Hanson

ABN: 90 009 679 734

Amended Response to Submissions

for the

Brandy Hill Quarry Expansion Project

Major Project Application No. 5899

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

September 2019

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Brandy Hill Quarry Expansion Project

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Prepared for:

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R.W. CORKERY & CO. PTY. LIMITED

Foreword

This Amended Response to Submissions has been prepared to provide a consolidated response to the submissions and requests for information that have been presented to Hanson Construction Materials Pty Ltd following the public exhibition of the *Environmental Impact Statement* for the proposed Brandy Hill Quarry Expansion Project.

This document responds to submissions provided by the Department of Planning, Industry and Environment with submissions prepared by State government agencies, Port Stephens Council, Maitland City Council, community groups and individuals in the community.

This document supports and consolidates information presented in the *Environmental Impact Statement* (dated February 2017) and an initial *Response to Submissions* (October 2018). The Amended Response to Submissions has also been informed by the feedback received from the local community since the public exhibition of the *Environmental Impact Statement*.

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Executive Summary

Hanson has commissioned R.W. Corkery & Co Pty Limited to prepare an *Amended Response to Submissions* that addresses the key issues raised by NSW Government agencies, Port Stephens Council, Maitland City Council, local elected representatives and the general public in response to the proposed Brandy Hill Quarry Expansion Project (the Project). An Environmental Impact Statement (EIS) for the Project was placed on exhibition from 10 March 2017 to 9 April 2017. Following the exhibition of the EIS, the Department of Planning, industry and Environment (DPIE) provided Hanson with copies of all submissions received for Hanson's review and response. A *Response to Submissions* document was submitted to DPIE in October 2018. Since that time, a range of additional submissions and information requests were presented to Hanson. This *Amended Response to Submissions* presents the consolidated response to all submissions and information requests received following the submission of the EIS.

Preparation of this *Amended Response to Submissions* has involved contributions from a multi-disciplinary team, including many of the consultants who were involved in the original assessment for the EIS. Additional assessments or more detailed information have been incorporated into this review to address the issues raised in the various submissions.

Review of Submissions Received

Following the public exhibition of the EIS, a total of 194 submissions were provided to Hanson for review and response. An additional 40 public submissions have been provided to Hanson following the preparation of the initial Response to Submissions document as well as comments and information requests from the Environment Protection Authority (EPA) and the Biodiversity Conservation Division of DPIE (BCD – formerly the Office of Environment and Heritage). Additional feedback has also been provided following meetings with Port Stephens Council and Maitland City Council that were held to resolve comments and requests for information and to formalise transport management procedures.

A review of all submissions has identified that transportation operations was the most frequently identified issue with local amenity concerns relating to noise and air quality also common. The proposed hours of operation were also a key issue in the submissions, something that was also reflected in ongoing consultation for the Project. It is noted that each of these issues has potential social impact outcomes which was also a common theme of submissions. The key topics in submissions supporting the Project related to employment and economic stability in Brandy Hill and the broader Port Stephens local government area.

During review of the submissions it was identified that several aspects of the Project have been misunderstood by readers. Hanson acknowledges that some of the information contained in the EIS could have been presented in more detail to better describe the Project and its potential environmental impacts. Some of these misunderstood aspects of the Project include the following.

- The proposed transportation activities were misinterpreted as inferring up to 150 heavy vehicles per hour, which is not physically possible for the existing or proposed site configuration.

- Maximum proposed levels for transportation was assumed to mean average levels and taken to represent the most likely scenario for operations.
- The requested flexibility of proposed 24-hour operations were assumed to mean continual operations throughout day and night at maximum levels.

In addition, the proposal for the Martins Creek Extension Project was also presented to the community at a similar time and perceived cumulative impacts from this operation and the Project exacerbated perceptions of potential environmental impacts and changes to existing social amenity and local sense of place.

Hanson has clarified the proposed transportation operations in this *Amended Response to Submissions* with proposed product despatch well below the numbers suggested in various submissions. Hanson has also reviewed the proposed operations and reduced operating hours for some aspects of the Project. This includes transportation activities.

Review of available information from the Martins Creek Extension Project documents indicates that assumptions made during assessment for the Project EIS were consistent with the proposed average operations of that project. It should be noted that since the preparation of the original *Response to Submissions* document, Hanson has been notified that Daracon has revised planning and traffic management for the Martins Creek Quarry and will no longer use the route via Brandy Hill Drive. This is yet to be formalised by Daracon and therefore the assumed cumulative impacts presented in assessments for the Project are conservative.

Refinements to the Project

Following review of the Project and additional assessment, Hanson modified several components of the Project to reduce potential environmental risks and to address the requests of the community. Review and refinement of the Project has been an iterative process that has involved consideration of how the operation may be refined and remain feasible, followed by presentation of the refinements to the community and to DPIE, Port Stephens Shire Council and Maitland Shire Council.

The key modifications to the Project since the completion of the EIS are compared to the initial Project presented in the EIS in the following table.

Activity	Initial Project	Current Project
Project Design		
Operational Mitigation of Environmental Impacts	Standard management and mitigation measures proposed to limit potential impacts including: • Watering of disturbed areas and haul roads to limit dust. • Limiting the speed of on-site vehicles. • Regularly maintaining equipment to ensure noise and emissions are reduced as much as practically possible. • Implement broadband reversing alarms on equipment. • A comprehensive monitoring program that would include particulate matter (PM_{10}), deposited dust, water quality and noise generation.	In addition to standard mitigation, site-specific mitigation now includes: • Enclosure of all fixed processing equipment and partial enclosure of the mobile crusher to be used for concrete recycling. • Stockpile/equipment positioned to limit potential noise impacts • An 18m to 20m earthen amenity barrier located to the south of Processing/Stockpiling Area from Stage 1 • 4m high temporary barriers to be constructed for each stage of operations in strategic areas. • An acoustic barrier fence located along the Quarry Access Road
Concrete Recycling Activities	Commencing from Stage 4 of operations.	Demand and acceptance of this process has improved over time. It is proposed that the beneficial reuse of concrete washout material would now occur from Stage 1 of operations.
Environmental Management		
Salvage of natural habitat features	A tree clearing protocol that would ensure careful removal of natural habitat features.	Hollows in trees would be carefully salvaged and re-hung in vegetation surrounding the Quarry. This process would be implemented and managed through the Biodiversity and Rehabilitation Management Plan.
Biodiversity Offsetting Strategy	All residual biodiversity impacts to be offset through purchase of biodiversity credits from other land owners.	The same strategy would be used, however, biodiversity offsetting would be staged in line with vegetation clearing required for operational stages. Offsetting requirements would be satisfied in three stages.
Hours of Operation		
Construction Works	Monday to Friday – 5:00am to 8:00pm Saturday – 5:00am to 5:00pm No operation on Sundays or public holidays	*Reduced hours for Construction Works* Monday to Friday 7:00am to 6:00pm Saturday 7:00am to 5:00pm No operation on Sundays or public holidays
Blasting	Monday to Friday – 8:00am to 5:00pm No blasting on Sundays or public holidays	*Reduced hours for Blasting* Monday to Friday 9:00am to 5:00pm No blasting on Saturdays or Sundays or public holidays
Load and Haul	Monday to Saturday – 5:00am to midnight No activities on Sundays or public holidays	*Reduced hours for Load and Haul* Monday to Saturday 5:00am to 10:00pm No activities on Sundays or public holidays

Activity	Initial Project	Current Project
Hours of Operation (Cont'd)		
Primary Crusher	Monday to Saturday – 5:00am to 1:00am No activities on Sundays or public holidays	*Reduced hours for Primary Crusher* Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
Secondary and Tertiary Plant	Monday to Sunday – 24 hours	Monday to Sunday – 24 hours These hours are considered necessary to satisfy anticipated demand for construction materials. Assessment has demonstrated that noise generated by this process would not impact amenity, intrude on residents or cause sleep disturbance
Maintenance	Monday to Sunday – 24 hours	Monday to Sunday – 24 hours These hours are standard industry practice and relate to maintenance that is not audible at nearby residences.
Transport Management		
Traffic Limits on the Operation	Not clearly stated in the EIS which led to some confusion for readers.	A review of the proposed traffic levels and assessment of road traffic noise has been undertaken with product despatch from the Quarry to be limited to the following levels. • No more than 301 laden loads between 7:00am and 10:00pm. • No more than 58 laden loads between 10:00pm and 7:00am.
Night time product despatch (10:00pm to 7:00am)	Product despatch to occur on any night (within limits to traffic movements)	Product despatch between the hours of 10:00pm and 5:00am to occur on a maximum of 20 nights per year. Seven days notification to be provided to community members that have registered for notification.
Speed limitation	N/A	Hanson has been trialling a speed reduction to 60km/hr for Hanson trucks along Brandy Hill Drive. A formal trial would be undertaken within 6 months of commencement under the Project. The outcomes and longer-term implementation would be dependent on community feedback.
Hourly limit to product despatch	N/A	Maximum of 30 laden loads despatched per hour in the day time period (7:00am to 10:00pm). This is the maximum experienced under existing operations (that is, no change to existing) and would be a worst-case limit. Morning shoulder and night time operations would involve a maximum of: • 5 laden loads despatched per hour between 10:00pm and 5:00am; • 9 laden loads despatched between 5:00am and 6:00am; and • 12 laden loads despatched between 6:00am and 7:00am.
Road Maintenance Contributions	Hanson to continue to provide road maintenance contributions for Port Stephens Council.	Road maintenance contributions would be paid to both Port Stephens Council and Maitland Shire Council.

Activity	Initial Project	Current Project
Community and Stakeholder Engagement		
Community Consultation Committee (CCC)	Formalisation of CCC to occur after approval	A CCC has been formalised and meets quarterly, unless alternative arrangements are made with the committee.
Implementation of Community and Stakeholder Engagement Plan (CSEP)	N/A	A CSEP has been prepared and implemented as a working document and made available to community members during the initial Have-a-Chat session as well as through the CCC.
Voluntary Planning Agreement (VPA)	Standard road contributions provided to Council	A VPA is being negotiated to incorporate improvements to community infrastructure– specifically a pathway along Brandy Hill Drive and bus bays along the transport route.
Community Enhancement Fund	N/A	A Community Enhancement Fund would form a commitment of the Project. Management of this fund is yet to be finalised.
Community Support and Sponsorship Policy (CSSP)	Informal local sponsorships provided	A Brandy Hill Quarry CSSP has been formalised.
Website publishing	When required within the Conditions of Consent (after approval)	Documentation available on the website: • Environmental monitoring location map • CCC minutes • BHQ Drivers Code of Conduct • Air quality and water (discharge) monitoring results • Blast monitoring results This will be increased to accommodate environmental management plan requirements.
Engagement outside of CCC	Not formalised.	<u>Have-a-Chat Meetings</u> The first Have-a-Chat meeting occurred on 6 February 2019 with plans to hold meetings on a regular basis to provide community members outside of the formal structure of the CCC an opportunity to directly communicate and discuss the Project with Hanson staff. <u>Community Notification Register</u> Hanson has provided community members and stakeholders an opportunity to nominate how and for what matters they wish to receive communications from Hanson through the distribution of the BHQ Community Notification Register and collation of community feedback. <u>Community visits to the Quarry</u> Hanson has provided an invitation to community members who wish to visit the Quarry. Community members who wish to visit the Quarry should contact the Quarry Manager to arrange a suitable time. A second Have-a-Chat meeting was held on 8 May 2019 at the Quarry.

Additional Assessment

Hanson has undertaken a comprehensive review of the Project in light of the submissions received. This review focused particularly on road safety and transportation management as well as refinement of operating hours to reduce these as much as is considered feasible. Additionally, as a result of the Project review, Hanson has reduced the proposed daily vehicle movements to manage any potential noise impacts arising from the road transport of quarry product. Therefore, the Transport Impact Assessment (Intersect, 2015), as presented in the EIS has been retained for conservatism (i.e. vehicle numbers are overestimated). This notwithstanding, the following additional technical assessments were undertaken or amended as a result of this review.

- Intersect Traffic has undertaken an assessment of all intersections between the Quarry and the Pacific Motorway, with specific assessment of the intersections of Raymond Terrace Road and Seaham Road, the roundabout at the intersection of William Bailey Street, Port Stephens Street and Newline Road and the intersection of Adelaide Street and William Bailey Street.
- Following consultation with Port Stephens Council and Maitland Shire Council, Hanson agreed to amend the transport route presented in the Driver's Code of Conduct to take into account the preferred routes of each Council. Subsequently, DPIE requested that Hanson provide an assessment of potential impacts along the preferred route, specifically between Raymond Terrace Road, Richmond Road and the Pacific Highway in Raymond Terrace and between Flat Road, Pitnacree Road Melbourne Street and the New England Highway in East Maitland.
- The assessment of potential noise impacts was amended to incorporate additional mitigation and management measures prompted by a review of background noise levels and assessment criteria.
- The assessment of road traffic noise generation was also amended to incorporate additional mitigation and management measures prompted by a review of road safety and noise generation.
- A consolidated air quality assessment has been undertaken that provides both a transparent assessment of potential air quality impacts and recommendations for ongoing management and monitoring of dust in the vicinity of the Quarry. Predictive modelling of dust dispersion also incorporated modified operational conditions resulting from the review of mitigation and management and to provide additional information requested in the submissions.
- The Blast Impact Assessment was amended to incorporate additional information requested by DPE. This included blast impact predictions at specific residences and consideration of potential blast impacts on livestock.
- The Biodiversity Assessment Report was updated to reflect the outcomes of targeted surveys for the Rusty Greenhood Orchid, review of potential impacts to Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and an update to the Biodiversity Offsetting Strategy to present a staged approach to this process.

- A Community and Stakeholder Engagement Plan and a Social Impact Assessment has been prepared by Key Insights.

Response to Submissions

The key outcomes of Hanson's review of the Project and the additional assessment undertaken for the Project includes the following.

- Hanson has clarified the proposed transport levels for the Project.
- Hanson has amended the preferred transport route to reflect the preferences of Port Stephens Council and Maitland City Council.
- The transport operations would not significantly impact road capacity or intersection performance.
- Concerns regarding the condition of the local road network and the availability of pedestrian infrastructure is a matter for Port Stephens Council. However, Hanson would continue to pay road maintenance contributions for transport of product over local roads. It is estimated that over 30 years, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions.
- Hanson is currently in negotiations with Port Stephens Council regarding contributions to construction of a pedestrian pathway along Brandy Hill Drive and construction of bus bays along the transport route.
- It is predicted that operational noise levels between 1dB(A) to 2dB(A) above the Project Specific Noise Levels would be expected at properties to the south of the Quarry under worst case operating conditions. However, this impact is considered negligible given that a change in noise level of 2dB is not perceptible to the average human ear.
- Review of predicted road traffic noise indicates that noise levels would remain within the relevant assessment criteria during the night time period at the closest residence to Brandy Hill Drive. Existing noise levels already exceed the criteria during the daytime period and Hanson has limited the change in noise level during this period to 1.1dB(A), a change in noise level that is not perceptible to the average human ear. Road traffic noise levels are therefore not predicted to significantly increase under the Project.
- Hanson has considered the potential for sleep disturbance and concluded that operational noise generation would remain below levels likely to result in sleep disturbance for the closest privately-owned residences. It is acknowledged that some residences on Brandy Hill Drive that have been built close to the road may experience noise levels from any passing traffic that disturb sleep under existing conditions. Hanson has proposed to limit night time operations to no more than 20 calendar days per year and provide interested community members with seven days' notice of this occurring so that the likelihood of impact is limited, and people are aware of noise sources during that time.

- Predictive modelling of dust dispersion from the Quarry has indicated that dust dispersion is likely to remain consistent with, but slightly higher than existing operations. This includes assessment at more than double the maximum production rate. This is principally the result of design controls including enclosure of processing equipment. Diesel emissions and blast fumes are not likely to significantly impact the closest privately-owned residences.
- Potential blasting impacts have been assessed and it has been concluded that blast-related ground vibration and air-blast overpressure would remain below levels likely to cause impacts at the closest privately-owned residences under proposed blast management.
- Additional assessment of the potential occurrence of the Rusty Greenhood Orchid within the areas proposed for disturbance failed to identify the species.
- Assessment of threatened and migratory flora and fauna species listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* has been undertaken and identified that significant impacts are not expected for these species, excluding the Koala which has been assessed as potentially subject to a significant impact based on habitat removal.
- A Biodiversity and Rehabilitation Management Plan would be implemented to manage potential risks to flora and fauna including potential impacts to Koala habitat. While the loss of Koala habitat is considered a significant impact locally, the area supports only a small population of Koala, would not fragment surrounding remnant Koala habitat and the offset for the loss of this habitat is likely to result in the conservation of approximately 450ha of Koala habitat in perpetuity. Assessment has been undertaken in accordance with the NSW Biodiversity Offset Scheme and EPBC Act Environmental Offsets Policy to ensure that an acceptable outcome results from the proposed vegetation clearing for the Project.
- Key Insights has considered publicly available information on the local area, the outcomes of a consultation program and feedback presented in the submissions in preparing an assessment of potential social impacts of the Project. The assessment identified that generally the community was not opposed to the Quarry, but rather wanted to ensure that operations occurred at levels that would not significantly impact local amenity and the local experience of the area. Notwithstanding this, fears remain in the community regarding change to the local area over which they have no control.

  Hanson has undertaken additional consultation since the exhibition of the EIS in order to inform, educate and listen to the community. However, the need for Hanson to proactively engage with the community on an ongoing basis has been identified and it was acknowledged that Hanson need to demonstrate high levels of ongoing environmental performance and accountability for the Project in order to develop trust in the local community. Key Insights presented a range of recommendations that have been accepted as commitments by Hanson. Many of these recommendations have been proactively implemented by Hanson since the completion of the Social Impact Assessment.

- In Hanson's experience, concerns regarding potential impacts to property value do not generally eventuate. Key Insights undertook a review of publicly available sales information that demonstrated that the local area is attractive to potential property buyers. Given the resolution of traffic-related issues, there is no Project-related reason for this positive growth to cease.

Additional responses to concerns raised regarding matters such as potential impacts to water resources, Aboriginal and historic heritage, human health and economic impacts have been reviewed and addressed and it has been concluded that potential environmental risks could be managed as proposed, and under conditions of consent. Based on these outcomes, it is considered that the comments and requests regarding the technical aspects of the assessment of the Project have been resolved satisfactorily.

Conclusion

Review of the various submissions highlights the difference between expectations of impact felt by the community and that predicted in the technical assessments for the Project. In response to the concerns expressed in the community, Hanson has refined the Project to reduce potential amenity impacts and has explained to the participants in community consultation how the environmental management and performance of the operation would be managed, monitored, reported and regulated/audited during the life of the operation. Community consultation since the exhibition of the EIS has largely been positive, with Hanson and its representatives able to answer questions from the community regarding the ongoing operation.

Many people in the local community have expressed their satisfaction with the approach and information provided. However, there remains concerns in the local community principally regarding the proposed increase to transport operations and 24-hour operations for some processing activities. It is also acknowledged that community members remain concerned about other potential impacts of the Project including operational dust and noise generation, impacts to native flora and fauna including the Koala, dust generation from concrete recycling and silicosis. These concerns are reflected in apprehension about change to the locality and the way of life currently experienced.

The concerns expressed regarding the increase to transport operations relates to road safety, traffic noise and sleep disturbance and the local community's experience of their neighbourhood. Hanson has considered each of these matters carefully and is proposing a range of mitigations to reduce the potential risks associated with transportation. These include the following.

- Limiting night time product despatch to 20 calendar days per year with seven days' notice to be provided to community members who have registered with the Quarry.
- Contribution to construction of a pathway on Brandy Hill Drive that would provide a level of separation between vehicles and pedestrians or cyclists.
- Contribution to construction of bus bays along the transport route to provide safe sections for buses to pull off the road.
- Ongoing contributions to road maintenance and upgrade along the transport route.

- Following review of the submissions received, Hanson lobbied RMS to review speed limits in the vicinity of the Quarry. From 16 September 2019, the speed limit along Clarence Town Road in the vicinity of the Quarry will be reduced from 100km/hr to 80km/hr. The speed limit on Brandy Hill Drive was considered appropriate.
- Hanson trucks and drivers would continue to operate with best practice management protocols including monitoring of location, speed and use of braking systems.
- Ongoing implementation of a Drivers Code of Conduct would guide driver behaviour and incorporate a disciplinary protocol for identified poor performance.
- The existing complaints procedures would be maintained that includes investigation of issues raised and response to complainants on concerns raised.

With regards the proposed operating hours, Hanson has limited operating times as much as is considered feasible in order to allow for the crushing and sizing of material to meet client specifications and that permits on-time delivery. Additional mitigations have been applied to reduce noise generation for all operations and the generation of noise during night time operations has been assessed. It has been concluded that noise generated by these operations is not likely to be intrusive or cause sleep disturbance. It is acknowledged that for some in the community the approval of night time operations would change their concept of the locality. However, it is not expected that night time operations would be a regular feature of the operation and that when these do occur, they would be experienced as a low hum and that this noise would be difficult to discern when residents are indoors.

Some members of the community expect that the Project would significantly change the existing way of life and experience of the local area for residents, which is reflected in concerns regarding the sense of place for the local community. These perceptions have been exacerbated by misunderstandings regarding the Project and the fact that some people in the community feel that consultation has not be satisfactory. Consultation activities since the exhibition of the EIS have included CCC meetings, informal Have-A-Chat meetings and invitations for community members to visit and tour the Quarry. Through these activities Hanson has attempted to explain the operations, educate the community and allay fears. It is accepted that some members of the community remain concerned, but consultation has generally been positively received.

Hanson acknowledges that it would be important for ongoing operations that the Company develops an effective engagement strategy that connects the operations with the local community. This would allow Hanson to demonstrate that it is a valuable part of the local community. There has been some success with this over the life of the existing Quarry and since the exhibition of the EIS, but actions here would need to be maintained. Technical assessment of the Project has demonstrated that the proposed operations would occur within expected limits that are designed to avoid significant impacts and meet community expectations. Ongoing operational and environmental management would be required and would be described in the various environmental management plans for the operation. Ongoing management would be complemented by a regime of annual reporting and environmental auditing that is standard practice for State significant extractive industry developments.

Material from the Quarry would support key infrastructure projects in the Newcastle, Port Stephens, Maitland and Hunter region as well as within the Central Coast and Greater Sydney areas. The strategic location of the resource and the fact that it is an expansion to an existing operation (rather than a greenfield site) would have positive outcomes for the cost of supply and development in these regions. The ongoing operation would also continue to provide employment and training outcomes for the local area as well as a source of local spending on consumables.

Given the size and location of the resource at the Quarry, it is necessary that a balance be established between the need for access to a suitable hard rock resource for local and regional infrastructure development, the equitable distribution of economic benefits from the operation, and the need for the local community to live a healthy lifestyle with the amenity they currently appreciate. Hanson considers that the Project, as presented, would satisfy each of these needs.

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Project Summary

Project Component	Summary of Component
Location	The Brandy Hill Quarry is located on Clarence Town Road at the intersection with Brandy Hill Drive in Seaham, NSW. The Quarry is 3.5 km east of Seaham, 15km northeast of Maitland and 30km north of Newcastle.
Existing Consent and Operations	Development Application No 1920 was granted by Port Stephens Shire Council to the Hunter Valley Mining Corporation Pty Ltd in 1983. The current operation extracts approximately 700,000 tonnes of material annually and employs 20 people. The current operation involves extraction from within a 19.5ha extraction area to an elevation of 30m AHD and processing, stockpiling and administrative activities within a further 17ha area. The total area of land currently disturbed for operations is 36.5ha.
The Site and Disturbance Areas	A total area of 97.7ha is proposed for the ongoing operational areas. The following site components and surface disturbance is proposed. • Extraction Area – 78.5ha • Processing and Stockpiling Area – 19.2ha (to be constructed from Stage 3) • Amenity barrier to the south of the Processing and Stockpiling Area. • Water management structures. • Roads and other infrastructure. The final extraction depth of the Project is -78m AHD.
Quarry Site Components and Infrastructure	Quarry infrastructure would consist of the following. • Processing Plant and Stockpile Area • Pre-Coat Plant • Concrete Batch Plant • Recycled Concrete Processing Plant and recycled roadbase stockpiles • Pug Mill. • Office, Weighbridge and Workshop.
Resource	The resource in the proposed extraction area is well understood as a result of historic operations and comprehensive drilling programs. • Total available resource – 78.1 million tonnes (ignimbrite, sandstone and conglomerate resource). • Estimated overburden – 2.0 million tonnes.
Annual Production	Extraction and processing operations to produce a maximum of 1.5 million tonnes per annum of aggregate products transported from the Quarry. Concrete batching to produce 15 000m^3 of concrete once this infrastructure is constructed. Import of approximately 20 000t of concrete material per annum for crushing and blending to product road base products.
Quarry Life	The Project seeks approval for a further 30 years of operations.

Project Component	**Summary of Component**
Operational Stages	The Project consists of five operational stages summarised as follows. • Stage 1 – would involve deepening of the existing extraction area and lateral extension to the west and south. Extraction would progress to an elevation of approximately 22m AHD. • Stage 2 - would involve progression towards the south west corner of the extraction area and further deepening of the extraction area to an elevation of approximately -8m AHD. • Stage 3 – involves progression to the southern boundary of the extraction areas towards the existing processing area. The western dam is removed during this stage and extraction progresses to a depth of -38m AHD. • Stage 4 – involves relocation of the processing area to the south of the existing location and extraction of land on which the infrastructure was formerly located. Extraction progresses to a depth of -58m AHD. • Stage 5 – involves completion of the extraction area to the south east, with extraction progressing to a final elevation of -78m AHD.
Extraction Method and Sequence	Conventional drill and blast methods would continue to be used for extraction. Blasted rock would be loaded and hauled to the primary crusher for processing. Extraction is proposed to occur in five stages commencing in the existing extraction area before moving south and then to the east within the area currently used for processing activities.
Blasting Frequency	Blasting would occur no more than once per week, except in the event of a misfire.
Processing	The Processing and Stockpiling Area would remain in the current location and configuration until Stage 4 of operations, when activities would be relocated to the south of the proposed extraction area. Construction of the new Processing and Stockpiling Area would commence during Stage 3 of operations. Hanson would enclose all existing fixed processing equipment from the commencement of Stage 1 of operations. A three-sided enclosure would be constructed for the mobile crushing equipment proposed to be used for concrete recycling activities (campaign crushing of 20,000tpa). The same configuration would be expected in the relocated Processing and Stockpiling Area. The processing plant currently consists of the following components. • A primary crusher • Secondary and tertiary crushers • A quaternary crusher • Five screens • Conveyor belts, bins and hoppers. • Pug Mill • Pre-Coat Plant All new processing plant would be constructed in accordance with standard practice for the quarrying industry and incorporate suitable enclosures and other mitigation for potential noise and dust impacts. Facilities for recycled concrete crushing and management would be constructed from Stage 1 of operations. A Concrete Batching Plant would be constructed within the relocated Processing and Stockpiling Area to be commissioned from Stage 4 of operations.

Project Component	**Summary of Component**
Products	The Quarry would continue to produce the following products. • Concrete grade aggregates • Fill material • Manufactured sand • Pre-coated aggregates • Road base • Gabion and armour rock • Drainage materials Once constructed the Concrete Batching Plant would provide the capacity to produce concrete for direct use in construction related projects.
Product Despatch	Product despatch activities would continue via two main transport routes. • Access to the Pacific Highway via Brandy Hill Drive and Seaham Road. • Access to Maitland and the New England Highway via Clarence Town Road and Paterson Road. For the purpose of assessment, it has been estimated that 75% of trucks would use the route along Brandy Hill Drive and Seaham Road with the remainder using Clarence Town Road towards Maitland. However, some local deliveries may require access to other roads dependent on the final destination and, on occasion, delivery may be required to use alternative routes.
Traffic Levels	Product despatch from the Quarry would be limited to the following levels. • No more than 301 laden loads between 7:00am and 10:00pm. • No more than 58 laden loads between 10:00pm and 7:00am. Hourly product despatch would be limited as follows • 5:00am to 6:00am – 9 laden loads. • 6:00am to 7:00am – 12 laden loads. • 7:00am to 10:00pm – 30 laden loads per hour. • 10:00pm to 5:00am – 5 laden loads per hour. Night time despatch (between the hours of 10:00pm and 5:00am) would occur on a maximum of 20 days per calendar year. Community members who have registered for notifications would receive seven days' notice of any night time product despatch activities. Once operating, the concrete batching plant would require a maximum of 11 laden deliveries per day (22 movements) of sand and cementitious materials which would be included in the above traffic limits. It should be noted that one laden load requires two movements (that is, an inbound movement and an outbound movement). A range of ancillary transport movements would be required for the supply of consumables, technical services and other supplies. As these movements would not be regular, they are not included in the proposed traffic limits.
Overburden Management	Overburden removed during the early part of Stage 1 extraction operations would progressively be used to build an amenity barrier on the southern side of the proposed relocated Processing and Stockpiling Area. As this is completed overburden would be used as a substrate for progressive rehabilitation of terminal benches. Overburden that is not directly used for construction of the amenity barrier or in progressive rehabilitation would continue to be stockpiled temporarily in the floor of the extraction area.
Topsoil Management	Topsoil that is stripped during land preparation activities would be directly transported to areas undergoing revegetation including the amenity barrier and final benches within the extraction area.

Project Component	**Summary of Component**	
Water Management	The existing surface water management system consists of the following structures. • The Western Dam. • The northern and eastern sedimentation basins. • Two sedimentation basins and a polishing basin to the south of the existing Processing and Stockpiling Area. • A sump in the Quarry floor. As the Quarry is progressively developed, some of these structures would be decommissioned and additional water management structures developed including a treated stormwater storage dam, plant sedimentation basin and increased use of the sump in the Quarry floor.	
Waste Management	Production wastes would consist of overburden material only, which would be directly applied to construction of an amenity barrier or used in progressive rehabilitation. Non-production wastes would continue to be managed in accordance with current practices.	
Workforce	The current workforce would expand by ten extra full-time positions to 30 employees once the production level of 1.5 million tonnes per annum is reached. The equivalent of 12 full time transportation personnel would operate from the Quarry.	
Hours of Operation	Construction Works	Monday to Friday 7:00am to 6:00pm Saturday 7:00am to 5:00pm No operation on Sundays or public holidays
	Blasting	Monday to Friday 9:00am to 5:00pm No blasting on Saturdays or Sundays or public holidays
	Load and Haul	Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
	Primary Crusher	Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
	Secondary and Tertiary Crushing and Screening	Monday to Sunday - 24hrs
	Maintenance	Monday to Sunday - 24hrs
Hours/Days for Sales and Product Despatch	Day time (5:00am to 10:00pm)	Monday to Sunday
	Night time (10:00pm to 5:00am)	Maximum of 20 nights per calendar year.

Project Component	**Summary of Component**
Final Landform	It is acknowledged that in 30 years, community preferences for land use at the Quarry may have changed. Therefore, an indicative final landform plan has been prepared for the purpose of the application that includes the following. • All infrastructure areas would be decommissioned and revegetated. • All roads and tracks that are not required for a final land use would be decommissioned and revegetated. • A water storage would remain with water to an elevation of approximately 30m AHD. • As the water storage would take time to reach an equilibrium water level, completed benches would be progressively revegetated with the expectation that over time these areas would become inundated. • Benches above 30m AHD (principally in the northeast of the Quarry) would be revegetated with native species suitable for the local environment and remain in the landform over the longer term. Ultimately the final land use and final landform would be designed to be consistent with land use zoning in the area at the time of closure. Surrounding land that is owned by Hanson and would not be disturbed for the proposed extension would remain in its current state for the duration of the Quarry life. Use of this land would be subject to land zoning and development consent requirements.
Biodiversity Offset Strategy	An assessment in accordance with the *BioBanking Assessment Methodology 2014* (OEH, 2014) determined that a total of 3 096 ecosystem credits (various plant community types) and 1 324 species credits (Koala) would be required to offset the impacts of the proposed extension. An investigation of ecosystem and species credits available to purchase and retire following approval of the proposed extension indicates that Hanson would be able to readily satisfy a Tier 1 outcome for offsetting obligations, indicating an improve or maintain outcome.
Capital Investment Value	$22.5 million
Voluntary Planning Agreement	Hanson is currently in negotiations with Port Stephens Council regarding a Voluntary Planning Agreement that incorporates a pathway on Brandy Hill Drive and additional bus bays along the transport route.
Road Maintenance Contributions	Financial contribution towards the maintenance of local roads used by Quarry-related heavy vehicles accessing and departing the Quarry within the Port Stephens Local Government Area would continue under the Project. Similar contributions for the maintenance of local roads used by Quarry-related heavy vehicles within the Maitland City Local Government Area would be paid in accordance with the *Maitland City Wide Section 94 Contributions Plan 2016* and indexed to CPI.
Community Enhancement Fund	A Community Enhancement Fund would be established to provide direct benefit to local community members.
Community Sponsorship Policy	A Community Sponsorship Policy has been established for the Brandy Hill Quarry that contributes $0.01 per tonne sold towards initiatives where the benefit is specifically and directly received in the local community. Support is directed towards organisation (or individuals) based in townships and villages local to the Brandy Hill Quarry, nominally centred on Seaham, and in the area bordered by Raymond Terrace, Clarence Town & Woodville.

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1. INTRODUCTION

1.1 SCOPE

This *Amended Response to Submissions* has been compiled to provide a response to the key issues raised in submissions lodged with the Department of Planning and Environment (DPE) during and subsequent to the public exhibition period for the Environmental Impact Statement (EIS) for the Brandy Hill Quarry Expansion Project (the Project). A *Response to Submissions* document was submitted to DPE in October 2018. A range of additional submissions and information requests were presented to Hanson after this document was submitted. This *Amended Response to Submissions* presents the consolidated response from Hanson to all submissions and information requests received following the submission of the EIS.

Hanson recognises that some of the information contained in the EIS could have been presented in more detail to better describe the Project and its potential environmental impacts. Hanson has undertaken a comprehensive review of the submissions provided, continued to consult with DPIE, other Government agencies, Port Stephens Council, Maitland City Council and the local community, has reviewed the Project components in detail and has actively amended the Project to address the issues raised and incorporate the various requests received, where these were feasible. Section 3 provides a summary of the amendments to Project since preparation of the EIS.

From the outset it should be noted that the description of proposed transportation operations in the EIS may not have been clear and has led many readers to misunderstand the Project in this regard. Discussion of the technical assessment of road capacity and performance was taken to refer to intended traffic levels, which was not the case. Hanson has clarified the proposed transportation operations, with proposed product despatch decreased by a third compared to the numbers suggested in various submissions. The sentiment expressed in many of the submissions appears to have resulted from misunderstanding of proposed operations and therefore should be considered from this perspective. Hanson anticipates that once the local community clearly understands proposed transportation operations, they would be more comfortable with the proposal. This is not to disregard the need for Hanson to carefully manage transportation operations for the life of the Project.

Hanson notes that as there were more than 25 submissions received by DPE during the public exhibition of the EIS, that the application will be determined by the Independent Planning Commission, acting under the delegation of the Minister. DPE will prepare an assessment report and provide recommended conditions of consent to assist with this process. Hanson is confident that the issues raised in the various submissions have been addressed satisfactorily and that the concerns and objections of the community have been appropriately identified and addressed. Hanson considers that this *Amended Response to Submissions* document, when reviewed with the EIS and supporting documents, provides sufficient information for the Independent Planning Commission to determine the application.

1.2 DOCUMENT FORMAT

Preparation of this *Amended Response to Submissions* has involved contributions from a multi-disciplinary team including many of the consultants who were involved in the original assessment for the EIS. Additional assessments or more detailed information have been incorporated into this review to address the issues raised in the various submissions.

This document has been compiled in eight sections with 13 appendices.

Section 1: Introduces the scope and format of this document, reviews the common themes of submissions and presents an overview of the existing environmental management at the Brandy Hill Quarry (the Quarry).

Section 2: Provides an updated description of the Project taking into account the feedback and requests received from DPE, Government agencies, Port Stephens Council, Maitland City Council and the local community. This section effectively updates Section 2 from the EIS.

Section 3: Provides a summary of the outcomes of Hanson's review of the Project and amendments made to directly address issues raised in submissions.

Section 4: Provides an overview of the additional assessments undertaken since the public exhibition period.

Section 5: Provides detailed responses to all key issues raised in submissions provided by Government agency, community groups and private individuals. The issues have been presented in alphabetical order.

Section 6: Provides an updated Statement of Commitments.

Section 7: Provides a concluding statement.

Section 8: Presents sources referenced in this document.

A set of appendices are attached to the document including amended assessments prepared to support the *Response to Submissions*.

Appendix 1: List of Submissions and Issues Raised

Appendix 2: Environment Protection Licence Number 1879

Appendix 3: Social Impact Assessment Update and Response to Submissions – Key Insights September 2018

Appendix 4: Additional Intersection Analysis and Response to Submissions – Intersect Traffic May 2018

Appendix 5: Additional Haulage Route Assessment – Intersect Traffic May 2019

Appendix 6: Updated Noise Impact Assessment – Vipac Engineers & Scientists September 2018

Appendix 7: Addendum to Noise Impact Assessment (Operational Sleep Disturbance) – Vipac Engineers & Scientists February 2019

Appendix 8: Air Quality Impact Assessment – Todoroski Air Sciences September 2019

Appendix 9: Updated Blast Impact Assessment - Vipac Engineers & Scientists September 2018

Appendix 10: Biodiversity Assessment Report - Updated Final Report – Biosis August 2019

Appendix 11: Correspondence with RMS – Dated 31 May 2018 and 8 August 2018.

Appendix 12: Drivers Code of Conduct – Brandy Hill Quarry

Appendix 13: Brandy Hill Quarry: Community Support & Sponsorship Policy – September 2019

Appendix 14: Community and Stakeholder Engagement Plan – February 2019

Appendix 15: Correspondence with Maitland City Council – Transport Management – April 2019

1.3 SUBMISSIONS RECEIVED

1.3.1 Following Public Exhibition of the EIS

The EIS for the Project was placed on exhibition from 10 March 2017 to 9 April 2017. DPE has provided Hanson with a total of 194 submissions that were provided to the Department during the exhibition period and included the following.

- 12 submissions from Government agencies and Councils.
- 5 submissions from Special Interest Groups opposing the Project.
- 2 submissions from Special Interest Groups supporting the Project.
- 165 submissions from Individuals opposing the Project.
- 4 submissions from Individuals providing comment.
- 6 submissions from Individuals supporting the Project.

A comprehensive review of the submissions is presented in **Appendix 1**. **Table 1** presents a summary of the locations of the individual submitters, i.e. covering those that opposed, supported or provided comments about the Project, as determined from information on the DPE website. Approximately 159 (91%) of the individual submissions originated from people residing locally around Brandy Hill that opposed the Project.

Table 1
Summary of Locations of Submitters

Location	Object	Comment	Support
Brandy Hill and Surrounds			
Brandy Hill	73	1	2
Seaham	48	1	
Nelsons Plains	9	2	
Bolwarra Heights	10		
Other (local)	19		2
Other			
Wingham	1		
Newcastle Region	4		
Sydney Suburbs			1
Sydney Northern Beaches			1
Not supplied	1		
Total	**165**	**4**	**6**

1.3.2 Following Submission of the Response to Submissions Document

Following the submission of the *Response to Submissions* document in October 2018, several Government agencies have provided feedback on the assessment and response provided in that document. Feedback has been received from the following agencies.

- DPE has provided several requests for further assessment in response to amended aspects of the Project or requested clarification regarding the technical assessments and the *Response to Submissions*.
- The Environment Protection Authority (EPA) requested further information regarding the outcomes and proposed mitigation in the Air Quality Assessment. It was noted that the EPA was satisfied that noise generation at the Quarry would be managed satisfactorily under conditions of approval.
- The response received from the Biodiversity Conservation Division of DPIE (BCD – formerly the Office of Environment and Heritage) confirmed satisfaction with the biodiversity assessment and recommended offsetting be incorporated into the conditions of consent. A further request related to the BCD assessment of biodiversity in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Bilateral Agreement between the Commonwealth Department of the Environment and Energy and the NSW Government.
- The Department of Industry Water provided a recommendation for a 30m buffer zone from the top of the bank of Deadman's Creek, noting that this was already proposed for the Project. No specific response was required to this feedback.
- The DPE Division of Resources and Geoscience confirmed that it had no issue to raise with the *Response to Submissions*. No specific response was required to this feedback.
- The Heritage Council of NSW noted that the *Response to Submissions* adequately addressed it previous comments. No specific response was required to this feedback.
- Hunter New England Population Health reiterated its concerns regarding particulate matter impacts and recommended further consultation. Hanson has continued to consult proactively with the local community since the submission of the *Response to Submissions*. No specific response was required to this feedback.
- Roads and Maritime Services provided advice to the determining authority relating to minimising construction traffic impacts and ensuring intersection sight distances were in accordance with Austroads guidance. Hanson considers this feedback has been adequately addressed and therefore no specific response is required to this feedback.
- Transport for NSW confirmed in had no further comment. No specific response was required to this feedback.

Maitland City Council provided a further submission recommending conditions of consent relating to road infrastructure contributions, a Traffic Management Plan and Driver Code of Conduct. Hanson and RWC met with Maitland City Council officers on 21 February 2019. The

outcomes of this meeting and commitments made as a result are discussed in Section 3 and in Section 5.21.10.

Port Stephens Council provided a further submission relating to operating hours, ecological matters and traffic and transport impacts. Feedback on this submission was discussed at a meeting with Port Stephens Council on 15 November 2018 and a formal response provided directly to Port Stephens Council on 30 November 2018. Correspondence received from Port Stephens Council on 18 December 2018 noted acceptance of Hanson's proposed management of ecological matters including Koala protection. Port Stephens Council also requested that Hanson adopt an alternate transport route which has since been accepted by Hanson. The preferred transport routes are discussed in Section 2.11.1 and in Section 5.21.7. It is also noted that Port Stephens Council referred the matter of operating hours to the consent authority's determination.

Discussions with Port Stephens Council regarding a proposed Voluntary Planning Agreement commenced at the meeting on 15 November 2018 and were continuing at the time of completion of this *Amended Response to Submissions*.

A total of 40 additional public submissions have also been provided to DPIE. These submissions added to the existing objections in the community or re-state existing objections. Responses to additional matters raised in these submissions have been incorporated into this document.

1.4 KEY THEMES OF THE SUBMISSIONS

Figure 1 provides the frequency of themes raised in the public submissions opposing the Project that were received during the public exhibition period. Transportation operations was the issue most frequently identified in submissions, with local amenity issues relating to noise and air quality also raised. Concerns regarding noise generated by the Project included both operational and road traffic noise. The proposed hours of operation were also a key issue in the submissions, something that was also reflected in consultation for the Project. It is also noted that each of these issues has potential social impact outcomes which was a common theme of submissions.

The key topics in submissions supporting the Project related to employment and economic stability in Brandy Hill and the broader Port Stephens local government area.

1.5 CONSULTATION

Hanson considers that the public exhibition process and the opportunity for interested stakeholders to provide formal comments on the Project regarding issues that are important to them, is an important element of the planning process and also provides an opportunity for Hanson to receive direct feedback from a wide range of Government and community stakeholders. This feedback, presented in the submissions described in Section 1.3, has been the motivation for a comprehensive review of the Project.

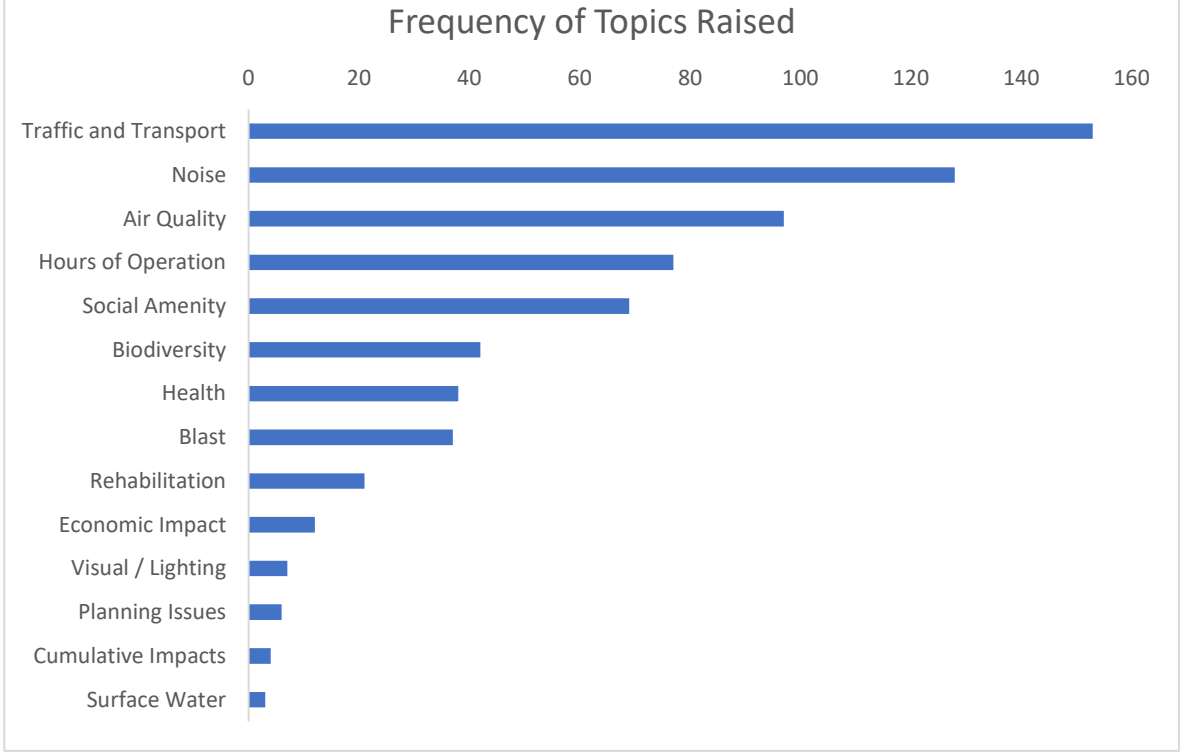

Figure 1
Frequency of Topics Raised by Residents of Brandy Hill and Surroundings

Hanson commissioned Key Insights to undertake independent community consultation designed to inform a Social Impact Assessment (presented as **Appendix 3** and summarised in Section 4.8). In addition, and in direct response to the consultation undertaken by Key Insights, Hanson has formalised the Community Consultative Committee and commissioned an independent chairperson to manage the meetings. Meetings of the CCC since the public exhibition period have been held on the following dates.

- 15 September 2017
- 9 March 2018
- 15 November 2018
- 21 February 2019
- 2 May 2019

The meetings included discussions concerning Hanson's progress with the response process and in initial meetings introduced Key Insights for the purpose of consultation for the Social Impact Assessment.

In addition, Hanson has implemented a regular Have-A-Chat session designed to provide community members not engaged in the CCC process with an opportunity to meet with Hanson personnel and to ask questions regarding the Project and the proposed ongoing operations. The most recent Have-A-Chat session was held at the Quarry on 8 May 2019 and provided visitors with an opportunity to tour the Quarry operational areas.

Both the CCC and the Have-A-Chat meetings have provided an opportunity for community members to explain their fears about changes to the local setting and their way of life that in turn informed the assessments and review of the Project.

Hanson has also initiated a community member registration process that provides the community members with an opportunity to register for notifications regarding proposed blasting events, Quarry-related news and updates and future community meetings. To date this process has been informal and occurred at CCC and Have-A-Chat meetings only, but would be expanded post-approval to the broader community.

1.6 ENVIRONMENTAL MANAGEMENT PERFORMANCE

1.6.1 Introduction

Existing development consent for the Quarry does not require that Hanson publish environmental monitoring or prepare and publish annual reporting on the progress and environmental performance of the Quarry. This does not mean that Hanson is not monitoring or managing its operations. The Quarry operates in accordance with Environment Protection Licence 1879 (EPL 1879 – a copy is reproduced as **Appendix 2**), which sets limits, monitoring and reporting requirements for the operation. Hanson prepares an annual return for the Environment Protection Authority (EPA) each year that summarises the outcomes of monitoring. Hanson recognises that the Quarry needs to operate within its local environment and endeavours to maintain performance outcomes as part of its commitment to reducing and mitigating potential impacts to the surrounding landscape. Environmental performance generally complies with expectations, however there have been occasions where criteria have been exceeded. In these instances, an investigation is undertaken to remove the source of any non-compliance or to modify operations to reduce impact.

In the past, Hanson has held open days and invited the local community to visit the Quarry and observe the operating conditions and setting of the active areas. It is planned to continue these open days in the future as it is often the case that people have more confidence in the operation having seen for themselves how operations are managed.

This section has been prepared to give readers an overview of recent environmental performance. Environmental management is an adaptive process and Hanson is continually reviewing monitoring results to ensure that the Quarry continues to operate in an environmentally responsible manner.

1.6.2 Deposited Dust Monitoring

Deposited dust levels are monitored using standard dust deposition gauges which are located at three points around the Quarry (see **Figure 2**). Samples are taken roughly every 30 days in accordance with *AS NZS 3580.10.1 Methods for sampling and analysis of ambient air – Method 10.1* and the results compared to the standard deposited dust 12-month rolling average limit of 4g/m^2/month. A summary of historic deposited dust monitoring is provided in **Table 2**. It is noted that on occasion high samples have been recorded. However, field records at these times generally record insects or other material that has landed in the gauge and contaminated the sample. The results indicate that dust levels have been consistently compliant at all monitoring points between 2011 and 2018.

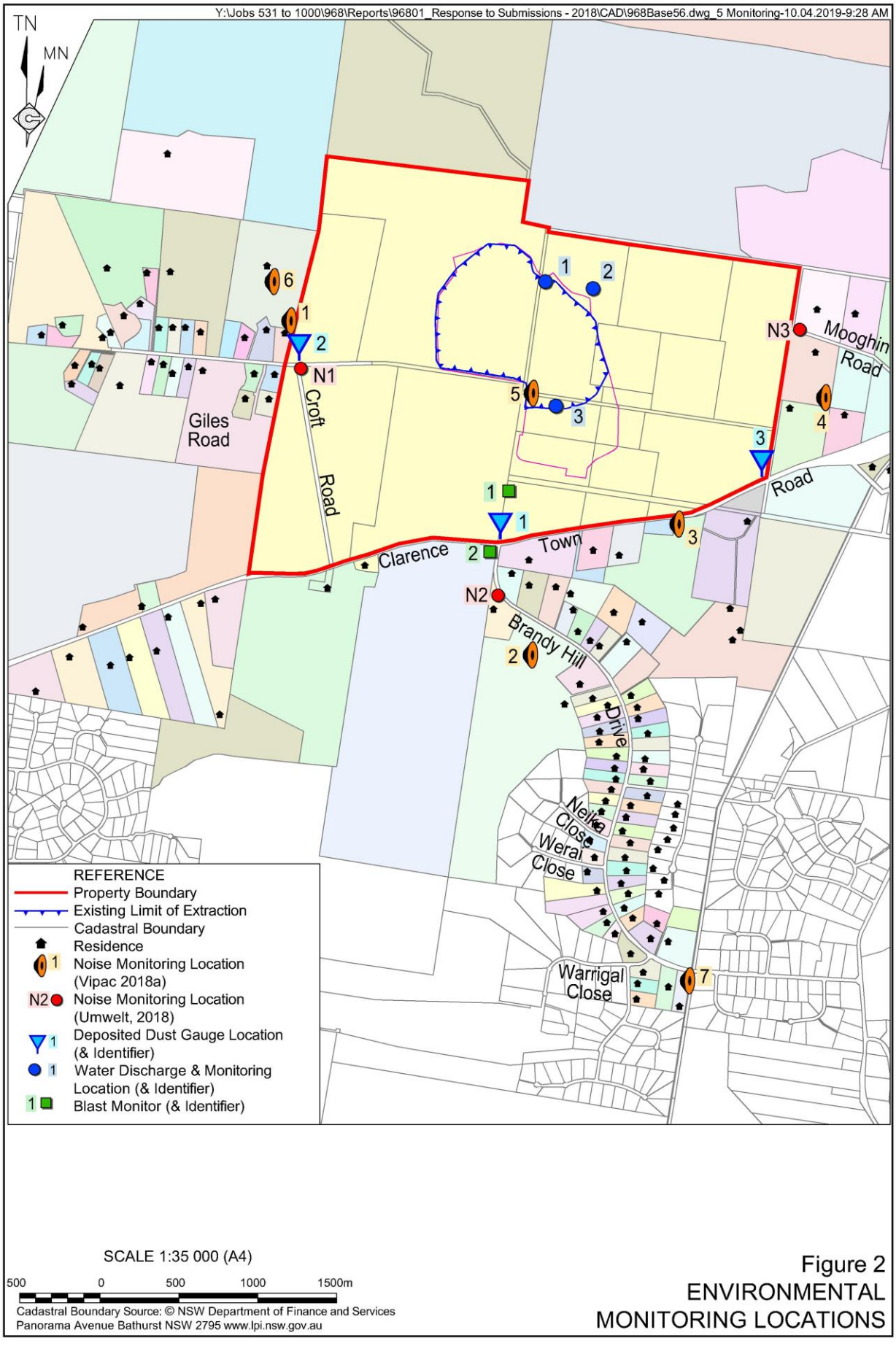

Figure 2
ENVIRONMENTAL MONITORING LOCATIONS

Table 2
Historic Deposited Dust Monitoring Results 2010 - 2018

	Insoluble Solids (g/m^2/month)		
Location[1]	**Giles Road**	**Front Gate**	**Cattle yards**
Period (July – June)			
2011-2012	0.4	3.1	1.1
2012-2013	0.6	3.1	1.9
2013-2014	0.5	2.3	1.4
2014-2015	0.5	1.4	0.6
2015-2016	0.6	0.8	1.2
2016-2017	0.7	1.5	2.9
2017-2018	1.6	3.0	2.3
Total Average	0.7	2.2	1.6
Note 1: See **Figure 2** for gauge locations			
Source: Hanson			

1.6.3 Water Monitoring

Three water discharge points (**Figure 2**) are identified in EPL 1879 for operational water management requirements. Currently only two discharge points are in use (North Dam 1 and South Polishing Dam 3). North Dam 2 has been decommissioned as it was no longer required for operations.

Hanson have found that water discharge generally occurs only during or following large rain events or if there is a need to empty or lower the water level in the dams. Lowering dam levels is generally only required in preparation for forecast storms or heavy rain. It is Hanson's experience this is required at most only one or two times each year. When such an event does occur where discharging is required, Quarry personnel sample the discharge water daily until the discharge ceases.

Water quality limits established in EPL 1879 are as follows.

- pH – 6.5 – 8.5
- Total Suspended Solids – 50mg/L
- Oil and Grease – non-visible

Although the water quality limits for oil and grease refer to visual presence, Hanson undertakes laboratory analysis for each sample. **Table 3** presents a summary of the water quality monitoring results over period from 2011 to 2018. The data indicates that water quality has been generally compliant over the last six years.

Table 3
Surface Water Monitoring Results

	Location[1]								
	Monitoring Point 4			Monitoring Point 5			Monitoring Point 6		
Period	Oil and Grease (m/L)	pH	Total Suspended Solids (mg/L)	Oil and Grease (m/L)	pH	Total Suspended Solids (mg/L)	Oil and Grease (m/L)	pH	Total Suspended Solids (m/L)
Water Quality Limits	Non-visible	6.5 - 8.5	<50	Non-visible	6.5 - 8.5	<50	Non-visible	6.5 - 8.5	<50
2011-2012	ND	ND	ND	<5	8.0	23	ND	ND	ND
2012-2013	ND	ND	ND	<5	7.8	23	ND	ND	ND
2013-2014	ND	ND	ND	<5	8.0	51	ND	ND	ND
2014-2015	<5	8.2	5	<5	7.9	28	<5	8.4	13
2015-2016	ND	ND	ND	5.5	7.9	32	<5	8.1	4
2016-2017	Nil	Nil	Nil	<5	8.0	24	<5	8.2	6
2017-2018	Nil	Nil	Nil	<5	8.0	229[2]	<5	8.1	5
Note 1: See **Figure 2** for discharge point locations Note 2: A significant rainfall event on 23 March 2018 resulted in overflow of sedimentation dams at the Quarry. This incident was reported to the EPA. ND = No Discharge at this point									
Source: Hanson									

On occasion, elevated suspended solids and the presence of oil and grease have been identified. The results have been investigated by Quarry personnel with the outcomes informing ongoing water management. A significant rainfall event in March 2018 that resulted in 129mm of rainfall in one day caused sedimentation dams at the Quarry to overflow. The water samples taken during the event had high suspended solid loads, which would be expected during this type of rainfall event and is noted in design guidance. The 5-day 90th percentile rainfall guidance depth in Landcom (2004) is 51.8mm for the Newcastle region (closest available reference location) indicating that this rainfall was 2.5 times the guidance level for dam design. It is expected that during this type of event there would be sediment laden overland flow generated with suspended solid levels consistent with that measured at the Quarry. Therefore, this result is not considered to have caused water pollution.

1.6.4 Blast Monitoring

Blasting activities at the Quarry occur in accordance with the conditional requirements of EPL 1879. This includes the following limits.

- Airblast overpressure levels from blasting operations must not exceed 115dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period.
- Airblast overpressure level from blasting operations must not exceed 120dB (Lin Peak) at any time.
- Ground vibration peak particle velocity from blasting operations must not exceed 5mm/s for more than 5% of the total number of blasts during each reporting period.
- Ground vibration peak particle velocity from blasting operations must not exceed 10mm/s at any time.

Blast monitoring locations are specified in EPL 1879 (see **Figure 2**). Blasting is carried out between 9:00am and 5:00pm Monday to Saturday. There is no blasting on Sundays or Public Holidays. Offensive blast fumes must not be emitted from the premises.

A summary of the blast monitoring results for the period from 2014 to 2018 is provided in **Table 4**. There have been no blasts that have exceeded 115dB airblast overpressure limit or the 5mm/second ground vibration peak particle velocity for the last five years. 38% of blast events have been small enough that the blast monitor has not been triggered (indicating that the air blast overpressure and ground vibration are too low to be recorded).

Table 4
Blast Monitoring Results 2014 - 2018

Year	Time Range	Number of Blasts	Blast Monitor Not Triggered	Airblast Overpressure Range (dB)	Ground Vibration Range (mm/sec)
2014	10:15am - 10:37am	25	7 (28%)	85.0 - 113.4	0.1 - 1.2
2015	9:328am - 2:52pm	27	6 (22%)	94.6 - 108.5	0.2 - 3.0
2016	10:05am - 2:22pm	23	14 (61%)	98.6 - 112.4	0.2 - 1.6
2017	10:15am - 4:31pm	23	11 (48%)	84.1 - 111.7	0.3 - 1.3
2018 (to August)	12:00pm - 3:41pm	5	1 (20%)	90.5 – 108.1	0.2 – 0.6
Source: Hanson					

1.6.5 Noise Monitoring

EPL 1879 includes a requirement for annual noise monitoring to demonstrate that the Quarry adheres to the relevant noise criteria. Noise is monitored continuously over a 15-minute period during the regular hours of operation for the Quarry at the locations specified within EPL 1879. Its purpose is to identify potential exceedances and the source of which they occur. **Table 5** presents the outcomes of the most recent compliance noise monitoring in May 2018 undertaken by Umwelt Australia (Umwelt, 2018). **Table 5** also includes the relevant noise limits described in EPL 1879.

Table 5
Summary of Noise Monitoring April 2018

Location and Period*	Criteria Level (dBA)	Measured noise levels (dBA)			Estimated site contribution (dBA)	
	$L_{Aeq\ 15min}$	$L_{A90,\ 15\ min}$	$L_{Aeq,\ 15min}$	$L_{A1,\ 1\ min}$	$L_{Aeq,\ 15min}$	$L_{A1,\ 1\ min}$
N1 - Night	36	30.3 - 35.5	41.0 - 47.2	52.5 - 66.7	<26	30.0
N1 - Day	45	33.1 - 33.7	36.8 - 41.8	45.8 - 56.5	<28	Not Available
N2 - Night	36	36.0 – 44.0	62.0 – 65.0	79.0 – 82.0	<30	Not Available
N2 - Day	45	38.0 – 44.0	65.0 – 66.0	81.0 – 83.0	<30	Not Available
N3 - Night	36	28.8 - 31.4	35.0 - 41.3	45.5 - 61.3	<10	30.0
N3 - Day	45	28.9 - 30.3	39.8 - 30.3	56.2 - 64.2	<13	Not Available
* See **Figure 2** for monitoring locations. Day period is 7:00am to 6:00pm and Night period is 10:00pm to 7:00am.						
Source: Umwelt (2018)						

Hanson also commissioned noise compliance monitoring at 1 Giles Road, Seaham on 19 April 2018 in response to a noise complaint. The results of this monitoring indicated compliance with operational noise limits (36dB(A) for the day time and 45dB(A) during the night time). It is noted that monitoring was undertaken between 5:10am and 7:35am on that day.

1.6.6 Complaints

Hanson have received a total of 45 complaints during the period 2013 to 2018. However, it is noted that 21 complaints were received in 2018 alone with the majority of these made anonymously to the EPA. The majority of complaints related to noise or vibration matters, however, were not all substantiated and may be a result of opposition to the proposed Project. Regardless, each complaint was investigated, and the outcomes of the investigation presented to the complainant.

Under the conditions of the EPL 1879, Hanson must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity in which the EPA licence applies.

Details of that record must include but not be limited to the following.

- The date and time of complaints.
- The method of which the complaint was made.
- Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note of that effect.
- The nature of the complaint.
- The action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant.
- If no action was taken by the licensee, the reasons why no action is taken.

The record of a complaint must be kept at least 4 years after the complaint was made.

1.6.7 Conclusion

Hanson has demonstrated a consistent regime of environmental monitoring and compliance at the Quarry. It is proposed that the majority of these management actions would continue under the Project. As a State Significant Development, Hanson would be required to publish all relevant documents and monitoring results, including an *Annual Review* that would present annual environmental management progress and provide an indication of the next 12 months of operations, management and rehabilitation at the Quarry.

2. AMENDED PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The Brandy Hill Quarry is located on Clarence Town Road at the intersection with Brandy Hill Drive in Seaham, NSW. The Quarry is 3.5 km east of Seaham, 15km northeast of Maitland and 30km north of Newcastle. The existing Quarry is operated in accordance with Development Application No 1920 granted by Port Stephens Shire Council to the Hunter Valley Mining Corporation Pty Ltd in 1983.

Hanson is seeking development consent to expand the existing operations over a period of 30 years. The ongoing operations are proposed to continue as follows.

- Extraction is proposed to occur from an expanded extraction area that covers approximately 78.5ha at its greatest extent.
- Production would be limited to a maximum of 1.5Mtpa.
- Extraction would continue to use existing drill and blast, load and haul methods.
- Operations would occur sequentially in five operating stages.
- Processing operations would continue to involve sequential crushing and screening to refine products to meet client specification.
- The existing fixed processing equipment configuration would continue to be used for the first three stages of operation. Stage 4 would involve the relocation of the processing and stockpiling area to the south of the existing area used for this purpose.
- Construction of the relocated processing and stockpiling area would commence during Stage 3 of operations. This area would cover approximately 19.2ha.
- An amenity bund would be constructed during Stage 1 of operations and would be developed to a height of between 18m and 20m.
- Transportation operations would continue to use the local and State road network to deliver Quarry products to concrete batching plants, to construction or road management sites or to private locations for personal construction activities.
- Native vegetation clearing over an area of approximately 53.8ha

The following subsections present a detailed summary of the proposed Project, staged operations and progressive and final rehabilitation.

2.2 OBJECTIVES

Hanson's objectives for the proposed expansion of the existing Quarry are principally to continue the efficient and productive operation of the Quarry. However, the following objectives are considered to form part of this approach.

- To extract and process the identified resource in a manner that maximises efficient recovery of the material.

- To continue to utilise the local and State road network to despatch Quarry products in a manner this is considerate of the amenity of those residents along the transport routes and of other road users.
- To continue to provide employment of a majority locally-resident workforce.
- To continue to operate the Quarry in an environmentally responsible manner that satisfies all relevant Government legislation, policies and guidelines and meets reasonable community expectations.
- To progressively create a final landform that is safe, stable and non-polluting and amenable to the proposed final land use of native vegetation conservation and water storage.
- To continue to satisfy the demands of the construction materials industry in a manner that maintains the viability of the operation.

2.3 APPROVALS REQUIRED

The following approvals and licences would be required for the Project.

1. Development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* is being sought. As the Project is classified as State significant development in accordance with Clause 7 of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011*, the application will be assessed by the Department of Planning, Industry and Environment. Due to the level of community opposition to the Project, the outcomes of this assessment, draft conditions of consent and a recommendation will be referred to the Independent Planning Commission to determine the application.
2. The Quarry currently operates in accordance with Environment Protection Licence (EPL) 1879 issued under the *Protection of the Environment (Operations) Act 1994*. Following approval of the Project, EPL 1879 would be varied to account for proposed ongoing activities.
3. A Water Access Licence will be required under the *Water Management Act 2000* to account for groundwater 'taken' as the Quarry is developed. The required allocation will vary over time but is estimated to reach a peak of 642ML per annum. Water would be sourced in accordance with the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*. All surface water used for the Project would be within the Maximum Harvestable Right Dam Capacity of the land and therefore a Water Access Licence for surface water take is not required.

2.4 GEOLOGY AND RESOURCE

2.4.1 Regional and Local Geological Setting

A Geological Assessment (presented as Appendix 5 of the EIS) confirms the known regional geological setting (displayed in **Figure 3**) that comprises Mt Johnstone Formation overlain by Patterson Volcanics which is the current target of extraction. Drilling has confirmed the presence of the Seaham Glacial Beds overlying the Patterson Volcanics. The Nerong Volcanics outcrop to the north of the Quarry. A fault called the Glenoak fault crosses the southeast corner of the Quarry Site.

The drilling program described in the Geological Assessment confirms the mapped regional sequence and Quarry Site geology including the composition of the Mt Johnstone sediments (predominantly fine-grained mudstone and sandstone) Patterson Volcanics (ignimbrite) and Seaham Glacial Beds (sandstone, mudstone and conglomerate). The ignimbrite of the Paterson Volcanics are up to 60m thick but narrow to the east and west of the Quarry Site. The base of this unit dips to the southeast with the unit continuing past the Glenoak fault. A geological cross-section indicating the dip in the ignimbrite and thickening of the overlying Seaham Glacial Beds to the southeast is displayed in **Figure 4**.

The northern side of the Hunter River supports a carboniferous rock which is separated from the younger Coal Measure geology to the south by a fault system, known as the Hunter Thrust. The area is highly faulted which has cut off the geological unity abruptly.

2.4.2 Resource

The geological model has been used to estimate the total available resource (based on the topography at surface to the base of the ignimbrite). A summary of these estimates is provided in **Table 6**. The total volume to the base of the ignimbrite in the pit area is 39.7 million bank cubic metres. This figure is the indicated mineral resource under the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves ("JORC code") and is included for the purposes of compliance with the JORC code.

The indicated mineral resource does not consider production factors such as amended pit floor plans, poor quality material, production losses or overburden amounts. The overburden volume based on drill hole lithology depth is 2.021 million bank cubic metres.

Based on the information obtained during the drilling program in 2014, it is concluded that there are 78.1 million tonnes of ignimbrite, sandstone and conglomerate resource in the relevant resource areas.

Table 6
Production Resource Tonnage

JORC Classification	Type	Cubic metres (x'000)	Tonnes (x'000)	Reason for classification
Proven reserve	Overburden	4		The drill holes and interpreted basement for earlier work indicate a body of Ignimbrite dipping to the south east. A loss factor of 10% is used here as most material is sold.
	Sandstone		83	
	B Grade		88	
	Ignimbrite		1,465	
Sub total			**1,636**	
Measured resource	Overburden	2016		This is for the resource below RL 30, the current approved limit and the extension of the pit to the south.
	Sandstone		7,182	
	Conglomerate		12,953	
	Sandstone		2,134	
	B Grade Ignimbrite		54,197	
Sub total			**76,466**	
Source: Geology, Drill Results and Resources prepared by Hanson 2014 (Appendix 5 of EIS)				

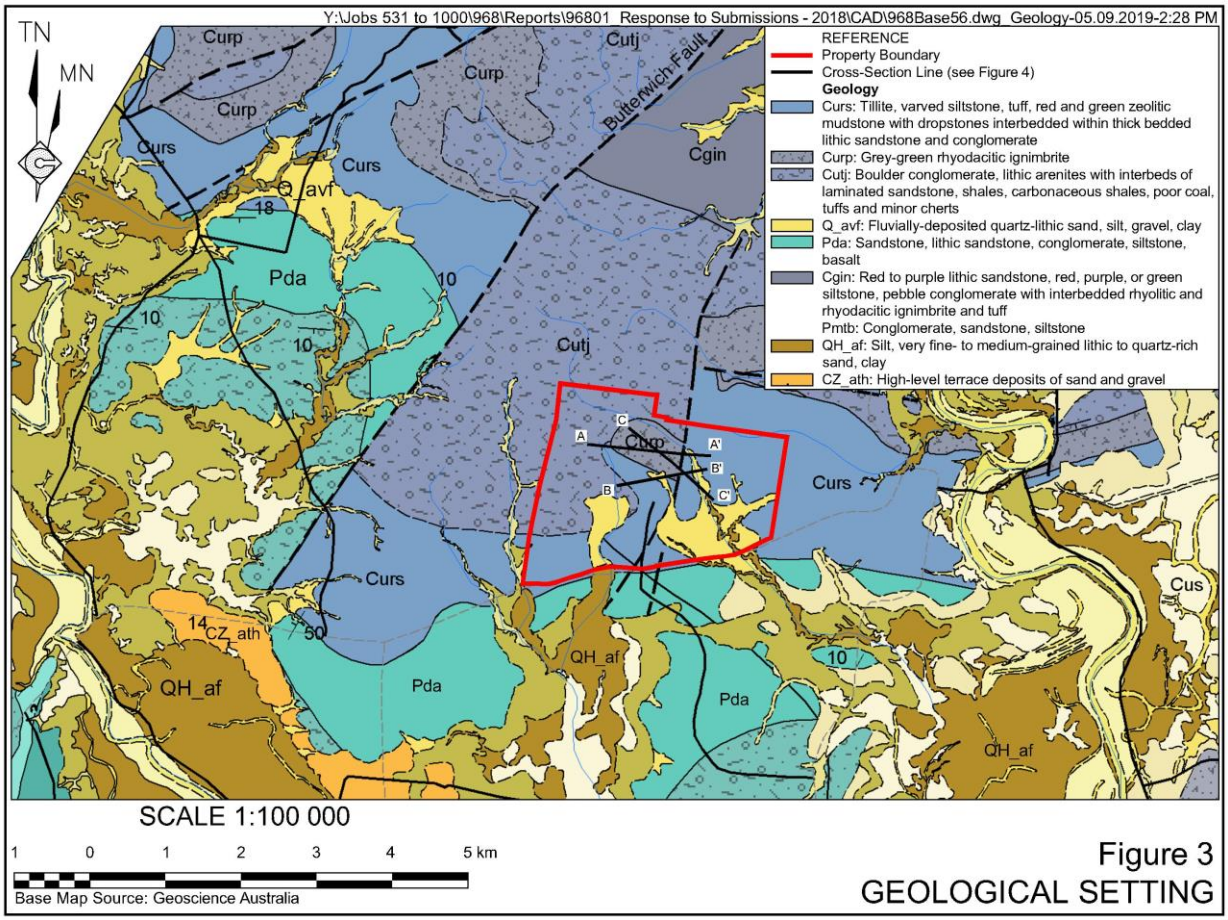

Figure 3
GEOLOGICAL SETTING

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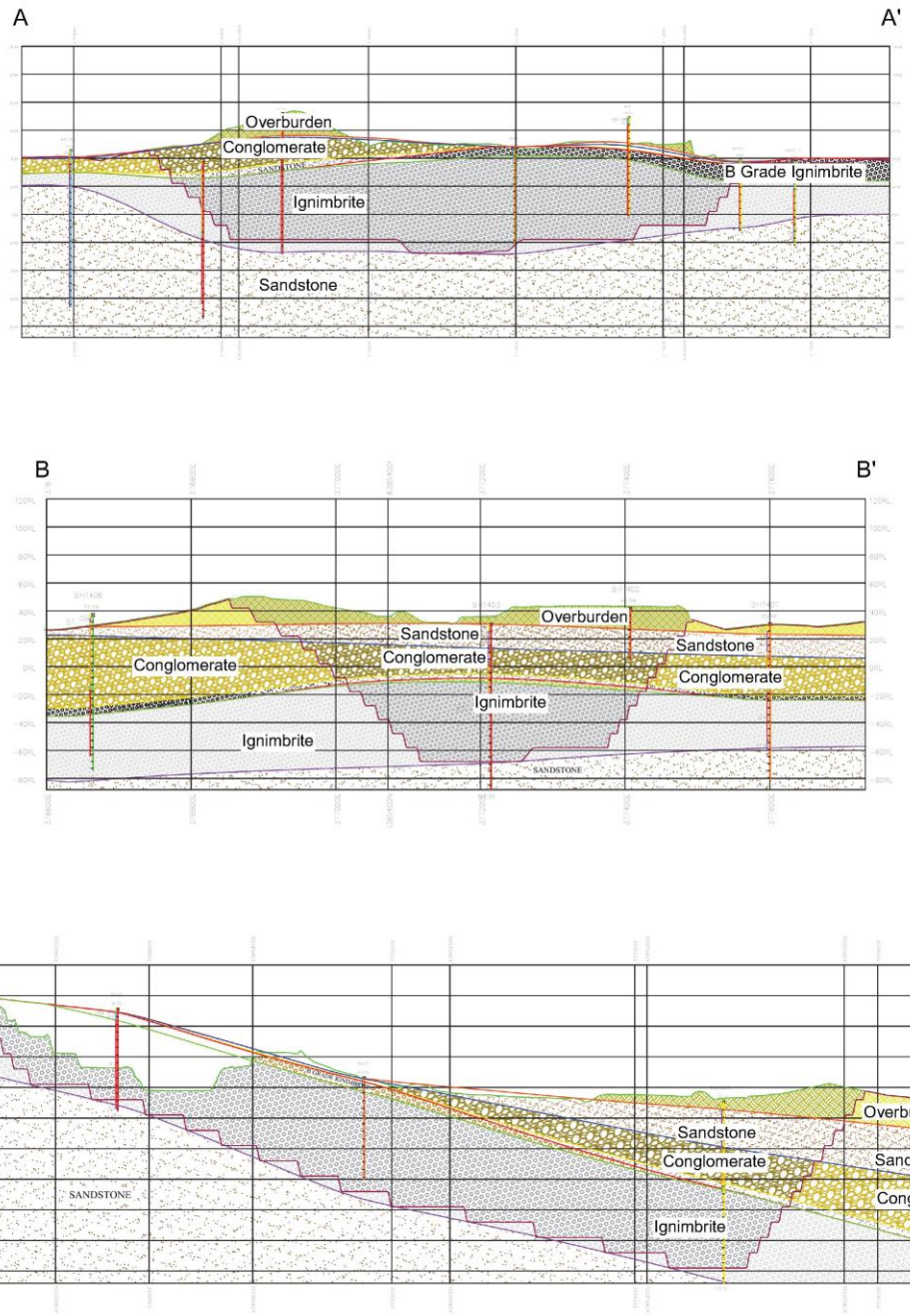


Source: Hanson Australia Pty Ltd

Figure 4
GEOLOGICAL
CROSS-SECTIONS

2.5 PRODUCTS

The Quarry would continue to supply products to a range of clients and applications, though principally for the production of concrete. Applications for Quarry products vary and Hanson maintains the flexibility to address the many needs of the construction, infrastructure and landscaping industries in the Port Stephens, Maitland, Newcastle and broader region as well as between the Quarry and Sydney.

The products that would be produced at the Quarry would remain the same as those currently being produced, including the following.

- Concrete grade aggregate – for concrete production and eventual use in residential commercial and infrastructure construction.
- Fill materials – for bulk earthworks and landscaping.
- Manufactured sand – an alternative to natural sand in concrete production.
- Precoated aggregates – for road construction and maintenance.
- Road base – for road and other infrastructure construction and maintenance.
- Gabion, armour rock and ballast – for marine development, retaining walls and railway construction.
- Drainage materials – for use in highways, residential and other infrastructure development.
- Other products shaped to meet client specifications and requirements.

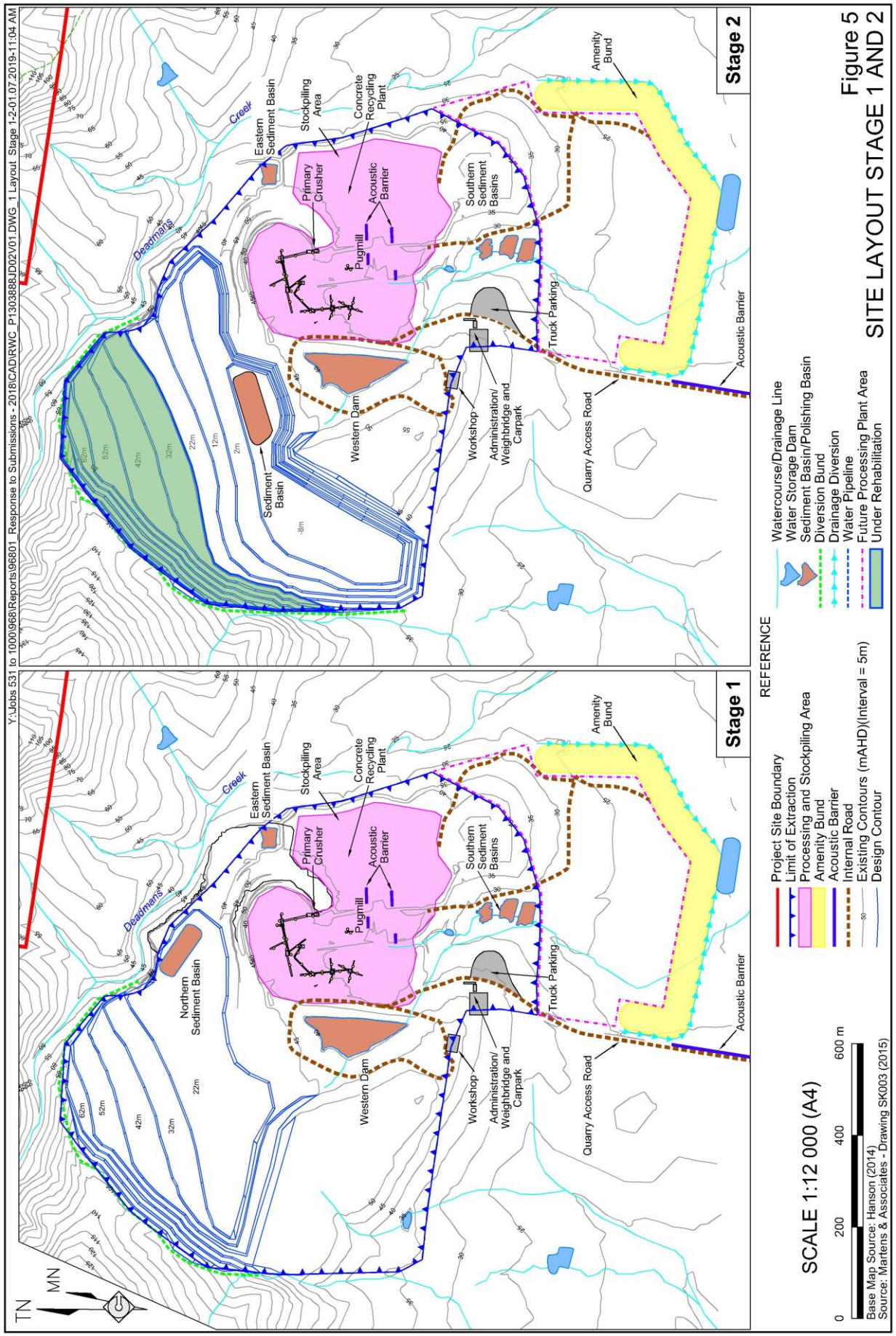
2.6 STAGED DEVELOPMENT OF THE QUARRY

Development of the Quarry would occur in five broad stages to maximise the extraction of available ignimbrite. These are indicative long-term development plans and during the life of the Quarry may vary in response to client demand and requirements, localised geology and market conditions. Indicative staging of operations is described in the following subsections and presented in **Figures 5** to **7**.

Quarry planning occurs continually, but generally on a 12-month basis, to identify progressive development targets, ensure consistency with the broader long-term plans, ensure safe access to operating areas, for overburden management and to identify where areas have reached terminal development and can begin being rehabilitated.

However, the following general limits would apply to the extraction area of the Quarry.

- Lateral development would be limited to an area of approximately 78.5ha.
- A 50m buffer from Deadman's Creek would be retained.
- The depth of extraction would continue to approximately -72m AHD.
- The Quarry would be developed as a series of broad operating benches that run generally east to west with benches on the southern, eastern and western boundaries developed much closer together.
- Operating faces would be developed to a height of between 10m and 12m.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Stage 1
Stage 2
Creek
Deadmans
Northern Sediment Basin
Eastern Sediment Basin
Sediment Basin
Stockpiling Area
Concrete Recycling Plant
Primary Crusher
Acoustic Barrier
Pugmill
Southern Sediment Basins
Western Dam
Workshop
Administration/ Weighbridge and Carpark
Truck Parking
Quarry Access Road
Amenity Bund
Acoustic Barrier
TN
MN
REFERENCE
Project Site Boundary
Limit of Extraction
Processing and Stockpiling Area
Amenity Bund
Acoustic Barrier
Internal Road
Existing Contours (mAHD)(Interval = 5m)
Design Contour
Watercourse/Drainage Line
Water Storage Dam
Sediment Basin/Polishing Basin
Diversion Bund
Drainage Diversion
Water Pipeline
Future Processing Plant Area
Under Rehabilitation
SCALE 1:12 000 (A4)
0
200
400
600 m
Base Map Source: Hanson (2014)
Source: Martens & Associates - Drawing SK003 (2015)
Figure 5
SITE LAYOUT STAGE 1 AND 2

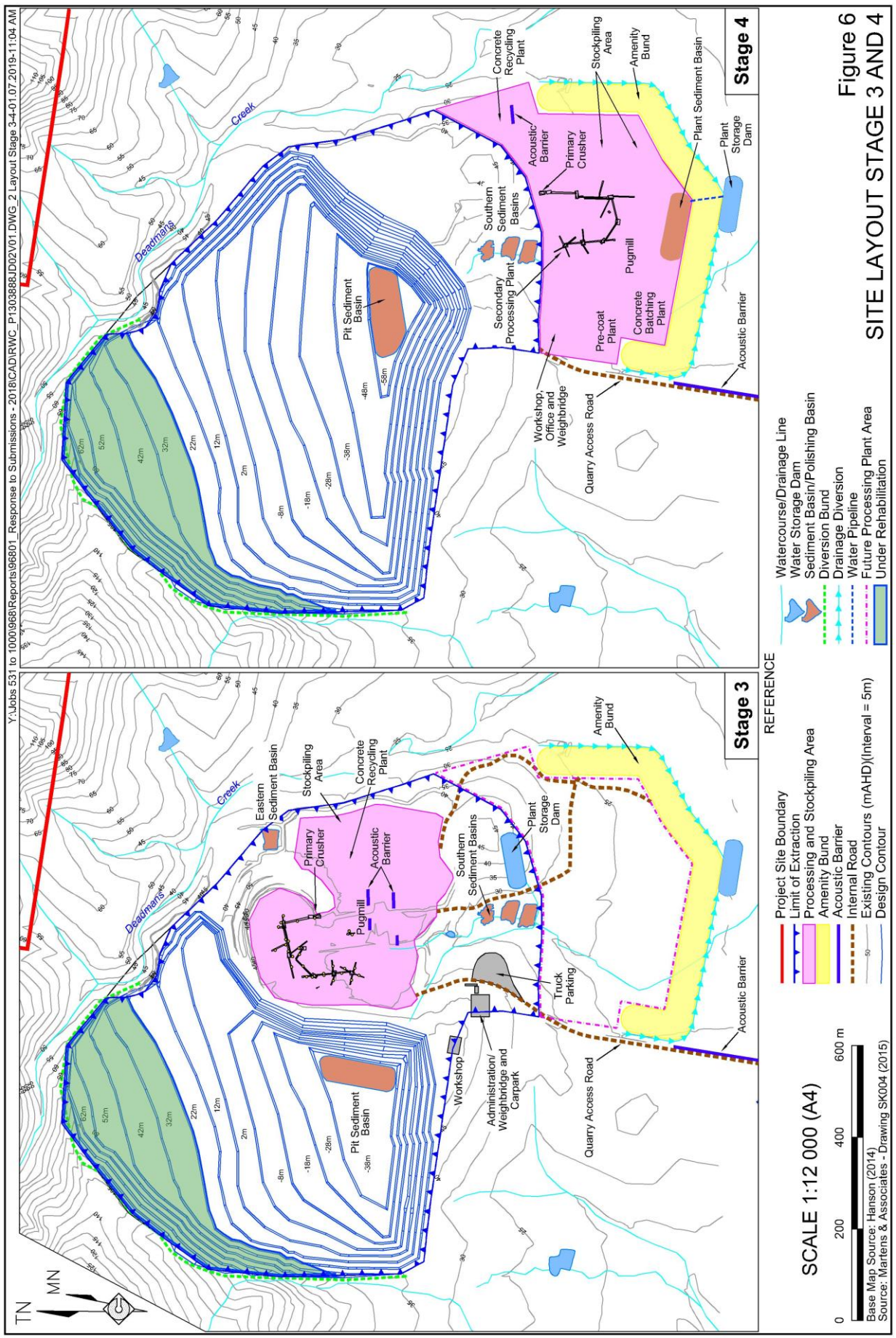
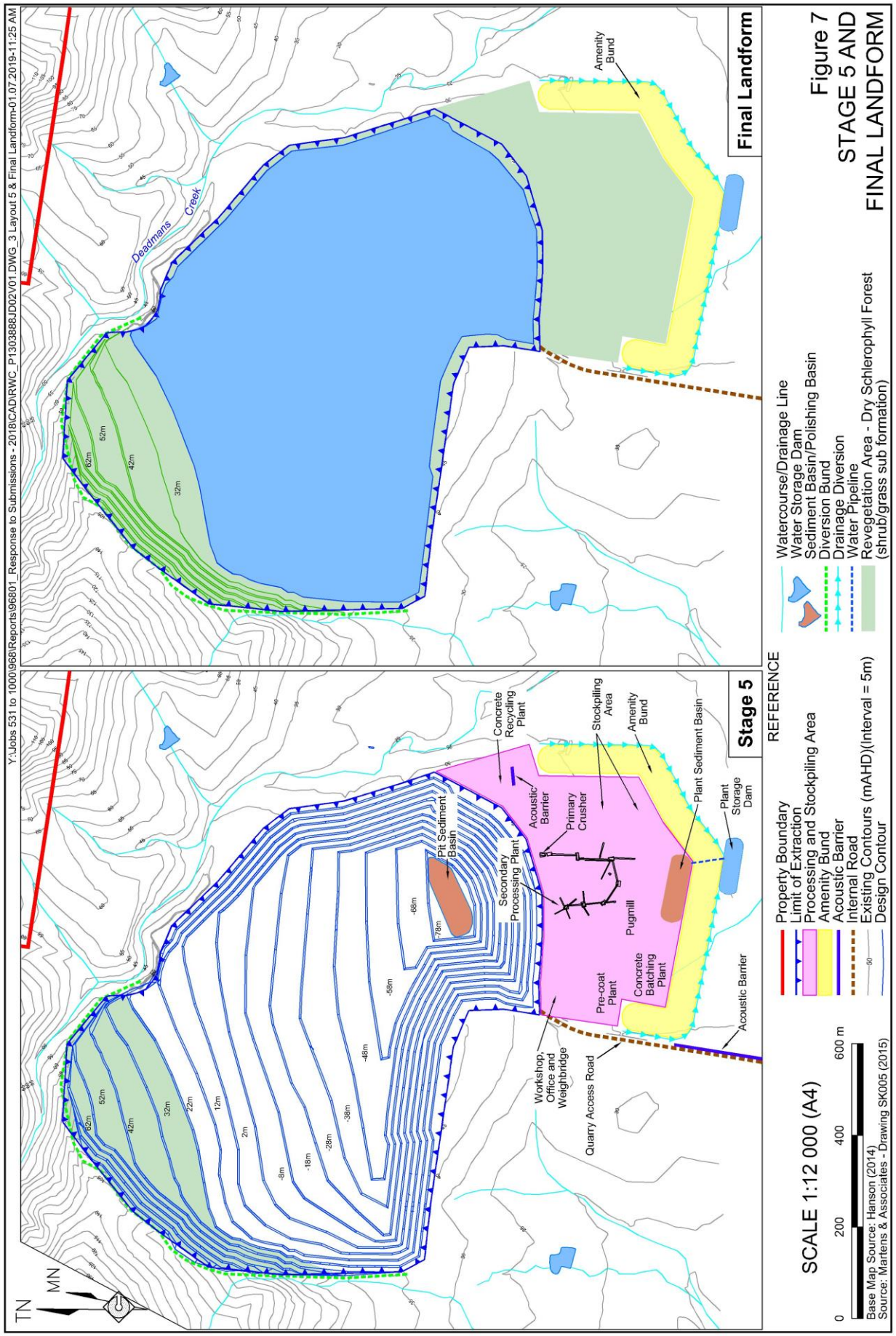


Figure 6
SITE LAYOUT STAGE 3 AND 4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Final Landform
Stage 5
Deadmans Creek
Amenity Bund
Concrete Recycling Plant
Stockpiling Area
Plant Sediment Basin
Plant Storage Dam
Acoustic Barrier
Primary Crusher
Pit Sediment Basin
Secondary Processing Plant
Pugmill
Pre-coat Plant
Concrete Batching Plant
Workshop, Office and Weighbridge
Quarry Access Road
TN
MN
REFERENCE
Property Boundary
Limit of Extraction
Processing and Stockpiling Area
Amenity Bund
Acoustic Barrier
Internal Road
Existing Contours (mAHD)(Interval = 5m)
Design Contour
Watercourse/Drainage Line
Water Storage Dam
Sediment Basin/Polishing Basin
Diversion Bund
Drainage Diversion
Water Pipeline
Revegetation Area - Dry Schlerophyll Forest (shrub/grass sub formation)
SCALE 1:12 000 (A4)
0
200
400
600 m
Base Map Source: Hanson (2014)
Source: Martens & Associates - Drawing SK005 (2015)
Figure 7
STAGE 5 AND FINAL LANDFORM

The following subsections describe the staged development of the Quarry.

2.6.1 Stage 1

The initial stage (**Figure 5**) involves expansion of the western section of the existing extraction area towards the south and extends existing benches running southwest to northeast and enlarges the Quarry floor at an elevation of approximately 22m AHD. Topsoil and overburden salvaged during this stage would be used to develop an amenity bund at the southern end of the final disturbance area.

Quarry infrastructure including that in the Processing and Stockpiling Area, workshop, administration and truck parking areas would continue in the existing locations.

Water management would rely on sumps in the Quarry floor and the existing Western Dam, Eastern and Southern Sediment Basins.

During Stage 1, revegetation activities would focus on the Amenity Bund, once constructed, so that this area would be useful as a visual shield for minor glimpses of the operating areas that may be available from residences and traffic along Clarence Town Road.

2.6.2 Stage 2

Stage 2 (**Figure 5**) further expands from the existing western section of the Quarry to the south to reach the southwestern extraction area boundary and would result in development of seven broad benches on the western extent of the extraction area. The Quarry floor would be developed to an elevation of approximately – 8m AHD.

Topsoil salvaged during site preparation would be temporarily stockpiled or applied directly to rehabilitate the benches above approximately 20m AHD, which would have reached terminal development.

Quarry infrastructure including that in the Processing and Stockpiling Area, workshop, administration and truck parking areas would continue in the existing locations.

Water management would rely on sumps in the Quarry floor and the existing Western Dam, Eastern and Southern Sediment Basins.

Rehabilitation of terminal benches would commence from this stage and continue for the life of the Quarry with self-sustaining native vegetation communities and derived native grasslands planted in accordance with an approved Biodiversity and Rehabilitation Management Plan.

2.6.3 Stage 3

Stage 3 (**Figure 6**) expands the Quarry along the southern extraction area boundary towards the existing Processing and Stockpiling area. The Western Dam would be removed during this stage and the Quarry developed to an elevation of approximately -38m AHD.

Topsoil and overburden salvaged during this stage would be directly applied to terminal benches for progressive rehabilitation.

Quarry infrastructure including that in the Processing and Stockpiling Area, workshop, administration and truck parking areas would continue in the existing locations. During Stage 3, construction of the relocated Processing and Stockpiling Area would be commenced to the south of the existing operational areas.

Water management would rely on sumps in the Quarry floor and the existing Eastern and Southern Sediment Basins.

Progressive rehabilitation of terminal benches would continue during this stage in accordance with an approved Biodiversity and Rehabilitation Management Plan.

2.6.4 Stage 4

Stage 4 (**Figure 6**) involves widening and deepening the extraction area towards the eastern extraction boundary. The Quarry would be developed to an elevation of approximately -58m AHD during this stage.

Topsoil and overburden salvaged during this stage would continue to be directly applied to terminal benches for progressive rehabilitation.

All Quarry infrastructure would be relocated at the commencement of this stage including the Processing and Stockpiling Area, workshop, administration and truck parking areas

Water management would rely on sumps in the Quarry floor and the existing Southern Sediment Basins. A sediment basin would be constructed within the relocated Processing and Stockpiling Area.

Progressive rehabilitation of terminal benches would continue during this stage in accordance with an approved Biodiversity and Rehabilitation Management Plan.

2.6.5 Stage 5

The final stage of development (**Figure 7**) realises the final form of the Quarry. This stage expands the Quarry to the extent of the proposed extraction boundary and to the final elevation of – 78m AHD.

Overburden salvaged during this stage would continue to be directly applied to terminal benches for progressive rehabilitation.

All Quarry infrastructure would continue to be used in locations established in Stage 4.

Water management would rely on sumps in the Quarry floor and a sediment basin within the Processing and Stockpiling Area.

Progressive rehabilitation of terminal benches would continue during this stage in accordance with an approved Biodiversity and Rehabilitation Management Plan.

2.6.6 Final Landform

The Final Landform (**Figure 7**) would indicatively involve progressive inflow and capture of water in the extraction area through groundwater seepage or rainfall. Modelling of predicted groundwater inflows, rainfall and evaporation indicates that an equilibrium water level would be reached at approximately 30m AHD. This process would require over 100 years and therefore it is expected that the water would slowing inundate the rehabilitated landform.

All infrastructure and buildings within the landform would be decommissioned, demolished and removed unless an ongoing use is approved post-approval. Sealed roads would remain in the landform to provide ongoing access as well as an access track to the extracted areas of the Quarry. All other internal roads would be ripped and revegetated. Ongoing access would be required for rehabilitation monitoring and management.

The final landform of the Processing and Stockpiling Area would be profiled and covered with a layer of available topsoil. A suitable growth medium may be imported to assist with rehabilitation in this location. The Amenity Bund would remain in the landform as well as associated drainage and a water storage dam.

2.7 SITE PREPARATION AND SOIL MANAGEMENT

Very little construction activities would be required during Stage 1 and Stage 2 of development as Hanson would continue to utilise the existing site infrastructure and all fixed processing equipment would remain in generally the same configuration. The only addition in these stages would be the inclusion of a mobile crushing unit once concrete recycling commences. During Stage 3, the surface for the relocated Processing and Stockpiling Area would be prepared so that construction activities can commence.

Figure 8 presents the staged vegetation clearing for the development of the Quarry which would occur to match the proposed staged development of the Quarry described in Section 2.6. Land preparation and vegetation clearing would only occur as needed.

Vegetation clearing would be undertaken using a bulldozer or hydraulic excavator and the cleared vegetation stockpiled separately for future application in rehabilitation areas.

During vegetation clearing, the following protocol would be followed.

- A pre-clearance survey of vegetation would be undertaken by an ecologist or other person trained in identifying habitat features and threatened flora and fauna.
- The pre-clearance survey would involve identification and marking of hollow-bearing trees in the vegetation to be removed.
- Vegetation clearing would be supervised by an ecologist or person trained to identify and treat injured fauna. Hollow-bearing trees would be carefully felled to allow any fauna occupying the hollows to escape prior to removal.
- All hollows would be checked by an ecologist or person trained to identify and treat injured fauna and the hollows would be separated from the remaining vegetation.

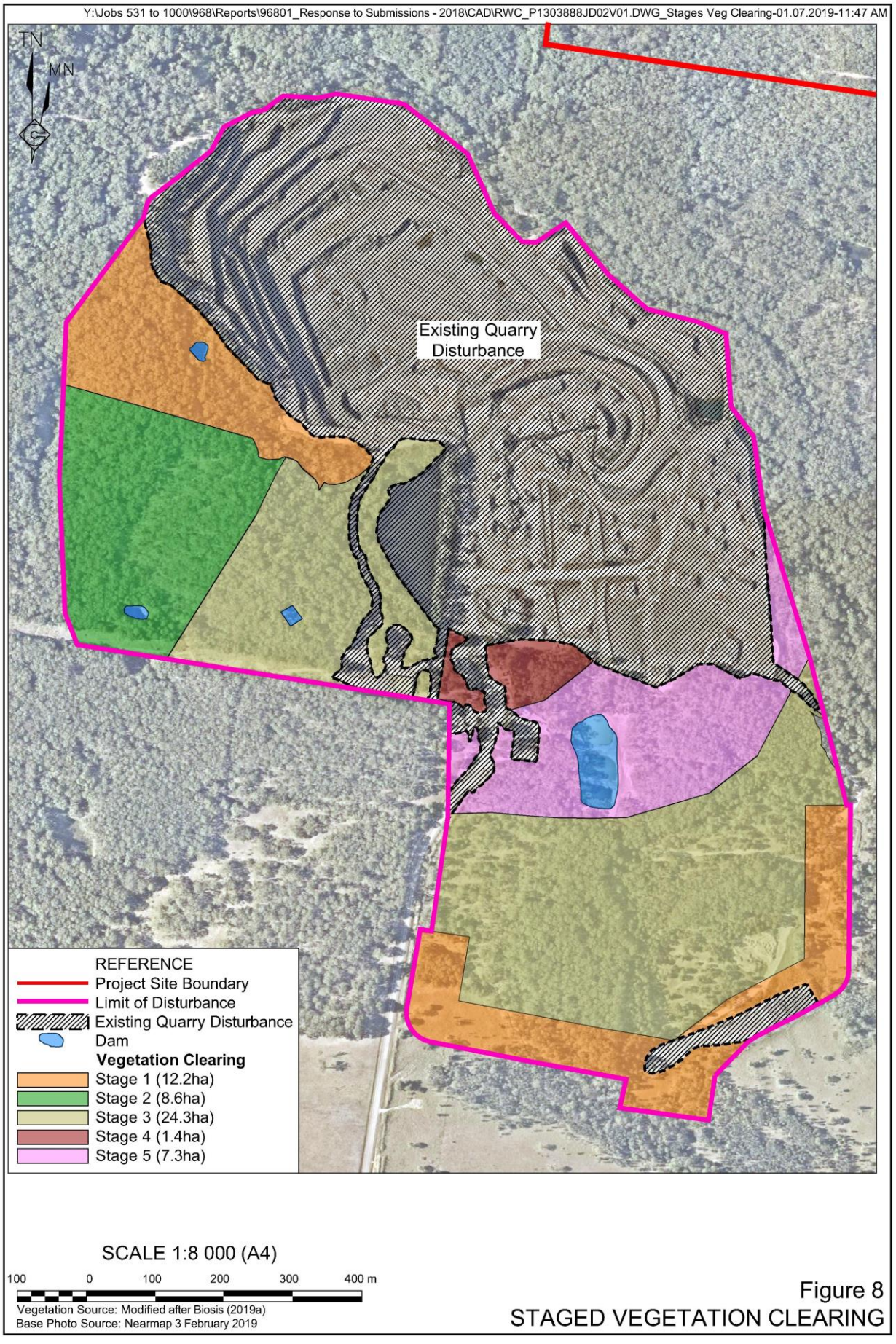


Figure 8
STAGED VEGETATION CLEARING

- Hollows would be stored and progressively re-hung in remnant vegetation by a suitably-qualified person in a designated area outside of the proposed disturbance areas for the Quarry.
- Cleared vegetation would be stockpiled, mulched (if needed) and applied to areas undergoing rehabilitation.

This protocol would be further defined in a Biodiversity and Rehabilitation Management Plan.

All topsoil and subsoil stripped during site preparation would be temporarily stockpiled or applied directly to areas undergoing revegetation including the Amenity Barrier or terminal benches within the extraction area.

2.8 EXTRACTION OPERATIONS

Extraction would continue to occur using standard drill and blast, load and haul methods. Blasting would generate between 25 000t and 100 000t of raw material for each blast event. Blasted rock would be loaded to haul trucks by excavator or front-end loader and hauled from the extraction area to the primary crushing equipment.

Blasting would be limited to at most weekly blast events. Blasting may need to be repeated in the event of a misfire, however this is rare.

2.9 OVERBURDEN MANAGEMENT

Overburden generated during extraction activities would continue to be temporarily stockpiled in the Quarry floor unless it is directly applied for the construction of the Amenity Barrier or in development of the final landform on terminal benches. It is anticipated that the majority of overburden materials would be blended to develop fill or road base products.

2.10 PRODUCT PROCESSING AND STOCKPILING

2.10.1 Processing Equipment and Layout

Stage 1, Stage 2 and Stage 3 of operations would utilise the existing processing equipment and configuration. During Stage 3 a relocated Processing and Stockpiling Area would be constructed with processing and stockpiling commencing in this area during Stage 4 of operations (see **Figure 6**).

From the commencement of Stage 1 of operations, all processing equipment would be enclosed.

The only additional equipment to be included from Stage 1 would be a mobile crushing unit that would be used on a campaign basis for recycling concrete washout materials. However, as this activity would be limited to 20 00tpa, the mobile crushing equipment may not remain at the Quarry at all times.

However, the precise layout and equipment may be altered in response to advances in technology, building design, stockpile layout and weighbridge location.

2.10.2 Pre-Coat Operations

Pre-coat operations involve the application of a combination of diesel hydrocarbon and bituminous film to crushed aggregate to give the material an adhesive coating that benefits application in road construction and maintenance.

It has been estimated that 4% of the existing Quarry production is pre-coated before despatch and the proportion of material pre-coated in ongoing operations is not likely to change.

Hanson upgraded the existing pre-cost plant in January 2016 with the existing plant displayed in **Plate 1**.

Plate 1 Existing Pre-Coat Plant
(Photo Ref: E968B_014)

The existing pre-coat plant would continue to be used for Stage 1 to Stage 3 of operations. A summary of the design and operation of the proposed pre-coat plant (to be constructed for Stage 4 of operations) is as follows.

- The pre-coat feeder bin would have a capacity of approximately 20t and the precoated material bins (awaiting loading and despatch) would have a capacity of approximately 200t.

- Bitumen would be stored in double skin 62 000L storage tank or a mobile self-bunded tank of similar capacity. Diesel would be stored separately in a self-bunded storage tank.
- Pre-coat operations are to run at ambient temperatures only (that is, not a very how days). This would limit potential odorous impacts.
- Operational components of the pre-coat plant would be located on concrete hardstand. All storage tanks would be self-bunded and/or located within concrete bunded areas. The capacity of the bunded areas and sump would be of sufficient volume to contain 110% of the total potential storage capacity. The bitumen storage area would be located in a dedicated roofed area so that rainfall is diverted away and the capacity of the bunding to contain stored materials is preserved.
- An oil and water separator and oil recycling system would also be located with the plant.
- The pre-coated materials would be stored within dedicated concrete hard standing bins with road trucks loaded directly from these bins. No additional stockpiles would be used outside these locations.
- Any rainfall captured within hardstand areas of the pre-coat plant would be captured and directed to the oil and water separator. All concrete hardstand and material bins are designed with a mild slope that would direct any captured surface water towards the oil and water separator. The oil and water separator would operate on a float switch.
- All hazardous materials stored within the Quarry Site are appropriately managed with diesel fuel stored in above-ground tanks with roofing and appropriate bunding (110% of the total diesel tank capacity).

2.11 PRODUCT TRANSPORTATION

2.11.1 Transportation Route

Heavy vehicles involved in product transportation would continue to access the Quarry using the private Quarry access road that intersects with Brandy Hill Drive and Clarence Town Road. The access road is sealed between this intersection and the weighbridge and is maintained by Hanson.

The preferred transportation route for Quarry products is displayed in **Figure 9**. This route was determined in consultation with officers from Port Stephens Council and Maitland City Council and reflects the preference of both Councils.

The transport route via Raymond Terrace to the Pacific Highway would be the most commonly used route. This route includes Brandy Hill Drive which was originally constructed as a haul road for the Quarry when it was first developed. Vehicles using this route would turn right from Brandy Hill Drive onto Seaham Road before continuing to the intersection with Adelaide Street. Trucks would turn left at this traffic-light controlled intersection and then right onto Richardson Road. Vehicles would pass through two roundabouts before turning right onto the Pacific Highway. This route is an alternative to the existing route to the Pacific Highway via the roundabout at Heatherbrae, however, has been selected as it avoids schools and built up areas of Raymond Terrace, as well as the possibility of delays at the roundabout at Heatherbrae.

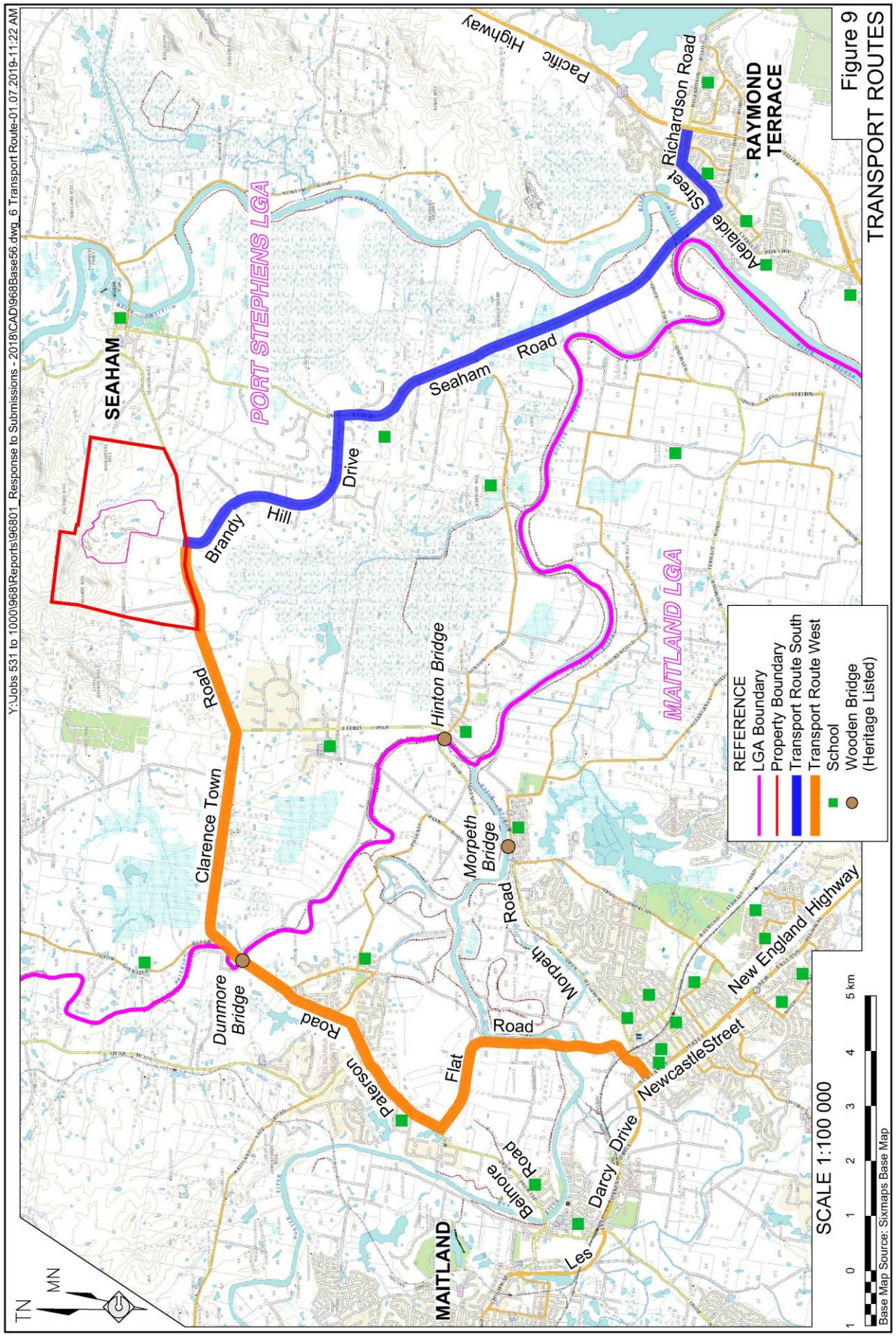


Figure 9
TRANSPORT ROUTES
Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\968Base56.dwg_6 Transport Route-01.07.2019-11:22 AM
SEAHAM
PORT STEPHENS LGA
MAITLAND LGA
RAYMOND TERRACE
MAITLAND
Brandy Hill Drive
Seaham Road
Pacific Highway
Richardson Road
Adelaide Street
Clarence Town Road
Dunmore Bridge Road
Paterson Flat Road
Hinton Bridge
Morpeth Bridge Road
Morpeth Road
New England Highway
NewcastleStreet
Belmore Road
Darcy Drive
Les
REFERENCE
LGA Boundary
Property Boundary
Transport Route South
Transport Route West
School
Wooden Bridge (Heritage Listed)
SCALE 1:100 000
0 1 2 3 4 5 km
Base Map Source: Sixmaps Base Map
TN
MN

The transport route via East Maitland would utilise Clarence Town Road and Paterson Road before turning left on to Flat Road and follow on to Pitnacree Road. Vehicles would turn right on to Melbourne Street at a traffic-light controlled intersection before accessing the New England Highway. This route is an alternative to a second access to the New England Highway via Belmore Road and High Street, Maitland and is preferred as it avoids the suburban area of Lorn and the built-up areas of Maitland.

Figure 9 also includes the locations of schools in the vicinity of the transport routes and heritage listed wooden bridges which have weight restrictions for heavy vehicle access and are limited to single lanes (one direction of travel at a time with vehicles required to give way once another is on the bridge). Loads on these bridges are limited to 50 tonnes and only a single heavy vehicle is to be on the bridges at any one time.

The transport route that will be incorporated into the following documents.

- Transport Management Plan.
- Drivers Code of Conduct.
- Driver induction procedures.

Hanson estimate that product delivery would on average be split unevenly between these routes, with 75% of vehicles accessing the Pacific Highway via Raymond Terrace and 25% accessing the New England Highway via East Maitland. However, product despatch may be required at numerous locations both locally and regionally. Therefore, there may be occasions when product transport is required to use alternative routes.

2.11.2 Traffic Levels

The determination of traffic levels for the Project has been informed by an assessment of the capacity of the road network and an assessment of road noise generation.

Product despatch from the Quarry would be limited to the following levels.

- No more than 301 laden loads between 7:00am and 10:00pm.
- No more than 58 laden loads between 10:00pm and 7:00am.

Night time despatch (between the hours of 10:00pm and 5:00am) would occur on a maximum of 20 days per calendar year. Community members who have registered for notifications would receive seven days' notice of any night time product despatch activities.

It should be noted that one laden load requires two movements or vehicle trips (that is, an inbound movement and an outbound movement).

Once operating, the concrete batching plant would require a maximum of 11 laden deliveries per day (22 movements) of sand and cementitious materials which would be included in the above traffic levels. A range of ancillary transport movements would be required for the supply of consumables, technical services and other supplies. As these movements would not be regular, they are not included in the proposed traffic limits.

In addition, it is anticipated that light vehicle access to the Quarry would include 30 vehicles arriving at the Quarry and 30 vehicles departing each day. An additional five visitors may attend the Quarry on any given day.

Transport records indicate that the peak despatch requirements for the existing Quarry operation was 32 laden loads in one hour on 7 August 2013. Hanson proposes to impose a limit on hourly transport activities of 30 laden loads per hour. Assessment of road traffic noise generation has indicated the following hourly transport rates would be acceptable with the proposed traffic generating no more than a 2dB increase in noise levels. Therefore the change in noise would be at a level that is not perceptible to the average human ear.

- 5:00am to 6:00am - 9 laden loads per hour.
- 6:00am to 7:00am - 12 laden loads per hour.
- 7:00am to 10:00pm - 30 laden loads per hour.
- 10:00pm to 5:00am - 5 laden loads per hour.

2.11.3 Truck Types

Transport activities would continue to predominantly require the use of 19m/26m Truck and Dog or B-Double vehicles, however smaller configurations or rigid vehicles may also be used from time to time.

Access to the New England Highway via Maitland is limited due to the presence of heritage wooden bridges that have a load limit of 50t for any heavy vehicles.

Use of large vehicles and configurations may be required and would be used only in accordance with the approved limits on the proposed routes. None of the routes are currently approved for higher mass vehicle activities.

Hanson would seek opportunities to reduce road degradation impacts through improvements to road truck technology. The Company currently implements GPS tracking on all Hanson-managed trucks that allow tracking of truck location, speed as well as more detailed information such as torque, gear and brake use.

2.11.4 Transport Infrastructure and Road Maintenance Contributions

An assessment of road safety along the transport route between the Quarry and Raymond Terrace has identified that all intersections have adequate sight distance and clearance and that the geometry of the route does not create hazards for heavy vehicle access (see the Traffic Impact Assessment prepared by Intersect and provided as Appendix 8 of the EIS and additional assessment presented in Section 4.1 and 4.2). However, the local community has raised concerns regarding the frequency of truck travel on the routes and the increased risk of a traffic incident.

While Hanson is confident that driver behaviour would be adequately managed through the Drivers Code of Conduct and Transport Management Plan, the construction of a shared pathway on Brandy Hill Drive has been identified as additional infrastructure that would improve road safety for residents along this road. Heavy vehicles from the Quarry currently contribute

approximately 17% of daily traffic on Brandy Hill Drive and at peak production under the Project would contribute at most 30% of total vehicles. As all vehicles using Brandy Hill Drive present a safety risk, Hanson should not be solely responsible for funding of this infrastructure. A contribution towards this infrastructure is proposed to be made under the terms of a Voluntary Planning Agreement (VPA) with Port Stephens Council.

In addition, it has been recognised that Brandy Hill Drive, Seaham Road and Clarence Town Road are used as a private school bus route, with buses stopping along the road to pick up and drop off school students in the vicinity of their homes. Discussions with local community members has identified the need for additional bus bays that allow buses to more effectively pull off the road to allow other vehicles to pass. A contribution towards additional bus bays along the transport route has also been discussed with Port Stephens City Council.

Hanson is currently providing a contribution to Port Stephens Council for road maintenance and upgrade along the transport route between the Quarry and the Pacific Highway at Raymond Terrace. It is proposed that these contributions would continue under the expansion Project It is estimated that over the life of the Project, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions in this manner.

Road maintenance contributions would also be paid to Maitland City Council in accordance with the *Maitland City Wide Section 94 Contributions Plan 2016*, with the quantum of the contributions based on annual weighbridge records and distance travelled on Council-funded roads.

2.12 CONCRETE RECYCLING

Recycling of concrete material would involve the following key activities.

- Import and stockpiling of no more than 20 000t of unused concrete or hardened concrete washout material.
- Loading of material for processing using a frontend loader or hydraulic excavator.
- Campaign crushing using a mobile crushing unit.
- Temporary storage of processed materials prior to relocation for further processing.
- Further processing may consist of simple blending, crushing and screening, stabilisation or a combination of all processes, depending on raw feed characteristics and the desired product specification.

The recycled concrete product would be used primarily in road base products to reduce the amount of raw materials used making this product thereby reducing waste going to landfill.

The proposed location of the concrete recycling plant within the Quarry expansion is shown in **Figures 5** to **7**.

Concrete washout material would be transported to the Quarry by trucks returning from concrete plants (i.e. backloading) and therefore additional transportation activities area not estimated to occur.

Incoming concrete washout material volumes would vary over the short and long term, as does product demand. To operate efficiently, the available recycling storage area would be large enough to temporarily store and process raw feed, and to temporarily store the crushed materials. Stockpiles would not be located within five meters of hazard areas, including likely areas of high velocity water flows such as waterways, paved areas and driveways.

Only solid concrete washout material would be transported to the Quarry. Solid wash out is pre-classified as General Solid Waste (non-putrescible) under the EPA's Waste Classification Guidelines. Solid wash out does not require a licensed transporter and does not need to be tracked. However, solid washout material can only be transported and stored at a licensed facility. This would require a variation to the EPL 1879 for the Quarry.

Recovered aggregates are the final product of concrete recycling and are subject to a general exemption issued by the NSW EPA. Under these exemptions recovered aggregates and fines can be applied to land for road making activities, building, landscaping and construction works, without the need for a licence.

It is therefore considered beneficial to recycle washout material at the Quarry from where it can be directly incorporated into products.

2.13 CONCRETE BATCHING

Hanson proposes to establish a conventional concrete batching plant within the Quarry Site with the capacity to produce up to 15,000m^3 of concrete per annum.

Concrete batching would involve the following key activities.

- Receipt and storage of concrete raw materials (in designated aggregate bins, cementitious storage silos and tanks).
- Conveying of aggregates and sand to batching bins.
- Blending of concrete raw materials.
- Despatch of concrete to customers in concrete agitators.
- Washout of returning concrete agitators.

These activities would require the construction of aggregate bins, cementitious storage silos, a batching office and an additional staff amenities building. The location of the concrete batching plant within the relocated Processing and Stockpiling Area is presented in **Figure 7**. The exact configuration of the required infrastructure would be determined upon commissioning of construction.

Production of concrete would require the importation of the following materials on a regular basis.

- Internally sourced sand (most likely from the Central Coast Sand Quarry) would be delivered by road-registered trucks. This material would be stored in designated aggregate bins.

- Cement and flyash would be delivered in pneumatic tankers and stored in storage silos.
- Additives, such as admixtures, would be transported in road registered trucks and be stored in a designated and appropriately bunded storage area.

Coarse aggregates and manufactured sand would be sourced on-site and limit the need for delivery of this material.

Returned concrete materials would be recycled on-site using the proposed concrete recycling facilities described in Section 2.12. Washout of concrete agitators would occur in dedicated washout bays that would be entirely sealed with concrete to capture all material. The bays are constructed to ensure that concrete washout material remains in the dedicated bays until it is dried and relocated to the concrete recycling area.

A range of cementitious materials are used in concrete production as standard practice to improves the overall performance and quality of concrete. The most common of these materials is cement which is well known. Fly ash is a by-product of coal combustion in power stations and its use in concrete production provides for the beneficial use of what would otherwise be considered a waste material. It is standard practice for cementitious materials to be transported in pneumatically sealed tankers and transferred to storage silos via a pneumatic pressure system and hoses. **Plate 2** displays the tankers currently used by Hanson to transport these materials. The cementitious materials are added to the concrete agitator via a sealed delivery chute system.

(Source: Hanson)

Plate 2 Photo of Cementitious Material Tanker Unloading at a Hanson Concrete Production Facility

Construction of the concrete batching plant would occur from Stage 4 of operations (see **Figure 6**) and is anticipated to meet demand for on-site concrete production by this time, while also limiting the need to transport raw materials from the Quarry to an external batching plant location.

2.14 WASTE MANAGEMENT

2.14.1 Production By-products

The only production-related by-products of the Quarry would be overburden which would either be sold as product or stored within the Quarry Site. Overburden management is described in Section 2.9.

2.14.2 Non-Production Wastes

All non-production wastes would be removed from the Quarry Site by a licenced contractor to a facility licensed to receive these materials. No domestic wastes would be disposed of on site.

General domestic waste would be segregated into recyclable and non-recyclable materials.

General waste is placed in skip bins for collection. Recyclables would be collected less frequently or on an as needs basis. It is anticipated that the Quarry would also produce waste steel that would also be stored in skip bins and collected on an as needs basis.

Waste oil would be stored in a 3 000L self-bunded tank from which it would be collected and removed from site for disposal/reuse by a licenced contractor. It is expected that the waste oil tank would be collected once or twice a year. All routine maintenance consumables would be treated as general mixed solid waste.

2.15 WATER MANAGEMENT

2.15.1 Water Supply

A water source and supply assessment was prepared by Martens & Associates (see the Surface Water Assessment presented as Appendix 13 of the EIS – page 34) and presented the three water sources for the Quarry.

1. Surface runoff collected within the extraction area.
2. Groundwater inflow into the extraction area.
3. Harvested rainwater.

All surface runoff would be stored in dedicated clean water dams or sediment dams and remain within the Maximum Harvestable Rights Capacity of the land on which the Quarry is located. Therefore, Hanson does not need to licence the take of surface water based on the proposed water management system.

Groundwater inflow to the extraction area would occur below an elevation of approximately 30m AHD and involve seepage of water through the walls and floor of the extraction area where it would collect in sumps. Martens & Associates modelled groundwater inflow for the Groundwater Assessment completed for the EIS (see Appendix 13B of the EIS) and predicted that groundwater inflow would increase as the Quarry was progressively developed with a maximum inflow to the extraction area predicted to be 642ML per year by Stage 5 of operations. Groundwater that seeps into the extraction area would be used for on-site dust suppression or periodically discharged from the existing discharge locations nominated on Environment Protection Licence 1879 (North Sediment Dam 1, North Sediment Dam 2 and Polishing Dam 3).

The groundwater seepage would need to be licenced under the *Water Management Act 2000*.

2.15.2 Water Use

Water use at the Quarry is estimated to require up to 190ML per annum including the following (see Martens & Associates (2016a) – Table 22).

- Operational demand for moisture conditioning of products.
- Site demand for dust suppression, plant maintenance and vehicle washdown.
- Water demand from concrete batching activities from Stage 4 of operations.
- Evaporative losses.
- Staff amenities.

A detailed water balance assessment is presented as Section 4 of Martens & Associates (2016a).

2.16 INFRASTRUCTURE AND SERVICES

2.16.1 Site Buildings

The existing site infrastructure would be retained for use throughout Stages 1 to Stage 3 of operations. This includes the existing administration areas, offices and crib room facilities as well as the area designated for the weighbridge and the workshop.

As the majority of buildings in the administration area are demountable, it is expected that these would simply be relocated during construction of the relocated Processing and Stockpiling Area. The workshop and weighbridge would also be relocated from Stage 4 of operations.

2.16.2 Equipment

When operating at maximum production, Hanson anticipate utilising the following equipment.

- 4 x Front End Loaders – Komatsu WA500-6 or similar.
- 2 x Haul Trucks – Caterpillar 773B or similar.

- 3 x Excavators – Komatsu PC450 and PC600 or similar. A rock hammer attachment may be required from time-to-time to break up oversize material in the extraction area.
- Occasional use of a Grader for road maintenance.
- A Drill Rig to prepare for blast events.
- A Water Cart – Caterpillar 773B or similar.

A range of electric or diesel pumps would also be used on-site as required.

Mobile plant or fixed plant may be required to be replaced, upgraded or additional equipment purchased throughout the planned 30-year life of the Quarry. Any equipment that replaces the above would have the same or similar sound power levels to ensure consistency with the assessed acoustic outcomes for the Project.

2.16.3 Power and Lighting

Power would continue to be sourced via a 11Kv mains supply directly to the Quarry.

2.16.4 Fuel and Lubricants / Oils

Diesel fuel would continue to be stored on site in self-bunded above-ground tanks (nominally 20 000L in capacity) located adjacent to the pre-coat plant. When the processing infrastructure is relocated from Stage 4 of operations, the fuel tanks would also be relocated to be within this area.

All fuelling of mobile equipment would be conducted within a bunded, concrete hardstand area.

Chemicals, lubricants and greases would be stored within the workshop area in either self-bunded containers or within suitably contained and sealed areas. All chemicals used on site would be stored within the workshop area in designated storage areas and cupboards in accordance with relevant Australian Standards and manufacturers' specifications. Material safety data sheets would be accessible for all chemicals used / stored on site.

2.16.5 Sewerage and Effluent Disposal

Hanson would continue to use the existing septic tank system that is serviced on average monthly.

2.17 HOURS OF OPERATION

The proposed hours of operation are presented in **Table 7**.

Table 7
Proposed Operating Hours

Activity	Proposed Hours
Construction Works	Monday to Friday 7:00am to 6:00pm Saturday 7:00am to 5:00pm No operation on Sundays or public holidays
Blasting	Monday to Friday 9:00am to 5:00pm No blasting on Saturdays or Sundays or public holidays
Load and Haul	Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
Primary Crusher	Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
Secondary and Tertiary Crushing and Screening	Monday to Sunday - 24hrs
Sales and Product Despatch	Day time (5:00am to 10:00pm) - Monday to Sunday Night time (10:00pm to 5:00am) - Maximum of 20 nights per calendar year.
Maintenance	Monday to Sunday - 24hrs

Hanson has reviewed the proposed hours of operations in order to ensure there is a balance between the requirements of the operation to satisfy projected demand, potential environmental impacts and the requests of the community. A review of the amendments made to operating hours is presented in Section 3 and a justification for proposed operating hours presented in Section 5.13.

2.18 PROJECT LIFE

Hanson is seeking extension of the Quarry life by a further 30 years.

2.19 EMPLOYMENT

By extending the life of the Quarry by 30 years, the current workforce, which consists of 20 operators, contractors, supervisors and management will be retained. At the proposed peak production level of 1.5Mtpa, a larger workforce of 30 to 31 employees is anticipated.

Hanson currently employs eight personnel on a full-time basis for transportation operations. It is estimated that a further four employees would be employed directly under the Project with contractors commissioned as needed for larger job requirements.

The concrete batching plant will employ up to five concrete agitator truck drivers, one batcher and one concrete plant manager.

The concrete waste recycling would require two drivers to deliver the concrete washout materials from Hanson concrete plants for stockpiling while waiting to be crushed and blended. This recycled product would be used at the Quarry and may also be transported to other Hanson quarries to produce more environmentally sustainable road base materials throughout the region.

2.20 REHABILITATION AND THE FINAL LANDFORM

2.20.1 Rehabilitation Overview

Only minor areas of the Quarry Site have been available for rehabilitation to date given the nature of operations and proposed expansion. However, where rehabilitation has occurred it has been successful.

Progressive rehabilitation would be key component of the Project and would be undertaken in accordance with an approved Biodiversity and Rehabilitation Management Plan prepared in consultation with DPE, Port Stephens Council, the Natural Resource Access Regulator and the Biodiversity Conservation Division of DPIE, with the final approval of the plan subject to review by DPIE.

Rehabilitation of the Quarry Site will not be a process of restoring the landform to its former condition. This is not physically possible given the nature of the extractive activities proposed. Rehabilitation should be considered as the process by which the Quarry is transformed to a landform capable of supporting a selected post-Quarry land use. In some cases, this may be a return to productive grazing, passive biodiversity conservation or a retained water body.

There are no plans to use the Quarry as a landfill or to permit dumping of vehicles or other material. Hanson currently propose a final land use for the Quarry that incorporates passive biodiversity conservation and a slowly developing water storage.

It is also important to recognise that in 30 years' time when this development consent would lapse, land use preferences of Port Stephens Council, Hanson as the land owner and the local community may have changed. Government policies and guidelines recognise that this is the case and are continually updated to reflect community values and preferences supported by current scientific evidence. It is proposed that the current plans for the final landform, progressive rehabilitation activities and closure criteria would be described in a Biodiversity and Rehabilitation Management Plan. It may be that the final land use strategy is updated over time through amendments to this document. Significant changes to the landform would require assessment of potential impacts and a modification to the development consent for the Project.

2.20.2 Rehabilitation Objectives

Hanson's broad objective for progressive and final rehabilitation are to create a final landform that is suitable for post-quarrying land uses. This includes the following specific objectives.

- To produce a geotechnically stable, safe and non-polluting landform through progressive shaping of the completed areas of the Quarry.
- To provide a landform that is free-draining and has low maintenance requirements.
- To blend the landform with the surrounding landscape through careful selection of species for revegetation.
- To monitor the success of rehabilitation over time to ensure revegetation is not dying back.
- Ensure that the final landform maintains the visual amenity of the locality and, where possible, enhances local biodiversity values.

2.20.3 Final Land Uses

The primary final land use for the Quarry would be a stable and safe final landform that permits passive biodiversity conservation and maintenance of a vegetated buffer and amenity barrier to shield any views to the final land form. Dams and diversion drains would form a component of this landscape to limit erosion and sediment movement.

Given the design and elevation of extraction within the Quarry a void would remain in the final landform. This is likely to slowly fill with water over a number of years. **Figure 10** demonstrates the water level progression in the final landform, noting that an equilibrium level of approximately 30m AHD would be reached after an estimated 163 years. This is a long time, with the speed at which this would occur influenced by evaporation and rainfall in the intervening years, which is in turn influenced by longer term climate patterns. Therefore, to improve the visual amenity of the area and to provide use of the area as habitat, Hanson would progressively revegetate completed benches within the Quarry. The majority of these rehabilitated areas would support vegetation and fauna habitat for long periods. However, it should also be acknowledged that these areas would eventually become inundated and the vegetation destroyed.

It is acknowledged that groundwater inflow to the final void would be more saline than water in Deadman's Creek, however this is likely to be at a level that would not impact riparian vegetation. It is not anticipated that any waterbody would be stagnant or that it would eventually overflow. Rather, the waterbody would become an environmental resource. This may require planning, specific revegetation and maintenance in the short term, however these actions would be specified in a Biodiversity and Rehabilitation Management Plan. Watercourses and drainage features in the final landform would be designed and constructed to ensure long-term stability, with those sections which are relatively steep likely to require rock armouring and careful revegetation planning. The detailed design of those watercourses would be undertaken progressively based on an assessment of slope, geomorphological characteristics, cross-sectional and longitudinal section profiles, ultimate (post-mining) catchment area and expected flow characteristics, planned vegetation and land use.

2.20.4 Rehabilitation Funding

Hanson would remain responsible for the land as long as it is the owner of the land and the quarrying operations. Should the land and Quarry be sold, responsibility for rehabilitation would pass to the new owner. However, while operating the Quarry, Hanson would be required to raise a bank guarantee to fund rehabilitation of the Quarry Site should the Company run into financial difficulty. The bank guarantee would be lodged with DPE with the NSW Government then able to call on those funds if it has credible evidence that Hanson is not meeting its requirements or is not capable of doing so. Managing rehabilitation security in this manner is standard practice for extractive industry development in NSW.

2.20.5 Indicative Final Landform

The Quarry is situated on the southern slope of Brandy Hill that intersects a flood plain north of the Williams River. The proposed final void will intersect the northern side of the hill at an approximate elevation of 95m AHD and will extend south to approximate elevation of 30m AHD. The final quarry void will have a bottom floor elevation of -78m AHD.

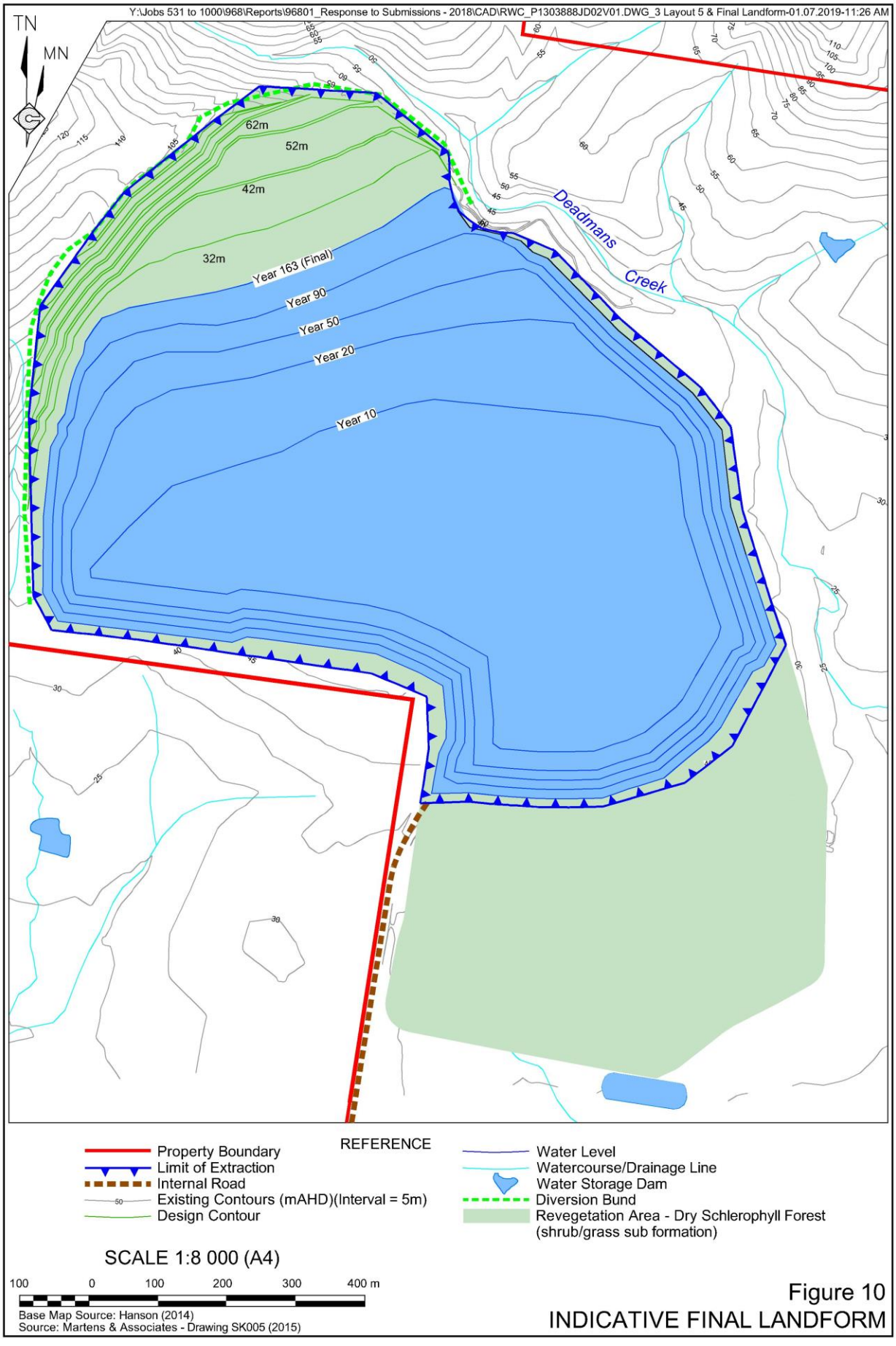


Figure 10
INDICATIVE FINAL LANDFORM

A key physical constraint on possible final landform development is the location of the Quarry, local topography and the size of the void. A final void with a floor 78m below sea level will be slowly filled with water through capture of rainfall and any groundwater seepage. It is not unusual for voids of this nature to remain in the landform.

It is noted in the Strategic Framework for Mine Closure guideline (ANZMEC–MCA 2000) that an indicative or conceptual closure plan is suitable for assessment of Project feasibility, planning and detailed design. The plan presented in **Figure 10** may be updated over time through a Biodiversity and Rehabilitation Management Plan if specific land use priorities change.

2.20.6 Rehabilitation Strategy

Upon cessation of quarrying it is anticipated that all Quarry-related infrastructure would be demolished and removed from the site. Mobile plant would be relocated to another Hanson site or sold/scrapped. All waste material would be removed to a licenced landfill.

It is anticipated that progressive rehabilitation would initially focus on the amenity barrier (once constructed). Topsoil would be actively placed on the constructed barrier to support vegetation establishment. The surface would be revegetated with a mix of local native flora.

Terminal benches would be progressively profiled to be geotechnically stable and graded to ensure free drainage away to the sides of the benches. The benches would be then covered with overburden and topsoil and revegetated with local indigenous species suitable for a rocky ledge environment.

Rehabilitation of the Processing Stockpiling Area would first require a contamination assessment focused on fuel storage areas. The final surface would be profiled to drain to the south and would be deep ripped to remove any compacted gravel sheeting. Overburden and topsoil would be applied and surface would be revegetated with a mix of local native flora.

All redundant roads and tracks will be removed and scarified to a minimum of 75mm depth and prepared for revegetation. The access road may remain open and sealed to provide permanent access to the landform.

A dam to the south of the amenity bund would be retained to capture rainfall temporarily from this structure. It is anticipated that by the time of closure the amenity bund would be revegetated and the water flowing to the dam would be considered clean water.

Fencing (or a similar barrier) will be erected where necessary to exclude and prohibit unauthorised entry into areas that have been rehabilitated. Signs will be placed in prominent locations to indicate areas that are undergoing rehabilitation.

This will be particularly important at the upper benches of the Quarry where trespassing may result in injury or death.

2.20.7 Revegetation Strategy

The Project seeks to recreate indigenous vegetation communities similar to those in the surrounding landscape. It is proposed to match the existing vegetation in both the upper canopy and understorey species. Hanson will seek to achieve a similar percentage of foliage cover, litter depth, microbial activity and ultimately canopy height.

A detailed plan of each stage will be prepared prior to rehabilitation works commencing. Native vegetation will largely be established using direct seeding and from the seed store within re-spread topsoil. Supplementary native pasture and/or tubestock planting will be undertaken where specific species combinations are required.

Rehabilitation of terminal benched would be undertaken progressively once extraction in that location is complete and the bench is no longer required for access to other part of the Quarry. As the extraction progresses through the resource, 10m wide benches will be left every 10m of depth to provide a horizontal platform on which native flora species will be established.

The revegetation program will re-establish native tree / shrub / ground cover and will stabilise reshaped and benched areas. Benches will be treated to actively promote infiltration of water which will enhance soil moisture requirements for direct tree seeding and minimise surface runoff to underlying benches and the pit floor dirty water control system. Revegetation will also visually screen disturbed areas and will re-establish habitat for native fauna; and

Any dead trees will be replaced quickly to keep the overall progress of the re-vegetation maturity on track.

2.20.8 Revegetation Methods

Direct seeding (via broadcasting) is preferred over tube stock planting as it enables a far greater success rate, limits the need for ongoing maintenance (e.g. watering) and is the most effective method in achieving a successful rehabilitation outcome. Notwithstanding this, tubestock will be utilised in landscape planting around the Quarry. Not all native trees and shrubs are suited to direct seeding due to their innate germination requirements, therefore, it may be required to supplement with some tubestock to increase biodiversity.

A mixture of native trees and shrubs endemic to the area will be sown onto the majority of the reshaped and benched pit areas following topdressing and site preparation. This tree and shrub seed will complement natural regeneration from seed contained within the soil seed bank. The seed mix used for revegetation of the disturbed quarry area will include some of the major tree and shrub species identified in ecological surveys of the proposed Quarry Site.

Growth rates of between 1m and 2m per year can be initially expected for many of the more dominant trees and shrubs. The correct treatment and application of seed in the appropriate ratios is important in controlling emerging weeds and in allowing the tree stand to develop in a positive direction. The native tree and shrub seed mix will be sown at a suitable combined rate. Seed will be broadcast evenly onto top dressed areas. Care will be taken to ensure it will not be buried. Seeding will be conducted in late spring, summer and early autumn giving superior results due to higher ground temperatures.

Revegetation activities will generally be undertaken in spring and autumn; however opportunistic revegetation will be undertaken if areas become available for sowing in summer or winter. After surface soil amelioration and tillage is completed for any given area, revegetation will commence as soon as practicable. The proposed method of sowing will be via conventional spreading using agricultural broadcasting equipment, or by hand if the terrain is difficult and machinery use is not possible; and slope stabilising techniques such as hydro seeding and straw mulching will be undertaken on slopes exceeding 18 degrees for enhancement of pasture germination.

2.20.9 Weed and Pest Management

Weeds present one of the most significant problems to the creation of a rehabilitated ecosystem. The minimisation of weed competition over the first six to twelve months after seeding is critical to successful tree establishment. Weed control will be undertaken on an "as required" basis should cyclical weed invasion events occur. As trees establish and mature they will compete and eventually eliminate most weeds. For this reason, dense direct seeding (as opposed to planting) is an effective long-term weed control mechanism that reduces maintenance significantly, particularly ongoing weed control.

Weed and pest management would be implemented over the life of the Quarry with a particular focus on areas under rehabilitation. Localised baiting programs would be undertaken, as required, and in consultation with neighbours to manage pests such as feral dogs, foxes and feral cats.

Weed and pest management would continue throughout active rehabilitation and continue at least annually for a period of three years post-closure.

2.20.10 Bushfire Management

Consistent with existing practices and during the operational life of the Quarry, the management of bushfire risks would be undertaken in consultation with the Rural Fire Service and surrounding landholders (where appropriate), in order to minimise the risks associated with ignition and hazards associated with managing an active bushfire.

2.20.11 Topsoil Management

Hanson recognises that topsoil is a valuable resource for rehabilitation and would ensure that where this material is stockpiled, these are no greater than 2m in height, are not driven over (to avoid compaction) and have a stabilising groundcover to limit dust lift-off and erosion. Management of topsoil would be undertaken in accordance with the recommendations made in the *Land Resource Assessment* undertaken by Martens and Associates and presented as Appendix 6 of the EIS.

The Soil Survey and Land Resource assessment found that there is sufficient existing topsoil suitable for stripping, stockpiling and respreading as a topdressing material for reshaped areas due to its textural properties and because it is non-saline.

Topsoil stripping within the disturbed area will be undertaken when the soil is in a slightly moist condition thus reducing damage to soil structure. Stripped material will be placed directly onto the disturbed areas and spread immediately if excavation sequences, equipment scheduling and weather conditions permit.

2.20.12 Scheduling of Works

Approximately 53.8ha of vegetation will be disturbed by quarrying and processing plant relocation over the duration of the Project. Rehabilitation work will be undertaken progressively as soon as reshaped, benched and topsoiled areas become available. Progressive revegetation

during operations would be actively undertaken with the proposed final rehabilitation on benches following closure of the Quarry. It is noted that the progressive rehabilitation proposed will also ensure visual impacts associated with the top northern and western benches are mitigated through the early establishment of trees on these benches as soon as they are available for revegetation.

2.20.13 Land Capability

In terms of post mining land capability, the proposed quarry activities will not have a significant impact on land capability in the area. No impacts will occur on adjacent lands and the only impacts will be associated with the area immediately impacted by the Quarry operation. The area contains a valuable State resource and the proposed development will involve extracting this resource prior to rehabilitation to permit the development of a water storage and for biodiversity conservation.

The land capability of this area will not alter from current land capability although the area of the void alter local topography. The land is currently not suited for grazing or agriculture and is best vegetated. It is not proposed to use this area for grazing or other agricultural purposes after extraction. Rather, the extracted area will be rehabilitated to create a water storage resource surrounded by an open forest environment.

2.21 BIODIVERSITY OFFSETTING STRATEGY

2.21.1 Introduction

The NSW government has established a framework through which residual impacts to biodiversity must be assessed, evaluated and managed. In accordance with the Secretary's Environmental Assessment Requirements the Project has been assessed under the NSW OEH interim policy on assessing and offsetting biodiversity impacts, State significant development (SSD) and State significant infrastructure (SS) projects (OEH 2011). A Biodiversity Assessment Report (BAR) has been prepared by Biosis (2019) to assess residual biodiversity impacts and establish the biodiversity offset obligations of the Project. The BAR was prepared in accordance with the NSW BioBanking Assessment Methodology (OEH 2014). An update to the BAR was prepared in April 2019 to incorporate minor areas of additional disturbance associated with the proposed amenity barrier and to present an updated Biodiversity Offset Strategy. The consolidated BAR is provided as **Appendix 10**.

The outcomes of the additional assessment are presented in Section 5.4 and confirm the conclusions of the preliminary assessment, that biodiversity-related impacts would be adequately managed under conditions of consent including a Biodiversity and Rehabilitation Management Plan.

2.21.2 Biodiversity Offsetting Obligations of the Project

Figure 11 presents the consolidated mapping of vegetation within the proposed Quarry Site. The staging of vegetation clearing is presented in **Figure 8**. The biodiversity offsetting obligations of the development relate to the native vegetation cleared (ecosystem credits) and the removal of potential Koala habitat (species credits).

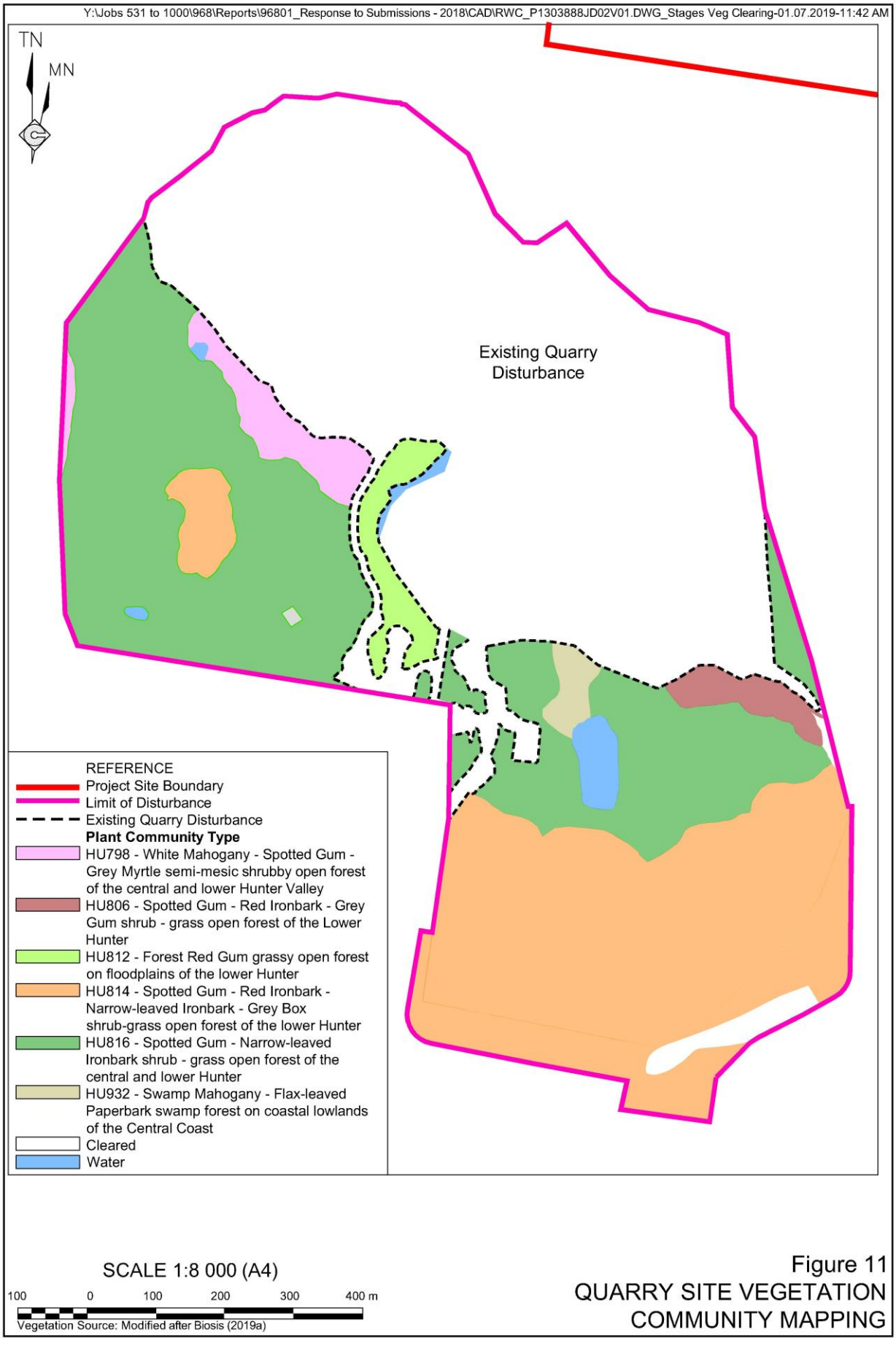


Figure 11
QUARRY SITE VEGETATION COMMUNITY MAPPING

Based on the mapping presented in **Figure 11**, consolidated ecosystem credit and species credit obligations for the Project have been assessed and are presented in **Table 8** and **Table 9** respectively.

Table 8
Biodiversity Offsetting Obligations (Ecosystem Credits)

Vegetation Zone	PC type code	Plant community type name	Red flag	Management zone area (ha)	Ecosystem credits required
VZ1	HU814	Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	No	22.26	1 281
VZ2	HU816	Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	No	25.91	1 492
VZ3	HU932 (previously HU591)	Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	Yes	0.67	46
VZ4	HU806	Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	No	1.12	63
VZ5	HU812	Forest Red Gum grassy open forest on floodplains of the lower Hunter	Yes	1.67	111
VZ6	HU798	White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley	No	2.16	103
Total				53.79	3 096
Source: Biosis (2019a) – Modified after Table 32					

Table 9
Biodiversity Offsetting Obligations (Species Credits)

Scientific Name	Common name	Species polygon area (ha)	Red flag	TS offset multiplier	Species credits required
Phascolarctos cinereus	Koala	51.63	No	2.6	1 342
Source: Biosis (2019a) – Modified after Table 33					

2.21.3 Biodiversity Offsetting Strategy

The following options are available under the legislation to satisfy the offsetting obligations of the Project.

- The purchase and retirement of credits established under agreement on private land
- The establishment of an offset area under agreement with the BCD. Offsets established on private land are placed on the title and remain in perpetuity.
- Funding a biodiversity conservation action that directly benefits the threatened species impacted by the development.

- Making a payment to the Biodiversity Conservation Fund calculated using the offset payments calculator.

The Federal Department of the Environment and Energy does not currently support payments into the Biodiversity Conservation Fund for impacts to species listed as threatened under the Environmental Protection and Biodiversity Conservation Act 1999 (such as the Koala). Therefore, this option is not currently available to Hanson.

Hanson proposes to retain the Biodiversity Offsetting Strategy for the Project that was presented in the EIS; namely that obligations would be satisfied through the purchase and retirement of biodiversity credits. It is proposed that timing to satisfy biodiversity offsetting obligations be staged to align with the operational stages and progressive development of the Quarry. This is consistent with other State significant extractive industry developments where development occurs in distinct stages.

Development of the Quarry Site is proposed to occur in five operational stages as described in the EIS for the Project. Vegetation clearing associated with Quarry development will occur progressively, with vegetation retained until development of an area is planned to commence (see **Figure 8**).

Timing for development of the Quarry would depend on product demand and the limits of development consent. Therefore, no specific timing for each stage of development is possible. Hanson is proposing that requirements to satisfy biodiversity offsetting obligations occur in three distinct stages as presented in **Figure 12**. **Table 10** compares the development stage to the proposed offset stage.

Table 10
Operational and Offset Stage Comparison

Offset Stage	Operational Stage	Total Area (native vegetation only)
Stage 1	Stage 1 and Stage 2	20.79ha
Stage 2	Stage 3	24.32ha
Stage 3	Stage 4 and Stage 5	8.68ha

Biosis (2019) provides an assessment of the biodiversity offsetting credits generated for each vegetation community for each Offset Stage (**Appendix 10**). These credit requirements are summarised in **Table 11** to **13**.

Table 11
Offset Stage 1 Credit Requirements

Offset Credit Type	Credits Required
HU814 - Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	434
HU816 - Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	647
HU798 - White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley	96
Koala (*Phascolarctos cinereus)*	488
Source: Biosis (2019a) – Modified after Table 37	

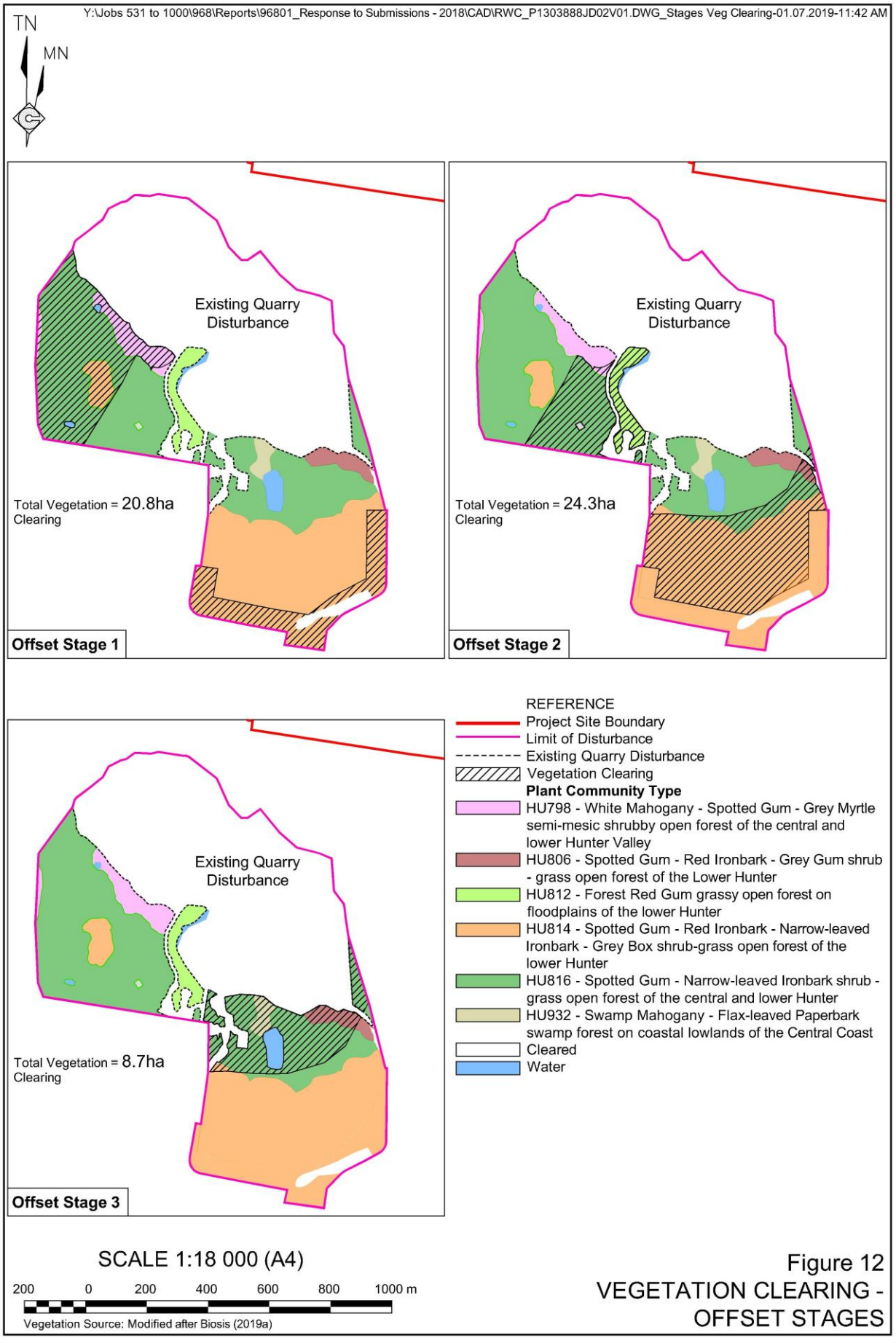


Figure 12
VEGETATION CLEARING - OFFSET STAGES

Table 12
Offset Stage 2 Credit Requirements

Offset Credit Type	Credits Required
HU814 - Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	840
HU816 - Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	440
HU806 - Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	15
HU812 - Forest Red Gum grassy open forest on floodplains of the lower Hunter	111
HU798 - White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley	7
Koala (*Phascolarctos cinereus)*	628
Source: Biosis (2019a) – Modified after Table 38	

Table 13
Offset Stage 3 Credit Requirements

Offset Credit Type	Credits Required
HU814 - Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	7
HU816 - Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter	405
HU932 - Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	48
HU806 - Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	46
Koala (*Phascolarctos cinereus)*	226
Source: Biosis (2019) – Modified after Table 39	

2.21.4 Availability of Biodiversity Credits

Table 34 of Biosis (2019) presents the outcomes of a review of the availability of biodiversity credits required to offset impacts associated with the Project. In summary, at the time of review, credits were available to satisfy a Tier 1 outcome for all credit requirements, which satisfies an 'improve or maintain' outcome.

It is proposed that no vegetation clearing for Operational Stages for the Project would occur until the biodiversity offsetting obligations for the relevant Offset Stage have been satisfied. All biodiversity credits associated with Offset Stage 1 (**Table 11**) would be satisfied prior to any vegetation clearing associated with commencement of the Project.

3. REFINEMENTS TO THE PROJECT

The Government agency, community group and public submissions received by DPIE during the public exhibition period and forwarded to Hanson for response prompted a comprehensive review of the Project. The review focused particularly on road safety and transportation management as well as the proposed operating hours and prompted several refinements to the Project to address the concerns raised. Review and refinement of the Project has been an iterative process that has involved consideration of how the operation may be refined and remain feasible, followed by presentation of the refinements to the community and to DPIE, Port Stephens Shire Council and Maitland Shire Council. The amendments to the Project do not modify the Project such that is would be considered a different application, however, Hanson considers that the Project, as presented, substantially addresses the issues raised.

In order to succinctly compare the original proposal with that now proposed, key components of the Project, environmental management and community engagement that have been amended since public exhibition of the EIS are presented in **Table 14** and compared to the initial Project.

Table 14
Comparison of the Proposed Project with that Originally Proposed

Activity	Initial Project	Current Project
Project Design		
Operational Mitigation of Environmental Impacts	Standard management and mitigation measures proposed to limit potential impacts including: • Watering of disturbed areas and haul roads to limit dust. • Limiting the speed of on-site vehicles. • Regularly maintaining equipment to ensure noise and emissions are reduced as much as practically possible. • Implement broadband reversing alarms on equipment. • A comprehensive monitoring program that would include particulate matter (PM_{10}), deposited dust, water quality and noise generation.	In addition to standard mitigation, site-specific mitigation now includes: • Enclosure of all fixed processing equipment and partial enclosure of the mobile crusher to be used for concrete recycling. • Stockpile/equipment positioned to limit potential noise impacts • An 18m to 20m earthen amenity barrier located to the south of Processing/Stockpiling Area from Stage 1 • 4m high temporary barriers to be constructed for each stage of operations in strategic areas. • An acoustic barrier fence located along the Quarry Access Road
Concrete Recycling Activities	Commencing from Stage 4 of operations.	Demand and acceptance of this process has improved over time. It is proposed that the beneficial reuse of concrete washout material would now occur from Stage 1 of operations.

Table 14 (Cont'd)
Comparison of the Proposed Project with that Originally Proposed

Activity	Initial Project	Current Project
Environmental Management		
Salvage of natural habitat features	A tree clearing protocol that would ensure careful removal of natural habitat features.	Hollows in trees would be carefully salvaged and re-hung in vegetation surrounding the Quarry. This process would be implemented and managed through the Biodiversity and Rehabilitation Management Plan.
Biodiversity Offsetting Strategy	All residual biodiversity impacts to be offset through purchase of biodiversity credits from other land owners.	The same strategy would be used, however, biodiversity offsetting would be staged in line with vegetation clearing required for operational stages. Offsetting requirements would be satisfied in three stages.
Hours of Operation		
Construction Works	Monday to Friday – 5:00am to 8:00pm Saturday – 5:00am to 5:00pm No operation on Sundays or public holidays	*Reduced hours for Construction Works* Monday to Friday 7:00am to 6:00pm Saturday 7:00am to 5:00pm No operation on Sundays or public holidays
Blasting	Monday to Friday – 8:00am to 5:00pm No blasting on Sundays or public holidays	*Reduced hours for Blasting* Monday to Friday 9:00am to 5:00pm No blasting on Saturdays or Sundays or public holidays
Load and Haul	Monday to Saturday – 5:00am to midnight No activities on Sundays or public holidays	*Reduced hours for Load and Haul* Monday to Saturday 5:00am to 10:00pm No activities on Sundays or public holidays
Primary Crusher	Monday to Saturday – 5:00am to 1:00am No activities on Sundays or public holidays	*Reduced hours for Primary Crusher* Monday to Saturday 5:00am to 10:00pm No operation on Sundays or public holidays
Secondary and Tertiary Plant	Monday to Sunday – 24 hours	Monday to Sunday – 24 hours The proposed hours for secondary and tertiary processing are reviewed in detail in Section 2.17. These hours are considered necessary to satisfy anticipated demand for construction materials. Assessment has demonstrated that noise generated by this process would not impact amenity, intrude on residents or cause sleep disturbance
Maintenance	Monday to Sunday – 24 hours	Monday to Sunday – 24 hours These hours are standard industry practice and relate to maintenance that is not audible at nearby residences.

Table 14 (Cont'd)
Comparison of the Proposed Project with that Originally Proposed

Activity	Initial Project	Current Project
Transport Management		
Traffic Limits on the Operation	Not clearly stated in the EIS which led to some confusion for readers.	A review of the proposed traffic levels and assessment of road traffic noise has been undertaken with product despatch from the Quarry to be limited to the following levels. • No more than 301 laden loads between 7:00am and 10:00pm. • No more than 58 laden loads between 10:00pm and 7:00am.
Night time product despatch (10:00pm to 7:00am)	Product despatch to occur on any night (within limits to traffic movements)	Product despatch between the hours of 10:00pm and 5:00am to occur on a maximum of 20 nights per year. Seven days notification to be provided. Night-time product despatch to be limited to 58 laden loads.
Speed limitation	N/A	Hanson has been trialling a speed reduction to 60km/hr for Hanson trucks along Brandy Hill Drive. A formal trial would be undertaken within 6 months of commencement under the Project. The outcomes and longer-term implementation would be dependent on community feedback.
Hourly limit to product despatch	N/A	Maximum of 30 laden loads despatched per hour in the day time period (7:00am to 10:00pm). This is the maximum experienced under existing operations (that is, no change to existing) and would be a worst-case limit. Morning shoulder and night time operations would involve a maximum of: • 5 laden loads despatched per hour between 10:00pm and 5:00am; • 9 laden loads despatched between 5:00am and 6:00am; and • 12 laden loads despatched between 6:00am and 7:00am.
Road Maintenance Contributions	Hanson to continue to provide road maintenance contributions for Port Stephens Council.	Road maintenance contributions would be paid to both Port Stephens Council and Maitland Shire Council.
Community and Stakeholder Engagement		
Community Consultation Committee (CCC)	Formalisation of CCC to occur after approval	A CCC has been formalised and meets quarterly, unless alternative arrangements are made with the committee.
Implementation of Community and Stakeholder Engagement Plan (CSEP)	N/A	A CSEP has been prepared and implemented as a working document and made available to community members during the initial Have-a-Chat session as well as through the CCC.

Table 14 (Cont'd)
Comparison of the Proposed Project with that Originally Proposed

Activity	Initial Project	Current Project
Community and Stakeholder Engagement (Cont'd)		
Voluntary Planning Agreement (VPA)	Standard road contributions provided to Council	A VPA is being negotiated to incorporate improvements to community infrastructure along Brandy Hill Drive – specifically a pathway and bus bays.
Community Enhancement Fund	N/A	A Community Enhancement Fund would form a commitment of the Project. Management of this fund is yet to be finalised.
Community Support and Sponsorship Policy (CSSP)	Informal local sponsorships provided	A Brandy Hill Quarry CSSP has been formalised.
Website publishing	When required within the Conditions of Consent (after approval)	Documentation available on the website: • Environmental monitoring location map • CCC minutes • BHQ Drivers Code of Conduct • Air quality and water (discharge) monitoring results • Blast monitoring results This will be increased to accommodate environmental management plan requirements.
Engagement outside of CCC	Not formalised.	<u>Have-a-Chat Meetings</u> The first Have-a-Chat meeting occurred on 6 February 2019 with plans to hold meetings on a regular basis to provide community members outside of the formal structure of the CCC an opportunity to directly communicate and discuss the Project with Hanson staff. <u>Community Notification Register</u> Hanson has provided community members and stakeholders an opportunity to nominate how and for what matters they wish to receive communications from Hanson through the distribution of the BHQ Community Notification Register and collation of community feedback. <u>Community visits to the Quarry</u> Hanson has provided an invitation to community members who wish to visit the Quarry. Community members who wish to visit the Quarry should contact the Quarry Manager to arrange a suitable time. A second Have-a-Chat meeting was held on 8 May 2019 at the Quarry.

4. ADDITIONAL ASSESSMENT UNDERTAKEN

The following additional technical assessments were undertaken or amended as a result of this review.

- Intersect Traffic has undertaken an assessment of all intersections between the Quarry and the Pacific Motorway, with specific assessment of the intersections of Raymond Terrace Road and Seaham Road, the roundabout at the intersection of William Bailey Street, Port Stephens Street and Newline Road and the intersection of Adelaide Street and William Bailey Street. The results of the additional assessment are discussed in Section 4.1 and provided in full as **Appendix 4**.
- Following consultation with Port Stephens Council and Maitland Shire Council, Hanson agreed to amend the transport route presented in the Driver's Code of Conduct to take into account the preferred routes of each Council. Subsequently, Hanson commissioned an assessment of potential impacts along the preferred route, specifically between Raymond Terrace Road, Richmond Road and the Pacific Highway in Raymond Terrace and between Flat Road, Pitnacree Road Melbourne Street and the New England Highway in East Maitland. Hanson commissioned Intersect Traffic to review intersection performance and road capacity at these locations. This review of the proposed transport route is summarised in Section 4.1 and provided in full as **Appendix 5**.
- The assessment of potential noise impacts was amended to incorporate additional mitigation and management measures prompted by a review of background noise levels and assessment criteria. The Updated Noise Impact Assessment (Vipac (2018) is presented as **Appendix 6** and the results of noise model predictions are presented in Section 4.2.
- The assessment of road traffic noise generation was also amended to incorporate additional mitigation and management measures prompted by a review of road safety and noise generation. The Updated Noise Impact Assessment (Vipac (2018) includes an amended assessment of road traffic noise (see **Appendix 6**). A summary of the outcome of the assessment are provided in Section 4.4.
- Feedback from the EPA regarding the air quality assessment queried some of the technical modelling assumptions and inputs to the assessment prepared by Vipac Engineers & Scientists. Hanson commissioned Todoroski Air Sciences to review the assessments prepared to date and undertake a consolidated air quality assessment that provided both a transparent assessment of potential air quality impacts and recommendations for ongoing management and monitoring of dust in the vicinity of the Quarry. The Air Quality Impact Assessment prepared by Todoroski Air Sciences is presented as **Appendix 8** and the results of the assessment summarised in Section 4.5.
- The Blast Impact Assessment was amended to incorporate additional information requested by DPIE. This included blast impact predictions at specific residences and consideration of potential blast impacts on livestock. The Updated Blast Impact Assessment is provided as **Appendix 9** with the outcomes of this review presented in Section 4.6.

- In its submission, the BCD identified the Rusty Greenhood Orchid as a species requiring further assessment and targeted survey due to the presence of potential habitat within the ecological study area and the proximity of the Quarry to the Grahamstown Dam (where a population of Rusty Greenhood Orchid has been identified). The Biodiversity Assessment Report (BAR) prepared by Biosis (2019) was updated to reflect the outcomes of these surveys and is presented as **Appendix 10**. The results of these targeted surveys are summarised in Section 4.7.
- BCD has also now reviewed potential impacts to Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. This assessment was required under the Bilateral Agreement between the NSW Government and the Commonwealth Department of the Environment and Energy. BCD requested that Hanson provide further assessment of the significance of impacts to the Koala, Grey-headed Flying Fox, Spotted-tailed Quoll, Regent Honeyeater and Swift Parrot as well as to migratory species that could potentially use the vegetation that would be removed under the Project. The review and assessment of MNES was incorporated into a consolidated BAR. The outcomes of this assessment are summarised in Section 4.7 and the consolidated BAR is presented as **Appendix 10**.
- Following the refinements to the Project design, it was identified that the assessment of biodiversity offsetting obligations provided for the EIS and Biodiversity Assessment Report had not accounted for all planned vegetation disturbance, specifically including the earthen amenity barrier as it was proposed to be constructed. In addition, Hanson has requested that biodiversity offsetting be staged in line with planned vegetation disturbance over the progressive development of the Quarry. It is not proposed to clear all vegetation at once, with clearing staged to only occur as needed (see Section 2.7 and **Figure 8**). As a result, Biosis has revisited the calculation of biodiversity offsetting credits. Updated credit calculations are presented in the consolidated BAR (**Appendix 10**) and reviewed in Section 4.7.
- Community and stakeholder engagement and a Social Impact Assessment has been undertaken by Key Insights and a report describing the outcomes of the assessment included as **Appendix 3**, with a summary presented in Section 4.8. The Social Impact Assessment has complemented the ongoing consultation and engagement undertaken by Hanson. A Community and Stakeholder Engagement Plan has been prepared as a working document with copies distributed to the community through the Have-A-Chat meetings and directly to CCC members.

The following subsections provide a summary of the outcomes of the above assessments.

4.1 INTERSECTION CAPACITY AND PERFORMANCE

4.1.1 Introduction

As a result of the Project review, Hanson has confirmed the proposed daily vehicle movements from the Quarry (see Section 2.11). The Transport Impact Assessment (Intersect, 2015), as provided in the EIS, presented the limit to transport operations above which intersection performance and road capacity would start to become unacceptable. The outcomes of this assessment were therefore very conservative and did not take into account other considerations including expected demand, traffic noise generation and the capacity of loading, weighing and despatch from the Quarry.

In response to requests from DPIE and RMS, Hanson commissioned Intersect Traffic Pty Ltd to review the predicted conditions at intersections along the proposed transport routes. This included after the transport route was adjusted in response to consultation and the preference of Port Stephens Council and Maitland Shire Council. The results of the additional assessment are provided in **Appendix 4** and **Appendix 5**.

Figure 9 presents the transportation routes that would predominantly be used for operations. It is noted that where it is required for local deliveries, heavy vehicles may need to use other routes. The use of other routes would only be required on rare occasions. The Driver's Code of Conduct would stipulate Hanson's direction that drivers give preference to the routes presented in **Figure 9**. If drivers are not using this route, they would need to have a good reason and would face disciplinary action in instances where they have deviated from the route in **Figure 9** without good reason.

4.1.2 Transportation towards Raymond Terrace

Assessment of the intersections of Clarence Town Road / Brandy Hill Drive and Brandy Hill Drive / Seaham Road was included in the EIS and concluded that the Level of Service (LoS), average delays and back of queue lengths during the existing peak AM and PM traffic periods would be satisfactory. The conclusions of these assessments are considered appropriate.

However, the RMS submission requests further assessment of the following intersections.

1. Raymond Terrace Road / Seaham Road give way controlled rural seagull.
2. William Bailey Street / Port Stephens Street / Newline Road roundabout.
3. Adelaide Street / William Bailey Street signalised intersection.

Beyond these intersections, the existing volume of traffic is such that the proposed change to traffic volume as a result of the Project would not significantly alter or impact intersection efficiency. This includes intersections between Adelaide Street and the Pacific Highway. At the request of Maitland Shire Council, intersection analysis between Flat Road and the New England Highway has also been undertaken.

Additional traffic counts were undertaken at the three intersections above on 2 and 3 August 2017. The data collected was used to model traffic levels at the intersections using the SIDRA 7 intersection analysis model. The modelling incorporated proposed traffic levels and conditions consistent with the assessment undertaken for the existing intersection modelling presented in the Transport Impact Assessment (Intersect, 2015).

Modelling for these intersections was carried out under the following assumptions which, for the purpose of presenting a conservative assessment of the potential impacts, differ slightly from the assumptions previously made in the Transport Impact Assessment (Intersect, 2015) for the Clarence Town Road / Brandy Hill Drive and Brandy Hill Drive / Seaham Road intersections. The assumptions, with a brief clarification, are as follows:

1. Intersection layouts remain unchanged over the life of the Quarry, this assumption is unchanged from the previous assessment.
2. The worst-case scenario is assumed such that all Quarry traffic, i.e. 30 laden loads (60 movements) per hour during a major order, is directed to the Pacific Highway at Raymond Terrace. In reality, approximately 25% of traffic would turn right upon exiting the Quarry and travel west towards Maitland. This assumption was adopted for conservatism to assess potential impacts.
3. At Adelaide Street, it is assumed that 90% of the development traffic had an origin / destination to the south towards Hexham and 10% had an origin / destination to the north towards Karuah / Medowie / Port Stephens. This assumption was adopted to reflect current and projected customer locations.
4. The adopted background traffic growth was 1.5% per annum which is the average background traffic growth rate adopted by RMS in their lower Hunter traffic models. This assumption is an increase on the 1% traffic growth that was utilised for local roads in Transport Impact Assessment (Intersect, 2015).

Existing traffic data used for the assessment was collected by Northern Transport Planning and Engineering on behalf of Intersect Traffic on 3 August 2017 (see Attachment A of **Appendix 4**).

The traffic data and the SIDRA summary results are provided within Attachments A and B of **Appendix 4**. The modelling undertaken on these intersections demonstrates the following.

- The intersections are all currently operating within the acceptable criteria set by the RMS for Level of Service (LoS), average delays and back of queue lengths during the existing peak AM and PM traffic periods (that is, between 6:00am and 7:00am and between 4:00pm and 5:00pm).
- All assessed intersections continue to operate within the acceptable criteria set by the RMS for LoS, average delays and back of queue lengths during the peak AM and PM traffic periods once operations under the Project commence. This indicates that the additional traffic generated by the development does not adversely impact on the current operation of these intersections.
- Over time, background traffic continues to grow (at the assumed rate of 1.5% per year) and intersection performance progressively deteriorates over the expected life of the Quarry. For example, the Adelaide Street / William Bailey Street traffic signals would be operating at capacity by 2044. The William Bailey Street / Port Stephens Street / Newline Road roundabout continues to operate satisfactorily over the life of the Quarry (through to at least 2044).

Additional commentary on the assessed intersections on the route between the Quarry and the Pacific Highway is provided as follows.

Raymond Terrace Road / Seaham Road

It is noted that since submission of the original RTS document, an upgrade of the intersection of Raymond Terrace Road / Seaham Road to a roundabout has been constructed. Intersect Traffic had concluded that this would be required by 2024. It is assumed that this has improved capacity issues at this intersection. However, community feedback on this upgrade indicates frustration at longer waiting times for those travelling on Seaham Road, particularly when several waste disposal trucks are using this route to return to the resource recovery park on Newline Road. These delays are not connected to the Quarry operations.

William Bailey Street / Port Stephens Street / Newline Road

The assessment has identified that operation of this roundabout would remain at a satisfactory level over the life of the Quarry. However, it is noted that the proposed Kings Hill residential development would have a major impact on this intersection (if approved) and as a result this intersection is likely to be converted to traffic signals in the future (assuming the residential development proceeds). It is understood the upgrading of this intersection is included within the proposed Section 94 Developer Contributions Plan for the Kings Hill residential development.

Adelaide Street / William Bailey Street

With the estimated growth in background traffic, by 2044 (life of the Quarry) the Adelaide Street/ William Bailey Street traffic signals would need to be upgraded to provide additional right turn lanes on both streets. The contribution to traffic volumes from the Quarry through the intersection in 2044 is only 2.4% of total traffic in the AM peak and 1.9% of total traffic in the PM peak, indicating an average contribution of 2.3% of total traffic. It is also noted that this intersection is also affected by the proposed Kings Hill residential development and upgrading of the intersection is understood to be included within the proposed Section 94 Developer Contributions Plan for the Kings Hill residential development.

Adelaide Street / Richardson Road and Richardson Road / Pacific Highway

It was confirmed in consultation with representatives of Port Stephens Council that Richardson Road already caters for significant heavy vehicle traffic and is constructed to a high enough standard to cater for truck and dog type movements from the Quarry with a maximum peak loading of 30 laden trucks per hour (60 movements). The proposed peak traffic output from the Quarry (60 movements) would be less than 10% of traffic already travelling through these intersections and a change in traffic at this level would be less than seasonal and daily variation in peak hour traffic volumes. Therefore, the proposed traffic levels would not result in any noticeable or unacceptable drop in level of service at the intersection of Richardson Road with Adelaide Street or the intersection of Richardson Road with the Pacific Highway.

4.1.3 Transportation towards Maitland

The volume of traffic using the route between the Quarry and the New England Highway is such that the change in traffic volume proposed for the Quarry would not significantly alter or impact intersection efficiency. At the request of Maitland Shire Council an intersection analysis between Pitnacree Road and the New England Highway has been undertaken to consider the potential impact at intersections that already experience delays during the peak hours.

Melbourne Street / Lawes Street / Pitnacree Road and New England Highway / Melbourne Street

Both of these intersections (with traffic signals) were modelled using traffic data supplied by Maitland City Council from 2015 and assumed a background traffic growth rate of 1% per annum for the state road network and a 1.5% per annum background traffic growth rate for the local road network. Given that the route via Maitland is not expected to be the most commonly used route, three scenarios were modelled including existing traffic, the projected 25% of Quarry traffic using this route and should all traffic leaving the Quarry use this route.

It was acknowledged in discussions with Maitland Shire Council that these intersections currently experience delays during peak hours. The query for assessment was whether the additional traffic from the Quarry would cause unacceptable delays. The outcomes of the modelling indicate that this additional traffic would cause only minor additional delays and that there would be no overall loss of Level of Service with average delays and queue lengths increasing by less than four seconds and less than one vehicle respectively.

4.1.4 Conclusion

It remains the conclusion of Intersect Traffic that the Project would not adversely impact the adjoining local and State road network.

4.2 OPERATIONAL AND CONSTRUCTION NOISE IMPACT ASSESSMENT

The following provides a brief overview of the existing acoustic environment, the methodology, criteria and the construction and operational scenarios applied in predictive noise modelling undertaken by Vipac Engineers & Scientists (Vipac, 2018a). A summary of all proposed noise-related mitigation and management measures is also provided followed by a summary of the predicted noise levels. The Updated Noise Impact Assessment is provided as **Appendix 6**.

It is noted that at the time that the Director-General's Requirements were provided the *Industrial Noise Policy* (INP) (EPA, 2000) was the relevant guidelines for assessment of predicted noise impacts for State significant extractive industry development. However, the *Noise Policy for Industry* (NPI) was published by the EPA in October 2017 and is now the relevant guideline for this assessment. Consultation with the EPA during the preparation of the Response to Submissions indicated that Hanson should take a consistent approach with assessment and either present results in accordance with one policy or the other. The INP incorporates a more stringent approach to establishing criteria for day time noise assessment and therefore Hanson and Vipac assumed this approach for assessment. However, it is noted that transitional arrangements for the NPI require that assessment of annoying noise characteristics apply the NPI and therefore this policy is referred to for assessment of tonal and low frequency noise.

4.2.1 Existing Acoustic Environment

The submission provided by the EPA highlighted that the rating background noise levels assumed for the 2015 Noise and Vibration Impact Assessment were not acceptable without further information and justification. This was principally due to the presence of insect noise that influenced background noise levels but would not be a year-round noise source. Vipac conducted

additional long term (unattended) and short term (attended) noise monitoring in March 2018 to re-establish acceptable background noise levels in order to derive relevant assessment criteria for noise-related impacts from the Project.

The noise monitoring locations, residential address and the residences for which the monitored noise is considered representative are presented in **Table 15**.

Table 15
Noise Monitoring Locations

Monitoring Point*	Location / Address	Representative Residence / Locations
N01	13A Giles Road, Seaham	R1, R2, R3, R6, R9, and R10
N02	115 Brandy Hill Drive, Brandy Hill	Road traffic noise along Brandy Hill Drive – 125m from road
N03	1060 Clarence Town Road, Seaham	R11, R13, R14, R15 and R16
N04	10 Mooghin Road, Seaham	R4, R5, R7, R8, R17 and R18
N05	Brandy Hill Quarry- reference	Quarry Site
N07	33 Brandy Hill Drive, Brandy Hill	Road traffic noise along Brandy Hill Drive – 30m from road
* Includes only those monitoring points used for the Updated Noise Impact Assessment		

An analysis of the attended and unattended noise measurements of locations relevant to residential receivers, i.e. N01, N03 and N04, was undertaken and Vipac has noted the following details.

- Cricket/cicada noise was predominant during the night time attended noise measurement. Intermittent cricket noise was present during the day but was not the dominant noise.
- Cricket noise peaks in frequency bands of 3.15kHz and 4kHz. The noise levels in these frequency bands range from 7 to 20dB higher than the adjacent frequency bands.
- Between 6:30pm and 9:00am cricket noise was evident during the unattended noise measurements.

Based on the details outlined above, it was possible to filter out the insect noise in the long-term noise monitoring records. The third octave bands adjacent to the insect noise frequencies (i.e. 2.5kHz and 5kHz) between 6:30pm and 9:00am have been used to replace the noise frequencies representative of insect noise (i.e. 3.15kHz and 4kHz). This method of filtering was conducted on the L_{eq} and L_{90} long term monitoring results to assist in providing a more representative characterisation of the background noise levels without undue influence from dominant insect noise. However, it is noted that insect noise would be a natural part of the background noise environment at these sites during warmer periods from October to March.

The long-term noise monitoring results (after filtering has been applied) and Project Specific Noise Levels are presented in **Table 16**.

The Project Specific Noise Levels presented in **Table 16** are between 3dB(A) and 15dB(A) lower than those presented in the 2015 Noise and Vibration Impact Assessment. In addition, it was identified that the noise levels predicted in the 2015 Noise and Vibration Impact Assessment would exceed the Project Specific Noise Levels in **Table 16** in some instances. As a result,

Hanson has worked with Vipac to develop a range of additional mitigating measures and to modify the Project to reduce noise generated under the proposed operations and to mitigate noise dispersion. These modified operations have been modelled by Vipac to predict noise levels. The updated assessment, including predicted noise levels, is presented in **Appendix 6**.

Table 16
Long Term Noise Monitoring Results and Assessment Criteria – Operational Noise Assessment

Monitoring Point	Period*	L_{Aeq}	L_{A90}	Rating Background Level+	Amenity Criteria	Intrusiveness Criteria	Project Specific Noise Level
N01	Day	55	30	30	50	35	35
	Evening	43	28	30*	45	35	35
	Night	40	27	30*	40	35	35
N03	Day	51	32	32	55	37	37
	Evening	47	29	30*	45	35	35
	Night	42	27	30*	40	35	35
N04	Day	54	35	35	50	40	40
	Evening	55	32	32	45	37	37
	Night	42	30	30	40	35	35

* Day is defined as 0700 to 1800, Evening is defined as 1800 to 2200 and Night is defined as 2200 to 0700

\+ The Rating Background Level is the median of the overall assessment background noise level and a minimum of 30 dB(A) for day, evening and night time periods has been applied, in accordance with Section 3.1 of the INP.

4.2.2 Assessment Methodology and Criteria

Vipac used the SoundPLAN computational noise prediction software package to develop a noise model and predict noise levels at privately-owned residences in the vicinity of the Quarry.

The model applies the following information to predict noise levels.

- Noise generated by relevant sources such as plant and mobile equipment using source data measured at the Quarry or where the equipment was not currently at use at the Quarry, measured at other Hanson operations or sourced from the Vipac library of noise sources (sound power levels are provided in Section 6.2 of Vipac (2018a)).
- Noise enhancing meteorological conditions that may be experienced in the locality including wind and temperature inversion conditions.
- Mitigation such as shielding from barriers or shielding by local topography and/or buildings.

Given that the first three stages of operations continue use of the existing processing plant, construction activities have been assessed during Stage 1 for the construction of the earthen amenity barrier and during Stage 3 for construction of the processing plant that would be commissioned at the commencement of Stage 4. Operational scenarios for each operational stage (Stage 1 to Stage 5) and two construction stages include the types of equipment, their geographic locations and elevations, under a worst-case scenario, at each stage and are displayed in **Figure 13** to **Figure 18**.

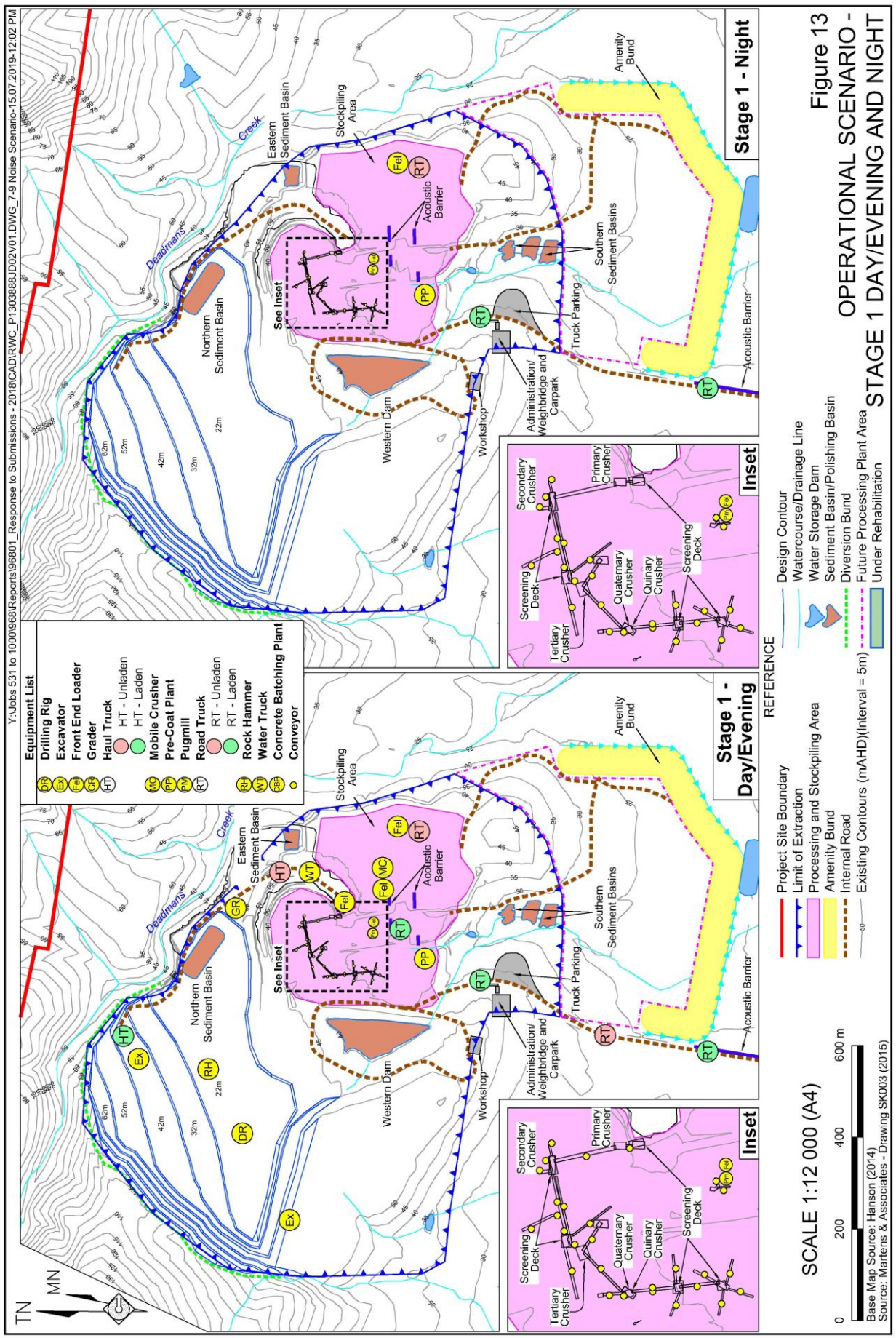


Figure 13
OPERATIONAL SCENARIO - STAGE 1 DAY/EVENING AND NIGHT

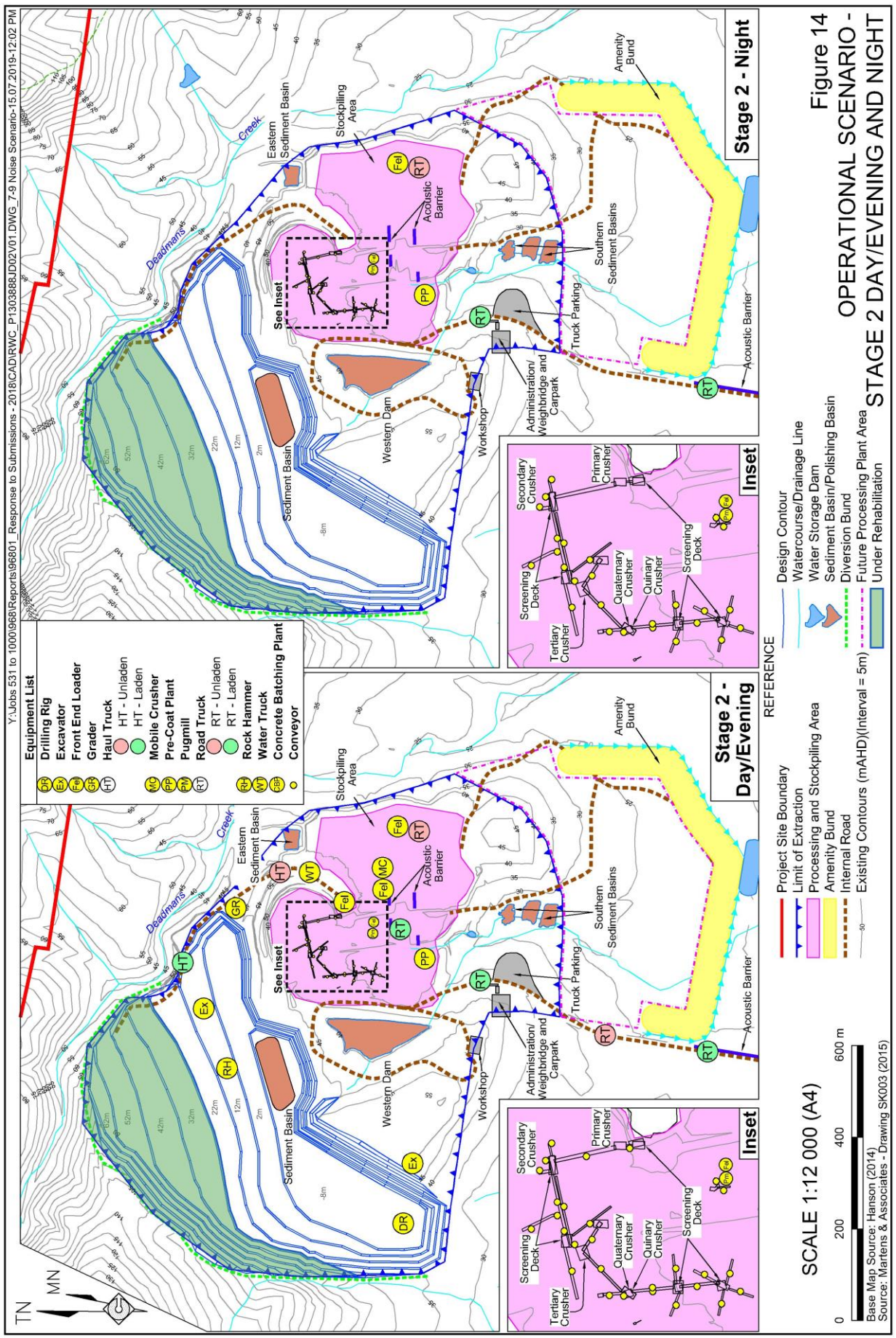
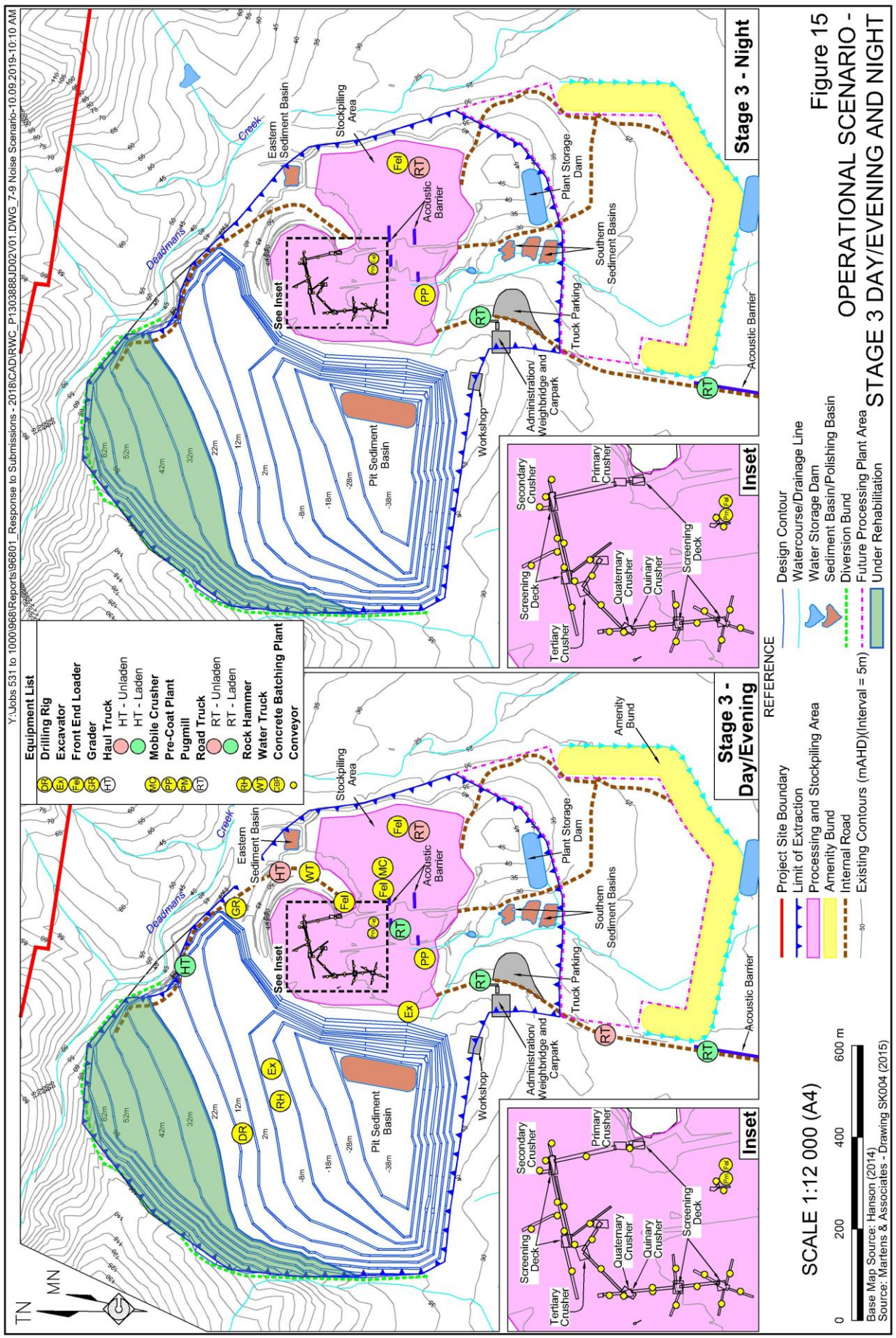
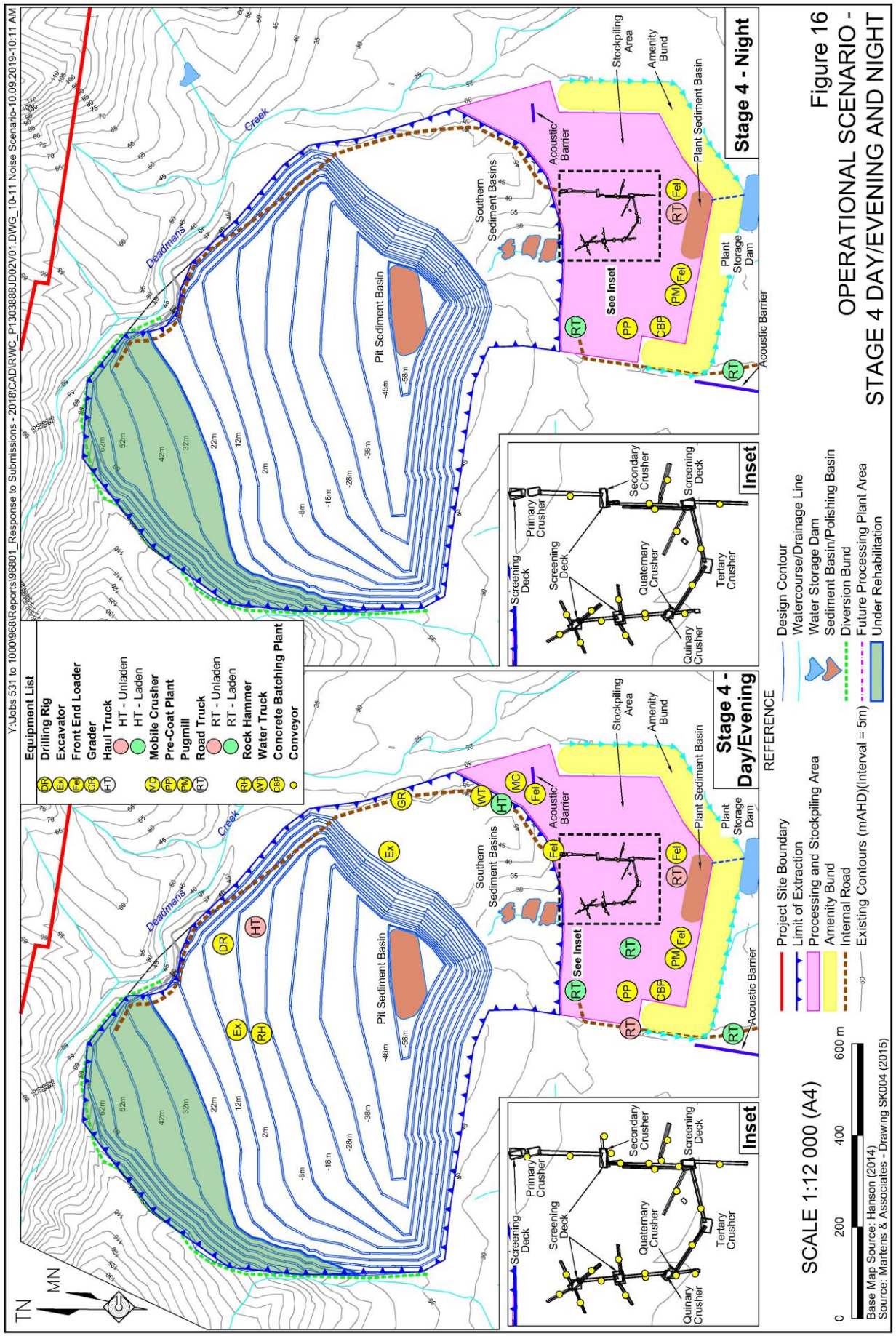


Figure 14
OPERATIONAL SCENARIO - STAGE 2 DAY/EVENING AND NIGHT


Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\RWC_P1303888JD02V01.DWG_7-9 Noise Scenario-10.09.2019-10:10 AM
Equipment List
Drilling Rig
Excavator
Front End Loader
Grader
Haul Truck
HT - Unladen
HT - Laden
Mobile Crusher
Pre-Coat Plant
Pugmill
Road Truck
RT - Unladen
RT - Laden
Rock Hammer
Water Truck
Concrete Batching Plant
Conveyor
Stage 3 - Night
Stage 3 - Day/Evening
Inset
See Inset
Eastern Sediment Basin
Stockpiling Area
Acoustic Barrier
Plant Storage Dam
Southern Sediment Basins
Truck Parking
Administration/ Weighbridge and Carpark
Workshop
Pit Sediment Basin
Amenity Bund
Primary Crusher
Secondary Crusher
Tertiary Crusher
Quaternary Crusher
Quinary Crusher
Screening Deck
Deadmans Creek
TN
MN
REFERENCE
Project Site Boundary
Limit of Extraction
Processing and Stockpiling Area
Amenity Bund
Internal Road
Existing Contours (mAHD)(Interval = 5m)
Design Contour
Watercourse/Drainage Line
Water Storage Dam
Sediment Basin/Polishing Basin
Diversion Bund
Future Processing Plant Area
Under Rehabilitation
SCALE 1:12 000 (A4)
0
200
400
600 m
Base Map Source: Hanson (2014)
Source: Martens & Associates - Drawing SK004 (2015)
Figure 15
OPERATIONAL SCENARIO - STAGE 3 DAY/EVENING AND NIGHT


Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\RWC_P1303888JD02V01.DWG_10-11 Noise Scenario-10.09.2019-10:11 AM
Equipment List
Drilling Rig
Excavator
Front End Loader
Grader
Haul Truck
HT - Unladen
HT - Laden
Mobile Crusher
Pre-Coat Plant
Pugmill
Road Truck
RT - Unladen
RT - Laden
Rock Hammer
Water Truck
Concrete Batching Plant
Conveyor
Stage 4 - Night
Stage 4 - Day/Evening
Inset
See Inset
Stockpiling Area
Amenity Bund
Plant Sediment Basin
Plant Storage Dam
Acoustic Barrier
Southern Sediment Basins
Pit Sediment Basin
Deadmans Creek
Primary Crusher
Secondary Crusher
Screening Deck
Quaternary Crusher
Tertiary Crusher
Quinary Crusher
REFERENCE
Project Site Boundary
Limit of Extraction
Processing and Stockpiling Area
Amenity Bund
Internal Road
Existing Contours (mAHD)(Interval = 5m)
Design Contour
Watercourse/Drainage Line
Water Storage Dam
Sediment Basin/Polishing Basin
Diversion Bund
Future Processing Plant Area
Under Rehabilitation
SCALE 1:12 000 (A4)
0
200
400
600 m
Base Map Source: Hanson (2014)
Source: Martens & Associates - Drawing SK004 (2015)
TN
MN
Figure 16
OPERATIONAL SCENARIO - STAGE 4 DAY/EVENING AND NIGHT

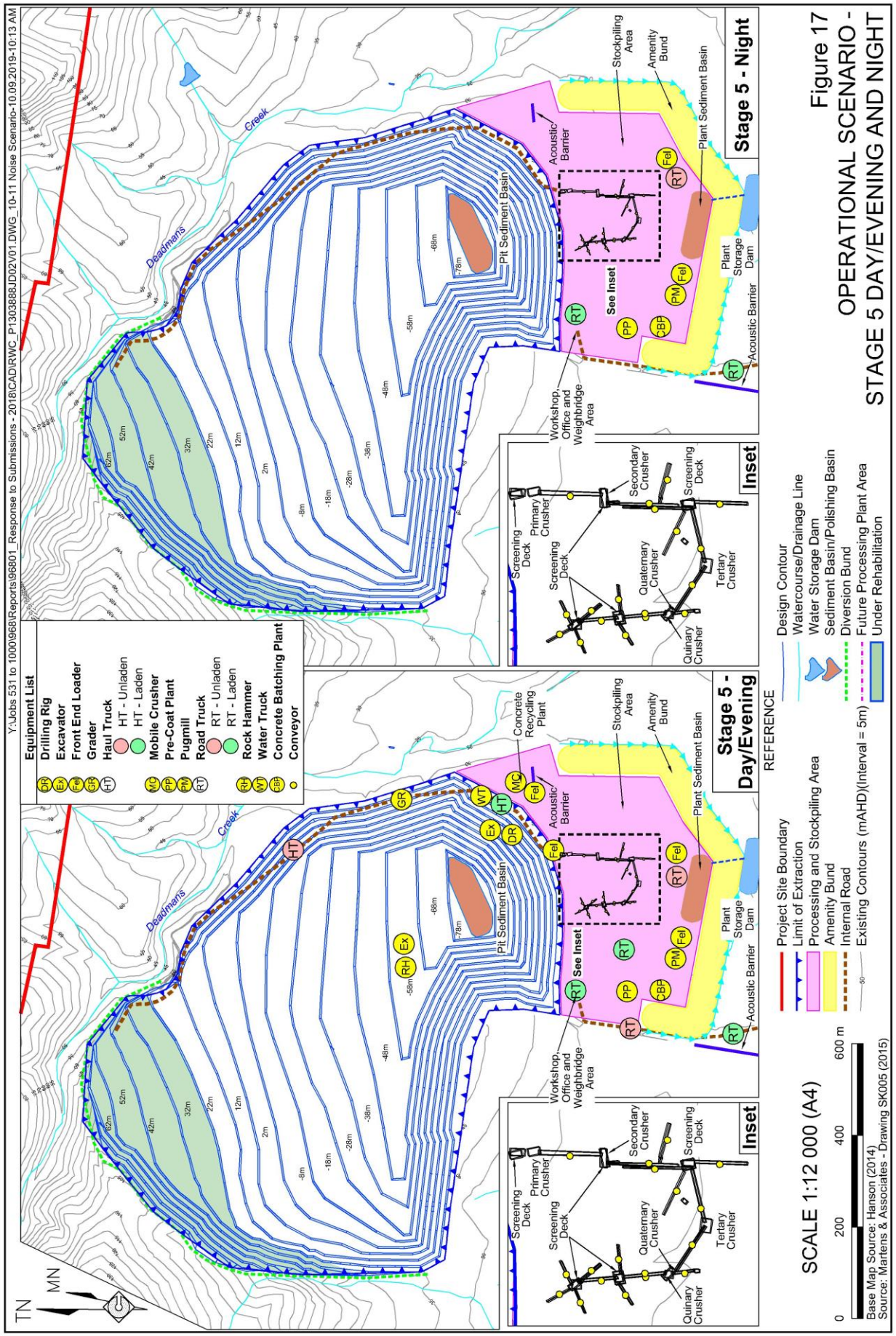


Figure 17
OPERATIONAL SCENARIO - STAGE 5 DAY/EVENING AND NIGHT

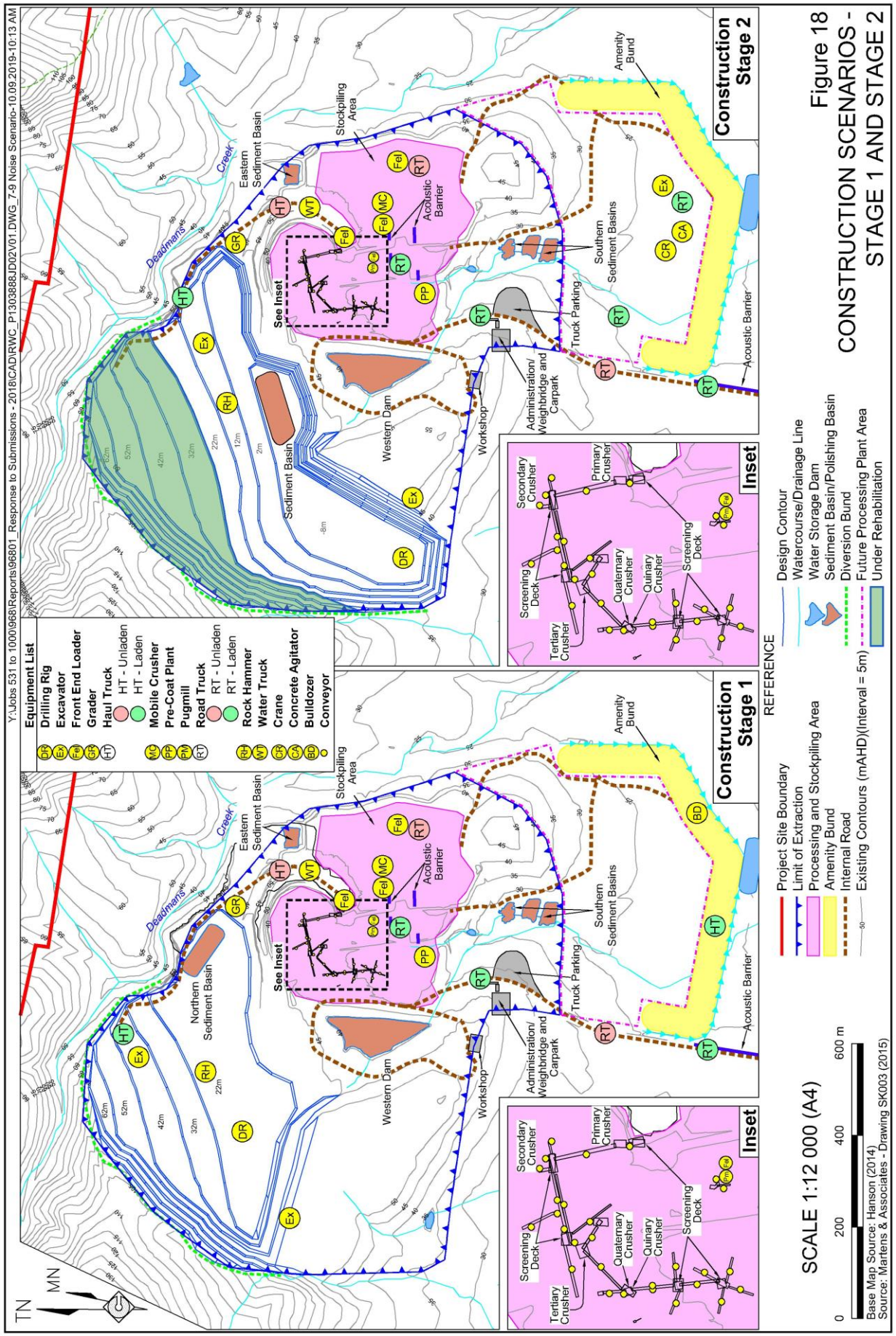


Figure 18
CONSTRUCTION SCENARIOS - STAGE 1 AND STAGE 2

The results of the noise modelling were used to estimate noise levels that would be experienced at the closest privately-owned residences. These noise levels were compared to the adopted assessment criteria to determine if there would be any exceedance of the relevant criteria under the Project.

Table 17 presents the criteria adopted for the assessment based on the Project Specific Noise Levels presented in **Table 16**.

Table 17
Noise Assessment Criteria

Monitoring Point	Representative Residences	Period*	Assessment Criteria	Previous Project Specific Noise Level#
N01	R1, R2, R3, R6, R9 and R10	Day	35	50
		Evening	35	45
		Night	35	40
N03	R11, R12, R13, R14, R15 and R16	Day	37	42
		Evening	35	41
		Night	35	38
N04	R4, R5, R7, R8, R17 and R18	Day	40	50
		Evening	37	45
		Night	35	40

* Day is defined as 0700 to 1800, Evening is defined as 1800 to 2200 and Night is defined as 2200 to 0700
# Adopted for the 2015 Noise and Vibration Impact Assessment (Vipac, 2015)

It is noted that the Interim Construction Noise Guideline states that for the assessment of construction noise impacts, noise from industrial sources (such a quarrying activities) should be assessed under the INP. Therefore, the assessment criteria presented in **Table 17** have been adopted for consideration of noise levels during construction stages.

In addition, Vipac considered potential impacts due to low frequency or C-weighted noise which is noise containing major components in the low-frequency range (10Hz to 160Hz) of the frequency spectrum and may be a feature of noise from industrial operations. Low frequency noise may be disruptive to people who are sensitive to it. The transitional arrangements for the NPI (EPA, 2017) identify that assessment of low frequency noise should be considered under this policy regardless of when assessment requirements or approvals were issued. As a result, Vipac first considered noise level predictions in accordance with a "C-A" screening methodology described in the NPI before considering noise levels against the low frequency spectral limits provided in the NPI and reproduced in **Table 18**.

Table 18
Low Frequency Noise Spectral Limit

Hz/dB(Z)	One-third octave L_{Zeq}, 15min threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

Source: Vipac (2018a) Table 20

4.2.3 Noise Mitigation and Management

The following noise mitigation and management measures are currently implemented at the Quarry and would be continued under the Project.

- All operations are undertaken in accordance with the approved hours of operation.
- Stockpiles and ancillary equipment are positioned to limit potential noise impacts.
- All equipment on site is maintained to adhere to existing noise standards and ensure that noise generated by equipment is not exacerbated.
- Operations at exposed locations and under unfavourable weather conditions are modified, where necessary, to reduce potential noise-related impacts.
- The internal road network is maintained to reduce body noise from empty trucks.

Following a comprehensive review of the Project, Hanson has proposed the following additional mitigation and management measures.

- Enclosures are to be installed on all fixed processing equipment from the commencement of Stage 1 of operations. The mobile crusher used for concrete recycling would be partially enclosed.
- An earthen amenity barrier located to the south of the relocated Processing and Stockpiling Area would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- Earthen amenity barriers between 15m and 60m in length and approximately 4m high would be temporarily constructed for each stage of operations and strategically located within the Processing and Stockpiling Area (see Table 31 of Vipac, 2018a).
- An acoustic barrier would be constructed along the Quarry Access Road to mitigate noise generated by heavy vehicles on the Quarry Access Road.
- Replacement or additional processing equipment would have the same or lower sound power levels as that assumed for the predictive modelling assessment.

All mitigation and management measures (where relevant) have been included in development of the noise model.

Hanson would also implement noise monitoring and a noise management system through a comprehensive Noise Management Plan. The noise monitoring program would be established in consultation with DPIE and would involve quarterly monitoring for a two-year period at locations to the south, east and west of the Quarry. This monitoring would take place over a single or consecutive days and record representative noise levels covering the day, evening and night time periods. After an initial two years of monitoring, the frequency of monitoring would be reduced to bi-annual, assuming that there are no identifiable seasonal trends in results. In addition, Vipac (2018a) recommend that an annual survey of sound power levels for all mobile equipment be undertaken to demonstrate that noise generated by this equipment is not exceeding that used in predictive modelling.

Reactive management measures would be implemented as a result of a range of triggers that may include:

- an exceedance of the noise limits identified through noise monitoring;
- in response to a substantiated noise complaint; or
- at the request of the DPIE.

These measures would be established through a trigger response plan and essentially involve investigation of the action that triggered the investigation, resolution of the issue and reporting to relevant parties. The results of an investigation may also trigger a review of proactive noise management measures to ensure these continue to be effective and may necessitate an update to the Noise Management Plan, which would be subject to the approval of the DPIE.

4.2.4 Predicted Operational and Construction Noise Levels

Predicted operational noise levels at the closest privately-owned residences are presented in detail in Section 7.1 of Vipac (2018a) (**Appendix 6**). Noise contour diagrams are presented in **Figure 19** to **Figure 24**.

The results presented in Section 7.2 of Vipac (2018a) and summarised in **Table 19** indicate that operational noise levels would generally comply with the relevant assessment criteria, except at residences adjacent to Clarence Town Road that may experience noise levels 1dB(A) to 2dB(A) above the assessment criteria during worst case scenario conditions. That is, during periods when a light wind is blowing from the Quarry towards the residence or during temperature inversion conditions.

Table 19
Summary of Noise Prediction Results

Scenario	Period	Number of Exceedances	Location[1]	Exceedance above criteria (dB(A))
Stage 1	Day	0	-	-
	Evening	4	R13A, R13B, R14 and R16	1-2
	Night	2	R14 and R16	1
Stage 2	Day	0	-	-
	Evening	4	R13A, R13B, R14 and R16	1-2
	Night	2	R14 and R16	1
Stage 3	Day	0	-	-
	Evening	4	R13A, R13B, R14 and R16	1-2
	Night	1	R16	1
Stage 4	Day	0	-	-
	Evening	2	R16 and R17	1-2
	Night	3	R13A, R16 and R17	1-2
Stage 5	Day	0	-	-
	Evening	4	R13A, R14, R16 and R17	1-2
	Night	3	R13A, R16 and R17	1-2
Construction Scenario 1	Day	1	R14	1
Construction Scenario 2	Day	0	-	-
1 – See **Figure 19** to **Figure 24**				
Source: Modified after Vipac (2018a) Table 35 to Table 44, Table 50 and Table 51				

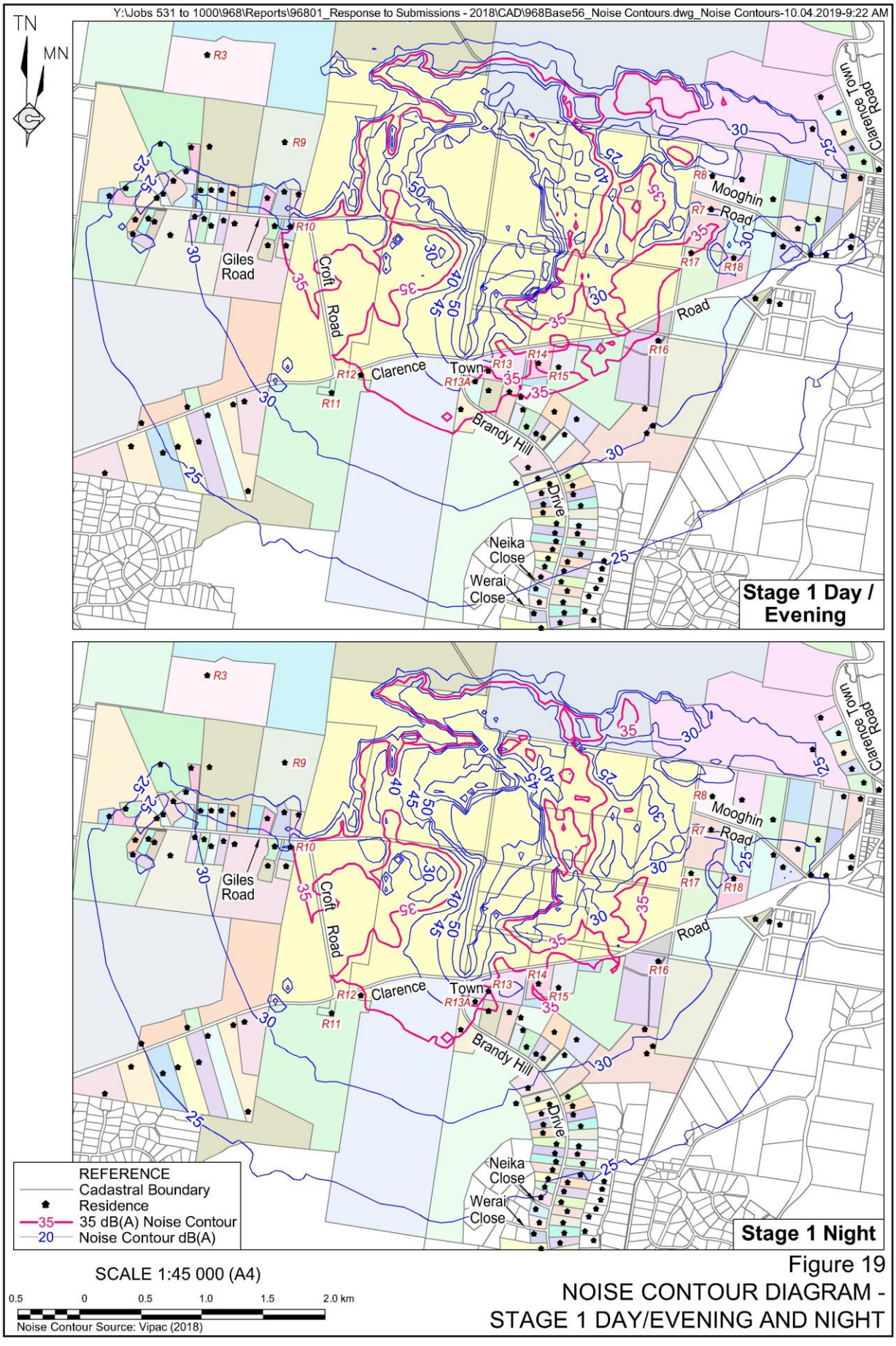


Figure 19
NOISE CONTOUR DIAGRAM - STAGE 1 DAY/EVENING AND NIGHT

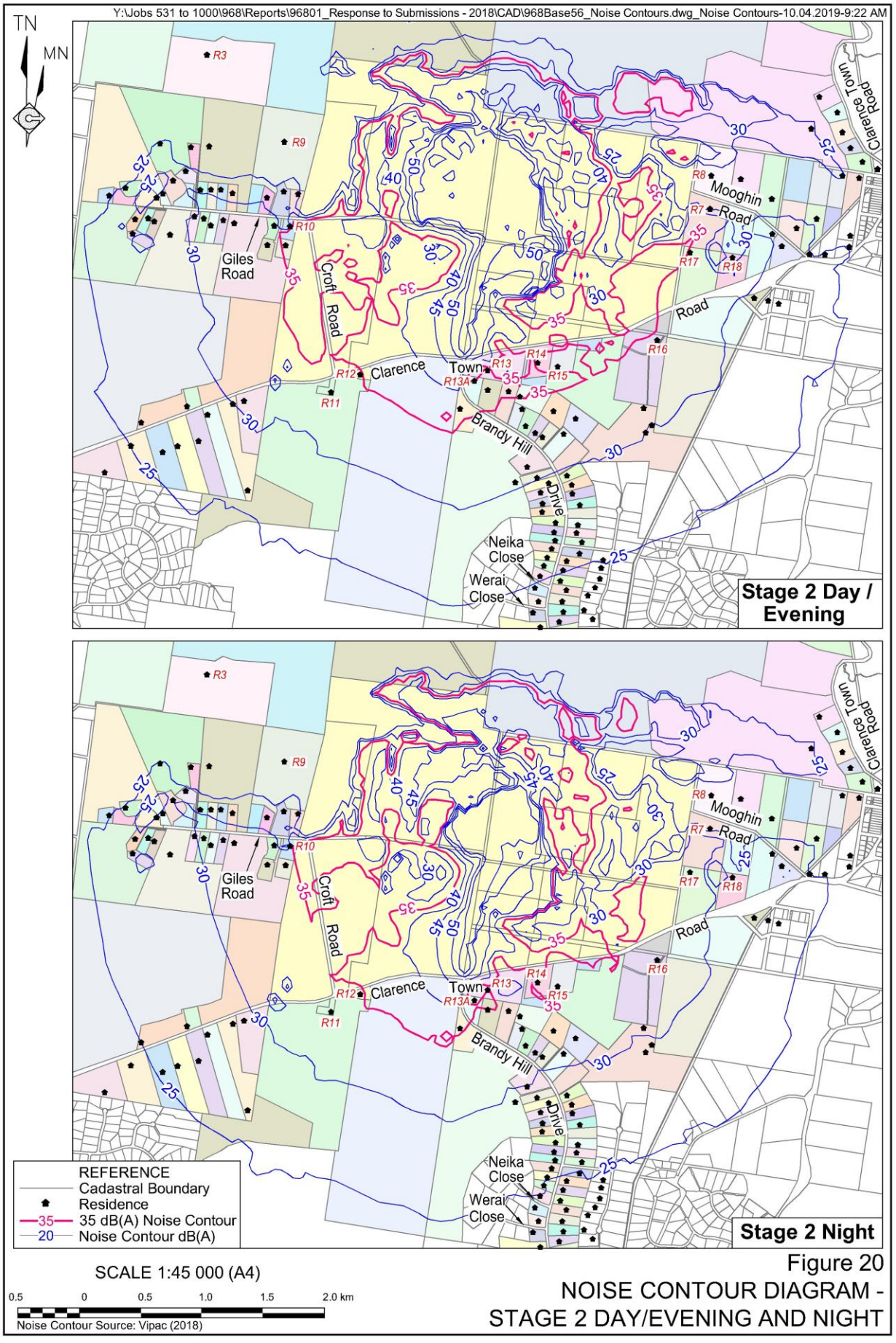


Figure 20
NOISE CONTOUR DIAGRAM - STAGE 2 DAY/EVENING AND NIGHT

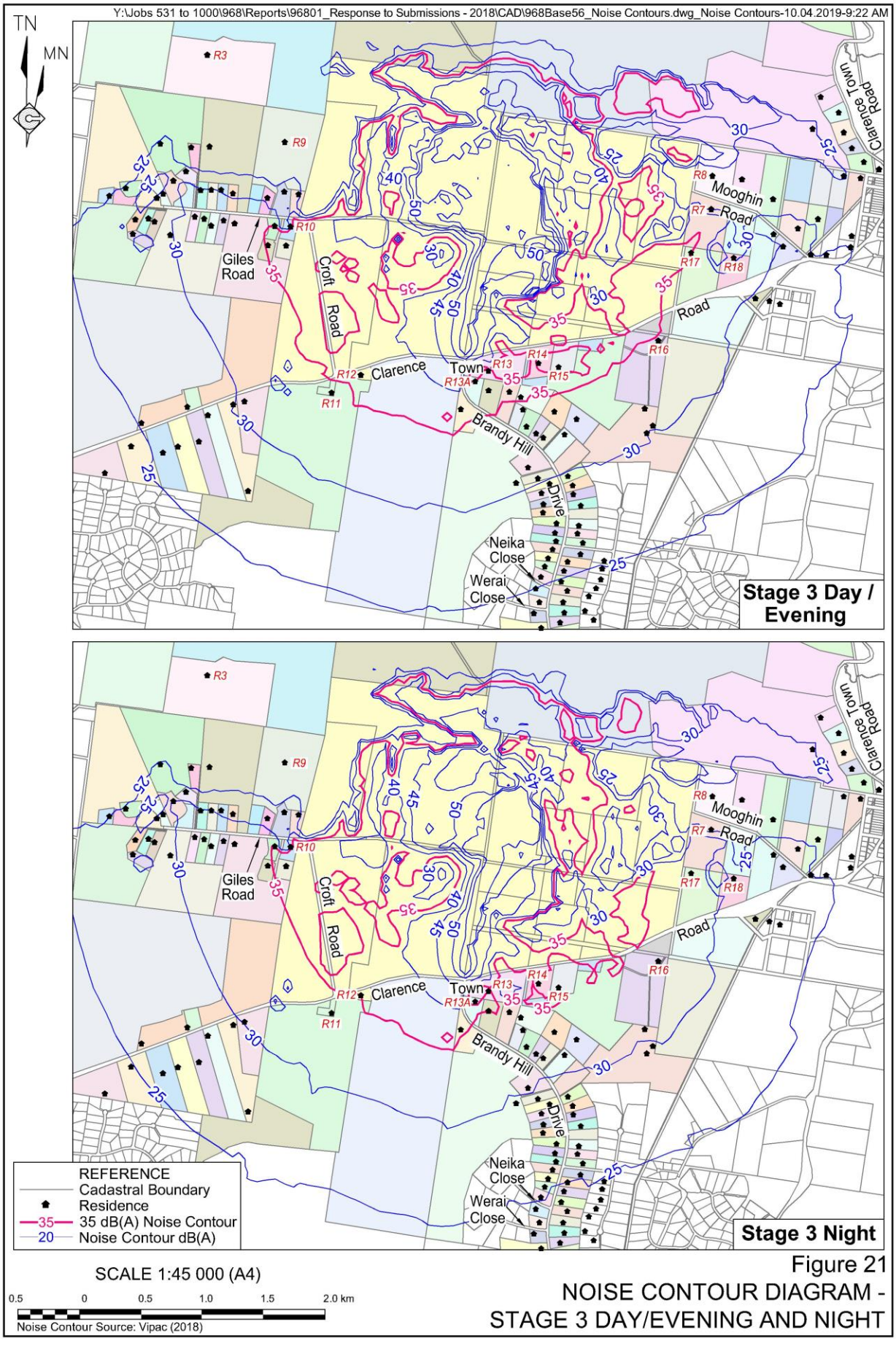


Figure 21
NOISE CONTOUR DIAGRAM - STAGE 3 DAY/EVENING AND NIGHT

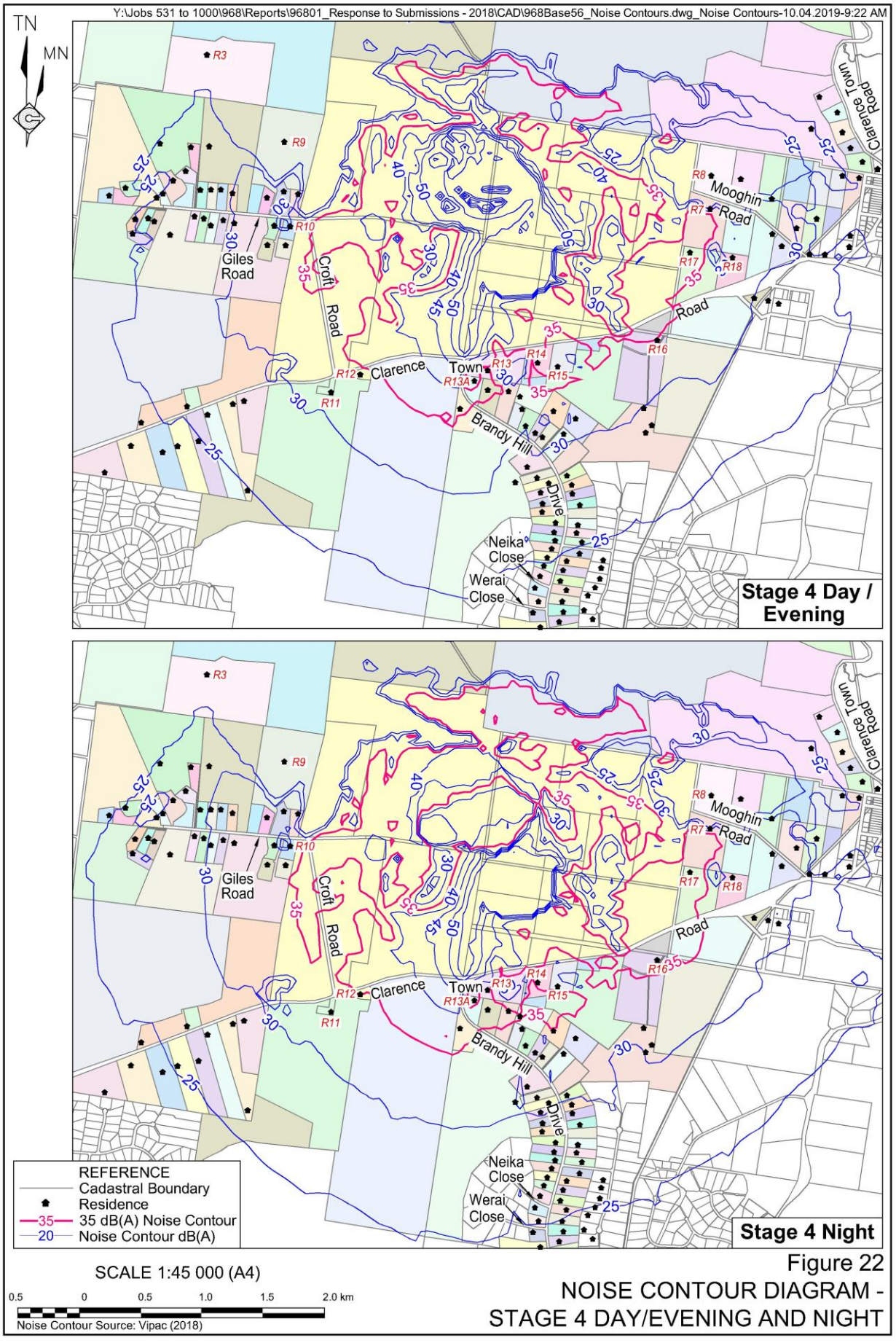


Figure 22
NOISE CONTOUR DIAGRAM - STAGE 4 DAY/EVENING AND NIGHT

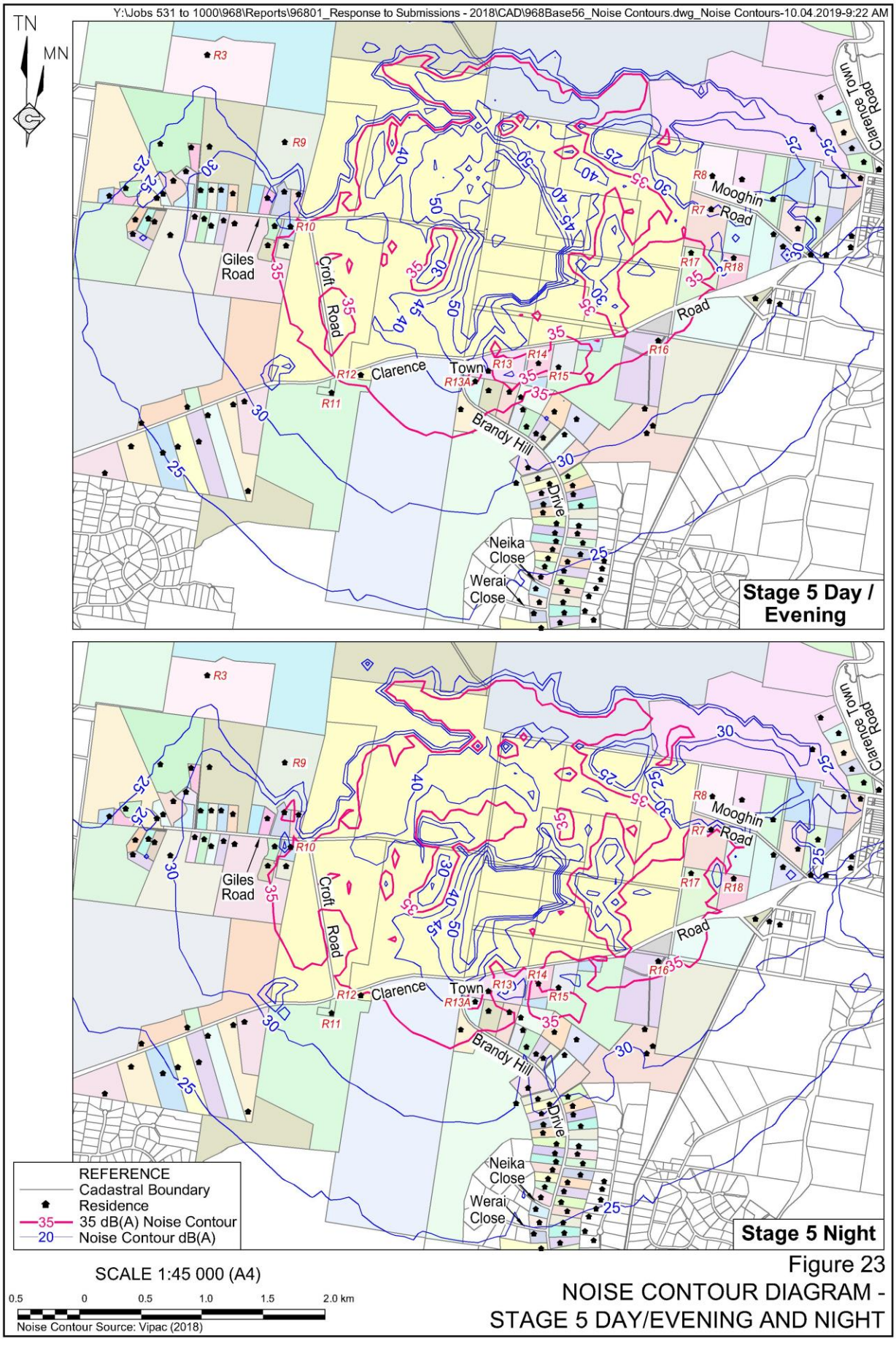


Figure 23
NOISE CONTOUR DIAGRAM - STAGE 5 DAY/EVENING AND NIGHT

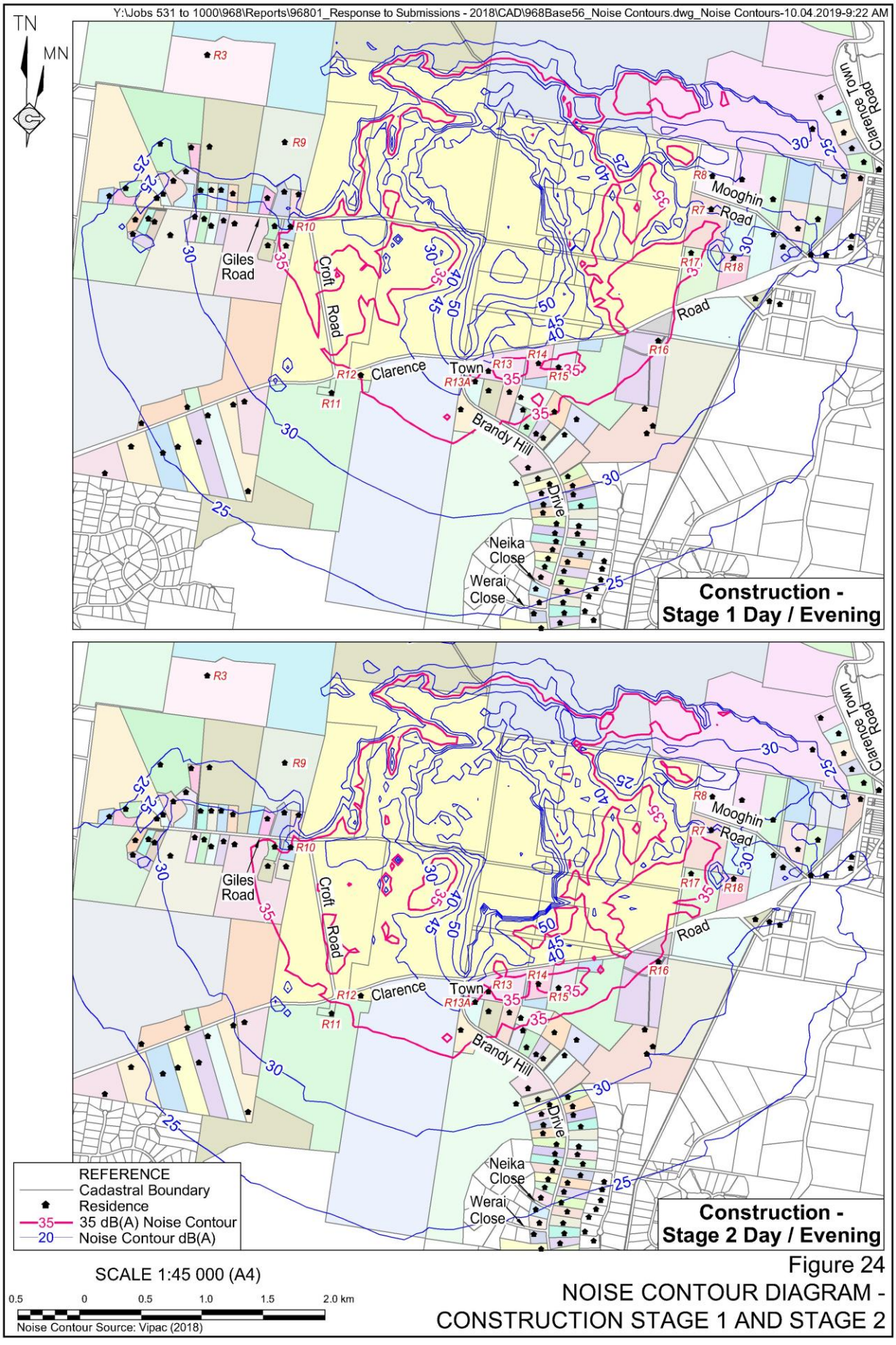


Figure 24
NOISE CONTOUR DIAGRAM - CONSTRUCTION STAGE 1 AND STAGE 2

The predicted noise impact is considered negligible as a change in noise level of 2dB(A) is not perceptible to the average human ear and therefore these predicted noise levels are unlikely to be perceived by the residents at these locations as intrusive. Regardless, the noise monitoring program and noise management system described in Section 4.2.3 would allow Hanson to monitor performance and respond to noise-related incidents appropriately.

In addition, Vipac (2018a) confirmed that operational noise levels would comply with assessment criteria for low frequency noise (**Table 18**) at all privately-owned residences and during all stages of operations and construction.

4.3 OPERATIONAL SLEEP DISTURBANCE

As the operational noise assessment has been undertaken in accordance with the INP (in order to retain more conservative limits on daytime noise levels), the assessment of operational sleep disturbance has been prepared in accordance with the INP to satisfy the transitional arrangements of the NPI. For the benefit of the community, the assessment of operational sleep disturbance in accordance with the NPI is also presented below as this approach is more conservative.

Assessment under the INP

It should be noted that the INP provides no definitive criteria for assessment of operational sleep disturbance. A sleep disturbance criterion of 15dB(A) above the prevailing $LA_{90(15minute)}$ level has been used previously by Vipac for assessment of development and is referenced in the INP Application Notes but is acknowledged as not being 'ideal'. The background noise levels (RBLs) at receivers on Brandy Hill Drive are 30dB(A) for the night time period. Therefore, the relevant sleep disturbance criteria would be 45dB(A). During the assessed worst-case operating scenarios, the highest predicted noise levels during the night time period were 36dB(A) and 37dB(A).

For short term maximum noise generation, Vipac (2018a) concluded that the maximum noise levels from a subset of the Quarry noise sources could be up to 10dB higher than the assumed L_{Aeq} sound power levels used in predictive noise modelling. Therefore, the short-term maximum noise levels ($L_{A1(1minute)}$) would be up to approximately 46dB(A) to 47dB(A). These levels would be 1dB(A) to 2dB(A) above the assumed criteria, however this difference in outcome when compared to the criteria level would not be perceptible to the average human ear.

Assessment under the NPI

Vipac (2018a) also considered trigger levels for a maximum noise level assessment described in the NPI as follows.

Where the subject development/premises night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LA_{Fmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater, a detailed maximum noise level event assessment should be undertaken.

With regards the potential for sleep disturbance from operational activities, in all instances, the Project Specific Noise Levels (referred to in Section 4.2.2) for the evening and night time periods are more stringent than the maximum noise level triggers, and therefore, the assessment of evening and night time operational noise levels is considered to provide an indication of potential

sleep disturbance. The operational noise assessment at residences adjacent to Clarence Town Road would satisfy the NPI sleep disturbance criteria of 40dB(A). Therefore, the assessment of operational noise during the night time period indicates that night time operations would not be likely to result in sleep disturbance.

With regard to the maximum noise level event assessment under the NPI, Vipac (2018a) concluded that the maximum noise levels from a subset of the Quarry noise sources could be up to 10dB higher than the assumed sound power levels used in the predictive modelling. Therefore, the likely L_{Amax} noise impact from all sources combined (even in the unlikely worst-case scenario of all sources operating at maximum levels simultaneously) is predicted to be less than the 52dB(A) L_{Amax} criterion at the nearest receivers for maximum noise level events and would not result in sleep disturbance.

4.4 ROAD TRAFFIC NOISE

The EPA submission also requested Hanson revisit the road traffic noise assessment for the Project. An Updated Noise Impact Assessment is provided as **Appendix 6** and presents the outcomes of the road noise assessment. The following provides a brief summary of the assessment and outcomes.

4.4.1 Existing Traffic Levels

Traffic levels for the assessment were drawn from a traffic survey undertaken in March 2015 to coincide with the background noise monitoring activities. This permitted Vipac to correlate noise monitoring with traffic levels over the period of monitoring.

Vipac undertook a comprehensive review of the background data to calibrate records and, where possible, account for extraneous noises such as insect noise (see Section 7.2 of Vipac (2018a)).

4.4.2 Assessment Criteria

Section 5 of the NSW Road Noise Policy (RNP) (DECCW, 2011) discusses the differences in a person's perceptions of noise and notes that environmental objectives for transportation-related noise sources are set approximately at the point at which 10% of residents are highly annoyed by the noise. The assessment criteria for the road traffic noise assessment is presented in **Table 20** and **Table 21** and is consistent with the criteria described in Section 2 of the RNP. Land use developments that result in a change to noise levels experienced at an existing residence must satisfy day and night-time traffic noise criteria as well as a relative increase criteria.

Table 20
Road Traffic Noise Assessment Criteria

Road	Type of Project and Land Use	Total Traffic Noise Criteria[1]
Sub-arterial Road	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments.	Daytime 60 $L_{Aeq(15hour)}$
		Night-time 55 $L_{Aeq(9hour)}$
1. Daytime 7:00am to 10:00pm, Night-time 10:00pm to 7:00am		
Source: Modified after Vipac (2018a) – Table 21		

Table 21
Relative Increase Criteria for Residential Land Uses

Road Category	Type of project/development	Total traffic noise level increase dB(A)	
		Day	Night
Sub-arterial roads	Land use development with the potential to generate additional traffic on existing road	Existing traffic $L_{Aeq,15hour}$ + 12dB (external)	Existing traffic $L_{Aeq,9hour}$ + 12dB (external)
1. Daytime 7:00am to 10:00pm, Night-time 10:00pm to 7:00am			
Source: Modified after Vipac (2018a) – Table 22			

In instances where the existing road traffic noise levels exceed the road traffic noise assessment criteria, Section 3.4 of the RNP notes the following in relation to the relative change in noise levels.

> *In assessing feasible and reasonable mitigation measures, an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.*

In addition, Section 3.4.1 of the RNP provides the following guidance in relation to the application of assessment criteria.

> *For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2dB above that of the corresponding 'no build option'.*

Based on this guidance and for the purpose of this assessment, where occupants of residences are affected by additional traffic on existing roads any increase in traffic noise level that is limited to 2dB(A) is acceptable as this change in noise level is barely perceptible to the average person. The application of this criterion is dependent on the implementation of feasible and reasonable mitigation measures.

4.4.3 Road Noise Mitigation and Management Measures

The Road Noise Policy provides the following order of priority for identifying feasible and reasonable mitigation.

a) Road design and traffic management.

b) Quieter pavement surfaces.

c) In-corridor noise barriers/mounds.

d) At-property treatments or localised barriers/mounds.

Noise management measures that are proposed to be implemented during ongoing operations that are relevant to road traffic noise generation include the following.

- Compliance with the approved hours of operation for product loading and despatch.
- Compliance with the maximum number of truck movements per day nominated in consent conditions.

- A reduction to the speed limit of all heavy vehicles involved in transportation activities to 60km/hr (from the existing speed of 80km/hr) on Brandy Hill Drive would be trialled. This would improve road safety as well as reduce road traffic noise generation but there is concern that this may lead to dangerous behaviour from other drivers.
- Night time transport operations would be limited to 20 calendar days per year with interested community members to be given seven days' notice that this would occur.
- All drivers would be required to review and sign a Drivers Code of Conduct (provided as **Appendix 12**) that directs driver behaviour during transportation activities. Issues addressed in the code of conduct would include:
  - advice for quiet driving practices and measures to reduce vehicle noise;
  - limiting the use of compression braking unless required for safety reasons;
  - advice for management of driver fatigue;
  - load covering for all laden vehicles;
  - timing for departure and arrival to remain within approved limits and avoid convoying;
  - management of breakdowns and incidents;
  - awareness of school buses, school zones, pedestrians and cyclists on roads;
  - use of preferred transportation routes; and
  - limiting the use of local roads unless directed by emergency services.
- Ongoing maintenance of the condition of the Quarry Access Road to limit noise sources such as potholes or edgewear.
- Maintenance of a complaints and incidents register for all traffic-related matters.

It is also noted that funds contributed to Port Stephens Council under an existing Voluntary Planning Agreement may be used to improve the condition of Brandy Hill Drive and/or Clarence Town Road to provide road noise mitigation. It is estimated that over the proposed 30-year life of the Brandy Hill Extension Project, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions. It is possible that a portion of these funds may be directed towards improving the surface of the road to improve traffic noise generated by all traffic using the road.

It is not feasible for Hanson to construct noise barriers within the road corridor or within property boundaries to limit noise impacts, nor would this be desirable to residents along these roads.

Finally, road traffic noise monitoring involving unattended noise monitoring would be undertaken on a bi-annual basis at the same location used for the road traffic noise assessment unless an agreement is reached for monitoring at a residential location. This noise monitoring program would be described in a Noise Management Plan that would be prepared in consultation with Port Stephens Council and DPIE (noting that the EPA generally does not comment on post-approval documentation).

4.4.4 Assessment Results

The road traffic noise assessment used the Calculation of Road Traffic Noise (CoRTN) method to model predicted road traffic noise levels generated by traffic on Brandy Hill Drive. Background monitoring at a location 30m from Brandy Hill Drive was used for the assessment and is considered to be representative of impact at the closest residence to Brandy Hill Drive and is therefore the closest to noise sources (i.e. passing traffic). The results of the road traffic noise assessment are presented in **Table 22**.

Table 22
Existing and Future Traffic Noise Levels dB(A)

Period	Existing Noise Levels (dB(A))	Traffic Generated		Applicable Noise Criteria (dB(A))	Difference (dB(A))
		Proposed Truck Movements	Future Noise Levels dB(A)[1]		
Day period (7am to 10pm)	62.2	603	63.3	64.2[2]	+1.1
Night Period (10pm to 7am)	52.1	117	54.1	55[3]	+2
Note 1: Assessment representative of noise levels at a location 30m from Brandy Hill Drive Note 2: Based on limiting the change in noise to no greater than 2dB(A) Note 3: See **Table 20**					
Source: Vipac (2018a) – Table 48					

Vipac (2018) also reviewed potential traffic noise generation during the morning shoulder period to ensure that traffic noise was acceptable during the time when people were waking up and preparing for work in the morning. The assessment of traffic noise between the hours of 5:00am and 7:00am concluded that:

- a limit of 9 laden loads (18 truck movements) between 5:00am and 6:00am; and
- a limit of 12 laden loads (24 truck movements) between 6:00am and 7:00am

would ensure that the change in traffic noise would remain less than 2dB(A) and therefore, would not be perceptible to the average human ear.

It is noted that the results reflect predicted noise levels at a distance of 30m from Brandy Hill Drive (i.e. the closest residence) and therefore noise levels experienced at other residences would be consistent with these predictions or below these predictions dependant of the distance from the residence to the noise source (i.e. passing traffic).

The results indicate that predicted road traffic noise levels during the night time period would satisfy the assessment criteria presented in **Table 20** as well as presenting a change in road traffic noise that is less than 2dB(A), a change in noise level that is not perceptible to the average human ear.

Existing road traffic noise levels during the day period already exceed the assessment criteria presented in **Table 20**. Therefore, road traffic noise levels are assessed against a relative increase criteria. The predicted change in noise level does not exceed 2dB(A) and is limited to a change in noise level of less than 1.1dB(A) and would therefore be well below change in noise level that is perceptible to the average human ear.

It should also be noted that since the preparation of this assessment, Hanson has been notified that Daracon has revised planning and traffic management for the Martins Creek Quarry and will no longer use the route via Brandy Hill Drive. Therefore, the cumulative noise level would be below that predicted in this assessment as Vipac (2018a) assumed an average of 6 laden loads per hour from this operation.

4.4.5 Road Traffic Sleep Disturbance

The Road Noise Policy provides indicative guidance on the maximum short-term internal noise levels that may cause sleep disturbance. Internal noise levels should be limited to 50dB(A) to 55dB(A) to limit the potential to awaken people from sleep. Noise monitoring of vehicles at locations on Brandy Hill Drive indicate that short term maximum noise levels at a location 30m from the road were between 71dB(A) to 79dB(A). Even correcting this for a façade with open windows (which is considered to provide a 10dB(A) reduction in noise levels experienced inside a building[1]) indicates noise levels of 61dB(A) to 69dB(A). This applies to all heavy vehicles and potentially large passenger vehicles using Brandy Hill Drive.

It is also noted that Hanson has committed to limit night-time product despatch (between the hours of 10:00pm and 5:00am) to only occur on 20 nights per calendar year. This would further reduce the potential for road traffic sleep disturbance.

Vipac (2018a) note the following from Section 1.2 of the Road Noise Policy.

> *Although it is not mandatory to achieve the noise assessment criteria in this RNP, proponents will need to provide justification if it not considered feasible or reasonable to achieve them. The policy must be used during the environmental assessment of road proposals to develop feasible and reasonable noise mitigation measures.*

Hanson has focused on providing all reasonable and feasible mitigation as described in Section 4.4.3. In summary, the key strategy to reduce potential sleep disturbance impact is to reduce the speed of all trucks on Brandy Hill Drive to 60km/hr from the sign-posted speed limit of 80km/hr. This would reduce the noise generated by trucks travelling on this road and result in a situation where it is most likely that Hanson trucks would be generating less noise than other heavy vehicles on the road and potentially less noise than some passenger vehicles. This mitigation would be trialled by Hanson with ongoing implementation dependent on community feedback. There is some concern that slower trucks would frustrate light vehicle drivers and create a traffic safety incident.

The speed limit would be implemented through the Drivers Code of Conduct that would also include restrictions to the use of compression brakes and other noisy behaviour.

Based on the mitigation described in Section 4.4.3, Hanson considers that all feasible and reasonable mitigation would be implemented to reduce potential sleep disturbance on Brandy Hill Drive.

[1] See Table 4.2 of the RTA Environmental Noise Management Manual 2001

4.5 AIR QUALITY

As noted in Section 4.2, Hanson has undertaken a comprehensive review of the Project to identify additional mitigation and management that may be implemented to reduce potential amenity impacts. As a result, it was identified that the proposed mitigation should also be applied to the predictive particulate matter dispersion modelling to accurately reflect potential air quality impacts. In addition, the submission from DPIE and the EPA requested further detail on potential air quality assessment methods and results, while several community submissions expressed concern about dust impacts including a comprehensive response provided by the Brandy Hill and Seaham Action Group.

Following feedback from the EPA regarding the assumptions and calculations used for the predictive dust dispersion modelling, Hanson commissioned Todoroski Air Sciences (TAS) to review the Project and prepare a standalone air quality assessment. The Air Quality Impact Assessment prepared by TAS is provided as **Appendix 8** and is referred to as TAS (2019). In completing this review, TAS have updated the assumptions made concerning background air quality and meteorological conditions compared to that used by Vipac in the original assessment. However, TAS have retained the Conservative Assumptions applied though reference to the BCD monitoring station at Beresfield. This subsection provides a brief summary of the local air quality setting, the air quality criteria adopted for assessment, the assessment methodology and the mitigation and management measures that would be applied for the operation. A brief summary of the dispersion modelling results is then provided.

4.5.1 Existing Air Quality Environment

TAS (2019) completed an analysis of local meteorological conditions recorded at the Paterson (Tocal) weather station over a five-year period from 2014 to 2018. The analysis is presented in Appendix B of TAS (2019) and identifies that the 2015 calendar year was the most representative of average meteorological conditions over the period.

There are no suitable records of existing particulate matter concentrations (PM_{10} and $PM_{2.5}$) available in the vicinity of the Quarry. TAS (2019) reviewed available data from the BCD monitoring stations at Beresfield, Wallsend and data available from the air quality assessment for the Rocky Hill Coal Project in the vicinity of Gloucester (120km north of Seaham). In order to ensure that the assessment remained conservative and representative of local conditions, TAS (2019) selected data from the closest representative monitoring location at the Francis Greenway High School in Beresfield, approximately 14km south-southeast of the Quarry. Data from the 2015 calendar year was selected as it was most representative of average records over the period from 2014 to 2018 and matched the year used as most representative of average meteorological conditions.

Records of daily air quality at this location already exceed the relevant air quality goals specified in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017), however the annual average records were within the relevant air quality goals. This indicates that existing particulate matter levels may be high on some occasions, but on average are acceptable. It should be noted that the monitoring station at Beresfield is approximately 1.8km from the intersection of the Pacific Highway and the New England Highway, both major motorways for heavy and light vehicle traffic driving north or east towards Newcastle and a source of fine particulates. At its closest point the Quarry is approximately 10.9km from the Pacific Highway north of Raymond Terrace and 12.8km from the New England Highway at Maitland.

As there is no available data for Total Suspended Particulates (TSP), TAS (2019) relied upon the generally accepted assumption concerning the proportion of TSP to PM_{10} under average conditions. It is generally accepted that an annual average PM_{10} concentration of 25µg/m^3 correlates with 90 µg/m^3 of TSP.

Dust deposition is currently monitored at three locations to the west, south and east of the Quarry. At the time the assessment was undertaken for the EIS, the annual average dust levels were between 0.7g/m^2/month and 2.2g/m^2/month. Section 1.6.2 reviews recent dust monitoring results and indicates that monitored dust levels have remained consistent with these levels and are well within the 12-month rolling average criteria of 4g/m^2/month.

A comprehensive review of the air quality conditions is included in Section 4 of TAS (2019). **Table 23** presents the background conditions assumed for the assessment of potential air quality impacts for the Project. As there are exceedances in the background data for daily PM_{10} and $PM_{2.5}$ records at the Beresfield monitoring station, data from across the 2015 calendar year has been used as representative year for the assessment of daily PM_{10} and $PM_{2.5}$ dust predictions.

Table 23
Adopted Background Air Quality Concentrations

Parameter	Period	Applied Background	Comments
TSP	Annual	67.7 µg/m^3	Double annual average PM_{10}
PM_{10}	Annual	18.8 µg/m^3	Annual Average Beresfield Data 2013
$PM_{2.5}$	Annual	7.3 µg/m^3	Annual Average Beresfield Data
Dust Deposition	Monthly	2.2 g/m^2/month	Average of available Quarry data
Source: TAS (2019) – Section 4.3.5.4			

4.5.2 Assessment Criteria

The adopted air quality assessment criteria for the Project are presented in **Table 24** including the relevant background levels assumed for each parameter and the source of the criteria.

Table 24
Air Quality Assessment Criteria

Pollutant	Averaging Time	Criteria	Applied Background	Source
TSP	Annual	90 µg/m^3	67.7 µg/m^3	EPA, 2017
PM_{10}	24-hour	50 µg/m^3	Variable	EPA, 2017
	Annual	25 µg/m^3	18.8 µg/m^3	EPA, 2017
$PM_{2.5}$	24-hour	25 µg/m^3	Variable	EPA, 2017
	Annual	8 µg/m^3	7.3 µg/m^3	EPA, 2017
Dust deposition	Annual	4 g/m^2/month	2.2 g/m^2/month	EPA, 2017
		Maximum incremental increase of 2 g/m^2/month		
Silica	Annual	3 µg/m^3	Not Available	VIC EPA, 2007
Source: TAS (2019) – Table 3-1 and Table 3-4				

Each criterion is based on cumulative values and therefore applies to the total of both the adopted background levels and predicted incremental values produced by the Quarry for the purpose of assessment.

The same criteria are relevant for assessment of the Project under the *Voluntary Land Acquisition and Mitigation Policy 2018* (VLAMP) for consideration of the rights of effected landowners to request mitigation or acquisition of the property. The difference between the trigger for mitigation or acquisition is the number of predicted exceedances over the life of the development. As predictive modelling is based on an average year, generally an exceedance of the criteria for particulate matter will trigger acquisition rights. The VLAMP applies to impacts at residences and over the closest affected 25% of vacant land that may be subject to development in the future under existing planning controls.

4.5.3 Methodology

Section 5 of TAS (2019) presents a comprehensive summary of the modelling methodology and assumptions including the following.

- Use of CALPUFF Modelling System and The Air Pollution Model (TAPM) to replicate meteorological conditions for modelling.
- The selection of four representative scenarios for modelling worst case dust generation.
- Estimates of emissions generated for each representative scenario based on locally developed and United States Environmental Protection Agency documents.

An air dispersion model was generated to simulate prevailing meteorological conditions, dust sources and intensity as well as mitigating factors such as the use of a water truck to dampen roads during dry conditions. The modelling was used to predict air quality impacts under different meteorological conditions.

Three operational scenarios were modelled to represent worst case operational and construction stages. In addition, TAS modelled existing operations for comparison with predicted results during operational stages. Modelled scenarios therefore included the following.

- Existing operations – Existing operations with an annual production rate of 0.7Mtpa.
- Stage 1 - Proposed site operations with an annual production rate of 1.5Mtpa, concrete recycling at a rate of 20 000tpa and including the construction of the amenity barrier.
- Stage 2 - Proposed site operations with an annual production rate of 1.5Mtpa and concrete recycling at a rate of 20 000tpa.
- Stage 4 - Proposed site operations with an annual production rate of 1.5Mtpa including concrete recycling at a rate of 20 000tpa, concrete batching at a rate of 15 000m^3 per annum and relocation of the fixed plant. This stage is the last stage where previously undisturbed land would be stripped to allow access to the resource material.

By Stage 2, the amenity barrier on the southern boundary would be complete and stand between 18m and 20m high. However, this barrier has not been modelled in CALPUFF due to limitations of the software. Stage 4 is representative of the relocation of the processing plant and incorporates the proposed mitigation measures for the relocated Processing and Stockpiling Area.

Due to the fact that daily monitoring records at Beresfield exceed the criteria levels on some occasions, a Level 2 contemporaneous assessment of 24-hour average $PM_{2.5}$ and PM_{10} has been undertaken that considers daily records over the 2015 calendar year rather than adopting an average level for this parameter. The Level 2 Contemporaneous Assessment Method is provided in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017). In this approach the measured background levels are added to the day's corresponding predicted dust level from the proposed changes to establish the number of additional days in a representative year when the criteria would be exceeded as a result of the proposed changes. As a result, a variable level is described as the assumed background in **Table 24** for these parameters.

4.5.4 Mitigation and Management Measures

The following mitigation and management measures were incorporated in the dispersion modelling. It should be noted that many of the following mitigation and management measures have been implemented successfully during existing operations.

- All fixed crushing and screening equipment would be enclosed and conveyor transfer points would be partially enclosed after Stage 4 of operations.
- The internal road network would continue to be surfaced with well graded materials to reduce dust generation. The roads would be regularly swept/cleaned.
- Internal roads would continue to be watered using a water truck. Watering currently occurs constantly during operating hours.
- An earthen amenity barrier located to the south of the relocated Processing and Stockpiling Area would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- The earthen amenity barrier to the south of the Quarry Site would be stabilised with groundcover vegetation as soon as practical following construction.
- Earthen amenity barriers of various lengths and heights would be temporarily constructed for each stage of operations and strategically located within the Processing and Stockpiling Area.
- The extent of exposed surfaces and stockpiles would be minimised.
- Disturbed areas within the Quarry Site that are no longer required for operations would be subject to progressive rehabilitation and be stabilised with groundcover vegetation as soon as practical following completion.
- A water truck would be used to water any exposed areas that are not suitably stabilised. Watering of roads and exposed stockpiles would be increased during dry and windy conditions.

- Vehicle speed on internal roads would be limited to 30km/hr to reduce potential dust lift off.
- Road trucks carrying loads would be covered when moving with the Quarry Site.
- Dump heights from trucks, front-end loaders and conveyors would be minimised, where practical. Quarry personnel would be trained to limit the height from which material is loaded to trucks to reduce the momentum of material falling into the trailer and therefore dust generation.
- It is expected that from Stage 4 of operations, the depth of the extraction area would provide natural mitigation by retaining dust.
- Operations at exposed locations would be modified under unfavourable weather conditions, where necessary, to reduce potential dust generation.
- Blasts would be scheduled to avoid windy conditions, where feasible.

Operational controls to limit the emission of greenhouse gases during operations would include the following.

- Optimising Quarry design to minimise travel distances for equipment and the need for rehandling of overburden and aggregate materials.
- Truck queuing, unnecessary idling of trucks and unnecessary trips would be reduced through logistical planning, where possible
- All equipment on site is maintained to maximise efficiency.

Hanson would also install a continuous particulate matter monitor to demonstrate the successful implementation of proactive dust controls measures, allow adaptive air quality management and reduce the likelihood of exceedances and complaints. The particulate matter monitor would incorporate a trigger mechanism to notify Quarry personnel when 24-hour particulate matter levels approaches the guideline. Notifications are generally provided by SMS and/or email.

The air quality monitoring program would be described in a comprehensive Air Quality Management Plan that would also incorporate an air quality management system with reactive management measures that would be implemented as a result of a range of triggers including:

- The internal alarm system that would be incorporated into the particulate matter monitoring equipment, which would give Quarry personnel an indication that dust levels are approaching criteria levels;
- an exceedance of the air quality limits identified through monitoring;
- a substantiated air quality complaint;
- extraordinary events such as bushfires or dust storms; or
- predicted adverse weather conditions such as high winds or excessive dry periods.

Reactive management measures would be implemented through a trigger response plan that would involve investigation of the action, resolution of the issue and reporting to relevant parties. The results of the investigation may also trigger a review of the Air Quality Management Plan.

4.5.5 Dust Dispersion Modelling Results

The results of dispersion modelling undertaken by TAS (2019) indicate the following.

- Average annual TSP – Including the assumed annual average background concentration of 67.7µg/m^3, the cumulative annual average TSP is predicted to be less than 75.4µg/m^3 at all residences, which is below the criterion of 90µg/m^3. The highest incremental change due to the Project is 7.8µg/m^3.
- Average annual PM_{10} – Including the assumed annual average background concentration of 18.8µg/m^3, the cumulative annual average PM_{10} is predicted to be less than 22.0µg/m^3 at all residences, which is below the criterion of 25µg/m^3. The highest incremental change due to the Project is 3.2µg/m^3.
- Annual average $PM_{2.5}$ – Including the assumed annual average background concentration of 7.3µg/m^3, the cumulative annual average $PM_{2.5}$ is predicted to be less than 7.9µg/m^3 at all residences, which is below the criterion of 8.0µg/m^3. The highest incremental change due to the Project is 0.6µg/m^3.
- Respirable Crystalline Silica (RCS) – TAS (2019) considered the predicted annual average $PM_{2.5}$ level to provide an indication of the RCS likely to be in particulate matter in the vicinity of the Quarry. As the maximum incremental annual average $PM_{2.5}$ level is predicted to be 0.6µg/m^3, and this is likely to contain only a small fraction of RCS, TAS (2019) concluded that the RCS concentration would be well within the adopted assessment criteria of 3µg/m^3.
- Deposited Dust – Including the assumed annual average background concentration of 2.2g/m^2/month, TAS (2019) predicted that the maximum monthly average level of deposited dust is 2.4g/m^2/month which complies with the total deposited dust criterion of 4g/m^2/month. The maximum incremental increase in dust deposition would be 0.2g/m^2/month which is within the criterion of 2g/m^2/month for incremental increases to total dust deposition.

Table 25 presents the maximum predicted annual average particulate matter concentrations for each operational stage that was modelled.

Table 25
Summary of Air Quality Modelling Predictions

Pollutant	Averaging Period	Criteria	Assumed Background	Maximum Predicted Concentrations at Any Receptor			
				Existing	Stage 1	Stage 2	Stage 4
TSP (µg/m^3)	Annual	90	67.7	71.4	72.6	72.1	75.4
PM_{10} (µg/m^3)	Annual	25	18.8	20.8	21.1	20.7	22.0
$PM_{2.5}$ (µg/m^3)	Annual	8	7.3	7.8	7.8	7.8	7.9
Dust Deposition (g/m^2/month)	Monthly Total	4	2.2	2.3	2.3	2.3	2.4
	Monthly Increase	2		0.1	0.1	0.1	0.2
* Monthly average over a rolling 12-month period.							

It is noted from this summary that predicted cumulative annual average particulate matter concentrations are driven principally by the adopted background concentrations assumed from the Beresfield monitoring station. In addition, mitigation assumed in modelling results in particulate matter concentrations that are consistent though slightly higher than the existing levels even with an assumed production increase from 0.7Mtpa to 1.5Mtpa (i.e. more than double). This is due to the benefits from implementation of additional mitigation for the development such as enclosures on processing equipment. It is also evident that predicted emissions decrease slightly in Stage 2 which is indicative of the variation caused by construction of the amenity barrier. Stage 4 of operations is the worst-case outcome which is consistent with the greatest extent of disturbance for the Project. The outcomes for Stage 4 are displayed graphically in contour diagrams in **Figure 25** to **Figure 28**.

The data from the Beresfield monitoring station used to provide an indication of existing air quality conditions contained exceedances of the 24-hr PM_{10} and 24-hr $PM_{2.5}$ criteria. Therefore TAS (2019) undertook a Level 2 contemporaneous assessment of predicted 24-hr PM_{10} and 24-hr $PM_{2.5}$ based on daily records over the 2015 calendar year.

The results of the Level 2 contemporaneous assessment undertaken by TAS (2019) indicate that there would be no additional exceedances of the 24-hr PM_{10} and 24-hr $PM_{2.5}$ criteria due to the Project. TAS (2019) conclude that in most cases the 24-hr PM_{10} and 24-hr $PM_{2.5}$ levels generated from the Project would be difficult to discern from the background dust concentrations.

4.5.6 Voluntary Land Acquisition and Mitigation

Based on the results presented in Section 4.5.5, the Project would satisfy the relevant criteria at all privately-owned residences and over the closest affected 25% of vacant land that may be subject to development in the future. Therefore, the VLAMP is satisfied for the Project.

4.5.7 Blast Fume Assessment

A review of potential impacts from blast fume emissions is presented in Section 7 of TAS (2019) – **Appendix 8**. The assessment considered blast fume emissions (NO_2) based on levels recorded in a CSIRO study of blasting in the Hunter Valley (Attala et al. 2008). Predicted dispersion was modelled for each scenario modelled for the dust dispersion predictions and predicted the worst case impacts based on hourly blasting events under adverse meteorological impacts.

Section 7 of TAS (2019) presents graphical representations of the blast fume modelling outcomes. The modelling predicted that incremental blast fume impacts are mostly contained within the Quarry Site boundary and that the potential for adverse impacts is unlikely.

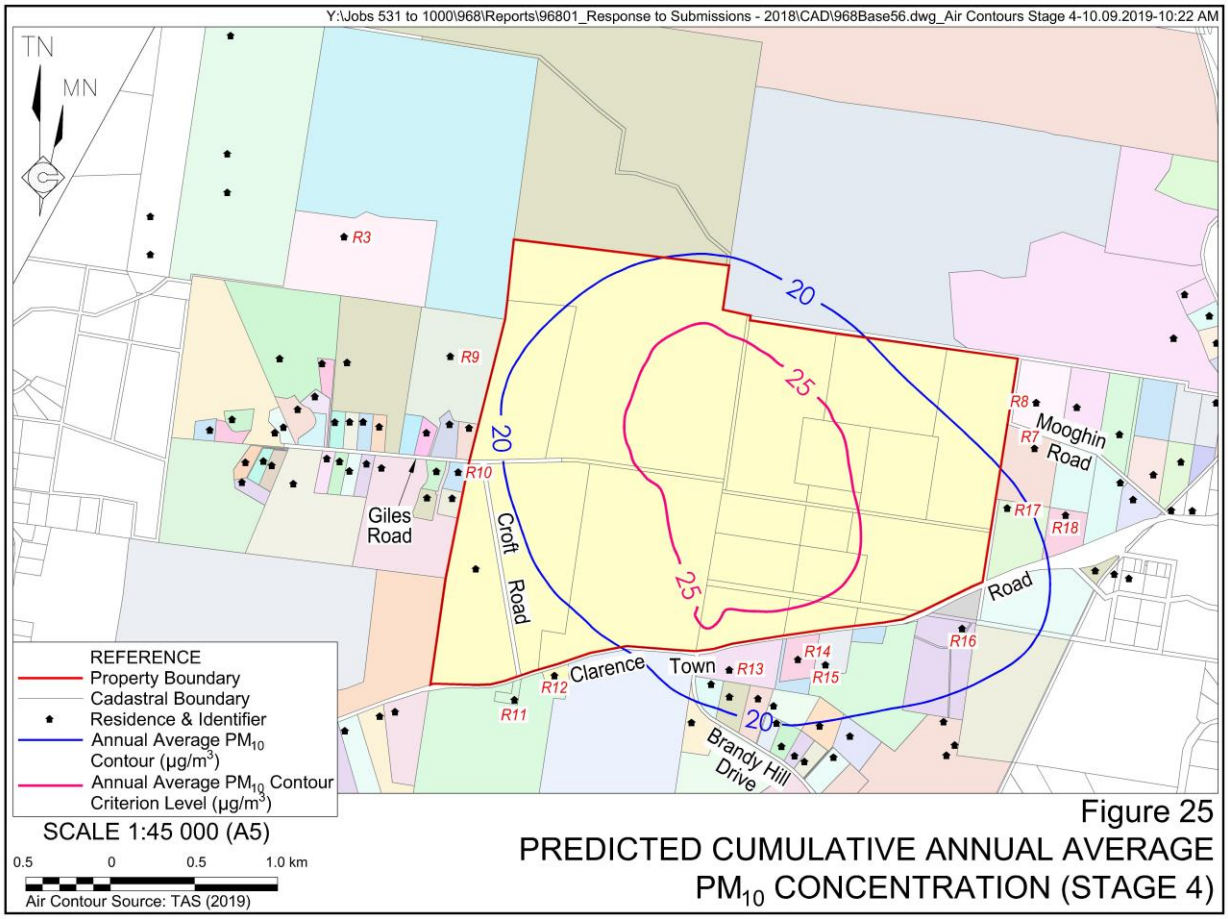


Figure 25
PREDICTED CUMULATIVE ANNUAL AVERAGE PM_{10} CONCENTRATION (STAGE 4)

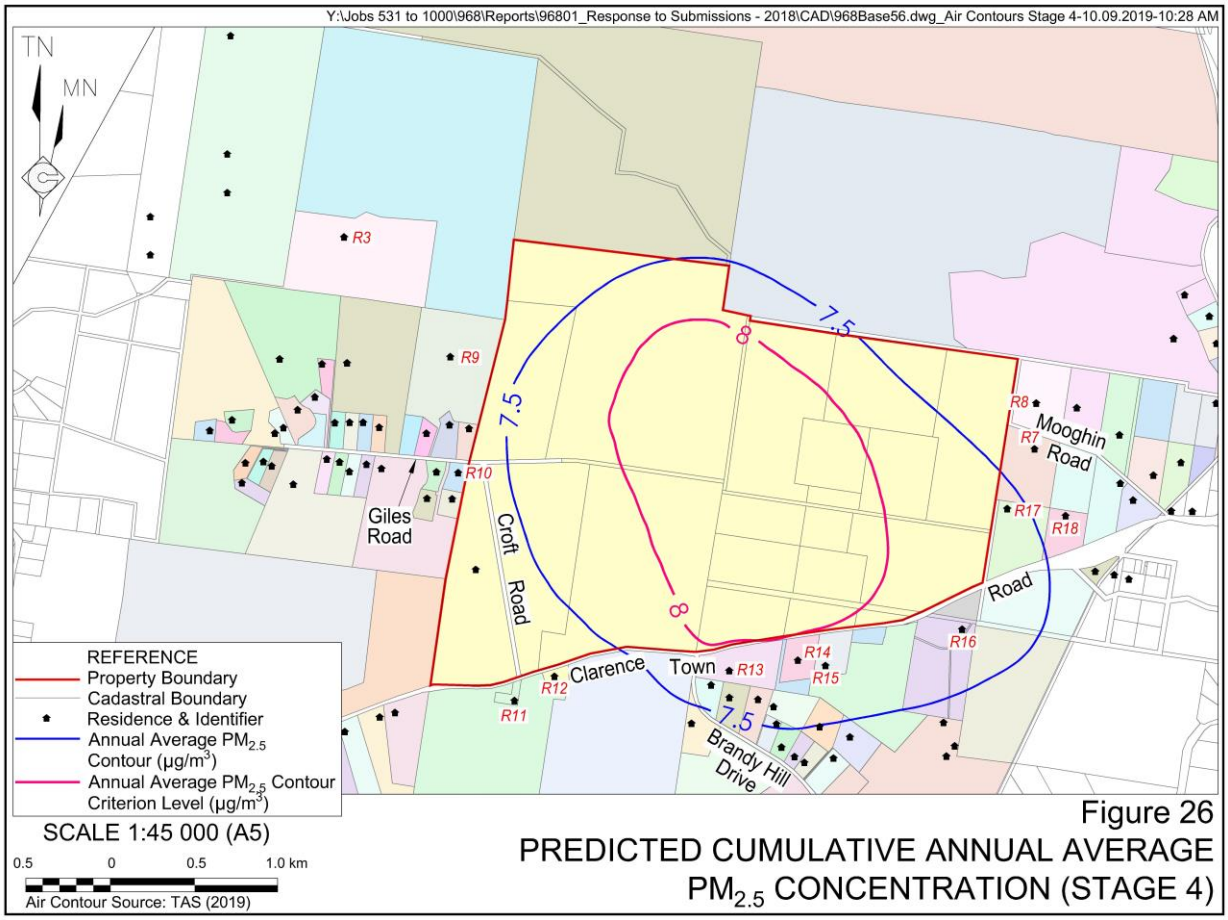


Figure 26
PREDICTED CUMULATIVE ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATION (STAGE 4)

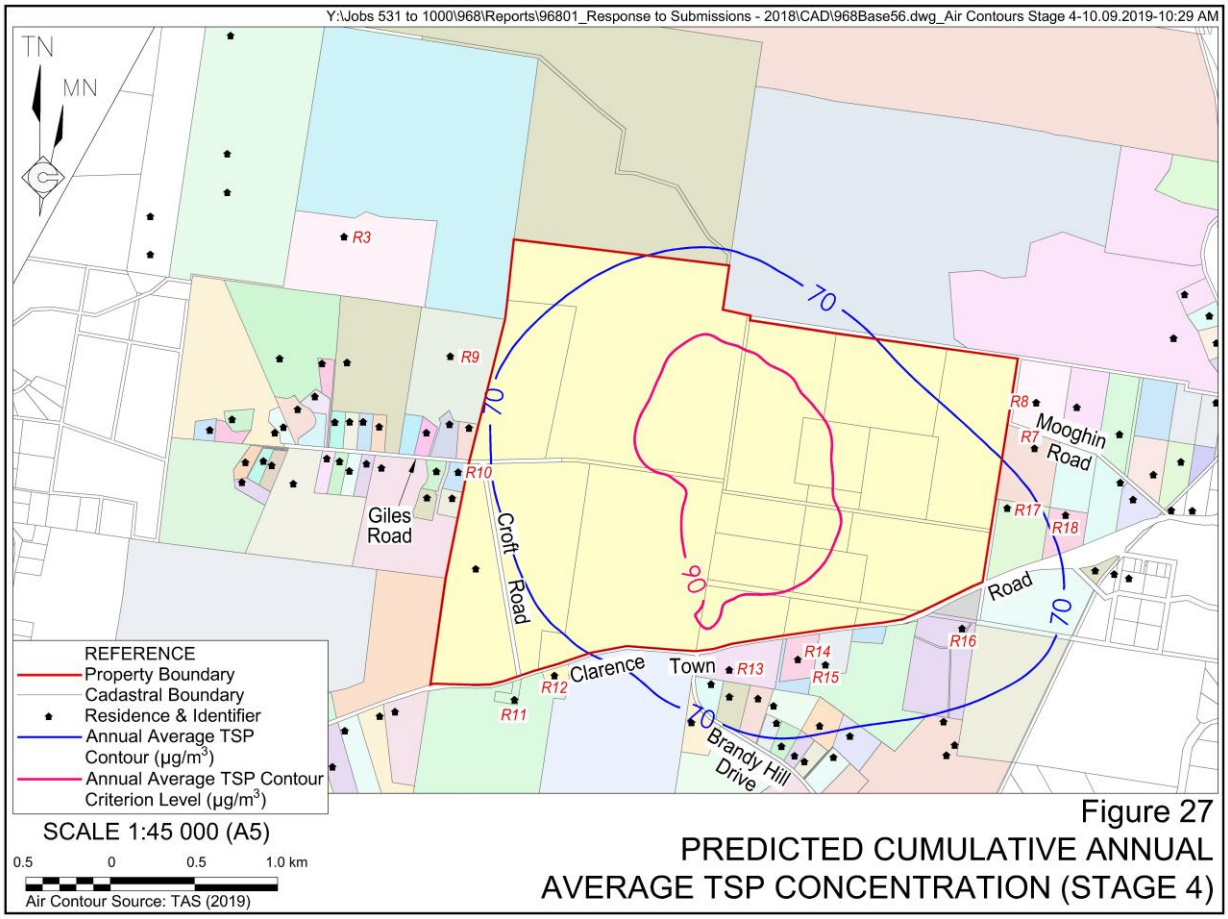


Figure 27
PREDICTED CUMULATIVE ANNUAL AVERAGE TSP CONCENTRATION (STAGE 4)

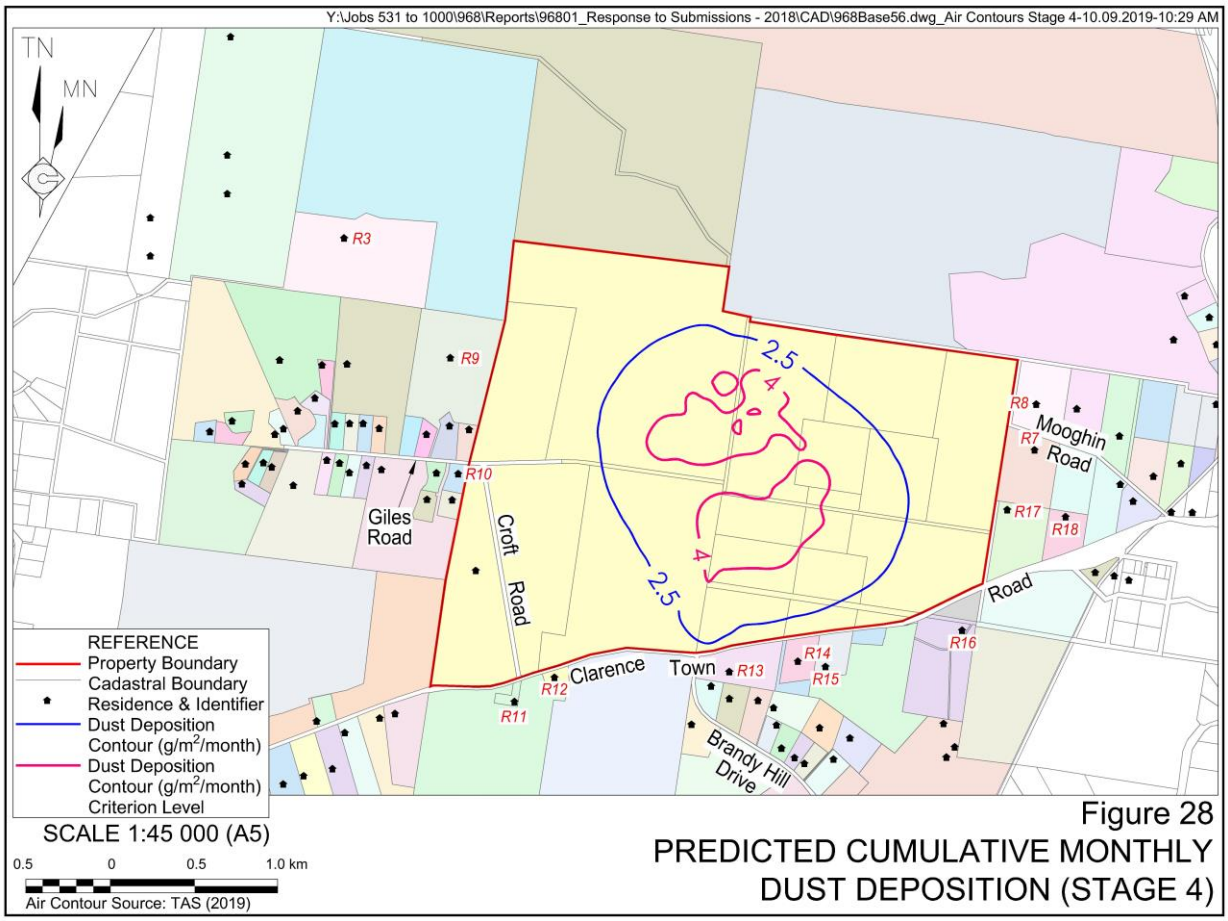


Figure 28
PREDICTED CUMULATIVE MONTHLY DUST DEPOSITION (STAGE 4)

Regardless, Hanson would continue to manage blasting events in accordance with standard practice. This would include the following.

- Review of predicted meteorological conditions in advance of blast events.
- Blasting would occur in accordance with the blast safety management requirements of the blast contractor.
- Blast monitoring for all blasts which would provide data to establish blast laws for the Quarry. This data would inform the design and implementation of blast events in a form of adaptive management.

Hanson would also provide notification of blasting events to registered stakeholders via text message or email.

4.6 BLAST IMPACT ASSESSMENT

A Blast Impact Assessment for the Project was prepared by Vipac and included as Appendix 10 of the EIS. Comments relating to the distance from privately-owned residences to the extraction areas that would be subject to blasting were reviewed by Hanson. It is acknowledged that these distances were overestimated. However, this was due to an estimate of the distance between the residence and the floor of the extraction area in Stage 5 (where the majority of blasting would occur in that stage). This error has been corrected in an Updated Blast Impact Assessment prepared by Vipac (2018b) and provided as **Appendix 9**.

The assessment of potential blasting impacts at privately-owned residences considered the results of historic blast monitoring and scaled these for distance from the monitor. A test charge monitored 36m from the blast event was included in review of ground vibration results, however this is not indicative of proposed blast settings or impacts.

Vipac (2018b) considered blast predictions at the closest privately-owned residences against criteria established in the Australian and New Zealand Environment and Conservation Council (ANZECC) publication "*Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration – September 1990*". These criteria are summarised as follows.

- The recommended maximum overpressure level for blasting is 115dB.
- The level of 115dB may be exceeded for up to 5% of the total number of blasts over a 12-month period but should not exceed 120dB at any time.
- The recommended maximum vibration velocity for blasting is 5mm/s Peak Particle Velocity (PPV).
- The PPV level of 5mm/s may be exceeded for up to 5% of the total number of blasts over a 12-month period but should not exceed 10mm/s at any time.

The Updated Blast Impact Assessment has confirmed that blast-related overpressure and ground vibration would be likely to remain within criteria levels at a Maximum Instantaneous Charge (MIC) no greater than 175kg. However, it is noted that in reality, blast MIC would not regularly be to this size. This MIC level is estimated based on standard equations and would be refined through blast experience at the Quarry and the results of blast monitoring.

Table 26 presents the 95th percentile predictions of blast-related impacts at the closest privately-owned residences.

Table 26
Predicted Blast Vibration and Overpressure

Residence	Distance approx. (m)	PPV (mm/s)	Overpressure (dB)	PPV (mm/s)	Overpressure (dB)
		Expected maximum MIC of 145kg		MIC limit of 175 kg	
13 Giles Road, Seaham	1,110	2.9	110	3.3	111
13B Giles Road, Seaham	950	3.7	112	4.3	113
994 Clarence Town Road, Seaham	960	3.6	112	4.2	113
1034 Clarence Town Road, Seaham	860	4.3	113	5.0	114
1094 Clarence Town Road, Seaham	980	3.5	112	4.1	112
1189 Clarence Town Road, Seaham	1,160	2.7	110	3.1	110
13 Mooghin Road, Seaham	1,310	2.2	109	2.6	109
Nearest livestock	1,100	2.9	110	3.3	111
Criteria		**5.0**	**115**	**5.0**	**115**
Source: Vipac (2018b) – Modified after Table 2					

4.7 BIODIVERSITY

4.7.1 Targeted Ecological Surveys - Rusty Greenhood Orchid

Targeted surveys of Rusty Greenhood Orchid (*Pterostylis chaetophora*) were undertaken on 12 October 2017 and 13 October 2017 by Biosis. Local flowering of Rusty Greenhood was confirmed prior the surveys through a visit to a known population in the vicinity of the ecological study area with BCD officers Steve Lewer and Paul Hellier.

The targeted surveys consisted of closely spaced (approximate 10m) parallel transects through vegetation of high habitat potential. Appropriately qualified and experienced botanists traversed each transect scanning a distance of approximately 5m either side. No Rusty Greenhood Orchids individuals were identified during the survey.

Further detailed information regarding the species is provided in response to the DPIE submission in Section 5.4.5. The Biodiversity Assessment Report (BAR) (Biosis, 2018) has been updated to reflect the additional survey and results and is included as **Appendix 10**.

4.7.2 Assessment of Matters of National Environmental Significance

In February 2015, the Bilateral Agreement relating to the environmental assessment of Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was signed by the Commonwealth and NSW Governments[2]. Under that agreement, environmental assessment of MNES would be undertaken by the NSW Government in accordance with the NSW assessment processes and the

[2] See http://www.environment.gov.au/protection/environment-assessments/bilateral-agreements/nsw

requirements of EPBC Act, with no specific assessment undertaken by the Federal Department of the Environment and Energy. The implication of the Bilateral Agreement is that assessment processes are streamlined, while retaining the transparency and regulation required under legislation at the State and Commonwealth levels.

The BAR prepared by Biosis to accompany the EIS provided Significant Impact Criteria (SIC) assessments for species listed under the EPBC Act that have the potential to be impacted by the Project. However, BCD identified several outstanding matters required to complete an assessment in accordance with the *Guidelines for preparing Assessment Documentation relevant to the Environment Protection and Biodiversity Conservation Act 1999* (Attachment 4 of the revised Environmental Assessment Requirements). Hanson commissioned Biosis to update the BAR and a more detailed assessment of potential impacts to the following species has been provided in Section 6.3 of the consolidated BAR (**Appendix 10**).

- Koala
- Grey-headed Flying fox
- Spotted-tailed Quoll
- Regent Honeyeater
- Swift Parrot
- Black-faced Monarch (migratory species)
- Rainbow Bee-eater (migratory species)
- White-bellied Sea-eagle (migratory species)

Biosis has reaffirmed its previous conclusion, and Hanson remains confident, that the Project would not result in significant impacts to the majority of these species. However, it is acknowledged that predicted impacts to the Koala would be significant (principally relating to the removal of potential habitat). The loss of habitat would be offset in accordance with the EPBC Act Offsets Policy and the NSW Biodiversity Offset Scheme (see Section 2.21).

The Commonwealth Government is yet to formally endorse the variation rules under the NSW Biodiversity Offset Scheme or the option to make payments to the NSW Biodiversity Conservation Fund in lieu of retiring biodiversity credits. Biosis (2019) confirms that the Biodiversity Offset Strategy would satisfy Tier 1 requirements (improve or maintain) for all vegetation communities that would be disturbed.

4.7.3 Biodiversity Offsetting Assessment

Review of the Project design and planning during the preparation of the Responses to Submissions document necessitated minor changes to the mitigations proposed by Hanson, including the scale and timing for construction of the earthen amenity barrier to the south of the Processing and Stockpiling Area of the Quarry. Following refinement of the dimensions of the barrier, it was identified that a 6.1ha section of the proposed barrier had not been incorporated into the assessment of biodiversity offsetting obligations for the Project. In addition, Hanson has requested that biodiversity offsetting be staged in a manner consistent with planned vegetation disturbance over the progressive development of the Quarry. Vegetation would be cleared progressively, and it is proposed that offset obligations also be satisfied progressively.

In order to incorporate the additional disturbance area, Biosis revisited the biodiversity offsetting calculations presented in the BAR. Once these were resolved, the offsetting obligations were separated into three broad stages. The outcomes of these calculations and the indicative staging is presented in Section 2.21 and are summarised in **Table 27**.

Table 27
Summary of Biodiversity Offset Obligations and Staging

Offset Stage	Comparative Operational Stage	Total Area (native vegetation only)	Biodiversity Credit Obligations
Stage 1	Stage 1 and Stage 2	20.8ha	1 177 Ecosystem Credits (various)
			488 Species Credits (Koala only)
Stage 2	Stage 3	24.3ha	1 413 Ecosystem Credits (various)
			628 Species Credits (Koala only)
Stage 3	Stage 4 and Stage 5	8.7ha	506 Ecosystem Credits (various)
			226 Species Credits (Koala only)
Total	All Stages	53.8ha	3 096 Ecosystem Credits (various)
			1342 Species Credits (Koala only)

4.8 SOCIAL IMPACT ASSESSMENT

4.8.1 Introduction

Hanson included a Socio-Economic Impact Assessment as Appendix 17 of the EIS (Hanson, 2017). The DPIE request for a *Response to Submissions* included feedback from internal (DPIE) review of the Socio-Economic Impact Assessment that concluded the assessment had not adequately addressed potential social impacts based on the following.

1. *It does not adequately address the impacts that matter most to people directly affected.*
2. *It has not been adequately informed by outcomes of community engagement activities.*
3. *Directly affected community members have not had sufficient opportunity to participate in the social impact assessment process.*
4. *It is not underpinned by accepted social science methods.*
5. *Assessment of impact significance has not followed accepted standards for assessing risk and opportunity.*
6. *Proposed mitigation measures are not obviously commensurate with the potential significance, especially when this includes the level of concern.*

Hanson commissioned Key Insights to prepare a Social Impact Assessment including a program of community consultation to consider potential social risks and opportunities and assess the significance of potential changes to social amenity in the local area of Brandy Hill, Seaham and nearby suburbs.

The following presents a summary of the methodology applied for the Social Impact Assessment, a review of the regional and local setting, research outcomes and assessment of impacts. The summary concludes by providing on overview of the recommendations of the Social Impact

Assessment and Hanson's progress implementing these recommendations including commitments should the Project be approved. The Social Impact Assessment is presented in full as **Appendix 3**.

4.8.2 Methodology

A detailed summary of the methodology applied by Key Insights is provided in Section 2 of the Social Impact Assessment. In summary, the assessment of social impacts has involved the following key steps.

- Review of background information including the Socio-Economic Impact Assessment (Appendix 17 of the EIS), the submissions provided to DPIE during the public exhibition of the EIS and familiarisation with the local setting.
- Summary of identified issues and stakeholder analysis.
- A consultation program that included meetings, interviews and intercepts with Community Consultative Committee (CCC) members and other key stakeholders and community members.
- Analysis of the issues identified through research and consultation.
- An assessment of the potential social impacts in terms of likelihood, sensitivity, extent, duration and severity.
- Review of the Project in light of the issues raised and consideration of strategies to mitigate potential social impacts.
- A conclusion and recommendations including for continuing engagement with the community.

4.8.3 Regional and Local Setting

4.8.3.1 Community Profile

Key Insights undertook a review of the local demographic profile, focused on the Port Stephens Local Government Area and the State suburbs of Brandy Hill and Seaham. The community profile and baseline updates the demographic information provided with the Socio-Economic Impact Assessment presented for the EIS. A snapshot of relevant conclusions drawn from the Social Impact Assessment (Key Insights, 2018) is provided as follows.

- Port Stephens has experienced consistently high population growth over the last 15 years which was considered by Key Insights to be a factor of its natural features and rural character, access to affordable housing, accessibility and proximity to a significant regional labour market.
- Port Stephens has an ageing population with high growth rates for people aged 65+ compared to NSW and when compared to growth rates for other age brackets.
- Similar population growth and age statistics were evident in Brandy Hill with the strongest representation amongst people aged 50 to 59 years.
- Brandy Hill has a stable population with Census data indicating that 89.2% of people that completed the 2016 Census had the same address in 2011.

- Seaham and Brandy Hill both tend to have larger family groupings than the entire Port Stephens area, however this is not reflected in the percentage of young people (aged 0-15) in the areas. This indicates that families in the area are not necessarily parents with young children but consist of mixed age groups.
- Residents of Brandy Hill are more likely to be employed when compared to the Port Stephens area as a whole.
- The dominant occupations of Brandy Hill residents are professionals (17.53%), followed by clerical and administrative workers (16.95%) and managers (15.8%). These percentages are all higher than the Port Stephens average.
- 11.21% of occupation descriptions for Brandy Hill are machinery operators and drivers compared to 8.23% for Port Stephens. This is an indicator of workers residing close to their employment and is supported by the qualitative research which reports that many of the Quarry truck drivers live locally.
- Review of the Socio-Economic Indexes for Areas (SEIFA) data collected by the ABS indicates that Brandy Hill is relatively more advantaged than average for the Port Stephens area and higher than the Raymond Terrace area which has a higher level of disadvantage compared to the average for the Port Stephens area.
- Review of published house sale prices and feedback from local real estate agents indicate that Brandy Hill has a stable real estate market and does not experience peaks and troughs common to other areas. House sales prices have generally exhibited positive growth.

4.8.3.2 Existing Local and Regional Land Use Character

It is clear from the feedback received from public submissions, and review of the local demographic characteristics, that residents in Brandy Hill and surrounding suburbs value the regional and rural character of the local area. Most properties are relatively large lot residential blocks that have been progressively developed and the density of properties particularly along Brandy Hill Drive has increased over time. This is consistent with the review of the local real estate market and relative attractiveness of the area. However, Key Insights highlights the following key features of the local setting.

- The Quarry is located in relatively close proximity to areas of high environmental value including national parks, coastal areas and the Hunter estuary.
- There are several heritage wooden bridges in the locality.
- Brandy Hill and the surrounding area is bisected by important arterial roads connecting regional locations with the Pacific Motorway, Maitland and Newcastle.

Within this context it is noted that the Project would not directly conflict with other local land uses including small and large lot agricultural properties, other extractive industries and rural lifestyle properties.

In terms of historical land use in the Brandy Hill area, it is noted that Brandy Hill Drive was built to service the Quarry and that land along this road was progressively subdivided and developed in the presence of an operating Quarry. The extractive industry and associated transportation activities have co-existed with rural residential living since 1983.

4.8.3.3 Impacts of Existing Operations

Key Insights notes that there are conflicting views in public submissions regarding the existing impacts of the Quarry. While some people in the local community object to the presence of the Quarry and existing impacts, others recognise the economic benefits and historic place of the Quarry in the community. Many people in the local community are comfortable with the ongoing operation of the Quarry, however expressed concern at the intensity of operations and potential for significant impacts to occur.

Key Insights (2018) note the following important benefits of the existing Quarry operation.

- The Quarry currently provides 20 jobs and a number of supplier contracts with an estimate that approximately 50% of employees live locally.
- The annual spend with local suppliers is estimated to be greater than $3 million per annum with flow on effects bringing this to more than $4 million per annum.
- Hanson has records of contribution amounts to Port Stephens Council from the period of December 2005 to March 2018 which indicate that during this 12-year period, $3.47 million has been paid to Port Stephens Council. This amounts to, on average, $289,000 per annum. Based on this annual amount it is estimated that the Quarry would have paid in the order of $9.6 million in contributions since consent was granted in December 1983.
- Since April 2013 Hanson has paid $1.7 million towards road infrastructure and maintenance through contributions, demonstrating the benefit of a higher rate of production.
- Hanson also donates to local community organisations including Seaham Preschool, local Netball and Cricket teams as well as supplying free aggregates to the community in times of need, such as post the 2015 floods. Hanson has prepared an internal policy titled the *Brandy Hill Quarry - Community Support & Sponsorship Policy* to guide its contributions directly to the community (**Appendix 13**).

It is also noted that at the time Key Insights prepared the Social Impact Assessment, Hanson was engaging the community through an informal CCC.

In terms of environmental performance to date, Hanson considers that the existing operations have a good record of compliance and relatively few complaints are received each year. This has changed in recent years but is considered to be a factor of the extension proposal and not indicative of historic operations.

4.8.4 Social Research

Submission Review

A comprehensive review of the social amenity issues raised in the submissions provided to DPIE during the public exhibition period is presented as Appendix 3 of Key Insights (2018). Key Insights (2018) notes the following two key positions presented in submissions.

- Support for the Quarry continuing at the current level of operations with objection focused on the Quarry expansion. Proponents of this position identified current impacts but recognised that the Quarry had existed for a long time and were prepared to “live with it”.

- No support for the Quarry in any form. Proponents believed that current impacts are unacceptable and not in keeping with the emerging rural / residential communities that surround the Quarry. While the Quarry may have been operating for many years, the community is changing and, according to this group of objectors, the impacts have reached a critically unacceptable level.

It was also noted that the majority of issues were not strictly social impacts but related to environmental impacts that potentially have social aspects. Issues such as impacts from high levels of trucks, 24-hour noisy operations (including blasting) fit in this category.

Key Insights (2018) grouped issues raised in public submissions objecting to the Project as follows.

- Loss of amenity – relating to the value held in the local community for a semi-rural lifestyle and the relative quiet of the area. This category also includes concerns about post-quarrying land use and impacts to local wildlife.
- Loss of lifestyle – relating to the loss of connectivity with neighbouring properties and the impact trucks on the roads would have on the ability for local people to ride horses and bicycles in the area on weekends.
- Safety – relating to road safety especially when it comes to child safety at bus stops.
- Health and welfare – relating to impacts from particulate matter generated by the Quarry and the duration of noise impacts.
- Economic impacts – relating to potential impacts to property prices and vibration impacts to property structure and integrity. Impacts to local road condition. The community also generally recognised the economic benefits of the ongoing Quarry operation.
- Heritage – relating to potential impacts to heritage wooden bridges in the local area. The heritage of the Quarry and its importance to development of the local area was also recognised.
- Trust – relating to the described lack of trust in Hanson and the information presented in the EIS. Others noted the positive contributions that Hanson has made to the local area in the past.

Submissions from Government agencies (excluding that provided by DPIE) focused on potential social impacts from other amenity impacts and the need for robust and ongoing consultation.

It was noted by Key Insights (2018) that several of the above impacts are not exclusive to the use of local roads by Hanson-related vehicles. The local area is heavily trafficked as a thoroughfare between regional areas and the Pacific Motorway, Maitland and Newcastle.

Primary Research and Consultation

The research program undertaken by Key Insights involved the following activities.

- A review of the issues raised during the public meeting hosted by DPIE on 22 March 2017. While not primary research, comprehensive notes were made available by DPIE following this meeting.

- A meeting with Hanson representatives at the Quarry to provide an overview of the existing operations and the proposed expansion, review of activities that are currently undertaken to mitigate potential environmental and social impacts. Review of existing corporate policies and management.
- Community meeting with residents on Giles Road located to the west of the Quarry.
- Attendance and participation in a meeting of the CCC on 15 September 2017. The meeting also involved other residents that were invited to attend.
- Interviews with local community members including child care workers, local business owners, young workers and real estate agents.
- Interviews with Port Stephens Councillor Paul Le Mottee and Mr John Maretich, Asset Section Manager at Port Stephens Council.

In addition to the above consultation, Key Insights also proactively consulted with Hanson regarding the issues raised directly, with Hanson addressing these during planning and preparation of the *Response to Submissions* document, where possible. The information provided by Key Insights informed the comprehensive review of the Project, particularly in relation to proposed operating hours and transport management.

4.8.5 Analysis and Impact Assessment

Key Insights (2018) notes the following key outcomes of the consultation program that have informed the assessment of social impacts.

- There appears to have been a misunderstanding in communication between Hanson and the community. The approach taken by Hanson for preparation of the EIS was to present a technical assessment of the Project and to review community input during preparation of the *Response to Submissions* and in finalising a Voluntary Planning Agreement with Port Stephens Council. This was not understood by the local community, who interpreted this as Hanson dismissing the community concerns.
- Many in the local community interpreted the proposal for 24-hour operations to imply that the Quarry would be operating 24-hours every day of the year. However, it should be noted that the sale of Quarry products is demand driven and while the Project is intended to permit flexibility for operations and satisfaction of customer requirements, it does not imply constant operation. Key Insights notes that it would be important that the conditions of any consent address this through stringent night time operating conditions.
- The apparent concern about disruption to social amenity is in conflict with growing demand for extractive materials, sourced from a location close to the end use. This is necessary to keep the price of infrastructure and residential development down while satisfying high levels of demand.

Regardless of the above, the key issues for the local community remain the potential impacts associated with 24-hour operations and the proposed increase to heavy vehicles levels on the road network. Impacts to amenity and lifestyle are most likely to be felt by those living closest to the Quarry, with concerns around sleep deprivation, road safety, use of the local area and environmental impacts from noise and vibration intruding on the existing rural lifestyle.

4.8.6 Economic Benefits and Impacts

The economic benefits of the Project are summarised as follows.

- The creation of an estimated 30 jobs and flow-on industrial effects in terms of local purchases of goods and services are anticipated. It is estimated that these indirect impacts would result in the gain of a further 42 jobs.
- It has been estimated that wage payments would increase by $3.6 million over the life of the Project and flow on economic benefits from other job opportunities in the order of $3.5 million in wage payments.
- Contribution to servicing markets in the Hunter, Central Coast and Newcastle. The *Hunter Regional Plan 2036* identifies an additional 70 000 dwellings needed by 2036 and an additional 60 000 jobs. Building and infrastructure associated with growth predictions in these areas would generate demand for the Quarry's materials and it is strategically positioned to deliver these cost-effectively.
- Securing the supply of construction materials to the local, regional and Sydney market and its contribution to important infrastructure projects.

Potential economic impacts may result from the following.

- Impacts to the local road network resulting from heavy vehicles use.
- Potential negative economic impacts on local land values if there are significant and sustained losses to amenity and current lifestyle.

4.8.7 Ongoing Community Engagement

One of the key recommendations of the Social Impact Assessment is for ongoing community engagement and communication to be improved. This has been reinforced in community submissions on the Project. Key Insights (2018) notes that Hanson has taken an ad-hoc approach to community engagement and contributions in the past. Contributions to local schools or help provided to people to concrete their drive-ways to repair flooding impacts have been noted and appreciated by the community. However, the long history of operations and slow development of the local areas have meant that Hanson have taken a more casual but positive approach to engagement. It is apparent that there are now more complex relationships with groups in the local community and a higher expectation of engagement and accountability. In addition, Hanson has not been successful in communicating its environmental performance record to the community. **Table 28** presents a summary of the ongoing community engagement actions recommended by Key Insights (2018) and a summary of Hanson's progress implementing these recommendations since the completion of the Social Impact Assessment.

Table 28
Community Engagement Recommendations and Progress

Recommendation	Completed?	Progress and Comments
Formalisation of a Community Consultative Committee (CCC).	Yes	A CCC has been formed and meets every quarter. Review of the CCC would occur following approval with further steps required to satisfy the relevant guidelines. However, in the meantime Lisa Andrews, an approved CCC Chairperson, currently runs the CCC meetings generally in accordance with the guidelines.
Hanson to prepare and implement a Community and Stakeholder Engagement Plan (CSEP)	Yes	Hanson commissioned Key Insights to prepare a CSEP taking into account the advice provided in the draft guideline prepared for the Draft Environmental Impact Assessment Guidance Series June 2017 – *Community and Stakeholder Engagement*. The CSEP has been distributed to all members of the CCC and was provided to people participating in Have-A-Chat meetings during 2019. The CSEP is also available from the Hanson website. It is anticipated that the CSEP would be updated following commencement of the Project to account for any conditions of consent. The CSEP is intended to be a working document that is updated continually to incorporate community preferences.
Establishment of communication mechanisms through or beyond the CCC, with local businesses and other residents, particularly near neighbours.	Yes	Broader communication mechanisms are described in the CSEP and would initially include newsletters and fact sheets distributed in the locality. Preliminary steps have been taken to engage with the broader community through the commencement of informal Have-a-Chat meetings and through the commencement of a notification register for blasting notification, Project updates and community meetings
Develop a community donations / sponsorship policy that is fair and consistent across the whole community.	Yes	The Brandy Hill Quarry Community Support & Sponsorship Policy has been formalised and is presented as **Appendix 13**. A copy has also been provided to CCC members. The previous approach to community sponsorship was more informal and ad hoc. The Community Support & Sponsorship Policy for the Quarry establishes protocols for support and sponsorship of community-based groups or individuals and guidelines for the process to apply for and receive funding from Hanson for local projects. Under the policy, Hanson would contribute up to $15,000 each year to community-based projects.
Revision of the complaints management policy with firm commitment to feedback and closing investigations.		Hanson has a Company-wide approach to community complaints which would continue to be implemented through an *Environmental Management Strategy* for the Project.

Table 28 (Cont'd)
Community Engagement Recommendations and Progress

Recommendation	Completed?	Progress and Comments
Hanson to make the following information regarding the Quarry readily available. • Quarry operational information that is regularly updated. • A newsletter that is published on-line or distributed via mail for those who prefer this option. • Monitoring data and management documentation for the Quarry		Environment monitoring locations and results as well as Quarry management documents are available on the Brandy Hill Quarry website[3]. Current management documents available from the website include: • Pollution Incident Response Management Plan • Brandy Hill Quarry EPL 1879 • BHQ Monitoring Locations • BHQ Driver's Code of Conduct • BHQ Community and Stakeholder Engagement Plan Current monitoring data available includes that for: • Dust (PM_{10} and deposited dust) • Water (during discharge) • Blast monitoring • Noise (annual noise monitoring)

[3] https://www.hanson.com.au/about-us/regulatory-information/brandy-hill-quarry-expansion-project/

4.8.8 Social Mitigation and Management

Key Insights (2018) reviewed the mitigation proposed in the Socio-Economic Impact Assessment prepared for the EIS (Hanson, 2017) and developed a range of amended strategies taking into account the assessment of social impacts that was undertaken.

Table 29 presents a summary of the ongoing community engagement actions recommended by Key Insights (2018) and a summary of Hanson's progress implementing these recommendations since the completion of the Social Impact Assessment.

Table 29
Social Mitigation Recommendations and Progress

Recommendation	Progress / Comments
Hanson to form partnerships with local employment providers, including Indigenous organisations, to source new employees for the Quarry. In addition, Hanson would approach local school career's advisors about presenting to pre-school leavers about employment and apprenticeships with Hanson. Hanson would set a percentage target for employees from within the local government areas of Port Stephens and Maitland and report against this target on its website.	Hanson currently accepts applicants for school-based traineeships for Year 11 and Year 12 students to take up career opportunities in ready mixed concrete manufacturing. These traineeships are available for students based in the Port Stephens, Newcastle or Maitland areas. Opportunities to extend these to the local Aboriginal community, schools in the vicinity of the Quarry and the broader region will be investigated in the future.
Hanson would provide training and certification to ensure suitable applicants can improve or acquire the necessary skills for their employment.	Hanson offers Trade Apprenticeships and Quarry Traineeships to students enrolled in TAFE courses. This approach is applied nationally and includes employees based in the Port Stephens, Newcastle or Maitland areas.
Hanson would manage transportation operations to limit night time product despatch as much as practical. Delivery to Hanson or Hymix concrete batching plants would be coordinated to occur during daytime or evening periods as much as possible.	Hanson predicts that night time despatch from the Quarry would be required at most on a total of 20 nights per calendar year. In response to community concern about heavy vehicles use of the roads at night time, it is now proposed that night time product despatch be limited to 20 nights per calendar year. Hanson has also committed to notifying interested community members seven days prior to any night time despatch. This approach was positively received by the CCC at the meeting on 21 February 2019.
Hanson to reiterate instructions to heavy vehicle drivers to use the transport routes presented in the Drivers Code of Conduct. While Hanson needs to maintain the flexibility to use local roads for local deliveries, the requirement to avoid short cuts and unnecessary alternative routes would be incorporated in the Drivers Code of Conduct.	The Driver's Code of Conduct (**Appendix 12**) has been updated to include discussion regarding short cuts and unnecessary alternative routes. Transport staff are continually reiterating instructions included within the Driver's Code of Conduct, including the approved transport routes.

Table 29 (Cont'd)
Social Mitigation Recommendations and Progress

Recommendation	Progress / Comments
Hanson to maintain consultation and communicate with the local community over the life of the Project, where appropriate. This would be achieved through scheduled CCC meetings every three months with additional important information relayed to relevant parties via fact sheets, e-mail correspondence, written correspondence or via face to face exchange when relevant.	The Project CCC meetings have been scheduled at quarterly intervals, however it is anticipated that this frequency would be amended as Project development progresses and where the CCC members agree that a reduced frequency is appropriate. Additionally, Hanson has organised Have-a-Chat meetings to provide community members an opportunity to speak with Hanson personnel face-to-face on an informal basis. This format is new, and Hanson are continuing to develop the meeting so it meets community expectations. Feedback from the meeting held on 6 February 2019 requested a more informal setting and that the timing of the meeting be moved to allow people to attend after work. This was implemented for the meeting on 8 May 2019 which was held at the Quarry. Hanson has also reiterated in consultation that the community members are welcome to email or ring Hanson personnel about potential issues involving the Quarry. These enquires are answered via email, phone call or face-to-face feedback. Hanson encourages management personnel at the Quarry to develop relationships with the local community in order to facilitate meaningful feedback. This personal feedback has been utilised by some community members who have requested visits to the Quarry Site or assessment of water tank water at their properties.
Driver behaviour to continue to be managed under a Drivers Code of Conduct that includes instructions to minimise compression breaking and other activities that generate concern for local residents. Drivers to be informed of any relevant traffic concerns for the local community through the code of conduct and regular 'toolbox' style meeting.	A Driver's Code of Conduct (**Appendix 12**) has been updated for the existing and proposed ongoing operation with the noted information included. Breach of the Drivers Code of Conduct would result in, after two warnings, dismissal or cancellation of contract. The Code of Conduct would be placed on the Hanson website and the CCC would be informed of compliance issues. The Code of Conduct would be reviewed from time to time in conjunction with the CCC to ensure alignment with community expectations.
Design a mechanism for oversight of the 'Statement of Commitments' and Voluntary Planning Agreement (VPA).	Feedback from Port Stephens Council during negotiations concerning the VPA is that it would not be appropriate to include community oversight processes in a VPA. It is currently managed through Council's consultation processes.
Lobbying of relevant road authorities to reduce the speed limit on Clarence Town Road (see **Appendix 11**).	An RMS review of speed limits on roads in the vicinity of the Quarry, including Clarence Town Road, has been completed. The designated speed limit on Clarence Town Road in the vicinity of the Quarry has been reduced to 80km/hr. There has been no change to the speed limit on Brandy Hill Drive..

Table 29 (Cont'd)
Social Mitigation Recommendations and Progress

Recommendation	Progress / Comments
Review number of truck movements during school bus operating times.	Hanson is conscious of school buses in the vicinity of the Project and has included the locations of schools or child care facilities in the Driver's Code of Conduct (**Appendix 12**). Hanson is proposing that on an average day, product despatch activities would commence from 5:00am. Through discussions with the local community, Hanson has established that school bus pick-up commences from as early as 7:00am. It is not possible to commit to reduced activity during school bus periods, as Hanson needs to be able to respond to client demands. Rather, Hanson would continue to instruct drivers to be mindful of school buses, speed limits in the vicinity of these buses and the potential for school-age children to be using the road. Hanson agrees with the majority of the community that road safety would be improved on Brandy Hill Drive once a pathway is constructed along the road. To date there have been no accidents involving Quarry-related vehicles on the local road network and Hanson encourages driver professionalism. However, this does not reduce the risk of such events occurring and the Driver's Code of Conduct is in place to ensure that drivers are vigilant in their approach to road safety.
Monitor night time Quarry operations and consider limitations to prevent sleep disturbance while permitting for some flexibility in peak demand times.	As noted above, Hanson has reviewed the need for night time operations in response to community concern. It has been determined that night time product despatch be limited to 20 nights per calendar year. Monitoring during these times is not currently proposed as it is also proposed to limit product despatch to five laden loads per hour over the period from 10:00pm to 5:00am on those days when night time despatch is required. This may be compared to other vehicles that may use the local road network at any time without restriction.
Negotiate with the community and Port Stephens Council regarding the improvement and potentially widening of local bus stops to provide safer waiting spaces for users.	Improvements to bus bays along Brandy Hill Drive and Seaham Road is a component of the VPA that is currently being negotiated with Port Stephens Council.
Discuss options with Port Stephens Council and other infrastructure providers and road users, for ways of increasing local walkability through walkways / cycleways. This should be consistent with Port Stephens Council priorities, should be achievable and able to enhance connectivity for local residents. Explore alternative routes for walkways; for example, along the Hunter Water Pipeline.	The construction of a pathway along Brandy Hill Drive is a component of the VPA that is currently being negotiated with Port Stephens Council.
Review Quarry closure strategies and appropriate post-operations land uses and involve the local community by seeking feedback from the community.	Hanson has discussed post-closure land use and rehabilitation with the local community. The community feedback to date refers to its preference that the land not be used for landfill (all kinds). However, during consultation it was noted that a final land use will depend on the land use strategies and constraints experienced in the local area at closure. A closure strategy would be developed two years prior to closure and include consultation with relevant stakeholders including the local community.

In addition to the recommendations of the Social Impact Assessment, Hanson has investigated mechanisms for ongoing feedback between the community and regulators that may be facilitated by Hanson in a responsible manner.

It is anticipated that the conditions of consent for the Project would include a requirement that Hanson prepare an *Annual Review* for the Project. The *Annual Review* would describe activities during the preceding 12 months, anticipated activities during the next 12 months and comprehensively review environmental performance over the preceding 12 months against the relevant assessment criteria and predictions in the assessment reports that accompanied the application. In order to formalise feedback and engagement with the community, Hanson proposes that prior to the submission of the *Annual Review* each year, the Company would host a Have-A-Chat meeting at which the environmental performance of the operation would be presented to the community. Feedback received during the meeting would be presented under the 'Community' section of the final *Annual Review*. This process would provide social monitoring of community experiences and the community's view on the environmental performance of the Project. It would also provide an opportunity for Hanson to receive feedback on how the Project is affecting the community as it is developed. This monitoring would continue for a period of three years and be implemented through the CSEP. After this time the process would be re-evaluated.

4.8.9 Social Impact Assessment

Table 1 of Key Insights (2018) provides a detailed review of each identified potential social impact in terms of the likelihood/severity, extent, duration and severity of the impact. The outcome without mitigation and with mitigation is considered where impacts are predicted to be significant. **Table 30** presents a summary of the key conclusions presented by Key Insights (2018) and additional comments taking into account the ongoing consultation, assessment and refinements to the Project.

Table 30
Social Impact Overview

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Social Impact	Key Insights Assessment	Additional Comments
Amenity	There is a strong community perception that local amenity would be adversely impacted. Impact to amenity would be highly dependent on the proposed hours of operation and effectiveness of mitigation with environmental impacts experienced by those closest to the Quarry. These impacts would occur over the life of the Project and are predicted to be of medium intensity without mitigation. Mitigation through driver behaviour management and careful planning of operations would address potential impacts with this success demonstrated by existing operations.	Through consultation and additional assessment Hanson is confident that more of the community is aware of how the proposed mitigations and management of the operation would limit potential amenity impacts. Hanson has thoroughly reviewed proposed night-time operations and proposed mitigation and management measures would limit amenity impacts. For example, indicative modelling of dust dispersion has indicated that particulate matter concentrations would be slightly higher, but consistent with existing operations even at more than double the rate of production (see Section 4.5). It is expected that amenity impacts would not be significant, assuming the implementation of proposed mitigation measures.

Table 30 (Cont'd)
Social Impact Overview

Social Impact	Key Insights Assessment	Additional Comments
Access	Several local community members expressed concerns regarding disrupted access to properties as heavy vehicles approach on the roads. These impacts would be low and are not likely to change from existing operations. This impact would result from any use of the local road network by heavy vehicles and would not be limited to Quarry-related vehicles.	Hanson has committed to limiting transport activities to no more than 30 trucks per hour (or one truck every two minutes). It is expected that potential social impacts associated with access would remain low.
Built environment	Impacts to the built environment relate principally to impacts to road condition, which would not be exclusively caused by vehicles accessing the Quarry. This impact was assessed as having a medium intensity if not mitigated given the importance to the local community. However, it is noted that Port Stephens Council consider infrastructure projects such as a public pathway on Brandy Hill Drive to be a low priority for funding.	The potential for impacts to the local road network would be managed through payments to Port Stephens Council and Maitland Regional Council for road maintenance. There would be no impacts to public domain infrastructure associated with the Project, however, negotiations are underway regarding a contribution towards the construction of a pathway on Brandy Hill Drive and bus bays along the transport route, which would provide social benefit.
Heritage	The Quarry is part of the heritage of the local area given the involvement of the operation in the development of Brandy Hill. The cessation of operations would impact the heritage value of the Quarry. Similarly, the use of heritage wooden bridges in the area would also impact the heritage value of these structures. These impacts are considered to be of low intensity but would be present for the life of the operation.	The potential for social impacts to matters of heritage significance remains low. Hanson would continue to manage transport operations to limit the potential impact to heritage timber bridges in the locality.
Community	The perception of impact is greatest for the matter of community. Given the lack of trust currently felt in the community, concerns regarding potential impacts to health, safety and social cohesion have been exacerbated. The key impact to social cohesion relates to the ability of local community members to connect through the use of the roadway. These impacts, if not managed, may remain for the life of the Quarry. Key Insights (2018) identify the potential for these impacts to be of medium to high intensity without mitigation or management but that with proposed mitigation strategies would be reduced to medium to low intensity. This would rely on satisfying environmental conditions and the ongoing successful engagement with the community.	Health impacts relating to air quality, water quality (water tank drinking water) and sleep disturbance have been assessed for the Project and are not expected to be significant. However, community concerns regarding these matters remains. Hanson has implemented a comprehensive Drivers Code of Conduct to guide driver behaviour and manage the interaction of heavy vehicles with other road users such as pedestrians and cyclists. In addition, Hanson has commenced discussions with Port Stephens Council regarding a contribution to funding for a pathway on Brandy Hill Drive and to bus bays along the transport route. With regards to community cohesion, there remains the opportunity that ongoing contributions to the community through local employment and funding of community projects would provide social benefit.

Table 30 (Cont'd)
Social Impact Overview

Social Impact	Key Insights Assessment	Additional Comments
Economic	Key Insights (2018) notes that economic benefits would be experienced locally, regionally and within the State of NSW given the Project would be a State Significant Development. These economic benefits would be experienced throughout the life of the Project and be of medium intensity given the importance of the resource to the construction industry locally, regionally and for the Sydney market.	Positive economic impacts associated with employment and the direct contribution to the construction of local infrastructure projects such as the proposed replication of the Hexham Bridge would remain benefits of the Project.
Environment	It is noted that environmental impacts may have a social component, and this has been highlighted in submissions and through consultation. These impacts would be highly dependent on the successful implementation of environmental management and mitigation. The benefits of a location for concrete material recycling are also noted. These impacts are considered to be of low severity given the successful environmental management of the existing operation, however this management would need to continue for the life of the development.	The likelihood of a social impacts associated with changes to the local physical environment would continue to depend on Hanson's ongoing compliance with the terms of development consent and environmental management performance and responsibility. The biodiversity offsetting process results in the designation and management of an area in perpetuity for biodiversity conservation. The size and features of the area are determined in accordance with the NSW Biodiversity Offset Scheme. Impacts to potential koala populations and habitat would also be offset in accordance with NSW legislation and policies as well as the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and the Port Stephens *Comprehensive Koala Plan of Management 2002*.

4.8.10 Discussion

The Social Impact Assessment prepared by Key Insights (2018) has been informed by review of the issues raised in the submissions received by DPIE during the public exhibition of the EIS, consultation records, meetings, interviews and intercepts with the local community and engagement with the CCC. Concerns regarding potential impacts to the existing way of life for the local community have been expressed through the potential change to amenity or rural lifestyle. Social amenity impacts have been raised through potential environmental impacts that may have social aspects. Although there are a range of issues and potential impacts identified in the research or described by the local community, the key concerns for the community relate to the proposed 24-hour operation of the Quarry and the potential interaction with heavy vehicles. Importantly, Hanson has reviewed the proposed hours of operation and reduced the operating hours for some components where this is considered feasible and reasonable. It should be clear that Hanson takes transportation operations very seriously and the importance of the Drivers Code of Conduct is reiterated. An overview of the Drivers Code of Conduct is provided in Section 4.4.3 and a copy provided as **Appendix 12**.

The local community of Brandy Hill is well established with households generally supporting more than two occupants and residents that are generally in employment, often in a "white collar" capacity. The community have identified the rural nature of the locality as something they value. A component of this local environment has historically included the Quarry and it is important to note that much of the feedback on the Project did not object to the Quarry operation but wanted to ensure that it was being responsibly managed and was not significantly impacting local amenity and way of life.

It should be noted that Hanson's review of the submissions and the feedback received from Key Insights during the consultation process informed a comprehensive review of the Project. Several of the recommendations made by Key Insights would be implemented as standard practice for a State Significant Development. This includes publishing monitoring data, management documentation (such as the Drivers Code of Conduct), and annual reporting on the environmental performance of the Quarry. While this may be expected, it may not previously have been made clear to the local community. It should also be noted that Hanson has commenced implementation of many of the recommendations of the Key Insights assessment.

A key concern expressed in community feedback on the Project has been the expectation that increased transportation operations would change the experience of the locality for the community. The community does not want the local area to become akin to a freight corridor or to become a location for late-night industrial operations. Hanson has reviewed operations and has limited operating hours as much as is considered feasible. Hanson would also limit product despatch from the Quarry to no more than 30 laden vehicles per hour or, on average, one every two minutes. It needs to be stressed that this would be a maximum despatch level and not representative of general operations. It is acknowledged that the frequency of vehicle despatch, particularly on Brandy Hill Drive, would increase. However, the hourly limit to despatch has deliberately been limited to be consistent with peak periods under existing operations. By taking this approach, Hanson is confident that there will not be a significant change to the experience of the locality. Assessments of operational noise generation, road capacity, intersection performance and road noise generation have all indicated that the Quarry would operate with acceptable impacts, in accordance with NSW Government policies, guidelines and legislation.

Hanson is currently in negotiations with Port Stephens Council regarding a Voluntary Planning Agreement that incorporates a pathway on Brandy Hill Drive and additional bus bays along the transport route. This infrastructure has been requested by the community to mitigate road safety concerns. While the negotiations have progressed, the details of the construction of this infrastructure are yet to be finalised.

4.8.11 Conclusion

Review of the potential social impacts of the Project indicates that the key concerns and expected impacts of the Project relate to changes to the local setting as a result of increased transport operations and proposed operations during the night-time. These changes are expected to be experienced through amenity impacts (dust and noise), health impacts (dust and water) and safety concerns relating to the interactions of road uses with Quarry vehicles. Hanson is confident that the potential impacts raised by some members of the community would not be experienced in the manner that is expected. A range of standard and specific mitigation and management measures would be implemented to proactively limit the likelihood of social impacts. Where community members may experience an impact, measures for feedback and response would be available to

address the concerns. Where the impacts are specific to transport operations, Hanson has included disciplinary protocols in the Drivers Code of Conduct to ensure good driving behaviour is maintained and/or improved upon.

Hanson recognises that it would be important for any ongoing operations to demonstrate a high standard of environmental management practice and performance and to communicate this to the local community. Some of this management would be enforced through conditions of consent but may also be improved through implementation of mechanisms described in a Community and Stakeholder Engagement Plan. By demonstrating accountability for its operations, it is hoped that Hanson would be in a position to build trust with the local community.

5. RESPONSE TO SUBMISSIONS

5.1 INTRODUCTION

This section provides a response to the submissions received by DPIE during the public exhibition of the EIS and supporting documents for the Project, following the public exhibition period and additional requests for clarification or more information presented to Hanson by DPIE. The subject areas for response have been presented in alphabetical order for ease of review. Issues to be addressed have been compiled by assembling a series of representative comments that have been extracted from the various submissions and are considered to broadly represent the content and sentiment of the submissions. Therefore, readers should not review this document expecting a direct response to their submission, but rather a response to the issue raised in that submission.

The extracts have been drawn from the submissions from all Government agencies, specialist interest groups and a range of individual submissions. Where available, the source of each extract in this section is noted, although in some cases names were withheld at the request of the respondent. All representative comments have been presented as direct quotes, however in the interest of brevity, only the issue being addressed has been included. Longer submissions have either been split to various responses or only the key phrase or sentences presented.

Where reasonable, reference is made to figures or tables within this document. Reference is also made to the EIS or specialist consultant assessments presented as appendices to the EIS.

5.2 ABORIGINAL HERITAGE

5.2.1 Introduction

An Aboriginal Cultural Heritage Assessment Report was prepared for the Project by Biosis and included as Appendix 12A of the EIS. The report noted that there were no previously recorded Aboriginal artefacts, sites or locations in the Quarry Site and that field surveys did not locate any Aboriginal artefacts, sites or locations within the Quarry Site. It was therefore concluded that there were there was no additional archaeological or cultural heritage assessment needed for the Project.

A range of ongoing management and mitigation measures were described in the Aboriginal Cultural Heritage Assessment Report and reflected in the Statement of Commitments (Section 7.4.2 of the EIS and updated in Section 6).

It is noted that the BCD submission on the Project commented that the EIS adequately addressed Aboriginal Cultural Heritage issues.

5.2.2 Aboriginal Heritage Assessment

Representative Comment(s)

We the Karuah Indigenous Corporation have just noted some of the issues that came out of the report that's still needs to happen……

……..It is proposed that detailed studies will be undertaken as part of the formal EA which will include:

- *A review of relevant environmental information, past Aboriginal cultural heritage investigations and relevant statutory registers and inventories in order to identify areas of archaeological potential and known sites.*
- *Conducting and documenting aboriginal cultural issues as set out in the Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005) as well as the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, April 2011), Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, April 2010), and Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, September 2010).including surveys and the Aboriginal community.*
- *Identifying the nature and extent of impacts on Aboriginal cultural heritage values across the project area.*

Heritage - including:

- *an Aboriginal cultural heritage assessment (including both cultural and archaeological significance) which must:*
  - *demonstrate effective consultation with Aboriginal communities in determining and assessing impacts, and developing and selecting mitigation options and measures;*
  - *outline any proposed impact mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures); and*
- *a historic heritage assessment (including archaeology) which must:*
  - *include a statement of heritage impact (including significance assessment) for any State*
  - *significant or locally significant historic heritage items; and,*
  - *outline any proposed mitigation and management measures (including an evaluation of*
  - *the effectiveness and reliability of the measures);*

Karuah Indigenous Corporation, Karuah, NSW – Page 1-2

Response

As outlined in the Aboriginal Cultural Heritage Assessment Report, the Aboriginal community has been extensively consulted in relation to the assessment undertaken for the Project. Consultation was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. As a part of this process, the appropriate government bodies were notified, and an advertisement was placed in the *Newcastle Herald*. The following Aboriginal groups registered an interest in the Project.

- Worimi Local Aboriginal Land Council (LALC)
- Gomeroi Namoi

- Lower Hunter Aboriginal Incorporated
- Maaiangal Aboriginal Heritage
- Mur-roo ma Inc
- Nur-Run-Gee Pty Ltd

A search conducted by the Office of the Registrar listed no Aboriginal Owners with land within the Quarry Site. A further search conducted by the National Native Title Tribunal listed no Registered Native Title Claims, Unregistered Claimant Applications or Registered Indigenous Land Use Agreements within the Quarry Site.

A search of the Aboriginal Heritage Management System (AHIMS) database detected 16 previously recorded Aboriginal archaeological sites within a 10km x 10km search area centred around the Quarry. No previously recorded sites are located within or in close proximity to the Quarry Site.

The assessment of the archaeological significance (presented in Section 5 of Biosis, 2015) concluded that the Quarry Site had low archaeological, historic and aesthetic significance and overall low Aboriginal heritage significance.

The Aboriginal Cultural Heritage Assessment Report provides recommendations for ongoing management that were accepted by Hanson and included in the Statement of Commitments (Section 7.4.2 of the EIS and updated in Section 6).

Historic heritage is discussed in Section 5.12.

5.2.3 Unexpected Finds

Representative Comment(s)

It is further stated in the Environmental Assessment Section of the main EIS, Section 5.10.2.5 Mitigation and Conclusion:

Provided that the recommended procedure for the discovery of Unanticipated Historical Archaeological Sites (Appendix 12) is followed for the life of the Project as well as any additional conditions of approval, the Project is able to proceed.

However, in the Statement of Commitments, Section 7.4.2 Aboriginal and European Heritage, the Unanticipated Historical Archaeological Sites procedure is not included. It is recommended that the procedure for unanticipated relics be included as a condition of consent for this development.

Heritage Council

Response

The recommendations of the Aboriginal Cultural Heritage Assessment Report (see Section 7 of Biosis, 2015) included management of unanticipated finds of Aboriginal objects or Aboriginal ancestral remains. However unlikely it may be that this would occur, Hanson agrees to formalise a procedure for the discovery of unanticipated historical archaeological sites and would incorporate this in an Aboriginal Heritage Management Plan.

As this procedure is relatively standard for the extractive industry, it is not considered relevant for the conditions of consent or the Statement of Commitments.

5.3 AIR QUALITY

5.3.1 Introduction

An Air Quality Assessment was prepared by Vipac Engineers & Scientists (Vipac) and presented as Appendix 11 of the EIS for the Project. Following review of the Project by Hanson, the predictive dispersion modelling was updated to reflect the additional mitigation proposed. Todoroski Air Sciences (TAS) has undertaken an Air Quality Impact Assessment (TAS, 2019) with this assessment and additional information requested in various submissions provided as **Appendix 8**. The outcomes of this additional assessment are summarised in Section 4.5.

5.3.2 Current Dust Impacts

Representative Comment(s)

I formally object to the Brandy Hill Quarry Expansion on the grounds as follows: […]

Dust plumes can be clearly seen from Clarencetown Road directly after blasting and on windy days.

Carl Mackaway of Seaham, NSW – Page 1

As a resident sharing a direct boundary with the Quarry, the impact of dust (irrespective of what Hanson's report states), is indeed certainly an issue. Even on present levels before allowing the mine to double or triple in size, our house spends the summer months especially with its westerly winds, absolutely covered in dust, from blasting and overburden. The concern highlighted in the report about Silica dust and its effects is of major concern.

Darren Gilmour of Seaham, NSW – Page 2

On a clear, still day, the air above the quarry site is filled with a large, brown, dust cloud, clearly visible from south of Wallalong township, a straight-line distance of approx. 5 km. Although not always so visible, this dust is produced every single hour of the quarry's operations and dispersed over a wide area around the site, depending on wind conditions.

David Kitchener of Seaham, NSW – Page 4

When we first purchased our home, in 2007, there was minimal impact of noise, dust, or diesel emissions. Regular maintenance of the exterior was required only once or twice a year. […]

The current levels of dust and diesel emissions are extremely high. The weatherboards on our front veranda, windows, and screen doors are covered in black soot. This increased in 2014 to the point that we considered researching how to lodge complaints or selling and moving. We since determined that for various reasons we prefer to remain in our home.

The proposed increase in operations, both in the number of quarry transport movements and hours of operations, will burden the community with additional health and property maintenance hazards.

(Name withheld) of Raymond Terrace, NSW (200593) – Page 3

Response

The concerns of the local community regarding potential dust generation are acknowledged. However, it should be noted that these comments are not reflected in the historic results of deposited dust monitoring at the Quarry. Dust deposition is currently monitored at three locations to the west, south and east of the Quarry. For the purpose of assessment, TAS (2019) considered annual deposited dust monitoring results from 2011 to 2018 and noted that the annual average dust levels were between 0.5g/m^2/month and 2.2g/m^2/month. This is well within the 12-month rolling average criteria of 4g/m^2/month. A review of monitoring data is provided in Section 1.6.2.

It is also worth noting that TAS (2019) adopted background particulate matter monitoring from the BCD monitoring station at Beresfield as the closest and most representative publicly available monitoring or background air quality. The monitoring at Beresfield indicates relative high background concentrations of particulate matter. The monitoring station at Beresfield is closer to major arterial roads than the Quarry Site and therefore is considered to provide a conservative estimate of background particulate matter concentrations. However, this data indicates that air quality is impacted by more than just blasting and quarry activities alone.

Finally, it should be noted that Hanson has undertaken a comprehensive review of the Project in light of the concerns presented in various submissions. It is now proposed that all fixed processing equipment would be enclosed for the life of the Project, which vastly reduces dust dispersion from the operation.

A review of the outcomes of predictive dust dispersion modelling is provided in Section 4.5.5 and the Air Quality Impact Assessment (TAS, 2019) presented in **Appendix 8**. In summary, relatively high particulate matter concentrations have been predicted to occur but are considered to be driven principally by the adopted background concentrations (from monitoring available at the Beresfield monitoring station). In addition, for most parameters, mitigation assumed in modelling results in particulate matter concentrations that are consistent with but slightly higher than the existing levels even with an assumed production increase from 0.7Mtpa to 1.5Mtpa (i.e. more than double).

Hanson would implement continuous monitoring of PM_{10} at a location between the Quarry and Clarence Town Road over the life of the Project; in accordance with an Air Quality Management Plan. The PM_{10} data would be used as a surrogate for both $PM_{2.5}$ and TSP, with additional monitoring to be undertaken if persistently high concentrations of PM_{10} are recorded.

5.3.3 Air Quality Assessment Criteria

Representative Comment(s)

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a) consideration of properties that exceed the impact assessment criteria in the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2016);

Department of Planning & Environment

The EPA requests the proponent revise the AQA to assess PM_{10} and $PM_{2.5}$ impacts against the Approved Methods for Modelling and Assessment of Air Pollutants in NSW (2016).

Environment Protection Agency

EIS PAGE 14: Table 4-1 PM10 [sic] *annual criteria value is incorrect. 25ug/m^3 is NEPM correct value.*

Brandy Hill and Seaham Action Group, Appendix 11 – Page 1

Response

The Air Quality Impact Assessment has adopted an average annual PM_{10} assessment criteria level of 25ug/m^3 in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017). It should be noted that at the time that the Director-General's Requirements and the original assessment was completed, this document was not publicly available. Therefore, it was reasonable to assume an assessment criteria level of 30ug/m^3 for the assessment and for presentation in the EIS. However, Hanson acknowledges the concern in the community and has assessed the Project against this annual average criterion.

The assessment of average annual PM_{10} concentrations is presented in Section 4.5.5 and did not predict exceedance of the assessment criteria at any privately-owned residence. The highest predicted outcome was 22.0mg/m^3 during Stage 4 of the Project. This is largely driven by the assumed background level of 18.8µg/m^3 and does not represent a significant impact as a result of the Project. It should be noted that Hanson would install a continuous particulate matter monitor once operations commence under the Project. This monitor would provide trigger warnings to Quarry personnel once the 24-hour particulate matter concentrations reach a level at which it would be necessary to amend operations to reduce potential dust generation. This may involve increased watering of roads, relocating equipment to lower elevations to reduce dust dispersion or temporarily reducing processing or stockpiling operations to limit dust generation.

5.3.4 Inputs to the Air Quality Assessment

Representative Comment(s)

EPA requests the proponent provide evaluation to demonstrate that the prognostic model adequately captures the terrain and meteorological effects of the project area. The model setup should also be clearly detailed in the AQA.

Environment Protection Agency

The EPA requests the proponent provides all information and assumptions used in estimating emissions from the proposed operations. The scenarios assessed should be justified and include the worst case emissions over the life of the project.

Environment Protection Agency

EIS PAGE 18: Site specific data [for the air quality monitoring] *would have been much more valuable.*

Brandy Hill and Seaham Action Group, Appendix 11 – Page 5

EIS PAGE 22: The use of 2013 data with no comparisons to other yearly data sets is questionable especially considering dry conditions with extensive bush fires present in 2013.

Brandy Hill and Seaham Action Group, Appendix 11 – Page 6

The air quality assessment provided in the EIS is inadequate, as evidenced by the following statement from the EIS: "PM_{10} is not currently monitored for compliance in the vicinity of Brandy Hill Quarry and therefore substitute data was used from Beresfield monitoring station which is the closest monitoring OEH monitoring station to the site. The station is located approximately 14.2 km south west of BHQ." (P236)

Substituting data for an entirely different site so far away does not bear scientific analysis. Likewise, other significant particles $PM_{2.5}$ and TSP are not monitored at the Brandy Hill Quarry site. This calls into complete doubt any results of dust and air quality assessment.

David Kitchener of Seaham, NSW – Page 4-5

Response

An Air Quality Impact Assessment has been undertaken by TAS (2019) to address the concerns raised in various submissions and to provide predictive dust dispersion modelling of the Project following review and modification to mitigation and standard practices for management of the Quarry.

Detailed information regarding the methodology applied for the assessment is included in Section 5 of TAS (2019). TAS is confident that the modelling adequately captures the terrain and meteorological effects of the local setting. More detailed information regarding assumptions used to estimate emissions is presented in Appendix C of TAS (2019) (**Appendix 8**).

It is common practice to adopt publicly available data for background air quality for the purpose of assessment. As described in Section 4.5.1, the data available at the monitoring station at Beresfield is assumed to be a conservative surrogate for site-based monitoring. Regardless of this, the assessment presented in the Air Quality Impact Assessment indicates that dust dispersion would generally remain consistent, but slightly higher than existing conditions over the life of the Project due to the mitigation assumed for assessment.

5.3.5 Output of the Air Quality Assessment

Representative Comment(s)

I am concerned about: Mercury, PM10, PM 2.5, and Respirable Crystalline Silica, to name a few, let along emissions from blasting.

I want to know what the approved methods for modelling and assessment of air pollutants are in NSW and around the globe.

Bronwyn White of Seaham, NSW – Page 1

Response

The technical guideline *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2016) presents the methods and assessment criteria suitable for assessment of potential air pollutants. Section 4.5 summarises the Air Quality Impact Assessment (TAS, 2019) which describes the results of predictive dispersion modelling of PM_{10}, $PM_{2.5}$ and

assessment of predicted respirable crystalline silica that was prepared in accordance with this guideline. Airborne mercury is a risk for power plants or other industrial developments that rely on burning and exhaust emissions. However, mercury is unlikely to be generated by extractive industry operations and is not considered for assessment.

The results of predictive modelling indicate that dust dispersion is likely to remain consistent with existing emission dispersion over the life of the operation. This is principally due to the design and operational controls (such as enclosure of processing equipment) that would be implemented.

Respirable crystalline silica would not be generated in significant levels at the Quarry.

Representative Comment(s)

b) revised contour maps, provided at higher resolution (including lot boundaries), that enable the identification of potentially affected receivers and vacant land;

Department of Planning & Environment

Response

Detailed contour maps, including lot boundaries are presented as **Figure 25** to **Figure 28** in Section 4.5.5 and as Appendix D of the Air Quality Impact Assessment (**Appendix 8**).

5.3.6 Vacant Land

Representative Comment(s)

c) an assessment of impacts on vacant land considering the provisions of the Voluntary Land Acquisition and Mitigation Policy (2014);

Department of Planning & Environment

Response

The rights of landowners in relation to the predicted impacts of State significant extractive industry development are described in the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) (NSW Government, 2018). This policy specifies the noise and air quality criteria to be used to assess the need for negotiated agreements involving voluntary mitigation or acquisition of property. The policy is triggered when the assessment criteria are predicted to be exceeded once all reasonable and feasible avoidance and/or mitigation measures have been adopted to minimise potential impacts of a development. The VLAMP also includes provision for the assessment of vacant land on which development may occur under existing planning provisions (that is, reasonable subdivision of existing properties).

Vacant land has been addressed specifically in Section 2.4 and Section 9.7 of the Air Quality Impact Assessment in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018). In summary, TAS (2019) predicted that air quality at vacant land would remain within the relevant assessment criteria for the life of the Project.

It should also be noted that the owners of two of the vacant properties to the north of the Quarry Site (Lot 1 DP 158373and Lot 52 DP 752487) provided submissions of support for the Project and indicated that the Project would not interrupt plans for development of this land (see submission numbers 201071 and 201073).

5.3.7 Blast Fume Emissions

Representative Comment(s)

d) an assessment of blast fume emissions at sensitive receivers, based on the different stages of the quarry extraction plan; and

Department of Planning & Environment

Response

A review of potential impacts from blast fume emissions is presented in Section 4.5.7 and Section 7 of the Air Quality Impact Assessment (TAS, 2019 – **Appendix 8**). Historic blast activities were reviewed including the bulk load of explosive used for these activities. It is assumed that the design of blasting activities would remain consistent with existing operations given that the current approach to blasting has been fine-tuned to account for local geological variations, climate conditions and proximity to privately-owned residences. It should be noted that the frequency of blasting may increase under the Project but would not occur more than once per week.

Predicted blast fume emissions would remain consistent with or below existing operations as well as within the relevant assessment criteria at privately-owned residences in the vicinity of the Quarry Site.

Blasting also results in fugitive particulate matter emissions. Particulate matter emissions from operational activities and blasting are included in the dispersion modelling results presented in Section 4.5.5.

5.3.8 Air Quality Management

Representative Comment(s)

Based on the predicted 24-hour average and annual average PM10 impacts at nearby sensitive receptors, EPA recommends additional mitigation measures for dust impacts should be included in the proposed project. Mitigation measures should include a reactive management strategy based on real time continuous PM10 monitoring at suitable location(s). It is the EPA's intention to require real time continuous PM10 monitoring as part of the environment protection licence requirements. Any additional mitigation measures identified should be included in the AQA.

Environment Protection Agency

Response

Section 4.5.4 provides a summary of proposed air quality management and mitigation measures that would be implemented under the Project. These include a reactive management strategy that incorporates continuous particulate matter monitoring.

Based on the results of the Air Quality Impact Assessment (TAS, 2019 – **Appendix 8**), it is predicted that, with the proposed design and operational controls, particulate matter concentrations would remain consistent with but slightly higher than existing operations. Through the proposed reactive management strategy Hanson would receive trigger alerts if particulate matter levels are high and can adapt operations to suit these conditions.

5.3.9 $PM_{2.5}$

Representative Comment(s)

EPA requests the proponent clarify the predicted impacts for 24-hour average PM2.5 for the current and Stage 1 scenarios.

The Approved Methods states "a licensee must demonstrate that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity and that best management practices will be implemented to minimise emissions of air pollutants as far as is practical'. Where exceedances of EPA criteria have been identified, additional mitigation measures should be considered and assessed.

Environment Protection Agency

Response

The results of the Air Quality Impact Assessment (TAS, 2019 – **Appendix 8**) are presented in Section 4.5 including the assessment of $PM_{2.5}$.

The assessment of 24-Hour $PM_{2.5}$ concluded that there is not likely to be additional exceedances of the assumed assessment criteria under the Project. The maximum incremental impact from the Quarry operation is predicted to be 3.0 at 994 Clarence Town Road and 1034 Clarence Town Road, however it is noted that this level is predicted under existing operations at 994 Clarence Town Road and therefore would be consistent with existing dust generation.

It should be noted that the predictive dispersion modelling estimates particulate matter concentrations during worst case conditions including peak production, conservative operating scenarios (including all equipment operating at the same time) and adverse climatic conditions.

5.3.10 Diesel Emissions

Representative Comment(s)

e) an assessment of diesel emissions at sensitive receivers.

Department of Planning & Environment

A recent research paper produced by the NSW Health Hunter New England Local Health District and able to view in You Tube [sic]*, 'The health impact of air pollution – A Hunter Perspective 2016', indicates that the impact on health from diesel particulates is similar to the known effects of asbestos. They were using coal train movements in the Hunter Valley mines to demonstrate the impact on lungs of the fine particles produced by diesel vehicles. The level of truck movements indicated in Hanson's EIS is at levels with would have a similar effect.*

Brandy Hill and Seaham Action Group – Page 16

With increase in traffic also increase [sic] *air pollution. Diesel fumes have been proven to be a health issue with diesel vapour containing both chemical and particulate matter that is a health issue. PM 2.5 particulates have been found to be detrimental to health.*

Darryl Hetherington of Bolwarra Heights, NSW – Page 2

Response

While the concern expressed in this submission is noted, it is assumed that this conclusion is based on an overestimate of proposed traffic levels for the Project. It is not considered likely that significant levels of diesel fumes would be produced by transportation activities at levels consistent with coal train movements in the Hunter Valley.

All vehicles and mobile plant are regularly maintained to ensure compliance with the *Protection of the Environment Operations Act* 1997 and the *Clean Air Regulations* (NSW EPA, 2013). In addition, the majority of privately-owned residences are over one kilometre from the source of diesel fumes generated by processing equipment.

Diesel emissions are incorporated in predictive dispersion modelling with diesel emission estimates incorporated into source emission estimates for Total Suspended Particulates (TSP) and PM_{10}. Diesel emission estimates are also incorporated into predicted $PM_{2.5}$ generation and presented in the emissions inventory for the assessments (see Appendix C of TAS, 2019). Incremental changes to annual average $PM_{2.5}$ concentrations at privately-owned residences are predicted to be no greater than $0.6\mu g/m^3$.

5.4 BIODIVERSITY

5.4.1 Introduction

A Biodiversity Assessment Report was prepared by Biosis and presented as Appendix 7 of the EIS. BCD requested that that assessment consider the Rusty Greenhood Orchid (*Pterostylis chaetophora*) which was listed as a threatened species shortly after the assessment was completed. The additional targeted surveys for this species were undertaken in October 2017 and are discussed in Section 5.4.5. In order to complete a review of matters of national significance required under the bilateral assessment agreement with the Commonwealth Department of the Environment and Energy, the BCD also requested further assessment of species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* including for migratory species. Further to this, Hanson has updated the proposed biodiversity offset strategy to more closely align with the staged development of the Quarry. The biodiversity offset strategy is described in more detail in Section 2.21.

A consolidated Biodiversity Assessment Report (Biosis, 2019) is provided as **Appendix 10**.

The following subsections provide a response to biodiversity-related issues raised in submissions and includes terrestrial and aquatic ecology matters.

5.4.2 Targeted Fauna Surveys

….further clarification on how the stratification units were determined and how the survey design was applied would help clarify the adequacy of these [targeted flora and fauna] surveys.

OEH acknowledges that Table 14 in the BAR provides details of the methodology undertaken. However, it does not indicate how this sampling meets the minimum survey effort requirements specified in OEH guidelines. Specifically, OEH requests that proponent provide details on the sampling methods and survey effort per stratification unit (i.e. area of unit) and how these meet the minimum requirements in OEH survey guidelines (DEC 2004).

Office of Environment and Heritage

Response

Targeted surveys were stratified on the basis of mapped vegetation zones and faunal habitats across the ecological study area. Trap lines were located in the most suitable habitat for fauna (i.e. largest areas of intact forest/woodland with understorey vegetation, shelter habitat, etc.).

This stratification method was considered adequate to achieve the objective of detecting targeted threatened fauna that may occur within the ecological study area for the following reasons.

- Trap lines were located in what was determined during initial habitat assessment as the habitat available for these species within the ecological study area.
- The total areas covered by trap lines, spotlighting transects, biobanking transects (which were also diurnal bird survey points) and incidental traverses during the course of 3 surveys were considered to comprehensively assess all fauna habitat available within the ecological study area.

An updated version of Table 14 of the Biodiversity Assessment Report has been provided below as **Table 31,** which describes the approach to stratification and how the surveys addressed the survey effort suggested in relevant guidelines. The rationale for this approach is based on the coverage of these methods.

Targeted surveys of Rusty Greenhood Orchid (*Pterostylis chaetophora*) were undertaken in October 2017. The survey methodology is described in detail in Section 5.4.5 in the response to the DPIE submission. No Rusty Greenhood Orchids individuals were identified during the survey.

5.4.3 Survey Methods

Representative Comment(s)

The Biodiversity assessment is manifestly inadequate, having undertaken only six (6) days study of the area, four days in winter and two in spring. This short period is unable to account for species that are migratory, feed sporadically in the area or are otherwise transient or present in the area for limited periods of time. Species that are more active or more likely to be located in summer or autumn have effectively been ignored.

David Kitchener of Seaham, NSW – Page 1-2

It has also been acknowledged within Appendix 7 – Biodiversity (page 76), of the Environmental Impact Statement (EIS) that the current flora and fauna assessment was conducted in winter during cool and rainy weather "which is not suitable time to determine the presence of most threatened species".

(Name withheld) of Seaham, NSW (200029) – Page 1

Table 31
Updated Summary of Fauna Survey Effort

Survey Method	Target Species	Description of Survey Methodology	Date	Survey Effort	Adequacy against Relevant Guidelines
Elliot trapping	Brush-tailed Phascogale, Eastern Chestnut Mouse, Eastern Pygmy-possum, Common Planigale	A total of 25 small Elliot traps were placed approximately 10 metres apart along each of three transects, resulting in a total of 300 trap nights (75 traps x four nights). Elliot traps were baited with a mixture of peanut butter, rolled oats and honey.	11 to 15 August 2014	4 nights	In accordance with the recommended survey effort and methods outlined in the *Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004).
Motion-triggered cameras	Brush-tailed Phascogale, Eastern Chestnut Mouse, Eastern Pygmy-possum, Common Planigale	A total of six cameras were deployed for four nights during winter surveys (at each end of three Elliot trapping transects). A total of three cameras were deployed for two nights at various locations within the study area adjacent to dams (two cameras) and ephemeral drainage lines (one camera). Cameras were baited with chicken carcasses.	11 to 15 August 2014	4 nights	Method used as an ethical alternative to cage trapping in accordance with the recommended survey effort and methods outlined in the *Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004).
Diurnal bird surveys	Red-backed Button-quail, Regent Honeyeater	A total of eight locations were surveyed in winter and eight locations (four of which were surveyed on two separate days) were surveyed in spring. Each diurnal bird survey was conducted for 0.5 hours by one ecologist. All birds seen and/or heard were recorded.	11 to 15 August 2014 and 12 to 14 November 2014	8 days	In accordance with the recommended survey effort and methods outlined in the following guidelines: *Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004) *Survey guidelines for Australia's threatened birds* (Commonwealth of Australia 2010)
Nocturnal fauna surveys	Green and Golden Bell Frog, Barking Owl, Sooty Owl, Masked Owl, Powerful Owl, Bush Stone-curlew, Squirrel Glider, Yellow-bellied Glider, Koala, Spotted-tailed Quoll	Nocturnal fauna surveys consisted of spotlight transects and call playback. Spotlight searches for nocturnal amphibians, reptiles, birds and mammals were carried out along a total of three transects (surveyed from a moving vehicle) and at nine points (surveyed on foot). Spotlighting was undertaken by two ecologists using powerful (maximum 700 lumen) focused-beam hand-held torches. Call playback was employed at a total of 14 separate locations. Call playback involved playing of recorded calls of target threatened fauna species over a period of five minutes through a 10 watt minimum output megaphone. The broadcasting of calls was followed by a five minute listening period. Spotlighting was conducted following the final listening period.	12 to 13 August 2014 and 12 to 13 November 2014	6 nights	In accordance with the recommended survey effort and methods outlined in the following guidelines: *Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004) *Threatened species survey and assessment guidelines: field survey methods – Amphibians* (DECC 2009) *Survey guidelines for Australia's threatened amphibians, birds and mammals* (Commonwealth of Australia 2010)

Table 31 (Cont'd)
Updated Summary of Fauna Survey Effort

Survey Method	Target Species	Description of Survey Methodology	Date	Survey Effort	Adequacy against Relevant Guidelines
Targeted Koala Surveys	Koala	Surveys were conducted by one ecologist with two field assistants for a maximum of eight hours per day. Points were selected systematically by overlaying a 200 metre interval grid over an aerial image of the study area. The intercept points of the grid were selected as potential survey sites. Potential survey points were discarded if they occurred in cleared land or within the quarry workings. A total of 29 points were surveyed. At each survey point searches for Koala scats within 1 metre of the trunk were undertaken of a central tree and the closest 29 surrounding trees with a diameter at breast height (DBH) for a maximum of two minutes. Each survey site was given a score based on the presence/absence of Koala scats at each tree. A map was then generated using this data showing relative levels of Koala activity as "High", "Medium" and "Low". In addition to scat searches, the central tree and all trees within a 25 metre radius (providing a total search area of 0.125 hectares) were surveyed for individual Koalas for a maximum of 5 minutes. The results of the Koala searches were used to determine a Koala population density estimate for the study area. The timing of the surveys was considered appropriate for detecting both Koalas and signs of Koala activity, as stipulated in the EPBC Act Referral Guidelines for the vulnerable koala (DoE 2014). The targeted survey was guided by key documents: EPBC Act Referral Guidelines for the vulnerable koala (DoE 2014). The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus (Phillips and Callaghan 2011). DRAFT NSW Threatened Biodiversity Survey and Assessment Guidelines (DEC 2004).	9 to 11 December 2014	3 days	In accordance with the recommended survey effort and methods outlined in the following guidelines: *EPBC Act referral guidelines for the vulnerable koala* (DoE 2014).
Hollow-bearing tree and fallen log assessment	Pale-headed Snake	The relative abundance of hollow-bearing trees and fallen logs was obtained from within a total of 19 representative 20 x 50 metre plots across the study area using the BioBanking methodology. This methodology counts the total number of hollow-bearing trees within the plot, where hollows were visible from the ground. Fallen logs were recorded as the total length of logs ≥ 10 centimetre diameter within the plot. Active searching under rocks and logs and in hollows was undertaken to determine if any species were using these habitats.	11 to 15 August 2014 and 13 to 14 November 2014	7 days	In accordance with the BioBanking Assessment Methodology

Response

The biodiversity assessment, including targeted ecological surveys, has been undertaken in accordance with relevant guidelines (for example, OEH 2016) and BioBanking Assessment Methodology. All targeted surveys were conducted during the appropriate season as identified within the OEH Threatened Species Profile Database.

The exhibited version of the Biodiversity Assessment Report made reference to the assessment having been conducted *"during cool and rainy weather, which is not suitable time to determine the presence of most threatened species."* However, further consideration of climate conditions during the surveys (as demonstrated in Table 13 of Biosis (2019)) has identified that this comment was erroneous. Targeted surveys were undertaken under mostly dry conditions except for some light rain on one of the 2014 survey days.

It rained on the days that the targeted surveys for the Rusty Greenhood Orchid were undertaken in October 2017, however the rain was light and did not impact the survey effort. The reference to cool and rainy weather has been removed and Biosis (2019) updated to accurately report survey conditions.

5.4.4 Hollow-Bearing Trees

Representative Comment(s)

.....provide an assessment of:

c) the loss of hollow-bearing trees, as requested by Port Stephens Council.

Department of Planning & Environment

There is insufficient information on loss of hollow-bearing trees (density, size class and location) within the development area.

- *Any hollows lost within the development footprint should be compensated for in the local area with the number, size class and area of compensatory nest boxes forming part of the Biodiversity Offset Strategy. It is recommended that compensatory nest boxes are provided within E3 zoned land owned by the applicant, adjacent to the development footprint to mitigate the loss of this local, often limiting important habitat resource.*

Port Stephens Council

Response

Hanson recognises the importance of hollow-bearing trees as a habitat feature. The assessment of hollow-bearing trees was undertaken in accordance with the BioBanking Assessment Methodology (BBAM) and Framework for Biodiversity Assessment (FBA) (OEH, 2014). Hollow-bearing trees are recorded for vegetation plots prepared for assessment and plot records are presented in detail in Appendix 2 of the Biodiversity Assessment Report included as **Appendix 10**. This methodology assumes that hollow-bearing trees located in vegetation to be removed are part of the habitat features that are offset in accordance with the methodology. Therefore, a specific count of hollow-bearing trees is not required across the Quarry Site as the removal of hollow-bearing trees is accounted for in the calculation of biodiversity credits.

Hanson notes the concern of Port Stephens Council regarding the removal of local hollow-bearing trees and replacement elsewhere. However, it is noted that residual impacts requiring offsetting need to be satisfied within the same bioregion as the proposed impact. Therefore, proximity is also something that is addressed in the methodology.

However, Hanson has reviewed hollow-bearing tree removal with Biosis and established an indicative protocol for hollow-bearing tree removal and rehanging of hollows. It should be noted that the following protocol is indicative and would be refined in a Biodiversity and Rehabilitation Management Plan for the Project. However, the key steps may be as follows.

- A pre-clearance survey of vegetation would involve identification of hollow-bearing trees in the vegetation to be removed.
- Hollow-bearing trees would be carefully felled to allow any fauna occupying the hollows to escape prior to removal.
- All hollows would be checked by a suitably-qualified person and the hollows would be separated from the remaining vegetation.
- Hollows would be stored and progressively re-hung in remnant vegetation by a suitably-qualified person in a designated area outside of the proposed disturbance areas for the Quarry.
- Once in place, the hollows would be monitored to determine condition and occupancy. Maintenance would occur during monitoring if required.
- Monitoring may include external inspection and use of a camera mounted on a telescopic pole to check for occupancy.

It is understood that existing hollows that have been artificially placed in this manner generally have a higher rate of use than nesting boxes. It should be noted that the following protocol is indicative and would be refined in a Biodiversity and Rehabilitation Management Plan for the Project that would be prepared in consultation with the BCD. However, the key steps would remain consistent with this description. It is anticipated that this process would involve rehanging of more than 150 hollows over the life of the Project.

5.4.5 Rusty Greenhood Orchid

Representative Comment(s)

.....provide an assessment of:

a) Pterostylis chaetophora, including the provision of targeted surveys as requested by OEH;

Department of Planning & Environment

OEH notes that the BAR does not include targeted surveys or an impact assessment on the recently listed Pterostylis chaetophora, a threatened orchid (gazetted 29 August 2014), nor is this species referenced in any database searches or the credit calculator. OEH requires further consideration of this species, including targeted surveys (or expert report) and impact assessment (including if appropriate determination of 'species credits' as outlined below), in accordance with OEH guidelines DEC 2004, OEH 2016).

Office of Environment and Heritage

Response

The Rusty Greenhood Orchid (*Pterostylis chaetophora)* was listed as Vulnerable under the *Threatened Species Conservation Act 1995* (TSC Act) on 29 August 2014 (this listing is now under Schedule 1 the *Biodiversity Conservation Act 2016*). The flora assessment for the proposed extension was finalised on 11 August 2014 and as such this species was not considered in the list of candidate threatened flora species requiring seasonal targeted surveys. Moreover, more recent application of the Biobanking Calculator also failed to identify the Rusty Greenhood Orchid as a candidate credit species requiring targeted survey.

In its submission, the BCD identified the Rusty Greenhood Orchid as a species requiring further assessment and targeted survey due to the presence of potential habitat within the ecological study area and the proximity of the Quarry to the Grahamstown Dam (where a population of Rusty Greenhood Orchid has been identified).

Vegetation with potential for providing Rusty Greenhood Orchid habitat was identified based on a review of vegetation plot data from the ecological study area, desktop review of the extent and topographic position of PCTs and subsequent field validation. Given the cryptic nature of the Rusty Greenhood Orchid, Biosis consulted with the BCD to identify high potential habitat including an inspection of the Grahamstown Dam population to confirm local flowering and qualitatively assess parameters of suitable habitat for Rusty Greenhood Orchid in the local area. Published information concerning the preferred habitat of the species was also reviewed and considered when determining the extent of suitable habitat within the ecological study area.

Targeted surveys of Rusty Greenhood Orchid were undertaken on 12 October 2017 and 13 October 2017 by Biosis. Local flowering of Rusty Greenhood was confirmed prior the surveys through a visit to a known population in the vicinity of the ecological study area with BCD officers Steve Lewer and Paul Hellier.

Vegetation with potential to provide habitat for Rusty Greenhood Orchid was identified based on a review of vegetation plot data, desktop review of the extent and topographic position of PCTs and subsequent field validation. In consultation with BCD Regional Biodiversity Conservation Officer, Mr Steve Lewer, a targeted survey plan covering areas of highest habitat potential was developed in accordance with NSW threatened plant survey guidelines (OEH 2016). Targeted surveys consisted of closely spaced (approximately 10m) parallel transects through vegetation of high habitat potential. Appropriately qualified and experienced botanists traversed each transect scanning a distance of approximately 5m either side. No Rusty Greenhood Orchid individuals were identified during the survey. The Biodiversity Assessment Report (Biosis, 2019) has been updated to reflect the additional survey and results.

Review of refinements to the Project following public exhibition of the EIS identified that an area in the south of the proposed expanded Quarry had not been covered in the targeted surveys. These areas would be subject to targeted survey prior to any vegetation disturbance in the identified area with the results presented in a Biodiversity and Rehabilitation Management Plan. This approach has been agreed in consultation with BCD and DPIE.

5.4.6 Koala Habitat

Representative Comment(s)

…….OEH is of the belief that the Koala habitat may have been over-estimated. The proponent has indicated that it may refine these calculations. OEH has no issue with amending the Koala habitat polygon provided it is done in accordance with the BBAM guidelines and the recognised approach in determining core/preferred Koala habitat.

Office of Environment and Heritage

Response

The extent of Koala habitat was determined using a combination of the Threatened Species Profile Database (TSPD) and targeted Koala survey results. Any vegetation communities (technically considered as PCTs) where the Koala is predicted to occur by the TSPD, or any vegetation communities where more than 15 percent of the trees at any Spot Assessment Technique (SAT) location were Koala feed trees listed under *the State Environmental Planning Policy 44 – Koala Habitat Protection* (SEPP 44) or the Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) (2002), were mapped as Koala habitat.

As indicated by the BCD, this approach likely overestimates the extent of Koala habitat however this precautionary approach is considered by Hanson to be appropriate given the prominence of Koala as an icon species in the locality.

Representative Comment(s)

The proponent proposes to clear 45.8 hectares of Koala habitat…… The Koala has been listed as 'vulnerable to extinction' under the NSW Threatened Species Conservation Act 1995 and 'vulnerable' under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

This habitat does not only support an active population of koalas but the vegetation that is to be cleared contains one primary koala food tree species (Eucalyptus tereticornis), three secondary koala food trees species (E. canaliculate, E. moluccana, E. punctata) and one supplementary koala food tree species (E. globoidea) as well as equally important shelter trees.

It has been acknowledged that the main threats to Koalas are habitat loss and habitat fragmentation, both of which will occur should this proposal be permitted.

(Name withheld) of Seaham, NSW (200029) – Page 1

Hanson is proposing to purchase 1191 Koala credits to off-set the destruction of this habitat. I fail to see how purchasing credits that will manage land for conservation elsewhere will help towards the conservation and protection of this population of koalas.

(Name withheld) of Seaham, NSW (200029) – Page 1

Response

The presence of Koala and predicted impacts have been acknowledged in the EIS and Biodiversity Assessment Report, with Biosis (2019) concluding that the Project will result in a significant impact to the Koala due to the loss of habitat for the species and would require

approval by the Commonwealth Department of the Environment and Energy under the *Environmental Protection and Biodiversity Conservation Act 1999*. However, assessment of impacts to this species indicates the following.

- The locality supports a low density of Koalas (≤0.1 Koala per hectare).
- The Quarry Site does not feature a breeding population of Koala (females with young) (see Section 5.4.8).
- The area is unlikely to support an important population of Koala and therefore the Project would not fragment the habitat or interrupt the breeding cycle of an important population.
- It is unlikely that extension of the Quarry to the south would result in a significant barrier to Koala movement in the wider locality (see Section 5.4.7).
- It is unlikely that the Project would result in indirect impacts through introduction of threats (wild dogs) or diseases.

In accordance with the requirements of the FBA, Hanson has endeavoured to avoid and minimise ecological impacts to the Koala and its habitat prior to the application of biodiversity offsets. A range of measures will be implemented before, during and after construction to avoid, minimise and mitigate the impacts of the Project. These are described in detail in Table 22 of the Biodiversity Assessment Report and include the following relevant to the Koala.

- A Biodiversity and Rehabilitation Management Plan would be prepared to outline the clearance procedure, protocols for Koala finds and incidents and include an educational brochure for all workers to review prior to working at the Quarry.
- Pre-clearance surveys would occur prior to the removal of any vegetation and be supervised by a suitably qualified person.
- A suitably qualified person (such as an ecologist or trained fauna rescuer) would be present during vegetation clearing to minimise impacts on Koalas displaced or injured during clearing.
- A Biodiversity Offset Strategy, that includes offsetting of Koala species credits, has been prepared to offset the residual impacts to the Koala as a result of the Project.
- Remnant native vegetation within the Hanson property would be fenced from operational areas.
- Hanson personnel would continue to comply with speed limits described in the Drivers Code of Conduct.
- Hanson personnel would continue to avoid areas outside of constructed internal roads.

Considering the above, Biosis (2019) conclude that the Project would lead to the removal of 51.63ha of Koala habitat and therefore would modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent the species is likely to decline locally. Therefore, the impact to the species and its habitat has been considered under the relevant NSW and Commonwealth offsetting policies.

There are two separate offsetting policies that apply to disturbance of Koala habitat in NSW: the NSW Biodiversity Offsetting Scheme prescribed in the NSW *Biodiversity Conservation Act 2016*; and the EPBC Act Environmental Offsets Policy prescribed in the *Environmental Protection and Biodiversity Conservation Act 1999*. The Koala credits are 'species credits' calculated under the NSW Biodiversity Offsetting Scheme for impacts to a threatened species (as listed in the *Biodiversity Conservation Act 2016*). There are a range of technical factors that apply to the calculation of species credits. Under the NSW legislation an assessor needs to be accredited to perform the calculation of credits generated by a proposed impact (requiring training and registration). Under the EPBC Act Environmental Offsets Policy, a like-for-like outcome in terms of offsetting impacts is required for approval to be granted for a project that may impact a threatened species.

The biodiversity assessment concluded that 1 342 Koala species credits would be required to be purchased and retired to offset the predicted impacts to the Koala, while 2 993 ecosystem credits would be required for native vegetation that is habitat for the Koala (all vegetation types except HU798 – see Section 2.21). These credits have been calculated in accordance with the NSW legislative requirements and as it is proposed that credits would be purchased and retired from a registered biobanking agreement site (or similar) it satisfies the like-for-like requirement of the EPBC Act Environmental Offsets Policy. Preliminary assessment of the outcomes of this offset strategy indicate that the payment provided for purchase of the above credits would fund conservation actions over approximately 450ha of Koala habitat in perpetuity. The quantum of the area would be determined during the transaction, however it should be acknowledged that this area would be secured for conservation use with the agreement registered on the title (therefore requiring current and future owners of the property to maintain the biodiversity values of the area).

As described in the comments provided by the BCD, the loss of Koala habitat resulting from the Project is likely to be an over-estimate due to the precautionary approach adopted when defining the Koala habitat polygon. The habitat polygon has been used in determining the number of Koala species credits that must be retired in order to offset residual impacts to Koala habitat in accordance with the NSW Biobanking Scheme.

Therefore, while the loss of Koala habitat is considered a significant impact locally, the area supports only a small population of Koala, would not fragment surrounding remnant Koala habitat and the offset for the loss of this habitat is likely to result in the conservation of approximately 450ha of Koala habitat in perpetuity. The assessment has been undertaken in accordance with the NSW Biodiversity Offset Scheme and EPBC Act Environmental Offsets Policy to ensure that an acceptable outcome results from the proposed vegetation clearing for the Project.

5.4.7 Koala Movement

Representative Comment(s)

.....provide an assessment of:

b) impacts on Koala habitat connectivity and movement pathways;

Department of Planning & Environment

OEH also notes that the EIS and BAR fails to discuss the importance of the overall subject site and surrounds with regards to habitat connectivity and movement pathways for the Koala. OEH is of the opinion the inclusion of comments relating to the areas to the north of the subject site, being conserved under the BioBanking Scheme (under the Threatened Species Conservation 1995) and maintaining this connective link, would have adequately help argue this point. Furthermore, the retention of vegetated areas and potential Koala habitat to the north of the development area (on the overall Hanson property), also helps maintain these links.

Office of Environment and Heritage

The loss of koala foraging and movement habitat at a local level has not been adequately addressed or satisfactorily offset.

- *A more thorough assessment of impacts to koala movement corridors should be undertaken, including a post-development assessment of koala movement areas.*
- *The Biodiversity Offset Strategy should include specific mitigation measures for koalas relating to compensatory feed tree planting, fauna movement structures or required speed limits and signage of roads.*

Port Stephens Council

Response

Large tracts of native vegetation will be retained within land owned by Hanson to the north east, north west and west of the development area which, based on available vegetation mapping (Cockerill et al. 2013), contain habitat opportunities for Koala similar to that within the Quarry Site. Moreover, land to the immediate north and north west of the Hanson property boundary is the subject of two separate BioBanking Agreements and have been secured for biodiversity conservation in perpetuity. Under the terms of these BioBanking Agreements, management measures will be undertaken which improve or maintain the condition of native vegetation and hence Koala habitat.

Koala habitat mapping provided in the Port Stephens Council's Comprehensive Koala Plan of Management (CKPoM) indicates that a narrow strip of preferred Koala habitat occurs to the east of the Quarry Site, providing an opportunity for north-south movement of individuals at Brandy Hill to the south and existing biobank sites located to the north of the Quarry Site. This north-south corridor will not be impacted by the Project.

Based on Koala records from the BCD database it is likely that Koala movement occurs north-west to south-east along a corridor of habitat located to the west of the Quarry Site. It is therefore considered unlikely that extension of the Quarry (the Project) to the south would result in a significant barrier to Koala movement in the wider locality.

The connectivity value of the ecological study area was assessed in accordance with Appendix 4 of the FBA. The ecological study area was assessed as being part of two connective links (see Figure 1 and Section 3.4.2 of Biosis 2019). One connective link runs east to west within the southern portion of the ecological study area and provides connectivity between patches of vegetation to the east and west of the Quarry. A second connective link connects the first connective link to remnant native vegetation to the south of the ecological study area. The second link is transected by Clarence Town Road, south of the Quarry, with no connective structures. The extension of the Quarry would remove both of these connective links (assessed in

Section 3.4.2 of Biosis 2019). However, as noted above, it is considered unlikely that this would create a significant barrier to koala connectivity and movement and does not require supplementary mitigation. It should be noted that the impact of the removal of connectivity links is taken into account within the Biobanking Calculator when calculating the quantum of ecosystem and species credits required to adequately offset the impacts of the Project.

5.4.8 Koala Breeding

Representative Comment(s)

Biosis, seems unable to say if they found koalas present on the BHQ site (Justification column page 46, Appendix 7), but rightly assumes that they are present. […] *Having not actually locating koalas (sic), Biosis then assumes that they are not a breeding population as they did not see any mothers with young. It is impossible to understand how they can make this claim. Their success in identifying koalas was no doubt in part due to the time of year that they were making their surveys, four days in August and two in November. They may have had more success if they had used recording equipment in November, but even then from personal experience our local koalas are most obvious in December and January, when the males bellowing is a common occurrence. It has been shown that the bellow vocalisations of males are an indication of breeding activity (Ellis et al, 2011). I have also personally witnessed pre-mating behaviour of koalas within 20m of my house, with a male following a female koala, who was making the typical squawking as she was approached.*

Anne Kitchener of Seaham, NSW - Page 1

Response

Detection of Koalas is not considered to be seasonal given adults are present in all seasons. However, one of the survey periods was in spring when breeding typically occurs.

Biosis (2019) recorded Koalas on two separate occasions within the Quarry Site. Based on the absence of any direct evidence of breeding (i.e. females with back young), the low abundance of individual Koalas recorded during surveys and the low levels of activity recorded during Spot Assessment Technique (SAT) surveys it is considered unlikely that the Koalas present within the Quarry Site would represent a breeding population.

During spring adult males can sometimes be detected calling during nocturnal surveys, especially in response to call playback. Detection of calling males can be used in conjunction with other more effective methods to detect Koalas. However, the presence of calling males does not confirm breeding activity and cannot be used in isolation to determine the presence of a breeding population of Koalas.

5.4.9 SEPP 44 – Koala Habitat Protection

Representative Comment(s)

State Environmental Planning Policy 44 – Koala Habitat Protection (SEPP44) is currently under review, which could have implications for the BHQ expansion. The BHQ EIS does not mention this at all. Hanson has used SEPP 44's koala habitat definitions, but these are one of the sections currently under review and may change in the future.

(Name withheld) of Seaham, NSW (200184) – Page 1

Response

It is not appropriate for Hanson to address legislation that is yet to be finalised, given that draft provisions are subject to feedback from within Government, industry and local stakeholders. As discussed in Section 5.4.6, the BCD has indicated that it considers Hanson to have overestimated Koala habitat within the Quarry Site. Residual impacts to Koala would also be offset in accordance with the *Biodiversity Conservation Act 2016*. It should also be noted that Hanson would prepare and implement a Biodiversity and Rehabilitation Management Plan that would incorporate threatened species management and specifically the management of Koala. Should Koala management practice change, this change would be reflected in the Biodiversity and Rehabilitation Management Plan that would be prepared in consultation with the BCD.

5.4.10 Brush-tailed Phascogale

Representative Comment(s)

Biosis claims that they did not find evidence of Phascogale tapoatafa on the site to be cleared. However, Biosis baited their Elliot Traps with rolled oats, honey and peanut butter, but neglected the common addition of sardines to attract animals such as Phascogales, which are carnivores. Phascogales feed almost exclusively in trees not on the ground. Biosis do not make mention of the where the Elliott Traps were placed, but this is typically at ground level. Also the use of Elliott traps, has been shown by many to be generally unsuccessful for catching Phascogales, with cage traps being more successful, especially when compared to small Elliott Traps (Marlow et al 2015). Biosis also used cameras and chicken carcasses to try and find evidence of Phascogales, however, although these animals have been known to eat small live chickens they are also known to avoid carrion (Nowak, 1999). Having lived in the area for 16 years, and taking an interest in the native wildlife, professionally and privately, I can confirm that Phascogales are present on our neighboring [sic] property, having observed them feeding in the trees near our house. The lack of success by Biosis in finding Phascogales on the BHQ property was to more likely due to the inappropriate methods and small number of trapping nights than to do with the lack of Phascogales on the BHQ site.

Anne Kitchener of Seaham, NSW - Page 1

Response

Brush-tailed Phascogales and other small terrestrial/scansorial carnivores can be successfully trapped using the standard bait mix without the addition of sardines. This is evidenced by the large number of antechinus that were trapped during survey as well as extensive experience of Biosis staff trapping Brush-tailed Phascogale and other fauna at numerous locations throughout NSW and Queensland over the past 15 years. Further, Biosis have had experience successfully trapping Brush-tailed Phascogales using Elliot traps located on the ground.

The determination regarding the success of cage trapping versus Elliot trapping in Marlow et al (2015) is flawed. This reference states that 100 cage traps and 17 Elliot traps were initially deployed, resulting in the capture of 6 individual Brush-tailed Phascogales (5 in cage traps and 1 in Elliot traps). The reference then determines that cage trapping was more successful that Elliot trapping despite the obvious differences in survey effort (812 cage trap nights vs 133 Elliot trap nights). Although nothing substantial can be inferred from these results considering the ratio of trap nights to individuals recorded, they imply that trapping success was actually higher, not lower, for Elliot trapping (162.4 trap nights per individual trapped for cage trapping versus 133 trap nights per individual trapped for Elliot trapping).

In addition to Elliot trapping, Biosis deployed remote cameras baited for Quolls, and conducted extensive nocturnal spotlighting surveys across the entire project over two survey periods. Trapping and survey effort was therefore considered to be in accordance with the BCD guidelines and adequate to detect Brush-tailed Phascogale.

5.4.11 Deadmans Creek

Representative Comment(s)

The existing and proposed extension of the quarry is adjacent on the south-western side of Deadmans Creek, which is a 3rd order creek in this location and flows into Eskdale Swamp on the floodplain of the Williams River. It is unclear from the documentation how close the proposed quarry extension will get to Deadmans Creek or if the riparian corridor has already been breached by the existing quarry footprint.

Port Stephens Council

Response

The Project would not result in direct physical disturbance of Deadmans Creek as this watercourse is outside the areas of disturbance for the Quarry. There would be negligible changes to the catchment of Deadmans Creek with no significant alteration in flow rates and volumes to the creek. The overall reduction in the catchment area is estimated to represent 2% of the entire Deadmans Creek catchment and therefore consequences for the Williams River would also be negligible.

5.4.12 Aquatic Ecology

Representative Comment(s)

Impacts to waterways and riparian vegetation by the proposed development require a more thorough assessment.

- *No baseline information is provided on the aquatic habitat present within the tributaries of Deadmans Creek and Barties Creek in the development site. These tributaries, while largely ephemeral in nature, form the headwaters of these waterways which will be excavated and completely removed as part of the proposed action.*
- *Additional survey effort and monitoring is required to adequately meet the DPI Aquatic Habitat Protection SEARs to assess existing waterway health, extent of habitat removal and potential downstream impacts. It is noted that degradation of riparian vegetation is a key threatening process under the Fisheries Management Act 1994.*
- *No description is provided on the nature or extent of the aquatic habitat removal or modification of the waterways including changes to hydrology downstream, resulting from the proposed action.*

Port Stephens Council

Response

Ephemeral tributaries have been included in the terrestrial ecology assessment undertaken by Biosis as it is not possible to identify aquatic habitat in areas that cannot consistently provide necessary habitat either through groundwater baseflow or spring flow. It is true that these areas

form the headways of Deadmans Creek and Barties Creek, however they are not considered likely to be aquatic habitat. An assessment of habitat in Deadmans Creek is provided in Section 5.5 of the Biodiversity Assessment Report (Biosis, 2019 – **Appendix 10**).

The Project would not result in any physical removal of riparian vegetation along Deadmans Creek or Barties Creek. As described in Section 5.23.6 in relation to water resource management, it is proposed to establish a discharge regime that occurs for 24 hours continuously on wet days only, in order to mimic natural conditions, and to prevent erosion impacts downstream by ensuring outflows are below the channel forming discharge flow rate. On this basis, it is concluded that impacts to riparian vegetation are not likely to occur and that changes to downstream hydrology would be largely avoided.

5.4.13 Groundwater Dependent Ecosystems

Representative Comment(s)

The Biodiversity Assessment Report should include a detailed assessment of potential impact of the development on any groundwater dependant ecosystems, as required in the SEARs.

Port Stephens Council

Response

Groundwater dependent ecosystems were considered in Section 5.11.3.4 of the EIS and in Section 3.10 of the Hydrogeological Assessment (Martens and Associates (2015) – Appendix 13B of the EIS). It was concluded that vegetation identified as potentially being groundwater dependent within the Quarry Site was terrestrial and therefore relied on subsurface groundwater such as that in the capillary zone or at the soil-rock interface and not the regional groundwater table. Therefore, remnant vegetation would be more reliant on rainfall infiltration and is unlikely to be reliant on baseflow from the underlying aquifer.

This was confirmed in the Hydrogeological Assessment (Martens and Associates, 2015) through consideration of the regional groundwater table which was estimated to be within fractured rock of low permeability with the standing water level up to 64 metres below ground level.

5.4.14 Vegetation Clearing

Representative Comment(s)

The proposal includes the planned removal of approximately 49 hectares (121 acres) of established native vegetation. This includes six plant community types (PCTs HU591, HU798, HU806, HU812, HU814, HU816), which form habitat for a wide range of native species. […]

Any reduction in quality native forest only puts further pressure on species that are already vulnerable due to the ongoing impacts of human activity involving land clearing. Purchasing an offset in another area does not represent any sort of assistance to the plants and animals of the established ecosystem that would be impacted by the proposal. It is contentious that "offsetting" provides any benefit at all, considering that the offset land is almost always already forested. True offsetting would require the planting/replacement of forest on bare land, equivalent in area to that being destroyed.

David Kitchener of Seaham, NSW – Page 1

Response

The Biodiversity Assessment Report and Biodiversity Offsets Strategy have been developed in accordance with all relevant NSW and Commonwealth policies and legislation. It should be acknowledged that the proposed impacts were assessed following consideration under the mitigation hierarchy of avoidance, minimisation and offsetting required under the FBA. Offsetting is the last step on this hierarchy and proceeds where impacts cannot reasonably be avoided or minimised.

BCD has developed the Biodiversity Assessment Methodology and Credit Calculator to take into account the difference between removal of remnant vegetation and conservation of existing vegetation. It is often the case that the ratio of impact area to conserved area is 1:5 (indicating that 1ha removed requires 5ha conserved) but has been lower and has been much higher in some cases. The Credit Calculator applies complex technical information to ensure that offsetting obligations are appropriate to the impact that is proposed.

5.4.15 Indirect Impacts

Representative Comment(s)

The area immediately surrounding the quarry is home to a number of wildlife species which include Eastern Grey kangaroos, Black Faced Wallabies, koalas, echidnas and reptiles such as goannas and bearded dragons all of which could potentially be displaced.

Carl Mackaway of Seaham, NSW – Page 3

Response

A range of common native fauna are likely to inhabit vegetation within the proposed Quarry Site and individuals are likely to be displaced as a result of the proposed development. However, this does not necessarily mean that these species would no longer inhabit the vegetated areas surrounding the Quarry Site, including areas that have been secured for biodiversity conservation in perpetuity. The BBAM does not require the specific assessment of impacts to such species, rather, impacts to these species and their habitats is accounted for in the calculation of ecosystem credits required to offset impacts to each vegetation community within the ecological study area.

Measures to mitigate direct and indirect impacts to native fauna will be addressed in a Biodiversity and Rehabilitation Management Plan for the Project and will include the following.

- Pre-clearance surveys would occur prior to the removal of any vegetation and be supervised by a suitably qualified person.
- A suitably qualified person (such as an ecologist or trained fauna rescuer) would be present during vegetation clearing to minimise impacts on fauna displaced or injured during clearing.
- A suitably qualified person would be contacted if any native fauna is injured and/or distressed during the construction and operation phases of the Project.

5.4.16 BBAM Assessment and Credit Calculations

Representative Comment(s)

OEH audited BIOSIS's BBAM /floristic plot data sheets and found them to provide an accurate representation of all the PCTs identified, albeit some minor issues outlined below which will require the credit calculator to be amended and re-run to determine the new credit yield:

- *PCT 1602 (HU816) – within plot 7 no trees with hollows were noted, however, OEH site inspection indicated that there were 2 hollows. OEH acknowledges that we may not have been exactly on the plot, but given we were within the GPS co-ordinates and the hollows were close to this point, OEH recommends the calculator be amended. This may slightly increase the site value score for this PCT.*
- *PCT 1598 (HU812) – the shrub cover in the ground layer was recorded as 0 by the consultants, however, the site inspection revealed it to be 5-10%. OEH acknowledges that at the time of sampling, the shrub cover may have been low or non-existent, however, it should reflect its current condition. As such OEH recommends that this site attribute be amended in the credit calculator. This will bring this attribute into 'benchmark' which may lead to a slight increase in the site value score.*
- *PCT 1584 (HU798) – plot 18 appears to have an incorrect native overstorey cover figure assigned to it. Based on the site inspection the cover was not 0.75%, but more in the vicinity of 75%. As such this appears to be a data entry error, and thus needs to be corrected in the credit calculator. This will mean that the PCT is in 'benchmark' for the overstorey cover attribute and thus increase the site value score.*

Office of Environment and Heritage

OEH concludes that the BAR and associated BOS have been undertaken in accordance with the BBAM and interim offset guidelines. OEH notes that the credit calculator will need to be rerun to reflect OEH's comments (as outlined above) and quantum of biodiversity credits amended.

Office of Environment and Heritage

Response

Biosis has revised the plot/transect data as suggested by the BCD. However, as the credit requirements have been recalculated since that time, the changes from this minor update have been incorporated into the updated credit requirement calculations presented in Section 2.21.3 and Section 7 of the Biodiversity Assessment Report (Biosis, 2019 – **Appendix 10**).

5.4.17 Commonwealth Biodiversity Matters

Representative Comment(s)

Request dated 28 November 2018

"The Department requests further elaboration and assessment of the significance of impacts to the Koala, Grey-headed Flying fox, Spotted-tailed Quoll, Regent Honeyeater and Swift Parrot, which have been identified by the Commonwealth as Matters of National Significance (MNES).

The Department notes that Appendix 6 of the Biodiversity Assessment Report (BAR) provides Significant Impact Criteria (SIC) assessments for these species, however, the SIC assessments and the BAR do not contain important information required by Attachment 4 of the revised Environmental Assessment Requirements (9 July 2015). To allow for the proper consideration of impacts to MNES, the Department requests a:

- *discussion of the likely direct, indirect, cumulative and consequential impacts relevant to MNES;*
- *description of the quantum and nature of the impacts on the species, the populations and/or the extent of the community (including discussion of the scale of impact in relation to local, regional, state and national populations / habitat);*
- *discussion of the nature and significance of impacts in the context of any relevant Approved Conservation Advice;*
- *statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible; and*
- *details of specific measures to avoid, mitigate and/or offset impacts to relevant MNES, with reference to any relevant policies or plans such as Conservation Advice, Recovery Plans and Threat Abatement Plans.*

OEH has noted that potential habitat exists for the above MNES species and failure to identify a species during field surveys should not result in no further assessment being undertaken for those species (when potential habitat is present). Where there is potential habitat for a species, assessment of the above matters should be undertaken.

Additionally, Section 8 of the BAR notes that Tier 1 offsets are available for most of the credits required. The Department notes that OEH has advised a number of mechanisms to retire ecosystem and species credits, including payment into the Biodiversity Conservation Fund (BCF). It is important to note that the Commonwealth Government has not accredited the use of the BCF for retirement of credits required for MNES. Please confirm that the identified credit amounts for MNES are still available in the absence of this mechanism."

Additional Request Dated 8 March 2019

OEH is generally satisfied with the level of assessment undertaken, with the exception of two matters:

1. *OEH has requested an assessment against the Significance (sic) Impact Criteria (SIC) for the three migratory bird species that have previously been identified on the site. I understand that they do not expect any further field work in relation to these species, only further discussion against the SIC.*

2. *OEH has identified that PCTs proposed for the Tier 3 offset approach, are unlikely to meet Commonwealth requirements, as they require like-for-like offsets.*

Department of Planning and Environment

Response

It is noted that correspondence from the Commonwealth Department of the Environment (dated 3 June 2015 – EPBC 2014/7453) identifies the Project as a controlled action due to likely impacts to listed threatened species and communities. This information has been requested to inform the assessment of biodiversity matters under the EPBC Act.

A consolidated Biodiversity Assessment Report prepared by Biosis Pty Ltd (Biosis, 2019) is provided as **Appendix 10**. Section 6.3 of the Biodiversity Assessment Report reviews potential impacts in accordance with the *Guidelines for preparing Assessment Documentation relevant to the Environment Protection and Biodiversity Conservation Act 1999* (Attachment 4 of the revised Environmental Assessment Requirements).

Specifically, the addendum report considers potential impacts to the following threatened species listed in the EPBC Act.

- Koala
- Grey-headed Flying fox
- Spotted-tailed Quoll
- Regent Honeyeater
- Swift Parrot

Biosis has reaffirmed its previous conclusion, and Hanson remains confident, that the Project would not result in significant impacts to these species. Predicted impacts to the Koala and its habitat as a result of the Project would be offset in accordance with the EPBC Act Offsets Policy and the NSW Biodiversity Offset Scheme.

In addition, the consolidated Biodiversity Assessment Report presents assessment against the Significant Impact Criteria (SIC) for the three migratory bird species that may be potentially impacted by the Project (Black-faced Monarch, Rainbow Bee-eater and White-bellied Sea-eagle). These species are not listed as threatened species under the EPBC Act but are currently or were formerly listed as migratory species. The assessment confirms that a significant impact is unlikely to occur for these species from the Project.

Biosis (2019a) also confirms that the Biodiversity Offset Strategy would satisfy Tier 1 requirements (improve or maintain) for all vegetation communities that would be disturbed.

Hanson has also committed to develop a Threatened Species Management Plan as part of the Biodiversity and Rehabilitation Management Plan that will include the aforementioned species (see Section 6 – Statement of Commitments).

5.5 BLASTING AND VIBRATION

5.5.1 Introduction

A Blast Impact Assessment was included as Appendix 10 of the EIS. Following review of the submissions, Hanson commissioned Vipac to update the assessment to reflect revised distance estimates between privately-owned residences and the extraction activities. An Updated Blast Impact Assessment (Vipac, 2018b) is presented as **Appendix 9** and the outcomes of this assessment summarised in Section 4.6.

This subsection addresses blasting-specific comments and provides an overview of proposed blast management under the Project.

5.5.2 Blasting Hours of Operation

Representative Comment(s)

Blasting

The proponent needs to justify blasting from 8am or blast only from 9am.

Environment Protection Agency

Response

The operating hours for blasting activities have been adjusted to only occur between the hours of 9:00am and 5:00pm, consistent with the Environment Protection Licence for existing operations (EPL 1879) and the guideline *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZEC, 1990).

5.5.3 Blasting Frequency

Representative Comment(s)

Clarify the proposed frequency of blasting, as requested by EPA.

Department of Planning & Environment

In consideration of the fact that the annual throughput of the facility is proposed to increase and the footprint of the quarry will also increase, it appears unlikely that blast requirements will remain the same. Table 5.1.1 in the EIS indicates there will be an increase in blast frequency. The EPA requests the proponent clarify the proposed blast requirements and assess potential blast impacts on nearby sensitive receptors.

Environment Protection Agency

During the first ten years we lived on this property, blast events were less frequent and I believe Hanson under-reports the number blasts currently carried out. In the last 6 years, blasting has become almost a weekly event as demand for gravel has increased, and the apparent strength of blast forces has increased to the point where we have seen damage to brickwork, tiles and plaster not seen in the preceding 10 years. If they are to increase the output of the BHQ this will no doubt mean an increased frequency of blasting at the same level of as Hanson try to stay below the dB and wave propagation levels cited in their document.

Anne Kitchener of Seaham, NSW - Page 2-3

*There is also a statement in the EIS that blasting takes place "*approximately 20 to 25 times per year*" (P224). More recent experience is that blasts occur most weeks, more likely 40-45 times per year, sometimes with a significant impact felt, even indoors. The stronger blasts have noticeably shaken the entire house, rattling windows, doors and the contents of cupboards. While blasting was barely noticeable in the first ten years of residence (2000 to 2010), it has steadily increased in strength and frequency since then.*

David Kitchener of Seaham, NSW - Page 3

Response

Hanson would continue to operate in compliance with any conditions related to blasting, including any restrictions placed on blasting frequency within the development consent, Environment Protection License (EPL) or approved *Blast Management Plan*. A number of measures would also be taken by Hanson to mitigate any blast-related impacts as outlined in Table 4.3.1 of the EIS and detailed in responses 5.5.1 and 5.5.2.

It is proposed that blasting would be limited to no more than once per week, excluding any instances of misfire (52 blasts per year). However, in reality, the frequency would be lower. The size of blasting events is not predicted to change, however there would be an increase to blast frequency under the Project.

5.5.4 Predicted Blasting Impacts

Representative Comment(s)

The Blast Impact Assessment does not provide specific ground vibration and overpressure predictions at sensitive receptors. Blast impact predictions must be provided for sensitive receivers and consideration should be given to potentially affected infrastructure and livestock.

Department of Planning & Environment

We regularly experience the effects of blasting in the form of noise, and vibrations. There has been an increase in the awareness of these occurrences as evidenced by the vibrations of windows directly following blasting activities.

Carl Mackaway of Seaham, NSW – Page 1

By its nature BLASTING is earth-shattering, and LOUD, added to that the noise impacts from the CRUSHING PLANT will impact severely on the locals in this pastoral country area.

Patricia Betts of Brandy Hill, NSW – Page 1

Response

An Updated Blast Impact Assessment is provided in **Appendix 9** and the outcomes of the assessment are summarised in Section 4.6. In summary, it is concluded that blast-related overpressure and ground vibration would be likely to remain within criteria levels at a Maximum Instantaneous Charge (MIC) no greater than 175kg. However, this does not indicate that every blast would be of this size. Blasting events are technically designed and planned to account for local variations in geology (where known) and feedback from other blast events in a similar location.

Hanson acknowledges that the concept of blasting is challenging to the local community and that if unexpected, the noise from blasting can be unsettling. However, Hanson would endeavour to mitigate unexpected impacts from blasting activities as follows.

- Hanson would initiate a blast notification process under which the local community would be invited to register for blasting notifications. The community preference for SMS message, email or phone call would be recorded and the relevant stakeholders contacted 24 hours prior to any blast event.

- Blasting hours of operation would be limited to 9:00am to 5:00pm on Monday to Friday only.
- Blast Maximum Instantaneous Charge (MIC) would be limited to 175kg in accordance with the outcomes of the Blast Impact Assessment (see Section 4.6).
- Blast design would be constantly reviewed based on the outcomes of each blast event including blast monitoring results.
- Blast monitoring would be undertaken for each blast at locations to the east and to the south of disturbance areas.

These measures would be presented in a Blast Management Plan for the Project.

5.5.5 Damage to Buildings

Representative Comment(s)

Cracks have appeared to my house. What I mean by that is since we have lived in this area, we have noticed cracks appearing in our brickwork, and in our cement verandah, in line with hearing significant blasting from the quarry.

Bronwyn White of Seaham, NSW – Page 2

I am now able to identify a number of areas of damage to my home which have only occurred in that latter period as blasting has increased.

David Kitchener of Seaham, NSW – Page 3

Response

Hanson takes concerns about possible building damage seriously and encourages local residents with such concerns to contact the Quarry directly. As described in Section 5.5.4, blasting events are specifically designed to ensure that impacts are avoided. Blast monitoring is continually fed back to the design process to ensure that impacts are not occurring.

As a result, and without professional examination and assessment of these properties, it is expected that these cracks have not been caused by blasting at the Quarry. However, Hanson would be comfortable to initiate an investigation of structural impacts at specific properties if residents remain concerned.

5.5.6 Heavy Vehicle Vibration

Representative Comment(s)

No assessment has been made of vibrations currently experienced due to quarry traffic; nor has any analysis been carried out on the vibration impact of increasing the quantity of off-site traffic. Vibrations are only mentioned in the title of the report. We have felt vibrations from passing quarry vehicles regularly, and we suspect that those living in closer proximity to the quarries experience vibrations during on-site operation hours.

(Name withheld) of Raymond Terrace, NSW (200593) - Page 2

Response

While it is possible that residents experience vibration from passing heavy vehicles, it is considered unlikely that this vibration would be causing significant structural damage or other personal impacts other than nuisance to some people. Passing traffic is experienced regularly in the vicinity of the Quarry and it should be noted that Hanson is not the only contributor to heavy vehicle traffic (nor are Hanson vehicles the largest on the road).

5.6 BUSH FIRE MANAGEMENT

5.6.1 Introduction

The submission provided by the NSW Rural Fire Service included a range of recommended measures to ensure that the ongoing operation continues to manage and reduce bushfire risk. It is noted that existing operations incorporate bushfire risk management in a comprehensive Emergency Management Plan for the operation. This document is continually reviewed and updated by Hanson to reflect industry standards and the requirements of Port Stephens Council.

The following subsection responds to the comments in the submission provided by the NSW Rural Fire Service.

5.6.2 Bush Fire Protection

5.6.2.1 Representative Comment(s)

1. *The proposal should comply with the relevant provisions of Planning for Bush Fire Protection 2006.*
2. *Works which may lead to ignition of bushfire hazards e.g. blasting or refuelling of equipment, should only be undertaken on Total Fire Ban (TOBAN) days following consultation with, and approval from (where required), the NSW RFS District Office.*
3. *Any proposed vegetation remediation should be done in such a way as to ensure it will not result in an increased bush fire management and maintenance risk to adjoining land holders.*

NSW Rural Fire Service

Response

Hanson takes bushfire safety and prevention very seriously and notes that the existing operation is managed to comply with the relevant provisions of *Planning for Bush Fire Protection 2006*. Hanson's commitments would be formalised in a *Bushfire Management Plan* that would be incorporated in the Emergency Management Plan for the Quarry.

The objectives of RFS (2006) are to:

- afford occupants of any building adequate protection from exposure to a bush fire;
- provide for a defendable space to be located around buildings;

- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- ensure that safe operational access and egress for emergency service personnel and residents is available;
- provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the Asset Protection Zone (APZ); and
- ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush firefighting).

The bushfire prone land mapping prepared by the Port Stephens Council in June 2009, recognises the existing Quarry as an area not prone to bushfire, however it is noted that the vegetation immediately in the vicinity of the Quarry and the general local area may be a bushfire risk. It should be noted that there are no planned upgrades to access that would trigger requirements for that access to provide for bush firefighting, however internal access tracks that are progressively developed would provide adequate space for fire fighting vehicles. In addition, emergency evacuation procedures would be described in the Emergency Management Plan for the Quarry.

The Bushfire Management Plan would include an assessment of bush fire hazard (also referred to as the bush fire attack category) in accordance with Appendix 3 of RFS (2006). This would determine the relevant asset protection zones for site infrastructure as it is developed.

Specific controls for protection from bushfires and to ensure safe operational access were described in Section 5.15.5 of the EIS and would include the following.

- Maintenance of vegetation to reduce fuel loads within the operational areas of the Quarry and in the vicinity of site infrastructure.
- Maintenance of an asset protection zone in accordance with the assessment of bush fire hazard.
- Ensuring that mobile equipment is regularly maintained and inspected and avoids unnecessary access of vegetated areas where there may be a risk of igniting a fire.
- Ongoing provision of access to strategic areas on the site and water for firefighting.
- Stockpiling of cleared vegetation with a minimum 10m cleared buffer zone.
- Creation and maintenance of fire breaks in strategic locations for access and infrastructure.

Hanson would consult with RFS should blasting events be planned for days that are designated as Total Fire Ban days, however, notes that regular operational activities, that include refuelling vehicles, would continue as these would be mitigated on an ongoing basis.

Finally, Hanson would be comfortable to consult with the RFS with regards to how vegetation remediation can be undertaken to reduce bushfire risk, however, notes that revegetation activities within the proposed extraction areas and on amenity barriers is unlikely to result in direct threats to neighbouring properties.

5.7 CONCRETE RECYCLING

5.7.1 Introduction

During planning for the Project, Hanson identified that concrete recycling, involving the import of concrete material and subsequent recycling of this material for use in road base products, was likely to be an important aspect of ongoing operation of the Quarry and would provide a beneficial use for mainly washout material from Hanson's concrete batching operations. Due to the time taken to seek approval for the operation, this activity has been included in planning and assessment from Stage 1 of operations.

The EPA submission requested more information on this process which is provided in this subsection as well as a response to community concerns regarding this process.

5.7.2 Concrete Recycling Management

Representative Comment(s)

Further detail in relation to the following aspects will assist assessment of the proposal and development of recommended conditions of approval:

- *the location and procedure for storing concrete waste;*
- *details of the recycling process;*
- *assessment of the risks to human health and the environment; and*
- *details of appropriate control measures proposed (e.g. liquid waste generated by storing and processing concrete washout will be different to storage and processing of solid concrete waste).*

Environment Protection Agency

Response

Recycling of concrete material would occur on site with up to 20,000 tonnes annually recycled. Concrete recycling material would consist of processing unused concrete material and concrete plant hardened washout material. This recycled concrete product would be used primarily in road base products to reduce the amount of raw materials used making this product and reduce landfill waste. The proposed location of the concrete recycling plant within the Quarry expansion is shown in **Figure 5** to **Figure 7**. The concrete recycling plant would require separate areas for flexible unloading, processing, storage and despatch. Concrete washout material would be brought back by trucks returning from concrete plants on the return leg after delivering Quarry products into the plants. Trucks with incoming loads would enter through the single entrance/exit driveway off Clarence Town Road, proceed to the weighbridge and initial load inspection point, and then enter the internal road network. Within the Quarry Site, the incoming trucks would proceed as directed to the secondary load inspection point, and then to the correct drop-off stockpile.

The equipment that would be utilised in concrete recycling includes a single front end loader for loading and stockpiling and a mobile crushing system. On occasion, a hydraulic excavator may be used for stockpile management.

Hardened returned concrete can be handled and stored with little risk of contaminated water runoff. Materials would be temporarily stockpiled as raw feed and would be processed as required. The plant would crush the hardened concrete material to make an aggregate product which would be stockpiled until a suitable quantity is available. Processing may consist of simple blending, crushing and screening, stabilisation or a combination of all processes, depending on raw feed characteristics and the desired product specification. Various product stockpiles would be formed, from which materials would be despatched.

Incoming waste volumes would vary over the short and long term, as does product demand. To operate efficiently, the available recycling storage area must maintain maximum flexibility to store and process raw feed, and to store and despatch products. Stockpiles would not be located within five meters of hazard areas, including likely areas of high velocity water flows such as waterways, paved areas and driveways.

Liquid wash out is an unavoidable by-product of concrete batching and is classified as a liquid waste material. Due to this classification and transportation issues surrounding the transport of liquid washout material, only solid material would be transported to the Quarry (unless it is returned to the concrete batching plant once this component is constructed). Solid wash out is pre-classified as General Solid Waste (non-putrescible) under the EPA's Waste Classification Guidelines. Solid wash out does not require a licensed transporter and does not need to be tracked. However, solid washout material can only be transported and stored at a licensed facility. This would require a variation to the EPL 1879 for the Quarry.

Currently, the processing and storage of concrete washout materials at Hanson's concrete facilities includes the following.

- Washout pits (storage areas) specially designed for trucks to washout residual concrete. The pits capture the washout and provide a mechanism for progressive drying of the material for subsequent transport to an off-site recycling facility for use on recycling aggregates and road base materials.
- Concrete reclaimers recover aggregate and sand from unused concrete that has been returned to the plant. This recovered sand and aggregate is then reused in concrete product.
- A plate filter press filters the cementitious particles from the slurry water that is produced by the concrete reclaimer. This process produces high pH water which is utilised in concrete production and solid cement "cakes" that are disposed of in landfill.

Recovered aggregates are the final product of concrete recycling material and are subject to a general exemption issued by the NSW EPA. Under these exemptions recovered aggregates and fines can be applied to land for road making activities, building, landscaping and construction works, without the need to acquire an environmental protection licence. Some returned concrete and washout pit material is unsuitable to process through the concrete reclaimer and would be crushed at an offsite facility for future reuse. The quantity treated by this method is minimal.

It is therefore considered beneficial to recycle washout material at the Quarry from where it can be directly incorporated into products.

Risks to human health and the environment are considered minor and are well understood from existing recycling at Hanson's concrete batching plants. Use of a mobile crusher has been considered in predictive dispersion modelling that concluded that dust impacts would not be a significant constraint to operations. Any risks to human health are operational (that is, they relate to potential for fine dust to be inhaled in close proximity to its generation) and would continue to be managed at the Quarry in accordance with workplace health and safety standards. There is minimal risk of dust pollution or pollution of local watercourses from this process.

5.7.3 Asbestos Contamination

Representative Comment(s)

We are aware of a major Civil Construction company in the Newcastle area, which has advised its staff not to purchase crushed recycled concrete due to the risk of Asbestos being contained within this product. As it is intended that this plant is to be used to recycle concrete we have major concerns re -Asbestos and other contaminates being released into to air and health effects of exposure to Asbestos and dust for our community. So, what guarantees does our community have that this plant won't be crushing concrete containing asbestos.

Robert Palmer of Seaham, NSW – Page 2

Response

Hanson is not aware of these issues in its experience. However, it is proposed to only import concrete washout material or hardened concrete from Hanson or associated concrete batching plants. Older construction concrete sourced from demolition works that may contain asbestos would not be imported to the Quarry.

5.8 CUMULATIVE IMPACTS

5.8.1 Introduction

An assessment of the potential interaction of Quarry operations with other nearby extractive industry operations was presented in Section 5.2 of the EIS. An interaction score was generated for each operation. It is worth noting that interaction with other operations would generally be low and relate specifically to traffic impacts and the social impact associated with employment and economic impacts in the local area.

Cumulative traffic impacts are addressed in Section 5.21.12 to address concerns raised regarding the cumulative impact of traffic associated with the proposed Martins Creek Extension Project. It should be noted that due to constraints on operations at the Martins Creek Quarry, Daracon has indicated that it would cease using the route via Brandy Hill Drive for its transportation operations. This would reduce potential conflict with vehicles from the Quarry and the likely cumulative impacts of both operations.

5.8.2 Interaction Assessment Scores

Representative Comment(s)

Section 5.2 - Calculation of the total impact for Eagleton Quarry is considered to be incorrect and should be 5. This would push it into the "Low Interaction" category rather than "No impact" (Value 4).

Department of Planning & Environment

Response

Hanson notes the calculation error in determining the interaction with the Eagleton Quarry presented in Section 5.2 of the EIS. The interaction score for this operation should be a five, reflecting a low level of interaction between the proposed ongoing operations and the proposed Eagleton Quarry. It should be noted that the development application for this operation is yet to be determined.

Hanson reiterates the conclusion from the assessment of potential interactions with other relevant existing and proposed extractive industry developments presented in Section 5.2 of the EIS that the expected interaction between the Brandy Hill Quarry and other relevant operations would be either low or involve no interaction. **Table 32** summarises the results of this assessment.

Table 32
Summary of the Assessment of Potential Interaction Between the Brandy Hill Quarry and Other Relevant Extractive Industries

Operation	Score	Interaction Level
Bobs Farm Quarry	2	No interaction
Proposed Eagleton Quarry	5	Low interaction (traffic and social impacts)
Salt Ash Quarry	1	No interaction
Mackas Sand Project	3	No interaction
Tanilba North Quarry	1	No interaction
Fullerton Cove Sand Quarry	3	No interaction
Boral Windblown Sand Extraction	2	No interaction
Cabbage Tree Road Sand Quarry	2	No interaction
Martin's Creek Quarry (Proposed Extension)	6	Low interaction (traffic and social impacts)
Boral Seaham Quarry	4	No impact (potential impact from traffic interaction is considered limited due to the small size of this operation).
Karuah Quarry	4	No impact (potential impacts from traffic interaction is limited to occasional interaction at local delivery locations).
Source: EIS Section 5.2		

The methodology for assessing relative interaction is provided in Section 5.2 of the EIS. The following presents a brief summary of the conclusions of this assessment.

- There would be no interaction with the majority of extractive industry operations due to the distance of the Brandy Hill Quarry from these locations.

- There are no interactions that contribute to cumulative impacts relating to water resources, noise or air quality and there would be no impacts from the Brandy Hill Quarry that would exacerbate biodiversity impacts, increase hazards or limit waste management or rehabilitation at these operations.
- Potential interactions relating to transport operations would result where operations use the same route as the Quarry or where the same intersections are accessed. For the majority of other operations, potential interactions through transport operations would result from local deliveries to the same areas and would be consistent with general traffic interactions (that is, the interactions would be consistent with day-to-day interactions. Cumulative traffic impacts that may result from interaction of the Quarry operations and the Martins Creek Quarry activities are addressed in Section 5.21.12.

5.9 ECONOMIC IMPACTS

5.9.1 Introduction

A detailed Socio-Economic Assessment was provided as Appendix 17 of the EIS. The economic benefits and impacts of the Project relate principally to the provision of employment and local spending, the contribution of the Quarry to cost-efficient infrastructure, road and residential development as well as the potential for the Project to impact property values.

5.9.2 Economic Benefits

5.9.2.1 Representative Comment(s)

The Socio-Economic Impact Assessment notes the estimated cost for the quarry expansion as $15 million, hence a discrepancy between EIS and Socio-Economic Impact Assessment for capital investment value (CIV), i.e. $22.5 million v $15 million. The following economic characteristics of the development have been derived from the capital investment value (CIV) of $22.5M.

- *The corresponding creation of direct jobs is estimated at 43 jobs. From this direct expansion in the economy, flow-on industrial effects in terms of local purchases of goods and services are anticipated, and it is estimated that these indirect impacts would result in the gain of a further 42 jobs.*
- *It is estimated that direct wages and salaries would increase by $3.576 million. From this direct expansion in the economy, flow-on industrial effects in terms of local purchases of goods and services are anticipated, and it is estimated that these indirect impacts would result in the gain of a further 42 jobs and a further increase in wages and salaries of $3.502 million.*
- *The EIS suggests the operation would have considerable economic benefit related to securing the supply of construction materials to the Sydney market transcending into local expenditure and employment opportunities, with the project servicing markets in the Hunter, Central Coast and Newcastle.*

The Hunter Regional Plan 2036, does identify an additional 70,000 dwellings needed by 2036 and an additional 60,000 jobs. Building and infrastructure associated with growth predictions in these areas can generate demand for the materials proposed, and it is recognised that the quarry is in a strategic location when considering its proximity to the Sydney market and would assist in the provision of construction materials to enable infrastructure development.

Port Stephens Council

Response

Port Stephens Council submission acknowledges not only the significant employment and economic benefits of the Project but also the benefits to the local government area, Maitland, Newcastle and Greater Sydney Region from the provision of construction materials from a location that is relatively close to major arterial roads.

Unfortunately, Hanson cannot dictate where the resources, required to develop the local infrastructure, roads and residential development that the community relies upon is located. The cost-efficient provision of construction materials relies upon access to the resource (the Quarry) and ongoing transportation efficiency.

The Project proposes extension of an existing site with existing infrastructure in place to access and process the raw materials for delivery. Should the Project not proceed, Hanson would potentially need to look further afield for a suitable resource which may require an undeveloped 'greenfield' area to be established. This location may be further from Port Stephens or Newcastle and as a result, the cost of supply of this material would increase, not to mention the factored cost of developing a new operation. There are very few extractive material sources remaining in the Greater Sydney Region and those that remain are sand quarries. Therefore, the classification of the Project as a State Significant Development recognises the importance of the Project not only to the local area but other areas within the State of NSW.

Road congestion is experienced by most road users, but is particularly important for Quarry-product delivery. Heavy vehicles idling in traffic are using diesel and time, reducing the efficiency of operations through employee efficiency and increased consumable and maintenance requirements for vehicles. In addition, these vehicles result in additional greenhouse gas pollution. It is therefore vital that the approved operation of the Quarry include flexibility for efficient transportation. The occasional (20 times per year) late night product delivery is considered just one solution to remove trucks from busy roads during peak periods.

5.9.3 Employment

Representative Comment(s)

I support the application and look forward to the increased number of jobs in the area.

Delta 5 Land Pty Ltd of Seaham, NSW – Page 1

The Quarry has been a mainstay of the community for several years. I understand the Quarry currently has a positive record in regards to community complaints. Indeed, Brandy Hill would not exist if it was not for the Quarry.

The significance of this extension should be considered a positive move by Hanson (the Company) - that they are willing to invest further in our region to bring jobs, stability and deliver additional product to the market, where needed.

Andrew Nicholas of Brandy Hill, NSW

The proposal represents significant employment opportunities for people locally as well as providing economical building materials for regional construction projects.

(Name withheld) of Granville, NSW (195812)

Support this project. Good for ongoing local employment and supporting of regional industry.

(Name withheld) of St Ives, NSW (195633)

Response

These submissions follow the Port Stephens Council comments regarding the employment benefits of the Project. It is noted that the majority of the local community recognise these benefits. Consultation with local community indicates that there is general support for a Quarry in the current location, however concern remains regarding the environmental management and impact of any operation.

5.9.4 Tourism

Representative Comment(s)

Paterson, Martins Creek, Bolwarra Heights and Lorn are all small settlements frequented by tourists and cyclists. They are not only significant in their own right, but are also on the route to Barrington Tops. Their reputation as places of safe recreation is currently being ruined / is at risk to be further ruined by noise, dust and truck movements associated with the quarry.

Darryl Hetherington of Bolwarra Heights, NSW – Page 2

Tourism and its economic benefits will also be affected as roads dominated by B double trucks not lend themselves to scenic driving.

(Name withheld) of Brandy Hill, NSW (200205) – Page 1

Response

Submissions concerning potential impacts to tourism are noted. However, the Quarry is close enough to larger centres of Maitland and Raymond Terrace (both areas that are of higher density than the scenic areas referred to) that tourists embarking on a scenic drive would not be likely to be adversely impacted by heavy vehicles on the short drive between these locations and Quarry.

Cyclists and pedestrians are considered in the Drivers Code of Conduct which provides drivers with guidance on maintaining safety for these road users.

It is noted that Hanson propose a limit to hourly laden truck despatch of 30 trucks per hour and would avoid truck convoying through transport planning. A limit of 30 laden trucks per hour is consistent with the peaks under existing operations and therefore it is not expected that the frequency of trucks during peak periods would change.

Clarence Town Road and Seaham Road are important arterial connections to regional areas. While these roads are used by tourists, they are more frequently used for freight activities or commuters, activities which are consistent with the Quarry operation.

Finally, it is important to recognise that the ability to attract tourists relies on a flourishing local community. It is anticipated that the continued and growing support for the local community through local jobs and local spending would assist to ensure the viability of local attractions.

5.9.5 Property Values

Representative Comment(s)

The site is surrounded by undeveloped bushland and agricultural land with the town of Seaham approximately 3km east. The quarry is situated in a rural, residential, and environmental zoned land use area. From an economic perspective there may be potential economic impacts on surrounding land and its value associated with the development given the proximity of the development to:

- *the township of Seaham - potentially having a negative impact on business and consumers considering purchasing land/residential properties in the area;*
- *the impact of truck movements on the local economy in terms of safety, access, and co-location with other activity in the area; and*
- *economic cost post-operation in terms of land integrity and value.*

Port Stephens Council

The proposal will have an economic impact on those owning residential properties, rural or urban, along the designated off-site traffic routes.

a. Decreased property values may be experienced by owners. We have invested time and money in our home with various maintenance projects over the past 10 years and had intended to invest further. Now, we worry that despite these investments the value will decline with proposed increased impacts of quarry traffic.

b. Increased difficulty in selling properties may well be expected.

(Name withheld) of Raymond Terrace, NSW (200593) – Page 1

The devastating impact these areas of concern will have upon housing prices in the immediate vicinity and beyond is devastating. It is commonsense [sic] *to think that any prospective buyer couldn't get back in their car quick enough if they witness such problems as Trucks, Dust storms, blasting or noise firsthand. Why should residents have their right to a fair price for their property removed and for what corporate profit?*

Darren Gilmour of Seaham, NSW – Page 3

Brandy Hill is an high end residential area with large blocks sold as quiet residential living areas and as such attract higher price per block, most a million plus. With this operation the blocks are worthless.

Geoffrey Pettett of Wingham, NSW – Page 1

I'm concerned of the devaluation of our houses if this expansion is approved. Brandy hill is a community that people like to live in, we all accept the current status of the quarry, however, if this expansion is approved then our house prices will be adversely affected. Brandy hill has always maintained strong capital growth and we would envisage that it would remain this way. However, many articles and studies show that when the traffic increases, the house values drop, and people often will not buy a house that is effected by traffic noise.

Kim Streat of Brandy Hill, NSW – Page 3

As our age necessitates, we have been considering a move to retirement/assisted living in the coming years. However, should this development application be approved, the certain devaluation of our property will make this financially difficult.

(Name withheld) of Brandy Hill, NSW (196895)

Response

The real or perceived potential for the Project to impact local property values is acknowledged and its noted that particular care has been taken to avoid local amenity impacts associated with noise, dust and views of Quarry operations. The concern of residents regarding heavy vehicles on local roads is also noted and Hanson has reviewed and modified the Project to address these concerns. Any impact to property values in the area would be reflective of the total external cost of the Project. That is, the sum of all environmental impacts would be reflected in the attractiveness of the area to potential buyers.

Consultation with local real estate agents and review of house prices in the area indicates a positive upward trend, especially with professional people with older families. The area is also attractive to retirees which is evident in an ageing population. There is no indication that the existing operation of the Quarry has negatively impacted property value.

It has generally been Hanson's experience that concerns regarding property values do not eventuate. This has been the case for the Bass Point Quarry in Shellharbour where a thriving suburb has developed around a quarry and there has been a continued upward trend in house values. This is not to suggest that the local community does not, on occasion, complain about operational noise or dust and heavy vehicle operations. However, as is proposed for the Project, Hanson records all complaints, investigates the issues raised and responds to complainants.

Hanson is confident that amenity impacts would be managed through design and operational controls and ongoing management (that would be specified in conditions of consent). However, it is noted that particular attention would be placed on the management of transport activities so that the perceived fears of the community are not experienced and the community continues to develop.

5.9.6 General Economic Impacts

Representative Comment(s)

c. Increased electricity expenses will, and currently are, experienced by residents along the off-site traffic routes during operating hours of the quarries as doors and windows must remain closed preventing cross ventilation and requiring the use of air conditioners. Our home is over 100 years old and positioned to take advantage of breezes from any direction throughout the

year. During discussions with neighbours we found that we frequently have electricity bills well under half of the neighbourhood average. Should the proposal be approved this will no doubt impact on our ability to access those breezes.

d. Increased maintenance expense will be incurred, both financial and personal time, as the dirt and diesel emissions further increase on paintwork and outdoor living spaces. This has already been noted with the water use restrictions and increase in quarry traffic over the past 3 or 4 years.

e. Homes along the routes may require the installation of soundproofing and double glazing due to the intrusive and offensive noise levels.

Will residents be compensated for any of these additional costs and expenses?

(Name withheld) of Raymond Terrace, NSW (200593) – Page 1

Response

It is difficult to address concerns about access to breezes given that the Quarry would not block any breezes and would not necessitate the shutting of windows as dust dispersion is predicted to remain consistent with existing impacts and noise levels would remain below noise levels considered to be intrusive. This is directly relevant to concerns about increased electricity (assumed to relate to the need to air condition homes), cleaning and maintenance of properties and the need for sound proofing.

It is noted that the rights of landowners with regards to negotiated mitigation or property acquisition are described in the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2018). The provisions of this policy are addressed in Section 5.3.6 and Section 5.15.5 and conclude that this policy is not triggered under the Project.

5.10 GROUNDWATER

5.10.1 Private Bore GW078135

Representative Comment(s)

"The Groundwater Impact Assessment concludes that further works are required to determine measures to ensure long-term bore viability of GW078135 will not be affected or to assess necessary 'make good' provisions. This section also states that approval should be issued conditional to the applicant's commitment to ensure the ongoing yield of the bore is available to the licenced user or 'make good' provisions for any loss of bore yield.

Has this additional work been undertaken? Further information is sought regarding the proposed measures to ensure the long-term viability of this bore or Hanson's proposed make good provisions for the period of impact. "

Department of Planning and Environment

Response

Hanson has consulted with the landowner regarding the use of bore GW078135. This bore is no longer in use and has been left open (see **Plate 3**). The landowner has not used the bore since purchasing the property 10+ years ago. It appears that the bore was historically used to fill a dam on the property, but this is no longer required.

Plate 3 Condition of Groundwater Monitoring Bore GW078135 (Photo dated 14 March 2019)

The comments in the Groundwater Assessment refer to works that would be undertaken during preparation of a *Water Management Plan* for the development. In addition, the submission prepared by the Department of Primary Industries that refers to uncertainties with the hydrogeological report that should be addressed during the development of a *Water Management Plan*. The implication of this response from the Department of Primary Industries is that these uncertainties should not limit approval of the Project but that assessment should be refined in a *Water Management Plan*. The Department of Primary Industries submission supports the inclusion of additional monitoring bores to monitor potential drawdown impacts at privately-owned bores. Data collected in these bores would be the primary source of information on actual drawdown and ongoing changes to the groundwater setting.

Given the bore is not used and has fallen into disrepair, impacts from drawdown at this location are unlikely to impact water use at this property. However, during the preparation of the *Water Management Plan* for the development, Hanson would consult further with the landowner about monitoring and appropriate make-good provisions.

5.11 HAZARDOUS MATERIAL MANAGEMENT

5.11.1 Introduction

As a State significant extractive industry development, the Project would involve the storage of a range of hazardous substances. The risks associated hazardous material management are well understood from existing operations and Hanson's experience operating similar developments in NSW. Hazardous materials principally include hydrocarbons but also include oils and other chemicals used for equipment maintenance and Quarry management.

The following subsections present a response to issues raised by the EPA regarding hazardous material management.

5.11.2 Hydrocarbon Management

Representative Comment(s)

The following information is required to assist assessment of the proposal:

- *explanation of any likely contamination from hydrocarbon spills at the premises;*
- *classification of any likely waste from legacy contamination, including the pre-coat area; and*
- *details of proposed measures to manage any legacy contaminated waste prior to quarrying the area.*

Environment Protection Agency

Response

The Quarry is self-contained, with the natural flow of water gathering in on site dams which are isolated from all other water sources, including groundwater. To prevent discharge into the water system, all hazardous liquid materials including diesel, petroleum, emulsion and lubricants, are stored in bunded areas. These bunds are routinely inspected and are cleared after any major rain event so as to maintain efficient capture levels. The fuel depot and pre-coat storage area also has hard stands with a sump to catch any spillage that may occur while filling the tanks or mobile equipment. The maintenance workshop has a hard stand with oil and grease traps, and an oil/water separator. For diesel carried on mobile plant, fuel cart and delivery vehicles safety procedures are in place for minimising spill occurrence; including emergency shut off procedures and spill kit and mobile bunding procedures (Emergency Site Plan). All wastes are removed from site by an approved contractor.

If a spill was to occur, it would be managed as per the Brandy Hill Quarry Pollution Incident Response Management Plan and the Brandy Hill Quarry Emergency Site Plan.

The Pre-Coat Plant area undergoes regular maintenance with a general clean-up and visual inspection undertaken. There have been no reported spills or contamination from stored hydrocarbons at Brandy Hill Quarry.

Should contaminated materials be encountered during site earthworks, these materials are to be classified according to EPA NSW (2014) and disposed of to an off-site licenced waste management facility. Disposal of contaminated materials is to be determined by Quarry management and management method(s) should be determined irrespective of the volume of contaminated materials encountered.

5.11.3 Pesticide and Heavy Metal Storage

Representative Comment(s)

The Statement of Commitments (p318) makes reference to pesticide storage and heavy metal storage. The storage and use of all pesticides at the premises must comply with requirements under the Pesticide Act 1999 and Pesticide Regulation 2009. All chemical and fuel storage areas should meet best practice, including relevant bunding requirements.

Environment Protection Agency

Response

Weed management activities are undertaken on a six-month cycle principally involving weed spray control. Weed management contractors bring the required volumes of pesticide to the Quarry to complete the works. Approximately five litres of Glyphosate ("Roundup") is stored on-site for spot weed control undertaken by Quarry staff on an interim basis. It is noted that Clause 4 of the *Pesticides Regulation 2017* defines "Exempt domestic like use of pesticide" as follows.

> *4 Exempt domestic like use of pesticides*
>
> *The use of a pesticide by a person is an exempt domestic like use of pesticide for the purposes of this Regulation if the pesticide is, or is part of, a product that is widely available to the general public at retail outlets, is ordinarily used for domestic purposes (including home gardening), is being applied by hand or hand-held applicator and:*
>
> *(a) if the product is being used outdoors—no more than 20 litres or 20 kilograms of "ready-to-use" product or 5 litres or 5 kilograms of concentrated product is being used, or*
>
> *(b) if the product is being used indoors—no more than 5 litres or 5 kilograms of "ready-to-use" product or 1 litre or 1 kilogram of concentrated product is being used.*

Further to this, Clause 12 of the *Pesticides Regulation 2017* exempts domestic like use of pesticide from the need to hold a licence. As generally less than five litres of pesticide is stored at the Quarry at any one time and it is applied by hand by Quarry staff it is considered a domestic type use. The pesticide is stored in the workshop building within a bunded area.

Flammable and combustible chemical storage is undertaken generally in accordance with the Australian Standard *AS1940:2017 The storage and handling of flammable and combustible liquids* and includes the following.

- Diesel fuel is stored in an above ground self-bunded (double skinned) tank that has a safe fill capacity of 53 400 litres.
- Petroleum is stored within a 1 000 litre AdBlue pod container that is located within its own bunded stand.
- Pre-coat oil is stored in two 26 000 litre tanks with both tanks contained in a roofed concrete bunded area.
- All oils and greases within the workshop service bay are stored in bunded sheds and bunded oil storage tanks.
- Other chemicals such as paint, thinners, primers and glues are stored in small amounts in bunded areas within the workshop.

5.12 HISTORIC HERITAGE

5.12.1 Introduction

An Historic Heritage Assessment was prepared by Biosis and provided as Appendix 12B of the EIS. The assessment included a review of available records on the history of the local area and an archaeological field survey and review of the results of that survey. The assessment of heritage significance was based on consideration of historical, aesthetic, scientific and social values. It

was concluded that there are no listed historic heritage items within the Quarry Site and no items were identified through the assessment process. Historic use of the site was likely for grazing with minor cultivation, but no records remain of building or industry in the location. Biosis (2015) concluded that there were not likely to be impacts to objects of aesthetic significance or particular importance to particular groups. The assessment of significance concluded that the Quarry Site did not have heritage significance.

Representative Comment(s)

Whilst the EIS references that the subject site has no cultural or heritage significance, the proposed BHQ expansion encompasses a haulage route along Sea ham road which, will impact the existing characteristics of the small hamlet of Nelsons Plains.

Prior to early settlement, Nelson Plains was occupied by the Worimi Aboriginal people. The area consists of rich farmland and flood plains which are bound by the Williams and Hunter Rivers.

Land grants for Nelsons Plains date back to the early 1800's where farming, dairying and shipbuilding were the main economic drivers for the region.

Nelsons Plains is still an important farming hamlet of the Port Stephens LGA and the continuity of farming operations and the rural character of the area will be significantly impacted by the additional haulage movements along Seaham Road.

Donna Lidbury of Nelsons Plains, NSW - Page 7

Response

This submission relates to the heritage setting of the Quarry and the local area rather than specific sites or locations of heritage significance. The history of the local setting is noted, however it should also be recognised that the Quarry played a significant role in the suburb of Brandy Hill. Brandy Hill Drive was constructed for the Quarry and subsequent residential develop occurred along this route. It is therefore considered that the ongoing operation of the Quarry is entirely consistent with the history of the local area.

Visual amenity impacts of the Project would be limited as it is not considered likely that the operation would be visible from nearby vantage points. In addition, amenity issues such as noise, dust and water resource access would be managed under the Project mitigate potential local impacts. It is considered unlikely that the Quarry would impact surrounding agricultural land use or the rural character of the area.

5.13 HOURS OF OPERATION

5.13.1 Introduction

24-hour operations were proposed in the EIS for the Project in order to provide flexibility for material preparation and transportation operations to satisfy customer requirements. However, it is acknowledged that this was a key concern for the local community. Many in the community interpreted this as 24-hour operations at maximum production, which would not be the case. Assessment of operational noise and dust impacts was required to assess impacts at this level of production and this may have been misleading for some readers of the EIS.

Hanson has undertaken a review of planned operations to refine where 24-hour flexibility is necessary and where other operations may be modified to reduce night time operations. This subsection presents some of the submissions received regarding operating hours and presents a response and further justification for the proposed operating hours.

Representative Comment(s)

Further justification is required regarding the proposed hours of operation, particularly for use of the primary crusher and truck dispatch 24 hours per day. The Department understands that Hanson is seeking flexibility to meet last minute market demand. However, further information is required on the likelihood that 24 hour operations would be necessary or how often or intensively these may take place. Hourly maximums during each hour of the evening and night periods may be of assistance.

Department of Planning & Environment

The move to 24 hour operation is a significant concern to residents who have considered themselves to be accommodating neighbours to the existing quarry.

Residents are currently comforted that noise from the quarry is heavily limited in the evening which allows residents a level of amenity and minimises overnight disruptions to families.

Should 24 hour operations be approved it will have a substantial negative impact on surrounding residents and their quality of life.

Kate Washington MP, NSW Parliament of Raymond Terrace, NSW – Page 1

Increasing the hours of operation is not appropriate in a rural area. The current hours are business hours.

Graham Parr of Seaham, NSW – Page 1

The proposal of the quarry to operate 24 hours per day seven days a week is far too excessive given that it also means the truck movements would continue during these hours.

Ian Betts of Brandy Hill, NSW

Response

As described in Section 2.17 Hanson has reviewed the feedback concerning the proposed ongoing operating hours provided by the community through the CCC meetings, in public submissions and as expressed in the local community consultation undertaken by Key Insights and during Have-A-Chat meetings. However, it is noted that under the existing development consent, Development Application (DA) 1920, Hanson has the flexibility to operate 24 hours per day and it was not until the application to extend the Quarry and apply the same operating hours was proposed that the local community expressed these concerns to Hanson. It may be that the proposal to continue the existing flexible arrangements has resulted in the concerns expressed by the community, as many interpreted this as continual loud noise and trucks on the road. This will not be the case and it is likely that operations would continue in a similar manner to those occurring presently, albeit that the frequency of operations may increase due to the greater capacity of the Quarry under the Project.

Hanson has undertaken a comprehensive review of the proposed operations, likely demand and what this requires in terms of operating hours. The proposed operating hours are presented in **Table 33** and include the following amendments compared to the operating hours presented in the EIS.

- The EPA submission notes that the standard construction operating hours described in the Interim Construction Noise Guidelines (DECCW 2000) do not apply to construction for quarrying developments. However, in response to the feedback received, Hanson has amended the proposed operating hours for construction works to more standard hours as it has been determined that these operating hours would not constrain construction works.
- The proposed hours for blasting operations have been modified to 9:00am to 5:00pm Monday to Friday only in accordance with the existing Environment Protection Licence (EPL 1879) for the Quarry and the requirements of the Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990). Hanson has removed blasting activities on a Saturday (not required by EPL 1879 or ANZECC, 1990) in recognition of community concerns.
- Activities within the extraction area (load and haul) have been limited to the hours between 5:00am and 10:00pm. Hanson has concluded that these operating hours would not constrain its ability to maintain supply and note the benefit from removing night lighting requirements past 10:00pm in the extraction area.
- Hanson is conscious that the primary crusher is one of the more significant noise sources within the processing operations. Operating hours for the primary crusher have been reduced to a level that would not constrain processing operations and would provide a reduction in noise generated by processing activities.
- 24-hour activity on the local roads network was a key concern for the local community. Hanson originally proposed late-night product delivery in order to take trucks off the road network during peak periods, which would also improve the efficiency of operations. It has been recognised that this efficiency is not a necessity. However, in recognition of likely road construction / maintenance projects that will occur at night-time and require night-time delivery of material, Hanson proposes that night-time delivery be limited to service of these works. It is estimated that this would be required up to 20 times each year (which has been reflected in Table 33). Hanson would also provide seven day notice to interested community members to ensure this activity does not surprise residents. Maintenance works on busy roads such as the Pacific Highway occur at night to avoid traffic delays and Hanson wishes to retain the flexibility to be able to supply these Projects.

Table 33
Proposed Operating Hours

Activity	Day	Time
Construction Works	Monday – Friday	7:00am-6:00pm
	Saturday	7:00am-5:00pm
	Sunday and Public Holidays	None
Blasting	Monday – Friday	9:00am-5:00pm
	Saturday, Sunday and Public Holidays	None
Load and Haul	Monday – Saturday	5:00am-10:00pm
	Sunday and Public Holidays	None
Primary Crusher	Monday – Saturday	5:00am-10:00pm
	Sunday and Public Holidays	None
Secondary and Tertiary Crushing and Screening	Any day	24 Hours
Maintenance	Any day	24 Hours
Sales and Product Despatch	Monday to Sunday	5:00am-10:00pm
	Maximum of 20 nights per calendar year.	10:00pm-5:00am

Hanson proposes to retain the flexibility to operate extended hours for secondary crushing and screening activities and maintenance of equipment. The need to rely on flexible hours would depend on client demand, which determines:

- the volume of material required;
- when it is needed to be delivered; and
- the period for delivery (some clients need the full delivery at the start of their works and others require a continual feed of material).

As a result, it is difficult to estimate the intensity of operations throughout the day and therefore it is also not appropriate to provide an indication of intensity or frequency of night time operations. However, it is most likely that where these occur it will be for relatively short periods of time.

The following summarises the operations of the Quarry for which it is proposed that 24-hour operating flexibility be needed.

- Material for despatch is prepared through processing operations, which involves sizing material to meet client requirements. Given the large volumes often required, these activities need to be undertaken in advance of when delivery is due to occur. This element of the operation requires Quarry management to be adaptive due to the need to ensure that sufficient material is available to meet client needs, while maintaining the efficiency of staff time and ensuring there is sufficient downtime for maintenance.

  The need to ensure sufficient volumes of material are available to meet requirements, often at short notice, results in the need for flexibility for processing operations.

- Maintenance work is proposed to occur over 24-hours. This is a relatively standard operational requirement given that it may be necessary to repair equipment overnight so that it is operating again the following day. Maintenance procedures generate little noise or other disturbance for neighbours and therefore 24-hour maintenance is generally considered acceptable.
- Hanson is proposing occasional days (20 times per calendar year) during which 24-hour product despatch may occur. This would be required principally to supply late-night road maintenance project or clients with identified time constraints.

Night-time or 24-hour operations would not be a permanent feature of operations. However, where client demand requires additional hours, Hanson is able to arrange shifts to suit night time rosters. The additional shifts would only be arranged to meet demand.

The proposed operating hours are considered necessary and justified on the following basis.

- Hanson requires the flexibility to meet client demand with regards to ensuring that sufficient material has been sized to client requirements ready for despatch and to ensure that the delivery of material satisfies client requirements.
- The assessment of operational noise has confirmed that operational noise criteria would be satisfied during the morning shoulder, daytime, evening and night time periods. Additional assessment of operational noise has been undertaken by Vipac (2018a) and is discussed in Section 4.2. The results of additional assessments undertaken by Vipac are provided in **Appendix 7**.
- Vipac has also confirmed that Hanson would satisfy road traffic noise requirements as long as traffic levels are limited to the proposed levels (see **Appendix 7**).
- Hanson has committed to management of night time operations to limit possible light pollution through ensuring that lighting is directed downwards, away from vegetation and the selection of light bulbs that generate yellow light is given preference over bulbs generating blue/white light, where safety requirements are satisfied.
- Rosters for personnel would be arranged to ensure that staff are given the necessary breaks and that shifts are planned to ensure that fatigue is managed for any staff working night time shifts.
- The Drivers Code of Conduct incorporates specific measures for management of driver fatigue.

In summary, Hanson is proposing that ongoing operations retain some of the flexible arrangement regarding operating hours that has been implemented successfully for current operations. This would continue to provide the flexibility needed to satisfy client requirements and improve the efficiency of operations. Operations are unlikely to occur continuously over 24 hours each day and 7 days each week but would be driven by demand. It is expected that the local community would rarely notice night time operations or may only occasionally hear low levels of noise from the operation.

Representative Comment(s)

As we live directly underneath the air traffic approach path into Williamtown/Newcastle Airport, I think it is worthy to note that they have curfew times and strict noise regulations (particularly for civil aircraft) to operate in and out of the airport. The noise from the quarry trucks with the current operating regime is far more imposing than the noise from aircraft. Would you not find it somewhat hypocritical if the quarry were allowed to operate 24/7 when the local airport, (which would offer the opportunity to employ far more local residents), cannot?

Paul Kerkhof of Seaham, NSW

Response

This submission overlooks the fact that closure of the airport does not stop the delivery of passengers from occurring 24 hours a day, which is the source of noise for an air traffic corridor. The closure of airports is a logistical issue for the people working at the airports. Large airports around the world operate on a 24-hour basis. In addition, night time closure of airports is recognition that airports are most often located in densely populated areas and that as planes reduce their elevation to land, their noise impacts increase. By this logic, where noise impacts are not intrusive, the delivery activities should be permitted to continue. Hanson has assessed potential impacts from night time operations and transport activities and concluded that noise levels would remain below levels considered intrusive.

5.14 HUMAN HEALTH

5.14.1 Introduction

Health risks were not specifically considered in the EIS as the risk of health-related impacts is considered low. However, concerns raised regarding particulate matter concentrations and dust management, safety and sleep disturbance have been considered in this subsection.

5.14.2 General

Representative Comment(s)

Long and short-term exposure to $PM_{2.5}$ causes health effects including heart and lung diseases which may lead to premature death and increased hospital admissions. No threshold has been identified below which exposure to $PM_{2.5}$ is not associated with health effects. Therefore, the proponent should demonstrate that the mitigation measures implemented throughout their operation of the project will result in no increase in the net $PM_{2.5}$ to the air-shed impacting on the surrounding population.

Hunter New England Local Health District

The Project to double the output from the quarry and the EIS to justify this does nothing to address any of the Health and Safety issues which will impact the residents living in the vicinity. These include areas such as:

1. *Sleep deprivation,*
2. *Lack of walking opportunity,*

3. *Poor road conditions with high speed limits, inadequate shoulders and school bus stop bay, increased risk of accident and fatality due to an increase in heavy vehicle traffic,*
4. *Air Pollution due to dust and diesel particulates.*

Brandy Hill and Seaham Action Group – Page 14

I am concerned how this dust, its pollutants and potential toxicity might impact on my family's health. As our water is tank water, how can I be assured that these fine dust particles aren't going into my drinking water, or lying on my children's outdoor play equipment and potentially being digested?

(Name withheld) of Seaham, NSW (200599) – Page 1

Dust-related lung disease is now well recognised by medical professionals as a real and growing health concern, especially where humans are chronically exposed to fine particles.

David Kitchener of Seaham, NSW – Page 4

It is known around the world that the impacts from quarrying and also the processing of Concrete and Cement production, and recycling operations can have significant impact on human health.

- *the development of a child's brain,*
- *risk respiratory and cardiovascular disease,*
- *high blood pressure,*
- *Water Pollution,*
- *Non Hodgkinsons lymphoma,*
- *pancreatic problems,*
- *rashes, light headedness, gastric problems etc.*

[…] It is advised that people should live no closer than 8km's opposite to the way of the prevailing winds. Giles Rd residents live within 1,170 metres of BHQ, significantly closer than the 8km's recommended.

Bronwyn White of Seaham, NSW – Page 1

Response

Hanson has undertaken a comprehensive review of the Project and is confident with the conclusions of technical assessment that have been presented. The achievement of the relevant assessment criteria indicates the low risk of potential impacts to local health levels.

It is therefore considered unlikely that the perceived impacts described in these submissions would eventuate. Each of the matters raised are considered in more details as follows.

- Vipac (2018a) has considered potential sleep disturbance due to operations and due to road traffic noise, and concluded that operational sleep disturbance is not predicted to occur. Night-time despatch of products would only occur on a maximum of 20 nights per year. Community members would be given seven days' notice of this activity. Therefore, the risk of sleep disturbance due to night-time traffic has been reduced. For residences located close to the road, sleep disturbance may occur due to any heavy vehicle passing by (not just Hanson vehicles).

However, Hanson has been trialling a reduction to the speed of heavy vehicles (to no more than 60km/hr) on Brandy Hill Drive to improve road safety and road noise. A formal trial would be undertaken within 6 months of commencement under the Project. The ongoing implementation of the speed limit will depend on community feedback.

- Hanson is aware of the local community concerns regarding walking opportunities. However, it is noted that this is an existing issue and Port Stephens Council do not consider this infrastructure to be a high priority. Hanson is currently in negotiations with Port Stephens Council regarding a contribution to public infrastructure including a pathway on Brandy Hill Drive and bus bays along the transport route.
- Hanson has comprehensively reviewed the transport operations of the Project and taken steps to reduce road speed in the vicinity of the Quarry through proactive measures and lobbying of RMS to review the speed limits on Clarence Town Road. It is considered that by reducing the speed limits on local roads and continuing to implement the Drivers Code of Conduct, Hanson would be able to reduce the real and perceived risks to road safety associated with the Project.
- It is important to recognise and separate work place health risks from local health risks when considered dust and particulate matter dispersion. Health risks such as child development, pancreatic and other organ risks and most respiratory concerns are generally associated with constant exposure to high levels of fine particles. These risks are not generally experienced in the vicinity of extractive industry operations because the dust generation is not high enough or consistent enough to be the principal cause of health issues. The concerns of the Hunter New England Local Health District are noted, however the Air Quality Impact Assessment (TAS, 2019) has provided predictive modelling of dust dispersion and concluded that, due to the mitigation that has been proposed, air quality impacts would remain consistent with existing concentrations.

Representative Comment(s)

Health and wellbeing cannot be underestimated and minimum standards should not be considered 'good enough' in assessing this EIS. Hanson has not done enough to allay the fears local residents have with respect to the health and wellbeing of their children or, for that matter, for themselves.

Brandy Hill and Seaham Action Group – Page 16

Response

The Social Impact Assessment prepared by Key Insights (2018) highlights the implications of ineffective consultation with regards to the community acceptance of the outcomes of various technical assessments for the Project. Hanson notes that the key concerns expressed by the local community relate to potential noise impacts from those operations that occur over 24-hour and the proposed increase to traffic levels. It is noted that operations would not operate at maximum levels at all hours of the day and night. It is more likely operations would occur in peaks and troughs consistent with cycles of demand for large infrastructure projects. Therefore, it is considered that the noise impacts perceived by the local community would not eventuate. In addition, transport operations would be carefully managed to preserve local amenity, while providing Hanson with the flexibility to satisfy short term peak demand periods.

Through the proposed Community and Stakeholder Engagement Plan, Hanson hopes to 'do more' to allay the fears of the local community and to demonstrate that the environmental impacts experienced in the vicinity of the Quarry are consistent with predicted impacts or may be improved upon through environmental management.

5.14.3 Truck Noise and Human Health

Representative Comment(s)

In general, there should be consideration to the health and wellbeing of residents that reside along haulage routes associated with the quarry. As mentioned, these haulage routes need to be identified, and monitored through a Transport Management Plan to ensure that Council and residents have a say in relation to the impacts especially during peak periods of operation of the quarry or when there may be excessive combined effects of Martin's Creek Quarry and Brandy Hill Quarry operating at levels that may result in noise levels exceeded in government policy.

Maitland City Council

No information is provided in the EIS as to the potential impact of quarry traffic noise on public health - on the health of the residents of the communities through which the quarry traffic generated by this development will pass.

Voice of Wallalong and Woodville Inc. – Page 9

Response

At the outset it should be noted that the Quarry is located adjacent to Clarence Town Road and is in the vicinity of Seaham Road. Both of these roads are significant arterial roads connecting regional areas to the Pacific Motorway, Newcastle and Maitland. A review of existing noise levels by Vipac (2018a) confirmed that the local environment is relatively noisy and experienced traffic noise at levels above the relevant assessment criteria during the daytime period.

A review of the potential health effects of environmental noise is provided by the Federal Department of Health's Environmental Health Standing Committee in a document titled *The Health Effects of Environmental Noise (other than hearing loss)* (enHealth, 2004). Table 3 of this report presents a summary of recent review of noise levels below which health effects would not be expected. An extract from this table is presented in **Table 34**. It is noted that health effects are generally experienced from long term exposure of relatively high noise levels. This is not the case with road traffic noise that is intermittent in nature.

While it is difficult to directly compare **Table 34** to the outcomes of the road noise assessment, it is also relevant to consider advice from the Industrial Noise Policy on potential health impacts, which notes the following.

> *"…there is no single identifiable noise level that all people will find acceptable or unacceptable… In extreme cases health can be affected, but generally it appears that annoyance reactions can occur well before there is a question of any health impact."*

It is considered highly unlikely that intermittent road noise would result in health impacts and if this were to occur it would not be possible to isolate noise sources as being Quarry-related.

Table 34
Noise Levels and Health Outcomes

Health outcome	WHO 1999			Passchier-Vermeer 1993		
	Measure[3]	Value	In/out-doors	Measure	Value	In/out-doors
Annoyance[1]	$dBL_{Aeq16hr}$	50-55	Out	Lday-night	42	Out
	$dBL_{Aeq16hr}$	35	In	-	-	-
Hearing loss[2]	$dBL_{Aeq16hr}$	70	In	L_{Aeq24h}	70	In
School performance	$dBL_{Aeq16hr}$	50–55	Out	-	-	-
	$dBL_{Aeq16hr}$	35	In	-	-	-
Ischaemic heart disease	-	-	-	$L_{Aeq06–22h}$	65–70	Out
Hypertension	-	-	-	$L_{Aeq06–22h}$	70	Out
Sleep	$dBL_{Aeq16hr}$	30	In	-	-	-
	$dBL_{Aeq16hr}$	45	Out	-	-	-

Note 1: Speech intelligibility is often considered a component of annoyance.
Note 2: Noise levels below which hearing impairment would not be expected;
- Industrial, commercial shopping and traffic areas (in and outdoors) dBLAeq24hr 70
- Ceremonies, festivals and entertainment events (<5 times per year) dBLAeq4hr 100
- Public addresses, (in and outdoors) dBLAeq1hr 85
- Music and other sounds through headphones and earphones dBLAeq1hr 85

Note 3: The 16hr period in the rows above refers to the period 0600 to 2200 hours.

5.15 NOISE

5.15.1 Introduction

An assessment of operational, construction and road traffic noise was provided in the 2015 Noise and Vibration Impact Assessment prepared by Vipac and presented as Appendix 9 of the EIS. The inclusion of insect noise, industrial noise from a nearby chicken farm and uncertainty relating to noise contributions from the existing Quarry were cited in submissions regarding the background noise levels assumed for the assessment. Hanson commissioned Vipac to update the assessment based on a revised campaign of background noise monitoring and consideration of irregular noise sources. This resulted in revised Project Specific Noise Levels and updated predictive noise modelling. The outcomes of this assessment are presented in **Appendix 6** and summarised in Section 4.2 and Section 4.4. The following subsections should be reviewed in conjunction with Updated Noise Impact Assessment (Vipac, 2018a).

5.15.2 Background Noise Levels

Representative Comment(s)

Background Noise Level

The proponent needs to remeasure the background levels excluding noise from the existing development, or adjust the measured levels to account for the contribution from the existing development, or justify why no such adjustment is necessary, to the satisfaction of the EPA.

The EPA does not accept the rating background levels without further information.

Environment Protection Agency

Response

Background noise levels have been recorded by Vipac on three occasions to inform the assessment of operational and road traffic noise generation from the Project. Monitoring dates, locations and the purpose of the monitoring was as follows.

- September 2014 and October 2014 – Monitoring within the Quarry to measure the existing quarry operational noise for calibration with the operational noise prediction model. Monitoring at locations in the vicinity of the Quarry to measure existing background noise levels for operational and road traffic noise assessments.
- September 2014 and March 2015 – Monitoring at locations along Brandy Hill Drive at locations representative of the likely setback of residences from the road.
- March 2018 – Noise monitoring at locations previously monitored (where access was available) as well as new locations in the vicinity of the Quarry and on Brandy Hill Drive.

Long-term noise monitoring during March 2018 was undertaken at three representative locations in the vicinity of the Quarry to re-establish representative background noise levels at the closest residences and to filter out any cricket noise from the measurements. Vipac identified monitoring locations that would likely exclude extraneous noise (e.g. noise from chicken farm) and locations with minimal influence from the Quarry (i.e. noise shielding from residential structures). These long-term noise monitoring records have been relied upon to develop appropriate Project Specific Noise Levels for the updated assessment.

Insect noise is a feature of the local acoustic setting during the warmer months of the year. However, while noise from insects is present, it does not feature throughout the year. Vipac has reviewed the long-term noise monitoring results and filtered out insect noise based on frequency ranges (cricket noise frequency peaks in bands of 3.15kHz and 4kHz). This process is considered to provide background noise levels that are more representative of average background conditions in the vicinity of the Quarry. More information regarding the methodology used to filter out insect noise is available in Section 4.3 of Vipac (2018a). As a result, the monitoring results at N01, N03, N04 and N06 recorded in 2014 have been disregarded from the updated assessment. The long-term noise monitoring results at each of the monitoring locations used for assessment are presented graphically in Appendix B of Vipac (2018a) (see **Appendix 6**).

Noise monitoring of heavy vehicles passing by was conducted at two locations in March 2018 at locations that were 35m from Brandy Hill Drive and 16m from Seaham Road. These results were reviewed alongside previous monitoring at monitoring point N07 in March 2015. Monitoring point N07 is located at a non-residential location (33 Brandy Hill Drive), 30m from Brandy Hill Drive. The location was chosen to replicate the distance from the road of the closest residence (25 Brandy Hill Drive), which is approximately 30m from the road.

A summary of the results of monitoring, the updated Project Specific Noise Levels and the results of updated predictive noise modelling assessment has been presented in Section 4.2. It is noted that the background noise levels applied for the updated assessment were lower than those presented in the 2015 Noise and Vibration Impact Assessment and therefore Vipac adjusted the Project Specific Noise Levels applied for assessment. Hanson has worked with Vipac to develop a range of additional mitigating measures that have been applied for the updated noise modelling assessment. These measures are described in more detail in Section 4.2.3.

As described in Section 4.2.2, the updated noise modelling assessment has predicted that the proposed ongoing operations at the Quarry would generally comply with the relevant noise assessment criteria. This applies under all conditions, including worst-case scenario operational and climate conditions. It has been predicted that some residences along Clarence Town Road may experience noise levels above the Project Specific Noise Levels under worst-case conditions. However, the exceedances range from 1dB(A) to 2dB(A) and are considered a negligible impact as a change in noise level of 2dB is not perceptible to the average human ear. It is also noted that the noise level exceedances principally relate to heavy vehicle use of the Quarry Access Road (considered an operational noise source under the NSW Industrial Noise Policy (DECCW, 2000) (INP)). As the residences are located along Clarence Town Road, which is used as a heavy vehicle route 24 hours a day, noise would also be experienced from other traffic on the road network at these residences at noise levels consistent with noise generated by the Quarry transport operations and potentially higher than that generated by extraction and processing operations.

Representative Comment(s)

Hanson states their noise and vibration complies with criteria and is within guidelines, but this does not necessarily mean the impact is insignificant. Hanson's noise and vibration sensors are located between 1 and 4.3km from the quarry. Samples were taken on two days during September 2014. However, only one was located on Giles Road (at 1km) – N01. I reside further down Giles Road at 3km from the quarry and can feel the vibrations and hear constant crushing, machinery and vehicle noise from the quarry from as early as 6am. Due to topography, the N01 noise sensor is protected from the quarry site by Little Brandy Hill. Further down Giles Road can be more exposed, so is likely to receive more noise pollution.

(Name withheld) of Seaham, NSW (200184) – Page 1

Response

It should be noted that background noise monitoring is undertaken to gain an understanding of the existing environment in which the Project would operate. This monitoring is used to establish assessment criteria in accordance with the relevant guidelines (in this case the Industrial Noise Policy – see Section 4.2.2 for updated criteria). This monitoring is not used to gauge Quarry noise. It may be that this monitoring is being confused with attended compliance monitoring that is undertaken to specifically measure the Quarry contribution to the local noise setting (Section 1.6.5 describes the outcomes of compliance noise monitoring in April 2018).

It should also be noted that the assessment criteria is specifically aimed at preserving amenity and reducing intrusive noise. This is carefully defined in the guidelines and is not intended to reflect the absence of noise, but the noise at which amenity would be impacted or noise levels considered intrusive. It is accepted that amenity and intrusiveness are subjective measures, but the guidelines establish the means for a technical assessment and are based on thorough research. These guidelines form the basis for industrial development throughout NSW, from regional or rural extractive industry development to development in land zoned for heavy industry in the urban environment.

Representative Comment(s)

Appendix A of the NIA contains a series of figures that graphically illustrate the variation in Sound Pressure Levels (dBA) at each of these locations across a one week period. The data collected from N02 and N07 indicates a Sound Pressure Level ranges from a low of 35dBA to a

high in excess of 80dBA (80dBA appears to be the upper limit of the receptor.) Both receptors indicated day time levels ranging consistently above 60dBA, with receptor N07 consistently ranging above 60dBA from around 5.30am through to 11.00pm.

Brandy Hill and Seaham Action Group – Page 26

Response

Appendix B of the Updated Noise Impact Assessment presents the results of noise logging or monitoring undertaken to establish background noise levels and Project Specific Noise Levels relevant for the predictive modelling of noise levels under the Project. The results are presented as a time series display and represent the peaks (short term maximum noise levels) and troughs (when no noise sources are present). For the purpose of assessment of road traffic noise, the following noise parameters are considered.

- $L_{Aeq(15\text{-hour})}$ – The average noise level over the 15-hour period from 7:00am to 10:00pm considered to be representative of average day time noise levels.
- $L_{Aeq(9\text{-hour})}$ – The average noise level over the 9-hour period from 10:00pm to 7:00am considered to be representative of average night time noise levels.
- L_{AMAX} – The short-term maximum noise level which is the instantaneous noise level that may potentially cause sleep disturbance, but is generally experienced over a short period.

Each of these parameters is calculated from the noise monitoring results and presented in the assessment as either average noise levels for a given period or maximum short-term noise levels.

5.15.3 Noise Management and Mitigation

….the Department requests clarification and further information on the following matters:

a) a detailed discussion of measures that may be applied to minimise and mitigate noise emissions from both quarry operations and truck movements, as well as details of the proposed monitoring program;

Department of Planning & Environment

Response

It is anticipated that noise management and mitigation at the Quarry will be guided by a Noise Management Plan which would be submitted for approval to DPIE. The Noise Management Plan would be subject to ongoing review and update in accordance with the conditions of consent as well as being the subject of compliance auditing. The Noise Management Plan would describe the mitigation measures that would be implemented through a Noise Management System that incorporates both proactive and reactive management.

Proactive management measures are preventive actions taken by Hanson to reduce noise generated by the Quarry operations or to reduce the noise levels experienced at nearby residences. Management measures that may be implemented proactively (acknowledging that these need to be to the satisfaction of the Secretary of DPIE) include the following (summarised from Section 4.2.3 and Section 4.4.3).

- All operations would be undertaken in accordance with the approved hours of operation.

- All processing plant equipment would be enclosed to mitigate noise generated by this equipment. This includes the mobile crushing equipment that would be partially enclosed.
- An amenity barrier would be constructed to the south of the active disturbance areas to limit the propagation of noise to the south of the Quarry. The amenity barrier would be approximately 18m to 20m high once construction is completed (during Stage 1 of operations).
- Replacement or additional processing equipment would have the same or lower sound power levels as that assumed for the predictive modelling assessment.
- Stockpiles and ancillary equipment will be positioned to limit potential noise impacts.
- Ancillary equipment will also be enclosed, where feasible.
- Compliance with the maximum number of truck movements per day nominated in consent conditions.
- All drivers would be required to review and sign a Drivers Code of Conduct that directs driver behaviour during transportation activities. Issues addressed in the code of conduct would include limiting the use of compression braking unless required for safety reasons, using preferred transportation routes and limiting the use of local roads unless directed by emergency services.
- The internal road network would be maintained to reduce body noise from empty trucks.

In addition to the above, a noise monitoring program would be implemented in accordance with the approved Noise Management Plan (see Section 4.2.3 for more details).

Reactive management measures would be implemented as a result of a range of triggers established through a trigger response plan and essentially involve investigation of the action that triggered the investigation, resolution of the issue and reporting to relevant parties. The results of an investigation may also trigger a review of proactive noise management measures to ensure these continue to be effective and may necessitate an update to the Noise Management Plan, which would be subject to the approval of DPIE.

Representative Comment(s)

Noise Mitigation

The proponent needs to:

- *clarify whether the "screening bund" has been included in the noise modelling;*
- *demonstrate that all feasible and reasonable noise mitigation measures were included in the project's noise model; and*
- *identify whether there are any other feasible and reasonable noise mitigation measures that the proponent can implement.*

Environment Protection Agency

Response

Review of the updated assessment criteria based on the long term monitoring results identified that noise levels predicted in the 2015 Noise and Vibration Impact Assessment would not comply with the criteria. As a result, Hanson undertook a comprehensive review of the proposed operation to consider additional feasible and reasonable noise mitigation that could be applied through Quarry design, operational controls and other measures.

Section 7 of the Industrial Noise Policy (EPA, 2000) provides guidance on mitigation and management measures appropriate for particular types of development. Mitigation strategies are divided into the following three areas.

- Mitigating noise at the source – such as enclosing noisy equipment and operational controls and planning such as scheduling operations so that noisy equipment is not used concurrently.
- Mitigation of the noise transmission – such as noise barriers or strategically locating operations using existing landscape features such as natural topographic shielding.
- Mitigation at the noise receiver or where noise is experienced – such as insulation and double-glazing of windows.

Noise mitigation and management measures assumed in predictive noise modelling include the following.

- Construction operating hours have been modified to 7:00am to 6:00pm Monday to Friday and 7:00am to 5:00pm on Saturday only.
- Load and haul operations and the operation of the primary crusher have been limited to the hours between 5:00am and 10:00pm Monday to Saturday only.
- Enclosures are to be installed on all fixed processing equipment from the commencement of Stage 1 of operations. A mobile crusher to be used for concrete recycling would be partially enclosed.
- An earthen amenity barrier located to the south of the location for the relocated Processing and Stockpiling Area would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- Earthen amenity barriers of various lengths and heights would be temporarily constructed for each stage of operations and strategically located within the Processing and Stockpiling Area.
- An acoustic barrier would be constructed along the Quarry Access Road to mitigate noise generated by heavy vehicles on the Quarry Access Road.

A summary of all reasonable and feasible mitigation and management measures relating to noise management is provided in Section 4.2.3.

It is noted that noise mitigation at nearby residences is guided by the *Voluntary Land Acquisition and Mitigation Policy 2018*. The provisions of this policy are discussed in Section 4.5.2, however Hanson acknowledges that land owners in the vicinity of the Quarry may rely on this policy throughout the ongoing operations to request and negotiate noise mitigation or property

acquisition if noise levels consistently exceed the relevant criteria. Regardless, Hanson has not considered noise mitigation at residential properties as the result of the noise assessment indicate this is not warranted and it is assumed that mitigation such as double-glazing may be considered intrusive (seeing as it may require windows to remain closed).

5.15.4 Operational Noise Levels

Representative Comment(s)

HNEPH recommends that the proponent review their noise and blasting operations in consultation with the community to minimise the effect of any noise emissions.

Hunter New England Local Health District

Blasting, grinding and compression breaking are just some of the forms of noise pollution generated by the operation of Brandy Hill Quarry.

Any expansion of the operation of Brandy Hill Quarry will likely exacerbate the existing noise concerns of the neighbouring residents.

Should the expansion of the Brandy Hill Quarry be approved, residents have proposed a number of sensible changes to the operation to better control noise pollution, including the notification of neighbouring residents prior to any blasting activity and the limiting of machinery noise in the evening to minimise disruption to neighbours.

Kate Washington MP, NSW Parliament of Raymond Terrace, NSW – Page 1

The expansion to 24 hour 7 day operation must also be acknowledged as having a separate massive effect. The machinery already heard till late at night even on the smaller scale at present operating, will increase as the mine increases and the mine inches closer to residential housing. The creation of other operations within the mine such as a concrete plant can only also produce additional noise.

Darren Gilmour of Seaham, NSW – Page 2

Constant thumping/battering/vibration noise experienced at our property, 2.67km away from the quarry, until 12 midnight. This noise is from the plant operation.

Ian Docherty of Woodville, NSW – Page 1

If you can imagine the sound of a tin can full of rocks being shaken up and down at a steady constant rate – this is what the sound of the crusher is like. Currently we have to put up with this not only during the day but often well into the evening - sometimes up to 10:00PM (I'm not sure if their current licence allows this?). If the proposal goes ahead we will be constantly assaulted with this invasive noise pollution while trying to conduct our normal life activities – such as sleeping.

(Name withheld) of Seaham, NSW (200472) – Page 3

Response

Hanson has taken into consideration the concerns expressed by community members regarding the potential impacts of operational and blasting noise in reviewing the Project. The amended hours of operation are also presented in Section 2.17 and include reduced hours for load and haul and primary crushing operations. The use of other crushing and screening equipment would

continue as needed in order to satisfy demand from Hanson's clients. Hanson has revisited noise management and mitigation for the Project with a comprehensive overview of proposed noise mitigation described in Section 4.2.3 and Section 5.15.3. Some of this mitigation is able to be incorporated into predictive modelling whilst other mitigation measures would be more likely to reduce the risk of any exceedance. The noise management system that would be implemented through a Noise Management Plan would provide both proactive and reactive measures to manage potentially intrusive noise.

The Updated Noise Assessment (Vipac, 2018a) has demonstrated that noise levels predicted during worst case operating and climatic conditions would generally comply with the relevant assessment criteria relating to intrusive noise impacts. Noise levels at residences along Clarence Town Road may exceed the assessment criteria by 1dB(A) to 2dB(A) in the worst-case scenarios, however this exceedance is predicted to be at a noise level that is not perceptible to the average human ear and therefore considered to be a negligible impact.

Blast notification is a relatively standard practice in the extractive industry and Hanson encourages those interested in being notified of intended blasting to register their phone number or email address with the Quarry for this purpose. Blast management and mitigation would be described in a Blast Management Plan that would be prepared to guide blast operations and include notification measures, blast monitoring and the reporting of results.

Representative Comment(s)

….the Department requests clarification and further information on the following matters:

b) provide noise contour drawings to reflect all stages of the proposed development which also identify sensitive receivers and lot boundaries; and

Department of Planning & Environment

Response

Detailed contour maps, including lot boundaries are presented as **Figure 19** to **Figure 24** in Section 4.2.4 and as Appendix C of the Updated Noise Impact Assessment.

5.15.5 Vacant Land

Representative Comment(s)

….the Department requests clarification and further information on the following matters:

c) an assessment of impacts on vacant land considering the provisions of Voluntary Land Acquisition and Mitigation Policy (2014).

Department of Planning & Environment

Response

As described in Section 4.5.2 (regarding air quality), the rights of landowners in relation to the predicted impacts of State significant extractive industry development are described in the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) (NSW Government, 2018).

Vacant land has been addressed specifically in Section 7.1.3 of the Updated Noise Impact Assessment (Vipac, 2018a) in accordance with the VLAMP. In summary, Vipac (2018a) noted that the predicted 1dB to 2dB exceedance at a small number of receivers for some stage scenarios (and in worst case operating conditions) is considered negligible and as a result would not trigger mitigation or acquisition at any properties.

There is no vacant land that is closer to the Quarry than the noise sensitive prediction locations assessed and therefore impacts at these properties would also be negligible.

5.15.6 Construction Noise Levels

Representative Comment(s)

Construction Noise

If the project is approved EPA will likely apply noise licence limits derived from application of the Industrial Noise Policy that apply to "construction" activities as well as operational activities.

Environment Protection Agency

Response

This comment is noted and agreed by Hanson. Construction noise was assessed by Vipac (2018a) as separate scenarios that included the following (see Section 7.3 of Vipac (2018a) included as **Appendix 6**).

- Construction of the amenity barrier to the south of the Processing and Stockpiling Area during Stage 1 of operations.
- Construction activities in Stage 3 of operations to relocate the Processing and Stockpiling Area to the south of the existing operational area for commissioning at the commencement of Stage 4 of operations.

Noise levels during construction stages of the Project were generally consistent with operational noise levels. In fact, during the construction of the processing facilities for the relocated Processing and Stockpiling Area, noise levels would be lower than the worst-case Stage 3 operational noise levels due to equipment operating in the vicinity of the amenity barrier, providing mitigation for these activities.

5.15.7 Operational Sleep Disturbance

Representative Comment(s)

Sleep Disturbance

The proponent should provide an operational sleep disturbance assessment in accordance with the Industrial Noise Policy and associated Application Notes.

Environment Protection Agency

While I'm no expert on the effects of continuous noise I do know that sleep deprevation [sic] *is a form of torture and has severe health implications.*

(Name withheld) of Seaham, NSW (200472) – Page 3

If the quarry proceeds to 24hr operation, the residents will be subjected to sleep deprivation due to constant thumping/battering/vibration.

Ian Docherty of Woodville, NSW – Page 1

Request – Dated 1 February 2019

"The NIA has provided an assessment of sleep disturbance in accordance with the Noise Policy for Industry. Whilst the Department acknowledges the approach to assess noise impacts under the more contemporary policy, the implementation and transitional arrangements for the Noise Policy for Industry (2017) state:

Where application of the policy is triggered through the above circumstances and processes the policy is to be applied in full. The Noise Policy for Industry (2017) is designed to be used in its entirety and 'cherry picking' or 'mix and match' between the NSW Industrial Noise Policy (2000) and Noise Policy for Industry (2017) will not be accepted.

As the rest of the NIA has been undertaken in accordance with the INP, the Department requires operational sleep disturbance to be assessed in accordance with the INP Application notes."

Department of Planning and Environment

Response

The potential for operational sleep disturbance was assessed under both the *Industrial Noise Policy (2000)* and the *Noise Policy for Industry (2017)* with results described in Section 7.1.4 of Vipac (2018a) (**Appendix 6**) and as an addendum to the Noise Impact Assessment (**Appendix 7**). The outcomes are summarised in Section 4.3. In summary, review of operational sleep disturbance criteria indicates that sleep disturbance is unlikely to occur as a result of operational activities at the Quarry.

It should be noted that assessment of night time operational noise assumes peak production with equipment at exposed locations and operations occurring during adverse climate conditions. Therefore, the noise predictions are conservative in nature and not likely to reflect average operations.

It should also be noted that Hanson would investigate noise levels experienced at neighbouring properties through the complaints management processes. Hanson would modify evening and night time operations to ensure that they remain compliant, where the investigation determines there has been an exceedance.

5.15.8 Road Traffic Noise

Representative Comment(s)

Appendix 9 – Noise page 3 states "The predicted noise generated … on Brandy Hill Drive would comply provided …". Appendix 9 further states "The potential sleep disturbance impact from the overall level of road traffic generated noise, including potential traffic movements associated with the proposed Brandy Hill Quarry Expansion would be within the applicable criteria at the nearest noise sensitive receiver …". This does not take into consideration the off-site traffic that residences along the route will have to endure. Along Adelaide Street, where no noise sensitive receivers were placed, many homes are within a few metres of the route and will be subjected to 'Offensive Noise' at intervals for up to 18 hours per day, 6 days per week should this expansion be approved in the current form.

(Name withheld) of Raymond Terrace, NSW (200593) - Page 2

The noise from current traffic flows impact greatly on the wellbeing of my family and I with interrupted sleep at night and early morning from as early as 4.45am. Even with doors, windows and shutters closed the rumble of trucks and general traffic noise impact immensely on the use and amenity of our property. With the proposed extended hours and days of operation this current problem will increase exponentially with the projected increase in traffic flow.

Michael O'Brien of Nelsons Plains, NSW – Page 1

Our household wakes at around 5-5.30am each morning because of the trucks travelling to the quarry. The sleep deprivation is affecting us already at this current level.

Helen Hising of Brandy Hill, NSW – Page 1

Response

Resident concerns regarding existing road traffic noise have been acknowledged by Hanson and noted in the road traffic noise assessment. Noise monitoring at a location 30m from Brandy Hill Drive indicated that passing vehicles (including light vehicles and other non-Quarry vehicles) were already potentially causing short term maximum noise levels that may cause sleep disturbance. It should be noted that this is possibly a factor of houses being built too close to busy roads as residential development increased in what was a rural area.

Hanson has been trialling a reduction to the speed of all heavy vehicles on Brandy Hill Drive to 60km/hr to reduce the noise experienced at residences and generated by passing vehicles. Hanson expects that Quarry-related vehicles would generate less noise than other vehicles on the road. In addition, drivers would be guided to reduce noise-generating behaviours such as the use of compression brakes through a Drivers Code of Conduct. A formal trial would be undertaken within 6 months of commencement under the Project.

It should also be noted that Hanson has committed to limiting night-time (10:00pm to 5:00am) transport operations to only occur on 20 nights per year. Interested residents would be given seven days' notice of when this would occur.

Representative Comment(s)

Road Traffic Noise Levels

The proponent needs to clarify if the 524 vehicle trips per day (and peak 66 vehicles per hour) is the total estimated increase in number of vehicle trips based on the proposed quarry or the total number vehicles.

Inconsistencies between the "Noise Impact Assessment" and the "Traffic Impact Assessment" need to be resolved.

There needs to be a reassessment of traffic noise impacts from the proposal. Accurate traffic predictions from a Traffic Impact Assessment need to be used to assess traffic noise impacts. There needs to be clear and unambiguous statements made as to the impact of the proposal in terms of traffic and whether the proposal will (or will not) comply with the guidelines in the NSW Road Noise Policy. Feasible and reasonable noise mitigation measures need to be proposed as is appropriate.

There needs to be clear and unambiguous statements made as to the predicted maximum number of vehicles per hour that will travel along Brandy Hill Drive, should the proposal be approved.

Environment Protection Agency

Response

As described in in the Project Summary (page v), the proposed traffic limits for the ongoing operation of the Brandy Hill Quarry are as follows.

- No more than 301 laden loads during day time (7:00am to 10:00pm).
- No more than 58 laden loads during the night time (10:00pm to 7:00am).

The physical capacity of truck loading and despatch via the weighbridge is currently estimated to be approximately 30 trucks per hour. This limit would remain under the Project and would be a limit on Quarry output. As discussed in Section 5.21.4, this is a maximum level and is not intended to represent the general operating conditions at the Quarry.

Inconsistency between the 2015 Noise and Vibration Impact Assessment and the Traffic Impact Assessment have also been resolved (see Section 5.21.4). The inconsistency referred to in the EPA submission relates to conclusions regarding road and intersection capacity and the results of the road traffic noise assessment.

An Updated Noise Impact Assessment is provided as **Appendix 6** and presents the outcomes of the amended road noise assessment. Section 4.4 provides a summary of the road traffic noise assessment and outcomes.

The results of the road traffic noise assessment indicate that noise levels at a distance of 30m from Brandy Hill Drive during the night time period would satisfy the relevant assessment criteria. In addition, the change in road traffic noise (that is when compared to existing noise levels) would be less than 2dB(A), a change in noise level that is not perceptible to the average human ear.

Existing road traffic noise levels during the day period already exceed the relevant assessment criteria presented. Therefore, road traffic noise levels have been assessed against a relative increase criteria. The predicted change in noise level is limited to a change in noise level of less than approximately 1.1dB(A) and therefore well below a level that is perceptible to the average human ear.

Potential sleep disturbance impacts from road traffic noise have been discussed in Section 4.4.5. The Road Noise Policy provides indicative guidance on the maximum short-term internal noise levels that may cause sleep disturbance. Internal noise levels should be limited to 50dB(A) to 55dB(A) to limit the potential to awaken people from sleep.

In summary, it is concluded that existing short-term road noise levels already exceed the indicative sleep disturbance criteria for heavy vehicles on Brandy Hill Drive. Hanson has therefore considered all reasonable and feasible mitigation including a reduced speed limit. This would be implemented through the Drivers Code of Conduct that would also include restrictions to the use of compression brakes and other noisy behaviour. Based on the mitigation described in Section 4.4.3, Hanson considers that all feasible and reasonable mitigation would be implemented to reduce potential sleep disturbance on Brandy Hill Drive.

Representative Comment(s)

Road Traffic Noise Levels

More accurate estimates of trucks from Martins Creek Quarry using Brandy Hill Drive need to be factored into the traffic impact assessment and subsequently the traffic noise assessment.

Environment Protection Agency

Response

The proposed traffic routes and distribution levels for the Martins Creek Quarry are presented in Section 8.2 (Figure 18) of the EIS for the Martins Creek Quarry and note that Route 2 for that operation would use Clarence Town Road, Brandy Hill Drive, Seaham Road and William Bailey Street to Adelaide Street. The percentage traffic distribution from the Martins Creek Quarry via Brandy Hill is 25.1% of total traffic from that development. Based on the proposed average daily traffic levels through Brandy Hill, it is estimated that 42 laden loads per day (84 movements) and 5-6 laden loads per hour (10-12 movements) would use Brandy Hill Drive and Seaham Road.

Traffic levels from the proposed extension to the Martins Creek Quarry have been included in the road traffic noise assessment undertaken by Vipac (2018a) based on the estimates of traffic levels and distribution presented in the Traffic Impact Assessment for the extension project prepared by Seca Solution Pty Ltd. Table 33 of Vipac (2018a) describes the assumed traffic levels generated by the Martins Creek development for the relevant periods of assessment.

Therefore, the road traffic noise assessment summarised in Section 4.4 factors in an appropriate contribution from the Martins Creek Quarry. It should be noted that since the updated Noise Impact Assessment was completed, Daracon has notified residents of Brandy Hill that it no longer intends to use Brandy Hill Drive for transport operations. This makes the assessment of road traffic impacts for the Project more conservative.

Representative Comment(s)

Road Traffic Noise Levels

Given the large number of heavy vehicles currently using public roads in the area and the predicted large increase as a result of this proposal the EPA suggests DPE give consideration to how adequate maintenance of local roads used by Brandy Hill Quarry heavy vehicles will be maintained over the proposed 30 year life of the extended quarry such that the roads do not fall into disrepair and exacerbate noise issues for residents.

Environment Protection Agency

Response

Hanson has been paying contributions for road infrastructure and maintenance to Port Stephens Council since consent was granted in December 1983. It is estimated that the Quarry would have paid in the order of $9.6 million in contributions since that time. Based on the existing VPA, it is estimated that over the proposed 30-year life of the Project, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions.

Heavy vehicles are a feature of the road network around the suburb of Brandy Hill (including Clarence Town Road and Brandy Hill Drive), a factor that was identified in public consultation for the amended Social Impact Assessment. It is estimated that traffic generated from the Quarry would contribute approximately 32.5% of total traffic during the day time (7:00am to 10:00pm).

Therefore, an agreement such as the current VPA that bases contributions on actual use of the roads is considered the most appropriate. It is not for Hanson to mitigate for the use of these roads by other vehicles travelling from regional areas towards the Pacific Highway or Maitland.

The road traffic noise assessment has estimated background road traffic based on a 1% annual increase. This is considered conservative and from a noise perspective would be unlikely to change noise levels by 1dB(A) over that time.

Notwithstanding this, a road traffic noise monitoring program, involving bi-annual unattended noise monitoring, would be undertaken at the same location used for the road traffic noise assessment unless an agreement is reached for monitoring at a residential location.

Representative Comment(s)

Road Traffic Noise Levels

The proponent needs to explain why they predict the Lmax levels from road traffic noise to increase.

Environment Protection Agency

Response

The assumed increase in L_{MAX} levels under the Project has been reviewed and it is concluded this was an error. However, this comment has resulted in a review of noise generation and a trial speed reduction on Brandy Hill Drive. Should this speed reduction be permanently implemented, Quarry-related heavy vehicle travelling on Brandy Hill Drive would generate less noise than other trucks using the road. However, the ongoing implementation of the speed reduction will depend on community feedback and review of potential safety risks caused by frustrated drivers trying to overtake heavy vehicles.

Representative Comment(s)

Road Traffic Noise Levels

The proponent needs to justify the use of 20dB(A) noise reduction from outside to inside, rather than the 10dB(A) usually used by convention in NSW.

Environment Protection Agency

Vipac conducted noise monitoring at various sensitive receivers along Brandy Hill Drive with the nearest receiver, R19 which is located approximately 31 metres from Brandy Hill Drive, being used to monitor for night time truck movements and sleep disturbance levels.

*My residence is located at a setback distance of approximately **17 metres** from Clarence Town Road. In their report Vipac have predicted future night time noise levels externally at 74 dB (A) but have factored in the following:*

"Typically building facades exposed to the road are generally closed structures (including doors and windows) which provide a degree of attenuation (in the order of 20dB) to the inside amenity of the building." (page 26 Appendix 9 – Noise & Vibration Impact Assessment)

As a result, Vipac have decreased the predicted night time noise levels to 54 dB(A). I dispute this methodology for the following reasons:

- *My family reside in an older style weatherboard cottage that does not have air-conditioning.*
- *As a result, during the warmer months, approximately 4 months, due to the uncomfortably warm conditions within the house we have most, if not all, of the windows and doors open during the night time hours to cool both ourselves and the house down.*
- *We are unable to sleep with the windows and doors closed due to the oppressively hot conditions within the house.*

As a result, noise levels within the house during the night time hours would be closer to the unamended level of 74 dB(A).

(Name withheld) of Seaham, NSW (200029) – Page 2

Response

It is standard practice to allow for attenuation of external noise by 10dB(A) for a building façade with an open window. If the windows are closed, attenuation of 20dB(A) is assumed[4]. For the 2015 Noise and Vibration Impact Assessment it was assumed that residents would have closed windows and doors facing the road. However, it is acknowledged that residents along Brandy Hill Drive may elect to open their windows and doors. Therefore, a more appropriate attenuation of 10dB(A) has been considered in the updated assessment.

Representative Comment(s)

The impact of quarry traffic noise has not been assessed at Clarence Town Road Woodville or High Street Wallalong. There has been no noise monitoring performed for those roads and the assumptions of criteria *and wherewithal on those locations, again with respect, has not been shown to apply. The effect of proposed traffic noise upon the local populations in those localities is not known. In Clarence Town Road, Woodville the environment surrounding the road is totally different acoustically to that where the nearest receivers at and around the quarry at Seaham are located.* […]

The receiver R11 is the furthest west of the site in Clarence Town Road and is only a few metres from the Giles Road intersection that is a stone's throw from the quarry site. The topographies of Woodville and Wallalong are different to each other and to the BH Quarry site. There ought to have been further noise measurements and predictions made along the quarry traffic routes other than close to the BH Quarry and Brandy Hill Drive but there were not.

Voice of Wallalong and Woodville Inc. – Page 8

Response

For the purpose of assessment, it is assumed that residences on Brandy Hill Drive would be the most affected by changes to traffic levels associated with the Project. This is based on the lower existing traffic levels (and therefore the greater relative increase) and the fact that approximately 75% of heavy vehicles despatched from the Quarry use Brandy Hill Drive to access the Pacific Highway.

[4] See Table 4.2 of the RTA Environmental Noise Management Manual 2001

This is not to say that residents on Clarence Town Road would not notice transport operations. However, if the transport operations satisfy the relevant assessment criteria for trucks using Brandy Hill Drive, it is assumed that compliance would also be achieved on Clarence Town Road.

Representative Comment(s)

…..should there be a demand for quarry material to be transported through towards Maitland…… Council requests the Department of Planning consider:

- *Extending a traffic noise monitoring program to heavy haulage routes through the Maitland local government area through a Noise Compliance Management Strategy as was recommended by Vipac.*

Maitland City Council

Response

It has been estimated that approximately 25% of Quarry product delivery traffic would enter the Maitland local government area. It is proposed that annual monitoring on Brandy Hill Drive be undertaken in accordance with a Noise Management Plan. Considering that a larger proportion of Quarry traffic would use this route, compliance on Brandy Hill Drive would indicate compliance on roads in the Maitland local government area. There is therefore no reason for this additional cost and administrative burden.

5.15.9 Professional Review of the Noise Assessment

Representative Comment(s)

Acoustic Review of the Environmental Impact Statement, Brandy Hill Expansion Project.

Bridges Acoustics and included as Appendix 6 to the Brandy Hill and Seaham Action Group submission

Response

The Brandy Hill and Seaham Action Group attached to their submission a professional review of the 2015 Noise and Vibration Impact Assessment provided by Bridges Acoustics. The following key issues have been drawn from the recommendations made by Bridges Acoustics in that review and are followed by a brief response to the issues raised.

Measured Background Noise Levels

Repeat the long term noise survey at N01 to obtain the correct background noise levels and update the adopted noise criteria at this location. Alternatively, acknowledge a problem with the long term monitor results at N01 and adopt the more reliable and believable background levels measured at the nearby N06 location.

Reassess background noise levels at N04 to exclude existing quarry noise levels and noise from seasonal insects or other atypical sources, at least based on an additional attended noise survey during the day, evening and night. An alternative would be to acknowledge a problem with the long term monitor results at N04 and adopt the more reliable background levels measured at N06, as this location is also in a rural area some distance from Clarence Town Road so it is reasonable to assume similar background noise levels at both locations.

Background noise levels have been reconsidered, as discussed in Section 5.15.2. The outcomes of this monitoring included removal of insect noise and locating monitoring points at locations that were shielded from the Quarry. This monitoring resulted in revised Project Specific Noise Levels for the assessment of noise generation under the Project. The results of revised predictive noise modelling are described in Section 4.2.2.

Measured Traffic Noise Levels

Include a more detailed description of this location [N07], including distance from Brandy Hill Drive as this distance is important for the traffic noise model calibration, in the NIA.

Noise monitoring of heavy vehicles passing by was conducted at two locations in March 2018 at locations that were 35m from Brandy Hill Drive and 16m from Seaham Road. These results were reviewed alongside previous monitoring at monitoring point N07 in March 2015. Monitoring point N07 is located at a non-residential location (33 Brandy Hill Drive), 30m from Brandy Hill Drive. The location was chosen to replicate the distance from the road of the closest residence (25 Brandy Hill Driver), which is approximately 30m from the road.

Monitoring point N02 is located at 115 Brandy Hill Drive, however it is noted that this location is approximately 125m from road and has therefore not been used for predicting road traffic noise levels.

Operation Noise Criteria

Reassess operating noise criteria based on the correct background noise levels.

The Project Specific Noise Levels assumed for the Updated Noise Impact Assessment are discussed in Section 4.2.2 and presented in **Table 16**. In summary, the background noise levels recorded in March 2018 were lower than those used in the 2015 Noise and Vibration Impact Assessment after the influence of cricket noise was excluded from the results. The change to background levels was between 5dB(A) and 15dB(A). As noted previously, insect noise is a feature of the local environment, however it is acknowledged that this noise is not present year-round.

Sleep Disturbance Criteria

The NIA should at least comment on, and ideally adopt, the Draft ING sleep disturbance criteria for most receptors and retain the RNP sleep disturbance criteria for receptors affected by traffic noise.

Vipac (2018a) reviewed the NPI criteria for operational sleep disturbance, however, as noted in Section 4.3, in all instances the Project Specific Noise Levels (referred to in Section 4.2.2) for the evening and night time periods are more stringent (i.e. lower) than the maximum noise level triggers. Therefore, the assessment of evening and night time operational noise levels is considered to provide an indication of potential sleep disturbance. It is concluded that night time operations would not be likely to result in sleep disturbance for the closest privately-owned residences.

The Road Noise Policy provides indicative guidance on the maximum short-term internal noise levels that may cause sleep disturbance. Internal noise levels should be limited to 50dB(A) to 55dB(A) to limit the potential to awaken people from sleep. Sleep disturbance from road traffic noise levels has been discussed in Section 4.4.5 and Section 5.15.8.

Construction Noise Criteria

Reassess construction noise criteria based on the correct background noise levels.

The construction noise assessment has also been updated in Vipac (2018a) to account for the revised background noise levels. The outcomes of the construction noise assessment are presented in Section 4.2.

Predicted Operating Noise

Include detailed noise model plans in the NIA, showing modelled terrain and exact source locations, to confirm the noise model reflects the proposed project. The plans must include any modelled barriers, including the height of each barrier. Include data regarding the acoustic centre heights of each source, or source type, as source heights can have a large effect on received noise levels.

Operational and construction scenarios have been presented in **Figure 13** to **Figure 18** and discussed in Section 4.2.2. More detail on the operational conditions modelled by Vipac are provided in Section 6.4 (scenarios), Section 6.5 (control assumptions) and Section 6.6 (scenario layout) of Vipac (2018a).

The NIA should present clear evidence to support the listed sound power levels or correct the NIA to include representative and achievable sound power levels for all modelled sources. It should include all proposed quarry equipment or provide a clear justification for omitting significant noise sources.

Sound power levels of existing equipment were measured or where the equipment was not currently at use at the Quarry, measured at other Hanson operations or sourced from the Vipac library of noise sources. Sound power levels used for the updated noise prediction modelling are presented in Section 6.2 and Table 24 of Vipac (2018a).

The EIS should provide more specific information regarding "other equipment is hired as needed" as hired plant can produce significant noise not considered in the NIA. Alternatively, any project approval conditions must either limit the hired equipment, or otherwise avoid the potential for excessive noise at receptors from the hired equipment.

The operational and construction scenarios presented in Section 4.2.2 demonstrate worst case operating conditions for the Quarry and assume that all equipment is operating simultaneously. Worst case climatic (operating) conditions are then considered to predict noise levels. Operations would utilise a combination of the equipment presented and although it is possible that all equipment would operate simultaneously, this is unlikely to occur on a regular basis.

Fixed processing equipment is the most significant noise source within the Quarry. The type of mobile equipment presented in the operational and construction scenarios would not change, however by their nature, the locations of each item may change with use. However, it is estimated that the noise generated would be lower or similar to noise levels predicted under the worst-case scenarios.

The NIA should correctly assess all proposed operations in each time period rather than omitting significant sources from the evening and night noise model.

Based on the proposed hours of operation, the predictive noise modelling has been undertaken on the basis of day/evening and night time periods. A more stringent assessment criteria would apply for evening operations compared to day time, however it is noted that the same equipment may be used during these periods.

Recalculate predicted noise levels after all required noise model adjustments have been made as recommended above.

Vipac (2018a) re-modelled predicted noise levels for each of the operational and construction scenarios. The results of the modelling are summarised in Section 4.2.4 and presented in full in Section 7 of Vipac (2018a).

The NIA should ideally present 1/3 octave predicted noise levels at receptors to demonstrate quarry noise will not be tonal as defined in the INP, or apply tonal penalties to the predicted noise levels where required. This should include reverse alarms fitted to mobile machines which are not currently mentioned or assessed in the NIA, or justify omission of the alarms from the assessment.

The NIA must predict noise levels in octave bands or at least predict both dBC and dBA levels at all receptors to determine the need for the low frequency modifying factor required by the INP.

Annoying noise characteristics such as tonal noise or low frequency noise have been considered by Vipac (2018a) in accordance with the NPI (see Section 4.2.4 and Section 7 and Section 8.1.2 of Vipac (2018a)).

Low frequency noise levels have been assessed in the predictive modelling and although the C-A trigger is reached, further review of specific frequency levels in the low frequency spectrum indicate that low frequency noise would not be a feature and therefore a penalty from low frequency noise impacts is not required. It is noted that low frequency noise would be generated by trucks using the Quarry Access Road, however this noise is likely to be consistent with low frequency noise generated by other vehicles using Clarence Town Road.

Vipac (2018a) note that tonal noise may result from some mobile equipment and has recommended an annual survey of sound power levels for all operational equipment be included in the noise monitoring program to ensure that equipment is suitably maintained to limit tonal noise.

Include noise contour figures in the NIA to show noise levels over vacant land near the project site.

Figure 19 to **Figure 24** present the noise contour diagrams for the predictive modelling assessment. Of note, since the public exhibition of the EIS, Hanson has purchased Lot 25 DP 1101305 which is the vacant land directly adjacent to the southern boundary of the Quarry. This property is now considered a part of the Project (although it is not proposed for disturbance).

The closest vacant blocks to the Quarry are to the north and shielded topographically from operations. In addition, it is noted that this land is owned under the Company name Delta 5 Pty Ltd. A supportive submission was received by DPIE from the owner of this property that indicated that the Project would not influence plans for construction of dwellings on the property.

For all stages, the predicted noise levels on vacant land is below 35db(A) for the majority of the land (i.e. more than 75% of the total area). The Project does not trigger the *Voluntary Land Acquisition and Mitigation Policy 2014* at any privately-owned residence during any stage of operations. This applies equally to predicted noise and air quality impacts.

Predicted Road Traffic Noise

The NIA should assess traffic noise to the potentially most affected receptor, which is most likely to be a residence approximately 20 m from Seaham Road south of Brandy Hill Drive.

It is not agreed that this location would be the most affected receptor. Existing traffic on Seaham Road is higher than that on Brandy Hill Drive. Therefore, relative to the location chosen for assessment (30m from Brandy Hill Drive), the change in overall noise level would be less than that experienced at a location on Brandy Hill Drive.

The NIA should calculate the base case and proposed traffic noise levels, at the potentially most affected receptor(s), with the base case excluding current quarry related traffic.

This is not consistent with Section B1 of the Road Noise Policy that requires calculation of existing traffic noise levels. The assessment undertaken by Vipac (2018a) and described in Section 4.4 remains consistent with the Road Noise Policy.

The NIA should provide justification for assuming all residents close their windows at night and the associated 20 dBA difference from outside to inside a dwelling, compared to the commonly accepted position that some residents would prefer to sleep with window open. Following this, a reassessment of sleep disturbance levels is required, including an assessment of all feasible and reasonable mitigation options.

It is noted that Table 4.2 of the *RTA Environmental Noise Management Manual 2001* refers to noise attenuation from a building façade with a noise reduction of 20dB(A) provided by a building with closed windows. The 2015 Noise and Vibration Impact Assessment assumed that during the evening and night time periods, windows of properties would be closed. Vipac acknowledges this assumption cannot be proven and so has not applied this level of attenuation in assessment in the Updated Noise Impact Assessment (Vipac, 2018a).

The NIA should assess existing and proposed traffic noise levels to the criteria, not just to the relative increase criterion, and either recommend feasible and reasonable mitigation measures or justify the lack of measures to reduce criteria exceedances. In particular, given the community's concern regarding heavy truck movements at night, regulation of time of use should be considered in the NIA as required by the RNP or justification provided for this measure not being adopted for the project.

The Updated Noise Impact Assessment has assessed road noise for the night time period (10:00pm to 7:00am) and concluded that predicted noise levels would satisfy the assessment criteria. A summary of the road noise assessment results is presented in Section 4.4.4 and Section 7.2.3 of Vipac (2018a).

The NIA should provide reason(s) for the predicted 2 dBA increase in LAmax,9hr levels in Table 24, considering future truck passby events should not be individually louder than existing truck passby events.

Vipac has reviewed this comment and notes that this conclusion was in error and based on the assumed change to L_{AMAX} of 2dB(A) based on average noise level changes. This error has been corrected for the Updated Noise Impact Assessment (see **Appendix 6**).

The amended NIA should assess cumulative traffic noise levels with the Martins Creek Quarry Project and any other significant traffic generating projects in the area.

The 2015 Noise and Vibration Impact Assessment relied upon estimates of existing traffic provided in the Traffic Impact Assessment prepared by Intersect Traffic. It is noted that for predictions of future traffic levels, Intersect Traffic allowed for five to six trucks per hour from the Martin's Creek Quarry which is consistent with the average level proposed for the transport route that uses Brandy Hill Drive under that proposal.

Predicted Construction Noise

The NIA should justify overburden removal and transportation as a construction activity, rather than a part of normal quarry operation. Construction work associated with relocation of the processing plant should be assessed, or lack of assessment justified.

Construction noise has been assessed through predictive modelling of two scenarios.

- Construction Stage 1 considers Stage 1 of operations but incorporates the short-term construction of the amenity barrier to the south of the Processing and Stockpiling Area.
- Construction Stage 2 considers Stage 3 of operations but incorporates the activities required for construction of the processing facilities that would be commissioned at the commencement of Stage 4 of operations. Additional equipment has been modelled in the Processing and Stockpiling Area for this scenario.

The construction scenarios are displayed in **Figure 18** and the outcomes of the predictive modelling displayed in **Figure 24**. In summary, Vipac (2018a) predicted no significant changes to predicted noise levels from construction activities with a single minor exceedance of the assessment criteria at 1034 Clarence Town Road of 1dB(A) under worst case climate conditions.

The NIA should provide all relevant details of the construction noise model generally as recommended for the operating noise model including terrain, source location, source height, source sound power and weather details. Assuming the construction model includes building the bund south of the future processing area, then trucks and other earthmoving equipment must be modelled at realistic elevated locations on the bund as will occur during the construction period, to correctly calculate noise levels at receptors. Alternatively, construction of this bund must be included in the operating noise model.

Construction scenarios have been assessed as described above and presented in Section 7.3 of Vipac (2018a).

The NIA must also calculate construction noise levels for the evening and night, as construction work during these times is proposed in the EIS. The night construction noise assessment must include night weather conditions and a sleep disturbance assessment.

This comment is noted and the proposed hours of operation for construction activities modified to the more standard hours of 7:00am to 6:00pm Monday to Friday and 7:00am to 5:00pm Saturday only. No construction activities would occur during the evening or night time periods, nor on Sundays or public holidays.

SEARS Noise Compliance

The EIS and/or the NIA should consider whether annual or quarterly noise monitoring is appropriate upon reassessment of operating, traffic and construction noise levels, and consider appropriate receptor locations and other details (such as day/evening/night and measurement duration in each time period) for noise monitoring.

The noise monitoring program proposed in Section 4.2.3 incorporates quarterly attended noise monitoring for an initial period of two years after which time noise monitoring would be reduced to bi-annual frequency. The noise monitoring locations would be determined during preparation of a Noise Management Plan, however, would likely include monitoring locations to the east, south and west of the Quarry. Annual unattended monitoring on Brandy Hill Drive would be undertaken at a location also determined during preparation of the Noise Management Plan. Finally, an annual survey of sound power levels for mobile equipment would be undertaken to ensure that noise generated by equipment at the Quarry is consistent with the noise levels assumed for predictive modelling.

The EIS and/or NIA should consider real time noise monitoring as specifically required by the SEARS, and provide relevant justification if real time noise monitoring is not proposed.

Real time noise monitoring is considered overly onerous for this Project given than during worst case operating scenarios and worst case climatic operating conditions, it is predicted that noise levels may exceed the assessment criteria by 1dB(A) to 2dB(A), a change in noise level that is not perceptible to the average human ear and is considered a negligible impact. The most significant noise level change would be experienced at residences along Clarence Town Road, which are already in a relatively noisy environment considering the proximity to the road.

Blasting Receptor Locations

Check all receptor distances listed in Table 2 and update the predicted blast impacts with the revised distances.

An amended Blast Impact Assessment was prepared by Vipac (2018b) (provided as **Appendix 9**) with adjusted distances based on the proposed boundary of extraction. All residences remained within the relevant blasting air blast overpressure and ground vibration criteria at an indicative maximum instantaneous charge (MIC) of 175kg, however this would be refined through blast monitoring and practical experience with blast events.

Blasting Historical Impacts

Provide information regarding current blast monitoring locations and, in particular, the monitoring location and other details regarding the single blast producing a measured level of around 50 mm/s.

The blasting result referred to in the submission was recorded during testing of a blast monitor placed 35m from a blast. It is not representative of residential impacts. No blasting has taken place outside the approved extraction area and no substantiated complaints relating to structural damage have been received by Hanson. It should be noted that a Blast Management Plan would be implemented to guide blasting activities and include a comprehensive summary of the proposed blast monitoring programs and monitoring locations.

Blasting Times

Either align the proposed blasting hours in the EIS with the recommended hours in the ANZECC Guideline, or justify the extended hours proposed for this project.

The operating hours for blasting activities have been varied to only occur between the hours of 9:00am and 5:00pm, consistent with the Environment Protection Licence for existing operations (EPL 1879) and the guideline *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZEC, 1990).

5.16 PLANNING

5.16.1 Non-Discretionary Development Standards

Representative Comment(s)

Request dated 14 November 2018

During a teleconference with DPIE officers, it was requested that Hanson consider the implications of amendments to the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (the Mining SEPP) and the Voluntary Land Acquisition and Mitigation Policy 2018 (VLAMP) (NSW Government, 2018).

Department of Planning and Environment

Response

Assessment in accordance with the VLAMP is summarised in more detail in the following subsection (Section 5.16.2).

It is noted that the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (the Mining SEPP) has been amended as follows.

- The non-discretionary development standard for cumulative air quality described in Clause 12AB(4) of the Mining SEPP has changed for annual average PM_{10} from 30µg/m^3 to 25µg/m^3 and criteria has been established for annual average $PM_{2.5}$ of 8µg/m^3.
- The non-discretionary development standard for cumulative amenity noise levels described in Clause 12AB(3) of the Mining SEPP is now based on amenity criteria established in Table 2.2 of the *Noise Policy for Industry* (NPfI) (EPA, 2017a) rather that the now superseded *Industrial Noise Policy* (EPA, 2000)

It is recognised that the non-discretionary standards for cumulative amenity noise levels and cumulative annual average air quality levels apply to private dwellings only.

The criteria established in the Approved Methods for assessment of potential air quality impacts was considered in the Air Quality Impact Assessment for the Project prepared by Todoroski Air Sciences (2019) (see Section 4.5 and **Appendix 8**). In summary, it was predicted that at all privately-owned residences annual average PM_{10} concentrations would remain below 25µg/m^3 (worst-case outcome of 22.0µg/m^3) and annual average $PM_{2.5}$ would remain below 8µg/m^3 (worst-case outcome of 7.9µg/m^3). Therefore, dust generation and dispersion would remain within the criteria prescribed in the non-discretionary standards of the Mining SEPP.

With regards to the assessment of predicted noise levels under the Project, it is noted that the NPI provides a method for the calculation of Project Specific Noise Triggers for assessment of predicted noise levels during the daytime, evening and night time periods. The method is similar to that applied for the Updated Noise Impact Assessment prepared by Vipac Engineers and Scientists (2018a) (see Section 4.2 and **Appendix 6**) and requires the determination of the most restrictive of the intrusiveness criteria and the amenity criteria. **Table 35** presents an update to Table 19 of the Updated Noise Impact Assessment with consideration of amended methods under the NPI. The Rating Background Level that would be assumed under the NPI is provided as well as the Intrusiveness Criteria and Project Specific Noise Trigger for any assessment under this policy. **Table 35** also presents the Project Specific Noise Level assumed for the updated Noise Impact Assessment for comparison.

Table 35
Updated Noise Assessment Criteria – Operational Noise under the NPfI

Monitoring Point	Assessment Location	Period*	L_{Aeq}	L_{A90}	Rating Background Level+	Amenity Criteria	Intrusiveness Criteria	Updated NPfI Project Specific Noise Trigger	INP Project Specific Noise Level
N01 (rural / residential)	R1, R2, R3, R9 & R10	Day	55	30	35	50	40	40	35
		Evening	43	28	30	45	35	35	35
		Night	40	27	30	40	35	35	35
N03 (suburban / residential)	R11, R13, R14, R15 & R16	Day	51	32	35	55	40	40	37
		Evening	47	29	30	45	35	35	35
		Night	42	27	30	40	35	35	35
N04 (rural / residential)	R6, R7, R8, R17, R18 & R45	Day	54	35	35	50	40	40	40
		Evening	55	32	32	45	37	37	37
		Night	42	30	30	40	35	35	35

* Day is defined as 0700 to 1800, Evening is defined as 1800 to 2200 and Night is defined as 2200 to 0700

\+ Under the NPfI, the Rating Background Level is the median of the overall assessment background noise level or a minimum of 35 dB(A) for day or 30 dB(A) for evening and night time periods (Section 2.3 and Table 2.1 of the NPfI).

In all cases, the 'INP Project Specific Noise Level' is the same as, or more restrictive than, the Project Specific Noise Triggers that would be assumed under the NPI. It is therefore concluded that the Updated Noise Impact Assessment has provided a more conservative operational noise impact assessment than would have been required under the NPI. The outcomes of assessment of noise for the Project indicates that the non-discretionary standards in the Mining SEPP would be satisfied.

5.16.2 Voluntary Land Acquisition and Mitigation Policy

Representative Comment(s)

Request – Dated 1 February 2019

"The VLAMP requires acquisition to be afforded if 25% of any privately-owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls. This is the case for both noise and air quality. The contour maps in both the NIA and AQIA provide some indication of the distribution of impacts, however, we are unable to quantify the extent of

exceedances over the individual land parcels. The Department is seeking confirmation/ demonstration that there are no predicted exceedances over 25% of privately-owned land in the vicinity of the development."

Department of Planning and Environment

Response

In September 2018, the VLAMP was updated to reflect the requirements of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017b) with respect to air quality and the Noise Policy for Industry with respect to noise levels. This is consistent with the amendments to the Mining SEPP (discussed in Section 5.16.1).

With regards the outcomes of the Noise Impact Assessment, Stage 5 of operations is the worst case reviewed in terms of the outcomes of the noise predictions and therefore compliance during this stage is considered to be representative of all stages. **Figure 29** demonstrates the 25% of properties adjacent to the Quarry that are closest to the site and highlights those areas that are predicted to receive noise above the 35dB contour during Stage 5 of operations.

For Stage 5 of operations, the criteria during the daytime and evening was either 35dB or 37dB and during the night time was 35dB. **Figure 29** confirms the conclusions of the noise impact assessment that noise is predicted to remain within criteria levels except for some instances where noise is 1-2dB above the relevant criteria. This level of exceedance is described in the VLAMP as negligible and it is noted that this level of noise is predicted at full production in worst case climate conditions.

The modelling of predicted dust dispersion applied a Level 2 contemporaneous assessment of 24-hour average $PM_{2.5}$ and PM_{10} in accordance with *The Approved Methods for Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017). The outcomes of assessment presented in the Air Quality Impact Assessment (TAS, 2019) demonstrates that the particulate matter mitigation criteria (Table 2 in the VLAMP) and the particulate matter acquisition criteria (Table 3 in the VLAMP) would be satisfied over the life of development. The predicted outcomes of assessment under the VLAMP are presented in **Table 36**.

The VLAMP would not be triggered as a result of the noise or air quality impacts of the Project.

Table 36
Air Quality Modelling Results and VLAMP Criteria

Pollutant	VLAMP Mitigation / Acquisition Criteria*	Highest Predicted Result
$PM_{2.5}$ (Annual)**	8µg/m^3	7.9 µg/m^3
$PM_{2.5}$ (24-Hour) ***	25µg/m^3	3.0µg/m^3
PM_{10} (Annual) **	50µg/m^3	22.0µg/m^3
PM_{10} (24-Hour) ***	50µg/m^3	13.8µg/m^3
Total Suspended Particulates (Annual) ***	90µg/m^3	75.4µg/m^3
Deposited Dust (Cumulative)	4g/m^2/month	2.4g/m^2/month
Deposited Dust (Incremental)	2g/m^2/month	0.2g/m^2/month

* The difference between the mitigation and acquisition criteria is that the acquisition criteria allow for five exceedances over the life of the Project before acquisition is triggered. The mitigation criteria allow for no exceedances over the life of the Project.

** Based on cumulative impact (Project impact plus background).

*** Based on Project-alone incremental impact.

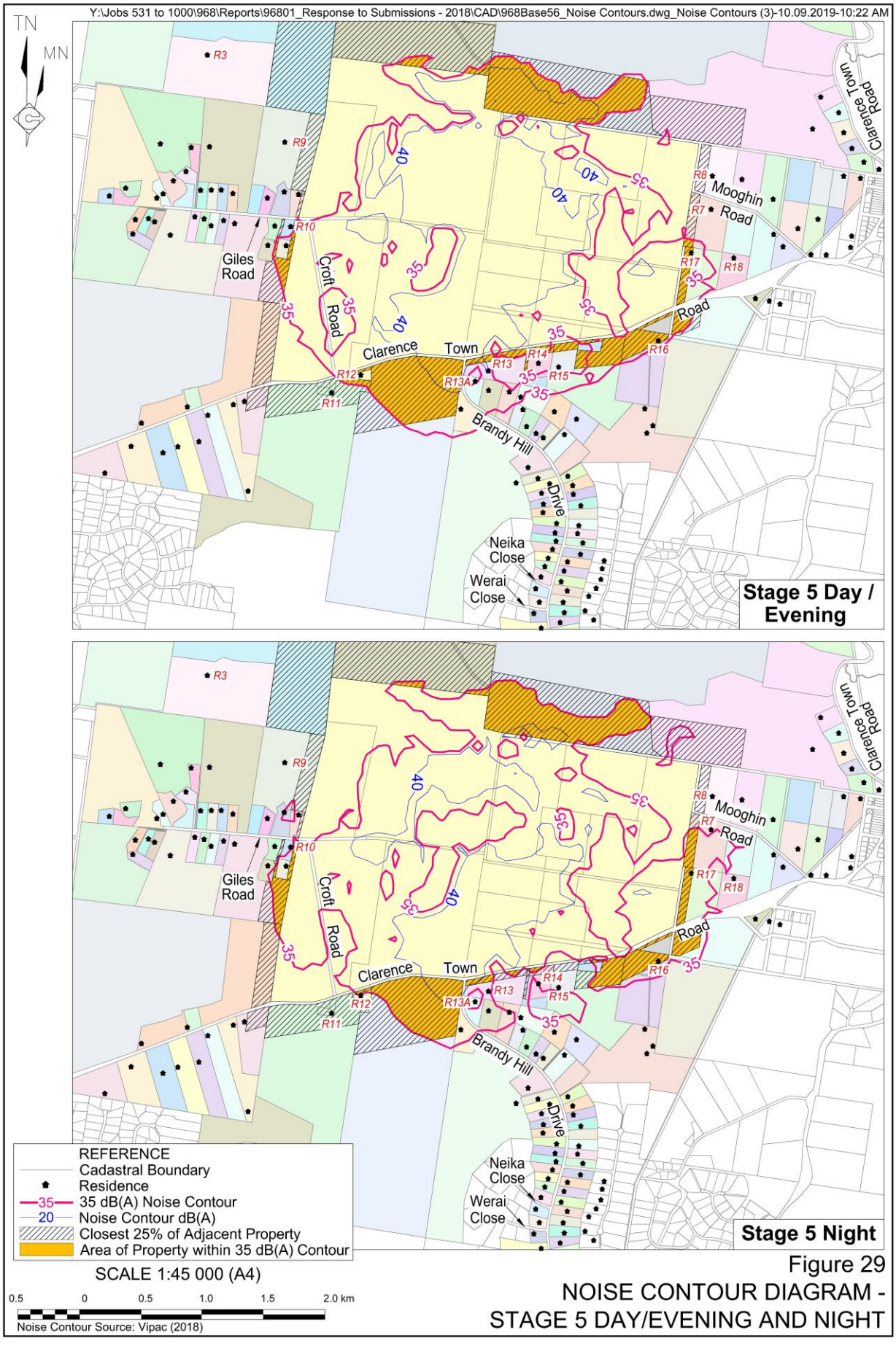

Figure 29
NOISE CONTOUR DIAGRAM - STAGE 5 DAY/EVENING AND NIGHT

5.17 PRE-COAT PLANT

5.17.1 Introduction

Pre-coat operations involve the application of a combination of diesel hydrocarbon and bituminous film to crushed aggregate to give the material an adhesive coating that benefits application in road construction and maintenance.

Hanson propose to include a pre-coat plant in operations for the Project and have included this infrastructure in operational scenarios for assessment of potential noise and dust generation. Pre-coat plants are relatively common for large quarry operations where it is intended to satisfy a range of customer requirements and it is noted that there is an existing pre-coat plant at the Quarry. The environmental risks of operating a pre-coat plant are therefore well understood and are anticipated to be minimal.

The following subsection presents a response to the EPA request for information on this equipment.

Representative Comment(s)

Given the potential for a range of impacts from this aspect of plant infrastructure, the EPA requests the following information to enable an adequate assessment of the impacts:

- *specification of the pre-coat plant capacity;*
- *specification of individual pre-coat tank capacities;*
- *clarification as to the whether the pre-coat materials are to run at elevated temperatures;*
- *details of all proposed environmental controls (e.g. concrete hardstand, bunding, sump, dedicated roofed area, odour control from potential emissions, waste disposal);*
- *details of how the pre-coat loading area controls will comply with the relevant Australian Standards;*
- *details of the surface water management system specifically for the pre-coat area; and*
- *demonstrate how the proposed pre-coat plant meets best practice.*

Environment Protection Agency

Response

A detailed description of the layout and operation of this component of the processing operations is provided in Section 2.10.2 that takes into consideration the requested information above.

5.18 REHABILITATION

5.18.1 Introduction

The proposed rehabilitation of the Quarry is described in detail in Appendix 18 of the EIS and Section 2.20. Hanson accepts that progressive rehabilitation, landscape management and provisions for a rehabilitation security bond would be included as conditions of any consent.

The following subsections provide additional information to address community concerns about the final landform. It is noted that final land uses are indicative at this stage of the operation but would be carefully managed through a Biodiversity and Rehabilitation Management Plan and secured through a bond arrangement with DPIE.

5.18.2 Quarry Void

Representative Comment(s)

We are also concerned with the proposed steep sided void that is likely to become a lake. With its remoteness and accessibility, will it become a dumping site for stolen cars and rubbish? Will it be adequately fenced or bunded to prevent the above, and to prevent stock or wildlife falling in Will it become a designated refuse dump, with the associated smell, greenhouse gas emissions and traffic Will the proposed rehabilitation be funded until it is completed? What guarantees are there if Hanson is sold or goes into administration etc.

Brandy Hill and Seaham Action Group – Page 29

There is really no significant complete rehabilitation proposed in the EIS. There will be a gigantic hole/void in the ground and to list this hole under that heading of "Rehabilitation" i.e. that the land can be restored to its former condition, beggars belief.

Voice of Wallalong and Woodville Inc. – Page 12

The rehabilitation report fails to consider the following points:

- *Water quality for the final void is not addressed. There is no information about aquifers that may be intercepted and no expected water quality information.*
- *The void will have three steep sides limiting safety post mining. The void in its current design will be unsafe for humans and wildlife with deep water being so close to the edge.*
- *There is no water run off or run in information. There is the possibility that evaporation will result in the water salinizing over the years, affecting ground water and possibly effecting water quality in the Williams River or in the wetlands around the Hunter.*
- *The storage of topsoil in dumps is known to be detrimental to soil microflora and fauna, and to nutrient levels. Under the current plan, topsoil stored in dumps will be of very poor quality by the time it is used again. This means that rehabilitation objectives will much harder to meet.*
- *The report states that dead trees will be removed. This is not best practice for rehab. Dead trees are usually incorporated as stag trees or as habitat.*
- *Eco stability after fire is glossed over.*
- *Rock benches heights are not given – these could pose a safety risk.*
- *We are not given the data to suggest that the current rehab is meeting specifications.*

Penny Dunstan of Brandy Hill, NSW

The information contained in Appendix 18 regarding rehabilitation and closure is a key concern. The void would be 78 metres below sea level and would be filled with water following the completion of mining. There is no discussion as to how long it would take for the void to be filled, the level to which it would be filled, the composition or cleanliness of the water, nor the after use of the void.

Carl Mackaway of Seaham, NSW – Page 3

The ultimate betrayal of residents would be as the result of approval of this expansion, the quarry would be left as a deep void down to 78 metres below sea level (-78 AHD and 108 metres lower than the current approval) to fill with the saline groundwater (appendix 14 and 5.11.3.4 p275) to a depth of 108 metres before flowing out unchecked into the environment.

Allowing to fill with noted saline groundwater is bad enough, but I can see no reference to testing for heavy metals or other contaminants, and there seems to be no flushing mechanism to stop this void becoming a dangerously deep stagnating cesspool within hundreds of metres of the commencement of a residential area.

(Name withheld) of Raymond Terrace, NSW (200567) – Page 6

Response

Information relating to the proposed progressive and final rehabilitation of the Quarry is presented in Section 2.20 and Appendix 18 of the EIS.

Concerns in the community regarding the outcomes for the land post-quarrying have been acknowledged and discussed with community members at CCC and Have-A-Chat meetings. Hanson also acknowledges that rehabilitation will not be a process of restoring the landform to its former condition. This is not physically possible given the nature of the extractive activities proposed.

In discussions with the community Hanson and its consultants have raised the following key points.

- Rehabilitation would occur progressively over the life of the Quarry and focus on the completed areas of the Quarry such as completed benches formed during operations and the amenity barrier once it is constructed.
- Rehabilitation would be guided by a Biodiversity and Rehabilitation Management Plan prepared in consultation with Port Stephens Council, the Natural Resource Access Regulator and the Biodiversity Conservation Division with final approval of the plan dependent on DPIE review.
- Progress on rehabilitation objectives and actions would be reported annually in the Annual Review document.
- It is anticipated that final land uses for the Quarry would include a return to productive grazing, passive biodiversity conservation and a retained water body. However, when development consent lapses, land use preferences of Port Stephens Council, Hanson as the land owner and the local community may have changed.
- There are no plans to use the land as a local landfill or to permit dumping of vehicles or other material.

- The general objectives of rehabilitation would include ensuring that the landform is safe, stable, secure and non-polluting. Additional rehabilitation objectives would also involve minimising the visual impact of the final landform and enhancing the surrounding biodiversity values.
- It is likely that a void would remain in the final landform which would slowly fill with water over an estimated 163 years. This is a long time, with the speed at which this would occur influenced by evaporation and rainfall in the intervening years, which is in turn influenced by longer term climate patterns. As a result, Hanson proposes to vegetate the landform post-closure, accepting that this vegetation may not be a permanent feature as it may be inundated at lower elevations (below approximately 30m AHD.
- It is acknowledged that groundwater inflow to the final void would be more saline than water in Deadmans Creek. However, the water is expected to support flora and fauna. It is not anticipated that any waterbody would be stagnant or that it would overflow. Rather, the waterbody would become an environmental resource.

The management of risks to successful rehabilitation would be presented in the Biodiversity and Rehabilitation Management Plan and would include management of the following.

- Adequate management of soil stockpiles and resources.
- Preservation of coarse woody debris for habitat enhancement.
- Bushfire management in the landscape (during and post-approval)
- Final landform design and use.
- Adequate funding of rehabilitation.
- Security of rehabilitation funding through an deposit to be held by DPIE.

Hanson would remain responsible for the land as long as it is the owner of the land. Should the land be sold, the rehabilitation obligations would be passed to the new owner. This process is secured through the rehabilitation bond that is held by DPIE until such time as rehabilitation requirements have been satisfied.

5.18.3 Closure Criteria

Representative Comment(s)

The Rehabilitation Plan should include specific performance criteria for areas of native vegetation.

Port Stephens Council

Response

This comment from Port Stephens Council is noted. Hanson accepts that any Biodiversity and Rehabilitation Plan for the Quarry would include closure criteria based on satisfying current expectation for closure and a final land use.

5.18.4 Security after Closure

Representative Comment(s)

The EIS deals in part with cursory forms of rehabilitation, but fails completely to cover security and ongoing site maintenance following closure.

The remnants include a large overall site, and a very steep sided, deep, slowly filling stagnant pit in an area close to main roads and a residential suburb.

One only has to observe other abandoned operations to recognise the difficulties in maintaining secure manproof fencing and gates, even over the shorter term.

(Name withheld) of Raymond Terrace, NSW (200567) – Page 7

Response

As described in the response in Section 5.18.2, as long as Hanson remains the land owner, ultimate responsibility for the land remains with the Company. This includes maintaining security, safety and maintaining the land. It is likely that closure planning for the Quarry would involve an assessment of community, Council and Government preferences for the land use. Rehabilitation would then be directed towards achieving that final landform and land use.

It should be noted that it is standard practice for DPIE to hold a security bond for the ultimate rehabilitation of the Quarry. This bond is not released until the closure criteria are satisfied. It would therefore be in Hanson's financial interest to satisfy these criteria and achieve the return of the security bond.

5.19 DEVELOPER CONTRIBUTIONS

5.19.1 Introduction

Hanson currently pays developer contributions to Port Stephens Council in accordance with a Voluntary Planning Agreement for the Quarry. While this is proposed to continue, consultation with the local community has indicated that the local road condition is an issue of concern. This subsection addresses the submissions relating to ongoing contributions and presents an alternative approach to this process.

Representative Comment(s)

Monthly contribution towards the ongoing maintenance, repair and upgrade of roads within the haulage route. The following haulage routes are proposed.

- *The major haul route is recommended to be from Brandy Hill Drive, right to Seaham Road, left to Adelaide Street through to the Pacific Highway via Richardson Road.*
- *The following minor haul routes will be: West on Clarence Town Road to Maitland (However additional information is required to assess this route) and East on Clarence Town Road to Dungog*
- *The haulage shall not be varied without the express written permission of Council. Such variation without Council consent will render this development consent null and void.*

- *Each payment shall be:*
  - *based on weighbridge records of the quantity of extractive material transported from the site quarterly. Those records are to be provided to Council within 14 days of the end of the relevant month;*
  - *paid within 21 days of receipt of the invoice received from Council; and*
  - *adjusted in line with the Consumer Price Index calculated from the date of approval and applied annually from the first day of operation.*

Contribution towards the construction of a pathway and bus stops along Brandy Hill Drive is recommended.

Port Stephens Council

Response

The requests of Port Stephens Council are unreasonable and are not consistent with the contributions paid by modern extractive industry operations. Hanson has agreed to the primary transport route through Raymond Terrace to the Pacific Highway via Richardson Road and assessed the use of this route in terms of road capacity and intersection performance (see Section 4.1.2). Regarding the suggested minor transport routes, Hanson often has to undertake local deliveries that require alternate routes. The transport routes that would be used by the majority of trucks are presented in **Figure 9**. Trucks would use alternative routes as necessary, however would operate under instructions to limit their routes to State and regional routes as much as practically possible and only use local roads where it is required or where directed by road authorities.

Hanson is currently in negotiations with Port Stephens Council regarding a Voluntary Planning Agreement and ongoing payment of contributions to road maintenance requirements. The Quarry has been the subject of developer contributions since the original development consent was granted in 1983. The existing consent requires contributions to be levied at $0.20 per tonne based on weighbridge records. However, these arrangements have been modified over time and are now based on tonnes per kilometre travelled consistent with modern quarry developments.

Hanson has records of contribution amounts from the period of December 2005 to March 2018 (12 Years) which indicate that during this 12-year period, $3.47 million has been paid to Port Stephens Council. This amounts to, on average, $289,000 per annum. Based on this annual amount it is estimated that the Quarry would have paid in the order of $9.6 million in contributions since consent was granted in December 1983.

Hanson received assessment requirements for the Brandy Hill Quarry Extension in April 2013 (this application). Since that time Hanson has paid $1.7 million towards road infrastructure and maintenance through contributions. It is noted that Port Stephens Council could have used these contributions to fund improvements to the local roads which would have addressed many of the safety concerns that have been raised by the community since the investigations into the Quarry expansion began in 2013.

Hanson initially proposed that ongoing contributions continue to be provided to Port Stephens Council directly but with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. This arrangement was to be established through the Voluntary Planning Agreement. Through discussions with Council, this approach has been refused in favour of a more traditional approach.

It is estimated that over the proposed 30-year life of the Brandy Hill Extension Project, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions.

Representative Comment(s)

Council requests the determining authority require:

- *The quarry operator to provide road contribution to Council equal in amount as defined in Council's Section 94 Plan – Extractive Industries.*

Maitland City Council

Response

Hanson has met with representatives of Maitland City Council and agreed to developer contributions to be paid over the life of the project. For each financial year, Hanson would pay Maitland City Council a monetary contribution for each tonne of quarry product transported from the site on roads for which Maitland City Council is liable for road maintenance funding. Each payment must be:

- based on a contribution rate described in the *Maitland City Wide Section 94 Contributions Plan 2016*;
- based on weighbridge records of the quantity of quarry products transported from the site and the distance travelled on Maitland City Council funded roads;
- paid by the date required by the invoice issued by Council; and
- increased over the life of the project in accordance with the CPI.

5.20 SOCIAL AMENITY

5.20.1 Introduction

Hanson prepared a Socio-Economic Assessment for the EIS and presented the outcomes in Appendix 17 of that document. While the Socio-Economic Assessment covered social amenity and economic impacts and benefits, several submissions, including review by DPIE, noted the lack of consideration of broader and more conceptual social impacts. Hanson commissioned Key Insights to undertake a Social Impact Assessment broadly consistent with the NSW Government *Social Impact Assessment Guideline for State significant mining, petroleum production and extractive industry development September 2017.* The assessment included review of feedback provided in the various submissions and a community consultation program undertaken by Key Insights. The Key insights Social Impact Assessment is provided as **Appendix 3** and the methodology and outcomes of the assessment presented in Section 4.8. The following subsections present a response to various submissions that incorporated social impact concerns.

5.20.2 Social Impacts of the Project

Representative Comment(s)

The Department's Social Impact Assessment (SIA) specialist has reviewed the EIS and had identified significant shortcomings with its SIA (see attached advice). These shortcomings are consistent with feedback from the community that consultation undertaken during the preparation

of the EIS did not result in the community's issues and concerns being addressed or resolved. The Department emphasises that meeting relevant assessment criteria does not mean there is no social impact.

Some of the key social concerns that were raised at the Department's community meeting and in submissions include the:

- *loss of rural amenity and 'liveability' caused by expanded hours of operation and additional truck activity;*
- *loss of sense of place (a quiet, safe, rural environment) caused by expanded hours of operation and additional truck activity;*
- *general adverse effects on health and wellbeing (e.g. ability to sleep) caused by expanded hours of operation and additional truck activity; and*
- *property devaluation, especially for residents on and near Brandy Hill Drive, Seaham Road and part of Clarence Town Road.*

Department of Planning & Environment

Given the current operations of the Brandy Hill Quarry already impacts negatively on residents' quality of life, the proposed expansion of operation is of great concern. The rural residential areas of Brandy Hill and Seaham are idyllic places of peaceful retreat. The increased operations pose an unacceptable threat to the lifestyle that residents live in the area for. On behalf of those that I represent, there is no objection to the current quarry operations. I share residents concerns about safety and impacts on quality of life and object to the Project in its current form.

Kate Washington MP, NSW Parliament of Raymond Terrace, NSW – Page 2

The EIS makes no attempt to address the social impact of loss of amenity. There is no mention of health and wellbeing, sleep disturbance or the safety for other road users……..

…..Our quiet, clean lifestyle is already being impacted upon and will be seriously threatened by the Project. There has been no mention of devaluation of property which is causing angst amongst some in the community. Any loss of amenity brings an associated loss of property values. The potential for expansions of two quarries has already had a profound effect in suppressing property values. The cloud hanging over anyone selling has been the prospect of "Trucking Hell" for another 30 years. This cloud must be dispersed as soon as possible.

Brandy Hill and Seaham Action Group – Page 12-13

We chose to live in a rural area so that we had plenty of space to exercise and keep active, and because of a lack of infrastructure we are unable to make the most of our environment. And expansion to the Quarry will reduce our enjoyment and our safety even further.

Brandy Hill Holiday Pet Care

The cumulative impact of all these activities in a rural area constitutes a major assault on the amenity and quality of life for all who live in the surrounding high growth areas which are now predominantly urban. The massive increase in noise, risks to human safety and damage to roads and property is totally unacceptable….

Glenn Albrecht of Duns Creek, NSW (198287)

If this proposed expansion of Brandy Hill Quarry is approved, the remaining tranquil ambience of this beautiful suburb will largely be ruined forever, and the roads will become incredibly dangerous, noisy, and polluted for residents, local traffic, cyclists, pedestrians, children & parents at bus stops, and animals (family pets, farming stock, and wildlife) for decades to come. In my opinion, this is completely inappropriate and unacceptable!

Michael Freund of Brandy Hill, NSW – Page 1

Response

These submissions highlight the interaction between perceived traffic, operational and road noise and the potential for these aspects of the Project to change the existing way of life experienced by residents. These comments were considered in the review of submissions undertaken by Key Insights (2018) with the outcomes of this review presented in Appendix 3 of Key Insights (2018) and summarised in Section 4.8.4. The conclusion of the Social Impact Assessment reflects the need for a balanced approach to the ongoing operation of the Quarry with the importance of the operation to the local and regional economy balanced with the preservation of local amenity.

From the outset it should be noted that the Project does not propose 100 trucks per hour, with a maximum of 30 laden loads (60 movements) proposed for ongoing operations. The transportation route would also be split 75% / 25% to the south and west respectively. 30 laden loads per hour is the maximum level Hanson has required under existing operations and Hanson is comfortable to maintain this level as a maximum for ongoing operations. It should be recognised that many members of the community interpreted the EIS text to refer to up to 150 trucks per hour which is in fact not physically possible for the proposed Quarry configuration.

It should also be recognised that limits to transportation operations represent maximum levels that are expected during peak demand periods and would not occur during an average day at the Quarry. Perceptions of impact or expectations of operating conditions, as expressed in many submissions, have also resulted from the submitters being unfamiliar with the operation of the Quarry. It should be noted that commuters and people on the street observe and may hear heavy vehicles on the road but may not necessarily connect this to concrete production or the road maintenance that benefits the broader community.

Hanson has also recognised community concern regarding road safety and has been trialling a reduction to the speed of heavy vehicles involved in product despatch to 60km/hr on Brandy Hill Drive to reduce the risk of incidents and to reduce road noise. While it has been recognised that some drivers on this road may become frustrated at trucks driving at a slower speed, Hanson believes the benefits to road safety outweigh the occasional frustration and this would be improved once community members recognise this commitment from Hanson. A formal trial of the speed limit reduction would be undertaken within 6 months of commencement of the Project. The ongoing implementation of the speed trials would also depend on community feedback regarding the trial.

Hanson considers that the rural nature of the surrounding environment would not be significantly disrupted by the Project. The Quarry has been operating since 1983 and trucks have been a presence in the local community for a much longer period. It is also noted that proposed transport levels are much lower than expected by some in the community.

Several submissions expressed concerns about pedestrian access along Brandy Hill Drive with some suggestions that Hanson should provide a pedestrian pathway along Brandy Hill Drive to provide space for walking and rubbish collection. However, just because Hanson is a large

company does not mean that providing significant funds in such a manner is feasible. Given the existing and proposed use of the road by other traffic 100% funding of this infrastructure is not considered reasonable. Hanson is currently in negotiations with Port Stephens regarding what would be a reasonable contribution towards this infrastructure, as well as consideration of additional bus bays along the transport route.

As noted in Section 5.19, Hanson has paid $1.7 million towards road infrastructure and maintenance since 2013, when the extension was first proposed, through the existing agreement with Port Stephens Council. Ultimately the condition of the road and availability of space is a matter for Port Stephens Council to consider. Hanson would continue providing contributions to Port Stephens Council for road maintenance in this manner with the expectation that over $12 million would be contributed over the life of the Project.

It has also been recognised from review of the submission that ecological aspects of the surrounding landscape reflect the community perceptions of their home and local community. Impacts to keystone species such as Koala would be suitably mitigated, and where residual impacts remain, would be offset. The offsetting arrangement would be in addition to the ongoing management of the landscape within the Quarry and on the Hanson property as well as progressive rehabilitation. Commitments such as the proposed management of tree hollows (described in Section 5.4.4) demonstrate Hanson's willingness to ensure ecological outcomes are beneficial to those species using the habitat features of the vegetation surrounding the Quarry.

It is noted that there is concern amongst the community regarding the potential for the Project to change their way of life and perhaps their sense of the local community if the ongoing operation at the proposed level of production is approved. Consultation undertaken by Key Insights and review of the submissions indicates that many in the community do not oppose the Quarry but do oppose the large numbers of trucks and proposed impacts. Hanson has taken this concern into consideration when reviewing the Project and proposes a range of measures to avoid and to mitigate for these concerns. The most important of which has been to clarify proposed transportation levels.

Hanson has also taken into consideration the community concerns regarding health and wellbeing. Review of the Project has included reducing the proposed hourly traffic levels and a proposal to reduce the speed of trucks on Brandy Hill Drive in order to reduce the potential impacts from truck noise and risks to road safety. Transportation activities would be limited to no more than 30 laden heavy vehicles per hour but are likely to be much less during the majority of operating hours. In addition, the reduced speed of Hanson vehicles on Brandy Hill Drive would result in heavy vehicles generating less noise than other heavy vehicles on the road. Hanson has also lobbied RMS to review the speed limit on Clarence Town Road which has now been confirmed. A review of predicted dust dispersion modelling results indicates that dust dispersion would be consistent with existing dust dispersion over the life of the Project. Health aspects of the Project have been addressed in more detail in Section 5.14.

Based on the refinements to the Project identified in Section 3, Hanson is confident that operational impacts to local amenity can be managed to remain below levels that would be considered intrusive for the local community with this directly affecting social amenity. Hanson would also continue to manage driver behaviour through a Drivers Code of Conduct and through this management reduce road traffic noise as much as practically possible.

A review of local property prices and trends by Key Insights indicates that the local area is popular with families and older residents with property prices growing consistently. It is not considered likely that the Quarry operation would result in direct land use conflicts. Therefore, it is considered unlikely that property values would be significantly impacted. Hanson's experience with land use conflicts reflects this conclusion (see Section 5.9.5 for a more detailed discussion).

It is clear from the submissions received that the consultation process for the preparation of the EIS for the Project did not satisfy the expectations of the local community or local and State government. Hanson acknowledges that this may have led to misunderstandings about the Project and the impression of the Company ignoring the community. Hanson accepts that it will take some time and effort to build community respect and trust. It is intended that this process would be commenced through the Community and Stakeholder Engagement Plan (included as **Appendix 14**) that would be a condition of consent and approved by relevant parties. This plan outlines ongoing communication and engagement and describe the connections that would be established between the Quarry operation and the local community.

5.20.3 Social Impact Assessment

Representative Comment(s)

The Department requests that Hanson provide a revised SIA which, at a minimum:

a) responds to the potential social impacts of the project, and either proposes adequate mitigation measures or justification as to why no mitigation is warranted. Particular consideration should be given to the various measures put forward by the Brandy Hill & Seaham Action Group (e.g. restricted production and operating hours, construction of shared pathways and road safety measures). Proposed responses should follow the hierarchy of avoid, minimise and mitigate.

b) undertakes a more rigorous assessment of the likely significance of each impact. This assessment of significance should:

i) have regard to the likelihood, extent, duration and severity of each impact;

ii) have regard to the sensitivity of local receivers, their capacity to adapt to change and their level of concern; and

iii) involve affected community members in genuine engagement activities; and

c) identifies proposed mitigation measures and assesses their adequacy. Hanson should again involve relevant community members (i.e. those living nearby who may be affected by the project). Community engagement activities should be undertaken by a suitably qualified and experienced practitioner(s). Hanson should identify the name, qualifications, and experience of any practitioner(s).

Department of Planning & Environment

Social Impact Assessment (SIA) that identifies and discusses the social impacts on the communities of interest (Brandy Hill, Seaham, Wallalong, Woodville, Nelson Plains and Raymond Terrace) should be submitted. The SIA should include, but not necessarily be limited to, comments within this report below and assessment of the impacts as they relate to the demographics of people who live in the affected suburbs as noted.

Port Stephens Council

Response

A Social Impact Assessment has been prepared by Key Insights and is presented as **Appendix 3** with the outcomes summarised in Section 4.8. In summary, Key Insights concluded that the key issues were the proposed 24-hour operations and proposed increase to traffic levels on local roads and the potential for both direct and subsequent social impacts to occur. Importantly, Hanson has reviewed the proposed hours of operation and reduced the operating hours for some components where this is considered feasible and reasonable.

Key Insights did not make any commitment on behalf of Hanson, but rather made a series of recommendations that have been accepted by Hanson. Some of these have been implemented already and include the following.

- Formalising community interaction with a Community Consultative Committee.
- Committing to longer-term consultation through the Community and Stakeholder Engagement Plan.
- Acting as an advocate for the community by lobbying for a review of speed limits by RMS.
- Committing to strategies to distribute economic benefits amongst the local community.
- Formalising community support and sponsorship through a Community Support & Sponsorship Policy (**Appendix 13**). Under this policy, Hanson would contribute up to $15,000 each year to community-based projects.

Hanson's progress with implementing the social mitigation recommendations is discussed in detail in Section 4.8.8. As noted previously, residual environmental impacts from noise, dust and transportation have the potential to have socially disruptive outcomes. Hanson has recognised the concern in the community and has reviewed the Project to incorporate more thorough mitigation (summarised in the Statement of Commitments – see Section 6). It is considered likely that these commitments would be incorporated into conditions of consent or a range of post-approval management plans.

Representative Comment(s)

*It is unconscionable that such a small amount of time has been spent on **LOCAL** impact with most of the "Socio-Economic Impact Assessment" (appendix 17), assessing National and Regional impact. Based on GDP and national employment in quarrying in general!*

Very little attention is given to the truly local area other than a table of the survey results provided by Brandy Hill/Seaham Action.

As a community we cannot condone the changes we will have to make to our lifestyle in order for Hanson to "ensure a competitive market in the region".

From the point of view of AMENITY alone we feel that Hanson's expansion plans must be opposed.

Brandy Hill and Seaham Action Group – Page 13

Response

Comments such as this were considered by Key Insights during preparation of the Social Impact Assessment. While Key Insights (2018) considered the Socio-Economic Impact Assessment, the updated Social Impact Assessment was prepared to address the objectives of the DPE *Social Impact Assessment Guideline 2017* and provided updates to the proposed social mitigation measures as well as additional mitigation measures to address the potential impacts identified during the assessment.

It is acknowledged in the Social Impact Assessment (see Section 4.8.9 and Table 1 of Key Insights (2018)) that the geographic extent of social impacts would be more likely to occur within the immediate neighbourhood or at most within the Port Stephens Local Government Area. Therefore, the focus of the amended and proposed mitigation is on locally targeted actions to reduce the risk of significant adverse changes to local amenity.

Key Insights (2018) also notes that a significant proportion of social amenity impacts related to environmental impacts (that is, those associated with traffic, noise or air quality) with the social aspects of these impacts directly impacting the local way of life, community relationships or cohesion. It would therefore be important that Hanson be able to demonstrate and communicate to the local community successful environmental practices and achievement of the predicted minor or negligible levels of environmental impact. This would be achieved through the proposed inclusion of community feedback in the *Annual Review* document following an annual community meeting (see Section 4.8.8).

Representative Comment(s)

The SIA should also provide adequate assessment of the cumulative effects that discuss the following:

- *All quarry related sources of noise, including transport of product and the impacts and cumulative impacts on people*
- *The impacts of dust associated with all quarry related activities, including road dust as a result of trucks and dust coming of loads in transit, which has not been addressed in the Air Quality Impact Assessment (Appendix 11). The Air Quality Impact Assessment is considered insufficient due to the lack of baseline air quality data and inability to measure and manage quarry related air quality impacts and nil assessment of the impacts of diesel fume emissions.*
- *On site air quality monitoring equipment to measure baseline air quality (existing air quality and quarry generated air quality impacts) and ongoing measurement and management of quarry related contributions to air quality is recommended if approval is granted.*

Port Stephens Council

Response

It is acknowledged that environmental impacts resulting from transportation activities, noise and dust generation may have social aspects referred to generally as social amenity. However, where these impacts differ from more conceptual issues such as the community sense of place and way of life is that each of these amenity issues may be managed through conditions of consent and ongoing management and mitigation. Hanson has noted the social amenity issues raised in the

various submissions and has proposed a range of mitigation measures and ongoing management activities to reduce the risk of intrusive impacts to the local community. These measures are described in the EIS, throughout Section 4 and summarised in Section 6 in the Statement of Commitments.

It is also anticipated that through demonstrating compliance and acceptable management of these issues, Hanson would be recognised for responsible environmental management, for being accountable for the potential environmental and social impacts of the operation and would build trust with the local community.

5.20.4 Public Infrastructure

Representative Comment(s)

Identify public infrastructure, such as school bus stops and general public bus stops. Changes to speed limits on Clarence Town Road and Brandy Hill Drive are recommended.

Port Stephens Council

Response

Hanson has incorporated the location of schools in the transportation route presented in the Drivers Code of Conduct. This is intended to identify for drivers where school zones would apply and where the most care and consideration of pedestrians is required.

Appendix 11 presents the correspondence between Hanson and RMS initiating review of speed limits in the vicinity of the Quarry as well as confirmation of the outcomes of this review. The RMS review of the sign-posted speed limit on Clarence Town Road has concluded and the speed limit in the vicinity of the Quarry has been reduced to 80km/hr. There has been no official change to the speed limit on Brandy Hill Drive, however Hanson has been trialling a reduction to heavy vehicle speed limits on Brandy Hill Drive to 60km/hr for all Quarry-product despatch activities.

5.20.5 Community Consultation

Representative Comment(s)

I also wish to advise you that the residents of Giles road [sic] *had not been consulted or included in any community engagement activities with BHQ in the past 2½ years, and in fact are one of BHQ's closest neighbours*.

Bronwyn White of Seaham, NSW – Page 2

Truth is, there has been little consultation or inclusion until this expansion programme came out of the blue, and the community meeting requested a consultative committee.

(Name withheld) of Raymond Terrace, NSW (200567) – Page 4

Response

Hanson acknowledges that consultation during the preparation of the EIS did not meet the expectations of the local community or that of local or State government. Several of the recommendations of the Social Impact Assessment (Key Insights, 2018 – **Appendix 3**) related to formalising ongoing engagement with the community. Hanson has accepted these recommendations and would continue to support the Community Consultative Committee and implement the Community and Stakeholder Engagement Plan (see **Appendix 14**).

Ongoing engagement with the community would encourage a greater level of community familiarity with the operation. Through these processes, Hanson would progressively demonstrate accountability for operational activities and impacts and build trust with the community.

5.20.6 Social Mitigation and Voluntary Planning Agreement

Representative Comment(s)

Additional Request Dated 31 October 2018

"The Social Impact Assessment (SIA) forms the conclusion that "With proper mitigation strategies, the Brandy Hill Quarry Expansion Project will deliver a net socio-economic benefit to the LGA". Additionally, Table 1 Social Impact Overview identifies the severity of social impacts with and without mitigation. For example, page 38 of the SIA states "the intensity of potential community impacts is medium to high without mitigation. With mitigation and a VPA negotiated with the local community, these impacts can be reduced to low-medium level."

However, a number of the proposed mitigation strategies propose 'consideration' of different strategies post approval, with no commitment or timeframe for their implementation. The Department does not consider this approach to be acceptable. The Department requests that Hanson provide specific mitigation strategies that will be implemented to address the identified social impacts.

The community has identified that footpath and bus stop infrastructure would play a key role in mitigating safety and connectivity impacts of the proposal. The Department acknowledges that the provision of such infrastructure would require input and cooperation from Council, however, it is unclear what options are available or have been discussed. The Department requests that Hanson consult further with Council regarding options for the provision of footpath and/or bus stop infrastructure and report back to the Department on the outcome of this consultation.

Additionally, the RTS discusses the establishment of a VPA. In order to assess whether a Voluntary Planning Agreement could be an acceptable option, further information must be provided. The terms of the VPA should be negotiated with Council and must specify what is being offered. The Department would seek Council's consideration of the proposed VPA prior to finalising its assessment report);

Department of Planning & Environment

Response

Hanson has committed to the social mitigation recommendations presented in the Social Impact Assessment (SIA) prepared by Key Insights (**Appendix 3**). These recommendations and Hanson's progress implementing them is summarised in Section 4.8.8. Some of the recommendations related to matters for Hanson to consider for long-term implementation. It should be noted that the SIA was completed several months prior to the submission of the RTS and therefore progress against these commitments has been made prior to and since submission of that document. **Table 29** (Section 4.8.8) presents a summary of the social mitigation commitments and presents an overview of Hanson's progress to date in implementing these.

Consultation with community members since the submission of the RTS has highlighted that there is community interest in the Project beyond the people that have registered for CCC involvement. The commencement of informal community meetings involving Quarry personnel

(Have-a-Chat meetings) has been received positively and would continue under the Project. Hanson has made a range of refinements to the Project (see Section 3) including those intended to reduce potential social impacts and in direct response from community feedback. However, it is recognised that there is uncertainty in the community regarding potential environmental impacts, particularly concerning dust generation, noise and transportation. This influences community expectations of impact and risk which do not match the outcomes of assessment of mitigated outcomes presented for the Project. Hanson remains confident that proposed social mitigations are currently and would continue to be implemented successfully and result in (or improve upon) the outcomes expected from the Social Impact Assessment (Key Insights, 2018).

As discussed in Section 4.8.8, Hanson has considered how to formalise feedback and engagement with the community in a manner that ensures this feedback is provided to DPIE. It is proposed that each year, prior to the submission of the *Annual Review*, a Have-A-Chat meeting would be hosted, and the environmental monitoring outcomes and environmental performance presented to attendees. Feedback from that meeting would be presented in the *Annual Review* under the "Community" section. This process would be undertaken initially for three years after which time its use and benefits would be re-evaluated.

Through discussions with the local community Hanson has been able to inform and educate attendees of CCC and Have-A-Chat meetings regarding the proposed mitigations and how these would be implemented, monitored and regulated/audited over the life of the Project. It is considered that Hanson's implementation of mitigations and consultation to date are already starting to provide some degree of relief to the concerns expressed. This is not to disregard those in the community that remain opposed to the Project.

Hanson has met with officers of Port Stephens Council twice (15 November 2018 and 25 March 2019) to discuss the structure and terms of a VPA relating to transportation activities within the Port Stephens Local Government Area. Hanson has also commissioned 3P Planning Services to liaise with Port Stephens Council on the matter. Hanson has made several offers to Port Stephens Council regarding ongoing road maintenance contributions and the terms of a VPA. However, final agreement on these matters has not yet been reached. Regardless of the detail in these negotiations Hanson has offered to continue paying road maintenance contributions and proposes to contribute to the construction of a pathway on Brandy Hill Drive and bus bays on the transport route. The outcomes of this process were not final at the time this document was finalised. Hanson has informed the CCC members and attendees of Have-A-Chat meetings of progress with those discussions, and would continue to do so until they are finalised. It is anticipated that resolution of these matters would provide some relief to concerned community members, with some people already commenting on their support of Hanson's approach.

5.21 TRAFFIC AND TRANSPORT

5.21.1 Introduction

An assessment of the existing and proposed road network and the transportation operations under the Project was prepared by Intersect Traffic and presented as Appendix 8 of the EIS. Transportation was one of the key issues raised in public submissions with associated impacts from road noise, hours of operation and social impacts caused by changes to the community way of life all being dominant amongst the issues raised.

Concern in the community regarding transportation operations was also intensified by the similar but separate application by Daracon Quarries to extend the Martins Creek Quarry. The proposed extension to the Martins Creek Quarry resulted in local community concern regarding traffic in the vicinity of that quarry with some residents local to that quarry also providing submissions on the Project.

Intersect Traffic has prepared additional assessment of several intersections not considered for the EIS and assessed amendments to the preferred transport route made at the request of Port Stephens Council and Maitland City Council. The results of these assessments are presented in **Appendix 4** and **Appendix 5** and are summarised in Section 4.1. The following subsections present a response to concerns raised and requests for additional information regarding the proposed transport operations and potential impacts. It should be noted that there has been some confusion regarding proposed traffic levels for the Project, which has been reflected in some of the submissions reviewed. This confusion has been resolved here and in Section 2.11.

5.21.2 General

Representative Comment(s)

c) the TIA should consider potential impacts on the road network if a large order for materials was to occur for delivery in the Port Stephens local government area (e.g. the Williamtown RAAF base);

Department of Planning & Environment

Response

This request is speculative, given that the details of the order are not available. However, Hanson has recently fulfilled an order for the Williamtown RAAF base that would serve as an example of a large project of this kind. It should be noted that such orders are planned carefully between Hanson and the client to ensure that material is available as required and that conditional requirements for both the Quarry operation and the project that is using the material remain satisfied. For such a project Hanson would dedicate transport personnel to the work or the client may wish to use their own transport contractors. It is noted that any transport personnel involved in these projects would be required to sign and satisfy the Drivers Code of Conduct for the Quarry. Therefore, it is considered unlikely that large orders would significantly interrupt local traffic and driver behaviour would be managed in accordance with approved operations.

There is often not room available to stockpile material at the destination and as a result it is delivered as it is used. There may also be a requirement for material to be available early in the morning for the commencement of work at the destination. It is common for early morning deliveries to represent the peak of daily operations to satisfy such requirements. Drivers would operate on 'turn-around', which means that they complete the return trip between the Quarry and the destination until the order is satisfied. Hanson prefers that transport personnel are dedicated to a project in this way so that they may become familiar with the delivery requirements which improves efficiency.

For an order at the Williamtown RAAF base, drivers would complete the approximately 30-minute drive from the Quarry to the base, take 10 minutes to unload and return to the Quarry. Orders such as this generally require no more than approximately 800 to 1 000 tonnes of material in a day. This is equivalent to 24 to 30 laden loads spread over the day based on an average load of 33t. These projects may last for several months with daily material requirements increasing or decreasing based on progress at the destination, weather conditions or other factors.

The benefit of the current location for the Quarry is principally the proximity of the operation to the destination, be that at the Williamtown RAAF base, or sites in Newcastle, Maitland or the larger Hunter Region. It is estimated that 60% of laden loads are delivered to the Hanson concrete batching plants, with the closest plants located in Maitland, Raymond Terrace and Salamander Bay. This proximity reduces the transport costs of aggregate supply, that is ultimately reflected in the cost of infrastructure development projects or road maintenance (ultimately reflected in Council rates or State government budgets), or in the cost for the local supply of concrete for home renovations or other private purposes.

5.21.3 Existing Transport Impacts

Representative Comment(s)

Residents already hold concerns about the existing level of truck movements, including: safety concerns about the condition of local roads; the impact of additional trucks on already poor roads; noise and dust impacts; lack of a safe verge for pedestrian or cyclist use; lack of room for school buses to pull-off the Brandy Hill Drv compromising school students' safety.

Kate Washington MP, NSW Parliament of Raymond Terrace, NSW – Page 1

Response

Hanson acknowledges the concern in the community regarding road safety and road conditions and the potential for this to change if the Project were approved. However, the Quarry has been a part of the local community for over 35 years and it should be acknowledged that Brandy Hill Drive was originally built to service the Quarry with the subdivision and development of the area occurring subsequent to this. As reflected in consultation undertaken by Key Insights for the Social Impact Assessment (see Section 4.8.9 and **Appendix 3**), there are those in the community that are concerned about traffic but also those in the community that have lived in the area all their lives and acknowledge that trucks have always been present in the area. As described in Section 3, in light of the submissions received, Hanson has reviewed the proposed transportation operations. Hanson has been trialling a reduction to the speed of all Quarry-related product despatch vehicles to 60km/hr on Brandy Hill Drive and successfully lobbied RMS to review the sign-posted speed limit on Clarence Town Road as the speed of 100km/hr does not match the current use of the road or land use along the road.

It should also be noted that since consent was granted in 1983, Hanson has been paying road maintenance and development contributions to Port Stephens Council. It is estimated that approximately $9.6 million in contributions have been paid over the life of the existing Quarry. Hanson has not been provided with any indication of how these funds have been spent or distributed to the local area. The community concerns about road maintenance and funding have been considered by Hanson.

Hanson would also continue to manage transportation operations in accordance with a detailed Traffic Management Plan and Drivers Code of Conduct to guide driver behaviour and reduce the risk of incidents and improve the safety of local road users and pedestrians and minimise noise and dust impacts. Specific measures that would be included in these documents are detailed in Section 5.2.10, Section 3, Section 5.21.11 and **Appendix 12**.

The specific issues identified in this submission are addressed in the following subsections.

- Road safety including pedestrian and cyclist use of the local roads and school bus and school student safety – Section 5.21.6.
- Noise impacts of the Project – Section 5.15.
- Dust impacts of the Project – Section 5.3.

5.21.4 Transport Levels

Representative Comment(s)

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a) The TIA proposes a maximum of 904 vehicle trips per day. The Social and Noise Impact Assessments note that truck movements would be limited to 584 during the day and evening period, and 78 during the night. Hanson need to clarify the maximum total daily and peak hour truck movements that are being proposed. These figures should be consistent across the different assessments. Preferably, all assessments should be based on the proposed worst-case figures for both traffic flows and truck movements;

Department of Planning & Environment

Hanson's [sic] *proposes to ramp up from 380vtpd to 904vtpd, with a potential hourly rate increasing from 84vtph to 150vtph, which equates to a heavy quarry vehicle from Hanson's quarry passing a single point every 24 seconds.* […] *It will be an unconscionable act by the approval authority if this Project by Hanson were approved.*

Brandy Hill and Seaham Action Group – Page 17

If the 'existing' traffic is 380 vtpd and the expanded quarry traffic is 904 vtpd, then the increase in traffic to and from BHQ is 2.38 times greater than what is said to be 'existing' such that BHQ's proportion of heavy vehicle traffic on the road network will be 40.46%.

Voice of Wallalong and Woodville Inc. – Page 3

The Quarry was approved in 1983 and it is fair to say that even the current levels of production were not considered, given the approval contained and allowance for 27 Vehicle Movements a day. This figure is miles away from the current movements of around 340 vehicles per day and an increase of another 504 trucks per day to a total of 844 per day is almost laughable such is the scale of vehicle increase to what was projected as suitable to the area.

Darren Gilmour of Seaham, NSW – Page 1

Response

It is acknowledged that the traffic levels presented in the Traffic Impact Assessment were different to those presented in the Social Impact Assessment and in the Noise Impact Assessment for the Project and that this has caused some confusion for readers of the EIS and supporting documents.

Transportation activities are limited by the following factors which may be reflected in the conditions of consent.

- The physical capacity of loading and despatch and the operation of the weighbridge.
- The road and intersection capacity of the transportation route.
- Ensuring that the generation of road traffic noise is within the relevant criteria.

- Safety factors along the transportation route.
- Demand from the Quarry's clients.

Technical assessments of road and intersection capacity, road safety and road traffic noise were presented in the EIS and supporting documents. It is important that the assessment of potential impacts consider the worst-case scenario for the matter being considered. However, the worst-case scenario for road capacity may be different to the worst-case scenario for predicted road noise impacts. Consideration of limiting factors and the worst-case scenario allows Hanson to determine where mitigation measures are best applied with the most stringent limits determining levels for the operation (and reflected in conditions of consent). Reference to transport limits in the Traffic Impact Assessment refers to the level that resulted from the assessments of road and intersection capacity by Intersect Traffic. That level of traffic was assessed as being within the capacity of the road network including intersections and accounting for existing traffic levels. Reference to transport limits in the 2015 Noise and Vibration Impact Assessment and referred to in the Socio-Economic Impact Assessment reflected the results of the road traffic noise impact assessment undertaken by Vipac Engineers & Scientists.

Peak hourly truck movements are an important factor for assessment of road capacity and intersection operation. Hourly traffic volumes from the Quarry during peak periods (worst-case scenario) are restricted principally by the physical capability of loading and weighing operations required before departure. It has been Hanson's experience that during major orders from the Quarry the maximum rate of departure for vehicles is one every two minutes due to the operation of the weighbridge. Based on this limit, the peak hour traffic volumes during a major order would be 30 laden loads despatched from the Quarry (or 60 vehicles movements based on two-way travel). It should be noted that this level of truck despatch is consistent with the peak operations of the existing Quarry. That is, peak hourly despatch would not change under the Project.

The Traffic Impact Assessment refers to the construction and operation of a second weighbridge, which would provide a despatch capacity of 60 vehicles per hour. However, based on the feedback from the local community regarding traffic volumes, Hanson has reviewed proposed transport operations and considers that the current despatch level of 30 laden vehicles per hour would provide sufficient capacity for expected client demand requirements for the ongoing operation. This limit impacts the efficiency of the ongoing operation; however, Hanson is prepared to maintain this limit so that the hourly despatch levels for the ongoing operation would not change from the existing operations for peak operating periods.

Hanson and its consultants have comprehensively reviewed the proposed product despatch levels and remodelled road traffic noise generation (see Section 4.4 and the Updated Noise Impact Assessment provided as **Appendix 6**). While the outcomes of the assessment of road and intersection capacity has not changed, product despatch levels would be limited to a level that would limit the change to road traffic noise generation to negligible levels.

As described in the Project Summary (page v), the proposed traffic limits for the ongoing operation of the Brandy Hill Quarry are as follows.

- No more than 301 laden loads during day time (7:00am to 10:00pm).
- No more than 58 laden loads during the night time (10:00pm to 7:00am).

One laden load requires two movements or vehicle trips (that is, an inbound movement and an outbound movement).

It is noted that the proposed traffic levels are slightly higher than those presented in the EIS as a result of the predictive modelling undertaken by Vipac (2018a) and described in Section 4.4. This is principally due to reduced noise generated by heavy vehicles travelling at a slower speed than originally assessed. However, these limits are considered to reflect the Project as proposed and are restrictions to traffic levels that limit the change in noise levels to less than 2dB(A), a change in noise level that is not perceptible to the average human ear. Notwithstanding the above, Hanson would be happy to accept the traffic levels proposed in the EIS.

The proposed limits would represent maximum levels for Quarry-related product despatch. Ongoing operational planning would be limited principally by the annual limit of extraction (1.5Mtpa). However, day-to-day operations would not occur at the maximum level. Limits to maximum product despatch would guide Hanson's planning for short-term intensive demand projects. Hanson would be comfortable providing product despatch levels for each calendar month in the *Annual Review* each year.

5.21.5 Traffic Surveys

Representative Comment(s)

The traffic survey in the EIS uses outdated figures, with no consideration of future needs, stating the Council would be responsible to maintain, repair & widen the roadways as the traffic volumes increased.

(Name withheld) of Brandy Hill, NSW (200595) – Page 1

The traffic loads quoted in the EIS are all non-current, years old, including those even relative to the applicant's own business!

(Name withheld) of Raymond Terrace, NSW (200567) – Page 5

Response

At the time that the traffic assessment was undertaken, the survey data was current and used to predict future traffic levels. Under these predictions, Quarry traffic remains the same, while assumptions are made about the increase to other traffic on the road based on historical growth, land use in the area and expected changes such as ongoing residential development.

The data is therefore predicted for future dates and the capacity and performance of road infrastructure considered on this basis. This is standard practice in the industry and provides an indication of when infrastructure may cease to operate as intended.

5.21.6 Road Safety

Representative Comment(s)

Pedestrian and road safety is a key issue of concern for the community. The Department requests further consideration of measures that could be implemented to improve pedestrian and road safety in response to the proposed increase of trucks on local roads. Specific consideration should be given to Council's recommendation to provide contributions toward the construction of a pathway and bus stops along Brandy Hill Drive.

Department of Planning & Environment

The existing and projected traffic data modelling indicates that the performance of the road network will not be adversely impacted by this proposed development. The main concern from a traffic perspective is the potential impact on safety, which include:

- *Quarry access road / Brandy Hill Drive intersection with Clarence Town Road has inadequate sight distance for traffic approaching on Clarence Town from the east. If development consent is recommended, relocating the Quarry exit road to a safer location with adequate sight distance is recommended;*
- *The increased volume of heavy vehicles on Brandy Hill Drive will also impact negatively on local residents with increased risk of conflict between school bus services. Consideration should be given to providing improved separation of bus stops from traffic by providing bus laybys to allow school buses to pull off the road safely;*
- *The increased volume of heavy vehicles on Brandy Hill Drive will increase the safety risk to pedestrians and cyclists using the roadway. It is recommended that consideration is given to the provision of an off-road pathway allowing school children to access bus stops and for local residents to walk in relative safety; and*
- *The cumulative impact of the overall expansion is beyond the scope of comment from an individual council but is obviously an issue which requires serious consideration at the state level.*

Port Stephens Council

The safety of pedestrians (particularly school children), cyclists, buses using bus stops, residents entering and exiting BHD and Seaham Road from their driveways and from side streets, and also the general safety of all road users particularly at the many intersections between the quarry gate and the RMS controlled main highways, will be unacceptably diminished by any expansion in output.

Brandy Hill and Seaham Action Group – Page 3

What we draw attention to here are the residents' concerns about their future safety particularly on BH Drive given the projection of BHQ traffic increasing from 380 to a likely 904 vtpd. The volume of traffic generated by the quarry is as important as the type of traffic. And both the volume *and* type *of traffic generated by the expanded development warrant pedestrian protective measures.*

Given that the SEARs relevantly require

- *A description of the measures that would be implemented to avoid, minimize and if necessary, offset the potential impacts of the development including Projects for adaptive management and/or contingency plans to manage any significant risks to the environment.*
- *an assessment of potential traffic impacts on the safety and efficiency and safety of the road network.*
- *a detailed description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road networks in the surrounding area over the life of the development*

no remedy is proposed to meet the impacts of increased BH quarry traffic affecting pedestrian safety.

Voice of Wallalong and Woodville Inc. – Page 6-7

As the father to four children I am hugely concerned about the increase in truck movements any such expansion would incur. Each morning I stand at the bus stop with my two young daughters as the b-doubles thunder by. My teenage children have to stand at their bus stop unsupervised. Brandy Hill Drive is not a road upon which trucks and the community can safely co-exist. There is nowhere safe to walk along it and riding a bike safely along it is out of the question.

Andreas Krieger of Brandy Hill, NSW

Response

Hanson acknowledges the concern in the community regarding pedestrian and road user safety. The Traffic Impact Assessment (Intersect, 2017) considered road safety in terms of the intersection capacity and sight distance, confirming that the design of the road is suitable and safe for the proposed traffic levels.

It is noted from the consultation undertaken by Key Insights for the Social Impact Assessment (**Appendix 3**) that many long-term residents were conscious and accepting of the truck traffic on the local road network, noting that heavy vehicle traffic has historically been a feature of the local area. However, other residents are concerned at the level of heavy vehicle traffic using the local road network.

The measures to be implemented by Hanson to improve road safety in the vicinity of the Quarry involve the following components.

- Continuing to contribute to road infrastructure and maintenance.
- Managing the speed of heavy vehicles including initial trials limiting the speed of all trucks delivering Quarry material and returning to the Quarry along Brandy Hill Drive to 60km/hr. Hanson has also successfully lobbied RMS to amend the speed limit on Clarence Town Road from 100km/hr in the vicinity of the Quarry, to 80km/hr. Feedback from RMS on this matter is presented in **Appendix 11**.
- Continuing to manage driver behaviour through a Drivers Code of Conduct and update this code to reflect the proposed road safety and speed requirements as well as the locations of schools in the local area.

Each of these components is considered in the response below.

Road Infrastructure and Maintenance

The local area that includes the localities of Brandy Hill, Seaham, Wallalong and Woodville have historically been considered rural areas and have developed around a local road network that connects regional areas such as Clarence Town and Dungog with Newcastle, Maitland and the Pacific Motorway (via Raymond Terrace). Clarence Town Road is an arterial road that connects regional areas to Maitland. Properties along Clarence Town Road are generally large lot rural properties, some of which have been subject to subdivision and further development. Brandy Hill Drive was originally constructed to provide access from Brandy Hill Quarry to Raymond Terrace and, since that time, land along this road has been subdivided and sold for rural lifestyle residential living consisting of approximately five-acre blocks.

The movement of additional residents into the area has not been preceded by the development of infrastructure that the local community expects to be available. This includes road network infrastructure such as pathways and school bus stops. The local road network is not exclusively

used by Hanson and it is worth noting that traffic surveys for the Traffic Impact Assessment (see Section 5 of Intersect, 2017) identified that Quarry product delivery trucks constitute only 17% of the total heavy vehicle traffic on the road network. However, it is acknowledged that this has changed over time and with the changes occurring for the Martins Creek Quarry development.

The Quarry has been the subject of developer contributions since the original development consent was granted in 1983. The matter of ongoing contributions under the Project is addressed in detail in Section 5.19. However, in summary, Hanson would continue to provide a financial contribution to the provision and maintenance of road infrastructure in accordance with Section 7.11 (formerly Section 94) of the EP&A Act.

Hanson is proposing that these contributions would continue to be provided to Council directly. It is acknowledged that the allocation of contributions by Port Stephens Council would have a whole of community element and administrative costs. However, Hanson would expect that, within reason, contributions for the use of the local road network are used to improve and maintain the road network used by Hanson vehicles. Hanson conservatively estimates that since the operation commenced in 1983, approximately $9.6 million has been paid to Port Stephens Council in contributions. Ongoing contributions, if directed towards the local road network, would provide a significant proportion of the funds required to construct the pathways and bus stops that are being requested by the community to enhance road safety.

Vehicle Speed

Hanson has reviewed the submissions received by community members living on Brandy Hill Drive and noted the concerns regarding truck speed and potential conflicts with school buses. The Drivers Code of Conduct for the Quarry provides specific instruction regarding compliance with speed limits along the whole of the delivery route and also provides the locations of schools in the local area so that drivers are aware of school zones, or where particular care is required (see **Appendix 12**).

It is noted that the Quarry is not the only source of heavy vehicles on Brandy Hill Drive and this road has been the principal access route to Raymond Terrace and the Pacific Motorway since Brandy Hill Drive was constructed. Nonetheless, Hanson has been trialling a reduced speed limit of 60km/hr for all trucks delivering Quarry material and returning to the Quarry along Brandy Hill Drive from the current speed limit of 80km/hr, where it is safe and sensible to do so. Through the initial trial truck drivers have identified some frustrated drivers attempting to overtake heavy vehicles that are not travelling at the speed limit. A formal trial would be undertaken within 65 months of the commencement of the Project and involve noise monitoring along Brandy Hill Drive, interviews with drivers and the local community. A report on the trial would be prepared and presented to the local community through the CCC and Have-A-Chat meetings. The reduced speed limit would be implemented through the Drivers Code of Conduct with disciplinary procedures managed through this code.

It is anticipated that the reduced speed limit would reduce the risk of traffic incidents on Brandy Hill Drive. It is noted that other motorists using Brandy Hill Drive may become frustrated with a slow-moving truck and act to pass trucks when it is not appropriate. For this reason, the process is being trialled with ongoing implementation dependent on community feedback.

The community has also previously raised concerns about the noise generated by trucks on Brandy Hill Drive, particularly as trucks accelerate on the uphill sections of the approach to the Quarry. The reduced speed limit would result in reduced engine noise generated by trucks on Brandy Hill Drive and would be expected to improve noise experienced at properties along this road.

There are several lay-by school bus pick up/drop-off locations on Brandy Hill Drive that are used by local school children. While all truck drivers maintain a speed of 40km/hr and take care when passing school buses and during periods when school children are likely to be in the area, the reduced speed limit would reduce stopping times and improve the risk of conflicts between school buses and school children with trucks leaving or returning to the Quarry.

Driver induction processes will be modified to educate all drivers of the importance of maintaining the reduced speed limit on Brandy Hill Drive to:

- reduce the risk of road safety incidents;
- reduce road traffic noise; and
- reduce the risk of conflicts between trucks and school buses or school children.

Hanson has also successfully lobbied the RMS regarding the speed limit on Clarence Town Road. A copy of the letter sent by Hanson to the RMS requesting a review of a reduced speed limit and the RMS response to this letter is attached as **Appendix 11**. The sign-posted speed limit on Clarence Town Road in the vicinity of the Quarry has been reduced to 80km/hr.

Driver Behaviour

Hanson also recognises that the behaviour of drivers is an important element in road safety. The existing transportation operations are managed in accordance with a Drivers Code of Conduct. However, after consideration of feedback from the local community, the existing Drivers Code of Conduct has been updated to reflect greater emphasis on road safety particularly during school bus pick up and drop off periods (7:00am to 9:00am and 2:30pm to 4:00pm). A copy of the proposed Drivers Code of Conduct is provided in **Appendix 12** and the matters included in the code summarised in Section 5.21.11. All transport operators would be required to undergo an induction that includes signed agreement with the terms of the Drivers Code of Conduct. Disciplinary procedures under the Drivers Code of Conduct are principally managed through the complaint's procedures for the entire operation, with complaints recorded and investigated. The results of all investigations are provided to the complainant and would be published on the Hanson website. Under the Drivers Code of Conduct a driver that is the subject of a substantiated complaint would be disciplined with a three strikes policy ultimately resulting in drivers being banned from the Quarry.

Feedback from the local community has referred to 'unsafe' behaviours by drivers, such as the use of short cuts and excessive speed when approaching school buses. It should be clear that this behaviour is not endorsed by Hanson and drivers that engage in this behaviour will be disciplined. The local community is encouraged to report inappropriate behaviour to Hanson so these drivers may be disciplined.

5.21.7 Transport Route

Representative Comment(s)

b) traffic impacts have not been assessed for all potential truck routes. The Department requires an assessment of traffic impacts, including intersection analysis, for all potential truck routes until trucks reach the M1 motorway or New England Highway. Additionally, the estimated number of truck movements on each haulage route should be identified.

Department of Planning & Environment

Roads and Maritime request that the Traffic Impact Statement be updated to include an assessment of the impact of this development on the following intersections:

- *Raymond Terrace Road and Seaham Road, Nelsons Plains;*
- *Seaham Road, Newline Road, Port Stephens Street and William Bailey Street, Raymond Terrace; and*
- *William Bailey Street and Adelaide Street, Raymond Terrace.*

It is recommended that an updated Traffic Impact Statement be provided and include the following detail in relation to the proposed intersection:

- *current traffic counts for each intersection during the AM and PM peak traffic and peak quarry hours;*
- *the distribution of the trips generated by the proposed development at each intersection, shown diagrammatically;*
- *traffic analysis of the intersections for the following scenarios using Sidra or similar intersection analysis software, including submission of electronic files:*
  - *Existing traffic conditions;*
  - *Full development traffic conditions; and*
  - *Full development plus 10 years growth; and*
- *If any of the intersections reach a Level of Service E on any critical leg, identify under what conditions and what year they reach this.*

Roads and Maritime Services

Statements in Appendix 8 - Traffic Impact Assessment are misleading. The Executive Summary on page 5 states "The main haulage route used for transporting the extracted material from the site will not change with the majority of quarry traffic (heavy vehicle) heading south along Brandy Hill Drive to Seaham Road and onto the Pacific Highway at Raymond Terrace."

a. This is an extremely misleading statement given the fact that access to the Pacific Highway at Raymond Terrace is via Adelaide Street or Adelaide Street and Richardson Road. Both these routes are predominantly residential and also include schools, motels, childcare centres, and a nursing home.

b. This reports states that the 'primary haulage route is south via Brandy Hill Drive to Seaham Road to Adelaide Street, Raymond Terrace and then on to the Pacific Highway to Newcastle' on page 5. The photograph of the route provided does not include the Raymond Terrace area. The report includes no analysis of the traffic impact to the dozens residences along the route within Raymond Terrace.

(Name withheld) of Raymond Terrace, NSW (200593) – Page 2-3

Response

The proposed transport route to be used by the majority of vehicles to deliver Quarry products is presented in **Figure 9**. This route has been modified at the request of Port Stephens Council and Maitland City Council to indicate preferred travel. This modified route has been assessed by Intersect Traffic as described in Section 4.1. The route via Brandy Hill Drive has been the focus of assessment given the majority (approximately 75%) of traffic would use the route and the greatest change in traffic levels would be experienced on this road. The remaining approximately 25% of traffic would use an alternative route along Clarence Town Road towards Maitland and the New England Highway. Where it is required for local deliveries, heavy vehicles may need to access local roads.

An assessment of the predicted performance and capacity of the following intersections has been undertaken by Intersect Traffic with the outcomes provided as **Appendix 4** and **Appendix 5**. The results of the assessment are summarised in Section 4.1.

- Raymond Terrace Road / Seaham Road give way controlled rural seagull.
- William Bailey Street / Port Stephens Street / Newline Road roundabout.
- Adelaide Street / William Bailey Street signalised intersection.
- Adelaide Street / Richardson Road and Richardson Road / Pacific Highway.
- Melbourne Street / Lawes Street / Pitnacree Road.
- New England Highway / Melbourne Street.

In summary, it has been confirmed that product transportation activities under the Project would not significantly impact the local and state road network. Road maintenance contributions may be used to contribute to upgrade or maintenance of these intersections as needed.

Intersect Traffic (2018) considered it unreasonable and unnecessary to undertake intersection analysis of all intersections along the haulage routes to the sub-arterial and higher road network. Beyond the assessed intersections, Intersect Traffic (2018) observed the road network to be operating with uninterrupted flow and concluded that in light of existing use of the road network, the change to traffic levels would not significantly impact intersection efficiency.

Representative Comment(s)

It is clear that the BHQ traffic that does not use Brandy Hill Drive will disperse in other directions, some going down the two other routes of Clarence Town Road, Woodville and High Street, Wallalong. No split between day and night time traffic is given for those, and it is impossible to ascertain from the EIS' documentation just what proportion of quarry traffic will use these other routes and at what times. There is a complete failure by Hanson to assess quarry traffic impacts on those routes.

Voice of Wallalong and Woodville Inc. – Page 3

Response

This submission and comments received during meetings of the Community Consultative Committee reflect local resident concern about drivers taking short cuts or otherwise unnecessarily using local roads. Taking short cuts is strongly discouraged by Hanson. The Drivers Code of Conduct specifies the preferred transport route to be used by drivers to access the closest major arterial roads. Drivers are required to review and sign the Drivers Code of Conduct and abide by its requirements. The Drivers Code of Conduct also includes disciplinary conditions that reflect that drivers suspected of poor behaviour will be disciplined, given formal warning and if their behaviour does not improve, they will be removed from the site and face losing their jobs as a result.

Hanson stresses that should community members observe poor behaviour they are encouraged to report this to Hanson. Hanson takes all complaints very seriously and has developed a complaints management system to ensure complaints are investigated thoroughly.

Representative Comment(s)

Identify the heavy haulage routes for these heavy vehicle trips that are proposed through Maitland LGA.

What is the estimated number of heavy vehicle trips expected to travel on any identified haulage routes through Maitland (i.e. through the Maitland local government area).

Maitland City Council

Response

The existing transportation routes are identified in **Figure 9**. It is estimated that approximately 25% of heavy vehicles despatched from the Quarry would need to use the route along Clarence Town Road towards Maitland.

Representative Comment(s)

Request – Dated 1 February 2019

"Please can you confirm which haulage route the company is currently using when accessing the Pacific Highway? Heathbrae Roundabout or Richardson Road on-ramp? Or Both?"

Department of Planning and Environment

Response

Figure 9 presents the preferred transport route that would be incorporated into the following documents.

- Transport Management Plan.
- Drivers Code of Conduct.
- Driver induction procedures.

The preferred transport route varies from that originally presented in the EIS and RTS documents in two ways.

1. Hanson has reviewed the use of Richardson Road to access the Pacific Highway at Raymond Terrace. This route will be communicated to drivers as the Company's preference for transport activities accessing the Pacific Highway.

2. During a meeting with Maitland City Council (21 February 2019), officers of Council expressed their preference that heavy vehicles access the New England Highway via Flat Road and Melbourne Street rather than Belmore Road and the built up areas of Lorne. Hanson has reviewed transport activities in the direction of Maitland and agreed that this route will be included as the Company's preference.

Heavy vehicles associated with the Brandy Hill Quarry may be required to deliver materials to numerous locations. Therefore, it is important that the Company be permitted the flexibility to use roads in the local area (provided that weight and vehicle type restrictions are satisfied). The routes outlined in **Figure 9** are Hanson's preference for transportation activities and drivers will require a valid reason for the use of alternative routes (e.g. local deliveries).

Hanson has been addressing queries about the transport route from the local community and encourages community members to actively report vehicles that they feel are in the wrong location or are behaving inappropriately. Hanson recently banned a driver from the Brandy Hill Quarry as a result of careless behaviour and have stated its disciplinary policy in the Drivers Code of Conduct.

Representative Comment(s)

Request – Dated 21 March 2019

Your recent advice has nominated two primary haulages routes that have been recommended by the relevant local Councils. The Department is seeking information regarding four intersections along these routes that have not been discussed in the EIS / additional documentation, including:

- *Richardson Road / Adelaide Street and Richardson Road / Pacific Highway; and*
- *Pitnacree Rd / Melbourne Street and Melbourne Street / New England Highway.*

The Additional TIA stated:

Please note that it is considered unreasonable and unnecessary to undertake intersection analysis of all intersections along the haulage routes to the sub-arterial and higher road network as many intersections are observed to be operating with uninterrupted flow conditions and the increase in traffic is not significant enough to alter or impact on intersection efficiency. It is more realistic to assess traffic impacts on the major intersections along the haulage routes that may not be operating with uninterrupted flow conditions and thus likely to be the most sensitive to traffic volume increases.

The Department acknowledges this position. However, the Department seeks further information to support that the increase in traffic would not be significant enough to alter or impact intersection efficiency (i.e. that further analysis at these intersections is not required).:

Department of Planning and Environment

Response

Section 4.1.2 presents additional assessment at four intersections including:

- Richardson Road / Adelaide Street;
- Richardson Road / Pacific Highway;
- Pitnacree Road / Lawes Street / Melbourne Street; and
- Melbourne Street / New England Highway.

These routes were selected as the preferred route by the respective Councils, with Port Stephens Council seeking to avoid the more heavily trafficked sections of Adelaide Road and Maitland City Council preferring to avoid Belmore Road and the suburb of Lorn where there are more residences along the road. Intersect Traffic completed traffic modelling of the intersections at Pitnacree Rd / Lawes Street / Melbourne Street and Melbourne Street / New England Highway.

As described in Section 4.1, Intersect Traffic has concluded that the proposed Quarry traffic on both routes (at maximum hourly despatch of 30 laden trucks in an hour) would not adversely impact on the operation of intersections. Hanson has committed to include these routes as the preferred routes in the Drivers Code of Conduct and Traffic Management Plan for the Project.

5.21.8 Road Degradation

Representative Comment(s)

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*Hanson states in the EIS that their independent study of the road capabilities meets **minimum** standards, as set out in the Australian Standards 2009, however as any resident can attest the road condition, even at present usage, does not remain in a safe condition for any length of time. If current usage is operating at minimum levels then there is no room for the increase in traffic expected with the increased output. […] The road was originally constructed to cater for considerably less traffic than it presently deals with and has had little or minimal upgrade in the last 30 years.*

Brandy Hill and Seaham Action Group – Page 15

The proposed expansion does not outline considerations with respect to the impact an increase in heavy traffic volumes on Brandy Hill Drive / Seaham Road will have on the dynamics of local traffic flows, in particular significantly increased 'bunching' of heavy traffic on those roads. The dynamic flow conditions of local traffic flows through Brandy Hill Drive and onto Seaham Road will be adversely impacted […].

(Name withheld) of Seaham, NSW (200619) – Page 1

I also object to the destruction the trucks will create of the roads themselves making a dangerous surface to drive on. The local council seem to have difficulty enough to keep up with the patchwork fixes from the somestimes-massive [sic] *holes produces from the trucks already using the roads.*

Karolyn Walker of Seaham, NSW

The existing road network has been developed over many years to cater for passenger and light vehicles. It is evident after a few days of rain that the local roads are not capable of withstanding large volumes of heavy vehicles.

Considerable investment in upgrading the structural integrity of the roads will be required to ensure the safety of all road users.

John Beesley of Seaham, NSW – Page 1

I base my submission on the general poor state of the road surface. You don't appreciate the condition of the road travelling in a car at 80km an hour. On my bike ride this morning I counted 23 pot holes in the 4km stretch of Brandy Hill Drive with the potential of that figure doubling without urgent repair works being carried out over the next few weeks.

(Name withheld) of Brandy Hill, NSW (200710) – Page 1

Response

The reference to 'minimum standards' in the EIS was not explained clearly and appears to have been misinterpreted. It is not the case that the existing road network is currently at a minimum level in terms of road condition. In fact, the Traffic Impact Assessment noted that the existing road network would be suitable for the current and future use by heavy vehicles including those associated with the Quarry and that the roads may accept up to an additional 904 heavy vehicle movements each day before the road capacity and intersection would become unsatisfactory.

However, it was noted that the roads would require maintenance and progressive upgrading to meet new standards and increasing traffic volumes. Road maintenance in the vicinity of the Quarry is the responsibility of Port Stephens Council. As described in Section 5.19, Hanson currently pays contributions to Port Stephens Council for road maintenance and would continue to pay contributions in this manner. This is a relatively standard practice described in the *Port Stephens Fixed Development Contributions Plan 2006*.

5.21.9 Upgrades to Local Roads and Intersections

Representative Comment(s)

The following upgrade road works are recommended:

- *Raymond Terrace Road and Seaham Road intersection; and*
- *William Baily Street roundabout.*

Port Stephens Council

I am also concerned that the proposed lack of upgrades to the quarry/Clarance [sic] *Town Rd/Brandy Hill Dr is likely to cause incidents moving forward. The visibility from the northern side of Clarence Town Rd is limited and needs to be addressed to manage the increased traffic.*

Chris Nicholas of Brandy Hill, NSW

Response

Upgrades to the local road network are only warranted where it is demonstrated that the proposed activity would directly result in impacts that require significant investment by the relevant road authority for maintenance or construction in order to maintain road safety, the road capacity or performance. The assessment undertaken by Intersect Traffic (2018) (see **Appendix 4**) demonstrates that this is not the case under the Project. Intersect Traffic notes that an upgrade to the give way controlled rural seagull at the intersection of Raymond Terrace Road and Seaham Road would eventually be required but that this would not be directly related to Quarry traffic, rather it would result from anticipated background traffic level growth.

Hanson acknowledges that Port Stephens Council has a range of priorities for road maintenance and upgrades within the local government area and this is generally an area that requires significant budget management. Port Stephens Council may determine it is appropriate to use the contributions made by Hanson to fund local road or intersection upgrades.

Representative Comment(s)

In Council's submission for Martins Creek Quarry, the intersection of Brandy Hill Drive and Clarence Town Road is a safety concern. Brandy Hill Quarry have advised that they will be hauling east and west, there is no specific turning bays and this will pose a safety risk to all road users. Martins Creek Quarry links an upgrade of this intersection to the proposed expansion of the Brandy Hill Quarry, however Council is of the opinion that this should be a joint contribution between both quarries.

Port Stephens Council

Response

The Environmental Impact Statement for the proposed extension to the Martins Creek Quarry notes that the generation of additional traffic from that development may result in traffic delays at the intersection of Clarence Town Road and Brandy Hill Drive due to increased wait times for traffic turning right from Clarence Town Road on to Brandy Hill Drive. It was identified that it may be necessary for a channelised right hand turn treatment to be constructed at this intersection if that proposal proceeds. However, it is noted that this requirement is entirely as a result of the proposed changes at the Martins Creek Quarry and that trucks from the Brandy Hill Quarry do not use the right turn movement at this intersection. Therefore, any intersection upgrades would be the responsibility of Daracon Quarries.

Notwithstanding this, Hanson is aware that due to recent changes to the development approval for the Martins Creek Quarry, Daracon has indicated it will no longer use the route to the Pacific Highway via Brandy Hill Drive. However, there has to date been no formal withdrawal or change to the Martins Creek Quarry Project[5].

5.21.10 Transport Management Plan

Representative Comment(s)

Section 12.2 of the TIA notes that noise issues and residential amenity associated with heavy vehicle traffic could be controlled through the preparation of a traffic management plan. What measures are being proposed to mitigate impacts on residential amenity which might be included in a Traffic Management Plan?

Department of Planning & Environment

The advice that Hanson…." ..will operate a Driver Code of Conduct for the life of the Project. If required, a Traffic Management Plan will also be implemented for the Project." (SOC 315) goes nowhere for the residents in the several communities represented in VOWW. We are left in the dark of what that plan and code will contain.

Voice of Wallalong and Woodville Inc. – Page 4

Response

The primary objective of a Traffic Management Plan would be to provide a practical reference document for Quarry personnel that describes approved transport limits and transport routes, management measures and monitoring and ongoing requirements such as reporting and review of the plan. In summary, the plan is prepared to ensure that transport operations at the Quarry are undertaken in a manner that minimises impacts to other road users and residents.

[5] See https://www.planningportal.nsw.gov.au/major-projects/project/10051

Generally, a Traffic Management Plan would incorporate a Drivers Code of Conduct which is described in more detail in Section 4.4.3.

Consultation with Maitland City Council's Traffic Engineer Mr. Scott Henderson and Port Stephens Council's Traffic Engineer Mr Joe Gleeson has indicated that both Council officers accepted that a condition of consent requiring preparation of a Traffic Management Plan and Drivers Code of Conduct for the Quarry would alleviate their concerns with the project subject to both Councils having input into the preparation of these documents.

Representative Comment(s)

Council requests consideration of the following measures to mitigate the impacts of heavy vehicle road transport through the Maitland LGA:

1. *The quarry operator prepare a Transport Management Plan (TMP) to minimise the traffic impact on residents located along designated access routes to the quarry.*

   Reason: A statement of the conditions of travel to heavy vehicle operators travelling to/from the quarry;

2. *Maitland City Council seeks a road maintenance contribution associated with the heavy vehicle traffic generated by the quarry where heavy haulage routes are identified on local roads in the Maitland local government area.*

   Reason: Council's apply a road maintenance contribution to quarry operators that generate heavy vehicle traffic on Council's local road network;

3. *Self-imposed limit heavy vehicle travel speed during early hours through built areas of Largs, Bolwarra Heights, Bolwarra, and Lorn.*

   Reasons: (a) Heavy vehicle traffic associated with the quarry travelling at early hours through built up areas such as Bolwarral Bolwarra Heights where dwelling setbacks from the main road are 75m to 20m. (b) Empty trucks travelling to the quarry are more likely to cause higher traffic noise at higher speeds, (c) Heavy vehicle especially laden vehicles may cause excessive vibration on nearby dwellings;

4. *Travel conditions such as limiting travel speed by agreement where issues are raised through government agencies associated with school traffic, and child cares centres and aged care centres and the like along the identified access routes.*

   Reason: To ensure road safety around school, and ensure that environmental amenity is maintained;

5. *Limit heavy vehicle volumes to specific periods of the day to minimise impact on residents and road traffic service levels where required by road authorities.*

   Reason: Peak heavy vehicle traffic generation associated with the quarry may occur for extended periods during major projects may cause noise above statutory thresholds (e.g. Bolwarra/Bolwarra Heights) and may impact on the service levels of part of the road network (Melbourne Street East Maitland signals at Pitnacree Road and at New England Highway);

6. *Heavy vehicle operators that provide services to the quarry maintain their vehicle fleet on a regular basis, and the use of compression braking controlled, where appropriate, through a Transport Management Plan.*

   Reason: To reduce engine and exhaust noise;

7. *Encourage the quarry to use Performance Based Standards (PBS) heavy vehicles with routes for these vehicles approved through the National Heavy Vehicle Regulator (N HVR).*

   Reason: To minimise non-compliance of heavy vehicle operators with road and travel conditions;

8. *Heavy vehicles are permitted to operate at PBS Level l General Mass Limits (GML) up to but not exceeding 50.5 tonnes Gross Combination Mass along Belmore Road Lorn, Paterson Road Largs, Hinton Road subject to posted local restrictions.*

   Reason: General access on all roads includes Roads & Maritime Services controlled bridges subject to load limits that form part of the local road network in the Maitland local government area. A 50.5 tonne load limit applies to Belmore Bridge over the Hunter River, and Dunmore Bridge and Hinton Bridge over the Paterson River; and

9. *The quarry operator / heavy vehicle operators are to comply with the requirements of Roads and Maritime Services.*

   Reason: State roads are under the care and control of Roads & Maritime Services, and Roods & Maritime Services are asset owners of state bridges in the Maitland local government area.

Maitland City Council

Response

It should be noted that Hanson has estimated that approximately 25% of Quarry-related traffic would use a transportation route to the east of the Quarry and towards Maitland. This is equivalent to 75 laden vehicles per day (150 truck movements). On this basis, the focus of assessment has been on Brandy Hill Drive and the transportation route towards Raymond Terrace. Additional information addressing the issues raised by Maitland Shire Council is provided as follows.

- Hanson accepts that a Transport Management Plan would be required for the Project and would prepare this plan in consultation with Port Stephens Council, Maitland City Council and RMS.
- Hanson has addressed road maintenance contributions in Section 5.19, however, in summary, would be comfortable to discuss a contribution with Maitland City Council.
- It is noted that Hanson's contribution to road traffic on this route is limited. During early morning hours traffic congestion is common in the built up areas of Largs, Bolwarra Heights, Bolwarra, and Lorn and therefore it is often difficult for trucks to reach sign-posted speed limits. Hanson would be comfortable to discuss specific areas of concern with Maitland City Council such as areas with school traffic, child care centres and aged care centres, but considers that these uses of the road are considered by RMS in setting speed limits.

- Hanson would be comfortable to limit use of particular roads for short periods at the request of relevant road authorities. This is standard practice, however, would require consultation with the relevant road authorities.
- Hanson uses its own fleet of heavy vehicles which are regularly maintained. While contractors and service providers that use heavy vehicles are asked to review and abide by the Drivers Code of Conduct for the Quarry, this covers driver behaviour (including use of compression braking) but does not extend to the maintenance of vehicles. This is a matter for the RMS and NSW police with respect to road-worthy vehicle requirements.
- Hanson plans Quarry product transportation activities in accordance with the relevant road classification and is required to be consistent with these classifications. Hanson's combined operations require significant logistical management and it is in the Company's interest to ensure there is an effective management system in place to satisfy this.
- The transport operation would be described in the Transport Management Plan which would require Hanson to implement these activities in accordance with the relevant requirements of RMS.

Representative Comment(s)

Request – Dated 1 February 2019

"I note that Maitland Council has requested that truck movements are limited during specific periods of the day. The RTS advised that Hanson would be comfortable to limit movements for short periods at the request of the relevant road authority. The Department is seeking further information as to what these limitations would be. It appears there are particular streets of concern to Council (i.e. Melbourne Street and Pitnacree Road) and it is unclear whether Council is seeking these limitations to be on a permanent or occasional basis. The Department request Hanson clarify this matter with Council and confirm what they company's commitments are in relation to this matter."

Department of Planning and Environment

Response

During a meeting with representatives of Maitland Council on 21 February 2019, three key issues were discussed as follows.

1. Maitland Council requested that Hanson consider establishing a preference in transport management documentation for a route to the New England Highway that used Flat Road and Melbourne Street rather than Belmore Road through the suburb of Lorn.
2. Maitland Council requested that conditions of consent and traffic management documentation refer to the management of road-related complaints that may be received by Maitland Council in relation to heavy vehicle traffic along the transport routes used by the Quarry and commit Hanson to involvement in investigations where these are required.
3. Establishment of a reasonable road maintenance levy for vehicle use of Council-funded roads within the Maitland Local Government Area.

As discussed in Section 2.11, Hanson has agreed to preference the transport route via Flat Road and Melbourne Street and has included only this route in direction given to drivers and in the Drivers Code of Conduct. This route is discussed in more detail in Section 4.1.3. It was noted that Hanson cannot stop trucks from using alternate routes. Where there is a need to use an alternate route for delivery Hanson requires the flexibility to efficiently deliver its products. However, it was agreed (as was raised in discussions with the local community) that if a driver does not have good reason to deviate from the route in the Driver's Code of Conduct they will face disciplinary action which may result in them being refused at the Quarry or banned from delivering material for the Quarry.

Hanson agreed to assist Maitland Council to address heavy vehicle-related complaints that may have been initiated by trucks that are delivering product for the Quarry. However, it is noted that it would be difficult to differentiate Quarry-related trucks from other extractive industry vehicles and freight or other heavy vehicles that may use the roads within Maitland City Council. To address this issue, Hanson agreed to participate in broader transport management investigations initiated by Maitland City Council (or Port Stephens Council), with this involvement potentially requiring the following (depending on the nature of the complaint).

- Road noise monitoring campaigns, and if there are exceedances of government noise criteria relating to Hanson's operations, then additional mitigation measures would be discussed with Council.
- Temporarily limiting product transport on particular roads at the request of Council.
- Providing vehicle despatch route, timing and direction of travel data for the periods being investigated.
- Participating in trial speed reduction programs.

Additional commitments relating to traffic management were summarised in a draft condition of consent that was provided to Maitland Council to review on 13 March 2019. Feedback was received from Maitland Council on 11 April 2019 with the recommended condition provided as **Appendix 15**. It is noted that **Appendix 15** presents an indicative condition of consent, noting that DPIE will review and resolve final draft conditions of consent that are likely to be provided to Maitland Council and Hanson for comment before being finalised.

In addition, **Appendix 15** provides a recommended condition of consent relating to establishing a road maintenance levy for product despatch activities on Council-funded roads. Hanson has agreed to a contribution rate in accordance with the *Maitland City Wide Section 94 Contributions Plan 2016*, with the quantum of the contributions based on annual weighbridge records and distance travelled on Council-funded roads. The contribution would be paid in accordance with an invoice to be issued by Maitland City Council. The rate of contribution would increase in accordance with the CPI.

In summary, Hanson considers that it can assist Maitland City Council with reasonable requests for involvement in addressing community complaints concerning heavy vehicles. While Hanson is not the only company contributing to the heavy vehicles using the transport routes preferred for the Quarry, the need for certainty around the investigation of complaints is acknowledged. It is expected that through the final conditions of consent and a Traffic Management Plan (which would be prepared in consultation with Maitland City Council), the requirements of Council would be satisfied.

5.21.11 Truck Driver Behaviour

Representative Comment(s)

There is no point having a code of conduct and then having no way that the public can lodge complaints about specific vehicles. The complaint process should also ensure that if the complaint is about a truck from another quarry, then it is forwarded to the other quarry on behalf of the complainant.

Brandy Hill and Seaham Action Group – Page 5

Require all trucks that deliver to or from the quarry, and any other quarries that use these roads, to have a short, large and therefore easily readable unique ID on both sides and the back of the rear trailer, as used for coal mine vehicles. This is to facilitate the identification of vehicles that are subject to complaints from the public.

Brandy Hill and Seaham Action Group – Page 5

This past week on Thursday the 6th of April at approximately 8.30am, we gave way to a fully laden Hanson quarry truck (with trailer) which was travelling southbound along Seaham Road. We continued to follow this truck (behind another vehicle) only to observe that this truck did not continue onto Adelaide Street but turned onto Raymond Terrace Road.

We then further observed this Hanson Truck turn left onto Woodbury road [sic] *where it then continued through Woodbury and proceeded over the Tarro rail bridge. This haulage vehicle then turned left onto Anderson Drive where it then merged right onto the Tarro overpass to continue onto the New England Highway.*

It would be our understanding that specific haulage movements relating to BHQ would not be permitted to use this back road for haulage purposes. We regularly witness many haulage trucks using this specific back road but are unsure of the origin of most of these heavy vehicles.

Donna Lidbury of Nelsons Plains, NSW – Page 5

Not to mention Brandy Hill Drive has countless houses/ driveways running off it, buses stops [sic] *frequently on either side and don't always have the room to completely get off the road way, pushbike rides and no paths or anything for walkers* [sic]. […]

Not to mention the fact that it is clearly [sic], *obvious some trucks DON'T stick to the speed limits, and compression breaking!*

(Name withheld) of Brandy Hill, NSW (195268)

Also hauling out of Brandy Hill quarry are `cowboy' contractors, over whose code of behaviour Brandy Hill quarry management has no control.

These contractors at time show no regard for speed limits, travel in convoys and feel no obligation to reduce speed to allow residents to enter their properties with any degree of safety. On March 7th I lodged a complaint with quarry management regarding a driver who made no attempt to reduce his speed to allow me to enter my property in safety despite having slowed down and indicating that I wished to do so. -Had I found it necessary to suddenly apply the brakes this driver would have had the greatest difficulty in avoiding running over the top of me.

(Name withheld) of Brandy Hill, NSW (198299) – Page 1

Response

The above submissions reflect the range of concerns expressed by local residents regarding transport activities and driver behaviour. It should be noted that single instances of bad behaviour should not be used to generalise the behaviour of all drivers. For many of the Hanson drivers, this is a career and they take pride in the safe management of their vehicles with careful consideration of other road users and road rules. It is not uncommon for drivers of passenger vehicles to take risks around heavy vehicles by overtaking or changing lanes without consideration of the braking capacity and weight of the vehicles.

The tone of these submissions also highlights the work that Hanson needs to do to maintain the trust of the local community regarding the safety of its operations. This process starts with a comprehensive Drivers Code of Conduct which informs and requires drivers to adhere to road rules, general good practice and site-specific strategies to minimise impacts on adjoining properties and improve road safety. The Drivers Code of Conduct is attached as **Appendix 12** and includes the following measures.

- Information concerning transport inductions, toolbox meetings, licence requirements and general behaviour.
- Speed limits within and outside the Quarry.
- Management of fatigue for all transport personnel.
- Rules around the use of compression braking.
- Approved transport operating hours.
- Noise awareness for transport operators.
- Load covering.
- Adequately separating deliveries leaving the site (i.e. avoiding convoying).
- Primary transport routes.
- Awareness around residential and school areas.
- Management of breakdowns and incidents.
- Compliance management.
- Emergency contacts and numbers.

Particular reference would be made in the Drivers Code of Conduct to a three strikes enforcement strategy, identification of road safety issues on the main haulage routes from the Quarry and compliance with consent conditions.

Hanson would expect and accept a condition of consent requiring the preparation of a Traffic Management Plan and Drivers Code of Conduct for the Quarry with input from Port Stephens Council, Maitland City Council and RMS.

Hanson acknowledges the importance of a robust complaints process and would manage traffic related complaints through the complaint's procedures implemented across the entire operation. All complaints would be recorded and investigated with the results of the investigation provided to the complainant and published on the Hanson website. Under the Drivers Code of Conduct, a

driver that is the subject of a substantiated complaint would be disciplined with a three strikes policy ultimately resulting in the driver being removed from the Quarry and faced with losing their job.

Hanson trucks are clearly branded and easily identified and traffic related complaints regarding trucks from other quarries should be made directly to the appropriate entity. Hanson would assist to provide contact details for other operators, however it may be difficult to identify operators whose trucks are not clearly marked.

Representative Comment(s)

It is acknowledged that Hanson operates a fleet of trucks that set a high standard in presentation and operate with low noise emission. However, there are quite a few sub contactors that fall well short of acquiring and maintaining this standard, and consequently are contributors to noise generation through:

- *the use of exhaust brake systems,*
- *loose suspension,*
- *loose connections between the prime mover and trailer, and*
- *general body and panel noise*

The quarry operators cannot renege on their obligation to manage the subcontractors that haul product from their site.

Brandy Hill and Seaham Action Group – Page 28

Response

Hanson accepts responsibility for trucks leaving the Quarry under the chain of responsibility laws in NSW. The transport fleet used by Hanson is internally trained with regular 'toolbox' talk style meetings to discuss transportation management issues. However, some of the Quarry's customers use their own fleet or may require a single load in a smaller truck. Once a driver of any vehicle used for product despatch arrives at the Quarry, they are asked to review the Drivers Code of Conduct and sign their agreement to the terms. Disciplinary action is more difficult in these situations, however if Hanson is made aware of particular companies or vehicles disrupting the local community, it may stop receiving that vehicle at the Quarry or stop providing product to certain clients if their drivers are reflecting badly on the Quarry. Hanson considers that the sale of some product to these customers is not worth the disruption to local amenity and Hanson's longer term standing in the community.

Representative Comment(s)

The increased truck movements will leave more stones on the road which flick up and damage windscreens. These stones fall off the trucks after being loaded and constantly drop on the road. I currently have to change 1 windscreen a year due to the rocks left by the trucks at the present levels.

Christopher Graham of Nelson Plains, NSW

Response

Stone chips in windscreens are experienced on most major roads in NSW and are indicative of wear on the road more than they are indicative of hard rock aggregate spills. The Drivers Code of Conduct incorporates a mechanism for all drivers to brush down their vehicles prior to departing to remove debris. All loads that leave the Quarry should be covered to avoid spills. Drivers that do not abide by these rules face disciplinary action.

Representative Comment(s)

Our concerns are as follows;

- *Other than residents observing and complaining; who will be policing the correct use of haulage routes, speed limits, compression breaking etc.?*
- *How does BHQ project haulage movements and how is this monitored to ensure that the proponent would not be in breach of any consent conditions.*
- *Without changes to current excessive speed limits (along Seaham Road), there are higher risks to local traffic, agricultural activities, school children getting on an [sic] off bus stops, access to driveways.*
- *What measures will the RMS implement in regards to policing speed limits (i.e.: speed cameras etc.).*

Donna Lidbury of Nelsons Plains, NSW – Page 4

Response

As described in Section 9.1 of the Drivers Code of Conduct, Hanson undertakes internal audits of driver compliance every three months. It is not practical to check every driver on every trip; however random spot checks are designed to maintain compliance as much as is practical. It is true that to some extent Hanson relies on the community to report poor driver behaviour, however this is expected to be rare and not a regular event. Hanson reiterates that the Drivers Code of Conduct includes disciplinary procedures that may result in drivers losing their jobs.

Transportation planning is carefully undertaken with consideration of the following.

- Customer requirements regarding timing and frequency of delivery.
- The volume of material available for supply.
- Relevant transportation limits on the Quarry and on specific local roads.
- The availability of drivers and trucks to satisfy orders.

All heavy vehicles that enter and leave the Quarry need to sign in electronically and then tare out with a load at the weighbridge. Through this process, records are kept of the time a vehicle enters and leaves the Quarry. It is common for detailed records to be presented in an *Annual Review* report for State significant extractive industry developments.

Hanson is aware of community concerns regarding the existing speed limits. Policing of speed limits remains a matter for RMS or the NSW police, however Hanson is comfortable to assist where reasonable.

5.21.12 Cumulative Traffic Impacts

d) Section 11.1 of the TIA notes that traffic figures are not available for trucks proposed from the Martins Creek Quarry Expansion. These figures are available in the Martins Creek EIS (exhibited in 2016) and should be used to inform potential cumulative traffic impacts; and

Department of Planning & Environment

The impact of this development application on local residents and roads should be reviewed in conjunction with the proposed impact of the Martins Creek Quarry project which, if approved to expand its operation, would utilise a network of local roads which overlaps the roads used by the Brandy Hill Quarry.

Kate Washington MP, NSW Parliament of Raymond Terrace, NSW – Page 2

A SEARS requirement is….The EIS must include:

A detailed description of the development, including:

- *the likely interactions between the development and any other existing approved or proposed extractive industry development in the vicinity of the site (such as the Martins Creek Quarry).*

It is impossible, to determine from the respective quarries EIS' the likely interactions of both quarries' traffic.

Voice of Wallalong and Woodville Inc. – Page 9

MCQAG's mission statement also requires that we represent our members in regard to the cumulative impacts of both MCQ and Brandy Hills Quarry (BHQ). It is clear from the EIS on exhibition that limited if any attempts have been made to adequately assess the current and future potential impacts that both facilities have on the surrounding communities along the haulage route.

Martins Creek Quarry Action Group

No real assessment has been made of the cumulative impact of BHQ and Martins Creek Quarry peak traffic impacts. The worst case scenario should be assessed i.e. peak transport form MCQ and BHQ via Raymond Terrace.

(Name withheld) of Paterson, NSW (200642) – Page 2

The combined impact from the proposed changes to the expansions of both Martins Creek and Brandy Hill Quarries should have been notified to the public jointly and with sufficient time to reply and with sufficient assessment of the combined impact. We (my husband and I) were unaware of the Martins Creek proposal as we were away for almost all of the Exhibition period. Even so, we would have objected to the Martins Creek expansion based on the adverse impact we currently experience from quarry trucks, although not as vigorously as we do to the impact of both quarries expanding.

(Name withheld) of Raymond Terrace, NSW (200593) – Page 1

Response

It should be noted that the Martin Creek Quarry EIS and supporting documents were not available to Intersect Traffic Pty Ltd at the time that the Traffic Impact Assessment was prepared for the Project and therefore was not specifically referenced in that assessment. However, Daracon provided existing traffic levels for the period when traffic surveys for the Brandy Hill Quarry were undertaken which indicated between 5 and 78 laden loads per day. Based on that data, it was assumed that on average 8 laden loads per hour were using Brandy Hill Drive (16 movements).

The proposed traffic routes and distribution levels for the Martins Creek Quarry are presented in Section 8.2 (Figure 18) of the EIS for the Martins Creek Quarry and note that Route 2 for that operation would use Clarence Town Road, Brandy Hill Drive, Seaham Road and William Bailey Street to Adelaide Street. The percentage traffic distribution from the Martins Creek Quarry via Brandy Hill is 25.1% of total traffic from that development. Based on the proposed average daily traffic levels through Brandy Hill, it is estimated that 42 laden loads per day (84 movements) and 5-6 laden loads per hour (10-12 movements) would use Brandy Hill Drive and Seaham Road.

Based on this data, the Traffic Impact Assessment overestimated the total traffic contribution from the Martin's Creek Quarry and therefore provides a conservative estimate of cumulative impacts incorporating the operation of this development.

Notwithstanding this, Hanson is aware that due to recent changes to the development approval for the Martins Creek Quarry, Daracon has indicated it will no longer use the route to the Pacific Highway via Brandy Hill Drive.

In relation to the assessment of cumulative road noise, it is noted that Vipac relied upon estimates of existing and future traffic provided in the Traffic Impact Assessment prepared by Intersect Traffic. This incorporated the assumed conservative level of traffic as proposed in the traffic impact assessment for the Martin's Creek Quarry.

Representative Comment(s)

I object to the Brandy Hill quarry expansion due to the increased number of trucks that will need to use the roads around Maitland areas, in particular Paterson Road at Bolwarra Heights. I live in this area and will be adversely affected with regard to road safety, pedestrian safety, truck noise and increased airborne dust that will result from the increased truck movements that will occur if the expansion is approved.

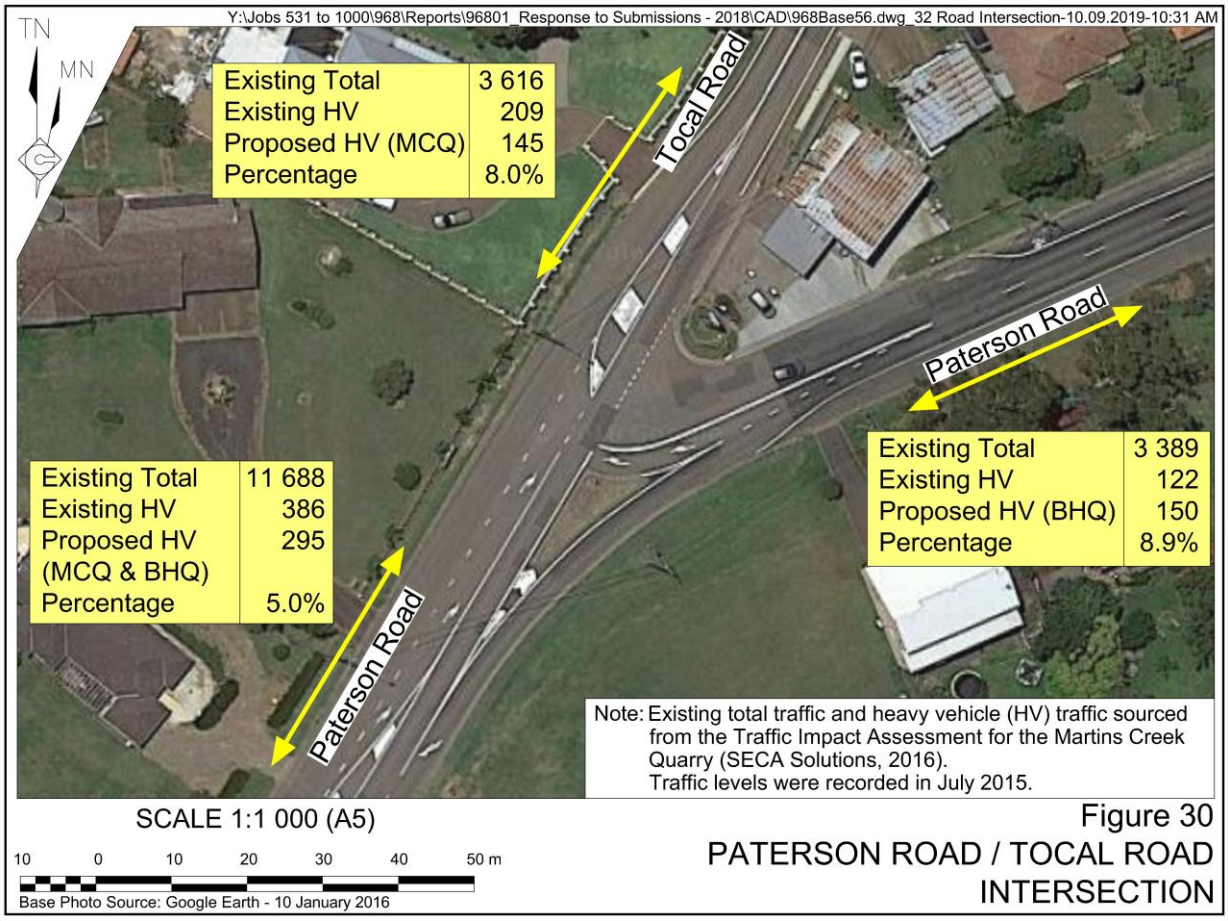
Martins Creek quarry is also applying to expand to 1.5 million tons per year, the cumulative affect of both these quarry expansion applications on Maitland roads from the intersection at Bolwarra Heights (Paterson and Tocal Rds) will be disastrous if both quarry expansion applications are approved, These two application must be considered together by the DoPE with regard to increased truck movements around the Maitland and surrounding areas.

Paul O'Donohue of Bolwarra Heights, NSW (199746)

Response

It should be noted that neither the Martins Creek Quarry nor the Brandy Hill Quarry proposals include plans to despatch all product via a single route. However, both proposals would result in an increase in heavy vehicle traffic accessing Maitland and the New England Highway via Bolwarra Heights, Bolwarra and Lorn.

Figure 30 presents the existing design of the intersection of Paterson Road and Tocal Road and indicative daily heavy vehicle use. It should be noted that the existing heavy vehicle use of the road network in this location includes the existing heavy vehicle use for the Martins Creek Quarry and the Brandy Hill Quarry. Therefore, existing heavy vehicle traffic and proposed heavy vehicle traffic is not directly comparable. Records of existing traffic at these locations were calculated for the *Traffic Impact Assessment for the Martins Creek Quarry* (Seca Solutions, 2016) with traffic surveys undertaken in July 2015. Therefore, it is likely that background traffic levels have increased since that time. The intersection design at the intersection of Paterson Road and Tocal Road is such that it encourages the flow of traffic in both directions, without the need for unnecessary queuing of vehicles.



It is evident from the proposed traffic levels and comparison to existing levels that heavy vehicle use of these roads would not comprise a significant proportion of existing traffic levels. It should be noted that Daracon Quarries has not progressed its expansion application and therefore traffic levels are a conservative estimate of future operations (subject to approval) and dependent on these being to the satisfaction of the consent authority for that application. Hanson does not expect that the Project would result in significant delays or risks in the vicinity of Bolwarra Heights, Bolwarra and Lorn. However, all Hanson transportation operations would remain subject to the Traffic Management Plan and Drivers Code of Conduct which would guide operations and driver behaviour. It is assumed that the same would be the case for operations at the Martins Creek Quarry.

5.21.13 Construction Traffic Management

Representative Comment(s)

Appropriate traffic measures are to be in place during the construction phase of the project to minimise the impacts of construction vehicles on traffic efficiency and road safety within the vicinity.

Roads and Maritime Services

Response

The initial stages of development (Stage 1 to 3) include the use of the existing processing infrastructure, road access and water management structures. Therefore, little additional construction would be required and construction traffic would not be generated during this time. It is proposed that the processing and stockpiling area would be relocated for the commencement of Stage 4 of operations (see **Figure 6**). This would require construction of new processing infrastructure during Stage 3 of operations so that operations can seamlessly transition to Stage 4 and new infrastructure.

It should be noted that Hanson are currently undertaking a similar construction phase at the Bass Point Quarry, whereby the existing processing plant is being used as the new infrastructure is constructed. Hanson estimate that the construction work at the Bass Point Quarry employs approximately 30 full time staff with a similar requirement expected for the Brandy Hill Quarry. These activities have not resulted in significant traffic disruption for the residents of Shell Cove and nearby Shellharbour.

As described in Section 2.17, Section 5.15.3 and **Table 7**, the construction operating hours would be limited to 7:00am to 6:00pm Monday to Friday and 7:00am to 5:00pm Saturday with no work on Sundays or Public Holidays. Based on Hanson's current experience at the Bass Point Quarry, the construction activities would not generate significant volumes of traffic, with the occasional requirement for an oversize and/or overmass load managed in accordance with Heavy Vehicle National Law that is legislated in NSW under the *Heavy Vehicle National Law (NSW) No 42a*.

All construction-related traffic activities would be required to satisfy the Transport Management Plan with transport operators required to complete an induction and where relevant, agree to abide by the Drivers Code of Conduct for the Quarry.

5.21.14 Intersection Sight Distance

Representative Comment(s)

As the site directly accesses Council roads, Council should have consideration for appropriate sight line distances in accordance with the relevant Australian Standards (i.e. AS2890:1:2004) and should be satisfied that the location of the access promotes safe vehicle movements.

Roads and Maritime Services

Response

The Traffic Impact Assessment (Intersect, 2017) notes that the two key intersections for the transport routes (Brandy Hill Drive / Seaham Road and Clarence Town Road / Brandy Hill Drive) satisfy the Austroads requirements as specified within the *Guide to Road Design (2009)*. Section 12.3 of the Traffic Impact Assessment notes the following with regard to intersection sight distances.

- The Brandy Hill Drive / Seaham Road intersection satisfies the safe intersection sight distance for the 80km/h speed zone (185m desirable or 170m minimum) in both directions as well as the stopping sight distance requirements (115m desirable and 105m minimum).
- The Clarence Town Road / Brandy Hill Drive intersection satisfies the safe intersection sight distance for the 100km/h speed zone (230m desirable or 215m minimum) to the west but is limited to the east and satisfies the minimum sight distance requirements only (215m). The stopping sight distance requirement (140m) is satisfied in both directions

Intersect (2017) reviewed the available traffic incident history and concluded that the limited (but still acceptable) sight distance to the east at the Clarence Town Road / Brandy Hill Drive intersection was not causing safety issues, as at the time of the assessment five accidents had been recorded in the vicinity of the intersection but only one occurred at the actual intersection and this incident did not involve heavy vehicles. The SIDRA modelling of the intersection also indicated that the level of service at the intersection would remain suitable under the Project and therefore additional road safety risks would not result from additional traffic.

Hanson lobbied RMS about reducing the speed limit on Clarence Town Road to 80km/hr, similar to the speed limit on Brandy Hill Drive. A copy of the letter sent by Hanson to the RMS requesting a review of a reduced speed limit and the RMS response to this letter is attached as **Appendix 11**. The sign-posted speed limit on Clarence Town Road in the vicinity of the Quarry has now been reduced to 80km/hr.

It is noted that the reduction to the speed limit also reduces the safe sight distance requirements (described in the Austroads *Guide to Road Design (2009)*) to 185m desirable or 170m minimum which would easily be satisfied at the Clarence Town Road / Brandy Hill Drive intersection for all traffic using this intersection. A reduction in the speed limit on Clarence Town Road would also reduce the potential for near misses, which are not recorded as traffic incidents but occur nonetheless. Near misses have been raised as a concern by the local community.

As the Clarence Town Road / Brandy Hill Drive intersection currently meets requirements for intersection sight distance and sight stopping distance, and the intersection capacity and level of service would be acceptable under the Project, any upgrade or relocation at the intersection is not warranted.

5.21.15 Comparison to Gunlake Quarry

Representative Comment(s)

The Gunlake quarry expansion that was refused yesterday by the PAC has many similarities to this EIS with 3 of the 4 reasons for refusal being in common. The summary from the PAC was as follows:

SCHEDULE 2

The Commission's reason for refusing the development application are:

1. *The Applicant has not given sufficient consideration to the provision of an appropriate upgrade to the local road network to account for the significant increase in heavy vehicle traffic movements in accordance with Austroads standards;*
2. *The Applicant has provided insufficient information to justify that the use of the local road network for haulage without compliance with Austroads standards would not create a potential road safety issue;*
3. *The Applicant has provided insufficient information to allow an accurate and genuine consideration of road versus rail based haulage; and*
4. *The Project as proposed will have unacceptable social impacts, including negative road safety outcomes, and is not in the public interest.*

This EIS has similar if not greater issues with inadequate provisions for the upgrade of the road network, the creation of a potential safety issue and that it will have unacceptable social impacts, and is not in the public interest.

Brandy Hill and Seaham Action Group – Page 33

Response

Hanson is aware of the Planning Assessment Commission determination of the Gunlake Quarry Expansion and notes that the DPIE Assessment Report originally recommended approval. Further to this, on 30 June 2017 the determination was overturned by a judgement of the Land and Environment Court (Gunlake Quarries Pty Limited v The Minister for Planning [2017] NSWLEC 1342) following negotiated agreement between the parties involved.

However, each operation should be considered on its merits and Hanson does not agree that the same level of mitigation and upgrade are required for the Project. It should be noted that the assessment completed for the Gunlake Quarry Expansion Project identified deficiencies in the existing road condition that are not evident for in the Brandy Hill locality. In addition, there is no question of alternative transportation options given the relatively remote location of the Quarry. Finally, the social impacts of the Project have been assessed by Key Insights as summarised in Section 4.8 and concluded that although Hanson has not consulted with the local community as was expected, the local community are aware of the importance of the operation to the local and regional economy and, while concerned by potential impacts to amenity and way of life, believe it is possible to find a balance as long as Hanson can demonstrate a good standard of environmental management and performance.

5.21.16 Heritage Bridges

Representative Comment(s)

Request – Dated 1 February 2019

"The traffic impact assessment notes that the western route towards Maitland is restricted due to difficulties crossing the Paterson River at Hinton and Woodville. Please can you provide further information on these difficulties and how the company proposes to manage the proposed additional truck movements in this direction."

Department of Planning and Environment

Response

The difficulties referred to in the Traffic Impact Assessment relate to the heritage listed wooden bridges at Hinton, Woodville and Morpeth. These wooden structures have specific requirements relating to weight and right of way. That is, loads on these bridges are limited to 50 tonnes and drivers must give way so that only one lane operates at a time. Only one heavy vehicle is permitted on these bridges at any one time.

The Driver's Code of Conduct (**Appendix 12**) contains advice for drivers on these restrictions and instructions relating to operations for deliveries travelling west towards Maitland. These bridges are also included on the route map. Only one of these bridges (Dunmore Bridge at Woodville) is on the preferred transport route. Hanson has been using this route for operations out of the Brandy Hill Quarry for decades with no identified impact. Changes to traffic levels from the Quarry are not expected to impact the bridges as the limit of one heavy vehicle on the bridge at any time would continue to be satisfied and weight and access restrictions met.

Please also note that Hanson plans transportation activities in accordance with the Heavy Vehicle National Laws (NSW equivalent) and network information for Performance-Based Standards (PBS) vehicles. Therefore, all drivers are required to be aware of restrictions relating to the network on which they are travelling.

5.22 VISUAL / LIGHTING

5.22.1 Visibility

A comprehensive Visual Impact Assessment was presented as Appendix 15 of the EIS and reviewed potential views of the Project, photo records and presented photomontage compositions to assess potential impact at residential locations. That assessment concluded that the Project would result in minimal changes to visual amenity. The key mitigation would be the construction of the 18m to 20m amenity barrier the south of the Quarry. Once vegetation has been established on this barrier, it would obscure potential views of the Quarry from Clarence Town Road and adjacent residences.

Representative Comment(s)

The land clearing of 49 hectares on top of current cleared land will leave a permanent scarp to the tree line and allow the mine to be seen by neighbours.

Geoffrey Pettett of Wingham, NSW – Page 2

For all the effort that may be put in to disguise the effects of mining, there can be no doubt that it has no visual appeal. I have grown many trees in our yard, to the detriment of what could be a lovely view of the hills, because we are in the direct line of sight to the quarry and it is not something I find attractive.

Tracy Wilkinson of Brandy Hill, NSW – Page 3

Response

Hanson recognises the importance of undertaking its activities in a manner that minimises visual impacts as much as possible. A Visual Impact Assessment for the Project and Quarry Site was undertaken by the Applicant to identify and document the existing surrounding visual landscape. The assessment identified potential visual impacts for each stage of the Project, with regard to visual harm within a defined Primary Visual Catchment.

The visual assessment adopted the commonly accepted visual methodology which consisted of identifying potential viewing platforms, photographic recordings, photomontage composition, and a visual impact assessment from these identified visual receptors. The assessment accounted for vegetation characteristics and location, land form geomorphology, view quality, visual absorption capacity and visual impact significance. Three main aspects of the Project were identified that could have the potential to alter the visual impact of the Project on the surrounding visual amenity. These would include the proposed expansion of the quarry footprint, the relocation of the quarry plant and the construction of a concrete batching plant.

The visual impact of the assessment was assessed using a two-part Visual Impact Assessment approach, inclusive of proposed mitigation measures to ameliorate any potential visual impacts pertaining to the Project. As a part of these measures, the Applicant would construct an 18m to 20m high amenity barrier. The amenity barrier would shield views of the Project from sensitive receptors in the eastern and southern viewing sectors. The Proponent also proposes to retain and maintain an existing vegetation buffer.

The assessment concludes that the visual impacts, inclusive of mitigation measures, would be very low, low, or moderate and the Project would be carried out in a manner that would ensure minimal impact on the existing local visual amenity.

It is not considered likely that residents would be able to see the progressive development of the Quarry Site and therefore these submissions are considered indicative of local community concerns rather than expected impacts.

5.22.2 Light Emissions

Representative Comment(s)

The radiant operational lighting is clearly visible from my residence during non daylight [sic] *hours.*

Carl Mackaway of Seaham, NSW – Page 2

The request for amended operating hours is just a pie in the sky idea and stupid. As mentioned previously the tree line will be opened up, flood lights will have to be installed to protect workers and allow a safe working environment. So all the lights on 24 hours can further disturb neighbours sleep time as well as the noise and truck/ loader/ plant movements.

Geoffrey Pettett of Wingham, NSW – Page 2

Response

Hanson would adopt a number of measures to minimise lighting impacts for the life of the Project. The key mitigation measures undertaken are as follows.

- All stationary/fixed lights would be directed downwards with the height of the light source minimised. Where appropriate, full cut-off fittings would be provided to ensure only localised areas are illuminated.
- All stationary/fixed lighting would be positioned to direct light away from the surrounding vegetation.
- All lighting within the Processing and Stockpiling Area would be positioned in locations/elevations that would maximise the illumination of the operational area yet minimises the amount of reflected light and light directed off site.
- Lighting would be selected to minimise the extent of bulbs generating blue/white light in favour of those generating yellow light. The selection would be guided largely by safety considerations.

The commitment to minimise lighting impacts is reflected in the Statement of Commitments (see Section 6).

5.23 WATER RESOURCES

5.23.1 Introduction

The submission provided by the Department of Primary Industries (now NRAR within DPIE) principally requested the preparation of a Water Management Plan in consultation with the Department and appropriate management of activities on waterfront land (that is, along Deadmans Creek and tributaries of Barties Creek).

The submission notes that matters regarding surface water management and groundwater management would be addressed though preparation of a Water Management Plan. That is, there are no issues that prevent approval of the application but that ongoing operations will require management. This includes development of a comprehensive monitoring program to inform the groundwater model and an adaptive management approach implemented through a Trigger Action Response Plan.

Hanson accepts the need for a Water Management Plan for the ongoing operation and would consult with NRAR during preparation of this plan. The Water Management Plan would include the following (at a minimum).

- A Site Water Balance.
- A description of likely licensing requirements and methods to assess annual requirements and water use.

- A Surface Water Management Plan that includes the following.
  - Baseline information on water flows and water quality in Deadmans Creek.
  - A description of the Water Management System including objectives and performance criteria.
  - An Erosion and Sediment Control Plan.
  - A comprehensive monitoring program.
- A Groundwater Management Plan that includes:
  - Baseline information on groundwater levels and groundwater quality in the vicinity of the Quarry.
  - A description of the Groundwater Management System including objectives and performance criteria.
  - A Trigger Action Response Plan for potential adverse groundwater impacts for surrounding groundwater users, groundwater quality and groundwater dependent ecosystems.
  - A comprehensive groundwater monitoring network including automatic water level loggers.

In addition, Hanson is comfortable to consult with NRAR during preparation of the Biodiversity and Rehabilitation Management Plan.

The following subsections provide additional information and clarification regarding water resource-related issues raised in the submissions.

5.23.2 Licensing Requirements

Representative Comment(s)

Section 3.9 of the Surface Water Assessment states 'Capture of surface water runoff within the quarry void is an authorised supply and is considered reliable'. It also states the development is consistent with the Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources (2009). Further information is required regarding this statement as clean water capture in excess of Maximum Harvestable Right may require licensing via the appropriate Water Access Licence (WAL) if not covered by an applicable exemption.

Department of Primary Industries

Request – Dated 1 February 2019

"Page 221 of the RTS states "Clean water capture is not proposed, as all clean water from upslope is directed away from the Quarry void via bunds at the top of the pit catchment." However, this is inconsistent with the SWIA which states that clean water which indicates that clean water would continue to be captured in the Western Dam during Stages 1 and 2. Please can you confirm that clean water would be captured during Stages 1 and 2."

Department of Planning and Environment

Response

Section 3.9 of the Surface Water Assessment (Martens & Associates, 2016a – Appendix 13A of the EIS) describes that surface water capture would only be from active parts of the Quarry in sedimentation basins located in the Quarry floor. Clean water capture would occur within the western dam during Stage 1 and Stage 2 of operations but would remain within the Maximum Harvestable Rights Capacity of the property. The Maximum Harvestable Right Dam Capacity of the property is calculated to be 50.85ML[6] and the capacity of the Western Dam is estimated to be 27.00ML. Other smaller dams within the Quarry Site contribute to a total dam capacity of 38.10ML, which is within the Maximum Harvestable Right Dam Capacity.

During all stages of operations clean water from upslope would be directed away from the Quarry void via bunds at the top of the pit catchment. Sedimentation basins only capture contaminated (sediment laden) runoff and are therefore exempt from harvestable rights dam capacity calculations and licencing in accordance with NSW Government Gazette 40 dated 31 March 2006 (pages 1628 to 1631). This was confirmed by the NSW Office of Water (now NRAR) in correspondence dated 20 May 2015 (refer to Attachment I of the Surface Water Assessment).

5.23.3 Streamflow Changes

Representative Comment(s)

Clarification is also required regarding catchment loss and impacts to streamflow (ML value) in the Williams River and Newcastle Water Sources under the water sharing plan, for all stages of the proposal.

Department of Primary Industries

Response

The catchment losses and flow changes associated with each stage of the Project are summarised in **Table 37**. This assessment is consistent with the methodology detailed in the Surface Water Assessment, and all assumptions are detailed as noted below **Table 37.** It should be noted that water would be captured in sedimentation basins where it would be stored and used on site, or if there is surplus water, it would be discharged to Deadmans Creek at approved discharge points once it reaches the water quality standards established in the Condition L2.2 of EPL 1879. This procedure is consistent with the existing approved operations.

This assessment demonstrates there would be reduced flows to Barties Creek due to minor catchment loss (11.6ha from a total catchment of 140.2ha), and overall increased flows to Deadmans Creek due to the discharge of surplus water from the Quarry, despite the catchment loss.

Under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009*:

- Deadmans Creek flows to Williams River downstream of Seaham Weir, and forms part of the *Williams River Water Source*; and
- Barties Creek flows to Hunter River, and forms part of the *Newcastle Water Source*.

[6] Calculation made using the WaterNSW Maximum Harvestable Right Calculator

Table 37
Catchment and Flow Changes to Receiving Environments

	Deadmans Creek Catchment				Barties Creek Catchment	
Stage	**Site Water Balance (ML/yr)** [1]	**Catchment Area Change (ha)** [2]	**Catchment Flow Change (ML/yr)** [3]	**Overall Flow Change (ML/yr)** [4]	**Catchment Area Change (ha)** [2]	**Catchment/ Overall Flow Change (ML/yr)** [3 5]
Stage 1	181	-5.4	-10	171	-1.4	-3
Stage 2	410	-7.3	-14	396	-9.3	-17
Stage 3	587	-14.2	-27	560	-11.6	-22
Stage 4	792	-31.5	-59	733	-11.6	-22
Stage 5	1031	-43.4	-81	950	-11.6	-22

Notes

1. Based on average year conditions as per Table 22 of the Surface Water Assessment. Note all site surplus flows are to Deadmans Creek.
2. Catchment changes are shown in Attachment B of the Surface Water Assessment.
3. Catchment flow = catchment area x average rainfall (934 mm/yr) x runoff coefficient (0.2) / units conversion factor (100).
4. Overall flow change = site water balance + catchment flow change.
5. No site waters are discharged to the Barties Creek catchment as part of the Project, hence the overall flow change is only based on the catchment flow change.

Streamflow estimates in these rivers are unavailable downstream of the Quarry but would be several orders of magnitude higher than the flow changes due to the Project. The magnitude of the changes to annual flows due to the Project are considered negligible compared to annual stream flows in Williams River and Hunter River. Further, Williams River downstream of Seaham Weir and Hunter River are connected and are both tidally influenced. There will be an overall increase to surface water flow volumes to this river system as a result of the proposed development.

5.23.4 Surface Water Management

Representative Comment(s)

Clarification of the sediment basin design (i.e. 'Type C' or 'Type F' or 'Type D') for each of the existing sediment basins (i.e. northern, eastern, basins 1, 2 and polishing basin 3) and the proposed sediment basins is required. If the existing or proposed basins are designed as Type C the proponent will need to provide justification that this is an appropriate design criterion.

The length of the management period for each of the sediment basins needs to be specified.

Environment Protection Agency

Response

The Surface Water Assessment provides details of sedimentation basin designs for both 'Type C' and 'Type F' basins in accordance with Landcom (2004), *Managing Urban Stormwater: Soils & Construction*, and Department of Environment & Climate Change NSW (DECC 2008), *Managing Urban Stormwater Soils & Construction Volume 2E Mines and Quarries.*

All sedimentation basins would be designed and managed as Type F basins to provide a conservative capacity for stormwater capture. The existing production and stockpile area sedimentation basins, which are currently sized as Type C basins, would be upgraded as part of the Stage 1 works, as they would form part of the proposed treatment sequence and are currently inadequately sized to be Type F basins. It should be noted that all sedimentation basins (apart from the existing production and stockpile area basins) are sized in the surface water management plans as Type F basins (Attachment B of the Surface Water Assessment).

Table 38 is adapted from Table 5 of the Surface Water Assessment and details Type F sedimentation basin requirements. Details for the proposed length of management for each basin have been added as requested. In addition, the Project would include a site-specific weather station to record site rainfall. This rainfall monitoring would enable sediment basin design criteria to be monitored and can be used to inform design changes based on site-specific rainfall.

Table 38
'Type F' Sedimentation Basin Requirements

Stage	Total Volume (ML)	Settling Volume (ML)	Storage Volume (ML)	Indicative Dimensions (m)	Surplus Water Discharge Point [1]	Management Period (years)
Production & Stockpile Area (Stages 1-3) [2]	11.5	7.7	3.8	166 x 55 x 1.3	DP1	18
Quarry (Stage 1)	17.2	11.5	5.7	121 x 40 x 3.5	DP2	6
Quarry (Stage 2)	26.9	17.9	9.0	152 x 51 x 3.5	DP2	6
Quarry (Stage 3)	30.5	20.3	10.2	162 x 54 x 3.5	DP1	6
Production & Stockpile Area (Stages 4-5)[3]	13.3	8.9	4.4	141 x 47 x 2.0	DP1 [4]	12
Quarry (Stage 4)	42.6	28.4	14.2	191 x 64 x 3.5	DP3	6
Quarry (Stage 5)	50.9	33.9	17.0	167 x 56 x 5.5	DP3	6

Notes

1. Surplus water is any remaining after reuse demands have been satisfied. Refer to Section 4 of the Surface Water Assessment for site water balance and Section 3.6 for discharge details.
2. These basins are the existing southern sedimentation basins (sedimentation basin 1, sedimentation basin 2 and polishing basin 3). These basins require upgraded capacity as part of the Stage 1 works, and effectively act as a single basin.
3. Once the Production and Stockpile Area is relocated (Stage 4), sedimentation basin 1, sedimentation basin 2 and polishing basin 3 will be decommissioned and a new sedimentation basin constructed (see **Figure 6**).
4. DP1 is relocated during Stage 4 of works. Refer to Section 3.6 of the Surface Water Assessment.

Source: Modified after Martens (2016a) – Table 5

5.23.5 Sediment Dam Overflow

Representative Comment(s)

The proponent should specify the average annual overflow frequency from each sediment basin during the life of the project to more clearly represent the number of overflow events likely to occur annually.

Environment Protection Agency

Response

Given the design of the Quarry and the fact that the Quarry floor is at least 5m below ground level for all stages, there is no possibility that the sedimentation basins within the active extraction area would overflow. Any discharge from the active extraction areas would be controlled by pumps and the volume of water discharged would be measured.

The only sedimentation basins which are able to overflow are the Production and Stockpile Area sedimentation basins. As presented in **Table 38**, for Stages 1 to 3 these include the existing southern sedimentation basins (which are to be upgraded as part of the Stage 1 works, and act as a single basin for assessment purposes) and for Stages 4 and 5, the plant sedimentation basin. As described in Section 3.6 of the Surface Water Assessment, these sedimentation basins would discharge via a licenced discharge point (DP1) into the unnamed drainage path running to Deadmans Creek. Monthly monitoring of these sedimentation basins would be undertaken to record water quality and to ensure that water quality in these basins satisfies the water quality criteria established in EPL 1879.

Water transfers are proposed throughout the life of the Quarry to maximise reuse and minimise uncontrolled overflow. The proposed transfer and reuse strategy, described in Section 3.7 of the Surface Water Assessment, will ensure that all basins and dams are at capacity before any discharge or overflow is to occur.

All sedimentation basins are to be sized as 'Type F' basins and have been designed with a 5-day 90th percentile rainfall depth of 51.8 mm based on data from Newcastle (closest available reference location) and based on Landcom (2004) and DECC (2008), as detailed in Section 3.3.4 of the Surface Water Assessment. The 5-day 90th percentile rainfall depth at the Quarry is 35.3mm based on daily rainfall data from 1967 to 2015 at Tocal (BOM station 061250), and hence basins have more capacity than required due to there being higher rainfall at Newcastle. Review of the Tocal rainfall dataset concludes there are, on average, 21 occasions of 5-day rainfall totals of more than 51.8mm per year. Based on this data, the Production and Stockpile Area sedimentation basins would overflow 21 times per year on average. The transfer and reuse strategy would minimise basin overflows. No other site sedimentation basins would be capable of overflow.

In addition, the EPA has advised that water application rates would be likely to increase due to increased dust suppression requirements. This would increase water demand, however it is not expected to change the site water balance from surplus to deficit (minimum surplus of 181ML/year using average rainfall). The estimate of 21 overflows per year is therefore conservative and actual overflows would likely occur less frequently.

5.23.6 Water Discharge

Representative Comment(s)

The proponent needs to detail measures that will be put in place to ensure the increased discharges will not cause increased erosion in downstream watercourses.

Environment Protection Agency

Response

Section 6.5 of the Surface Water Assessment outlines the excess water discharge regime. By design, it is proposed that water bodies are to discharge for 24 hours continuously on wet days only, in order to, as much as possible, mimic natural conditions, and to prevent erosion impacts downstream by ensuring outflows are below the channel forming discharge flow rate.

There are on average 128 wet days per year based on daily rainfall data from 1967 – 2015 at Tocal (BOM station 061250). The lowest number of wet days per year on record is 75 days in 1968, and the highest number of wet days / year on record is 171 days in 1999. Sediment basin discharge frequencies would therefore likely be 128 discharges per year on average, and between 75 and 171 discharges per year depending on annual rainfall conditions.

Table 39 is adapted from Table 34 of the Surface Water Assessment and summarises discharge flow rates for each stage of the proposal and for dry, average and wet conditions.

Table 39
All Stages Discharge Flow Rates for
Average, 95th Percentile Dry and 95th Percentile Wet Conditions

Stage	Discharge Flow Rates (L/s) – excess / (deficit)		
	95th Percentile Dry Conditions [1]	Average Conditions [2]	95th Percentile Wet Conditions [3]
Stage 1	(8.6)	16.4	27.6
Stage 2	21.6	37.2	45.8
Stage 3	46.8	53.2	59.5
Stage 4	65.1	71.8	79.5
Stage 5	98.6	93.5	97.5

Notes
1. Assumes 24-hour discharge for 75 days per year, based on the lowest number of wet days / year on record (1968)
2. Assumes 24-hour discharge for 128 days per year, based on the average number of wet days / year on record.
3. Assumes 24-hour discharge for 171 days per year, based on the highest number of wet days / year on record (1999).

Section 6.4 of the Surface Water Assessment provides modelling results to demonstrate the channel forming discharge flow rate in Deadmans Creek is 3.45m^3/s, or 3 450L/s. The largest flow rate in **Table 39** is 98.6L/s which is < 3% of the channel forming discharge flow rate, and therefore erosion impacts are not expected.

All site discharge points would be constructed in accordance with best practice design standards (Landcom 2004) including appropriately sized headwall, rip-rap and scour protection aprons. The design for these outlets would be provided prior to construction and would ensure the risks of localised erosion are minimised. **Plate 4** displays the existing conditions at discharge point DP3.

Plate 4 Discharge Point DP3 (photo date 26 Oct 2017 REF E968B_032)

5.23.7 Stormwater Management

Representative Comment(s)

Treatment and disposal of quarry generated water and naturally occurring water through rain or seepage must be considered. The modelling provided in the Development Application uses rainfall rates on 1 and 2 year maximum levels. With the already proven effects of global warming resulting in increased intensity and frequency of major storm events the groundwater run off rates in Deadmans Creek should be based on 100 year storm events not 1 and 2 year events.

John Beesley of Seaham, NSW - Page 2

The assumption that water quantity will not increase is incorrect. With the stripping of vegetation from further parts of the site, time of concentration is shortened, which means that for some storm events, flows will increase dramatically. The applicant should submit detailed stormwater calculations for pre and post developed scenarios to show this. The calculations shown are incomplete and misleading.

(Name withheld) of Kotara, NSW (200549) - Page 1

Response

The Project would increase the Quarry footprint and therefore the hardstand area, which reduces the volume of rainfall infiltration and increases the volume of rainfall runoff. These stormwater volumes have been calculated as part of the site water balance assessment (Section 4.1.2 of the Surface Water Assessment). However, increased surface water volumes would be captured by the Quarry void, which drains internally and would not enable overflow of rainfall runoff, even in extreme flood events. All discharge flows from the Quarry void would be controlled by pump as per the Surface Water Assessment and as further detailed at Section 5.23.6 in response to the EPA submission. The Quarry void effectively acts as a regional detention basin by significantly

attenuating the increased surface water flows and controlling discharge. Further, due to the catchment loss associated with the increased Quarry disturbance, there will be less uncontrolled runoff from the Hanson property. Therefore, despite increased surface water volumes, peak outflows would decrease due to the proposed surface water management system including controlled discharge (pumping) from the Quarry void.

The proposed rate at which water would be pumped from the Quarry floor (not the internal pit runoff rates) were assessed against the channel forming discharge flow rate, which is the 1 in 2-year Average Recurrence Interval (ARI) peak flow rate, to assess erosion potential.

Design to the 100 year ARI flood event is unnecessary for this operation as all sedimentation basins have been designed to manage a 'design rainfall event' in accordance with best practice engineering standards described in *Managing Urban Stormwater: Soils & Construction*, Landcom (2004), and the DECC NSW guideline *Managing Urban Stormwater Soils & Construction Volume 2E Mines and Quarries* (DECC 2008). The design rainfall event is the 5-day 90th percentile level described in the Landcom (2004). The closest reference for the Quarry is Newcastle that has a rainfall depth of 51.8mm in Landcom (2004).

In addition, it should be noted that the following design and management measures would be implemented.

- Hanson has also chosen to construct sedimentation basins sized as Type F basins (see Section 5.23.4), which allow for a conservatively larger capacity for storage and settling of sediments.
- Hanson would continue to implement a water transfer strategy that would maximise capacity for on-site use and in the event of significant rainfall.
- Hanson would also continue the existing program of monthly water monitoring in the southern sedimentation dams to guide management of water quality in these basins.

Regardless, if a significant rainfall event were to occur (i.e. above the design rainfall level of 51.8mm for this locality and including a 100 year ARI flood event), it would be highly unlikely that the Quarry void would overflow and it is recognised that if rainfall exceeds the design rainfall level, the local environment would be subject to significant sediment laden overland flow and any water overflowing from the Quarry would be of a similar quality.

Representative Comment(s)

I am not against the expansion but have concerns about the extra water runoff created by the clearing of trees for the development. I have contacted the quarry already in regards to a wall they have built which I believe has now interfered with the natural flow of the water and redirected the water from their land on my houses. [...] *I would like to be consulted in the approval process to ensure adequate planning takes place to ensure this isn't an issue…… there may need to be more piping on Clarence Town Road to allow for extra water run off at an increased flow rate due to the clearing of trees and undergrowth.*

David Rakus of Brandy Hill, NSW

Response

It has been assumed that the reference in the submission is to Lot 2 DP 1138575 (1092 & 1094 Clarence Town Road, Seaham, NSW), owned by D.K. and C.R. Rakus. Mr Rakus has provided Hanson with a copy of the WorleyParsons document *Hydrology Report Relating to the April 2015 Hunter Valley Weather Event* (June 2015) that describes hydrologic and hydraulic characteristics of the catchments arriving at the property and considered the damages that occurred at the property during a significant rainfall event in April 2015. This document is not publicly available. WorleyParsons concluded that damages were likely due to the catchment north of the property draining to and overtopping Clarence Town Road immediately upstream of the property.

The site water balance assessment (Section 4 of the Surface Water Assessment) considers the volume of increased surface water runoff due to the clearing of forested areas and Section 6.5 of the Surface Water Assessment outlines the excess water discharge regime. The majority of additional surface disturbance for the proposed Quarry extension would occur within the extraction area and rainfall in these areas would be captured within the Quarry void. Rainfall that falls on land that is disturbed for the relocated Processing and Stockpiling Area (Stage 4 of operations) would be captured in the sedimentation basin and storage dam (see **Figure 6**). Water captured in this location would be subject to the proposed transfer and reuse strategy, described in Section 3.7 of the Surface Water Assessment. It is proposed that controlled water discharge would occur for 24 hours continuously and preferentially on wet days, in order to emulate natural conditions, and to prevent erosion impacts downstream by ensuring outflows are below the channel forming discharge flow rate.

The 'wall' referred to in the submission is the amenity barrier located to the south of the Processing and Stockpiling Area and located on Hanson-owned land (see **Figure 5**). The amenity barrier is being constructed to mitigate noise from Quarry operations and to limit possible views of the Quarry operations. That amenity barrier also diverts overland flows away from the catchment which caused damage during the April 2015 event, instead directing overland flows to the west into the unnamed watercourse flowing west to east through Lot 2 DP 1138575 and which eventually flows to Deadmans Creek. The amenity barrier therefore reduces the catchment contributing to the flow path which caused damage at Lot 2 DP 1138575 in April 2015.

The amenity barrier and sedimentation basins would remain in the existing location during Stages 1 to 3 of operations with water diverted to the unnamed watercourse. It is proposed that the Processing and Stockpiling Area would be relocated by Stage 4 of operations (construction would commence during Stage 3). At this stage, the sedimentation basin and water storage dam for the Processing and Stockpiling Area would also be relocated with overflow from these basins directed to the unnamed watercourse. The proposed surface water management system would be described in a Water Management Plan for the ongoing operations of the Quarry.

In summary, whilst the amenity barrier has changed the natural flow of water to Lot 2 DP 1138575, it acts to direct flows to a defined watercourse and reduces uncontrolled overland flows, thereby reducing the likelihood of damage to buildings as was experienced during the April 2015 storm event. In addition, Hanson would implement a water transfer regime to ensure that the likelihood of overflow is minimised. It is therefore considered unlikely that there would be additional adverse surface water impacts on downstream receivers as a result of the proposed Quarry extension. The suitability of the culvert under Clarence Town Road in the vicinity of the unnamed watercourse is ultimately a matter for Council, however it is not considered likely that the proposed Quarry extension would increase the risk of overtopping of Clarence Town Road due to failure of the culvert.

5.23.8 Water Quality

Representative Comment(s)

I would like to voice my concerns regarding … contaminated water leaching into local dams, creeks (Heydons Creek, Barties Creek and Deadmans Creek)……

Why is there such a diverse colour variation in the water holdings outside the quarry site (dark blue) to the quarry site (green)?

Ian Docherty of Woodville – Page 1

Response

The reason for the different colouring of Quarry basins is likely due to the depth of water and the presence of natural fine-grained sediments.

Quarry sedimentation basins are subject to a water quality testing regime which has not revealed evidence of contamination, and further the existing operations have not caused any identified water quality impacts to downstream waterways. The Quarry currently operates in accordance with a surface water management regime and a Water Management Plan would be prepared for the extended operations in order to address the risk of increased sediment loads. Quarry sedimentation basins have been conservatively designed using best management practice in accordance with Landcom (2004), DECC (2008) and DLWC (2000), and hence there is a low risk of offsite contamination of waterways.

5.23.9 Potable Water

Representative Comment(s)

The EIA states that "Potable water for drinking and washing would be supplied from roof catchment and stored in rain water tanks. The assessment should, therefore, include comment on issues associated with drinking water quality and rainwater tanks.

Hunter New England Local Health District

Response

The existing Quarry uses rainwater to satisfy water demands for site amenities and maintenance needs only. The reference to use of captured rainwater as a source of drinking water is erroneous. Hanson imports bottled water and uses a floor standing water filter/dispenser for drinking water at the Quarry. Use of rainwater for site amenities and maintenance needs is proposed to continue as part of the proposed Quarry expansion.

Given that captured rainwater will not be used for drinking water at the Quarry it is concluded that there would be no potential health risks from drinking water.

Regardless of this policy, Hanson is aware that potential issues with rainwater tanks include the following.

- Contamination from birds, insects or other animals, via faecal material or dead animals or insects in the roof, gutter or rainwater tank itself.
- Chemical leaching from roof, gutter, pipe or tank materials.

- Vermin entry to the rainwater tank, such as mosquitoes.
- Contamination of rainwater due to air pollution from industrial / urban traffic emissions, pesticides and bushfires.
- Accumulation of sediments, sludge or leaf litter in the rainwater tank.
- Aesthetic issues such as taste, colour and odour of rainwater.

Should the current policy change, a drinking water management system will be prepared prior to commencement of any new rainwater tank use and would be followed during use. This quality assurance program should be consistent with *NSW Health Private Water Supply Guidelines* (2016) and will follow the template document available online.

5.23.10 Wastewater

Representative Comment(s)

There is minimal information in the EIA on wastewater and effluent disposal associated with the proposal. The collection, retention, treatment and use of wastewater and effluent needs to be approved by the appropriate regulatory authority and confirmation included in the EIA.

Hunter New England Local Health District

Response

A *Wastewater Assessment* prepared by Martens & Associates in 2016 (Martens, 2016b) details the wastewater and effluent disposal strategy associated with the proposed Quarry expansion. This report was sufficient to satisfy Port Stephens Council (the relevant regulator) to approve a Section 68 application for on-site effluent irrigation, and we therefore expect this report is sufficiently detailed for Hunter New England Local Health District.

It is noted that the effluent reuse area in the *Wastewater Assessment*, which is presently servicing the Quarry would need to be relocated during Stage 4 of the proposed Quarry expansion. At this time and prior to commencement of use, an updated wastewater assessment would be undertaken to assess the suitability of an alternate effluent reuse area. Based on site testing it is considered an effluent disposal strategy consistent with that proposed in the *Wastewater Assessment* will be appropriate and achievable. The approval of any modification to the on-site wastewater management system shall, under the *Local Government Act 1993*, be the responsibility of Port Stephens Council.

5.23.11 Flooding

Representative Comment(s)

I would like to voice my concerns regarding … overflow flooding to lower Brandy Hill floodplains leading into the Hunter and Paterson Rivers. In close proximity is the Williams River catchment supplying Newcastle with water.

Increased flooding events in the area over recent years i.e. 3 floods in 3 years.

Ian Docherty of Woodville – Page 1

Response

As discussed at Section 5.23.7 of this response, it is highly unlikely that the Quarry void will overflow, but instead act as a regional detention basin which will significantly attenuate flows. In a flood event, surface water will be captured and remain within the Quarry void. In the hours and days following the flood event, this water will be discharged via controlled pumping rates to Deadmans Creek, at flow rates significantly lower than the channel forming discharge flow rate to ensure erosion does not occur. The Project is therefore a substantial regional benefit and will reduce peak flood flows downstream of the site.

5.23.12 Water Tank Water Quality

Representative Comment(s)

Request – Dated 13 November 2018

"A few residents have raised concern about Giles Road being on tank water and potential air quality impacts associated with dust on roofs and tank water contamination.

As Hanson is currently reviewing the Air Quality Impact Assessment, can you please include this matter for consideration.".

Department of Planning and Environment

Response

The potential health risks associated with dust deposition on roofs and subsequent contamination of drinking water when this is washed into water tanks has been discussed with the local community. Modern water tanks often include first flush systems that divert the initial rainfall (likely to contain the majority of dust) away from the storage component of the tank. While these are not perfect systems they are a well-recognised and a recommended precaution. Hanson is aware that some of the water tanks in the vicinity of the Quarry do not have first flush systems as they are older systems. NSW Health recommends that all rainwater tanks used for drinking water are fitted with a first flush system to reduce the amounts of dust, bird droppings and leaves, that can accumulate on roofs, from being washed into tanks.

As noted within the *New South Wales Private Water Supply Guidelines, NSW Health 2016*, common sources of contaminants for rain water (tank water) include the following

- Organic and mineral matter in roofs and gutters (build-up of leaves and dirt).
- Roof materials (e.g. lead sheeting, peeling paint).
- Build-up of sludge in tank, dirt in inlet strainers and/or insect screens.
- Tank materials (e.g. pH of water with concrete tanks, high metals from metallic tanks, corrosion of metals from pipes).
- Insect, bird and animals in system (e.g. dead animals, mosquito breeding).

For dirt that is located on roofs, not only would the dust need to be washed into the tank, the contaminants would need to leach from the particles into the water.

The Quarry is also not the only source of dust in the local setting. Clarence Town Road is a busy thoroughfare and Seaham Road would contribute to dust experienced in the vicinity of the Quarry. Therefore, it would be difficult to establish conclusively that matter collected from the roof in a water tank came from the Quarry.

Hanson commissioned VGT Pty Ltd to take samples of water from two properties located on Giles Road. The results of assessment are presented in **Table 40**. The tanks do not contain a first flush system.

The results demonstrate that water captured in this tank is safe to drink, does not contain toxic levels of mineral contaminants and satisfies the *New South Wales Private Water Supply Guidelines, NSW Health 2016* with regards to metal contamination.

It should also be noted that one of the commitments of the Project is a Community Enhancement Fund. The Fund would be structured to provide funding for the provision of, for example, first flush systems for water tanks that do not currently have them. Please note that this inclusion is not based on expected impact, but rather is designed to provide a level of benefit to those residents in the vicinity of the Quarry who have concerns about the impact of ongoing operations.

Table 40
Water Tank Water Quality Monitoring Results

Health-based Characteristic	Description	Private Water Supply Guidelines Value (mg/L)	Tank 1 (Giles Road) Dated 16/01/2019 (mg/L)	Tank 2 (Giles Road) Dated 05/03/2019 (mg/L)
Antimony	Antimony is a metal that can be harmful in high concentrations. Its harmful effects are limited at lower concentrations. It is rare in source waters but may leach from antimony solder or be deposited in pollution from smelters.	0.003	<0.001	<0.001
Arsenic	Arsenic is a harmful element. Long term consumption of water with a high arsenic concentration (greater than 0.3 mg/L) has been shown to increase the likelihood of skin cancers and other diseases. Arsenic is found in soil and rocks, but is also released by the burning of fossil fuels, and in drainage from old gold mines and some types of sheep dip.	0.01	<0.001	<0.001
Cadmium	Cadmium is a toxic metal that, in cases of long exposure, can cause kidney problems. Cadmium may enter water supplies from impurities in the zinc of galvanised metal, from solders, or from some fertilisers.	0.002	<0.001	<0.0001
Chromium	Chromium is a toxic heavy metal, which can cause cancers. Chromium is found in small amounts in most rocks and soils, and has been used in many industrial processes.	0.05	0.003	<0.001
Copper	Copper is a common metal that can cause ill effects (nausea, abdominal pain and vomiting) in some people. Copper can be found in many rocks and soils, and is also frequently used in plumbing.	2	0.010	0.002
Fluoride	Fluoride is important for preventing dental decay, but can also be harmful at high concentrations. It is found naturally in rocks and waters, and is sometimes present in industrial air pollution.	1.5	0.1	0.1
Lead	Lead is a toxic heavy metal. It may enter a water supply from natural sources or from lead plumbing, solder, or roof flashings.	0.01	<0.001	<0.001
Nickel	Long term exposure to nickel can cause kidney problems. Nickel may enter water supplies from coalfired power stations or in small concentrations from nickel-plated tap and plumbing fittings.	0.02	<0.001	<0.001

Table 40 (Cont'd)
Water Tank Water Quality Monitoring Results

Health-based Characteristic	**Description**	**Private Water Supply Guidelines Value (mg/L)**	**Tank 1 (Giles Road) Dated 16/01/2019 (mg/L)**	**Tank 2 (Giles Road) Dated 05/03/2019 (mg/L)**
Nitrate & Nitrite	Excessive nitrate or nitrite in water can lead to occurrences of 'blue baby syndrome' in infants fed with formula made up using the water. The decomposition of organic wastes such as manure can introduce nitrate to water supplies. Nitrite is only likely to be present in water that has not been aerated.	50 (Nitrate) 3 (Nitrite)	0.62 <0.005	0.52 <0.005
Aesthetic (chemical)	**Description**	**Private Water Supply Guidelines Value (mg/L)**	**Tank 1 (Giles Road) Dated 16/01/2019 (mg/L)**	**Tank 2 (Giles Road) Dated 05/03/2019 (mg/L)**
Manganese	Although harmful at higher concentrations, the guideline value for manganese is set to avoid an undesirable taste and staining of laundry and plumbing fittings. Manganese is likely to enter water supplies from natural sources or from contaminated sites.	0.1	0.009	<0.005
Sulfate	Although harmful at higher concentrations, the guideline value for sulfate ions is set to avoid an undesirable taste in water. Under some conditions it can also contribute to corrosion of plumbing fittings. Sulfate at levels greater than 500 mg/L can have purgative effects. Sulfate ions are likely to enter water supplies from natural sources. The highest concentrations are likely to be seen in groundwater.	250	3	3

Table 40 (Cont'd)
Water Tank Water Quality Monitoring Results

Aethetic (physical)	Description	Private Water Supply Guidelines Value (mg/L)	Tank 1 (Giles Road) Dated 16/01/2019 (mg/L)	Tank 2 (Giles Road) Dated 05/03/2019 (mg/L)
pH	A pH of 7 is neutral, greater than 7 is alkaline, and less than 7 is acidic. Drinking water with increased acidity (pH less than 6.5) can corrode plumbing fittings and pipes. Apart from the damage caused, this can release harmful metals such as lead or copper. Drinking water with increased alkalinity (pH greater than 8.5) can lead to encrustation of plumbing fittings and pipes. A pH greater than 11 may cause corrosion. A pH greater than 8.0 can decrease the efficiency of chlorine disinfection.	6.5-8.5	7.9	8.4
Total dissolved solids (TDS)	Dissolved material, usually salts, in the water supply can affect the water's taste. It can also develop scale on the inside of plumbing fittings and pipes, or lead to excessive corrosion. Up to 900 mg/L is regarded as fair quality.	600	50	38
Total hardness	Hard water can contribute to the formation of scale in hot water pipes and fittings, and makes lathering of soap difficult. Hardness is the measure of calcium and magnesium in the water and comes from the dissolving of these materials from soil and rocks.	200	22	39
Turbidity	Less than 1 NTU is the target for effective disinfection. Less than 0.2 NTU is the target for effective filtration of *Cryptosporidium* and *Giardia*.	5 NTU	0.80	0.70

6. STATEMENT OF COMMITMENTS

Section 7 of the EIS presented a Statement of Commitments for the Project. The commitments have been updated following comprehensive review of the Project and ongoing operational requirements. The following subsections present an updated Statement of Commitments that summarises the proposed management and mitigation that Hanson would implement.

It should be noted that many of these commitments are standard operating conditions for a State significant extractive industry development, however, are provided here for the benefit of informing the local community. Each of these commitments would be reflected in the conditions of consent or described in environmental management plans for the operation. The management plans would be submitted to DPE for approval before being implemented.

The following commitments would apply to the operation of the Quarry, unless modified by conditions of consent, licence conditions or post-approval documentation approved by the Secretary of the Department of Planning and Environment. It is noted that the conditions of consent take precedence in the event of any conflict.

Project Operation

- Approval has been sought for a period of 30 years which is expected to be reflected in the terms of consent of the Project Approval.
- Rehabilitation upon quarry closure will be undertaken in accordance with the activities described in the EIS or this Amended Response to Submissions unless modified by a Biodiversity and Rehabilitation Management Plan or Closure Plan for the Quarry. As is standard practice, rehabilitation works may be undertaken outside of the approved operational period.
- Ensure no more than 1.5Mt of hard rock is transported from the quarry annually. Concrete production would not exceed 15 000m^3 per annum using an on-site concrete batching plant. Up to 20 000t per annum of hardened washout concrete material may be received at the Quarry for recycling.
- Ensure all site operations are undertaken in accordance with the approved hours of operation.
- The Project will remain within the extraction boundary identified in **Figure 7**, which is an area of 78.5ha, and a maximum depth of -78 m AHD. These boundaries will be mapped using digital software and made available to both site management and regional management.
- Install enclosures on all fixed processing equipment from the commencement of Stage 1 of operations.
- Partially enclose conveyor transfer points from Stage 4 of operations.
- Partially enclose the mobile crusher to be used for concrete recycling from the commencement of Stage 1 of operations.
- Maintain all equipment on site in good working order to maximise efficiency and to include appropriate exhaust and fire suppression systems.

- Product despatch from the Quarry would be limited to the following levels.
  - No more than 301 laden loads between 7:00am and 10:00pm.
  - No more than 58 laden loads between 10:00pm and 7:00am.
- Hourly product despatch would be limited as follows
  - 5:00am to 6:00am – 9 laden loads.
  - 6:00am to 7:00am – 12 laden loads.
  - 7:00am to 10:00pm – 30 laden loads per hour.
  - 10:00pm to 5:00am – 5 laden loads per hour.
- Night time despatch (between the hours of 10:00pm and 5:00am) would occur on a maximum of 20 days per calendar year.
- Community members who have registered for notifications would receive seven days' notice of any night time product despatch activities.
- Construct an earthen amenity barrier between 18m and 20m high to the south of the Processing and Stockpiling Area (see **Figure 5**).
- Temporarily construct earthen amenity barriers of various lengths and heights for each stage of operations, strategically located with the Processing and Stockpiling Area.
- Maintain the Quarry Access Road to limit noise sources such as potholes or edgewear as well as ensuring safe access around the site.
- Carry out all demolition work in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.
- Obtain and maintain all relevant licences and approvals throughout the Project life.

Non-Compliance and Complaints

- In the event of non-compliance, any exceedance will be recorded, investigated, and reported to relevant parties. Non-compliance incidents and their management will be published in the *Annual Review*.
- Maintain a complaints register with firm commitment to feedback and closing investigations.

Social Impact

- Prepare and implement a detailed Community and Stakeholder Engagement Plan to provide a channel of communication, demonstrate environmental management performance and accountability and build trust with the local community.
- Support and be involved in a Community Consultative Committee (CCC) with scheduled CCC meetings every three months (the frequency of meetings may be reduced at the request of the CCC). Additional important information to be relayed to relevant parties via fact sheets, e-mail correspondence, written correspondence or via face to face exchange, when relevant.

- Establish communication mechanisms through or beyond the CCC, with local businesses and other residents, particularly near neighbours as described within the Community and Stakeholder Engagement Plan.
- Implement a Community Support and Sponsorship Policy (Appendix 11).
- Establish and maintain public access to monitoring data, monitoring locations and management documents on the Hanson website.
- Form partnerships with local employment providers, including Indigenous organisations, to source new employees for the Quarry. This would include approaching local school career advisors about presenting to school-leavers about employment with Hanson.
- Establish a set percentage target for employees from within the local government areas of Port Stephens and Maitland and report against the target on the Hanson website.

Noise and Blasting

- Ensure stockpiles and ancillary equipment are positioned to mitigate potential noise impacts.
- Maintain all equipment located on site to adhere to existing noise standards and ensure that noise generated by equipment is not exacerbated.
- Modify operations at exposed locations and under unfavourable weather conditions, where necessary and without compromising safety, to reduce potential noise-related impacts.
- Maintain the internal road network to reduce body noise from empty trucks.
- Construct an acoustic barrier along the Quarry Access Road to mitigate noise generated by heavy vehicles on the Quarry Access Road.
- Establish noise monitoring at sensitive receptors and/or locations as stipulated in a Noise Management Plan.
- Implement an operational noise monitoring program, in consultation with DPIE, involving quarterly monitoring for a two-year period at the locations to the south, east and west of the Quarry. After an initial two years of monitoring, the frequency of monitoring would be reduced to bi-annual, assuming that there are no identifiable seasonal trends in results.
- Undertake bi-annual monitoring of road traffic noise on Brandy Hill Drive. The location of monitoring will be established in the Noise Management Plan.
- Undertake an annual survey of sound power levels for all mobile equipment to demonstrate equipment is not exceeding noted levels within the Updated Noise Impact Assessment (Appendix 5).
- Design all blasts within the extraction area to meet airblast overpressure and ground vibration criteria at all monitoring locations.

- Blasts would occur no more than once per week, except in the event of a misfire.
- Provide notification of blasts via the website, email and/or SMS (subject to individual arrangements).
- Prepare and implement a site Noise and Blast Management Plan and/or monitoring program for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Air Quality

- Implement routine watering or similarly effective dust suppression treatment of internal roads and unsealed surfaces (including stockpiles and stockpile transfer points) during operations and at an increased frequency during adverse climate conditions.
- Modify operations during unfavourable weather conditions and in areas with high potential for dust dispersion, where necessary, to reduce dust generation.
- Stabilise the earthen amenity barrier (once constructed) to the south of the Quarry Site with groundcover vegetation as soon as practical following completion.
- Stabilise disturbed areas within the Quarry Site that are no longer required for operations with groundcover vegetation as soon as practical following completion.
- Maintain the internal road network through surfacing with well graded materials to reduce dust generation.
- Limit vehicle speed on internal roads to 30km/hr to reduce potential dust lift off.
- Minimise dump heights from trucks, front-end loaders and conveyors, where practical.
- Where feasible and practical, and in accordance with safe use of explosive practices, schedule blasts (or re-schedule) to avoid windy conditions.
- Install a continuous particulate matter monitor at a location identified in the Air Quality Management Plan incorporating a trigger mechanism to notify Quarry personnel when 24-hour particulate matter levels approaches the guideline. Notifications to be provided by SMS and/or email to key Quarry personnel.
- Prepare and implement a site Air Quality Management Plan for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Biodiversity and Rehabilitation

- Engage in progressive rehabilitation as soon as practical after disturbance, in conjunction with the Biodiversity and Rehabilitation Management Plan.
- Document all rehabilitation works on site with yearly progress presented in the *Annual Review*.

- Only utilise flora species identified in the Biodiversity and Rehabilitation Management Plan for rehabilitation.
- Develop a Quarry Closure Plan a minimum of two years prior to the cessation of quarrying activities.
- Stockpile topsoils for rehabilitation and landscaping uses. Topsoil stockpiles will be no greater than 2m in height, not driven over and have a stabilising groundcover to limit dust lift-off and erosion.
- Design and construct watercourses and drainage features in the final landform to ensure long-term stability.
- Commission pre-clearance surveys by a suitably qualified and experienced person of the proposed disturbance area prior to vegetation clearance, to identify the presence of any threatened species, with particular attention given to the koala. If a koala or other threatened species are identified, operations will cease and appropriate authorities or regional animal care groups will be contacted for the safe removal and relocation of the koala(s) or other species identified.
- Implement a Biodiversity Offset Strategy to mitigate project impacts that cannot otherwise be managed.
- Implement a protocol for hollow-bearing tree removal and rehanging of hollows, as described in the Biodiversity and Rehabilitation Management Plan.
- Develop a Threatened Species Management Plan with attention given to threatened species on site, particularly the Koala. Additional attention will also be given to Endangered Ecological Communities found within the site: Spotted Gum-Ironbark Forest, Hunter Lowland Redgum Forest and Swamp Sclerophyll Forest on Coastal Floodplains.
- Management of sediment and erosion in accordance with the following:
  - Regeneration/replanting of exposed areas as soon as practical following exposure to enhance soil stability and eliminate run off,
  - Installation of erosion/sediment diversion bunds if required; and
- Application of sedimentation dams to collect “dirty water” on site, allow sediment to settle and then release “clean” water to EPA standards at the EPL approved discharge points.
- Prepare and implement a site Biodiversity and Rehabilitation Management Plan and/or monitoring program for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Waste, Surface Water and Groundwater

- Monitor groundwater levels in monitoring bores through use of continual monitoring equipment. Data will be extracted approximately every 6 months and reported upon in the *Annual Review*.

- Groundwater bore monitoring will include depth and temperature.
- Continual maintenance of the condition of existing settlement dams and the closed water system management.
- Installation of new settlement dams as required throughout the life of the Project.
- Any water discharge will be in compliance with Environmental Protection Licence (EPL) conditions.
- Obtain any required Water Access Licences.
- Monitor potential drawdown at nearby boreholes and the development of measures to address loss of bore yield, if any.
- Manage wastewater in accordance with the mitigation measures detailed in the Wastewater Impact Assessment.
- Update the effluent and wastewater management system during plant relocation in Stage Four. Any additional upgrades stipulated by the EPA or Council will be adhered to.
- Prepare and implement a Water Management Plan for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Transport

- Optimise Quarry design to minimise travel distances for equipment and the need for rehandling of overburden and aggregate materials.
- Reduce truck queuing, unnecessary idling of trucks and unnecessary trips through logistical planning, where possible.
- Compliance with the maximum number of truck movements per day nominated in consent conditions.
- Regularly service mobile equipment including optimising fuel economy for vehicles and maximum energy efficiency for other site equipment.
- Implement driver training to ensure all vehicles and machinery are operated at maximum efficiency.
- Ensure all drivers review and sign a Drivers Code of Conduct that directs driver behaviour during transportation activities. Issues addressed in the code of conduct would include:
  - advice for quiet driving practices and measures to reduce vehicle noise;
  - limiting the use of compression braking unless required for safety reasons;
  - advice for management of driver fatigue;
  - load covering for all laden vehicles;

  - timing for departure and arrival to remain within approved limits and avoid convoying;
  - management of breakdowns and incidents;
  - awareness of school buses, school zones, pedestrians and cyclists on roads;
  - use of preferred transportation routes; and
  - limiting the use of local roads unless directed by emergency services.
- Breach of the Drivers Code of Conduct would result in, after two warnings, dismissal or cancellation of contract.
- Ensure the Drivers Code of Conduct is accessible on the Hanson website and the CCC is informed of compliance issues.
- Ensure heavy vehicle drivers use the transport routes presented in the EIS and the Drivers Code of Conduct with a requirement to avoid short cuts and unnecessary alternative routes while maintaining flexibility to use local roads for local deliveries only.
- Review the Drivers Code of Conduct from time to time in conjunction with the CCC to ensure alignment with community expectations.
- Prepare and implement a site Transport Management Plan and/or monitoring program for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Lighting

- Direct stationary/fixed lighting downwards with the height of the light source minimised. Where appropriate, full cut-off fittings would be provided to ensure only localised areas are illuminated.
- Position stationary/fixed lighting to direct light away from the surrounding vegetation.
- Position all lighting within the Processing and Stockpiling Area in locations/elevations that would maximise the illumination of the operational area yet minimises the amount of reflected light and light directed off site.
- Minimise light generation through the selection of bulbs generating yellow light rather than blue/white light. The selection would be guided largely by safety considerations.

Aboriginal and European Heritage

- Should any Aboriginal objects be encountered during works associated with the Project, works will cease in the vicinity and the find will not be moved until assessed by a qualified archaeologist.

- Works will immediately cease if suspected human remains are discovered. The NSW Police Force and the BCD's Environmental Line (131 555) will be contacted as soon as practical and provided with details and location of the remains. Work will not re-commence in this location unless authorised in writing by BCDand clearance provided by the Police, if required. If skeletal remains are deemed to be of Aboriginal origin, a representative of the local Aboriginal Community and the BCD are to be contacted.
- Inform key relevant Aboriginal stakeholders of any unanticipated discoveries for the life of the Project.
- If required, prepare and implement an Aboriginal Cultural Heritage Management Plan (ACHMP), which will detail the findings and management initiatives from the EIS Heritage Impact Assessment. Should archaeological deposits or sites be identified during the Project's life, salvage of features, retrieval of information through excavation or collection and interpretation will be investigated.

Greenhouse Gas and Energy

- Document and evaluate energy use of the Project in the Annual Review.
- Ensure the use of appropriately sized, high efficiency motors on all pumps, crushers & equipment.
- Variable speed drives will be provided on electric motors in order to ensure energy savings and to deal with the results of varying loads on equipment.
- Apply timer switches, where possible, to relevant electrical appliances and sensor lights installed where possible to reduce energy use.
- Consider fuel economy and energy use when sourcing company vehicles.
- Incorporate the use of alternative fuels when feasible and available.

Hazards

- Comply with objectives under State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) including the storage of hazardous chemicals or other materials.
- Ensure all Quarry-related activities are undertaken, where practicable, in cleared areas.
- Inspect all mobile equipment working in vegetated areas to ensure that they do not pose a risk of starting a bushfire. This will include inspection of exhaust and electrical systems, including, in the case of vehicles using unleaded petrol, catalytic converters.
- Ensure mobile equipment working in vegetated areas will not be left unattended with the engine running.

Bushfire

- Actively maintain vegetation to reduce fuel loads within the operational areas of the Quarry and in the vicinity of site infrastructure.
- Maintain an asset protection zone in accordance with the assessment of bush fire hazard.
- Ensure that mobile equipment is regularly maintained and inspected and avoids unnecessary access of vegetated areas where there may be a risk of igniting a fire.
- Provide access to strategic areas on the site and water for firefighting.
- Stockpile cleared vegetation with a minimum 10m cleared buffer zone.
- Create and maintain fire breaks in strategic locations for access and infrastructure.

Geotechnical

- Maintain Quarry pit slopes in accordance with geotechnical report submitted with the Project EIS and updated over the life of the quarry where adjustments are advised.
- Ensure benches are graded to ensure stormwater, seepage, and groundwater is drained off the bench towards the on-site water collection points (i.e. settlement dams).
- If batter slopes exhibit failure signs then all excavations will cease in the affected area and a geotechnical engineer will be consulted to determine the appropriate course of action.
- Construct batter slopes accordance with site geotechnical modelling.

Contamination

- Engage an accredited asbestos consultant to conduct a formal site audit prior to any demolition or works being undertaken on the site. The audit will:
  - Determine if there is any asbestos (and the precise location/extent of asbestos) in accordance with Australian Standard 4964 – "Method For the Qualitative Identification of Asbestos in Bulk Samples".
  - Focus on maintenance areas, the storage shed and office, where appropriate.
- Undertake regular visual inspections to assess the state of pesticide storage and heavy metal storage on site to ensure compliance with hazardous materials storage management as outlined in Section 5.15.
- Undertake regular visual inspections to assess and ensure drums, containers and intermediate bulk containers (IBCs) are in a safe and suitable condition. Structural assessments will be conducted as and when required.
- Maintain above ground storage tanks (AST) in a safe and suitable condition and visually inspected regularly by site personnel. Structural assessments will be conducted as and when required.

7. EVALUATION AND JUSTIFICATION

7.1 INTRODUCTION

The following subsections provide an evaluation of the Project in terms of the principles of ecologically sustainable development as well as relevant local and State planning instruments and legislation.

A concluding statement for the Amended RTS is provided that presents a summary of the outcomes of this document including discussion of the predicted and expected residual impacts of the Project.

7.2 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

One of the Objects of the EP&A Act is to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. The EP&A Act provides the framework for the assessment and approval of development in NSW, but the principles of ecologically sustainable development have an arguably broader scale as they are recognised to be globally important. The principles of ecologically sustainable development are based upon ensuring that development meets the needs of the current generation while ensuring that actions do not limit the opportunities of future generations. The four principles of ecologically sustainable development are as follows.

- the precautionary principle;
- the principle of intergenerational equity;
- the principle of the conservation of biodiversity and ecological integrity; and
- the principle for the improved valuation, pricing and incentive mechanisms.

Hanson has considered the principles of ecologically sustainable development through the design and planning of the Project, by undertaking thorough assessment of the Project and by considering the concerns and expectations of the local community and various levels of government. The following presents a summary of how the principles of ecologically sustainable development have been considered and draws on Section 8.5 of the EIS.

7.2.1 The Precautionary Principle

Clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* defines the precautionary principle as follows.

> *that 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,*

Planning for the Project has involved broad consultation to understand potential risks and to guide comprehensive technical assessment that examined the existing environment, predicted possible impacts and recommended controls and mitigation measures in order to ensure that the level of impact is well understood. Each of the assessments (traffic, noise, air quality for example) assumed maximum production and the worst case for external factors such as climate and peak local traffic in considering potential impacts against assessment criteria sourced from relevant guidelines and legislation. In reality, the Quarry would not be operating at maximum production and traffic levels each day and therefore a conservative approach has been taken to the risks presented in the EIS and this document.

Hanson has attempted to avoid damage to the environment where it is feasible and reasonable to do so, and where residual impacts are expected, would operate under a range of mitigation and management measures. The key residual impacts of the Project include the permanent removal of native vegetation and impacts to the road network through use for transport operations. Hanson has committed to offset impacts to biodiversity values and would continue to pay a contribution to Port Stephens Council and Maitland City Council for road maintenance and upgrade. A program of environmental monitoring, reporting and auditing would occur over the life of the Quarry to ensure that impacts remain consistent with those predicted in assessment and so additional measures can be adopted where necessary.

7.2.2 Intergenerational Equity

Clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* defines intergenerational equity as follows.

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

Intergenerational equity embraces value concepts of justice and fairness, acknowledging that the present generation has a responsibility to ensure that activities now do not have unacceptable long-term impacts that become the responsibility of future generations.

A key residual impact of the Project is the removal of 53.8ha of native vegetation progressively over the life of the Quarry. An offset strategy is proposed that would require the conservation, in perpetuity, of a proportionate area (as determined using the NSW Government calculation tools). It is estimated that the offsetting approach for the Koala alone would require the conservation of 450ha of Koala habitat. This approach would ensure that the loss of vegetation is offset by securing an area for conservation that can then be available for future generations.

Hanson would progressively rehabilitate the Quarry Site so that it is suitable for beneficial use post-extraction. This is likely to involve areas of native vegetation conservation and a water resource. Water that is retained in the extraction area would be fed by groundwater and rainwater with natural evaporation establishing an equilibrium level at 30m AHD. The owner of the land would need to retain a water licence to account for the water lost to evaporation from the open water body. However, there is no indication that there would be significant impacts to groundwater users in the locality or to groundwater dependent ecosystems post-operational life at the Quarry.

Other residual impacts of the operation such as noise, dust and traffic would cease once the operations are completed. Consideration of potential impacts to cultural heritage through assessment of potential impacts to Aboriginal heritage and historic heritage has confirmed that the Project would not impact the cultural record of the local area.

The products of the Quarry would be used to build and maintain the infrastructure considered necessary for the quality and way of life of the community local to the Quarry but also through the Port Stephens, Maitland and Newcastle areas and in some cases the Hunter Valley, Central Coast and Greater Sydney regions. The high-quality and cost-efficient development of these assets would reduce the need for maintenance and re-construction at a later time and reduce costs associated with their use by future generations.

7.2.3 Conservation of Biological Diversity and Ecological Integrity

Clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* states:

> *that conservation of biological diversity and ecological integrity should be a fundamental consideration*

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.

The Biodiversity Assessment Report has addressed the potential impacts to the natural environment including for both flora and fauna. Hanson has reduced the area associated with impact as much as is feasible and reasonable for the operation and would stage vegetation clearing across the life of the Quarry. Residual impacts to native vegetation and potential fauna habitat would be offset in accordance with NSW Biodiversity Offset Scheme and the EPBC Act Environmental Offsets Policy.

The implementation of programs to re-establish habitat features such as hollows in remnant vegetation and for weed and feral animal management would further assist in addressing the principle of sustainable development.

7.2.4 Improved Valuation and Pricing of Environmental Resources

Clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* defines the improved valuation and pricing of environmental resources as follows.

> *that 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.*

Consideration of this principle is demonstrated through the thorough assessment undertaken for the Project and commitment to ongoing management of the Quarry Site to limit residual environmental risks and impacts. Hanson has proposed a range of measures to avoid or mitigate the residual impacts of operations including accepting the cost associated with enclosing processing equipment, building barriers that preserve amenity and funding the ongoing monitoring that would guide adaptive management. Hanson has accepted it has a responsibility to contribute to road maintenance and upgrade through contributions to local government funding for these processes. In addition, costs associated with offsetting the residual impacts to native vegetation and potential fauna habitat would also be the responsibility of Hanson.

7.3 PORT STEPHENS LOCAL ENVIRONMENTAL PLAN 2013

The *Port Stephens Local Environmental Plan (LEP) 2013* establishes the objectives, limits and guidelines for development in the Port Stephens Local Government Area. The aims of the Port Stephens LEP are as follows.

(a) to implement the community's Port Stephens Futures Strategy 2009 and Port Stephens Planning Strategy 2011,

(b) to cultivate a sense of place that promotes community well being and quality of life,

(c) to provide for a diverse and compatible mix of land uses supported by sound planning policy to deliver high quality development and urban design outcomes,

(d) to protect and enhance the natural environmental assets of Port Stephens,

(e) to continue to facilitate economic growth that contributes to long-term and self-sufficient employment locally,

(f) to provide opportunity for housing choice and support services tailored to the needs of the community,

(g) to conserve and respect the heritage and cultural values of the natural and built environments,

(h) to promote an integrated approach for the provision of infrastructure and transport services,

(i) to continue to implement the legislative framework that supports openness, transparency and accountability of assessment and decision making,

(j) to achieve intergenerational equity by managing the integration of environmental, social and economic goals in a sustainable and accountable manner.

The technical assessments for the Project have involved multi-disciplinary data gathering, review and assessment to address the potential impacts of the ongoing operation of the Quarry. This has included consideration of the built and natural environment, community well-being and quality of life, the cultural heritage of the locality and long-term residual impacts. The assessment outcomes presented in the EIS and this document have concluded that assuming the implementation of ongoing and additional controls and mitigation measures the potential impacts of the operation would be appropriately managed. It is therefore considered that the Project does not limit the achievement of these aims.

The economic stimulus from the Project as well as the ongoing production and cost-efficient supply of materials used in construction, infrastructure development and road maintenance would assist in the achievement of strategic growth and community planning within the Port Stephens Local Government Area. This would include facilitating cost-effective housing, providing opportunities for the development of diverse land uses and locally-based employment opportunities.

In addition, the land on which the Quarry is located is zoned RU2 – Rural Landscape. Extractive industry development in this zone is permissible with development consent. It is considered that the import and processing of concrete washout material and the development of a concrete batching plant are ancillary to the main use which is for development of a quarry and therefore are also permissible. Development in the RU2 – Rural Landscape zone has the following objectives.

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To maintain the rural landscape character of the land.*
- *To provide for a range of compatible land uses, including extensive agriculture.*

Extractive industries are, by their nature, not sustainable as development involves the removal and beneficiation of hard rock to form products used in the construction and infrastructure industry and for road maintenance. However, as described in Section 7.2, Hanson aims to develop the Quarry with consideration of the residual impacts on current and future generations and to provide for a productive use of the final landform. The development of the Quarry would not conflict with the rural nature of the landscape as quarrying has been a feature of the locality since 1983 and ongoing operations would not be visible from surrounding vantage points. The development of the Quarry would also be compatible with surrounding land uses such as rural residential living and agriculture.

It is not considered that the development of the Quarry would compromise the surrounding remnant vegetation that is zoned E3 – Environmental Management to the extent that the achievement of the objectives of that zone would be compromised for that land.

7.4 STATE ENVIRONMENTAL PLANNING POLICY (MINING, PETROLEUM PRODUCTION AND EXTRACTIVE INDUSTRIES)

This SEPP ("the Mining SEPP") was introduced in recognition of the importance to New South Wales of mining, petroleum production and extractive industries and provides for the consideration of the social and economic welfare provided by these industries. It also recognises the need for the orderly and economic use and development of the State's resources.

The Mining SEPP establishes appropriate planning controls to encourage ecologically sustainable development through environmental assessment, and sustainable management. A summary of the matters that the consent authority needs to consider when assessing a new or modified proposal and where these have been addressed in this document is provided in **Table 7.1**.

Table 7.1
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	Comments
12: Compatibility with other land uses	Consideration is given to: • the existing uses and approved uses of land in the vicinity of the development;	Hanson proposes to expand an existing Quarry development which has been operating since 1983. Surrounding land uses principally comprise rural residential living and minor agriculture.
	• the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	The development is a permissible land use with development consent under the Port Stephens LEP 2013 and does not currently, nor would the Project, conflict with surrounding land uses. Potential conflicts through road use by heavy vehicles would be managed through comprehensive management measures including a Drivers Code of Conduct.
	• any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.	
	The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.	The public benefits of the Project include the provision of cost-effective materials for construction, infrastructure development and road maintenance activities. These benefits are likely to extend through the Port Stephens, Maitland and Newcastle regions as well as to the Hunter, Central Coast and Greater Sydney regions. The alterative use of the land would be for native vegetation conservation, residential or industrial development. Considering these alternative land uses, the Project is considered a beneficial use of the land.
	Measures proposed to avoid or minimise any incompatibility are considered.	Potential conflicts through use of the road network by heavy vehicles would be comprehensively managed.
12AB: Non-discretionary development standards for mining	Consideration is given to development standards that, if complied with, prevents the consent authority from requiring more onerous standards for those matters	The non-discretionary development standards have been considered in the technical assessment and would be satisfied under the Project (see Section 5.16.1)
13: Compatibility with existing mining, petroleum production or extractive industry	Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible.	The development is not incompatible with future resource development and would not sterilise access to possible future resource.
	Measures taken by the Applicant to avoid or minimise any incompatibility are considered.	Not applicable.
	The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	Not applicable.

Table 7.1 (Cont'd)
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	Comments
14: Natural resource and environmental management	Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure:	
	• impacts on significant water resources, including surface and groundwater resources, are avoided or minimised;	The Project would avoid direct impact to Deadman's Creek and downstream water users. The Project would intercept groundwater which would be accounted for in licencing for the Project. Drawdown greater than 2m would be experienced at one registered bore, however investigations indicate this bore is not used and has fallen to disrepair (see Section 5.10.1). Should this bore be required by the landowner in the future, provisions for makegood to lost production would be agreed and incorporated into an approved Water Management Plan. Hanson would monitor water prior to any controlled discharge to ensure it meets water quality requirements.
	• impacts on threatened species and biodiversity are avoided or minimised; and	Hanson has limited physical disturbance and much as is feasible and reasonable for the Project. Hollows in trees that are to be removed would be salvaged and re-hung in remnant vegetation. Residual impacts associated with vegetation clearing and loss of potential Koala habitat would be offset.
	• greenhouse gas emissions are minimised to the greatest extent feasible.	Hanson is a large company and is constantly seeking means to improve the performance of its fleet of vehicles and equipment. Reductions to greenhouse gas emissions would be one aspect of the operation that would be considered over the life of the Quarry.
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	The progressive development of the Quarry and extraction beneath the current processing area would provide for the efficient recovery of the hard rock resource. The recycling of concrete material is gaining public acceptance through the benefits of its use in road base and other products. Hanson would reduce waste generation for its concrete batching plants through beneficial re-use of what would otherwise be a waste material.

Table 7.1 (Cont'd)
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	Comments
16: Transportation	The following transport-related issues are considered.	
	• The transport of some or all of the materials from the Quarry Site by means other than public road.	Given the location of the Quarry, transport by means other than public road is not feasible.
	• Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	Hanson has carefully considered the proposed transportation activities and amended the preferred transport route to avoid community infrastructure and schools. This has been done in consultation with Port Stephens Council and Maitland City Council. Sensitive areas such as where there are schools or heritage-listed bridge infrastructure has been included in the transport route map that is provided in the Drivers Code of Conduct.
	• The preparation of a code of conduct for the transportation of materials on public roads.	The Quarry currently operates in accordance with a Drivers Code of Conduct that would be continued under the Project.
17: Rehabilitation	The rehabilitation of the land affected by the development is considered including:	
	• the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;	An indicative final landform is presented in Section 2.20 and would be included in a Biodiversity and Rehabilitation management Plan.
	• the appropriate management of development generated waste;	Current practices for waste management have been successful and would be continued. Waste management is described in Section 2.14.
	• remediation of any soil contaminated by the development; and	Hanson accepts responsibility for remediation of any contamination caused by the Project. Risks of contamination principally relate to hydrocarbon spills in the vicinity of the workshop and fuel storage/refuelling areas. The management of oils, chemicals and additives for equipment maintenance and the components of concrete batching would be managed in accordance with industry best practice.
	• the steps to be taken to ensure that the state of the land does not jeopardise public safety, while being rehabilitated or at the completion of rehabilitation.	Hanson would remain responsible for the land as long as it remains the landowner. Fencing and safety bunding would be constructed and maintained over the life of the Quarry to discourage trespassing and reduce safety risks to the public.

7.5 OBJECTS OF THE EP&A ACT

The EP&A Act provides the framework for the assessment and determination of development in NSW and is administered by DPIE. **Table 7.2** provides a short description of how the Project has addressed and satisfies the objects of the EP&A Act.

Table 7.2
Objects of the EP&A Act

Object	Comments
The objects of this Act are as follows: a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,	It is considered that the Project would provide for the orderly and professional ongoing operation of the Quarry. The commitment to offset residual impacts to native vegetation and potential fauna habitat would provide for the conservation of these areas in perpetuity. The implementation of the comprehensive commitments described in the Statement of Commitments (Section 6) would ensure that the social and economic welfare of the community is considered over the life of the operation.
b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,	Final decisions on whether the Project is acceptable will be made by the Independent Planning Commission. However, Hanson has undertaken detailed technical assessment to understand residual risks and impacts for the Project and to plan to avoid, minimise or mitigate these impacts as much as is reasonable and feasible. The principles of ecological sustainable development have been considered in the development of the Project (see Section 7.1)
c) to promote the orderly and economic use and development of land,	The ongoing development of the Quarry would maintain the existing orderly development of an existing site and through doing so avoid the need for Hanson to seek alternate sources of resource. Development for the purpose of an extractive industry is considered a beneficial use of the land on which the Quarry is located.
d) to promote the delivery and maintenance of affordable housing,	While not directly relatable to the Project, it is considered that the cost-effective and local supply of materials used in the construction industry would have a beneficial impact on housing development in the locality.
e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,	Consideration of residual impacts to biodiversity values has been undertaken in accordance with the NSW Biodiversity Offset Scheme and the EPBC Environmental Offsets Policy. Direct disturbance to native vegetation and potential native fauna habitat has been minimised as much as possible to reduce the need for impact to biodiversity values.
f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	The Project would not reduce the availability of any matters or sites of cultural heritage value for the general public.
g) to promote good design and amenity of the built environment,	The Quarry has been designed to be developed such that potential views of the operation would be limited. In later stages of development extraction would occur beneath the already disturbed processing area. Hanson would pay contributions to Port Stephens Council and Maitland City Council to fund road upgrade and maintenance along the routes used by heavy vehicles associated with the Project.

Table 7.2 (Cont'd)
Objects of the EP&A Act

Object	Comments
h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,	The Project proposes the ongoing use of existing buildings and other infrastructure for the first three stages of operations. From Stage 4 all site infrastructure would be reconstructed in a location to the south of the existing area. Construction activities would be undertaken in consultation with the relevant authorities.
i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,	The assessment requirements for the Project and the various submissions that have been reviewed have included feedback from Port Stephens Council, Maitland City Council, the relevant State government agencies and the Commonwealth Department of the Environment and Energy. The Project would be determined by the Independent Planning Commission.
j) to provide increased opportunity for community participation in environmental planning and assessment.	Hanson has acknowledged that community involvement in planning for the preparation of the EIS did not meet community and Government expectations. The Project has been reviewed and refined to take into account feedback from all stakeholders. These processed have involved significant consultation at all levels including the pre-emptive establishment of the Community Consultative Committee and the commencement of regular informal Have-A-Chat style meetings with the community. Through these processes there has been opportunities for the local community be become involved in the assessment process for the Project.

7.6 CONCLUDING STATEMENT

Hanson and its consultants have undertaken a comprehensive review of the submissions received by DPIE during the public exhibition of the EIS for the Project as well as feedback from the government agencies, Port Stephens Council, Maitland City Council and the community in response to the original *Response to Submissions* document and concerns raised in community consultation since the EIS was exhibited. In light of the concerns raised the Project has been refined to provide additional mitigation for potential environmental impacts with a focus on the risks associated with changes to social amenity and way of life for the local community.

While the Project would increase the existing rate of production and Quarry-related traffic, the proposed Project would not result in the impacts expected by the local community. Many submissions referred to a level of traffic that is significantly higher than what Hanson is seeking approval for. Hanson has clearly stated proposed traffic levels (see Section 2.11) and is confident that through community consultation has been able to resolve the confusion around hourly and daily traffic levels. Concerns relating to amenity have been thoroughly assessed and additional mitigation proposed to limit the risk of potential environmental impacts.

The key outcomes of Hanson's review of the Project and the additional assessment undertaken for the Project includes the following.

- Hanson has clarified the proposed transport levels for the Project.
- Hanson has amended the preferred transport route to reflect the preferences of Port Stephens Council and Maitland City Council.

- The transport operations would not significantly impact road capacity or intersection performance.
- Concerns regarding the condition of the local road network and the availability of pedestrian infrastructure is a matter for Port Stephens Council. However, Hanson would continue to pay road maintenance contributions for transport of product over local roads. It is estimated that over 30 years, Hanson would contribute more than $12 million in road infrastructure and maintenance contributions.

  Hanson is currently in negotiations with Port Stephens Council regarding contributions to construction of a pedestrian pathway along Brandy Hill Drive and construction of bus bays along the transport route.
- It is predicted that operational noise levels between 1dB(A) to 2dB(A) above the Project Specific Noise Levels would be expected at properties to the south of the Quarry under worst case operating conditions. However, this impact is considered negligible given that a change in noise level of 2dB is not perceptible to the average human ear.
- Review of predicted road traffic noise indicates that noise levels would remain within the relevant assessment criteria during the night time period at the closest residence to Brandy Hill Drive. Existing noise levels already exceed the criteria during the daytime period and Hanson has limited the change in noise level during this period to 1.1dB(A), a change in noise level that is not perceptible to the average human ear. Road traffic noise levels are therefore not predicted to significantly increase under the Project.
- Hanson has considered the potential for sleep disturbance and concluded that operational noise generation would remain below levels likely to result in sleep disturbance for the closest privately-owned residences. It is acknowledged that some residences on Brandy Hill Drive that have been built close to the road may experience noise levels from any passing traffic that disturb sleep under existing conditions. Hanson has proposed to limit night time operations to no more than 20 calendar days per year and provide interested community members with seven days' notice of this occurring so that the likelihood of impact is limited and people are aware of noise sources during that time.
- Predictive modelling of dust dispersion from the Quarry has indicated that dust dispersion is likely to remain consistent with, but slightly higher than existing operations. This includes assessment at more than double the maximum production rate. This is principally the result of design controls including enclosure of processing equipment. Diesel emissions and blast fumes are not likely to significantly impact the closest privately-owned residences.
- Potential blasting impacts have been assessed and it has been concluded that blast-related ground vibration and air-blast overpressure would remain below levels likely to cause impacts at the closest privately-owned residences under proposed blast management.

- Additional assessment of the potential occurrence of the Rusty Greenhood Orchid within the areas proposed for disturbance failed to identify the species.
- Assessment of threatened and migratory flora and fauna species listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* has been undertaken and identified that significant impacts are not expected for these species, excluding the Koala which has been assessed as potentially subject to a significant impact based on habitat removal.
- A Biodiversity and Rehabilitation Management Plan would be implemented to manage potential risks to flora and fauna including potential impacts to Koala habitat. While the loss of Koala habitat is considered a significant impact locally, the area supports only a small population of Koala, would not fragment surrounding remnant Koala habitat and the offset for the loss of this habitat is likely to result in the conservation of approximately 450ha of Koala habitat in perpetuity. Assessment has been undertaken in accordance with the NSW Biodiversity Offset Scheme and EPBC Act Environmental Offsets Policy to ensure that an acceptable outcome results from the proposed vegetation clearing for the Project
- Key Insights has considered publicly available information on the local area, the outcomes of a consultation program and feedback presented in the submissions in preparing an assessment of potential social impacts of the Project. The assessment identified that generally the community was not opposed to the Quarry, but rather wanted to ensure that operations occurred at levels that would not significantly impact local amenity and the local experience of the area. Notwithstanding this, fears remain in the community regarding change to the local area over which they have no control.

  Hanson has undertaken additional consultation since the exhibition of the EIS in order to inform, educate and listen to the community. However, the need for Hanson to proactively engage with the community on an ongoing basis has been identified and it was acknowledged that Hanson need to demonstrate high levels of ongoing environmental performance and accountability for the Project in order to develop trust in the local community. Key Insights presented a range of recommendations that have been accepted as commitments by Hanson. Many of these recommendations have been proactively implemented by Hanson since the completion of the Social Impact Assessment.
- In Hanson's experience, concerns regarding potential impacts to property value do not generally eventuate. Key Insights undertook a review of publicly available sales information that demonstrated that the local area is attractive to potential property buyers. Given the resolution of traffic-related issues, there is no Project-related reason for this positive growth to cease.

Additional responses to concerns raised regarding matters such as potential impacts to water resources, Aboriginal and historic heritage, human health and economic impacts have been reviewed and addressed and it has been concluded that potential environmental risks could be managed as proposed, and under conditions of consent. Based on these outcomes, it is considered that the comments and requests regarding the technical aspects of the assessment of the Project have been resolved satisfactorily.

Review of the various submissions highlights the difference between expectations of impact felt by the community and that predicted in the technical assessments for the Project. Hanson has refined the Project to reduce potential amenity impacts and has explained to the participants in community consultation how the environmental management and performance of the operation would be managed, monitored, reported and regulated/audited during the life of the operation. Community consultation since the exhibition of the EIS has largely been positive, with Hanson and its representatives able to answer questions from the community regarding the ongoing operation.

Many people in the local community have expressed their satisfaction with the approach and information provided. However, there remains concerns in the local community principally regarding the proposed increase to transport operations and 24-hour operations for some processing activities. It is also acknowledged that community members remain concerned about other potential impacts of the Project including operational dust and noise generation, impacts to native flora and fauna including the Koala, dust generation from concrete recycling and silicosis. These concerns are reflected in apprehension about change to the locality and the way of life currently experienced.

The concerns expressed regarding the increase to transport operations relates to road safety, traffic noise and sleep disturbance and the local community's experience of their neighbourhood. Hanson has considered each of these matters carefully and is proposing a range of mitigations to reduce the potential risks associated with transportation. These include the following.

- Limiting night time product despatch to 20 calendar days per year with seven days' notice to be provided to community members who have registered with the Quarry.
- Contribution to construction of a pathway on Brandy Hill Drive that would provide a level of separation between vehicles and pedestrians or cyclists.
- Contribution to construction of bus bays along the transport route to provide safe sections for buses to pull off the road.
- Ongoing contributions to road maintenance and upgrade along the transport route.
- Following review of the submissions received, Hanson lobbied RMS to review speed limits in the vicinity of the Quarry. From 16 September 2019, the speed limit along Clarence Town Road in the vicinity of the Quarry will be reduced from 100km/hr to 80km/hr. The speed limit on Brandy Hill Drive was considered appropriate.
- Hanson trucks and drivers would continue to operate with best practice management protocols including monitoring of location, speed and use of braking systems.
- Ongoing implementation of a Drivers Code of Conduct would guide driver behaviour and incorporate a disciplinary protocol for identified poor performance.
- The existing complaints procedures would be maintained that includes investigation of issues raised and response to complainants on concerns raised.

The Project would require the removal of approximately 53.8ha of native vegetation progressively over the life of the Quarry. An offset strategy is proposed that would require the conservation, in perpetuity, of a proportionate area (as determined using the NSW Government calculation tools). It is estimated that the offsetting approach for the Koala alone would require the conservation of 450ha of Koala habitat.

With regards the proposed operating hours, Hanson has limited operating times as much as is considered feasible in order to allow for the crushing and sizing of material to meet client specifications and that permits on-time delivery. Additional mitigations have been applied to reduce noise generation for all operations and the generation of noise during night time operations has been assessed. It has been concluded that noise generated by these operations is not likely to be intrusive or cause sleep disturbance. It is acknowledged that for some in the community the approval of night time operations would change their concept of the locality. However, it is not expected that night time operations would be a regular feature of the operation and that when these do occur, they would be experienced as a low hum and that this noise would be difficult to discern when residents are indoors.

Some members of the community expect that the Project would significantly change the existing way of life and experience of the local area for residents, which is reflected in concerns regarding the sense of place for the local community. These perceptions have been exacerbated by misunderstandings regarding the Project and the fact that the some people in the community feel that consultation has not be satisfactory. Consultation activities since the exhibition of the EIS have included CCC meetings, informal Have-A-Chat meetings and invitations for community members to visit and tour the Quarry. Through these activities Hanson has attempted to explain the operations, educate the community and allay fears. It is accepted that some members of the community remain concerned, but consultation has generally been positively received.

Hanson acknowledges that it would be important for ongoing operations that the Company develops an effective engagement strategy that connects the operations with the local community. This would allow Hanson to demonstrate that it is a valuable part of the local community. There has been some success with this over the life of the existing Quarry and since the exhibition of the EIS, but actions here would need to be maintained. Technical assessment of the Project has demonstrated that the proposed operations would occur within expected limits that are designed to avoid significant impacts and meet community expectations. Ongoing operational and environmental management would be required and would be described in the various environmental management plans for the operation. Ongoing management would be complemented by a regime of annual reporting and environmental auditing that is standard practice for State significant extractive industry developments.

Material from the Quarry would support key infrastructure projects in the Newcastle, Port Stephens, Maitland and Hunter region as well as within the Central Coast and Greater Sydney areas. The strategic location of the resource and the fact that it is an expansion to an existing operation (rather than a greenfield site) would have positive outcomes for the cost of supply and development in these regions. The ongoing operation would also continue to provide employment and training outcomes for the local area as well as a source of local spending on consumables.

Given the size and location of the resource at the Quarry, it is necessary that a balance be established between the need for access to a suitable hard rock resource for local and regional infrastructure development, the equitable distribution of economic benefits from the operation, and the need for the local community to live a healthy lifestyle with the amenity they currently appreciate. Hanson considers that the Project, as presented, would satisfy each of these needs.

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