

# **Sydney Construction Materials**

## **Newnes Junction Sand and Kaolin Extraction Proposal**

**Additional information as requested during meeting  
with DIPNR, 23<sup>rd</sup> February, 2005**

**March 2005**

## Introduction

This paper presents all additional information as requested by DIPNR, DEC, and DPI, and as summarised during a meeting with DIPNR on 23<sup>rd</sup> February, 2005.

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## 1. Noise Impact Assessment – EPA, 22<sup>nd</sup> August 2003

### 1.1 Issues Raised

Following are the issues raised by the EPA in their letter to DIPNR of 19<sup>th</sup> August 2003, as forwarded to SCM by DIPNR on 22<sup>nd</sup> August 2003.

- a) *The noise emissions need to be evaluated to clearly state the level of noise predicted at affected residents.*

*The Environment Impact Statement (EIS) focuses on two residents, the most affected, but other potentially adversely residents should be specified especially where predictions exceed the Project specific noise as derived by the Environment Protection Authority's (EPA) Industrial Noise Policy (INP).*

- b) *The EIS partitions the noise sources impacting on residents and fails to clearly show the cumulative impacts and a worst-case scenario. For example the cumulative impacts of mining, rail loading and stage preparation should be evaluated.*

- c) *Additionally the EPA's INP requires that annoyance factors be taken into account. The EIS does not appear to include annoyances in its predictions. Given the types of operations being carried out on site there could be up to 10 dB that would need to be added to the predicted noise emission.*

- d) *In relation to construction noise, a major error has been made. The EIS claims background noise level (BG) + 10 dB allowance for construction not exceeding 26 weeks and a BG + 20 for each of 6 stage preparations and noise bund constructions.*

*The EPA's Environmental Noise Control Manual (ENCM) at Chapter 171 states "This may not applicable to long term constructions such as coal mines which may take several years."*

*Consequently and in conformity with past approaches in the mining industry, any noise emissions after the commencement of mining operations will be considered as the noise emitted from the premises and come within the INP. The +10 dB and +20 dB allowances will not apply after mining commences.*

- e) *The above issues will have a significant effect on the project ability to meet acceptable noise levels and may require a re-design of operations.*

*The EPA requires that impact of noise be re-assessed in terms of the above and in (accordance with the relevant protocols so that it can be re-evaluated.*

### 1.2 Responses

This section details SCM's responses to the issues listed above. It should be noted that these responses are directly from the Noise Impact Assessment – this section simply clarifies the details of that study.

### **1.2.1 a) Noise levels at affected residents**

With regards to a), DIPNR and DEC are referred to the revised “Noise Impact Assessment” (RNIA) by Atkins Acoustics and Associates (May 2004), submitted to DIPNR on 26<sup>th</sup> May, 2004.

### **1.2.2 b) Cumulative noise**

For the purposes of determining the cumulative noise impact of train loading and extraction, Atkins Acoustics<sup>1</sup> determined the impacts generated by loading alone and by extraction alone. An analysis of the two together was then conducted. This paper explains the results, and provides an operating regime under which no noise exceedances will be generated.

#### 1.2.2.1 Train Loading

The activities considered for the noise assessment of train loading operations are discussed in section 5.3 of the RNIA. Table 10 in that report lists the components as:

- Surge Bin
- Class 81 Locomotive (at Notch 3 power setting)
- Conveyor Drive – 200 kW
- Conveyor Belt – 400m
- FEL (Volvo L150C)

The second paragraph in section 6.3 (Train Loading Operations) states, “The results of the noise predictions for train loading activities show that the recommended project specific noise levels can be achieved at all reference residential locations.” This indicates that, for train loading alone, there will be no noise exceedances.

#### 1.2.2.2 Extraction Operations

The activities considered for the noise assessment of extraction operations are discussed in section 5.2 of the RNIA. Table 9 in that report lists the components as:

- Dozer (CAT D6)
- Surface Miner (Wirtgen 2200M)
- 35-50t Scraper (CAT 651)

The first paragraph on page 32 (section 6.2 – Mine operations) states, “The noise predictions... show extraction activities during both calm and west wind meteorological conditions satisfy the recommended project specific noise goals at all reference residential receiver locations under the operating scenarios referenced.” This indicates that, for extraction operations alone, there will be no noise exceedances.

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<sup>1</sup> Refer to the revised Noise Impact Assessment by Atkins Acoustics and Associates (May 2004), submitted to DIPNR on 26<sup>th</sup> May, 2004.

### 1.2.2.3 Cumulative noise

Paragraph 3 in section 6.3 (Train Loading Operations), the Noise Impact Assessment predicts that during periods when extraction operations and train loading operations are occurring simultaneously, “exceedances (1-3dB(A)) of the project goal (37-38 dB(A)) may occur at some reference receiver locations located at the western end of Newnes [Junction] village (Reference Locations R2-R5).”

Extensive research has been conducted into minimising the noise impacts of the project to the greatest extent possible, including:

- Adoption of alternative mining method
- Muffling of all site machinery through application of noise reduction technology by Metford Laboratories
- Installation of acoustic bund and barrier

Given that these activities result in the potential for some noise exceedances, Sydney Construction Materials will make a commitment, to be detailed in the project Development Consent Conditions, to cease extraction operations for the period during in which noise exceedances would be generated if conducted simultaneously with train loading operations.

Train loading operations at maximum production will occur nine (9) times per week. Each operation will take between 45-60 min. However, due to the configuration of the rail loop, which passes through a large cutting thereby shielding it from the Newnes Junction village, the period during which cumulative noise exceedances would be likely to occur would be somewhat less than 60 min. As such, SCM undertakes to perform noise monitoring throughout train loading operations to determine the period during which cumulative noise impacts would exceed the project noise goal. Extractive operations would be temporary halted during such times to ensure compliance with project noise goals.

### 1.2.2.4 Locomotive noise

The fourth paragraph in section 6.3 (Train Loading Operations) of the Noise Impact Assessment indicates that the bulk of the noise from train loading activities is associated with the locomotive. Given this, and given that the locomotive will be located outside the mine lease area at all times, Atkins Acoustics recommends that it not be considered for cumulative noise impact assessments. This is a recommendation only, and does not indicate that the locomotive was excluded from the cumulative noise impact assessment (see section 5.3 of the Noise Impact Assessment, pp23-24).

Given that DIPNR disagrees with this recommendation, and given that cumulative noise exceedances can be readily eliminated through manipulation of extraction operation schedules, Sydney Construction Materials does not intend to challenge the validity of including locomotive noise in the determination of projected cumulative noise impacts.

### **1.2.3 c) Annoyance Factors**

The EPA requested that the Noise Assessment consider annoyance characteristics in accordance with the guidelines and procedures presented in the Environmental Protection Authority, Industrial Noise Policy (EPA, INP). The modifying factors outlined in Section 4 of the EPA, INP that could be considered include: tonality, impulsiveness and low frequency content.

Measured 1/3 octave noise levels of the main plant and equipment (dozer, FEL, truck and generator) have been reviewed in accordance with the EPA, INP Section 4 and do not exhibit tonal characteristics.

A review of similar operations (Rocla, Newnes Junction) has confirmed that noise sources are not impulsive therefore corrections for impulsive characteristics are not relevant.

In terms of dominant low frequency content, a review of measurement results of the main plant and equipment (dozer, FEL, truck and generator) has found that the measured A-weighted and C-weighted noise levels from these plant vary do not vary by more than 15dB(A) in accordance with the EPA, INP Section 4. Hence low frequency adjustments are not relevant.

### **1.2.4 d) Construction Noises**

The EPA has confirmed that the use of construction noise goals will not be accepted for staged development of the site. Accordingly, a 'construction phase' of less than 26 weeks (background  $L_{A90} + 10\text{dB(A)}$ ) will occur, and will include site establishment, erection of infrastructure and development of an acoustic barrier for the purpose of noise control. Details of the acoustic barrier can be found in the RNIA. The RNIA was conducted with the RNIA in place, with results indicating that there will be no noise exceedances throughout the project life.

### **1.2.5 e) Re-design of Operations and Re-assessment of Noise Impacts**

As detailed in the RNIA, the development was altered to include the erection of an acoustic barrier. Reassessment of the development with the barrier in place is also detailed in the RNIA.

## 2. Visual Impact of Acoustic Barrier – DIPNR, 23<sup>rd</sup> February 2005

### 2.1 Issue Raised

During discussions held with DIPNR (David Kitto and Phil Jones) on 23<sup>rd</sup> February 2005, it was brought to the attention of the Company that it would be necessary to provide an assessment of the visual impact of the proposed visual/acoustic barrier (the “Barrier”) included in the revised quarry design to mitigate visual and acoustic impacts from the proposal.

### 2.2 Response

This section discusses the visual aspect of the Barrier to be installed as part of the mitigative measures for the SCM Newnes Junction project from the local residences. It provides a visual transect from the Newnes Junction residence closest to the Barrier, and discusses the measures required to eliminate any visual impact relating to the Barrier.

#### 2.2.1 Overview of impact of proposed visual/acoustic barrier

Figure 1 below provides a plan view of the proposed Project area, including the location and orientation of the Barrier. Figure 2 below provides a detailed plan view of the relationship between the Barrier and the nearest residence, including the location of the cross section A-A. The cross section A-A is depicted in Figure 3, Figure 4 and Figure 5 below.

Figure 3 below shows an aerial view of the Project area. It shows the approximate location of the Barrier, and gives an indication of the extent of vegetation already existing between the nearest residence and the Barrier.

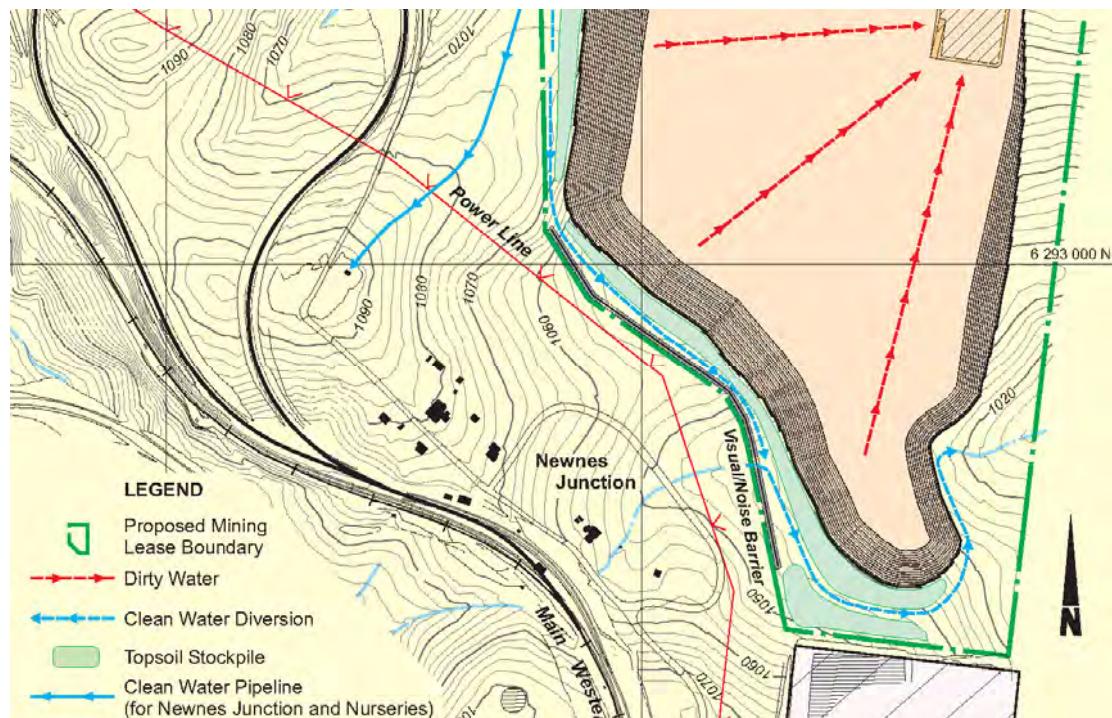


Figure 1 - Plan view of Project area

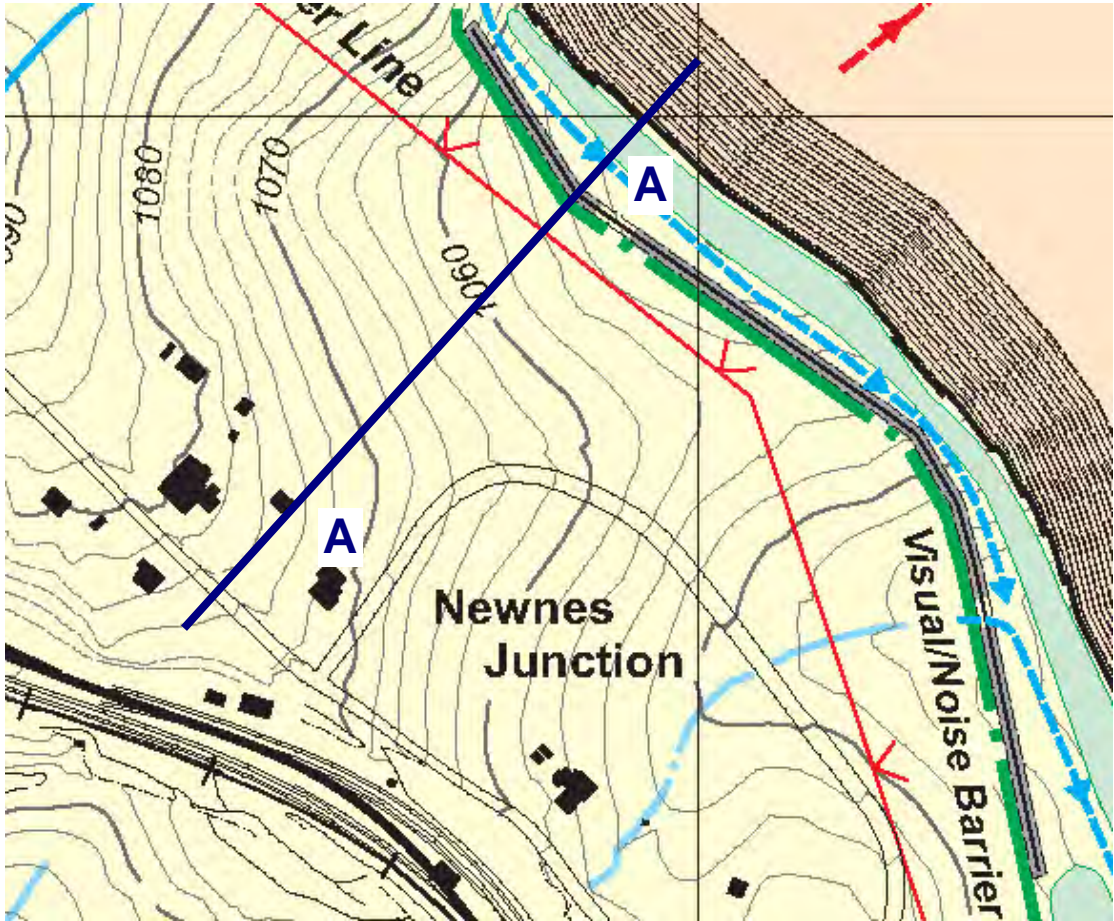


Figure 2 - Detail of visual/acoustic barrier including cross-section A-A for visual transect

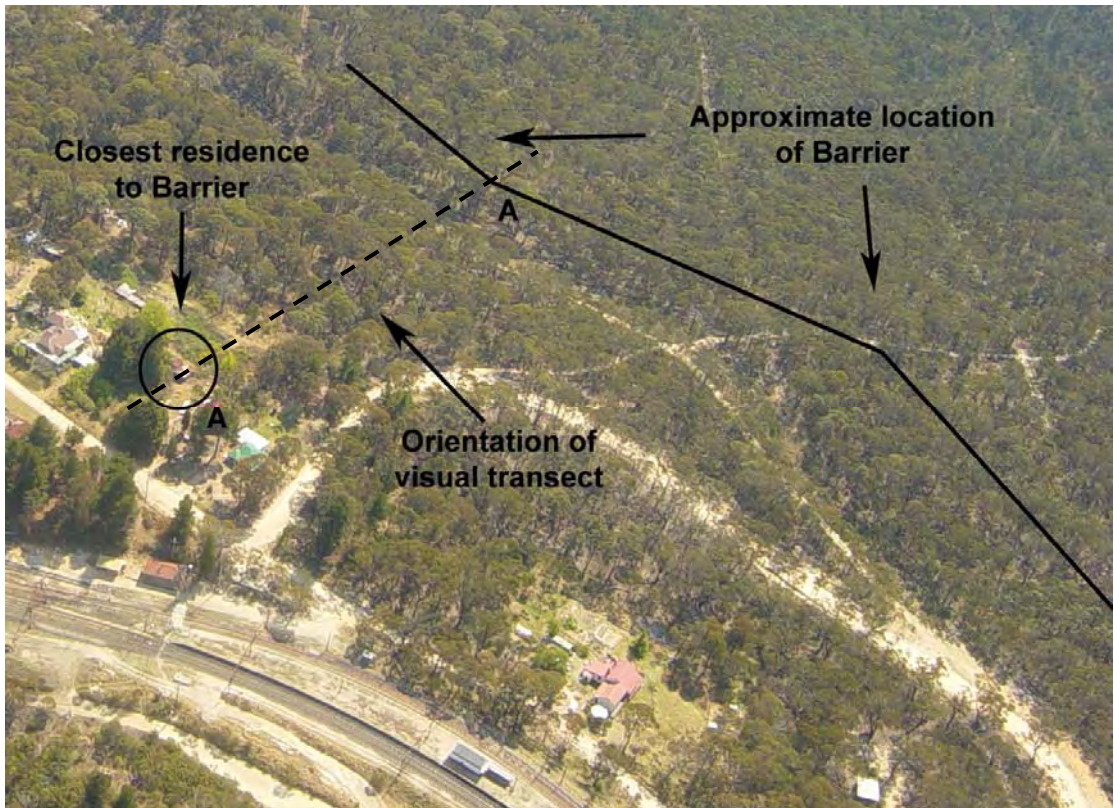


Figure 3 - Aerial view of Barrier locality

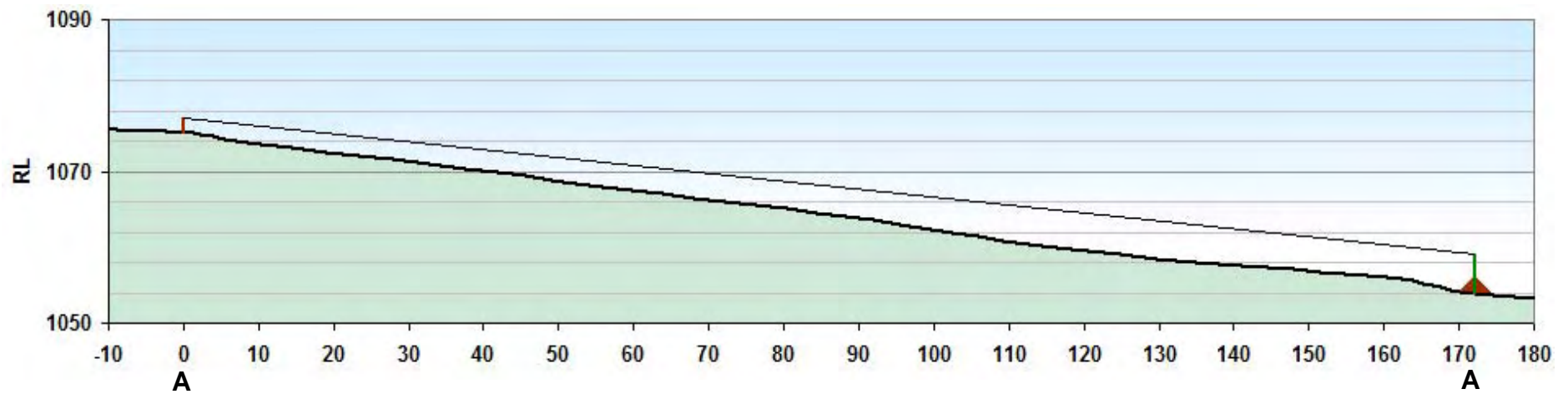


Figure 4 - Visual transect of Barrier from nearest residence, unvegetated

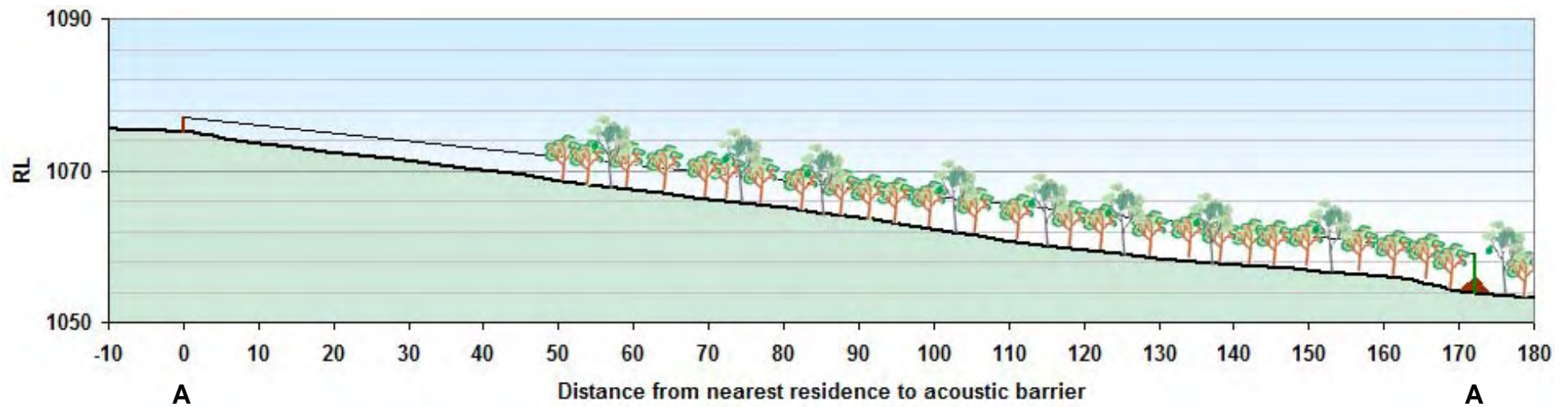


Figure 5 - Visual transect of Barrier from nearest residence, vegetated

### **2.2.2 Findings**

Investigations by the Company indicate that there will be minimal visual impact as a result of the installation of the Barrier. Examination of Figure 4 reveals that it is quite clear that at 50 metres from the nearest residence, a tree 3 or more metres tall will completely obscure the Barrier for a 2 metre tall person standing at the nearest residence. From Figure 3, it is quite clear that although there is an area of cleared land between the nearest house and the Barrier, there is nevertheless more than 100 metres of established vegetation that will provide adequate visual mitigation. Figure 3 also reveals that the amount of vegetation between the other residences and the Barrier is greater than that between the nearest residence and the Barrier, which means the visual impact from those residences will be equally non-evident.

### **2.2.3 Conclusion**

It is the Company's conclusion that although a 5 metre high visual/acoustic barrier might be expected to have a visual impact on the residents of Newnes Junction, the fact that there will remain over 100 metres of existing vegetation ranging in height to well over 3 metres indicates that there will be minimal, if any, visual impact created by the Barrier at the residences.

### **3. Flora and Fauna Assessment – DIPNR, 18<sup>th</sup> September 2003**

#### **3.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

1. **Flora and Fauna Assessment.** *The Department requires an adequate assessment of the existing flora and fauna of the site in order to assess the impacts of the proposal. The flora and fauna assessment has failed to identify areas of Newnes Plateau shrub/heath swamp that exist on the site which are potential habitat for the Blue Mountains Water Skink. The Department is yet to receive comment from the National Parks and Wildlife Service on the flora and fauna assessment. This will be forwarded when it is received. The Department has received a submission by P & J Smith Ecological Consultants which identifies deficiencies with the flora and fauna component of the EIS. A copy of the submission is enclosed. Please provide the additional information required to remedy the deficiencies identified by P & J Smith.*

#### **3.2 Response**

DIPNR is referred to the report entitled, "Flora and Fauna Issues" by Gunninah Environmental Consultants (May 2004), submitted to DIPNR on 26<sup>th</sup> May, 2004. The report includes a revised Section 5A Assessments of Significance, information additional to that in the EIS, and includes:

- a Supplementary Vegetation and Flora Survey (HWR Pty Ltd – Andrew Carty, Geoff Winning, and John-Paul King), and
- a Supplementary Survey for the Blue Mountains Water Skink (Biosphere Environmental Consultants Pty Ltd – Dr Arthur White).

#### **4. Impacts of Vegetation Clearing – DIPNR, 18<sup>th</sup> September 2003**

##### **4.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

*2. **Impacts of Vegetation Clearing.** The EIS identifies that over 25 hectares of native vegetation will be cleared by the proposal. Please provide information of the measures to be undertaken by the applicant to mitigate or offset this impact. The Department believes there should be a net environmental improvement in the area, in the medium to long term.*

##### **4.2 Response**

DIPNR is referred to the report entitled, "Conservation, Restoration and Enhancement Project" by Sydney Construction Materials (November 2004), submitted to DIPNR on 11<sup>th</sup> January, 2005.

## **5. Surface Water Impacts – DIPNR, 18<sup>th</sup> September 2003**

### **5.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

3. **Surface Water Impacts.** *Please provide an assessment of the proposal configured so that the final land form is free draining. Also provide an assessment of the impacts on the upper reaches of the Wollangambe River in terms of flow regime water quality and aquatic habitat.*

### **5.2 Response**

DIPNR is referred to the reports entitled, "Surface Water Management Plan" by Hughes Trueman (May 2004), submitted to DIPNR on 26<sup>th</sup> May, 2004, and "Soil and Water Management Plan" by GSS Environmental (October 2004), submitted to DIPNR on 11<sup>th</sup> January, 2005.

## **6. Final Void – DIPNR, 18<sup>th</sup> September 2003**

### **6.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

4. **Final Void.** *Please demonstrate the final void is safe in the long term for people and animals. Also assess the impacts of the proposed water impoundment on the ecology of the local area.*

### **6.2 Response**

This section details Sydney Construction Materials' response to the above issue. It discusses the elimination of over flow, wall breach, and drowning risks and the elimination of erosion, site collapse, and fall risks in the Project area.

#### **6.2.1 Elimination of over flow, wall breach, and drowning risk**

In an attempt to create a visually appealing feature with the final landform of the Newnes Junction project, SCM proposed a shallow lake at the bottom of the development at the conclusion of operations. It was considered that this option would constitute a far more suitable rehabilitation than is currently performed in the extractive industry.

Following discussions with local environmental groups, and taking submissions to the EIS into consideration, SCM altered the final design concept to provide a free-draining wetland at the conclusion of operations rather than a shallow lake (see Figure 6 below). Details of the altered quarry plan and final rehabilitation landform can be found in the "Quarry Plan" by MineConsult Pty Ltd (May 2004). This design, inspired by the nearby Gooches Crater (Figure 7), is in keeping with the surrounding landscape, and will result in a far safer, much more stable environment than the original shallow lake concept.

As water will not pool in the final landform, as it will be free-draining, there will be no risk of over flow or wall collapse during storm events. The quarry wall at the north-eastern corner of the development will be excavated at the end of operations, allowing the to-be-created wetland to drain into the existing drainage. This wetland will act as a natural filter, supplying clean rainwater to the Wollangambe River. Moreover, as water will not be able to pool, there will be no possibility for humans or animals to drown, further increasing the safety of the development's final landform.

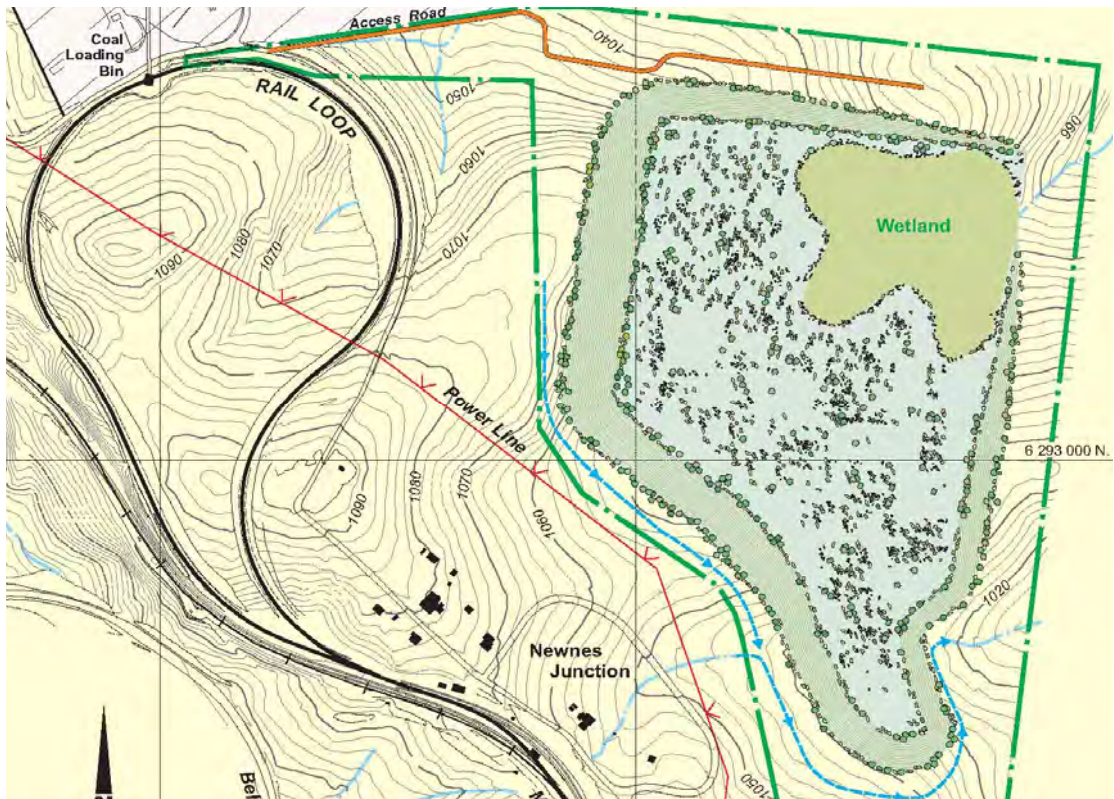


Figure 6 - Conceptual design of final landform, including free-draining wetland



Figure 7 - Gooches Crater, the inspiration for the development's final landform

### 6.2.2 Elimination of erosion, site collapse, and fall risk

The progressive rehabilitation to be employed throughout operations at the Sydney Construction Materials development will create a series of steps or terraces down the wall of the development. This is done specifically so as to provide benches on which native vegetation will be planted to enable the site's rehabilitation and visual integration, but also provides a significant safety feature for the development (see Figure 9 below).

As can be seen in Figure 8 below, these benches will be left every 3 vertical metres down the development wall. By growing native vegetation on these benches, the walls of the development will be stabilised, preventing erosion or collapses. In addition, the visual impact potentially created by such a development can be effectively eliminated, by providing a green, vegetated wall. The slight gradient of the benches towards the wall (see Figure 10 below) will provide further safety and landform security by promoting the motion of loose objects towards the wall. By slowing the flow of water over the edge, this feature will also contribute to the slowing of potential erosion. Moreover, by placing a 2 metre wide bench every 3 vertical metres, the distance a person could potentially fall is significantly reduced to just 3 metres. Other quarries in the area, and indeed other natural landforms, do not provide similar such levels of safety, with some permitting potential falls in excess of 20 metres. Further details on the design of the terraced landscaping can be found in section 6.2 of the Soil and Water Management Plan prepared by GSS Environmental (October 2004).

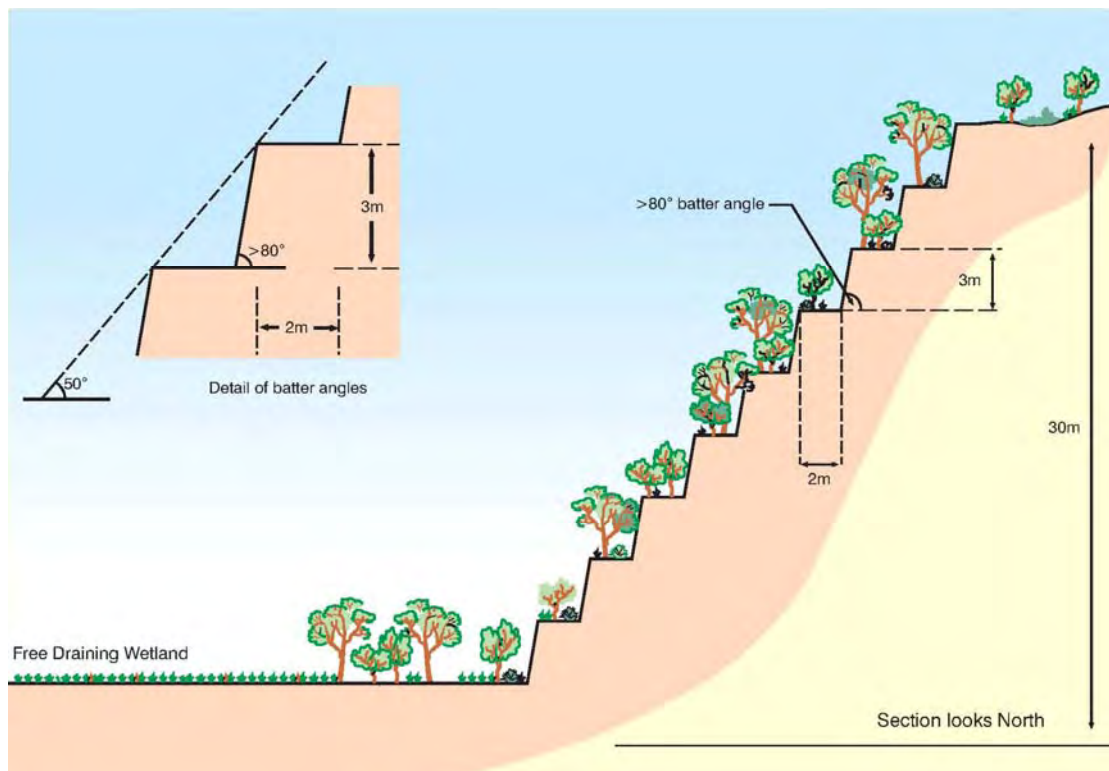
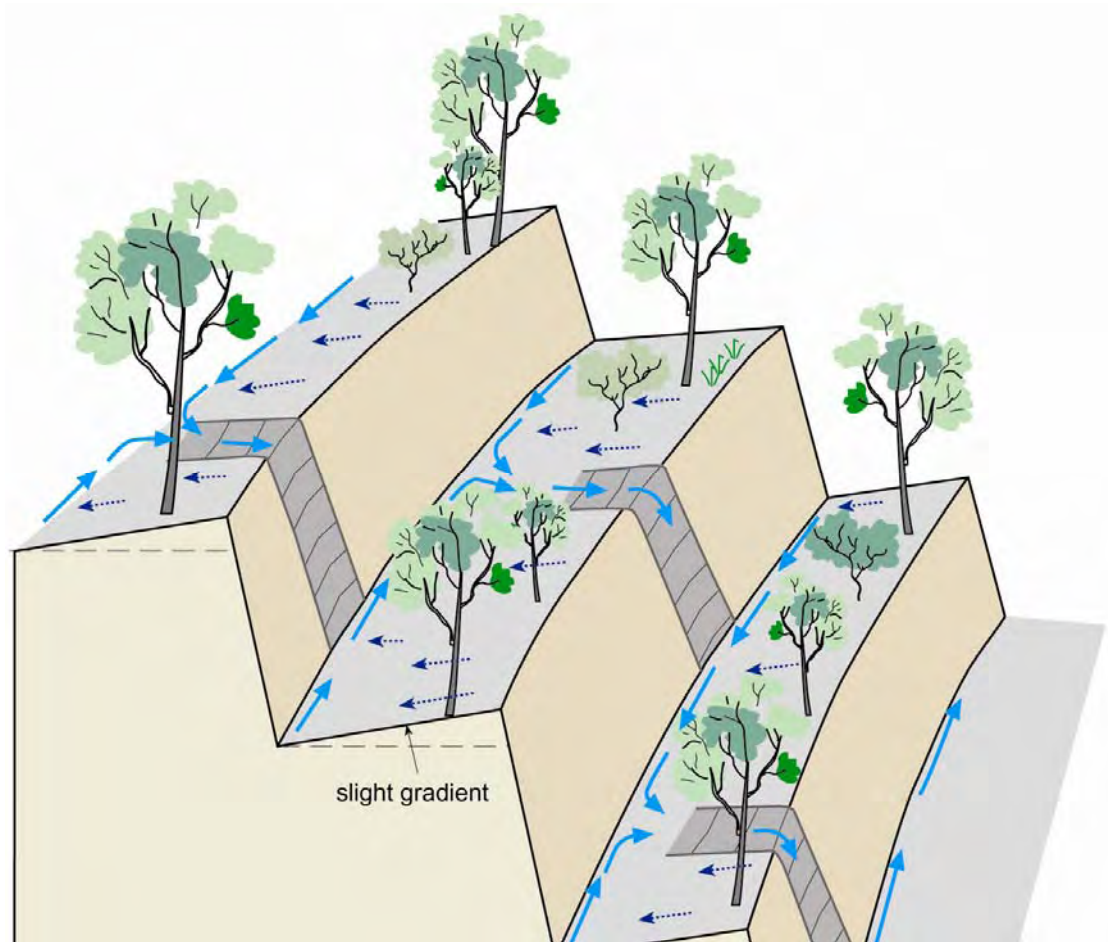


Figure 8 - Cross-sectional detail of progressive rehabilitation



**Figure 9 - Actual terraced landscaping in progress**



**Figure 10 – Close-up detail of terraced landscaping benches**

### **6.2.3 Conclusion**

Sydney Construction Materials believes that the work done to ensure the safety of surrounding bushland and to provide a development with minimal visual impact has resulted in a development far superior to and far safer than any current extractive operations. The removal of the shallow lake from the final landform, eliminating over flow, wall breach, and drowning risks, and the provision of terraced landscaping, eliminating erosion, collapse, and fall risks, will ensure the safety of the development site after the conclusion of operations in perpetuity.

## **7. Groundwater Assessment – DIPNR, 18<sup>th</sup> September 2003**

### **7.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

5. **Groundwater.** *You are required to provide a groundwater assessment that utilises sufficient baseline data to thoroughly evaluate the likely drawdown impacts.*

### **7.2 Response**

DIPNR is referred to the report entitled, "Hydrogeological Impact: Newnes Kaolin Proposed Open-Cut" by Kalf and Associates and the Water Research Laboratory UNSW (December 2004), submitted to DIPNR on 11<sup>th</sup> January, 2005.

## 8. Iron Factor – DIPNR, 18<sup>th</sup> September 2003

### 8.1 Issue Raised

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

6. **Iron Factor.** *Please provide an explanation of the derivation and use of the "iron actor" referenced in section 4.1. Please address the issues raised by the DMR in their submission of 5 September 2003.*

Following is a summary of the issues raised by the DPI (formerly the DMR) in their submission of 5 September 2003.

| Issue # | Issue Summary  |
|---------|--|
| 1       | Geology and resource reporting not well documented in EIS.   |
| 2       | No map showing drill-hole locations.   |
| 3       | No details provided of the distribution of the pale (low iron) and darker (high iron) coloured sandstones within the site (include cross-sections to illustrate this).   |
| 4       | Resources not reported in a format consistent with JORC code.  |
| 5       | No details of the basis on which resource estimates have been determined, nor reference to reports in which it was calculated.   |
| 6       | No explanation of "iron factor" or how it was determined.  |
| 7       | No qualification for reliability of quoted "iron factor" values.   |
| 8       | Agreement/consent required from holders of conflicting titles (CCL 705: Coalex P/L, Clarence Coal Investments P/L & Authorisation 307: Hartley Valley Coal Company P/L).   |
| 9       | Follow-up whether Mining Lease should be extended over areas of conflict in point 8 above. This may result in a part cancellation of affected coal titles.   |
| 10      | Information in EIS relating to soil stripping, water management, fauna and flora management, rehabilitation/revegetation and final closure land use is only conceptual. Details will be required under the Mining, Rehabilitation and Environmental Management Process (MREMP), including the development of a satisfactory Mining Operation Plan (MOP). |
| 11      | Further information and clarification on specific rehabilitation objectives is required prior to commencement of operations.   |
| 12      | Attention should be drawn to design of overburden emplacement stockpiles, means of retaining safe and adequate access to rehabilitation benches, and location of topsoil stockpiles (so as to ensure they're not adversely affected by mine operations and do not impede progressive rehabilitation).  |
| 13      | Further detail on ongoing maintenance and upgrading of reclaim tunnel (transport route between mine site and rail loop) required.  |

- 14 Evidence of any necessary licences and approvals for the use of ground water from the sump must be presented in the MOP. Details of the type of work and the nature of the infrastructure as well as environmental management procedures should also be included.

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  - 15 Groundwater hydrology investigations are inadequate. Baseline data presented is insufficient for thorough evaluation of drawdown impacts.

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  - 16 Onsite water management should be designed for 1/50 year 1 hour rain event in parallel with design rainfall isopleths from the BOM.

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  - 17 Concern relating to the proposed width of the rehabilitated slope benches. The conceptual width does not allow mobile plant to access and egress safely and for fall protection of machinery and people. Design for construction and maintenance of benches must be supported by adequate risk assessment of potential hazards.
- 

## **8.2 Responses**

The submission by the Department of Primary Industries (DPI), Mineral Resources, (Ref L03/0455) on the Sydney Construction Materials (SCM) EIS lodged on May 2003 highlighted the importance of the proposed development site with its large resources of friable sandstone to be utilised for a range of construction and industrial uses. It is noted in the submission that this deposit has the potential to be an important source of construction sand for the Sydney Region, particularly when the Penrith Lakes Scheme and Kurnell cease production in the near future. In addition, it is acknowledged that the substantial resources of kaolin within the matrix of the sandstones have potential for use in a range of applications.

The DPI supports the Newnes Junction Sand and Kaolin Project as an appropriate and effective development of a valuable resource and the ultimate benefit of the local region and the State.

This section details SCM's response of the issues raised in the DMR submission.

### **8.2.1 Issue # 1 – Geology and Resource Reporting**

Exploration geology over the tenement area (Exploration Licence 4192) has been carried out under the requirements of the Department of Mineral Resources (DMR) since 1992 resulting in a substantial database of geological information. Although they are in the possession of the DMR (now DPI), they are classified confidential and therefore not available for public scrutiny.

MineConsult was commissioned in 1999 to prepare a conceptual quarry design and to prepare a resource statement based on available drilling data (MineConsult, 1999, Report 1438). The friable sandstone has been subdivided into two grades based on iron content. Premium grade comprises white, off white and pale yellow sandstone, whilst standard grade comprises variegated sandstones. At this current stage of mine planning and resource assessment, reporting under the Joint Ore Reserves Committee (JORC) code has been initiated but not yet finalised.

Drill hole data (based on 11, 9 inch auger drill holes) was used to create a geological model using Gemcom computer software. Grades of premium and standard ores were determined from the drill logs and computer modelling in a pit shell design of 10 metre horizontal slices (MineConsult 1999). Average grade of kaolin (7.6%) was determined from laboratory separation from bulk drill hole samples (Goldbery 1997).

Since 1999, the pit design has undergone certain changes to accommodate environmental concerns raised during the submission process. Final resource assessment is presented in MineConsult (2004).

In summary, the geological characteristics of the friable sandstone of the Banks Wall Sandstone, within the proposed quarry area are best summed up in the following table:

|   |   |
|---|---|
| Premium Grade – 74%                     | Pea Gravel <sup>2</sup> > 2mm = 2.26%     |
| Standard Grade – 26%                    | Sand <sup>2</sup> (+ 75µm) = 77.40%       |
| Kaolin Grade – 7.6% (-10µm)             | Kaolin <sup>2</sup> (-20µm) = 7.60%       |
| Shales/Claystones – Absent              | Silt <sup>2</sup> (-75 to +20µm) = 12.44% |
| Ironstone – Traces (thin bands only)    | = 100.00%                                 |
| Aquifers – Absent (Kalf & Assoc., 2004) |   |

**Table 1: Main Characteristics of Friable Sandstone Ore**

### 8.2.2 Issue # 2 – Drill Hole Locations

Several generations of drilling programmes have been carried out on EL4192 since 1992. The following table provides a summary of the data:

| Drilling Method     | No. of Holes | Year | Report (Location Map) |
|---------------------|--------------|------|-----------------------|
| Reverse Circulation | 9            | 1992 | Brink & Co. (1992)    |
| Reverse Circulation | 57           | 1994 | Goldbery (1995)       |
| Auger 4inch & 9inch | 15           | 1996 | Goldbery (1997)       |

**Table 2: Summary of Drilling Programmes**

Each of the reports referred to in Table 2 above, contain a drill-hole location map.

### 8.2.3 Issue # 3 – Distribution of Premium and Standard Grade Sandstones

Although the RC programme of 1994 (see section 8.2.2 above) produced samples contaminated with silica flour and was hence unsuitable for kaolin grade determination, the colour variation were a reliable guide to the sub-surface distribution of Premium and Standard grades of friable sandstone. Detailed cross sections appear in Goldbery (1996). Cross sections of the auger-drilling programme of 1996, appear in Goldbery (1998).

<sup>2</sup> Based on sieve analysis, various reports. Brink and Co (1992), Goldbery (2002)

### 8.2.4 Issue # 4 – JORC Code Format

The classification and calculation of the reserves of the two classes of friable sandstone (Premium and Standard) have been based on auger drill hole data from the western portion of the tenement (EL4192) i.e. drill lines 1-3 (Figure 11 below) (MineConsult, 1999 – Appendix A).

The resource over this area is classed as estimated reserves, whilst the resource over the eastern area is classed as probable reserves. It is however acknowledged that until finalisation of the JORC code analysis, these reserve classifications remain tentative even though there are no changes anticipated in the outcome. JORC code analysis, however, is not required for the Development Application process.

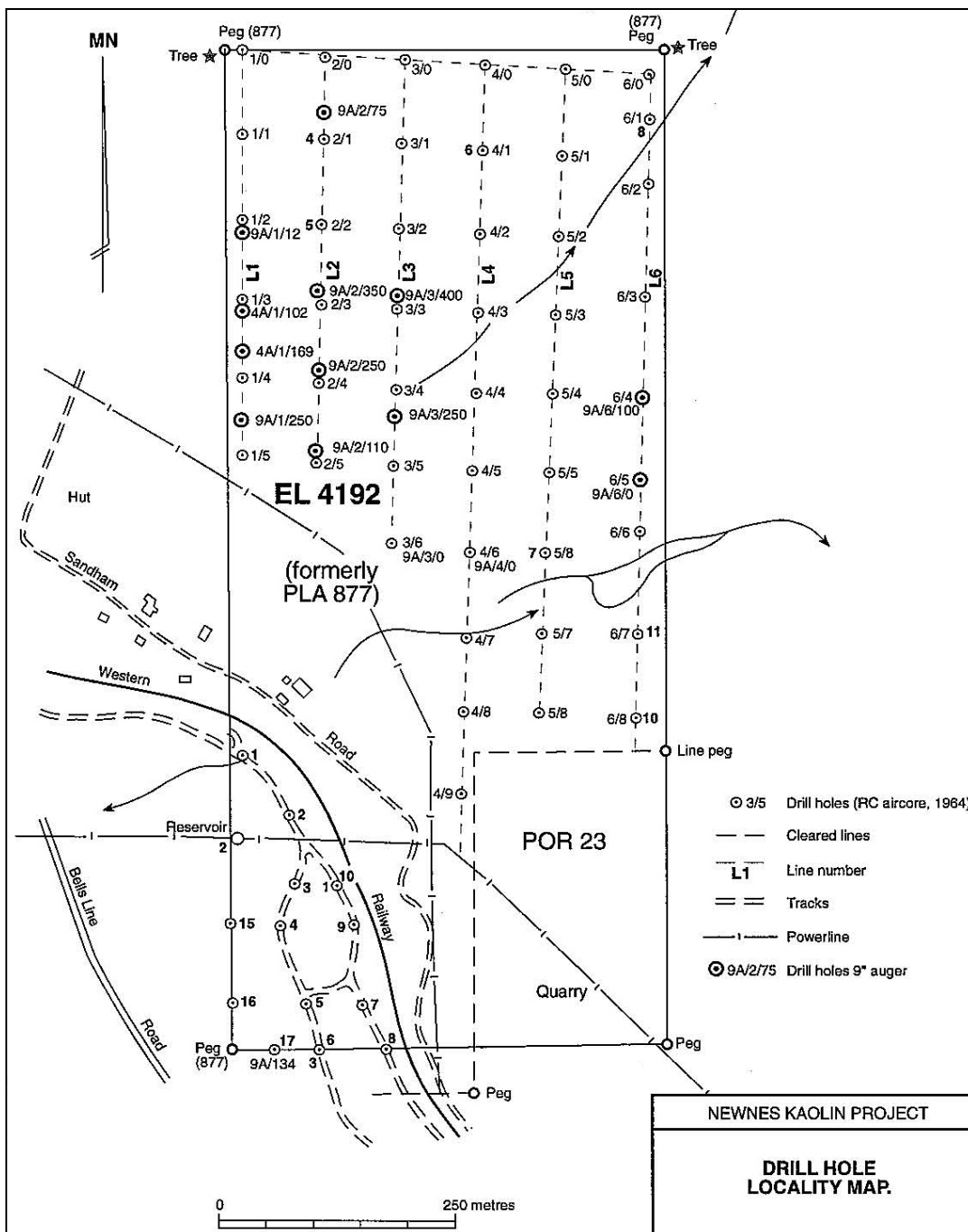


Figure 11 - Map of drill hole locations

### 8.2.5 Issue # 5 – Resource Estimates

Initial modelling and resource estimates have been discussed in section 8.2.1 above. Revised resource estimates have been prepared in accordance with changes in the conceptual mine plan, in response to environmental issues raised during the display period of the EIS. The final estimates have been presented in MineConsult (2004).

### 8.2.6 Issue # 6 – Explanation of “Iron Factor”

Quantification of ironstone (ferricrete) occurrences within regional drill holes over the Newnes Plateau (Pecover 1986) has been achieved by assigning a conversion factor for each of the drill log terminologies of Pecover (1986). The values assigned are subjective, however when applied to each of the eleven drill holes and measured sections it provides us with the relative means of comparison of ironstone values over the Newnes Plateau – see Figure 12 below. Figure 12 contains graphical logs from drill holes and measured sections at various locations on the Newnes Plateau (Pecover, 1986) showing the distribution of ferricrete densities and the calculated iron factors. The conversion table used follows below:

| <b>Pecover (1986) Drill Log Terminology for Ferricrete Concentration</b> | <b>Factor for Conversion to Ironstone Thickness</b> | <b>Probable Factor Based on Field Exposures</b> |
|--|---|---|
| Ferricrete (F)   | 1m = 1m (100%)                                      | 100%  |
| Thin closely spaced bands of Ferricrete (C)                              | 1m = 0.75m (75%)                                    | 30%   |
| Numerous bands of Ferricrete (N)   | 1m = 0.5m (50%)                                     | 20%   |
| Minor thin bands of Ferricrete (M)                                       | 1m = 0.25m (25%)                                    | 10%   |

**Table 3 – “Iron factor” conversion table**

Following site visits to exposures of friable sandstone containing ferricrete bands, in particular the Clarence Sand and Gravel Quarry (Boral Pit) on the southern side of the Main Glow Worm Tunnel Road (Boral), more accurate “ground truthed” conversion factors, scaled down to less than half the original estimates, have been included in the table.

When calculating the iron factor in a particular drill hole, the thickness of ironstone (ferricrete) in each of the logged intervals is calculated back as an adjusted thickness. For example, for a 6m interval logged as friable sandstone with numerous bands of ferricrete, the calculated thickness of ferricrete is 50% x 6m = 3m. The final iron factor is the percentage of total ferricrete thickness over the entire drilled section.

Measured section NPS1 of Pecover (1986) (4<sup>th</sup> sample, Figure 12 below) yielded an iron factor of 38.5. When recalculated with probable values (see previous table), the iron factor is 18. As all iron factor values are calculated on the same scale the results are relative and there is no difference to the final interpretations.

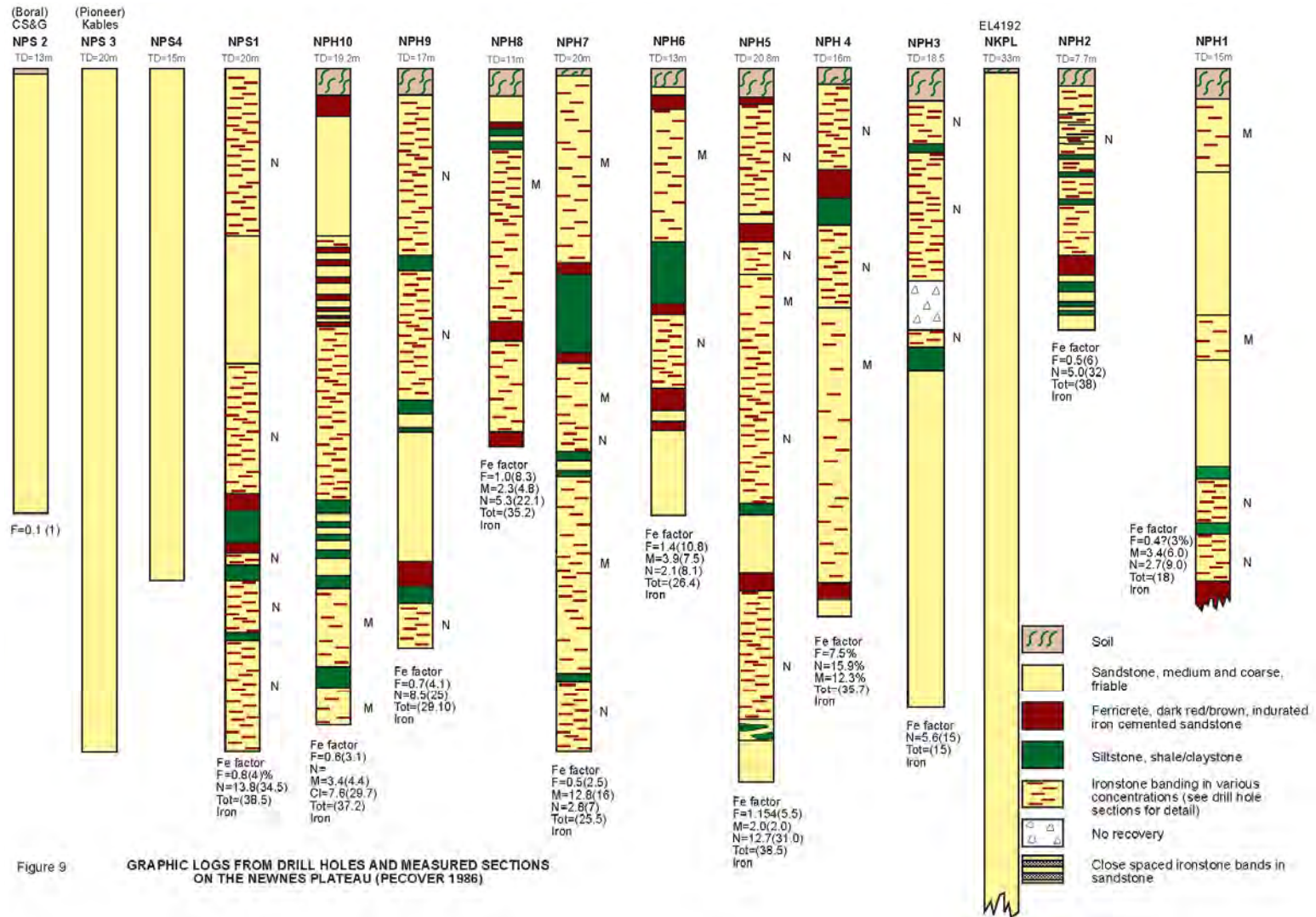


Figure 9

GRAPHIC LOGS FROM DRILL HOLES AND MEASURED SECTIONS ON THE NEWNES PLATEAU (PECOVER 1986)

Figure 12 - Graphic Logs from Drill Holes and Measured sections on the Newnes Plateau (Pecover 1986)

### **8.2.7 Issue # 7 – Reliability of quoted “iron factor”**

Iron factors based on a subjective interpretation of the drill cuttings by the geologist carrying out the drill logging can never produce precise quantitative results. Only diamond drill core can achieve this. However, the terminology employed to qualify a measure of concentration of ironstone banding can be readily sorted into a sequence from most abundant to least abundant, and then converted to a quantitative value.

On the assumption that the drill logger is consistent with the application of his descriptive terminology, a direct comparison can be made between drill holes and the percentage of ironstone in each of the drill holes.

### **8.2.8 Issues # 8 & 9 – Agreement to use portion of existing Coal Title**

The portions of the existing Coal Titles will be leased from titleholders to access land for conveyance of friable sandstone to the Rail Loop.

Agreements have been reached through a Heads of Agreement with Centennial Coal Company over the use of a portion of CCL705 for rail access.

### **8.2.9 Issues # 10, 11 & 12 – Rehabilitation; stockpile designs (MOP)**

The GSS Environmental (2004) report provides details of the distribution of soil stockpiles along the pit margins; their management, design of clean water diversion works; in pit water management; quarry haul road design and management and sediment control plans. Hughes Trueman (2004) deals with detailed Surface Water Management plans.

The Mining Operation Plan (MOP), a requirement of the Mining, Rehabilitation and Environmental Management Process (MREMP) is a prerequisite for the commencement of mining and not a requirement of the EIS. The proponent is aware of these obligations. Details of rehabilitation and revegetation processes consistent with the surrounding undisturbed areas have been presented in the GSS Environmental (2004) report.

The final landform constitutes a wetland design, designed in accordance with the equivalent of the Constructed Wetlands Manual (1998) (DIPNR, formerly DLWC) and will involve input from and consultation with, government regulatory agencies including DEC (comprising the former NPWS and EPA).

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, a natural crater feature located approximately 2km north east of the project area.

### **8.2.10 Issues # 13 & 14 – Maintenance of reclaim tunnel, ground water licences**

These issues will be dealt with in the MOP, presented for approval prior to commencement of mining.

### **8.2.11 Issue # 15 – Groundwater Hydrogeology**

The hydrogeological impact of the proposed development at Newnes Junction has been assessed in accordance with the guidelines requested by Dan McKibbin, Senior Natural Officer (Ground Water Management, Sydney South

Coast Region, DIPNR). Drilling was completed to a maximum depth of 60m at three sites within the proposed development area. Packer testing and recovery tests were carried out for permeability and ground water modelling using these results followed. Kalf and Associates Pty Ltd (2004) have prepared a detailed report, concluding that the sandstones have low permeability and thorough modelling has shown that there will be minimal disturbance of the groundwater as a result of mining.

#### **8.2.12 Issue # 16 – 1/50Year Rain Event**

Onsite water management has now been designed to cater for a 1/100 year ARI 72 hour storm event. DIPNR is referred to the “Surface Water Management Plan” by Hughes Trueman (May 2004).

#### **8.2.13 Issue # 17 – Stockpile/overburden design; rehab benches**

Rehabilitation benches do not need to be accessed after ripping and direct seeding. The method of vegetating terraced landscaping structures has been successfully applied to a quarried friable sandstone sequence in the Somersby region. Six months produced a significant growth of native trees and shrubs (GSS Environmental, 2004).

The terrace design (see figure 3.14, Sydney Construction Materials, EIS, May 2003, reproduced in Figure 10 above) illustrates the slight gradient of each terrace directed back to the pit wall. This provides both for optimum water retention on the ripped surface of the bench and also is a safety factor, which inhibits loose material falling down the terraces into the active pit during mining operation.

#### **8.2.14 References**

Brink and Co. Pty Ltd, 1992, Report on Resource Evaluation (Clay, Sand, Sandstone) at Newnes Crossing, Blue Mountains.

GSS Environmental, 2004, Soil and Water Management Plan (SWMP) Newnes Junction Sand and Kaolin Extraction Project, Newnes Junction, NSW, SCM 1-1

Goldbery, R, 1995, Third Annual Report to the New South Wales Department of Mineral Resources on Exploration Licence 4192, Newnes Plateau Clay Deposit (confidential)

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Goldbery, R, 2002, Tenth Annual Report to the New South Wales Department of Mineral Resources on Exploration Licence 4192, Newnes Plateau Clay Deposit (confidential)

Hughes Trueman, 2004, Surface Water Management Plan, Newnes Junction Sand and Kaolin Extraction Project, 045112

Kalf and Associates Pty Ltd, 2004, Hydrogeological Impact, Newnes Kaolin Proposed Open-Cut

MineConsult, 1999, Newnes Kaolin quarry conceptual mine design, report No. 1438 (unpublished)

MineConsult, 2004, Newnes Junction Sand and Kaolin Extraction Project Quarry Plan, report no. 1864 (unpublished)

Pecover, S.R., 1986, Construction and industrial sand resources of the Newnes Plateau Geological Survey of New South Wales, Report GS 1986/214 (unpublished)

## **9. Justification of Kaolin Extraction – DIPNR, 23<sup>rd</sup> February 2005**

### **9.1 Issue Raised**

During discussions held with DIPNR (David Kitto and Phil Jones) on 23<sup>rd</sup> February 2005, it was brought to the attention of the Company that it would be necessary to provide a justification of the Company's claims regarding the feasibility of extracting, processing and marketing Kaolin from the Project area.

### **9.2 Response**

Some submissions on the Sydney Construction Materials EIS brought into question the economic feasibility of extracting and marketing kaolin from the Newnes Junction deposit. This section provides justification of SCM's plans to extract friable sandstone, process off-site, and market the kaolin component of the NJ resource.

#### **9.2.1 Kaolin Investigations Prior to the Granting of Exploration Licence 4192 (EL4192)**

Considerable interest for commercial development of the kaolin resource within the friable sandstones at Newnes Junction dates back to 27 September, 1988 with an application lodged for a Prospecting Licence 887 (PLA 887) for Group 5 (Clays) with the NSW Department of Mineral Resources (DMR) by Australian Aggregates Pty Ltd.

The "kaolin" tenement predates by almost four years an application lodged by the same party on 23 January 1992 for a sand extraction licence over the same area at Newnes Junction. The application was refused on 9<sup>th</sup> September 1996 – on the basis that "if it could be proven that damage to the environmental and nature conservation values of the locality could be minimised, mining may become a viable land use for this area if the decision was made for economic benefit to outweigh the loss of natural resource". Newnes-Kaolin Pty Ltd applied for a new application for a licence to extract sand on 10 October 2000.

PLA 887 was converted to Exploration Licence 4192 by the DMR on 7 February 1992 and title was transferred to the Newnes Kaolin Pty Ltd partnership during 1994. The stimulus for kaolin exploration at Newnes Junction was no doubt initiated by an investigation carried out by the DMR in June 1984 (Kmetoni, 1984).

The investigation was undertaken to evaluate the industrial mineral potential of sand washing tailings from the current Rocla Pit (formerly Australian Aggregates Pty Ltd) as a raw material resource for the production of beneficiated kaolin. The beneficiated clay produced through hydrocyclone classification was proven to be high quality china clay suitable for use in whiteware ceramics. It should be pointed out that samples for analyses for the DMR investigation were taken directly from the tailings dam adjacent to EL4192, and as such, provide an excellent representative sample of the kaolin from the proposed extraction site.

Magnetic filtration for further beneficiation of the kaolin carried out by the Aquafine Corporation in USA (Kmetoni, 1985) showed the technical feasibility of producing beneficiated kaolin, with a significantly lower iron content, from the Rocla tailings dam with the following proportions:

|                                |                     |       |
|--------------------------------|---------------------|-------|
| Fe <sub>2</sub> O <sub>3</sub> | As low as           | 0.34% |
| TiO <sub>2</sub>               | As low as           | 0.26% |
| Kaolinite (dickite)            | As high as          | 83%   |
| Al <sub>2</sub> O <sub>3</sub> | As high as          | 35.1% |
| Brightness                     | (unfired)           | 77%   |
| Brightness                     | Calcined briquettes | 93%   |

**Table 4: Some Technical Specifications of Newnes Junction Kaolin**

According to the Department of Mineral Resources (Kmetoni 1985), the beneficiated kaolin is therefore suitable for high-grade china clay in whiteware ceramics, refractories and also as mineral fillers.

### 9.2.2 Kaolin Investigation Following Granting of EL4192

Sydney Construction Materials (SCM) has carried out an extensive evaluation of the kaolin resource within the tenement area since the granting of EL4192 in 1992. X-ray diffraction analyses of kaolin obtained from drill hole and outcrop samples were carried out by the CSIRO Division of Exploration and Mining (Goldbery, 1995).

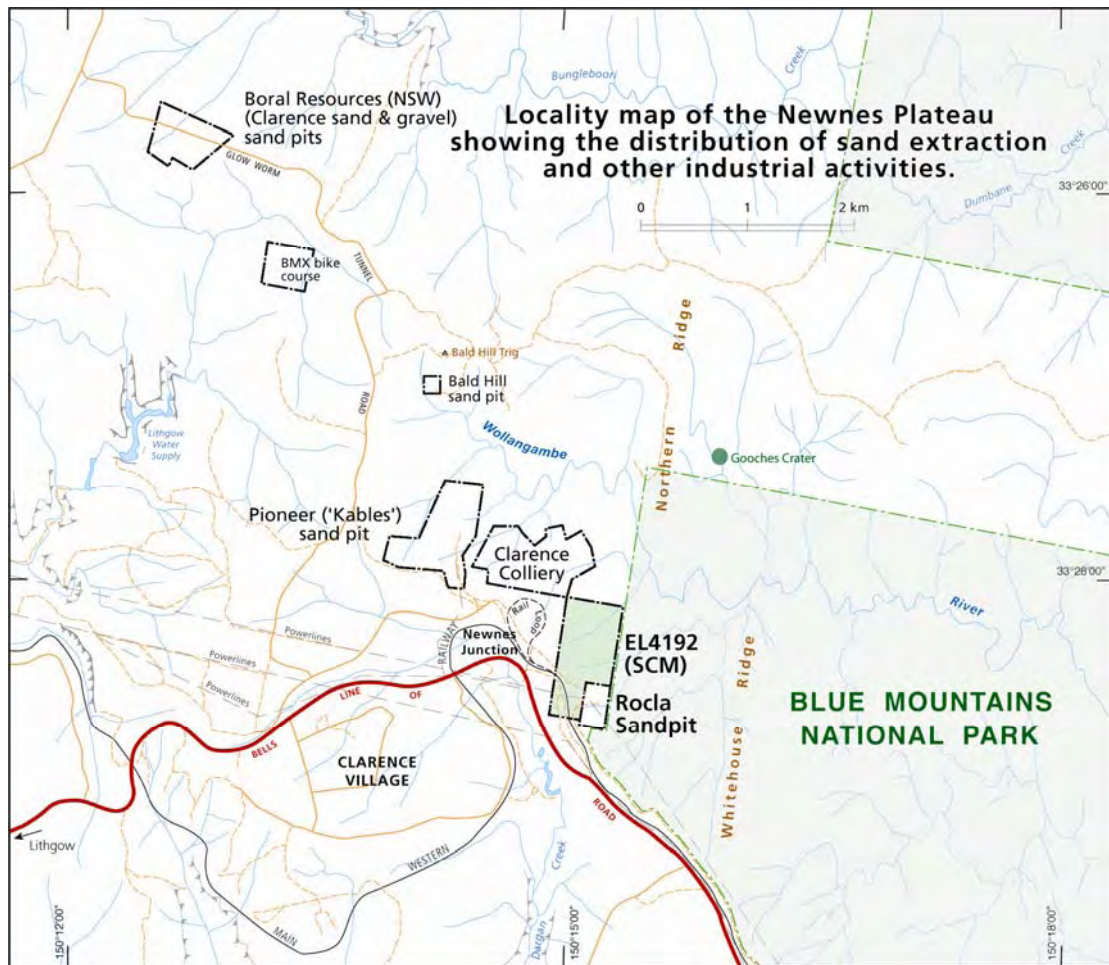
Kaolinite occurs together with Dickite (a polymorph) in well crystalline form very similar in characteristics to well crystalline kaolin from Georgia in the USA. The results clearly demonstrate the homogeneity and high-grade characteristics of the kaolin.

Quantitative analyses to determine the <10µm kaolin content of bulk samples of friable sandstone from 9 inch auger drill holes on the tenement (Goldbery, 1997) were carried out at Macquarie University on a purpose built, bulk sample separation plant. The results gave an overall grade of 7.6% kaolin for the friable sandstone deposit (Goldbery, 1997). The actual grade of kaolin is anticipated to be higher, based on analyses of kaolin content vs. depth (from drillhole samples), which show an increase of kaolin to a maximum of over 15% at 20m and therefore a more realistic figure for overall grade is closer to 10%, a figure which coincides with the kaolin grade determined by Kmetoni (1984) from the Rocla tailings dam.

### 9.2.3 Newnes Plateau Geological Characteristics

Geological modelling, based on available data on the Newnes Plateau, has shown that the project site is unique. The quality of the kaolin, as determined by percentage of iron oxide and brightness, increases across the plateau in a south-east direction towards the Project area. Beneficiation studies carried out by the DMR (Kmetoni 1984 a,b,c) determined the iron content (Fe<sub>2</sub>O<sub>3</sub>) and brightness on a suite of raw untreated kaolin samples and beneficiated (magnetic filtration and calcination to 1200°C) kaolin samples from each of the three sand extraction pits on the Newnes Plateau. These include the pits

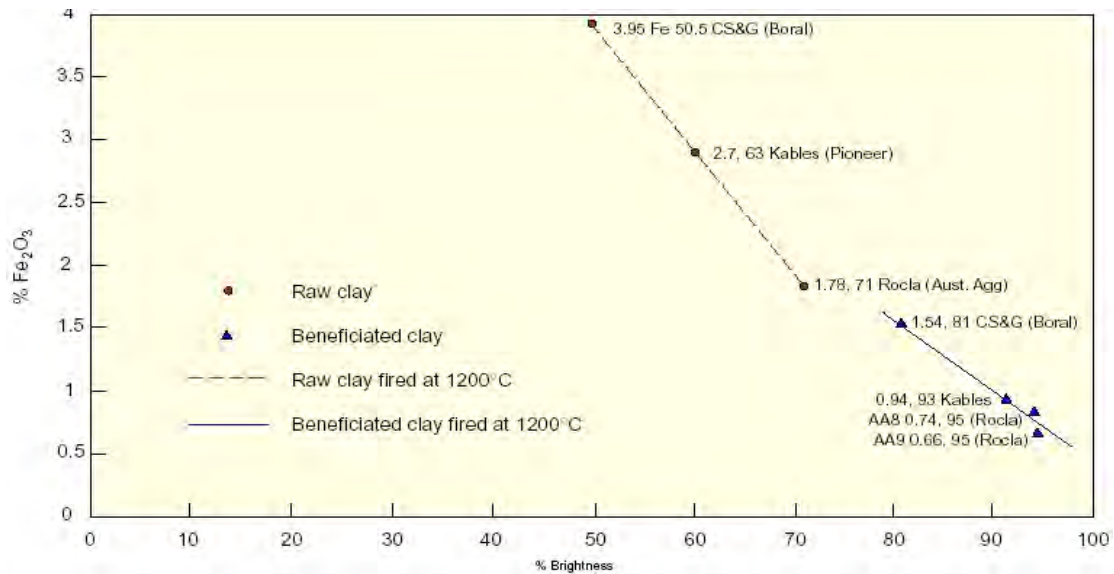
operated by the former Clarence Sand and Gravel Pty Ltd (now Boral), Kables (now Pioneer) and Australian Aggregates Pty Ltd (now Rocla) (Figure 13).<sup>3</sup>



**Figure 13: Locality map of the Newnes Plateau showing the distribution of sand extraction and other industrial activities**

The results have been plotted in Figure 14, and show a definite improvement in kaolin quality moving from the Boral pit in the north to the Rocla pit in the south. Anecdotal evidence gives 4% (pers. comm. Keith Muir & Kables mine manager, from unpublished CSIRO report, quoted in "The Environment Groups'" submission to the SCM EIS) for the percentage of kaolin in the friable sandstone from the Kables (Pioneer) pit to the north. The nearly double kaolin content at the Newnes Junction site further reinforces the theory regarding the general direction of enrichment of the kaolin resource already reflected by a progressive lowering of iron content and consequent increase in brightness of the kaolin from north-west to south-east.

<sup>3</sup> The determination of the kaolin content from drill hole samples taken from the Project area were carried out by Mr Keith Maxwell from the Macquarie University School of Earth Sciences. Mr Maxwell does not and has never held any commercial interest in this Project. Testing of the kaolin fraction within the tailings dams at the Rocla site, carried out by Kmetoni (1989), indicated an average of 10% kaolin.



**Figure 14: Plot of average % Fe<sub>2</sub>O<sub>3</sub> against average % Brightness for Three Newnes Plateau Pits, Raw and Beneficiated, Calcined at 1200°C**

As EL4192 is adjacent to the Rocla Pit, it clearly demonstrates that it has the capability of yielding the highest quality of kaolin of all the existing sand operations on the Newnes Plateau.

#### 9.2.4 Newnes Junction Kaolin Properties

As discussed above and below, significant market research has gone into determining the economic feasibility of extracting, processing, and marketing the Newnes Junction kaolin. Attached at Appendix 1 is an outline of the material properties of the Newnes Junction kaolin resource and a comparison with other currently available kaolins.

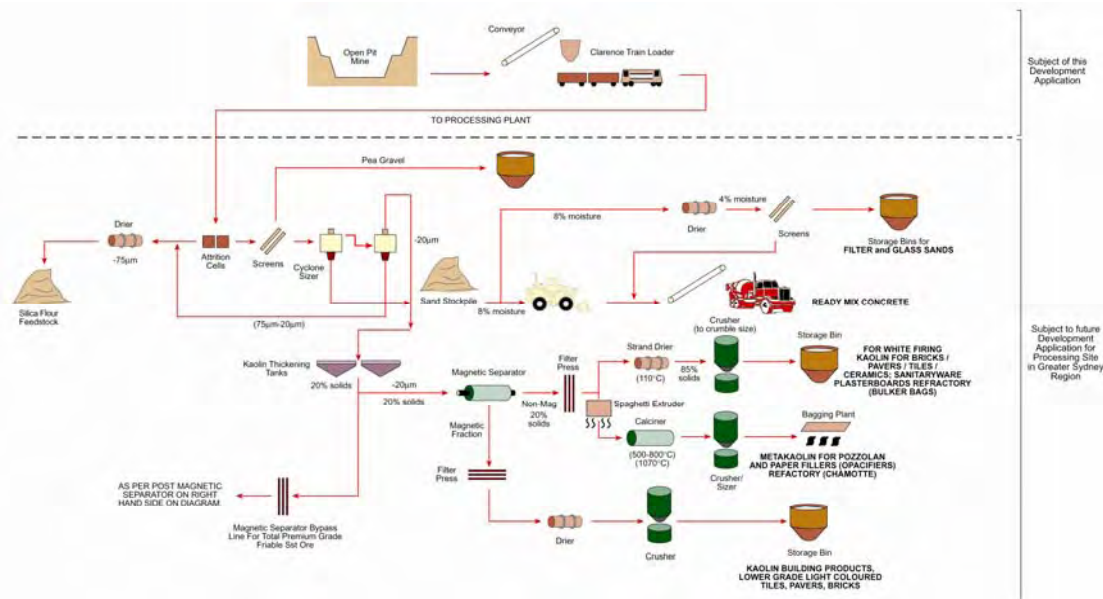
#### 9.2.5 Kaolin Processing Plant

Sydney Construction Materials has held commercial discussions with landholders of three sites within the Great Sydney area for locating a sand washing and kaolin processing facility. These discussions, however, are the subject of commercial confidentiality, and as such, cannot be made public at this stage.

A conceptual flow-chart describing the process for production of the various kaolin products is shown in Figure 15 below. The friable sandstone will be washed in attrition cells to remove the kaolin and silt matrix (particle size <75 µm) from the loosely bound quartz sand and gravel fraction, and then passed through screens to remove pea gravel (particle size >2mm). The next process involves a series of hydro-cyclone sizers in which sand (particle size >75µm), kaolin (particle size <20 µm), and remaining quartz silt (particle size 75 µm-20 µm) are separated.

The kaolin component is passed to a thickening tank where it settles to produce a slurry of 20% solids. Investigations are underway to determine the feasibility of bacterial beneficiation to further reduce the already very low iron content. If this process is to be implemented, it would occur at this stage. If bacterial beneficiation is not implemented, the kaolin will pass through magnetic separators to remove any particles coated with a film of iron oxides,

before being passed through a filter press to significantly lower the moisture content. Although low in iron content, this component is not white enough for the higher-end products, and so would be sold for low value building products (light coloured bricks, tiles, and pavers).



**Figure 15: Conceptual SCM kaolin processing flow chart**

The non-magnetic kaolin component will be further processed, first by being passed through a filter press, before proceeding into one of two processes. The first involves drying and crushing to produce white firing kaolin for bricks, pavers, tiles, ceramics, sanitaryware, plasterboards, and refractory clays. The second involves calcining (heating to between 500°C and 1200°C depending on final application) and crushing to produce metakaolin for pozzolans (cement additive) or paper and paint fillers (opacifiers & functional fillers).

These processes have been designed in conjunction with Stratum Resources (experts in modern processing plant technology) and Roger Smith & Associates (Mineral Processing Engineers), following significant processing and product investigations. The market research underpinning the production of the various kaolin products is discussed below.

## 9.2.6 Market Research

### 9.2.6.1 Resource characteristics

Kaolin is the most valuable component of the Newnes Junction deposit. Kaolin is a near-white clay, predominantly composed of the mineral kaolinite, the chemical composition of which is  $Al_2Si_2O_5(OH)_4$  (hydrous kaolinite). For many modern industrial applications, kaolin must be extensively refined and processed (mainly water-washing, delaminating and calcining) from its original state to obtain important, required commercial characteristics. After beneficiation, kaolin ranks as one of the most valuable of the industrial clays.

The Newnes Junction kaolin occurs as a matrix within quartzose sandstone, and averages 7.6% by volume with individual zones exceeding 15% concentrations. The kaolin has been formed on site by ground water alteration of detrital feldspar and other clay minerals, such as illite, and as a result, has

recrystallised into a homogeneous, well-ordered, crystalline platy kaolinite, exhibiting superb industrial properties.

There are other deposits of kaolinite sand/sandstone deposits elsewhere in the world (e.g. Europe), where, like the SCML resource, the host sand is a valuable co-product.

#### 9.2.6.2 Industrial properties

In comparison to other clay minerals, the kaolin from the Newnes Junction deposit has a range of unique optical, physical, and a compositional properties that makes it ideally suited for a broad selection of industrial uses. These properties (from Kmentoni 1986 report) are summarised below.

- High brightness (reflectivity): 77/100 GE (raw); > 93/100 GE calcined
- Particle size: 50% finer than 2 microns
- Low alkalis: K<sub>2</sub>O ~0.72%; Na<sub>2</sub>O ~0.10%
- Low iron content (after magnetic separation): ~0.34%
- Low titanium: ~0.26%
- High alumina: ~35.1%
- High Pyrometric Cone Equivalent (PCE): 32
- Well ordered, crystalline structure; hexagonal plates (mixture of kaolinite and dickite), close resemblance to world's best kaolins, i.e. Georgia USA, Cornwall UK

#### 9.2.6.3 Industrial uses

The main industrial uses of kaolin include:

- Partially-calcined (750-800° C kaolin with its high brightness is used as a paper filler and coater (in the form of Metakaolin) and replaces expensive TiO<sub>2</sub> as an opacifier.
- Uniform particle size and homogeneity is necessary for optimum use in plastics, paint, and rubber as functional fillers, improving the tensile strength, electrical properties, and dimensional stability of finished products.

The above uses of kaolin account for approximately 60% of worldwide kaolin consumption (2002), and require a high-quality product. The remainder is used in the following applications:

- Excellent additive in mix for bricks, tiles, and pavers to produce a range of pastel coloured products. The kaolin additive, known as “white-firing clay”, is currently in short supply in Sydney.
- Low alkalis and low iron are necessary chemical properties for the production of Metakaolin, a cement pozzolan.
- High PCE, combined with suitable chemistry, i.e. low alkalis and low iron, are necessary ingredients for the production of refractory kaolin.

- Main whiteware ceramic markets include sanitaryware and glazes, utilising the higher grades of kaolin.
- Unrefined kaolin is used in traditional ceramics such as floor and wall tiles.

#### 9.2.6.4 Sources of kaolin

World production of kaolin in 2002 was an estimated 24.6 Mt with an annual growth rate of around 1.75%. Overall demand for kaolin is forecast to grow at a rate of approximately 2% pa to attain some 27.7 Mt in 2010. Kaolin is produced in over 60 countries, and in most cases output is relatively small. Processed production only exceeds 1 Mtpa in the USA, UK, Brazil, and probably China.

The majority of kaolin is consumed close to where it is produced, but there is a substantial amount shipped over large distances. Apart from supply and demand, the main factor affecting the price of kaolin is the cost of processing.

#### 9.2.6.5 Australian production

There are six main kaolin producers in Australia, mainly supplying the local market. A period of consolidation of ownership has led to Unimin (part of Sibelco, Belgium) emerging as a major domestic producer. Australia currently produces close to 155,000 tpa. Kaolin occurs in all states of Australia with major deposits in WA, NSW, Qld, and Vic. There are very large resources of kaolin in WA and SA but the lack of water of suitable quality for processing has been a consistent impediment to the development of these deposits (mainly high salt levels). Several of the deposits are in remote locations resulting in prohibitively high costs of transportation (e.g. Broome, Skardon River).

Victoria has a significant 200,000 t kaolin resource at Axedale, with an open cut mine producing 50,000 tpa of ball clay, suitable only for the ceramic white ware industry. At the Lal Lal and Pittong deposits near Ballarat, Imerys Minerals Australia (formerly English China Clays) produces around 60,000 tpa of kaolin used mainly for paper coating.

Cape York Peninsula has been the focus of active mining development of kaolin deposits since the late 1990s. The Weipa operation by Comalco ceased production in 1996, exploration is ongoing by Cape York Kaolin south of Weipa, and Minerals Corporation, the owner of Skardon River Kaolin, operating in the same region has experienced technical problems with processing and are still attempting to commercialise this operation. It plans to export calcined kaolin to Europe and Asia. Unimin Australia is the largest producer of kaolin in Queensland from its recently acquired Kingaroy deposit, where it processes crude kaolin, dried pelletised, and bagged for general use, and produces a delaminated kaolin for paper coating.

South Australia is a small producer of kaolin mainly used in cement manufacture and industrial fillers. At Williamstown, a mixed sillimanite-kaolinite product (Kaosil) is used for the manufacture of refractories and insulators (< 3,000 tpa).

Kaolin in NSW is currently sourced from Gulgong, mainly ceramic and filler grade products. Altogether, the Gulgong plants have a combined production capacity of 40,000 tpa. It is apparent that current production is becoming sub-economic because of excessive overburden thickness, with kaolin restricted to deep pockets only.

Additional sources of kaolin are in the Southern Highlands area around Marulan and Windellama, where individual small pockets of kaolin are mined for the bricks, tiles, and pavers industry to produce light coloured products.

The huge advantage of the SCML kaolin resource is its outstanding technical properties, which make it suitable for a wide range of industrial applications. Its source will be in the Western Sydney area as a co-product of washed friable sandstone. Processing facilities will be located within industrialised Western Sydney on a rail facility for export and interstate distribution and adjacent to a source of non-saline water for processing.

The Newnes Junction kaolin resource fits the motto for a successful industrial mineral project “BIG, WHITE, AND CLOSE TO MARKET”. The deposit has a resource of approximately 2 Mt, a beneficiated brightness of ~93/100, and will be located virtually in industrial Western Sydney.

#### 9.2.6.6 End uses

Markets into which SCM intends to sell the Newnes Junction Kaolin include:

|                               |   |
|-------------------------------|---|
| Metakaolin – pozzolans        | High Reactivity Metakaolin is a semi-calcined kaolin, used to significantly enhance the performance characteristics of cement-based mortars, concretes, and related products. It contributes to increased strength, reduced permeability, greater durability, efflorescent control, and control degradation caused by Alkali Silica Reaction (“ASR”). |
| Metakaolin – opacifier        | Metakaolin plays an important role in paper manufacture as a paper coating, used to reduce strikethrough (the ability to see printing on the reverse side) in thin paper, thus allowing the use of thinner paper.<br>Also used as an opacifier in paint to achieve the same effect.   |
| Plastic filler                | Used in the production of polyvinyl chloride, polypropylene, polyethylene, and unsaturated polyesters. Minerals are added to polymers as low cost extenders and/or reinforcement materials.   |
| Rubber filler                 | Kaolin is a major non-black filler material used in rubber, accounting for a portion of all the non-black filler used. It is used in shoe heels and soles, floor tiles and mats, conveyor belts, bicycle tyres, household products, toys, rubber, and clothing.   |
| Refractory clays and Chamotte | SCML kaolin has excellent refractory properties, i.e. high Pyrometric Cone Equivalent (PCE), low alkalis, and high purity, allowing it to serve as a suitable raw material for refractory kaolin production.  |

|                           |   |
|---------------------------|---|
| Glass fibre reinforcement | Used as a reinforcer in the production of glass-fibre products (e.g. printed circuitboards).  |
| Ceramics                  | Kaolin is a prime ingredient in a wide range of traditional products, such as floor and wall tiles, tableware, sanitaryware, and electrical porcelain.  |
| Plasterboard filler       | Used as a filler in the manufacture of various types of white plasterboard.   |
| Brick and tile additive   | Structural clay products include common and facing bricks, clay pipefittings, roofing tiles, outdoor pavers, and other fired clay products used as basic components in the building and construction industries. In order to achieve the currently fashionable pastel shades of bricks, tiles, and pavers, it is necessary to use a blend of a number of different raw materials. |

### **9.2.7 Failure of Other Operators to Market Kaolin**

Sydney Construction Materials cannot comment on the specific reasons for the failure of other operators on the Newnes Plateau (Rocla, in particular) to market the kaolin in their developments. As discussed above, independent testing of the kaolin fraction in the Rocla tailings dam indicates that it represents 10% of the resource, so the argument that it is too low a proportion of the deposit is not valid. Indeed, since Rocla have already gone to the effort of extracting the kaolin from the ground, and the market research discussed above indicates that there is clearly a market for the resource, the decision to bury this valuable co-product in tailings dams is difficult to understand.

Sydney Construction Materials suggests that one reason for Rocla's failure to market this valuable resource is that it is a construction sand business, not an industrial minerals business. The two industries are currently quite separate, and historically have maintained independence. However, given that SCM is not privy to internal Rocla discussions, this suggestion should be considered speculation only.

The situation in the Kables Sands quarry to the north west is different. Sampling has shown that the kaolin content averages only about 4% in the Kables quarry, making it less feasible to extract, beneficiate and market than at the proposed SCM and Rocla developments.

### **9.2.8 Conclusion**

This is the only location on the Newnes Plateau adjacent to a rail loop, allowing the extracted product to be economically transported entirely by rail. The combination of the high-grade industrial characteristics of the kaolin in the Project area, the high market demand for Kaolin products, together with its proximity to the rail loop, make this a unique resource on the Newnes Plateau.

### **9.2.9 References**

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- Goldbery, R, 1997, Fifth Annual Report to the New South Wales Department of Mineral Resources on Exploration Licence 4192, Newnes Plateau Clay Deposit, 33p (confidential)
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## **10. Interactions with Zig-Zag Railway – DIPNR, 18<sup>th</sup> September 2003**

### **10.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 18<sup>th</sup> September 2003:

*7. Interactions with the Zig Zag Railway. The Zig Zag Railway has development consent to extend its railway line to the village of Newnes Junction. Please assess the potential impacts of the proposed mine on the operation of the railway and vice versa.*

### **10.2 Response**

Sydney Construction Materials has met with representatives of the Zig Zag Railway and has discussed its potential interaction with the Newnes Junction Sand and Kaolin Extraction Proposal. Zig Zag Railway did not raise any objections. A letter from SCM to ZZR confirming these discussions is attached at Appendix 2.

## **11. Flora and Fauna Assessment – NPWS, 22<sup>nd</sup> September 2003**

### **11.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 22<sup>nd</sup> September 2003 summarising NPWS's requests for further information:

*The applicant is required to provide the following:*

- *Provision of a thorough and comprehensive evaluation of the habitat of the site,*
- *Provision of 8-part tests for species potentially affected.*

### **11.2 Response**

NPWS is referred to the report entitled, "Flora and Fauna Issues" by Gunninah Environmental Consultants (May 2004), submitted to DIPNR on 26<sup>th</sup> May, 2004. The report includes a revised Section 5A Assessments of Significance, information additional to that in the EIS, and includes:

- a Supplementary Vegetation and Flora Survey (HWR Pty Ltd – Andrew Carty, Geoff Winning, and John-Paul King), and
- a Supplementary Survey for the Blue Mountains Water Skink (Biosphere Environmental Consultants Pty Ltd – Dr Arthur White).

## **12. Aboriginal Heritage Assessment – NPWS, 22<sup>nd</sup> September 2003**

### **12.1 Issue Raised**

The following issue was raised in DIPNR's letter to SCM on 22<sup>nd</sup> September 2003 summarising NPWS's requests for further information:

*The applicant is required to provide the following:*

- *Provision of a revised assessment of Aboriginal Heritage values to address issues as identified by the National Parks and Wildlife Service in its earlier submission (dated 13 August 2003).*

### **12.2 Response**

NPWS is referred to the document entitled, "Response to NPWS Comments on the Archaeological Assessment" by Mills Archaeological and Heritage Services (August 2003), submitted to DIPNR on 26<sup>th</sup> May, 2004.

## **13. Potential Air Quality Impacts – DEC, 10<sup>th</sup> October 2003**

### **13.1 Issue Raised**

The following issues were raised in DEC's letter to SCM on 10<sup>th</sup> October 2003:

1. *Provide predictions of the maximum dust concentrations and deposition levels at the boundary of the proposal and the Greater Blue Mountains World Heritage Area (Blue Mountains National Park), and Wollemi Wilderness Area, for;*
  - *Predicted maximum 24-hour average PM10 concentration at ground level as  $\mu\text{g}/\text{m}^3$*
  - *Predicted annual average PM10 concentration at ground level as  $\mu\text{g}/\text{m}^3$ ,*
  - *Predicted annual average TSP concentration at ground level as  $\mu\text{g}/\text{m}^3$ ,*
  - *Predicted annual average dust deposition at ground level as  $\text{g}/\text{m}^2/\text{month}$ .*

*The predictions should be provided for Stage 2 (indicative of conditions early in the operation of the quarry), and for Stage 5 when the proposed quarry would be operating at maximum production and with the greatest area of disturbed area (when the potential Impact on the World Heritage Area is expected).*

*The proponent needs to clarify the difference, if any, between the modified buffer and the buffer which may be implemented for the proposed quarry. There needs to be greater focus and discussion on the Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area.*

2. *Provide a map showing the predicted extent and concentrations of dust deposition over the Greater Blue Mountains World Heritage Area (Blue Mountains National Park), and Wollemi Wilderness Area ie what area will be affected and in what concentrations. A preliminary map is provided for the proponent's benefit.*
3. *Provide details of walking tracks, if any, in Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area in the vicinity of the interface between these areas and the proposed quarry, and assess the likely impacts of predicted air pollution levels (dust, TSP, PM10) on persons using those tracks.*
4. *Provide details on the potential impacts of predicted air pollution levels (TSP, dust) on flora and fauna in the adjacent Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area. The sensitivity of individual plant species to dust, and the sensitivity of the botanical community (in that part of the World Heritage Area and Wilderness Area closest to the proposed quarry) as an ecological entity, should be assessed. Any potential impacts on fauna in these areas should also be addressed.*

5. Provide details of design, orientation, plant arrangement and operation, etc. that would reduce the dust, TSP, PM10 emissions in the Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area.

### 13.2 Response

This section clarifies the Company's findings on the Air Quality Impact Assessment (AQIA) (Holmes Air Sciences, 2003) of the proposed Newnes Junction Sand and Kaolin Extraction development. It should be noted that the issues raised in the DEC's submission were covered in the Air Quality Impact Assessment in SCM's EIS (Holmes Air Sciences, 2003, included in SCM EIS, Appendix F).

Nevertheless, following are responses to DEC's requests regarding the Air Quality Impact Assessment.

#### 13.2.1 Issue #1 – Air Quality Impacts at Boundary of GBMWA and Wollemi Wilderness Area

Table 5 below details the criteria for which results were requested by DEC, the Project goals for those criteria, and the modelled results at stages 2 and 5 of the project. These figures are inferred from Figures 7-14 in the Air Quality Impact Assessment by Holmes Air Sciences (2003), included in the SCML EIS.

| Criteria  | Target <sup>4</sup> | Stage 2 <sup>5</sup> | Stage 5 <sup>5</sup> |
|---|---------------------|----------------------|----------------------|
| Predicted maximum 24-hour average PM <sub>10</sub> concentration at ground level as µg/m <sup>3</sup> |                     | ~10                  | ~20                  |
| Predicted annual average PM <sub>10</sub> concentration at ground level as µg/m <sup>3</sup>          | 12                  | ~1                   | ~5                   |
| Predicted annual average TSP concentration at ground level as µg/m <sup>3</sup>                       | 45                  | ~2                   | ~7                   |
| Predicted annual average dust deposition at ground level as g/m <sup>2</sup> /month                   | 2                   | ~0.2                 | ~1                   |

**Table 5 - Air quality impact results (Holmes Air Sciences, Figures 7-14)**

It is clear from these results that the air quality impact from the SCM proposal will not exceed the air quality goals determined in the Air Quality Impact Assessment.

The nearest part of the Wollemi Wilderness Area to the Project area is over 10km distant. Given that it is unlikely that there would be any exceedances outside the Project area as a result of this development, there is therefore very little likelihood of there being any adverse air quality impacts on the Wollemi Wilderness Area.

<sup>4</sup> These figures are from section 5 in the Air Quality Impact Assessment (Holmes Air Sciences, 2003) included at Appendix F of the SCML EIS.

<sup>5</sup> These figures are estimates, based on Figures 7 – 14, Air Quality Impact Assessment (Holmes Air Sciences, 2003) at Appendix F of the SCML EIS. The point at which readings were taken is the north-eastern corner of the Lease area.

### **13.2.2 Issue #2 – Maps of Air Quality Impacts**

Figures 7-14 in the AQIA contain maps showing the extent of air quality impacts from the proposed development on the GBMWA.

### **13.2.3 Issue #3 – Impacts on Users of Nearby Walking Tracks**

Attached at Appendix 3 is an SCM File Note on investigations into the presence of established bushwalking tracks in the vicinity of the proposed development. The conclusions of SCM's investigations are:

- The main focus for walking activities is well to the north of the Newnes Junction project area and is accessed by the Glow-worm Tunnel Road. The main attractions of the area – Deep Pass, Galah Mountain, Glow Worm Tunnel and Bungleboori Picnic Area – are in a range of 10 to 30kms from the proposed development site.
- There are no formed tracks for bushwalking purposes identified from any of the references in the attached list<sup>6</sup> and no tracks have been identified by National Parks and Wildlife Services Personnel within a 5km radius of the proposed development site. The Dargan's Creek Canyon south of the Bells Line of Road is probably the closest locality used by bushwalkers and canyoneers, but is located several kilometres south of the project area, and is in the opposite direction of the prevailing winds.

### **13.2.4 Issue #4 – Air Quality Impacts on Flora and Fauna**

Sydney Construction Materials is not aware of any specific criteria against which the impact of TSP and dust on flora and fauna in the GBMWA are to be measured.

In Australia there is limited research into the impact of dust on the flora and fauna. An examination of the literature indicates that the overall level of knowledge and science of dust pathway impacts is at an early stage; however, most attention is directed to examining any changes in the floristic or fauna composition of the receiving area. Also, studies undertaken in Europe and the United States indicate discernible impacts from dust generation are more related to levels of metals contained in the dust, for example, mercury or copper, and the sensitivity of the receiving environment.

The material to be extracted from the Newnes Junction proposal is essentially inert and contains only small amounts of iron. Literature indicates that iron deposition may be an aid to growth in certain environments. This also applies to other mineral nutrients contained within the dust mix.

An examination of the vegetation immediately adjacent to existing extraction operations at Newnes Junction (Rocla and Kables) indicates no change in the floristic composition as a result of dust deposition or any other impact. This is consistent with the findings of other assessments such as those conducted at Maroota.

In assessing the impact of dust, it is important to take account of the receiving environment's resilience. It is recognised that much of the Australian landscape is susceptible to natural dust generation through drying phases and

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<sup>6</sup> See Appendix 3

is accentuated by agricultural practices. The Newnes Plateau is characterised by dry forest on poor quality soils and is prone to dust generation, particularly during droughts.

It is a matter of scientific record that much of the vegetation in Australia developed in parallel with the drying of the continent and the existence of dust storms and high ambient dust levels. Whether the flora and fauna developed as a result of the existence of higher ambient dust levels is a matter for conjecture.

There is no evidence that the existing extraction and mining operations or the addition of a new development will result in measurable impacts on flora and fauna. It would be trite to say that any deposition of dust on leaves is removed by rain but sometimes the obvious is not so obvious.

Any assessment of cumulative impact needs to take into account the likely cessation of extraction at the Rocla operation prior to or shortly after commencement of the SCM proposal due to lack of reserves.

### **13.2.5 Issue #5 – Dust Reduction Measures**

Based in part on feedback to the EIS, and in part on the emergence of more efficient mining technology, SCM has adopted surface mining technology for the extraction of ore from the Project area. Furthermore, the Mining Plant to be employed will provide continuous dust suppression by means of an onboard water tank specifically designed for such a task. These measures will eliminate some of the potential dust emission sources discussed in the Air Quality Impact Assessment, further reducing the already minimal air quality impacts of this development.

### **13.2.6 Conclusion**

Based on an analysis of the findings in the Air Quality Impact Assessment prepared by Holmes Air Sciences (2003) for the Sydney Construction Materials EIS (2003), the air quality impact on the adjoining Greater Blue Mountains World Heritage Area will be well below project air quality goals.

Further, given that the Wollemi Wilderness Area, a part of the GBMWH, is over 10km distant at its nearest approach to the Project area, it is predicted from the results of the Air Quality Impact Assessment that the air quality impacts there will be negligible.

Finally, with the adoption of surface mining technology, the potential dust emission sources of this development will be lower than those resulting from other conventional quarrying operations.

## **14. Potential Noise Impacts – DEC, 10<sup>th</sup> October 2003**

### **14.1 Issue Raised**

The following issues were raised in DEC's letter to SCM on 10<sup>th</sup> October 2003:

- 1. Provide predictions of the maximum noise levels ( $L_{Aeq}$ ) at the boundary of the proposed quarry and the Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area, and evaluate them in terms of the DEC's Industrial Noise Policy.*
- 2. Provide a map showing the above predicted extent and levels of noise impact over the Greater Blue Mountains World Heritage Area (Blue Mountains National Park), and Wollemi Wilderness Area. A preliminary map is provided for the proponent's benefit.*
- 3. Provide details as to the impacts of predicted noise levels on fauna in the adjacent Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area.*
- 4. Provide details of design, orientation, plant arrangement and operation, etc. that would reduce noise emissions in the Greater Blue Mountains World Heritage Area and Wollemi Wilderness Area.*

### **14.2 Response**

It should be noted that the majority of issues raised in the DEC's submission were covered in the revised Noise Impact Assessment conducted by Atkins Acoustics (May 2004), which was submitted to DIPNR on 26<sup>th</sup> May, 2004.

Following are DEC's requests and SMC's responses based on the revised Noise Impact Assessment.

#### **14.2.1 Issue #1 – Noise levels at Boundary of GBMWhA and Wollemi Wilderness Area**

The DEC is referred to the revised "Noise Impact Assessment" (RNIA) by Atkins Acoustics and Associates (May 2004), submitted to DIPNR on 26<sup>th</sup> May 2004. In particular, DEC is referred to section 7.0 Findings and Recommendations. The third paragraph down indicates that the recommended noise goal of 50dB(A) can be satisfied within 150m of the park boundary.

#### **14.2.2 Issue #2 – Maps of Noise Impacts**

The DEC is referred to the revised "Noise Impact Assessment" (RNIA) by Atkins Acoustics and Associates (May 2004), submitted to DIPNR on 26<sup>th</sup> May 2004. In particular, DEC is referred to Appendices 4, 5 and 6, which include noise contour plots at various stages of development.

#### **14.2.3 Issue #3 – Noise Impacts on Fauna**

Sydney Construction Materials (SCM) is not aware of any specific criteria against which the impact of predicted noise levels on fauna in the Greater Blue Mountains World Heritage Area (GBMWhA) are to be measured. Nor is

SCM aware of any evidence for the imposition of significant impacts on native fauna by similar activities elsewhere.

Personal observations and investigations undertaken during other projects (e.g. the Lake Cowal gold mine project and a proposed helicopter landing pad in northern Sydney) by F Dominic Fanning of Gunninah Environmental Consultants indicate that the impacts on wildlife of low-level, continuous or gradual noise are extremely limited. Even precipitous noise (e.g. blasting in quarries) has been documented as having little effect on wildlife such as nesting falcons (see below).

In a paper entitled "*Effects of Military Noise on Wildlife: a Literature Review*" by Ronald P Larkin (Centre for Wildlife Ecology, Illinois Natural History Survey), results indicate that...

*"Risk of hearing damage in wildlife is probably greater from exposure to nearby blast noise from bombs and large weapons than from long-lasting exposure to continuous noise or from muzzle blast of small arms fire ... Military blast noise from bombs and large weapons poses greater risk, if any, of hearing damage in wildlife than does continuous noise or small arms fire."*

The literature regarding the issues of noise and its impacts on native fauna within Australia is relatively sparse, but a substantial body of information is available from overseas, particularly from the United States of America. Investigations there have been related principally to the impacts of aircraft overflights on fauna (especially birds), and to the use of sound to discourage birds from using facilities ('hazing').

In general terms, the impacts of helicopter and aircraft overflights appear to be of little concern to native wildlife. Hockin *et al* (1992) report that Red-tailed Hawks in Britain readily habituated to helicopter overflights, and that...

*"least terns were found to nest on take-off pads of Harrier jets despite their frequent use (Altmann and Gano, 1984). It is also relevant to note that in the United Kingdom many of the Sites of Special Scientific Interest controlled by the Ministry of Defence are used as training areas and artillery ranges support diverse breeding bird populations (Fuller, 1982)."*

Ellis *et al* (1991) reported that the responses of birds to "*real and simulated mid- to high-altitude sonic booms were often minimal and never appeared productivity limiting*", and Andersen *et al* (1989) concluded, "*aircraft overflights are often initially startling, but animals generally adapt to them very well under most circumstances*".

The use of noise to discourage birds from using certain facilities or sites appears to have generally been unsuccessful. Jeffress (1990) reviewed the use "*hazing*" techniques as an avian deterrent on cyanide ponds at gold mines in the USA, and concluded that "*sound devices have a very limited overall effectiveness as deterrents to waterfowl*". The use of radio-controlled boats and planes, pyrotechnics, cannons, rock music, avian distress and predator calls, sirens, whistler bombs, and a range of other devices have failed to have other than a short-term effect on waterfowl (Allen 1990; Jeffress 1990). In one instance, the use of 10 automatic acetylene-based bird scarers along an

airport runway “*proved effective for 1 week, after which birds even started perching on them*” (Hockin *et al* 1992).

Similar observations pertain to species such as the Grey-headed Flying Fox and other frugivorous bats in eastern Australia. The use of noise has been spectacularly unsuccessful in deterring such species from raiding fruit orchards or from roosting in certain trees or at certain locations.

At the Temora Gold Mine (Gidginbung NSW), a pair of Peregrine Falcons were reported nesting in the open pit (C Doon *pers comm*). This pair apparently bred successfully and the nest site was subsequently destroyed by a “*pit pushback*” which had been delayed until the young Peregrine Falcons had fledged. This pair of Falcons subsequently built a new nest elsewhere in the open pit, and there were three nesting pairs of Peregrine Falcons within the active Temora Gold Mine pit in 1995.

Whilst the Newnes Junction proposal obviously does not involve military activities, the findings from the above research would reasonably apply to this Project. In particular, the quasi-continuous, low-level (‘white’) noise from the Project area is not likely to disrupt or otherwise adversely affect wildlife in the adjacent Greater Blue Mountains World Heritage Area.

The Newnes Junction Project complies with the recommended noise guidelines and goals, and the noise emissions from the site will be significantly lower than from a military installation. Furthermore, given that for much of the Project life operations will be located in a pit, shielded from the GBMWA, the potential for adverse impacts on wildlife will be extremely limited.

#### **14.2.4 Issue #4 – Noise Reduction Measures**

The DEC is referred to the revised “Noise Impact Assessment” (RNIA) by Atkins Acoustics and Associates (May 2004), submitted to DIPNR on 26<sup>th</sup> May 2004. In particular, DEC is referred to section 7.1 Noise Control Recommendations, pages 37-38.

## **15. Groundwater Assessment – DIPNR, 5<sup>th</sup> November 2003**

### **15.1 Issue Raised**

The following request was raised in DIPNR's fax to SCM on 5<sup>th</sup> November 2003:

*Dan McKibben has provided comment on the Groundwater Assessment and the need for the applicant to undertake site-specific groundwater investigations.*

### **15.2 Response**

DIPNR is referred to the report entitled, "Hydrogeological Impact: Newnes Kaolin Proposed Open-Cut" by Kalf and Associates and the Water Research Laboratory UNSW (December 2004), submitted to DIPNR on 11<sup>th</sup> January, 2005.

## **List of Appendices**

Appendix 1 – Newnes Junction Kaolin Specification Sheet

Appendix 2 – Letter from Sydney Construction Materials to Zig Zag Railway

Appendix 3 – Sydney Construction Materials File Note on Bushwalking Tracks

# **Appendix 1 – Newnes Junction Kaolin Specification Sheet**

## Sydney Construction Materials

# CLAY NKPL GP1

**Description:** A dry milled kaolin, (china clay) of good white colour.  
Typically used for the manufacture of whiteware ceramics,  
manufacture of paints, or as a filler where a white colour is required.

### Specifications

Typical Chemical and Physical Properties

|                  |                                | Commercial Kaolin Currently Marketed in NSW |         |       |        |
|------------------|--------------------------------|---|---------|-------|--------|
|                  |                                | NKPL-GP1 %                                  | HR1/F % | Q38 % | Q145 % |
| Silica           | SiO <sub>2</sub>               | 50.7  | 48.4    | 50.3  | 49.3   |
| Alumina          | Al <sub>2</sub> O <sub>3</sub> | 35.1  | 33.4    | 34.3  | 33.8   |
| Magnesia         | MgO                            | 0.15  | 0.2     | 0.3   | 0.4    |
| Potash           | K <sub>2</sub> O               | 0.72  | 0.2     | 1.1   | 2.4    |
| Soda             | Na <sub>2</sub> O              | 0.10  | 0.2     | 0.2   | 0.1    |
| Lime             | CaO                            | 0.04  | 0.1     | 0.1   | 0.1    |
| Ferric Oxide     | Fe <sub>2</sub> O <sub>3</sub> | 0.34  | 1.3     | 0.9   | 0.8    |
| Titania          | TiO <sub>2</sub>               | 0.26  | 2.5     | 1.5   | 1.5    |
| Loss of Ignition | (1000°C)                       | 12.49                                       | 12.8    | 12.0  | 10.9   |

### Mineralogy (NKPL – GP1)

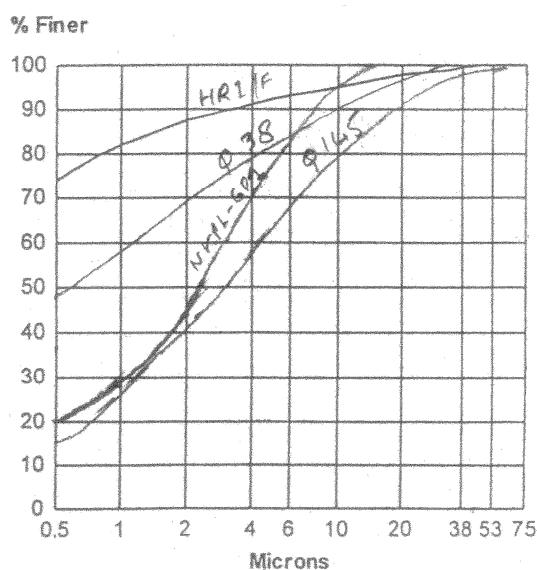
|           |   |       |
|-----------|---|-------|
| Quartz    | - | 9.4%  |
| Kaolinite | - | 83.0% |
| Mica      | - | 6.1%  |

### Brightness – R457nm

|          |   |    |
|----------|---|----|
| NKPL-GP1 | - | 77 |
| HR1/F    | - | 71 |
| Q38      | - | 72 |
| Q145     | - | 72 |

### Calcined Brightness (NKPL GP1)

|        |   |    |
|--------|---|----|
| 1000°C | - | 76 |
| 1100°C | - | 85 |
| 1200°C | - | 93 |



**Typical Particle Size Distribution**

### PCE (Pyrometric Cone Equivalent) – 31.5 to 32

Notes:

1. NKPL GP1 sample from Rocla tailings dam; -20µm, non-magnetic, split after separation (Kmetoni, 1985)
2. HR1 – Home Rule 1 (Gulgong)
3. Q38, Q145 – Gulgong
4. Particle size for NKPL-GP1 determined by Kmetoni (1985)

## **Appendix 2 – Letter from Sydney Construction Materials to Zig Zag Railway**

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# Sydney Construction Materials



*...Building Sydney's Future*

12<sup>th</sup> April 2004

Mr Michael Forbes OAM FCIT  
General Manager  
Zig Zag Railway Co-Operative Limited  
PO Box 187  
Clarence, NSW 2790

Dear Michael,

**RE: Proposed and Sand Extraction and Kaolin Mining Operation –  
Newnes Junction**

During the course of the last year we have been in the process of refining our development proposal for and sand extraction and kaolin mining development at Newnes Junction.

Some time has elapsed since we had the opportunity to meet with you on two occasions to discuss the plans for the extension of the Zig Zag railway to the old Newnes rail station.

Sydney Construction Materials (SCM) is in the final stages of supplying to the NSW Government additional information on the operation of the proposed development. In this light we are conscious of our discussions and we wish to confirm our verbal commitments.

Firstly, when the mining/extraction project is approved and operational, we wish to affirm our commitment to assist in the extension of the Zig Zag Railway through the provision of in-kind services such as earthmoving equipment and other assistance on terms to be further discussed once your plans are finalised and our approvals have been granted.

Secondly, we re-confirm our offer to work with the Zig Zag Co-Operative to identify opportunities to utilise existing houses at Newnes Junction that may be acquired by SCM for the benefit of the society and the preservation of railway heritage. As you are aware SCM has made offers to local residents to acquire their properties in the event the project is approved and they wish to re-locate.

SCM is also cognisant of the issues raised in your letter to the Department of Infrastructure Planning and Natural Resources dated 4 August 2003.

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In that letter you highlighted two matters. In summary, you identified part of the access road and rail loop currently serving the Clarence Colliery and Kable Sands is on land owned by the Zig Zag Co-operative. These issues are not in dispute by Sydney Construction Materials.

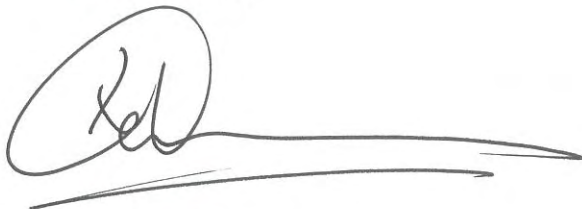
In the first instance, our requirement for the access road is limited to daily transport of employees entering the site of the mining operation. As all product will be shipped by rail, no ore trucks will use the access road. Secondly, the rail loop, which is now owned by Clarence Colliery, would be utilised by trains transporting raw sand and kaolin to the Sydney region. The addition of nine trains per week on the rail loop is within the historical usage and design parameters of the existing rail loop.

During our discussions, your willingness to accommodate the proposed operation in so far as it would not impact on the plans for the extension of the railway was appreciated. As the re-establishment of the Old Newnes railway station is some distance from the existing Newnes Junction station and the proposed mining lease, it will not be impacted by SCM activities.

We look forward to pursuing with you plans to boost what is one of this nation's great railway heritage and tourism ventures.

Should you have any further queries please contact me on 02-92328282 or 0418-221956.

Kind regards,

A handwritten signature in black ink, appearing to read 'I. Wisken', with a long horizontal flourish extending to the right.

Ian Wisken  
Project Adviser

## **Appendix 3 – Sydney Construction Materials File Note on Bushwalking Tracks**



## File Note

**Date:** 16<sup>th</sup> April 2004

**Re: Bushwalking tracks in the vicinity of the Newnes Junction development application area**

An intensive literature search on popular walking tracks, campsites and picnic areas located on and around the Newnes Plateau, which include the Blue Mountains National Park, the Wollemi National Park, Gardens of Stone National Park and the Newnes State Forest, was carried out.

The main focus for walking activities is well to the north of the Newnes Junction project area and is accessed by the Glow-worm Tunnel Road. The main attractions of the area; Deep Pass, Galah Mountain, Glow Worm Tunnel and Bungleboori Picnic Area, are in a range of 10 to 30kms from the proposed development site.

There are no formed tracks, for bushwalking purposes identified from any of the references in the attached list and no tracks have been identified by National Parks and Wildlife Services Personnel within a 5km radius of the proposed development site. The Dargan's Creek Canyon south of the Bells Line of Road is probably the closest locality used by bushwalkers and canyoners and is located several kilometres south of the project area.

A research programme on the sedimentary history of the Newnes Plateau sandstones carried out jointly by the Company (R. Goldbery) and John Whitehouse from the NSW Department of Mineral Resources has required detailed traversing of the area surrounding the proposed development site at Newnes Junction. During these surveys, no bushwalking tracks have been found on any of the ridges or drainage networks of the area. It is therefore considered extremely unlikely that the area within a 2km radius of the DA proposal will attract any recreational bushwalking activities.

R. Goldbery  
(Project Manager)

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