Section 7

Evaluation and Justification

This section concludes the Environmental Assessment of the proposed New Berrima Clay/Shale Quarry and its extractive and transportation operations. Alternative development options are considered and the residual environmental risks assessed. This section also includes an assessment of the Project against the principles of Ecologically Sustainable Development and concludes with a justification of the Project.

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7.1 INTRODUCTION

As a conclusion to the *Environmental Assessment*, the proposed New Berrima Clay/Shale Quarry is evaluated and justified through consideration of both the potential impacts on the environment and benefits to the local and wider community.

Project evaluation has been undertaken by firstly re-assessing the risks posed to the local environment by Project activities, following consideration of the controls, safeguards and/or mitigation measures proposed by the Proponent and summarised in Section 5. The Project has also been evaluated against the principles of Ecologically Sustainable Development (ESD) in order to provide further guidance as to the acceptability of the Project, as presented in the *Environmental Assessment*.

Section 7.4 presents the justification of the Project and reviews the predicted residual impacts on the biophysical environment, considers the socio-economic benefits which would be provided and assesses the consequences of not proceeding with the Project.

7.2 EVALUATION OF THE PROJECT

7.2.1 Residual Environmental Risk and Impacts

Following consideration of the proposed operational safeguards, controls and mitigation that would be implemented by the Proponent as part of the project design, **Table 7.1** reassesses the mitigated risk associated with each of the potential environmental impacts identified in Section 3.5.

Table 7.1
Analysis of Mitigated Environmental Risk

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Potential Impact	Unmitigated Risk Rating	Consequence of Occurrence if mitigated	Likelihood of Occurrence if mitigated	Residual Risk Rating
Transport / Traffic				
Increased traffic on roads – congestion and delays nuisance	H	1	D	L
Increased deterioration of road pavement	H	1	C	L
Increased risk of accident – major accident	H	5	E	H*
Increased risk of accident – serious accident	H	4	E	H*
Increased risk of accident – minor accident	M	3	E	M*
Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic				
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare				
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low				
Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare				
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant				

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Impact	Unmitigated Risk Rating	Consequence of Occurrence if mitigated	Likelihood of Occurrence if mitigated	Residual Risk Rating
Noise				
Increased noise impacts at receptors – occasional minor exceedance (1-2 dBA)	L	1	D	L
Increased noise impacts at receptors – regular minor exceedance (1-2 dBA)	L	2	E	L
Increased noise impacts at receptors – occasional high exceedance (3-5 dBA)	L	3	E	M*
Increased noise impacts at receptors – regular high exceedance (3-5 dBA)	M	3	E	M*
Increased traffic noise	H	2	E	L
Air Quality				
Deposited dust impact on native vegetation off site (no native vegetation on site)	L	1	E	L
Deposited dust – nuisance to residences	H	2	E	L
TSP – nuisance to residences	L	2	E	L
PM_{10} – health impacts at residences	L	2	E	L
Significant emissions of greenhouse gases	H	2	E	L
Visual Amenity				
Temporary (<2 years) view of disturbed areas	H	1	C	L
Medium-term (>2, <15 years) view of disturbed areas	M	2	D	L
Long-term >15 years) view of disturbed areas	H	2	D	L
Highly identifiable permanent impact	M	1	D	L
Surface Water				
Reduced water quality in Wingecarribee River	H	2	E	L
Reduced flows into Wingecarribee River	M	2	E	L

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic

Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare

Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare

Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Impact	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Groundwater				
Reduced water quality of groundwater	L	2	E	L
Impacted levels of groundwater table	L	2	E	L
Soils and Land Capability				
Loss of soil by erosion	L	2	E	L
Sedimentation impacting land and water	L	2	E	L
Degradation of soil quality	M	2	E	L
Reduction in land capability / agricultural land	H	2	D	L
Ecology				
Death or injury to native species	L	2	E	L
Loss of habitat for native species	L	2	E	L
Disruption to breeding cycle of native species	L	2	E	L
Reduced biodiversity	L	2	E	L
Heritage				
Destruction of Aboriginal sites, artefacts, objects	M	3	E	M*
Damage to Aboriginal sites, artefacts, objects	L	2	E	L
Destruction of non-Aboriginal sites, artefacts, objects	L	2	E	L
Damage to non-Aboriginal sites, artefacts, objects	L	2	E	L
Land Contamination				
Contamination by hydrocarbons	L	1	E	L
Waste				
Litter and waste accumulation	L	1	E	L
Loss of resources	H	1	B	M#
Socio-economic impacts, property values				
Increased employment	H	2	A	H positive
Loss of property values of neighbouring properties	H	3	E	M*

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Through the implementation of the proposed controls, safeguards and mitigation measures summarised in Section 5, the risk rating for the majority of potential environmental impacts has been reduced to either a moderate or low risk rating.

It is noted that the residual risk ratings for major and serious road accidents attributable to increased traffic remain "High" despite mitigation measures. Every precaution would be taken by the Proponent in relation to the design of traffic management and education of its workforce and the likelihood of a major or severe accident involving Project-related traffic has been considered rare. However, it is considered that the likelihood cannot be reduced to non-existent. Therefore, even though it is highly unlikely that an accident would occur, as the consequence of a major or severe accident is considered major or catastrophic, the overall risk rating has been retained as high.

The risks associated with the majority of possible environmental impacts are considered moderate or less and therefore, while these may result in impacts deemed unacceptable to some stakeholders, with the implementation of appropriate management plans, are overall considered acceptable.

7.2.2 Ecologically Sustainable Development

7.2.2.1 Introduction

Sustainable practices by industry, all levels of government and the community are recognised to be important for the future prosperity and well-being of the world. Schedule 2(6) of the *Environmental Planning and Assessment Regulation 2000*, requires an environmental impact assessment process to evaluate projects in terms of the principles of Ecologically Sustainable Development (ESD). The principles of ESD that have been recognised for well over a decade were based upon meeting the needs of the current generation while conserving our ecosystems for the benefit of future generations. In order to achieve sustainable development, recognition needs to be placed upon the integration of both short-term and long-term environmental, economic, social and equitable objectives.

Throughout the design of the Project, the Proponent has endeavoured to address each of the sustainable development principles as identified during the 1*992 Inter-governmental Agreement on the Environment* and defined in Section 6(2) of the *Protection of the Environment Administration Act 1991*. The following sub-sections draw together the features of the Project that reflect the four principles of sustainable development, namely:

- the precautionary principle;

  "If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

  i) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*

  ii) *an assessment of the risk-weighted consequences of various options"*

- the principle of social equity;

  "The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations."

- the principle of the conservation of biodiversity and ecological integrity

  "Conservation of biological diversity and ecological integrity should be a fundamental consideration"

- the principle for the improved valuation and pricing of environmental resources.

  "Environmental factors should be included in the valuation of assets and services, such as:

  i) *polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*

  ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*

  iii) *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems."*

7.2.2.2 The Precautionary Principle

The precautionary principle holds that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental impacts. In the application of this principle, decisions need to be guided by careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and an assessment of the risk-weighted consequences of various options should be made. Emphasis must be placed on anticipation and prevention of environmental damage, rather than remediation after the damage has occurred.

During the planning phase for the Project and throughout the preparation of the *Environmental Assessment*, the Proponent has engaged specialist consultants to examine the existing environment to clarify areas of uncertainty regarding potential environmental harm and to conduct detailed assessments of a number of environmental issues identified during the consultation and issue identification stage of the environmental assessment. They have predicted possible impacts and recommended controls, safeguards and/or mitigation measures in order to ensure that the level of impact satisfies statutory requirements or reasonable community expectations. Throughout the development of the Project, the Proponent and its consultants have adopted an anticipatory approach to impacts, particularly to the socio-economic values of the Project Site and its surrounds by undertaking an analysis of the risks posed by activities of the Project, and an appropriate level of research and baseline investigations.

The controls, safeguards and/or mitigation measures have therefore been planned with a comprehensive knowledge of the existing environment and the potential risk of environmental degradation posed by Project activities. This level of planning has ensured that there is a sufficient scientific understanding of the Project and the surrounding environment to enable the Minister to make a decision consistent with this principle.

Examples of matters relating to the precautionary principle that were considered during the various stages of the Project are listed below.

Project Objectives

The Project has been designed with the principal objective being to develop and operate the proposed quarry in a safe and environmentally responsible manner, ensuring compliance with relevant statutory requirements, environmental criteria, accepted industry standards and reasonable community expectations.

The Proponent recognises that only through comprehensive environmental assessment and an environmentally responsible approach to the design and operation of the Project can the risk of harm to the environment be minimised. Demonstration of this approach is provided both by the identification and prioritisation of issues (Section 3) for which a risk analysis formed an important component, and the draft Statement of Commitments provided in Section 6.

Design Safeguards

A number of design features of the Project were incorporated in recognition of the Precautionary Principle. These design features included the following.

- The proposed extraction area was reduced in size and duration since the original proposal presented to government agencies and the community in 2008, to reduce the level of potential environmental impact associated with the Project. These reductions included:
  - reduction of the Project duration from 60 years to 30 years;
  - reduction of the extraction area from 26.7ha to 7.7ha; and
  - locating the extraction area approximately 730m south of the bank of the Wingecarribee River.
- Staging of the extraction to facilitate the following.
  - Progressive rehabilitation to reduce visual amenity, air quality, noise and other impacts. The Project is to be staged such that extraction operations are to be completed within one section of the extraction area prior to commencing within the next section. This would ensure that the area disturbed at any one time is minimised and that rehabilitation is undertaken progressively throughout the life of the Project.
  - Optimisation of shielding of the extraction area by the local topography and the proposed farm forest.
- Use of the existing topography to offer shielding of the extraction area.
- Retention of existing trees which offer screening of the extraction area.
- Design of amenity bunds to shield the extraction area and reduce noise, air quality and visual amenity impacts.
- Establishment of farm forest on land which would be excavated during later stages, to provide long-term screening.

- Stockpiling would be undertaken within the deepest section of the extraction area wherever possible. This would ensure that noise, air quality and visual amenity impacts are minimised.
- Rehabilitation using existing topsoil, subsoil and species selection. This would assist the re-establishment of a vegetation community with a similar composition to the vegetation community that occurs within undisturbed sections of the Project Site at present.

Management and Operational Safeguards

The framework for ongoing environmental management, operational performance and rehabilitation of the Project Site would be provided through the project approval. An annual report would be prepared which would report on the progress of the operation and provide an opportunity to review the effectiveness of the environmental management strategies adopted. In addition:

- the proposed mitigation measures and management procedures would be regularly reviewed and modified where necessary in light of environmental monitoring results and feedback received from government agencies, surrounding residents, employees and other interested parties;
- surface water, noise, deposited dust levels would be monitored at locations potentially most affected by the Project in order to ensure the continued compliance of the operation with goals outlined in this document;
- the recommendations outlined in the Surface Water Assessment, summarised in Section 5.2.4 would be adopted to minimise any impact on water quality or quantity exiting the Project Site. Wherever possible, areas not required for extraction or associated activities would remain vegetated to assist in minimising erosion and reducing the suspended sediment load in surface water flowing through the Project Site; and
- topsoil and subsoil would be stripped, stockpiled and re-spread in accordance with the procedures outlined in Section 2.4.5. A record would be maintained of the location, volume and date of creation of all soil stockpiles.

Rehabilitation and Subsequent Land Use

Long term adverse impacts on the environment would be avoided through:

- progressive rehabilitation of the recreated landform and other disturbed areas within the Project Site, including shaping of the final landform, spreading of subsoil and topsoil and reseeding or replanting with species as described in Sections 2.4.5 and 2.11.

Conclusion

The precautionary principle has been considered and adopted throughout all stages of the design and assessment of the Project. The approach adopted, including initial assessment, initial design, consultation, risk analysis, specialist environmental assessment, design modification and safeguard design, provides a high degree of certainty that the Project would not result in any major unforeseen impacts.

7.2.2.3 Social Equity

Social equity embraces value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is a fair distribution of costs and benefits to the community. Social equity includes both inter-generational (between generations) and intra-generational (within generations) equity considerations.

Equity within generations requires that the economic and social benefits of the development be shared equitably among all members of the community. Equity between generations requires that the present generation pass onto the next generation an environment that does not limit the ability of future generations to attain a quality of life at least equal to that of current generation.

Both elements of social equity are addressed through the design of the Project itself, the implementation of operational safeguards to mitigate any short-term or long-term environmental impacts, and the proposed rehabilitation of the areas directly disturbed. Examples of matters relating to social equity that are relevant to the various stages of the proposed development are listed below.

Project Objectives

The main objective of the Project is the economically viable recovery of the scarce clay/shale resource from the Project Site to ensure continued long-term provision of raw material for the production of a unique and highly sought after construction product, and the survival of the Bowral Brick Plant, while minimising the Project-related impacts on the environment within and surrounding the Project Site. This would provide a benefit to the entire community through reduced construction costs and continued employment at the brick plant. In addition, the Proponent intends to maintain an open and honest relationship with the members of the surrounding community through ongoing consultation addressing issues of concern in the event they arise.

The Proponent intends to ensure inter-generational equity by ensuring that the clay/shale resource is not sterilised. This objective would be upheld with the company's intentions to apply for further development approval when this project is near completion, to maximise the utility of the total 8 million tonne resource. Inter-generational equity is also provided by the Proponent developing a land use that returns more than 50% of the disturbed land to its pre-extraction land use. Furthermore, the Project would sustain the viability of the Bowral Brick Plant and increase the opportunities for future economic activity in the Bowral and New Berrima areas, both directly and indirectly.

Design Safeguards

The Project has been designed to maintain inter-generational equity in regard to ensuring that the components of the existing biological, social and economic environment which are available to existing generations would also be available to future generations. Examples include the following:

- The proposed extraction area has been designed to ensure that surface water quality and flows are not impaired.
- The rehabilitation of the Project Site has been designed to provide a landform and land use for future generations similar to that used by the existing local community.

- The extraction area has been set back 730m from the Wingecarribee River to avoid disturbance to riparian vegetation adjacent to Wingecarribee River and to avoid disturbance to native vegetation and sensitive habitats.

Management and Operational Safeguards

The Proponent recognises that all members of the local community should benefit appropriately from the Project either directly or indirectly. In order to ensure a realistic distribution of benefits, the Proponent would continue to consult with the local community and maintain a pro-active approach to issues of interest. This dialogue would also include a system to record, manage and respond to any complaints relating to the operation.

The Proponent has, and would continue to ensure, inter- and intra-generational equity through the following management and operational safeguards.

- Management of the extraction, transportation and rehabilitation operations to ensure that Project-related impacts on residents and other members of the public in the vicinity of the Project Site are minimised.
- Consultation with local community stakeholders to ensure the Project does not have a significant negative impact on the facilities, services and amenity of the area surrounding the Project Site.

Rehabilitation and Subsequent Land Use

Rehabilitation would be undertaken in such a manner to ensure that the soil/substrate profile is similar to the existing profile, and that re-establishment of the vegetation communities would be similar to the existing communities in adjacent land and would not be compromised by an incompatible soil/substrate profile. Alternatively, should the Proponent pursue a development approval to further develop the total resource the amenity bunds and other features of the final landform would be suitable for the extraction of the clay/shale for future generations. The proposed final land use would provide for future use of the Project Site, either in an economic capacity as pastoral land or for additional extraction.

Conclusion

The principle of social equity has been addressed throughout the site selection, design, operation and rehabilitation of the Project. The Project would contribute to the economic activity in the vicinity of the Project Site, being the Bowral Brick Plant and the proposed quarry, and provide competitively priced bricks for the public and would result in the long-term preservation of the existing land use. As a result, the benefits of the Project would be distributed throughout the local community. The Proponent would adopt a pro-active approach to identifying and addressing any concerns identified by the local community or its members.

The Project was also designed such that elements of the existing environment available to this generation, including water flows and quality, would continue to be available to future generations.

7.2.2.4 Conservation of Biological Diversity and Ecological Integrity

The protection of biodiversity and maintenance of ecological processes and systems are central goals of sustainability. It is important that developments do not threaten the integrity of the ecological system as a whole or the conservation of threatened species in the short- or long-term. Details of how the Project has been designed to achieve compliance with these principles are set out below.

Identification of Project Objectives

The Proponent is committed to undertake all activities in an environmentally responsible manner, and recognises the need to ensure that changes to natural components of the environment do not significantly adversely affect biological diversity or ecological integrity. As such, the Project has been designed to:

- avoid, as far as practicable, negative impacts on threatened flora and fauna; and
- increase the long-term biodiversity of the Project Site through the establishment of rehabilitated areas vegetated with native species and the establishment of a native tree forest. It is noted that there is very limited biodiversity on the existing Project Site, it being comprised almost entirely of introduced pastures.

Design of Project Components

The Proponent, on advice from the specialist consultancies commissioned to assist with the design and to assess most of the impact of the Project, has provided for the conservation of biological diversity and ecological integrity through the following design elements.

- Water management structures have been designed and would be constructed to ensure that only water within DECCW specified criteria leaves the Project Site and enters the Wingecarribee River.
- Progressive rehabilitation of the Project Site would include an increase in native trees and shrubs (on the benches of the final landform).

Integration of Safeguards and Procedures

The Proponent would prepare and implement weed eradication programs, as required to maximise the conservation of biological diversity and ecological integrity on and surrounding the Project Site.

Rehabilitation and Subsequent Land Use

The final landform has been designed to provide for some ongoing commercial activity, however, a significant proportion of the Project Site and final landform would be rehabilitated to native vegetation and entered into long-term conservation through the biodiversity offset strategy.

Conclusion

The Project addresses the principle of conservation of biological diversity and ecological integrity through the minimisation of disturbance to areas of native vegetation, and the establishment of some areas of native vegetation. Should threatened species be identified within those areas of the Project Site to be disturbed, these would be relocated or managed

appropriately in consultation with DECCW or a suitably qualified professional. Weed eradication programs would be implemented as appropriate and would further assist in addressing the principle of sustainable development.

7.2.2.5 Improved Valuation and Pricing of Environmental Resources

The Proponent's principal objective is to operate the Project in a profitable, safe and environmentally responsible manner, which demonstrates that an appropriate value has been placed on elements of the existing environment.

Design of Project Components and Integration of Safeguards and Procedures

The extent of research, planning and design of environmental safeguards and mitigation measures to prevent irreversible damage to environmental resources, other than the clay/shale product to be extracted, is evidence of the value placed by the Proponent on these resources.

Rehabilitation and Subsequent Land Use

The design of the final landform to integrate ongoing commercial activities with the establishment of some native vegetation illustrates the value placed by the Proponent on both the commercial elements of the Project Site and improving the ecological value of the site.

Conclusion

The value placed by the Proponent on environmental resources is evident in the identification of Project objectives, extent of site-specific research, planning and environmental safeguards and measures to be implemented to prevent irreversible damage to the environment on and surrounding the Project Site. It is planned that the income received from the sale of the quarry products would be sufficient to enable the Proponent to achieve an acceptable profit level whilst undertaking all environmentally-related tasks and meeting all commitments in all approvals, licences and permits and those made to the local community.

7.3 ALTERNATIVES

7.3.1 Introduction

The General Requirements within the Director-General's Requirements (**Appendix 2**) nominates that the *Environmental Assessment* needs to include coverage of the "alternatives considered" during the formulation of the Project. The following subsections outline the feasible alternatives considered during the preparation of the *Environmental Assessment* with respect to alternative quarry sites (Section 7.3.2), alternative transportation (Section 7.3.3) and alternative locations of the brick plant (Section 7.3.4).

7.3.2 Alternative Quarry Sites

The following four sites were subjected to preliminary investigations and constraints assessments and considered inferior to the resource on the "Mandurama" property.

- Lots 12 and 4, corner of Douglas and Carribee Roads, Moss Vale West were subject to exploratory drilling. Preliminary ecological investigations identified approximately 10.5ha of an Endangered Ecological Community on the site, namely Southern Highlands Shale Woodland. This presented a significant constraint because the trees in the site are considered to be of high conservation value. The proposed site was also considered too small and land zoning issues prevailed.
- Old Hume Highway, Bendooley Hill, Bowral was subjected to exploratory drilling but found to present too much overburden to make extraction cost effective and environmentally responsible.
- Chesley Park, Berrima Road, Moss Vale was subjected to exploratory drilling and found to be too expensive for purchase, presented too much sandstone and land zoning issues prevailed.
- McVitty Grove, Welby was subjected to exploratory drilling but found to be too small a site and on environmentally sensitive zoned land. Issues with road transportation were also evident.

7.3.3 Alternative Transportation

The Proponent undertook a preliminary assessment of the potential for the product clay/shale to be transported by rail to the Bowral Brick Plant but quickly identified issues with cost effectiveness and on-site logistics within the brick manufacturing plant made the alternative financially not feasible. Also transportation by rail presented a unique set of environmental issues relating to dust and noise and visual amenity impacts attributable to rail loading and unloading.

7.3.4 Alternative Locations of the Brick Plant

The Proponent considered the possibility of relocating the Bowral Brick Plant to a site closer to potential clay/shale resources in an effort to reduce impacts attributable to the transportation of the resource. The Company has recently upgraded its plant at Bowral at a cost of approximately $15 million. This upgrade has a potential life at least 25 to 30 years. Relocation of the brick plant would result in the loss of a considerable proportion of this investment and the initial capacity investment for the site. The Proponent however, has not discounted the possibility of relocating its brick plant at a time further in the future when the plant requires further upgrade and capital investment. It reviews the Proponent's view that the considerable benefits of continuing operations at the Bowral Brick Plant for outweigh the, comparatively low levels of impacts predicted throughout this document.

7.3.5 Not Proceeding with the Project

The consequences of not proceeding with the Project include the following.

- The recoverable clay/shale would not be extracted by the Proponent. Such an outcome would be contrary to the objectives of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* whose objectives include *"To provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State" and " To facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources."*
- The opportunity to establish a long term supply of clay/shale products would be foregone. This would place additional pressure on existing resources. It could lead to the development of other potentially less suitable sites. The Bowral Brick Plant would be required to source the scarce clay/shale from other sources. Previous investigations by the Proponent into alternative sources of these materials have highlighted the scarcity of the resource and/or the constraints with development of any identified alternative resources. Suitable sources may be identified at greater distances from the Bowral Brick Plant than the proposed quarry site and development at alternative sites may increase the cost of such material and the distance it has to be transported, resulting in higher construction costs and additional heavy vehicle traffic and greenhouse gas emissions.
- The building industry would lose an important source of architecturally accepted / sought after bricks.
- The Bowral Brick Plant would probably cease operations within approximately 5 years resulting in the loss of employment for its existing workforce.
- The loss of the opportunity to create up to 4 full-time equivalent positions directly involved in the quarry and transportation operations would be foregone.
- The disposable wages associated with the above positions would be foregone, a substantial portion of which would be otherwise spent within the Wingecarribee Local Government Area.
- The benefits flowing to the Wingecarribee Shire Council and the NSW and Commonwealth Governments through additional rates, royalties, taxes and contributions would be foregone.
- The various impacts identified throughout this document would not occur.

7.4 JUSTIFICATION OF THE PROJECT

In assessing whether the development and operation of the Project is justified, consideration has been given both to the predicted residual impacts on the local and wider environment and the potential benefits the Project would have for the Proponent, the Wingecarribee LGA, NSW and Australia. When considering the predicted residual impacts, a review of the proposed controls, safeguards and mitigation measures prepared by the Proponent was also undertaken to determine the emphasis placed on impact minimisation and the incorporation of the principles of ESD.

The Project would have a range of impacts on the biophysical and socio-economic environments. Section 5 of this document identified the potential residual impacts of the project, following the adoption of a number of design and operational procedures, mitigation measures and/or offset strategies. Assuming the commitments made by the Proponent in Section 6 are adhered to, these residual impacts are summarised as follows.

Transportation

While the Project would increase the number of heavy vehicles using some local but predominantly regional and state roads, there is unlikely to be any detrimental impact on road safety given:

- the small contribution of the Project related traffic to all other traffic on the same roads;
- the high standard of the roads to be used;
- the proposed improvement to the intersection of Berrima Road and Taylor Avenue and the access to the Project Site from Berrima Road, constructed to RTA standards; and
- a Code of Conduct, stipulating safe driving practices at all times, has been successfully implemented to date for all the Proponent employees and truck drivers.

Surface Water Resources

Assuming the construction and maintenance of the proposed water control structures, the Project would not have any adverse impact on local water quality.

Noise

The Project has been designed with consideration given to minimising noise impacts on surrounding properties and noise modelling has predicted that with the implementation of noise controls (including the establishment of amenity bunds), operational noise levels would comply with the nominated criteria (based on measured rating background noise levels).

Furthermore, traffic noise criteria would not be exceeded.

Flora and Fauna

Because the Project Site is largely comprised of improved pasture, the proposed quarry would not lead to the clearing of any native habitat or impacts on any threatened species.

Visual Amenity

It has been assessed that with the implementation of the design features to provide visual screening, visual amenity impacts would be minimal.

Air Quality

The air quality assessment concluded that assuming the implementation of the Project design features, operational safeguards and mitigation measures summarised in Section 5.7.5 the potential impact on air quality at surrounding residences would be minor and would not exceed the recommended air quality goals. Specifically, the air quality modelling determined:

- incremental monthly dust deposition rates are predicted to be well below the 2.0g/m^2/month at all assessment locations;
- the incremental contribution of the Project to maximum 24-hour average PM_{10} concentrations are predicted to be less than the site specific goal 50µg/m^3 at all assessment locations;
- the annual average PM_{10} concentrations are predicted to be less than the site specific goal 30µg/m^3 at all assessment locations;

Soils and Land Capability

The management of the soil resource has been designed to ensure their proper handling and to provide the maximum opportunity for its re-use in the successful rehabilitation of the Project Site. The impact associated with topsoil/subsoil removal, storage and re-use is anticipated to be minimal.

Groundwater Resources

It has been assessed that the groundwater impacts would be minimal.

Topography

As a result of the proposed construction of amenity bunds and extraction and reshaping to create a final landform, the Project would result in localised modification of the Project Site topography. The long term rehabilitation of the Project Site incorporating landform reconstruction would create a final landform providing for ongoing agricultural use.

Aboriginal Heritage

It has been assessed that, due to the absence of any identified Aboriginal sites or items and any Potential Aboriginal Deposits, impacts on Aboriginal heritage would be minimal.

Cumulative

It is considered that there are not sufficiently significant impacts from sources other than the proposed Project to cause cumulative impacts on the biophysical or socio-economic environment.

7.5 CONCLUSION

The benefits of proceeding with the proposed New Berrima Clay/Shale Quarry are considered to outweigh the predicted impacts on the environment that would result if the Project is approved. The consequences of not proceeding with the Project also weigh heavily in favour of proceeding with the Project.

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