the development. Table 3 below outlines this numerically.

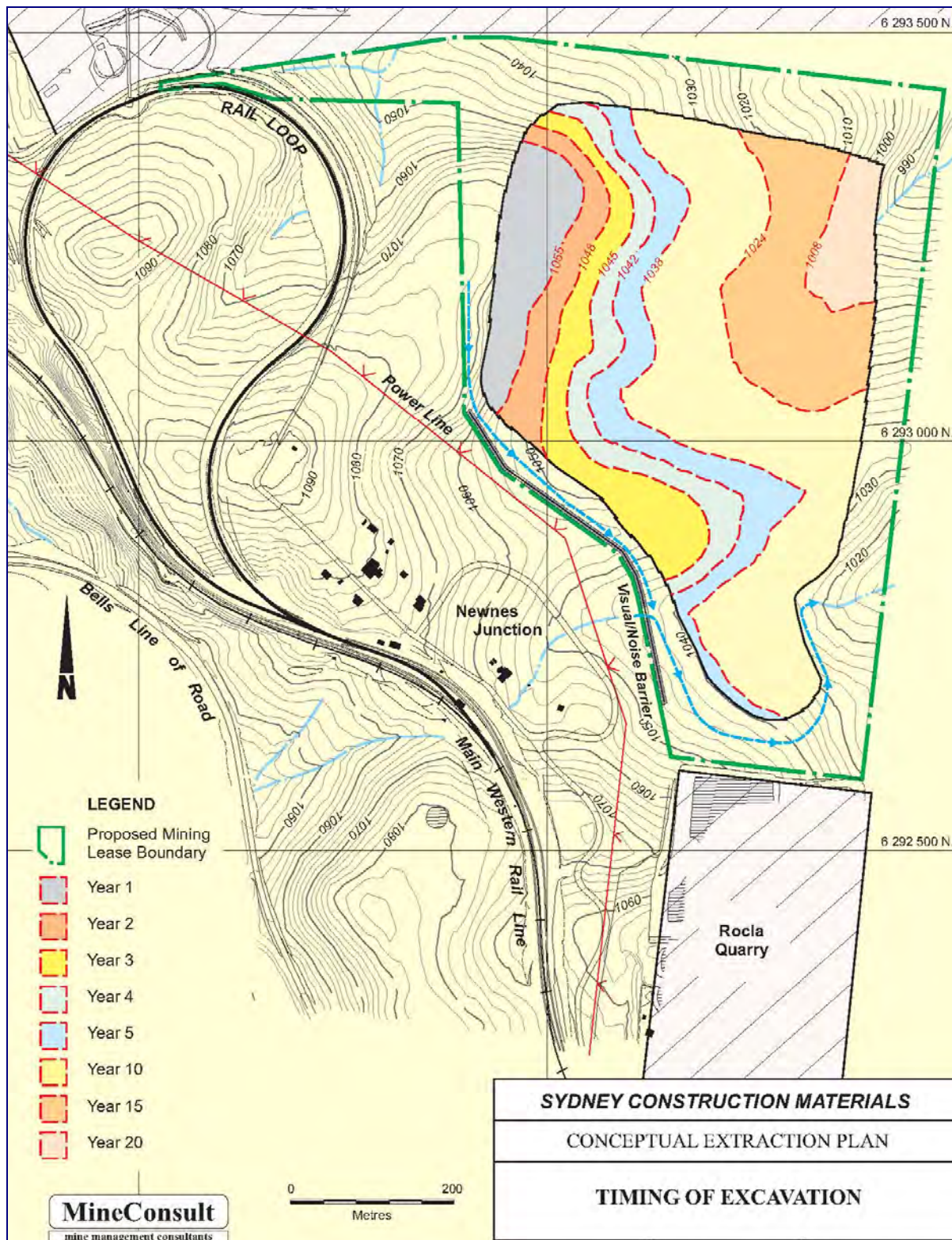


Figure 17: Staged timing of excavation

End of Year	Incremental Area Cleared	Total Area Cleared
1	2.04ha	2.04ha
2	1.48ha	3.52ha
3	2.64ha	6.16ha
4	2.07ha	8.23ha
5	2.90ha	11.13ha
10	8.87ha	20.00ha
15	3.85ha	23.85ha
20	1.16ha	25.01ha

Table 3: Area of site affected in staged development

Clearance	Area
Total Area	25ha
Offsets	
Project 1	5ha
Project 2	864ha
Project 3	n/a
Total	869ha

Table 4: Comparison of area affected vs. proposed offsets

The intention of Objective 3 is to ensure that any green offsets provide similar, or “like for like” environmental replacements for any development impacts, resulting in net environmental improvement. As Table 4 above shows, the total area of land identified for restoration under Projects 1 and 2 totals 869ha. The total area of land to be cleared totals 25ha. The types of proposed works do not require large lead times, and will demonstrate positive results in a very short period of time. In the medium to long term, therefore, the ratio of green offsets to cleared area is in excess of 30:1.

5.3.2 Quality

The following section, which details the quality of vegetation on the proposal site, is drawn from the Gunninah Environmental Consultants Supplementary Submission to DIPNR on Flora and Fauna Issues for the Sydney Construction Materials Newnes Junction development.

5.3.2.1 Development site characteristics

5.3.2.1.1 *Database*

The information on which the consideration and assessment of flora and vegetation on the subject site at Newnes Junction was based includes:

- the original investigations of native flora and vegetation conducted for the EIS (International Environmental Consultants (IEC), 2003). It should be noted that the IEC investigations also included the consideration of information contained in other

reports on sites in the immediate vicinity, as well as published scientific papers and other available information;

- data and information contained in submissions on the proposed mining operation and EIS. In particular, the information contained in the submission by P & J Smith³ has been incorporated, and is regarded as a valuable contribution to the overall information base for the project. Whilst the submission by the NSW National Parks & Wildlife Service (NPWS)⁴ does not contain any specific data or records, the matters regarding flora and vegetation contained in that submission have also been considered; and
- other supplementary investigations for flora and vegetation were undertaken specifically for the proposed development at Newnes. These supplementary investigations included a dedicated 3-day flora survey by HWR Pty Ltd and a 1-day investigation by Dr A White of Biosphere Consultants in mid-March 2004⁵.

On the basis of the total quantum of investigations for flora and vegetation which have now been undertaken on the subject site at Newnes⁶ and other previous investigations for flora undertaken on other lands in the immediate vicinity⁷, it can be reasonably asserted that a comprehensive and adequate investigation for native flora and vegetation communities has now been achieved.

Data from all of the investigations undertaken on the subject site, as well relevant information from adjoining lands and other studies, has been incorporated. The combined information constitutes the database upon which analysis and assessment of the proposed activity is determined.

5.3.2.1.2 Flora species

A total of 171 flora species, including introduced plants and weeds have been recorded on the subject site at Newnes (see Appendix C in the GEC "Flora & Fauna Issues" report provided as supplementary information to DIPNR on the EIS). While the total number of flora species present on the subject site is likely to be greater than that identified to date, the total inventory that has been established is regarded as a reasonable approximation of the full suite of flora species present.

It is nearly always possible to locate additional species on a site as large as that at Newnes by the conduct of further investigations. However, the accumulated information from the investigations conducted to date can reasonably be considered to constitute a comprehensive and adequate database for the site.

The suite of flora species that have been recorded on the site constitutes a sub-sample of that which would occur within the adjoining National Parks and World Heritage Area. The subject site contains only a small sample of the habitats and environments present within that extensive landscape, and the site could therefore support only a sub-set of the species contained within the Blue Mountains National Park or the Greater Blue Mountains World Heritage Area.

It is of particular note that not a single threatened flora species has been recorded by any of the investigators who have conducted surveys on the subject site at Newnes. Whilst it is

³ See public submissions to the Sydney Construction Materials EIS.

⁴ The NPWS has recently been incorporated into the NSW Department of Environment & Conservation (DEC).

⁵ See GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues"

⁶ IEC, 2003; P & J Smith, 2003; Biosphere, 2004; HWR, 2004

⁷ Corkery & Co, 1993; IEC, 2000

doubtless possible that individuals or stands of some threatened species could potentially occur on the site, there has to date been no evidence for the presence of any such species.

Eighteen threatened plant species have been listed on the Wallerawang 1:100,000 Map Sheet (HWR 2003 – Appendix A). Of these species:

- four are considered unlikely to occur on the site as the habitat present is only "*marginal*";
- six are also regarded as unlikely to occur because the habitat present is only of "*minimal*" relevance, particularly given the absence of rocky habitats; and
- the remaining eight species were not recorded on the subject site during any investigations conducted to date, despite some "*moderate*" habitat being present.

As indicated above, none of these species had been recorded by any of the researchers who have investigated the subject site at Newnes during any previous studies.

5.3.2.1.3 *Vegetation communities*

As indicated in the detailed report by HWR Pty Ltd (2004)⁸ and in the submission by P & J Smith (2003)⁹, the subject site is predominantly characterised by an open forest/woodland community of Silvertop Ash and Sydney Peppermint. This community is also described as Blue Mountains Sandstone Plateau Forest (BMSPF), and was mapped as that community in the original vegetation mapping provided in the EIS by IEC (2003).

However, there are small patches of other vegetation communities present on the subject site, including:

- a small area of Newnes Plateau forest in the south-western part of the site (HWR 2004);
- an area of open forest with a higher density of Scribbly Gums (a variant of the BMSPF) in the northern part of the site (HWR 2004);
- some riparian vegetation along the narrow drainage lines which traverse the site. This vegetation type is a variant of the sandstone ridge top vegetation community, with a component of riparian or moister plant types; and
- small areas of swamp or near-swamp communities within the drainage lines, although these are generally of very restricted distribution. The relatively steep slopes and rapid draining characteristics of the site are not conducive to the establishment of extensive swamp communities. Nevertheless, some small patches of shrub swamp vegetation are present in isolated locations (as discussed in detail in section 5.3.2.1.4 below).

Most of the vegetation on the subject site is of an open forest or woodland structure, and may be described as a dry sclerophyll community, which is characterised by relatively dry soils, an open to moderate dense shrub layer, and a sparse (but locally dense) understorey layer. This type of vegetation is generally adapted to relatively dry or xeric conditions, such as are typical of the rapidly draining nature of the site and of the soils.

Given those circumstances, vegetation which requires a high soil moisture level is relatively restricted on the subject site (as is typical of much of the sandstone country within the Blue Mountains). Drainage lines on the site are generally narrow and do not support broad areas of soil with high moisture content. As a consequence, vegetation that requires such

⁸ See GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues", 2004.

⁹ See public submissions to the Sydney Construction Materials EIS.

circumstances (such as riparian, swamp or wet heath type communities) are only located in restricted portions of the site.

The vegetation mapping by HWR (2004) identifies the presence of riparian or swampy vegetation along two drainage lines, which traverse the site. Of these, the northern (central) drainage line is relatively narrow and steep, and supports only very small, isolated, and limited areas of swampy or moister riparian vegetation. This community is regarded as a variant of the drier eucalypt forest vegetation on the site. The southern drainage line, conversely, supports a somewhat broader area of moister vegetation, although the abiotic and floristic characteristics of that area do not identify it as a swamp¹⁰.

Nevertheless, the vegetation in that portion of the site is considered as having some affinities to the Newnes Plateau Shrub Swamp community. The drainage lines to the east of the subject site do support larger areas of swamp-type vegetation, as a consequence of local topographic features and their general structure.

Development of the mine plan has been cognisant of the critical need to protect habitats downstream of the subject site, particularly areas of riparian or swamp vegetation that may occur along drainage lines within the National Park. The mining operation incorporates a number of measures specifically designed to protect those habitats and resources downstream and down-slope of the site, particularly within the GBMWA and in the BMNP.

5.3.2.1.4 *Newnes Plateau Shrub Swamp*

Amongst the issues raised in the submissions on the development application and EIS for the proposed development is that related to the possible presence of the Newnes Plateau Shrub Swamp (NPSS) community on the subject land.

This plant community was originally described by Benson & Keith (1990), and is defined as "*Narrow, elongate, shrub-swamps*" which are restricted to the "*eastern half of the Newnes Plateau*"¹¹. These swamps "*are formed in characteristic low-slope head water valleys*" where "*sediments are relatively deep ... and are periodically water logged*" (Benson & Keith 1990). These elements of the community are significant in distinguishing NPSS from other moist or riparian habitats in the locality.

The supplementary flora investigations of the subject site have included specific investigation of this plant community and its presence (or otherwise) on the subject site. It had been asserted by P & J Smith (2003) and the NPWS (2003) that this community is or may be present on the site. As a consequence, specific investigations of potential areas for this community were undertaken¹².

Consideration of the characteristics of the NPSS community, and of vegetation on the subject site and the physical features of those portions of the landscape, has resulted in the conclusions that:

- the drainage line which traverses the central part of the subject site, whilst supporting very small and isolated patches of swampy vegetation, does not support the association identified as the NPSS community. This drainage line:
 - ◆ is very narrow and relatively steep;

¹⁰ See Appendix A in GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues" report, 2004

¹¹ See Appendix D in GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues" report, 2004

¹² See Appendices A and B in GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues" report, 2004

- ◆ does not support areas of long-term moist soil (other than potentially in extremely small areas);
- ◆ does not contain the characteristic floristics of the NPSS community; and
- ◆ contains scattered medium to large eucalyptus trees.

This vegetation, therefore, has been designated riparian (swampy) vegetation in the report prepared by HWR¹³; and

- the southernmost drainage line through the subject site supports a small area of relatively moist soil with a sparse tree canopy. This area is characterised as a shrubland dominated by the Tea-tree (*Leptospermum trinervum*), and supports a number of the plant species identified in the description of the NPSS community. However, few of the plant species present are indicated as dominant within the NPSS community, and the vegetation present is regarded at best as a marginal example of that community or a variant thereof.

It is to be noted that the NPSS community is not listed as an "*endangered ecological community*" on the *TSC Act 1995*. This community does not therefore warrant specific or special consideration pursuant to the statutory processes within NSW.

A nomination has been received by the Commonwealth Department of Environment & Heritage (DEH) for the listing of Blue Mountains Swamps as a "*threatened ecological community*" on the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act). The NPSS community is part of that complex of swamp communities, but a number of other swamp communities are also part of the nomination, occurring over a much larger area than the NPSS vegetation. The Blue Mountains Swamp communities have not yet been listed on the *EPBC Act*, and the NPSS community constitutes only one element of that matrix of vegetation types.

As discussed above and in detail in the relevant vegetation reports¹⁴, the subject site supports only one small area of vegetation supporting affinities with (or which could potentially be described as) the NPSS vegetation. That area (in the southeast of the site) has been identified for retention, and the mine plan has been modified to avoid and protect that area of swamp vegetation, although the effect of this measure is to reduce the available resource. Measures of relevance in this regard include:

- retention of the area of swamp vegetation within the south-eastern part of the site;
- provision of a buffer around that vegetation;
- the re-routing of natural stormwater runoff from above the mining operation and its discharge into the retained swamp vegetation (see Section 4.4.2 above); and
- a program of monitoring and management of that portion of the site.

5.3.2.2 Green offset site characteristics

Characteristics of the proposed Green Offsets sites are described in section 4.5 above.

5.3.2.2.1 *Downstream conservation values*

A number of public reserves are present within the catchment downstream of the Dargan Creek crown lands (Project 2). Many of the remediation and restoration works undertaken in the reserve are likely to have beneficial outcomes on these downstream environments.

¹³ See Appendix A in GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues" report, 2004

¹⁴ See Appendices A and B in GEC's "Supplementary Submission to DIPNR: Flora & Fauna Issues" report, 2004

One such reserve is on the Lett River, locally known as "Hyde Park", in which a population of *Asterolasia buxifolia*¹⁵ has recently been re-discovered for the first time since it was initially described by Allan Cunningham in the 1830s and 40s. It had previously been presumed extinct in the wild. The species occurs in the riparian zone, mostly within 20m of the Lett River. The population size is estimated to be in the order of 50-100 plants.

The native vegetation of the Cox's River riparian zone has been very heavily compromised, and for the most part destroyed. The combination of tenure and terrain at Hyde Park has preserved an area of species-rich and mostly very healthy native shrubby riparian vegetation, to a degree that is now very uncommon both on the Lett River and on the main course of the Cox's River, into which the Lett River flows (about 5km downstream).

The "Hyde Park" riparian zone on both banks of the Lett River, probably represent the best substantial linear area of this vegetation type left at valley-floor altitude on the middle part of the Cox's River system.

Possible threats to *Asterolasia buxifolia* include weeds and alterations to water flow regimes. The species is also threatened due to a small population size and possible stochastic events.

An additional species of note is *Grevillea rosmarinifolia* subspecies *rosmarinifolia* (Type form). This form of the species was thought for many years to be extinct in the wild until recently. The site and the surrounds (both banks of the Lett River and for some distance up- and down-stream) contain a population in excess of 450 plants of the Type form, initially recorded in late 1999.

On this site *G. rosmarinifolia* occupies ground on the riverbanks and those parts of the lower slopes within or adjacent to the flood zone at least over 1.5 km both up and down stream. It does not occur more than about 25-30 m from the river.

Subspecies *rosmarinifolia* as a whole is widespread from the Hartley/Hampton area, south along the Great Divide into eastern and central Victoria. Partly because of the unresolved taxonomy, and the considerable overall range of the species, neither the subspecies nor its Type Form have ever been listed or nominated for listing under NSW legislation.

The Type Form of *Grevillea rosmarinifolia* subsp. *rosmarinifolia* should be awarded some conservation significance, even pending full taxonomic resolution of the populations currently regarded as within the species, and even without a formal listing under the *TSC Act 1995*. A description of the subspecies, and notes on some of the forms, are given in Makinson, *Flora of Australia* vol. 17a: 300-1 (2000).

<i>Genus</i>	<i>Species</i>	<i>Location</i>	<i>TSC Act 1995</i>	<i>ROTAP coding 1988</i>	<i>EPBC Act 1999</i>
<i>Asterolasia</i>	<i>buxifolia</i>	Lett River riparian zone, northern bank only	E1		
<i>Grevillea</i>	<i>rosmarinifolia</i>	Both banks of the Lett river. species sufficiently sporadic in occurrence to be considered naturally rare			

Table 5: Rare or threatened plant species recorded in Hyde Park on the Lett River, downstream of the Dargan's Creek site

¹⁵ *Asterolasia buxifolia* is described in the revised edition of Harden, G.J. (2002) *Flora of NSW Volume 2* pp 312 –313. University of NSW Press, Kensington

5.3.2.3 Summary

As discussed in section 5.3.2.1 above, no flora or fauna of conservation significance were detected on the proposed development site. The flora alone on the proposed offset sites contain over 10 species that are listed as Rare, Vulnerable or Endangered under the *TSC Act*, the *EPBC Act*, and the ROTAP listing. Moreover, as discussed in section 5.3.2.2.1 above, there exist plant communities of significant conservation values that will benefit from rehabilitation works carried out under this strategy.

Both projects sites 1 and 2 contain areas of Newnes Plateau Shrub Swamp. These areas also have the potential to be habitat for the Blue Mountains Swamp Skink, a species listed under the *Threatened Species Conservation Act*. The proposed development site has one small area, which, although not true NPSS, does share some affinity with it. Nevertheless, it has been excluded from the mine footprint.

Sydney Construction Materials considers the investigations into the quality of these sites to have identified areas with environmental values of much higher conservation significance than those of the proposed development site.

5.4 Objective 4

Objective 4 (see Section 3 above) outlines the need for green offsets to ensure that there are *no permanent environmental costs due to time lag in establishing the offsets*.

As it is proposed to provide “like for like” habitat in terms of area (quantity) and quality immediately, there will be no time lag in the establishment of the offset. The restoration of the degraded land described in Sections 4.5-4.5.3 above will provide immediate offsets for the area affected by the development. The revegetation and natural regeneration of the offset areas, made possible by the eradication of weeds and illegal tracks, will provide further habitat in the medium to long term.

Further, given that there will be progressive clearing associated with the project throughout the duration of the development, the offsets will actually secure habitat well in excess of that being cleared throughout the mine life.

5.5 Objective 5

Objective 5 (see Section 3 above) outlines the need for green offsets *to last for the term of the impact*.

Sydney Construction Materials' Newnes Plateau Conservation, Restoration, and Enhancement Project proposes to provide offset areas in perpetuity. That is, irrespective of the term of the impact, the offsets will adequately provide compensation for the impact.

The area described in Project 2 is currently vacant Crown land. Once restoration of this area has reached an adequate level, the Company will investigate the feasibility of this land reverting back to Crown land reserve status. As described above, Sydney Construction Materials will continue to fund the restoration of this project throughout the life of the development.

The local nursery to be established under Project 3 will provide the plant stock required for the progressive rehabilitation of the development site. To do so, it will be necessary for this nursery to operate at least until the end of operations. This nursery could also provide plant stock for the rehabilitation of other degraded sites in the area. It is anticipated that over the life of the development, this nursery will grow to become a significant supplier of native flora to the region, enabling it to remain in operation well after the cessation of mining activities.

5.6 Objective 6

Objective 6 (see Section 3 above) outlines the need for *impacts and benefits to be readily identifiable and quantifiable*.

The EIS, and supplementary information supplied to DIPNR, provides further information regarding the impacts potentially generated by this development, and the measures taken to lessen or eliminate them.

The key impact addressed by this Green Offsets Strategy is the loss of approximately 25ha of vegetation. This loss has been quantified in terms of the area to be cleared and the quality in terms of vegetation types to be cleared, in Section 5.3 above.

Sections 4.5 above outline the benefits to be generated by each of the proposed offset projects.

5.7 Objective 7

Objective 7 (see Section 3 above) outlines the need for *offsets to be located appropriately, offsetting the impact in the same area*.

This objective refers to the appropriate location of offsets in terms of the offsets providing net environmental improvement in the same local region as the impacts. As all three projects occur within a few kilometres of the proposed development site, as described in Section 4.5 above the proposed offsets satisfy this objective.

Given that Objective 3 of the Strategy includes provision of "like for like" in terms of quantity and quality, it is considered that an appropriate offset is one that includes similar vegetation communities, species, habitat value, and similar physiological characteristic such as topography and soil type. One of the more significant vegetation communities on the Newnes Plateau is the Newnes Plateau Shrub Swamp (NPSS). Although no true NPSS exists on the development site, there is one community (on the southern drainage) that shows some affinity with NPSS. Because of the similarity of this drainage to NPSS, Sydney Construction Materials amended the mine plan to exclude this section of land, with consequent loss of resource. The sites on which it is proposed that Projects 1 and 2 be located were chosen precisely for the NPSS located therein, thus also satisfying Objective 7. Further detail is given in Section 5.3 above.

5.8 Objective 8

Objective 8 (see Section 3 above) outlines the need for *offset areas to be supplementary beyond existing requirements i.e. they must be in addition to existing offset areas*.

As the proposed development is new, i.e. not an application for an extension, there are currently no related offsets in the region. Consequently, any offsets established as part of this development will be new, designed solely for the purpose of satisfying this development's requirements.

As discussed in Section 4.4 above, Sydney Construction Materials will employ progressive rehabilitation throughout the life of the development. Sydney Construction Materials recognises that site rehabilitation is required by the *Mining Act 1992*, and therefore cannot be considered a green offset. Nevertheless, attention is drawn to this feature of the proposal as the nature and extent of the rehabilitation confirms Sydney Construction Materials' commitment to the promotion of environmental integrity in the Newnes Junction area.

5.9 Objective 9

Objective 9 (see Section 3 above) outlines the need for the *minimisation of risks and threats*:

- *enforceable and legally secure,*
- *threats from future development and land use conflicts,*
- *adequate resources for management and monitoring, including best practice, adaptive management, open and accountable administration such as advisory panel and public annual report.*

As discussed in Sections 4.5.1, 4.5.2, and 5.5 above | 5.5 above}, it is proposed to provide protection for each offset area through reclassification as Crown land reserve.

Threats from future development and land use have been considered in the selection of offset areas. An assessment of the likelihood of sand resources being located beneath potential offset areas has been undertaken. Although the land on which Project 2 is proposed has a Section 119 direction applying to it, it is understood that the resource in this region is high in iron content. This, coupled with the absence of rail infrastructure providing access to this area, indicates that any future project over this area will be economically unfeasible. Based on current knowledge there are no economical sand resources located beneath any of the proposed land restoration areas.

The enhancement of habitat within the offset areas is consistent with surrounding land uses, being primarily coal mining, sand quarrying, residential (Clarence Village, Bell, Newnes Junction), forestry, and environmental conservation.

Sydney Construction Materials will invest up front establishment funds as well as on-going management funds to ensure adequate resources for management and monitoring do exist. It is anticipated that the Hawkesbury-Nepean Catchment Management Authority (HNCMA) will be the Scheme Manager, holding and disbursing these funds, and using its standard project reporting process to report to the Company, DIPNR, NSW EPA, and other stakeholders in a public, annual report. This will also ensure that the administration of the scheme remains open and accountable.

Sydney Construction Materials recognises that as this area of policy is still under development, it will be ready to adapt to new developments in the field of green offsets.

6. Conclusion

Sydney Construction Materials has designed the Newnes Junction Sand & Kaolin development to eliminate or mitigate, to the greatest extent feasible, any impact on the surrounding environment. The project will, however, result in the staged clearance of 25ha of regrowth forest on vacant Crown land. An assessment has been undertaken in order to identify appropriate offsets to compensate for this clearance. As well as employing progressive rehabilitation to minimise the overall impact of the development, diversion of an affected drainage, and a regionally-compatible final landform, the Strategy provides for the protection of over 869ha of vacant crown land of similar quality to 25ha to be progressively cleared. Furthermore, the establishment of a local native flora nursery will facilitate the responsible rehabilitation of the site, and will continue to serve as a regional source of native plants well after project completion. The detailed assessment of the proposed clearance area and proposed offsets, as contained in the Strategy, demonstrates that these on- and off-site offsets will provide "like for like" both immediately and a net improvement in the medium to long term. All offsets are to be located on Crown land. At the completion of restoration, it is proposed that the offset areas be submitted for reclassification as Crown land reserves.