Hanson

ABN: 90 009 679 734

# Response to Submissions

for the

# Brandy Hill Quarry Expansion Project

Major Project Application No. 5899

*Prepared by:*

**R.W. CORKERY & CO. PTY. LIMITED**

October 2018

This page has intentionally been left blank

ABN: 90 009 679 734

# Response to Submissions

for the

# Brandy Hill Quarry Expansion Project

Major Project Application No. 5899


**Prepared for:**

Hanson Construction Materials Pty Ltd
ABN: 90 009 679 734
Level 7, 75 George Street
PARRAMATTA NSW 2150

Telephone: (02) 6331 1933
Facsimile: (02) 6331 3805
Email: andrew.driver@hanson.com.au

**Prepared by:**

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

**Brooklyn Office:**
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Email: brooklyn@rwcorkery.com

**Orange Office:**
62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Email: orange@rwcorkery.com

**Brisbane Office:**
Suite 5, Building 3
Pine Rivers Office Park
205 Leitchs Road
BRENDALE QLD 4500

Telephone: (07) 3205 5400
Email: brisbane@rwcorkery.com



Ref No. 968/01

October 2018


R.W. CORKERY & CO. PTY. LIMITED

**This Copyright is included for the protection of this document**

COPYRIGHT

**© R.W. Corkery & Co. Pty Limited 2018**
**and**
**© Hanson Construction Materials Pty Ltd 2018**

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to R.W. Corkery & Co. Pty Limited.

# CONTENTS

**Page**

# CONTENTS

**Page**

# CONTENTS

**Page**

# CONTENTS

**Page**

# CONTENTS

**Page**



## APPENDICES



## FIGURES

# CONTENTS

**Page**



## TABLES

# CONTENTS

**Page**

This page has intentionally been left blank

# Executive Summary

Hanson has commissioned R.W. Corkery & Co Pty Limited to prepare a *Response to Submissions* that addresses the key issues raised in submissions lodged with the Department of Planning and Environment (DPE) during the public exhibition period for the Environmental Impact Statement (EIS) for the Brandy Hill Quarry Expansion Project (the Project). The EIS for the Project was placed on exhibition from 10 March 2017 to 9 April 2017.

Preparation of this *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

DPE has provided Hanson with a total of 194 submissions that were provided to the Department during the exhibition period. 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 *Response to Submissions* with proposed product despatch decreased by a third compared to the numbers suggested in various submissions. Hanson has also reviewed the proposed operations and reduced operating hours for some aspects of the Project, however has retained night time operations where this is important to satisfy demand. 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. While there would be a level of interaction between these projects through the use of similar transport routes, these interactions have been incorporated into the assessments undertaken for the Project and indicated that cumulative impacts would not exceed the relevant guidelines. Given that the Martins Creek Extension Project is still being reviewed by Daracon Quarries, the assumed cumulative impacts remain conservative.

### 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.
- 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.
- Predictive modelling of dust dispersion was repeated to incorporate modified operational scenarios 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
- Community and stakeholder engagement and a Social Impact Assessment has been undertaken by Key Insights.

### Modifications 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. The key modifications to the Project since the completion of the EIS include the following.

- Proposed operating hours have been modified as follows.
  - Construction operations have been limited to daytime hours only Monday to Saturday.
  - Blasting hours have been limited to 9:00am to 5:00pm Monday to Friday. Blasting operations on a Saturday have been removed.
  - Load and haul activities (activities in the Extraction Area and transport of materials from the Extraction Area to the Processing and Stockpiling Area) have been limited to 5:00am to 10:00pm Monday to Saturday.
  - Operation of the primary crusher has been limited to 5:00am to 10:00pm Monday to Saturday.
  - Operation of the secondary and tertiary crushing and screening equipment, sales and despatch and routine maintenance may occur up to 24 hours each day.
- Product despatch from the Quarry would be limited to the following levels.
  - 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).

  Hanson has also reviewed proposed hourly product despatch and would limit hourly heavy vehicle despatch to 30 vehicles per hour for product delivery. This includes heavy vehicle movements associated with the import of concrete material and the operation of the proposed Concrete Batching Plant.
- Hanson would limit the speed of all Quarry-related product despatch vehicles to 60km/hr on Brandy Hill Drive (compared to the sign-posted speed limit of 80km/hr). The reduced speed is intended to improve road safety and reduce the road traffic noise generated by trucks on this road.
- Hanson has requested that Roads and Maritime Services (RMS) review the sign-posted speed limit on Clarence Town Road with initial feedback indicating that a review of speed limits in this location is currently under way.
- Enclosures are to be installed on all fixed processing equipment from the commencement of Stage 1 of operations, excluding Screen 1 and Screen 5. All fixed processing equipment would be enclosed from Stage 4 and Stage 5.
- The earthen amenity barrier located to the south of the relocated Processing and Stockpiling Area has been extended, would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- Additional 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.

- Concrete recycling activities would commence from Stage 1 and involve the use of mobile crushing equipment.
- Hanson is proposing to recover tree hollows removed during vegetation clearing activities and progressively rehang these hollows in remnant vegetation within the property that would not be disturbed under the Project. It is understood that existing hollows that have been artificially placed in this manner generally have a higher rate of use than nesting boxes.
- Hanson is proposing that ongoing road maintenance contributions would continue to be provided to Port Stephens Council directly, however with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed.
- Hanson acknowledges that consultation during preparation of the EIS has not met the expectations of DPE or the local community. A key recommendation of the Social Impact Assessment is the implementation of a Stakeholder Engagement Plan to provide channels of communication, demonstrate environmental management performance and accountability and build trust with the local community.

Hanson considers that the Project, as presented, substantially addresses the majority of the issues raised.

### Response to Submissions

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

- Hanson has clarified the proposed transport levels for the Project and confirmed that it is not proposed to change the currently experienced hourly maximum laden vehicle despatch from 30 trucks per hour. Transport levels have been limited in order to reduce the potential change in road traffic noise generated by heavy vehicles using the local road network.
- Hanson and Intersect Traffic remain confident that the transport operations would not significantly impact road capacity or intersection performance.
- Hanson has acknowledged community concerns regarding the condition of the local road network and the availability of pedestrian infrastructure. It has also been noted that Port Stephens Council is the relevant local road authority and that there is some confusion regarding how the road contributions currently paid by Hanson have been allocated in the past. Hanson propose that ongoing road construction and maintenance contributions would be overseen by a community-based committee that would provide direction on where road infrastructure and maintenance work is most needed. Under this arrangement Port Stephens Council would need to provide feedback on the allocation of funds paid by Hanson.

  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 that would effectively be managed through the Voluntary Planning Agreement.

- It is predicted that operational noise levels between 1dB(A) to 2dB(A) above the relevant assessment criteria 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 implemented a reduced speed limit for trucks on Brandy Hill Drive to ensure that Quarry-related product delivery vehicles generate less noise than other vehicles on the road.
- Predictive modelling of dust dispersion from the Quarry has indicated that dust dispersion is likely to remain consistent or lower than existing operations. This is principally the result of design controls including enclosure of fixed 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 survey for the Rusty Greenhood Orchid within the areas proposed for disturbance failed to identify the species indicating it does not grow within the Quarry.
- Potential impacts to Koala habitat would be managed in accordance with the *Biodiversity Conservation Act 2016* and would not result in a significant impact to the local population of this species.
- Key Insights assessed potential social impacts based on social research including comprehensive consultation and identified that in general, 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.

- The need for Hanson to proactively engage with the community on an ongoing basis was 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.
- Key Insights undertook a review of publicly available sales information that demonstrated that the local area remains attractive to potential property buyers. In Hanson's experience, concerns regarding potential impacts to property value do not generally eventuate. Given the resolution of traffic-related issues, there is no Project-related reason for 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.

### Conclusion

Review of the various submissions highlights the interaction between perceptions of impacts from road traffic, operational and road noise and to a lesser extent other operational impacts in overall impacts to amenity. This has also been perceived as potentially changing 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 community feels it has not been consulted. This *Response to Submissions* has demonstrated that potential amenity impacts from noise and dust would be consistent with expectations expressed in the relevant guidelines. In addition, transport levels would be limited to no more than 30 heavy vehicles per hour which is consistent with current experience. The frequency of heavy vehicle use of the road network would increase, however this would remain within levels that avoid or mitigate potential environmental impacts. 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, but actions here would need to be renewed. 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.

Given the size and location of the resource at the Quarry, it would be 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.

# 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.<br>The current operation extracts approximately 700,000 tonnes of material annually and employs 20 people.<br>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.<br>• Extraction Area – 78.5ha<br>• Processing and Stockpiling Area – 19.2ha (to be constructed from Stage 3)<br>• Amenity barrier to the south of the Processing and Stockpiling Area.<br>• Water management structures.<br>• Roads and other infrastructure.<br>The final extraction depth of the Project is -78m AHD. |
| Quarry Site Components and Infrastructure | Quarry infrastructure would consist of the following.<br>• Processing Plant and Stockpile Area<br>• Pre-Coat Plant<br>• Concrete Batch Plant<br>• Recycled Concrete Processing Plant and recycled roadbase stockpiles<br>• Pug Mill.<br>• 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.<br>• Total available resource – 78.1 million tonnes (ignimbrite, sandstone and conglomerate resource).<br>• 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.<br>Concrete batching to produce 15 000$m^3$ of concrete once this infrastructure is constructed.<br>Import of approximately 20 000t of concrete material per annum. |
| 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 presented in **Figure 1**, **Figure 2** and **Figure 3** and summarised as follows.<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>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.<br>The same configuration would be expected in the relocated Processing and Stockpiling Area. The processing plant currently consists of the following components.<br>• A primary crusher<br>• Secondary and tertiary crushers<br>• A quaternary crusher<br>• Five screens<br>• Conveyor belts, bins and hoppers.<br>• Pug Mill<br>• Pre-Coat Plant<br>Facilities for recycled concrete crushing and management would be constructed from Stage 1 of operations.<br>A Concrete Batching Plant would be constructed within the relocated Processing and Stockpiling Area to be commissioned from Stage 4 of operations.<br>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.<br>Hanson would enclose all existing fixed processing equipment from the commencement of Stage 1 of operations, excluding Screen 1 and Screen 5. |

| **Project Component** | **Summary of Component** |
|---|---|
| Products | The Quarry would continue to produce the following products.<br>• Concrete grade aggregates<br>• Fill material<br>• Manufactured sand<br>• Pre-coated aggregates<br>• Road base<br>• Gabion and armour rock<br>• Drainage materials<br>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.<br>• Access to the Pacific Highway via Brandy Hill Drive and Seaham Road.<br>• Access to Maitland and the New England Highway via Clarence Town Road and Paterson Road.<br>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.<br>• No more than 301 laden loads during day time (7:00am to 10:00pm).<br>• No more than 58 laden loads during the night time (10:00pm to 7:00am).<br>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.<br>It should be noted that one laden load requires two movements (that is, an inbound movement and an outbound movement) |
| 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.<br>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. |
| Water Management | The existing surface water management system consists of the following structures.<br>• The Western Dam.<br>• The northern and eastern sedimentation basins.<br>• Two sedimentation basins and a polishing basin to the south of the existing Processing Plant.<br>• A sump in the Quarry floor.<br>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.<br>Non-production wastes would continue to be managed in accordance with current practices. |

| **Project Component** | **Summary of Component** | |
|---|---|---|
| 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. | |
| Hours of Operation | Construction Works | Monday to Friday 7:00am to 6:00pm<br>Saturday 7:00am to 5:00pm<br>No operation on Sundays or public holidays |
| | Blasting | Monday to Friday 9:00am to 5:00pm<br>No blasting on Saturdays or Sundays or public holidays |
| | Load and Haul | Monday to Saturday 5:00am to 10:00pm<br>No operation on Sundays or public holidays |
| | Primary Crusher | Monday to Saturday 5:00am to 10:00pm<br>No operation on Sundays or public holidays |
| | Secondary and Tertiary Crushing and Screening | Monday to Sunday - 24hrs |
| | Sales and product despatch | Monday to Sunday - 24hrs |
| | Maintenance | Monday to Sunday - 24hrs |
| 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 is presented in **Figure 3** for the purpose of the application that includes the following.<br>• All infrastructure areas would be decommissioned and revegetated.<br>• All roads and tracks that are not required for a final land use would be decommissioned and revegetated.<br>• A water storage would remain with water to an elevation of approximately 30m AHD.<br>• 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.<br>• 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.<br>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.<br>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 2 799 ecosystem credits (various plant community types) and 1 191 species credits (Koala) would be required to offset the impacts of the proposed extension.<br>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 offsetting obligations. | |
| Capital Investment Value | $22.5 million | |

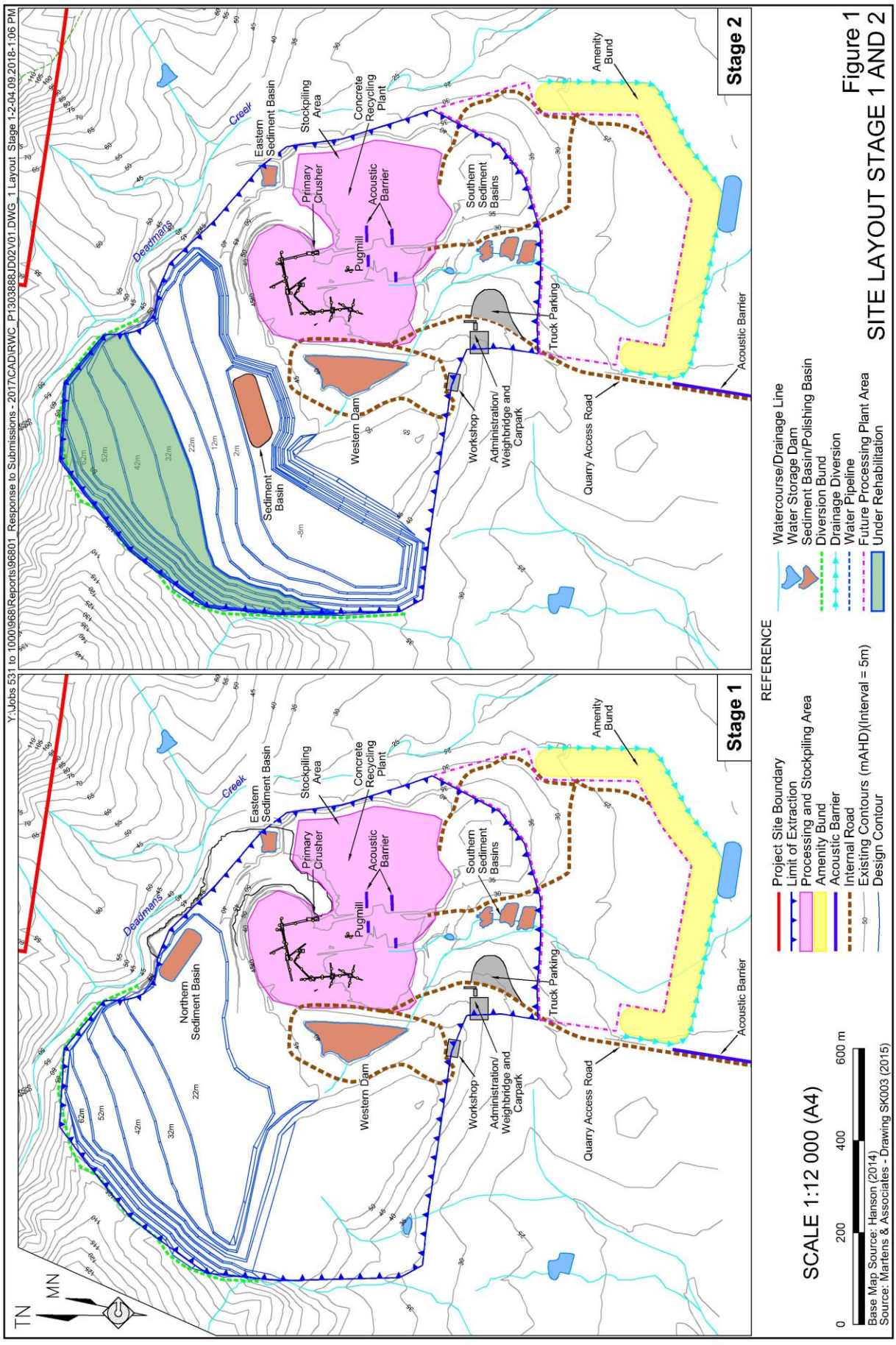



Figure 1
SITE LAYOUT STAGE 1 AND 2

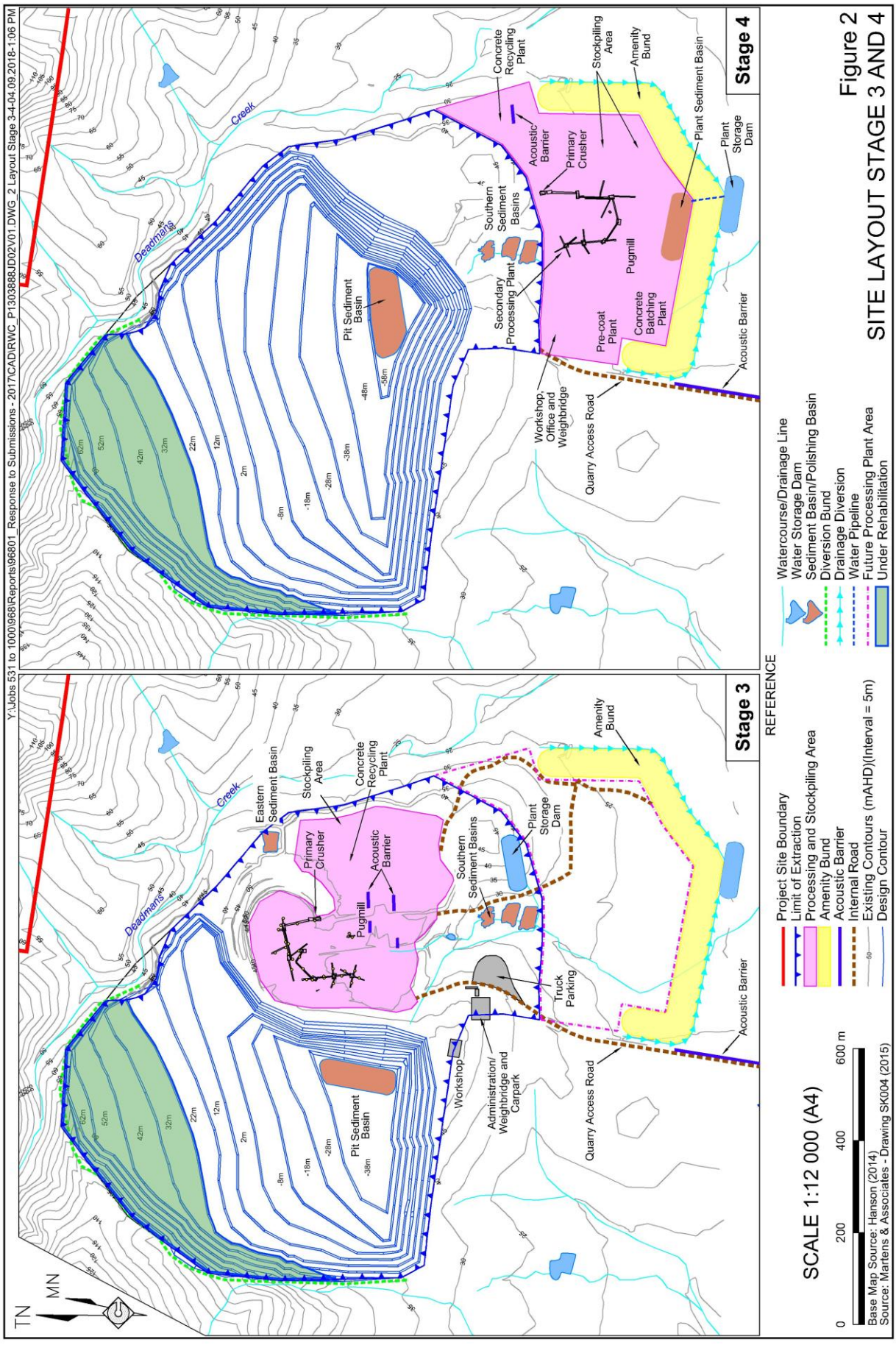
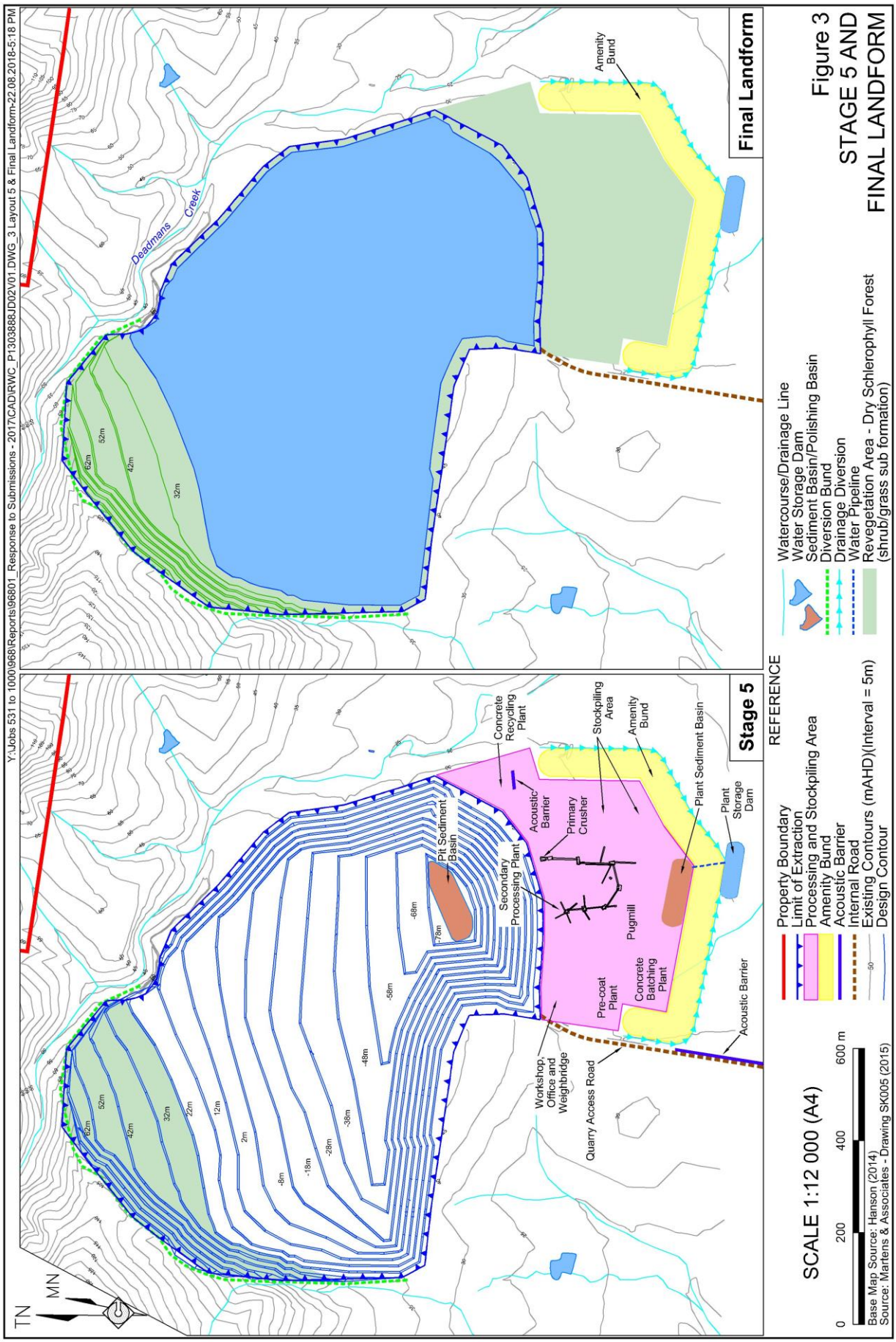



Figure 2
SITE LAYOUT STAGE 3 AND 4


Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2017\CAD\RWC_P1303888JD02V01.DWG_3 Layout 5 & Final Landform-22.08.2018-5:18 PM
Final Landform
Stage 5
Deadmans Creek
Amenity Bund
Concrete Recycling Plant
Stockpiling Area
Acoustic Barrier
Primary Crusher
Plant Sediment Basin
Plant Storage Dam
Pit Sediment Basin
Secondary Processing Plant
Pugmill
Pre-coat Plant
Concrete Batching Plant
Workshop, Office and Weighbridge
Quarry Access Road
Acoustic Barrier
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 3
STAGE 5 AND
FINAL LANDFORM

# 1. INTRODUCTION

## 1.1 SCOPE

This *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 the public exhibition period for the Environmental Impact Statement (EIS) for the Brandy Hill Quarry Expansion Project (the Project). The EIS and supporting technical assessments and plans were exhibited by DPE from 10 March 2017 to 9 April 2017. During that period, 194 submissions were received by DPE from Government agencies, community-based organisations and from private individuals. 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, reviewed the Project components in detail and has actively modified the Project to address the issues raised.

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. This caused outrage in the community, which was expressed in the submissions received by DPE. Hanson has clarified the proposed transportation operations in this *Response to Submissions* 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 *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 *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 five sections with 10 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 a summary of the outcomes of Hanson's review of the Project, modifications made to directly address issues raised in submissions and an overview of the additional assessments undertaken since the public exhibition period.

Section 3: 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 4: Provides an updated Statement of Commitments.

Section 5: Provides a concluding statement.

Section 6: 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 December 2017

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

Appendix 5: Updated Noise & Vibration Impact Assessment – Vipac Engineers & Scientists September 2018

Appendix 6: Updated Air Quality Assessment – Vipac Engineers & Scientists September 2018

Appendix 7: Updated Blast Impact Assessment - Vipac Engineers & Scientists September 2018

Appendix 8: Biodiversity Assessment Report - Updated Final Report – Biosis November 2017

Appendix 9: Correspondence with RMS – Dated 31 May 2018 and 8 August 2018.

Appendix 10: Drivers Code of Conduct – Brandy Hill Quarry

Appendix 11: Brandy Hill Quarry: Community Support & Sponsorship Policy

## 1.3 SUBMISSIONS RECEIVED

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** |

## 1.4 KEY THEMES OF THE SUBMISSIONS

**Figure 4** provides the frequency of themes raised in the submissions by residents opposing the Project. 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.

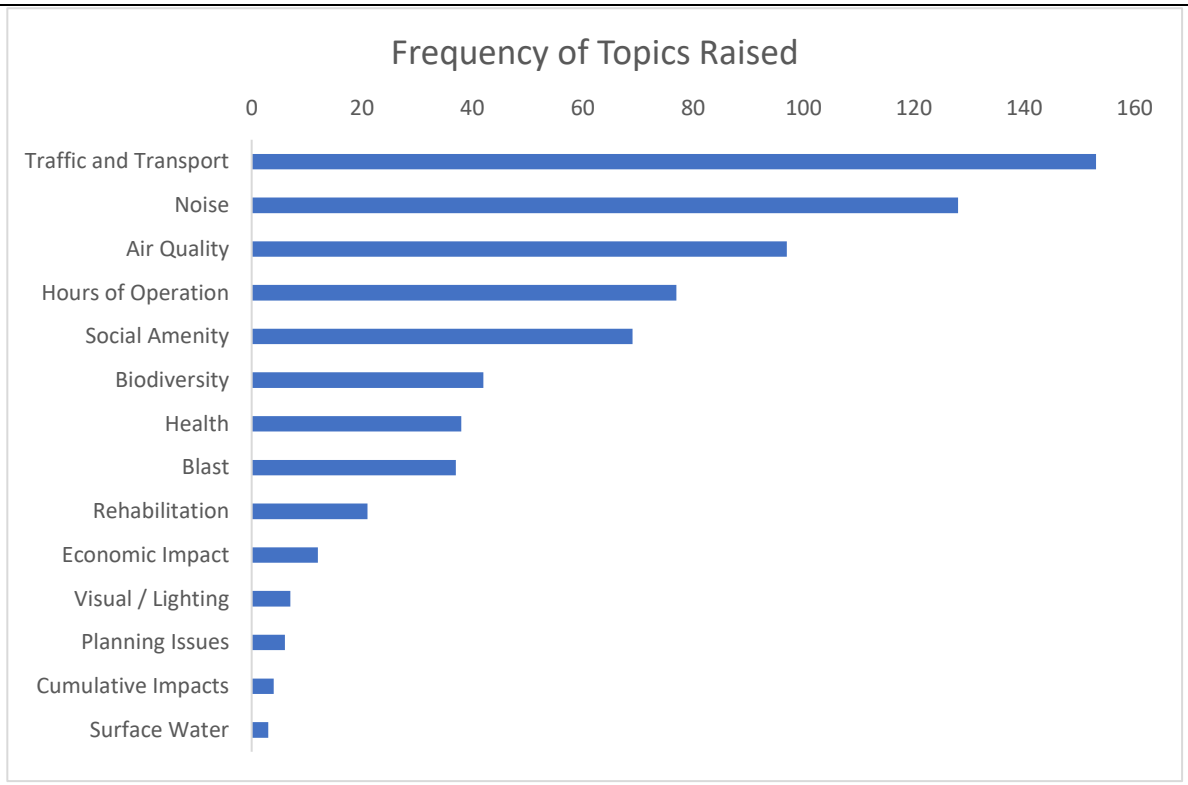



**Figure 4**
**Frequency of Topics Raised by Residents of Brandy Hill and Surroundings**

Hanson commissioned Key Insights to undertake independent community consultation designed to inform a Social Impact Assessment (presented as **Appendix 3** and summarised in Section 2.9). 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 15 September 2017 and 9 March 2018 which included discussions concerning Hanson's progress with the response process and introduced Key Insights for the purpose of consultation for the Social Impact Assessment. These meetings were also an opportunity for community members to explain their fears about changes to the local setting and their way of life that also informed additional assessments and review of the Project.

## 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 5**). 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.

**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 | 1.5 |
| Note 1: See **Figure 5** for gauge locations | | | |
| Source: Hanson | | | |

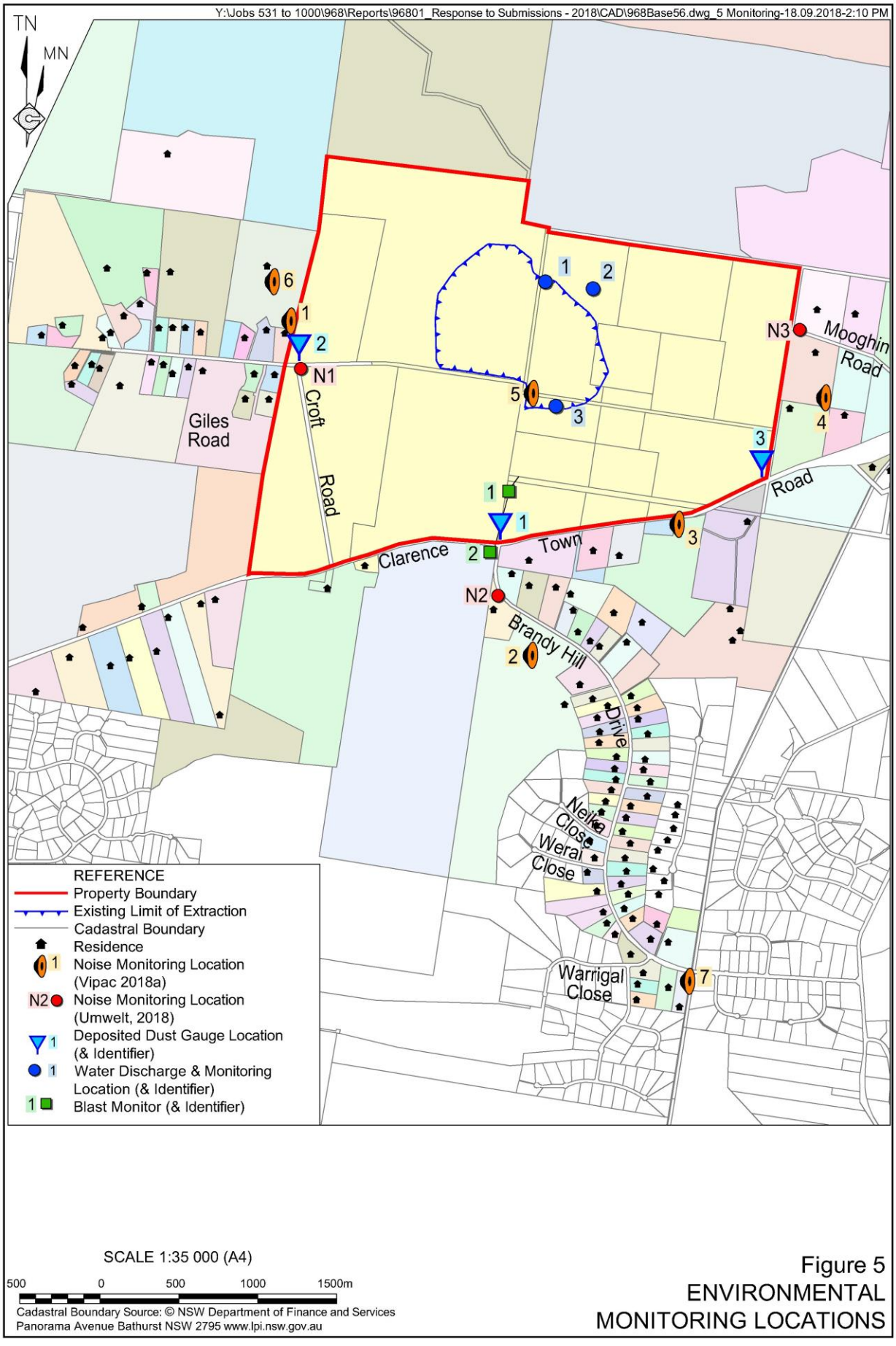



Figure 5
ENVIRONMENTAL MONITORING LOCATIONS

### 1.6.3 Water Monitoring

Three water discharge points (**Figure 5**) 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 5** 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 5**). 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 to 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 5** 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. AMENDMENTS AND ADDITIONAL ASSESSMENT FOR THE PROJECT

## 2.1 INTRODUCTION

The Government agency, community group and public submissions received by DPE 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 refinement of operating hours to reduce these as much as is considered feasible.

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 2.3 and provided in full as **Appendix 4**.
- 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 (2018a) is presented as **Appendix 5** and the results of noise model predictions presented in Sections 2.4 and 2.5.
- 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 (2018a) includes an amended assessment or road traffic noise (see **Appendix 5**). A summary of the outcome of the assessment are provided in Section 2.6.
- Predictive modelling of dust dispersion was repeated to incorporate modified operational scenarios resulting from the review of mitigation and management and to provide additional information requested in the submissions. The Updated Air Quality Impact Assessment is provided as **Appendix 6** and the results summarised in Section 2.7.
- 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 Updated Blast Impact Assessment is provided as **Appendix 7**.
- In its submission the Office of Environment and Heritage (OEH) 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 was updated to reflect the outcomes of these surveys and is presented as **Appendix 8**. The results of these targeted surveys are summarised in Section 2.9.

- 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 2.10.

In addition, Hanson's review of the submissions prompted several minor modifications to the Project to address the concerns raised. 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 majority of the issues raised.

## 2.2 MODIFICATIONS TO THE PROPOSED PROJECT

A Project Summary is provided on Page v with key modifications since the completion of the EIS (Hanson, 2017) including the following.

- Operating hours have been modified as follows.
  - Construction operations have been limited to daytime hours only Monday to Saturday.
  - Blasting hours have been limited to 9:00am to 5:00pm Monday to Friday. Blasting operations on a Saturday have been removed.
  - Load and haul activities (activities in the Extraction Area and transport of materials from the Extraction Area to the Processing and Stockpiling Area) have been limited to 5:00am to 10:00pm Monday to Saturday.
  - Operation of the primary crusher has been limited to 5:00am to 10:00pm Monday to Saturday.
  - Operation of the secondary and tertiary crushing and screening equipment, sales and despatch and routine maintenance may occur up to 24 hours each day.

  Operating hours are discussed in more detail in Section 3.12.
- 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 during day time (7:00am to 10:00pm).
  - No more than 58 laden loads during the night time (10:00pm to 7:00am).

  Hanson has also reviewed proposed hourly product despatch and would limit hourly heavy vehicle despatch to 30 vehicles per hour for product delivery. This includes heavy vehicles movements associated with the import of concrete material and the operation of the proposed Concrete Batching Plant. Further discussion of traffic levels is provided in Section 3.19.4.
- Hanson would limit the speed of all Quarry-related product despatch vehicles to 60km/hr on Brandy Hill Drive (compared to the sign-posted speed limit of 80km/hr). The reduced speed is intended to improve road safety and reduce the road traffic noise generated by trucks on this road. Road safety is discussed in more detail in Section 3.19.4 and road traffic noise is discussed in Section 3.14.8.

- Hanson has requested that Roads and Maritime Services (RMS) review the sign-posted speed limit on Clarence Town Road with initial feedback indicating that a review of speed limits in this location is currently under way (see correspondence provided in **Appendix 9**).
- Enclosures are to be installed on all fixed processing equipment from the commencement of Stage 1 of operations, excluding Screen 1 and Screen 5. All fixed processing equipment would be enclosed from Stage 4 and Stage 5.
- The earthen amenity barrier located to the south of the relocated Processing and Stockpiling Area has been extended (see **Figure 1**), would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- Additional 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.
- Concrete recycling activities would commence from Stage 1 and involve the use of mobile crushing equipment. Hanson has found that demand for recycled concrete materials has increased and is therefore proposing to commence the beneficial reuse of concrete material from the commencement of the Project. More information concerning proposed concrete recycling is provided in Section 3.7
- Hanson is proposing to recover tree hollows removed during vegetation clearing activities and progressively rehang these hollows in remnant vegetation within the property that would not be disturbed under the Project. It is understood that existing hollows that have been artificially placed in this manner generally have a higher rate of use than nesting boxes. More information on this program is provided in Section 3.4.4.
- Hanson is proposing that ongoing road maintenance contributions would continue to be provided to Port Stephens Council directly, however with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. More information on this program is provided in Section 3.17.
- Hanson acknowledges that consultation during preparation of the EIS has not met the expectations of DPE or the local community. A key recommendation of the Social Impact Assessment is the implementation of a Stakeholder Engagement Plan to provide channels of communication, demonstrate environmental management performance and accountability and build trust with the local community.

## 2.3 INTERSECTION CAPACITY AND PERFORMANCE

As a result of the Project review, Hanson 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). However, Hanson commissioned Intersect Traffic Pty Ltd to review the predicted conditions at intersections along the proposed transport routes. The results of the additional assessment are provided in **Appendix 4**.

**Figure 6** presents the transportation routes predominantly used for existing operations, although it is noted that, where it is required for local deliveries, heavy vehicles may need to access local roads.

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, traffic is considered to operate with uninterrupted flow conditions and 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 on the route between the Quarry and the New England Highway. It is therefore considered unnecessary to undertake intersection analysis of all intersections along the haulage routes to the sub-arterial and higher road network.

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).

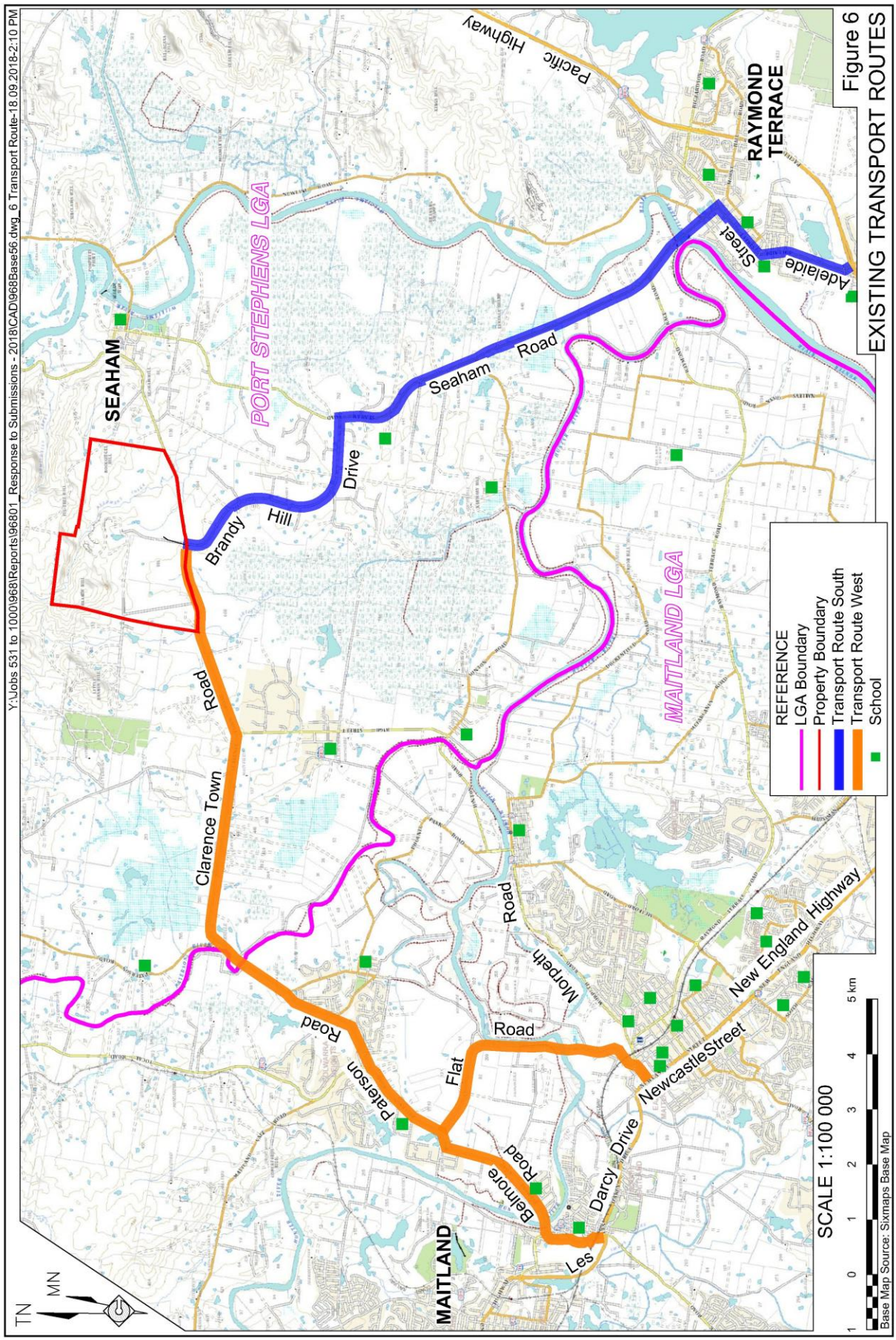


Figure 6
EXISTING TRANSPORT ROUTES
Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\968Base56.dwg_6 Transport Route-18.09.2018-2:10 PM
PORT STEPHENS LGA
MAITLAND LGA
SEAHAM
RAYMOND TERRACE
MAITLAND
Pacific Highway
Seaham Road
Brandy Hill Drive
Clarence Town Road
Paterson Road
Flat Road
Belmore Road
Morpeth Road
New England Highway
Newcastle Street
Darcy Drive
Les
Adelaide Street
REFERENCE
LGA Boundary
Property Boundary
Transport Route South
Transport Route West
School
SCALE 1:100 000
5 km
Base Map Source: Sixmaps Base Map
TN
MN

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**).

Modelling of the rural seagull at Raymond Terrace Road / Seaham Road did not match the observed behaviour during the traffic counts when the SIDRA defaults were used, therefore a calibration step was included in this modelling. The calibration was based on the critical gap acceptance criteria for right turning vehicles out of Raymond Terrace Road.

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 with both the Raymond Terrace Road / Seaham Road rural seagull and the Adelaide Street / William Bailey Street traffic signals operating at capacity by 2024 and 2044 respectively. 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 is provided as follows.

### Raymond Terrace Road / Seaham Road

With the estimated growth in background traffic, by 2024 the Raymond Terrace Road / Seaham Road rural seagull would need to be upgraded to a roundabout. The contribution to traffic volumes from the Quarry through the intersection in 2024 is only 3.4% of total traffic in the AM peak and 3.0% of total traffic in the PM peak, indicating an average contribution of 3.2% of total traffic. It is understood that RMS already has plans to upgrade this intersection to a roundabout under the blackspot program, which would resolve capacity issues at this location.

### 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.

In summary, it remains the conclusion of Intersect Traffic that the Project would not adversely impact the adjoining local and State road network. Intersect (2018) conclude that contributions negotiated with Port Stephens Council and implemented through the Voluntary Planning Agreement should also be directed towards any future upgrade of the Raymond Terrace Road / Seaham Road rural seagull intersection. This contribution should be relative to the proportion of Quarry traffic using this intersection.

## 2.4 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 5**.

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.

### 2.4.1 Existing Acoustic Environment

The submission from 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 6**.

**Table 6**
**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 7**.

The Project Specific Noise Levels presented in **Table 7** 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 7** 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 5**.

**Table 7**
**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.

### 2.4.2 Assessment Methodology and Criteria

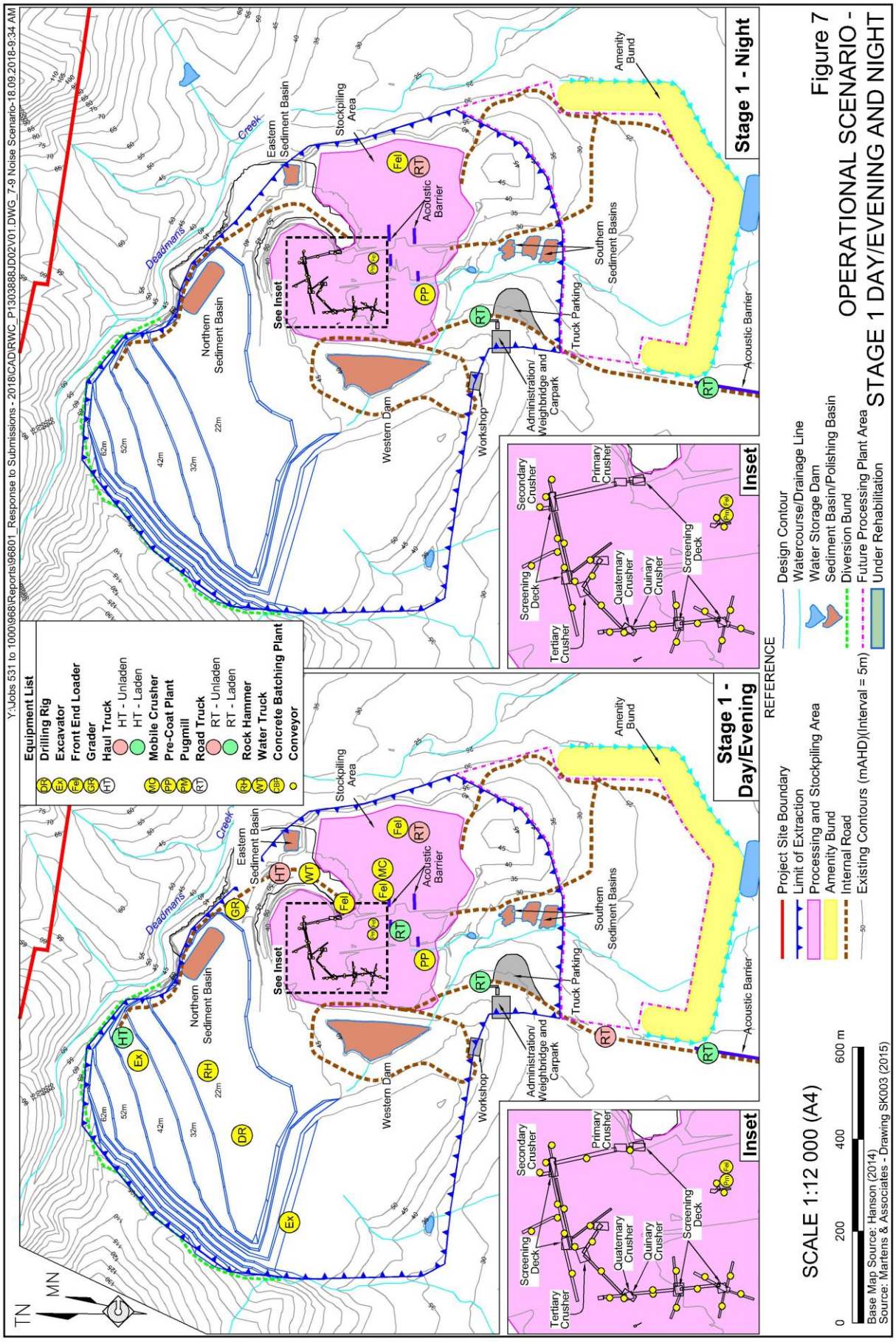
Vipac used the SoundPLAN computational noise prediction software package to develop a noise model and predict noise levels at privately-owned residences in the vicinity of the Quarry.

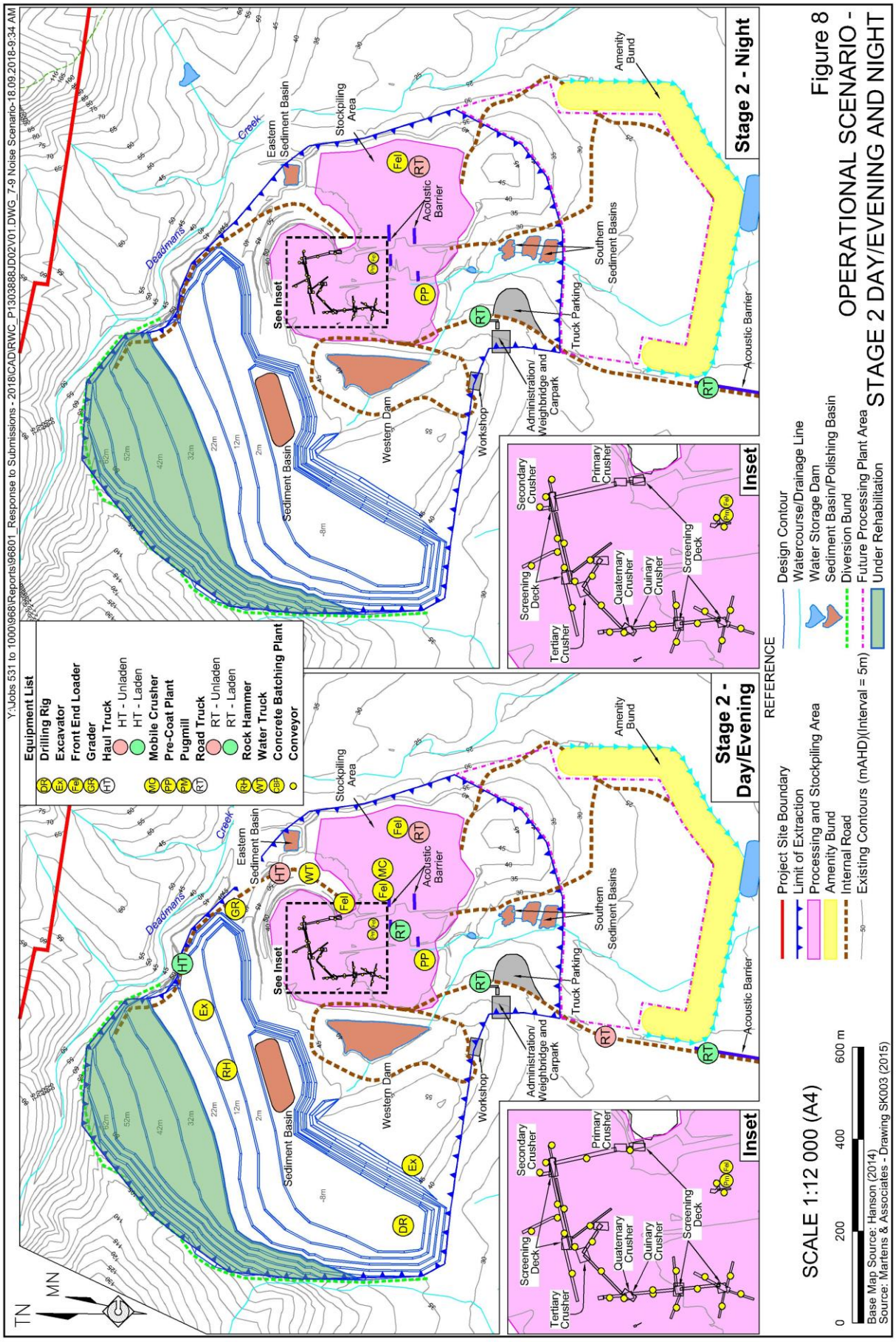
The model applies the following information to predict noise levels.

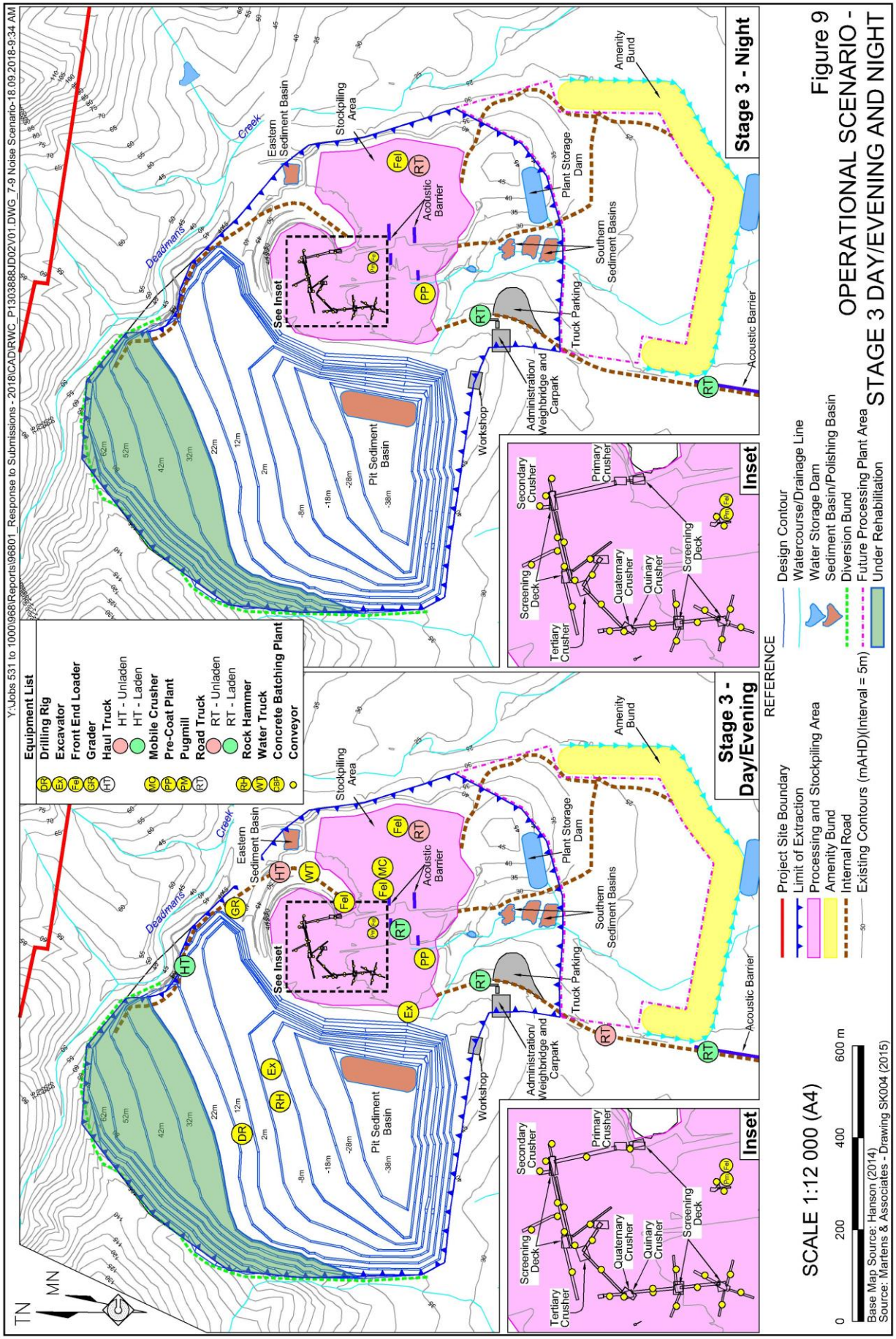
- Noise generated by relevant sources such as plant and mobile equipment using source data measured at the Quarry or where the equipment was not currently at use at the Quarry, measured at other Hanson operations or sourced from the Vipac library of noise sources (sound power levels are provided in Section 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 7** to **Figure 12**.

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.


Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\RWC_P1303888JD02\V01.DWG_7-9 Noise Scenario- 18.09.2018-9:34 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 1 - Night
Stage 1 - Day/Evening
Inset
See Inset
Eastern Sediment Basin
Northern Sediment Basin
Southern Sediment Basins
Stockpiling Area
Amenity Bund
Acoustic Barrier
Truck Parking
Administration/ Weighbridge and Carpark
Workshop
Western Dam
Deadmans Creek
Secondary Crusher
Primary Crusher
Screening Deck
Tertiary Crusher
Quaternary 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 SK003 (2015)
Figure 7
OPERATIONAL SCENARIO - STAGE 1 DAY/EVENING AND NIGHT


Y:\Jobs 531 to 1000\968\Reports\96801_Response to Submissions - 2018\CAD\RWC_P1303888JD02\V01.DWG_7-9 Noise Scenario- 18.09.2018-9:34 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 2 - Night
Stage 2 - Day/Evening
Inset
See Inset
Eastern Sediment Basin
Stockpiling Area
Amenity Bund
Acoustic Barrier
Western Dam
Workshop
Administration/ Weighbridge and Carpark
Truck Parking
Southern Sediment Basins
Sediment Basin
Deadmans Creek
Primary Crusher
Secondary Crusher
Tertiary Crusher
Quaternary Crusher
Quinary Crusher
Screening Deck
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 SK003 (2015)
Figure 8
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-18.09.2018-9:34 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
Amenity Bund
Administration/ Weighbridge and Carpark
Workshop
Pit Sediment Basin
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 9
OPERATIONAL SCENARIO - STAGE 3 DAY/EVENING AND NIGHT

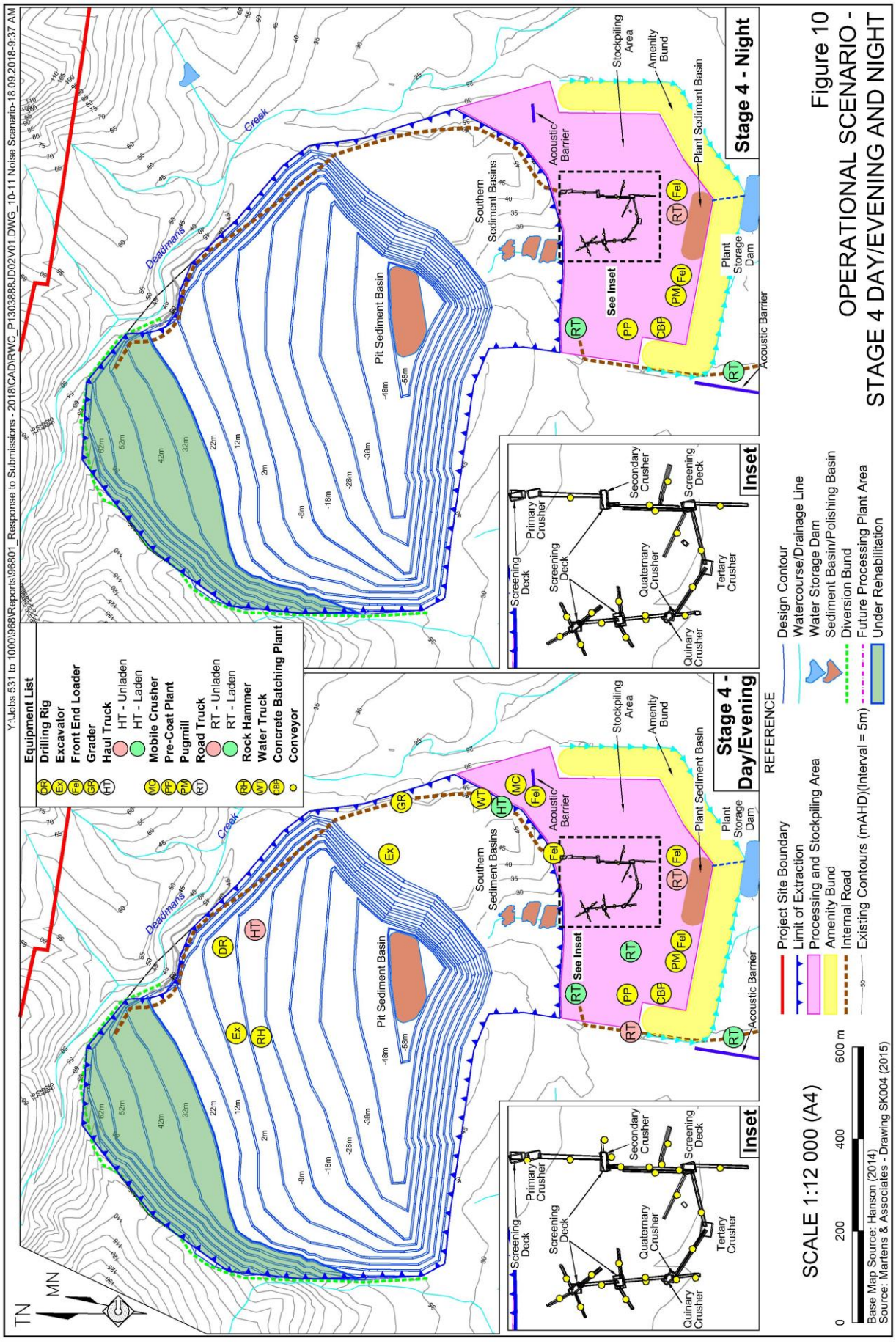



Figure 10
OPERATIONAL SCENARIO - STAGE 4 DAY/EVENING AND NIGHT

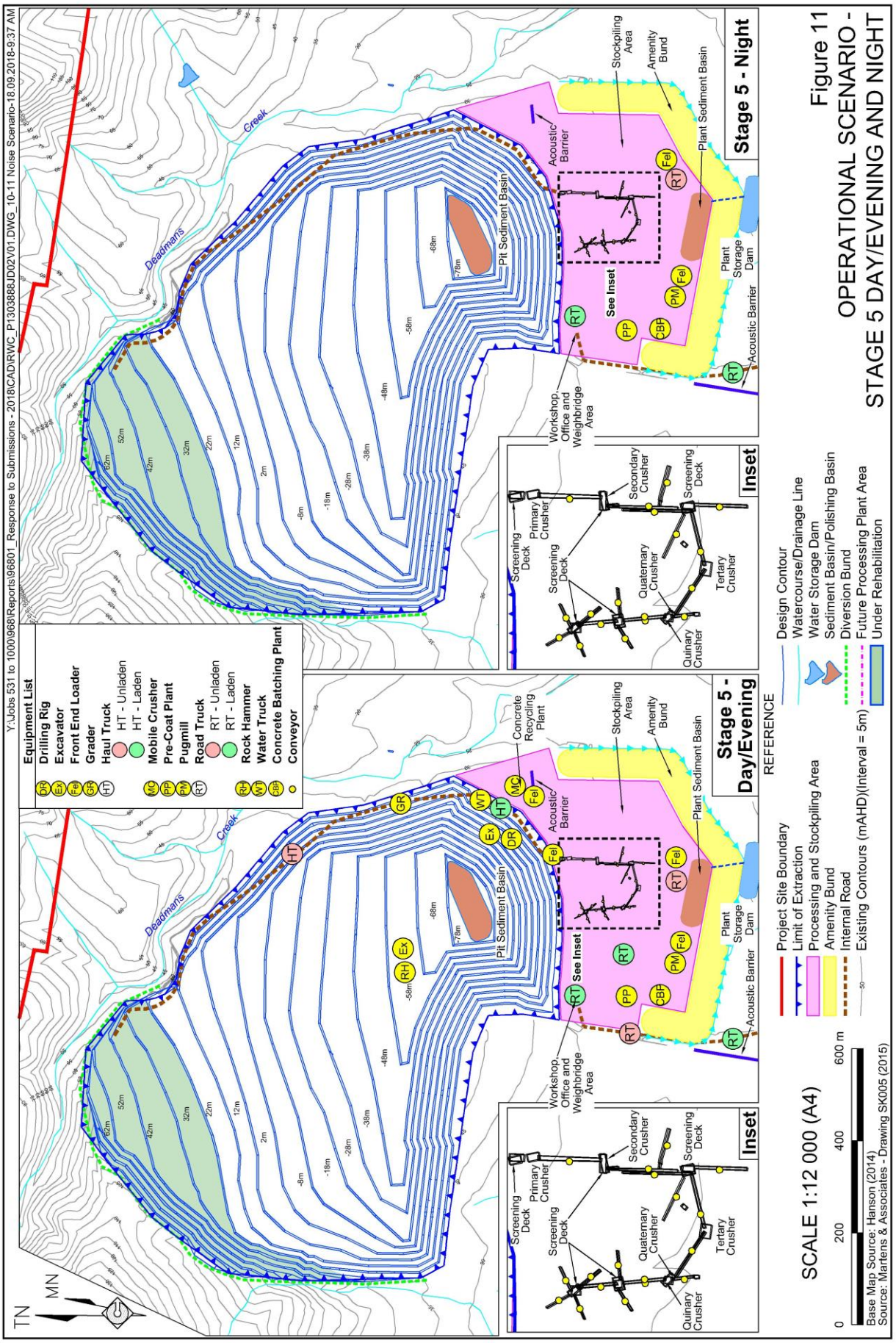



Figure 11
OPERATIONAL SCENARIO - STAGE 5 DAY/EVENING AND NIGHT

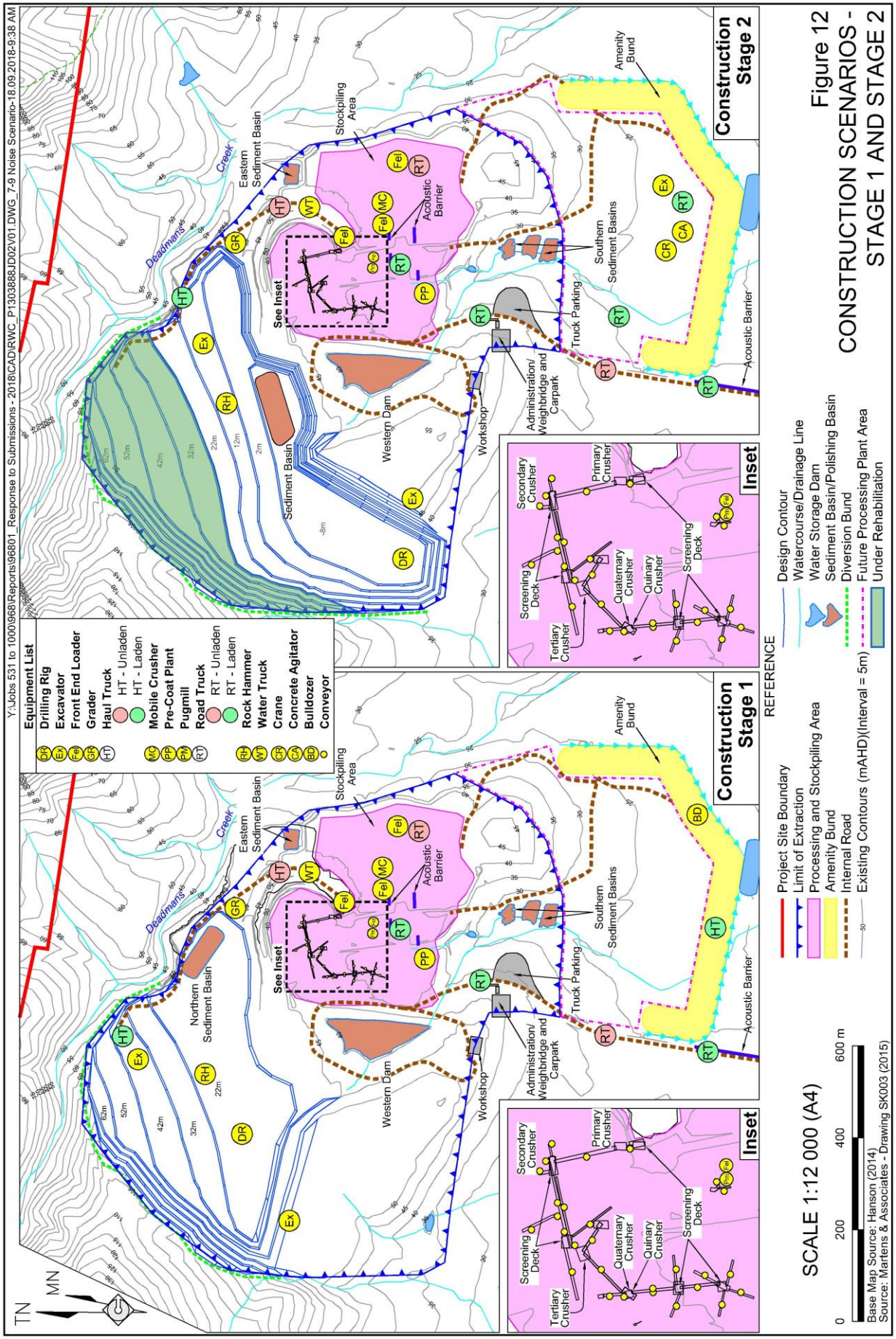



Figure 12
CONSTRUCTION SCENARIOS - STAGE 1 AND STAGE 2

**Table 8** presents the criteria adopted for the assessment based on the Project Specific Noise Levels presented in **Table 6**.

**Table 8**
**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 8** 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 9**.

**Table 9**
**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 |

### 2.4.3 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, excluding Screen 1 and Screen 5. All fixed processing equipment would be enclosed from Stage 4 and Stage 5.
- 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 DPE 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 DPE.

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 DPE.

### 2.4.4 Predicted Operational and Construction Noise Levels

Predicted operational noise levels at the closest privately-owned residences are presented in detail in Section 7.2 of Vipac (2018a) (**Appendix 5**). Noise contour diagrams are presented in **Figure 13** to **Figure 18**.

The results presented in Section 7.2 of Vipac (2018a) and summarised in **Table 10** 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 10**
**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 | - | - |

Source: Modified after Vipac (2018a) **Table 36** to **Table 44**, **Table 50** and **Table 51**
1 – See **Figure 13** to **Figure 18**

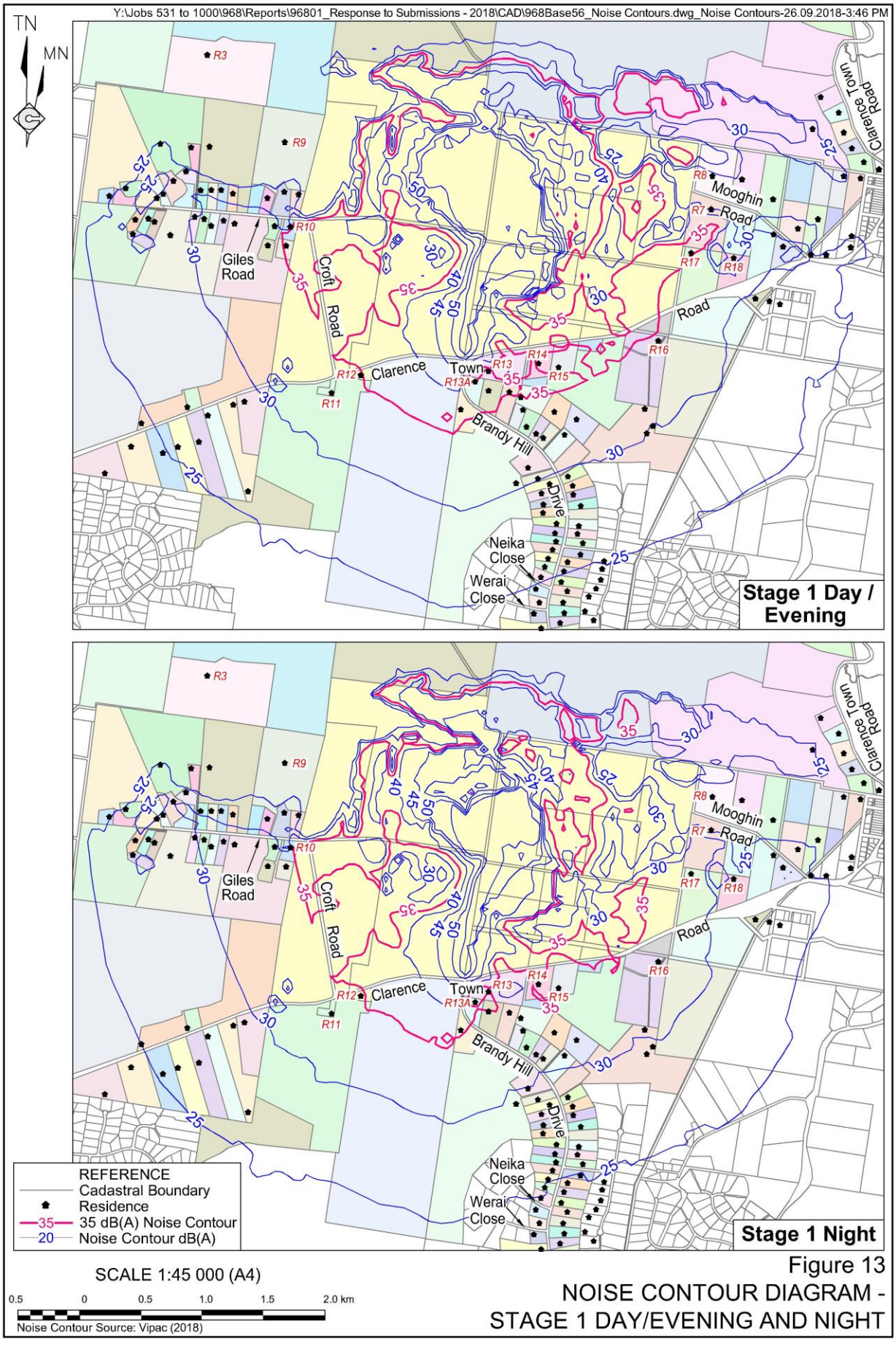



Figure 13
NOISE CONTOUR DIAGRAM - STAGE 1 DAY/EVENING AND NIGHT

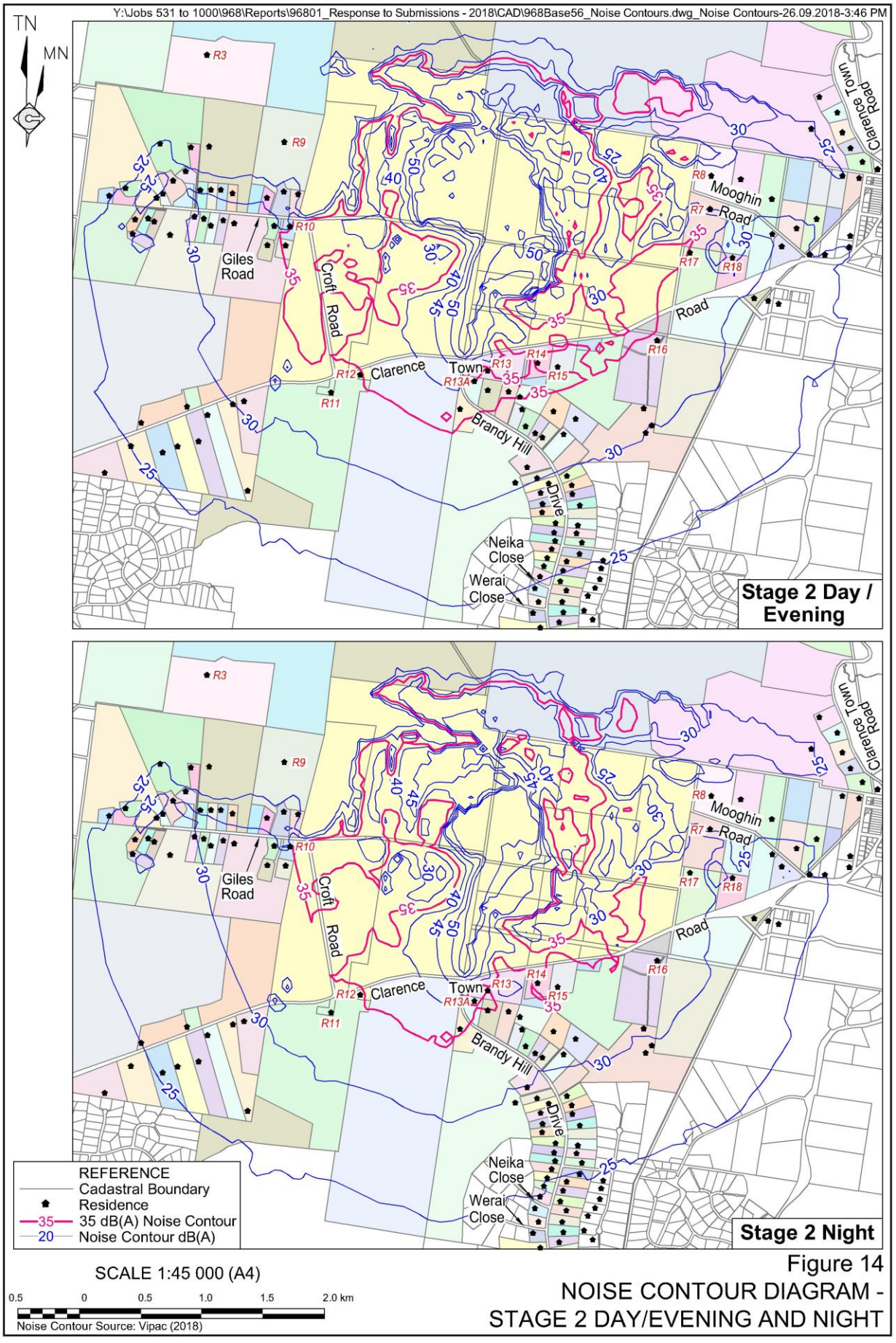



Figure 14
NOISE CONTOUR DIAGRAM - STAGE 2 DAY/EVENING AND NIGHT

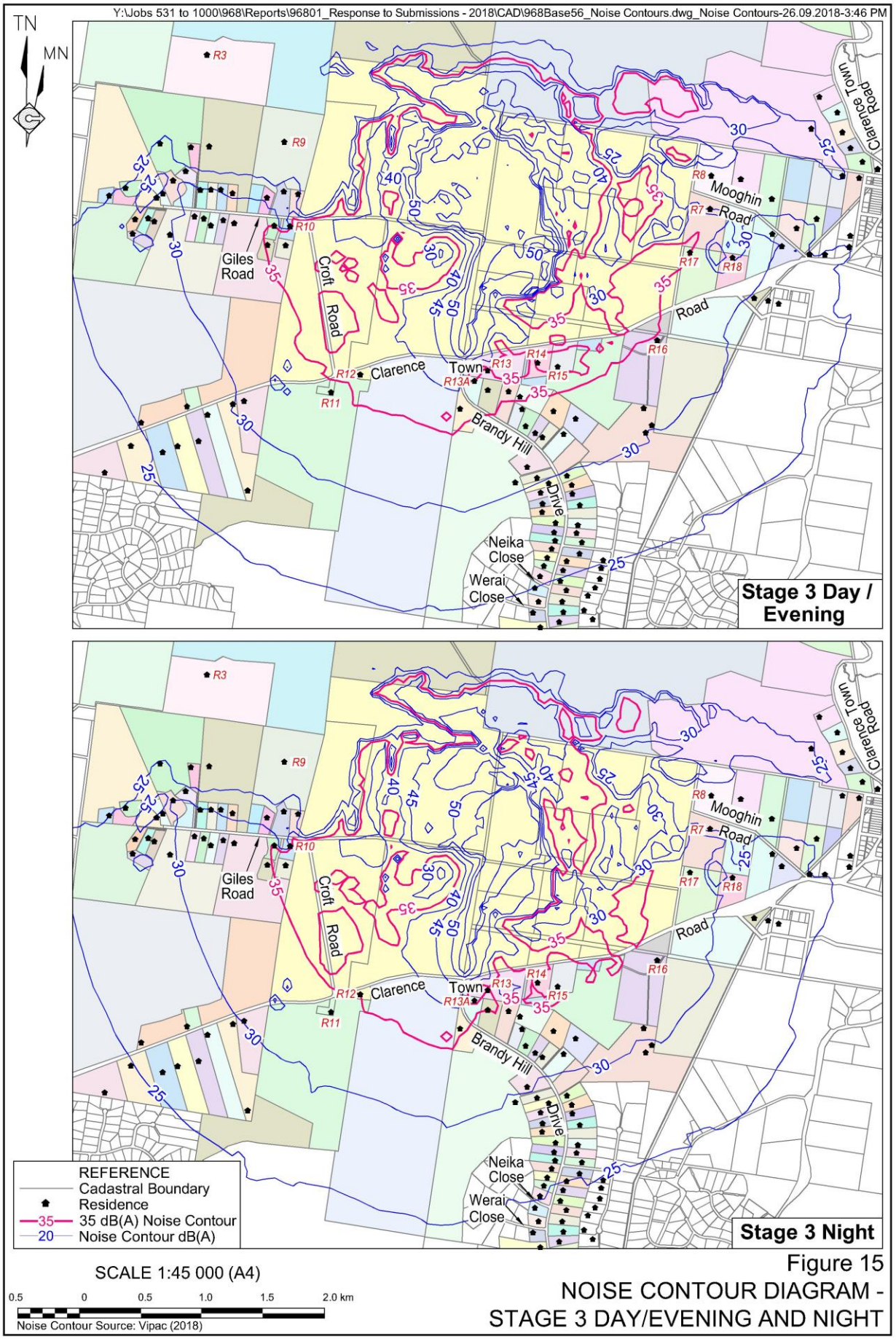



Figure 15
NOISE CONTOUR DIAGRAM - STAGE 3 DAY/EVENING AND NIGHT

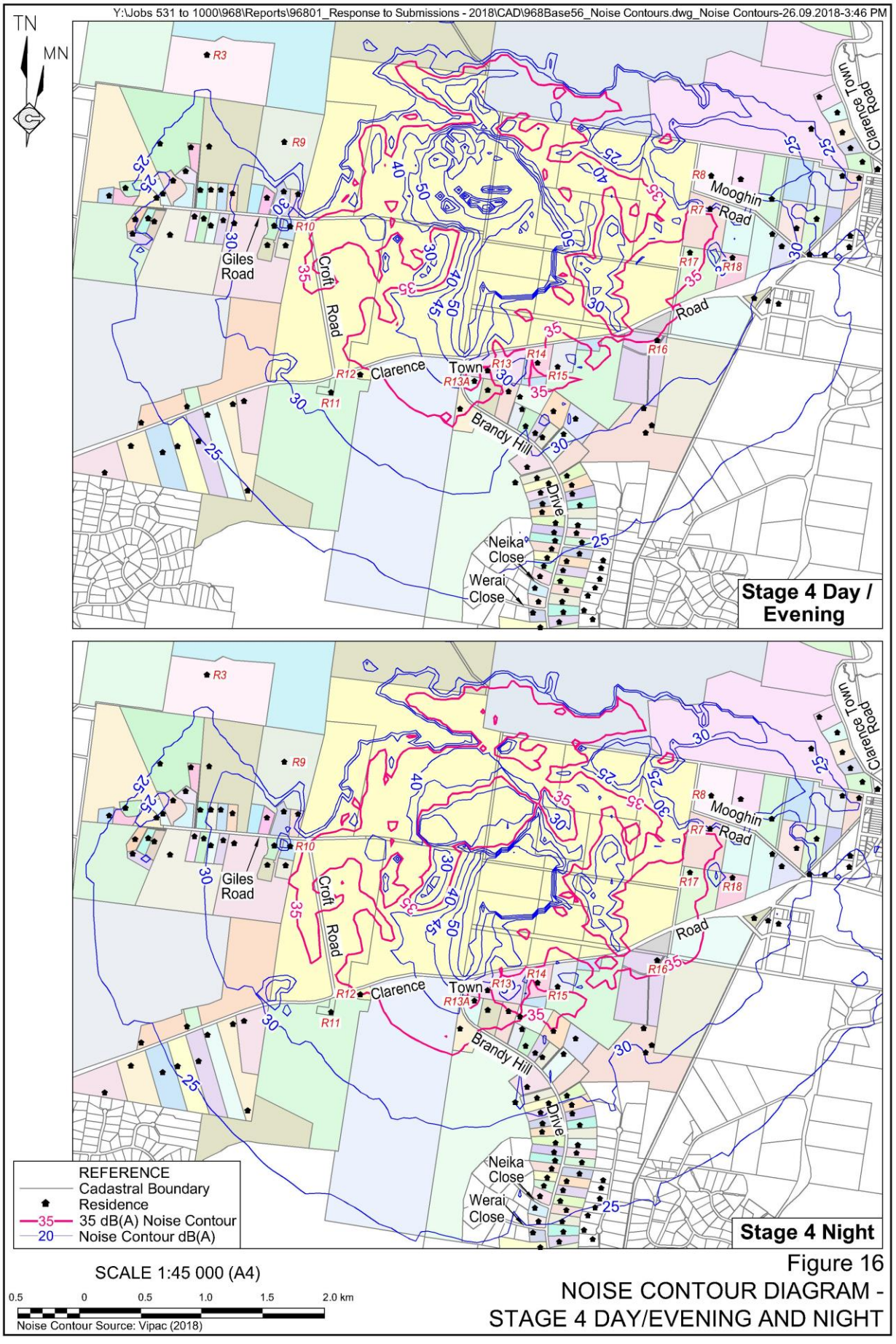



Figure 16
NOISE CONTOUR DIAGRAM - STAGE 4 DAY/EVENING AND NIGHT

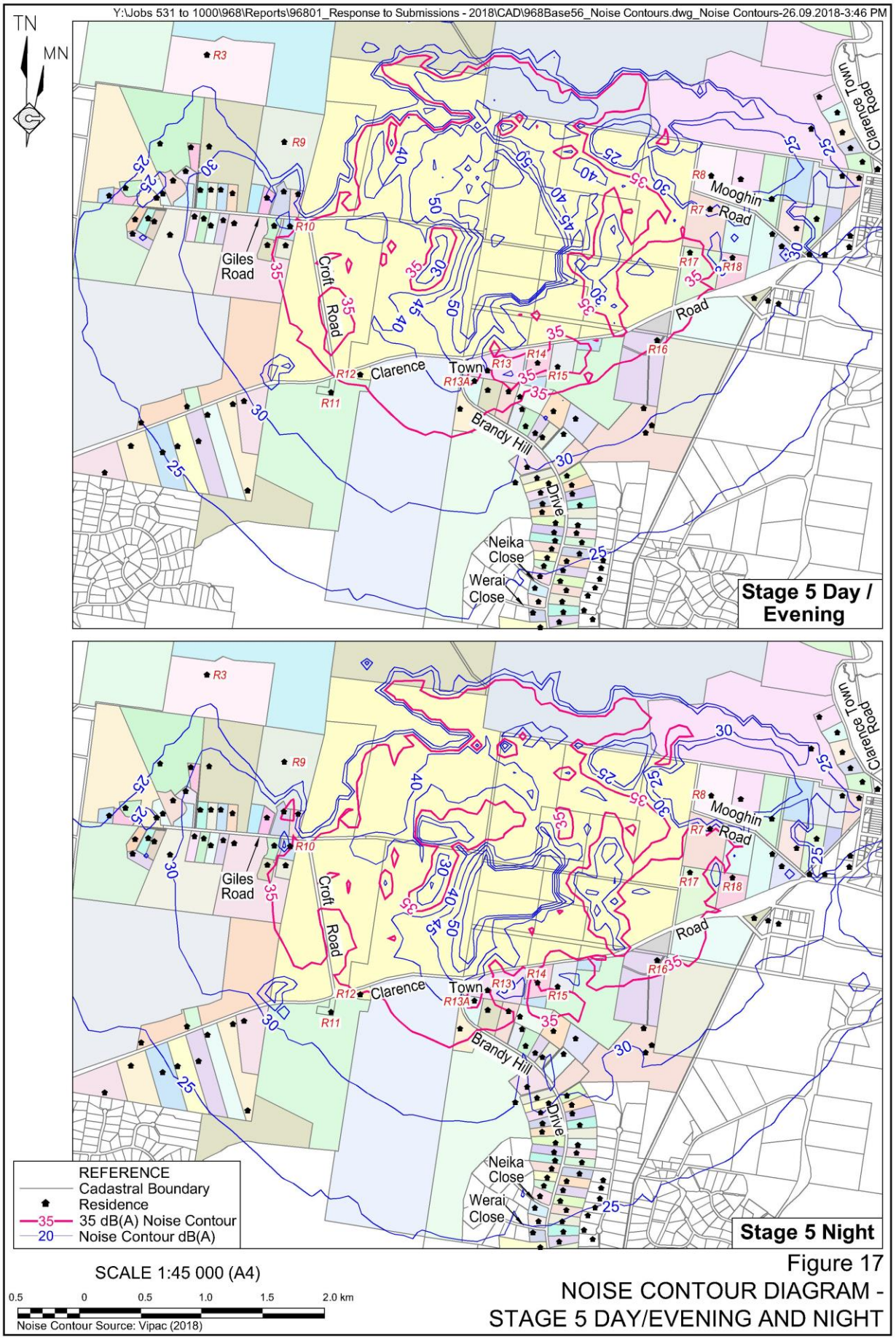



Figure 17
NOISE CONTOUR DIAGRAM - STAGE 5 DAY/EVENING AND NIGHT

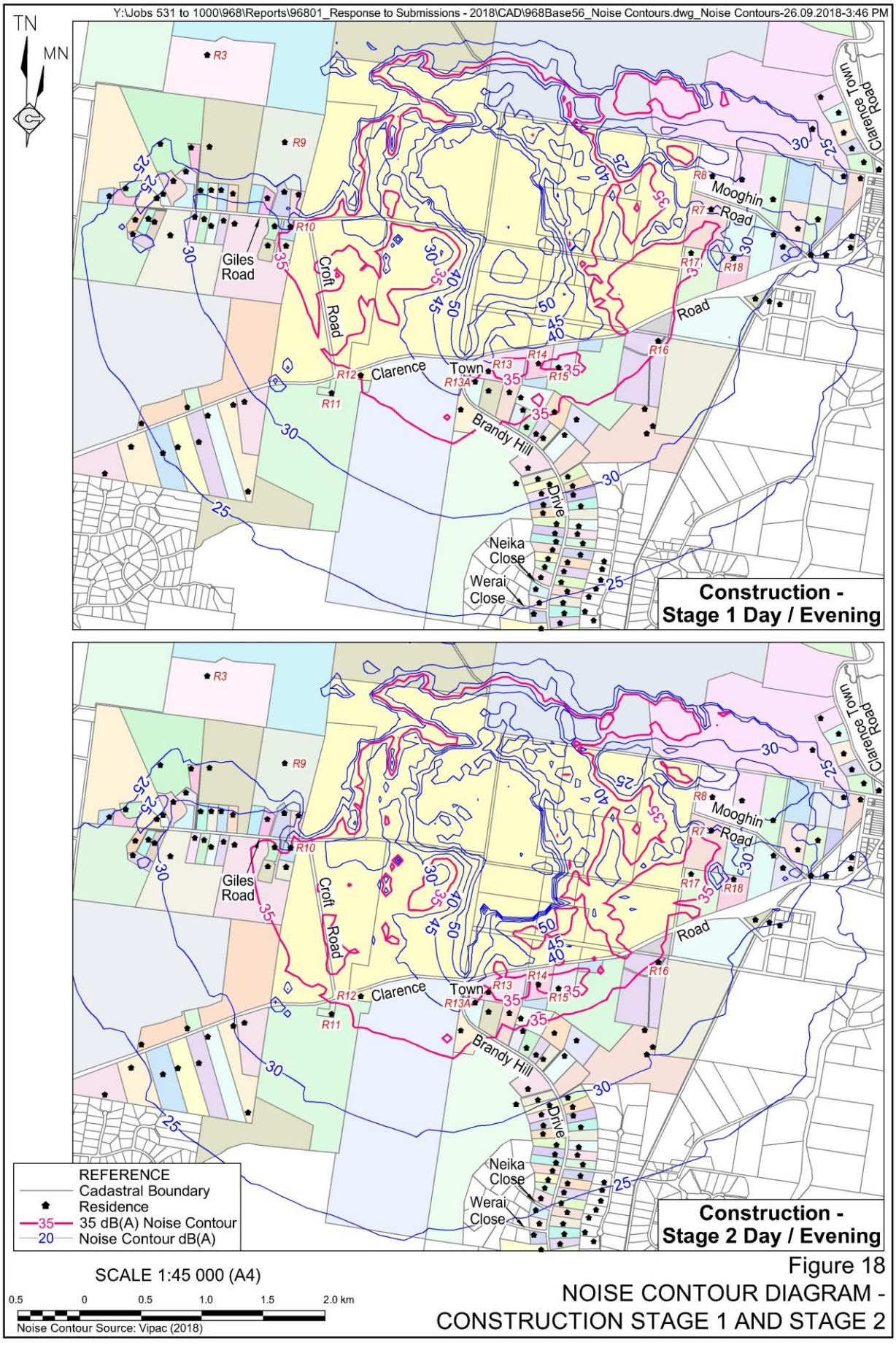



Figure 18
NOISE CONTOUR DIAGRAM - CONSTRUCTION STAGE 1 AND STAGE 2

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 2.4.3 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 10**) at all privately-owned residences and during all stages of operations and construction.

## 2.5 OPERATIONAL SLEEP DISTURBANCE

It should be noted that the INP provides no definitive criteria for assessment of operational sleep disturbance. A sleep disturbance criterion of 15dBA 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'. Vipac (2018a) therefore 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 2.4.2) 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 exceed the assessment criteria by between 1dB(A) to 2dB(A) during worst case operating scenarios but would satisfy the NPI sleep disturbance criteria. 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, Vipac (2018a) concluded that the maximum noise levels from a subset of the Quarry noise sources could be up to 10dB to 15dB 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.

## 2.6 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 5** and presents the outcomes of the amended road noise assessment. The following provides a brief summary of the assessment and outcomes.

### 2.6.1 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)).

### 2.6.2 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 11** and **Table 12** 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 11**
**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 12**
**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<br>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.

### 2.6.3 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. This would improve road safety as well as reduce road traffic noise generation.
- All drivers would be required to review and sign a Drivers Code of Conduct (provided as Appendix 10) 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 that would effectively be managed through the Voluntary Planning Agreement. 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 DPE (noting that the EPA generally does not comment on post-approval documentation).

### 2.6.4 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 13**.

**Table 13**
**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<br>Note 2: Based on limiting the change in noise to no greater than 2dB(A)<br>Note 3: See **Table 11** | | | | | |
| Source: Vipac (2018a) – Table 48 | | | | | |

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 11** 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 11**. 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.

### 2.6.5 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.

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 2.6.3. 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.

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 2.6.3, 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

## 2.7 AIR QUALITY

As noted in Section 2.2, 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 DPE 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.

The Updated Air Quality Impact Assessment, prepared by Vipac is provided as **Appendix 6** (Vipac, 2018b). 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.

### 2.7.1 Existing Air Quality Environment

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 0.5g/m$^2$/month and 2.1g/m$^2$/month. Section 1.6.2 reviews more 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.

There are no records of existing particulate matter concentrations ($PM_{10}$ and $PM_{2.5}$) available in the vicinity of the Quarry. As noted in the 2016 Air Quality Impact Assessment, the closest representative monitoring location is the OEH monitoring station at the Francis Greenway High School in Beresfield, approximately 14km south-southeast of the Quarry. Records of background 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, 2016).

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.

Notwithstanding, the 2013 daily and annual average $PM_{10}$ and $PM_{2.5}$ data from the Beresfield Station have been adopted by Vipac (2018b) as background levels and are therefore considered highly conservative. Vipac (2018b) has also made the conservative assumption that $PM_{10}$ concentrations at Beresfield comprise 50% of TSP (which is not measured) and applied background TSP levels based on this assumption. Representative data from a quarrying operation in Victoria has been selected to give an indication of background levels of respirable crystalline silica.

A comprehensive review of the background dust and particulate matter concentrations is included in Section 6 of Vipac (2018b). **Table 14** presents the background conditions assumed for the assessment of potential air quality impacts for the Project.

**Table 14**
**Adopted Background Air Quality Concentrations**

| Parameter | Period | Applied Background | Comments |
|---|---|---|---|
| TSP | Annual | 41.8 µg/m$^3$ | Double annual average $PM_{10}$ |
| $PM_{10}$ | 24 Hour | Variable | Daily Beresfield Data for 2013 |
| | Annual | 20.9 µg/m$^3$ | Annual Average Beresfield Data 2013 |
| $PM_{2.5}$ | 24 Hour | Variable | Daily Beresfield Data for 2013 |
| | Annual | 8.1 µg/m$^3$ | Annual Average Beresfield Data |
| Dust Deposition | Monthly | 2.1 g/m$^2$/month | Quarry data |
| Silica | Annual | 0.7 µg/m$^3$ | No local data – interstate data used |
| Source: Vipac (2018b) – Table 6-1 | | | |

### 2.7.2 Assessment Criteria

Vipac (2018b) considered the following guidelines and legislation to establish appropriate air quality assessment criteria for the Project.

- *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016* (EPA, 2016)
- *The Voluntary Land Acquisition and Mitigation Policy 2014* (NSW Government, 2014)
- *Protection of the Environment Operations (Clean Air) Regulation 2010 (Clean Air Regulation).*
- *Action for Air* (EPA, 1998)
- *Protocol for Environmental Management - Mining and Extractive Industries* (EPA Victoria, 2007)

The adopted criteria are presented in **Table 15** including the relevant background levels assumed for each parameter and the source of the criteria.

**Table 15**
**Air Quality Assessment Criteria**

| Pollutant | Averaging Time | Criteria | Applied Background | Source |
|---|---|---|---|---|
| TSP | Annual | 90 µg/m$^3$ | 41.8 µg/m$^3$ | EPA, 2016 |
| $PM_{10}$ | 24-hour | 50 µg/m$^3$ | Variable | EPA, 2016 |
| | Annual | 25 µg/m$^3$ | 20.9 µg/m$^3$ | EPA, 2016 |
| $PM_{2.5}$ | 24-hour | 25 µg/m$^3$ | Variable | EPA, 2016 |
| | Annual | 8 µg/m$^3$ | 8.1 µg/m$^3$ | EPA, 2016 |
| Dust deposition | Annual | 4 g/m$^2$/month | 2.1 g/m$^2$/month | EPA, 2016 |
| | | Maximum incremental increase of 2 g/m$^2$/month | | |
| Silica | Annual | 3 µg/m$^3$ | 0.7 µg/m$^3$ | VIC EPA, 2007 |
| Source: Vipac (2018b) – modified after Table 4.3 and Table 6.1 | | | | |

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.

### 2.7.3 Methodology

The emission rates for individual activities were obtained from the *National Pollutant Inventory (NPI) - Emissions Estimation Technique (EET) Manual for Mining*. (Department of Sustainability, Environment, Water, Population and Communities, 2012) and standard equations used to estimate total emissions.

Vipac developed an air dispersion model 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, Vipac 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 including the construction of the amenity barrier.
- Stage 2 - Proposed site operations with an annual production rate of 1.5Mtpa.
- Stage 4 - Proposed site operations with an annual production rate of 1.5Mtpa including the concrete batching plant 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 to 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. As such, Stage 4 is representative of the relocation of the processing plant and incorporates the proposed mitigation measures for the relocated Processing and Stockpiling Area.

Synoptic scale meteorological data were first processed in The Air Pollution Model (TAPM) and then further processed in CALMET to produce the wind field and weather data suitable for dispersion modelling with the CALPUFF modelling suite (v6.4.2).

Due to the fact that monitoring records at Beresfield are close to or exceed the criteria levels, a Level 2 contemporaneous assessment of 24-hour average $PM_{2.5}$ and $PM_{10}$ has been undertaken that considers daily records 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, 2016). 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 in **Table 15** for these parameters. It is noted that the assumed annual average $PM_{2.5}$ concentrations already exceed the 8µg/m$^3$ criterion and the highest 24-hour $PM_{10}$ concentration is 48.8µg/m$^3$, which is just below the $PM_{10}$ criterion of 50µg/m$^3$.

A more detailed review of the modelling methodology is provided in Vipac (2018b).

### 2.7.4 Mitigation and Management Measures

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

- Internal roads would continue to be watered using a water truck during dry and windy conditions.
- All fixed crushing equipment would be enclosed.
- Screen 2, Screen 3 and Screen 4 would be enclosed during Stage 1 to Stage 3 and all fixed screening equipment would be enclosed during Stage 4 and Stage 5.
- Conveyor transfer points would be partially enclosed after Stage 4 of operations.
- The earthen amenity barrier to the south of the Quarry Site would be stabilised with groundcover vegetation as soon as practical following construction.
- Disturbed areas within the Quarry Site that are no longer required for operations would be stabilised with groundcover vegetation as soon as practical following completion.
- Standard mitigation measures have also been incorporated into the dispersion model including variable height stockpile loading and in-pit particulate matter retention (Stage 4 only).

While not able to be incorporated into the modelling software, the following additional mitigation and management measures would potentially reduce dust dispersion from the Quarry Site.

- Operations at exposed locations and under unfavourable weather conditions would be modified, where necessary, to reduce potential dust generation.
- The internal road network would continue to be surfaced with well graded materials to reduce dust generation.
- 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 of various lengths and heights would be temporarily constructed for each stage of operations and strategically located within the Processing and Stockpiling Area.
- During dry and windy conditions, the water truck would be used to water any exposed areas that are not suitable stabilised.
- Vehicle speed on internal roads would be limited to 30km/hr to reduce potential dust lift off.
- Dump heights from trucks, front-end loaders and conveyors would be minimised, where practical.

- Blasts would be scheduled to avoid windy conditions, where feasible.
- Replacement or additional processing equipment would have the same or lower sound power levels as that assumed for the predictive modelling assessment.

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:

- an exceedance of the air quality limits identified through monitoring;
- a substantiated complaint; or
- a request from DPE.

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.

### 2.7.5 Dust Dispersion Modelling Results

Contour diagrams of predicted dispersion modelling results are presented in **Figure 19** to **Figure 30**. The results of dispersion modelling undertaken by Vipac (2018b) indicate the following.

- Average annual TSP – Including the assumed annual average background concentration of 41.8µg/$m^3$, the cumulative annual average TSP is predicted to be less than 59µg/$m^3$ at all residences, which is below the criterion of 90µg/$m^3$.
- 24-Hour $PM_{10}$ – Predicted exceedances of 24-hour $PM_{10}$ concentrations are driven by the assumed background levels. Vipac (2018b) noted from review of annual data that five exceedances occurred during the 2013 review period. Vipac (2018b) undertook a Level 2 Contemporaneous Assessment of this parameter and concluded that under the Project, no additional exceedances of the 24-Hour $PM_{10}$ criteria would occur.

- Average annual $PM_{10}$ – Minor exceedances of annual average $PM_{10}$ have been predicted at a single residence (1189 Clarence Town Road) with a maximum annual average of 25.5µg/$m^3$ predicted which is 0.5µg/$m^3$ above the adopted criteria. This is largely driven by the assumed background level of 20.9µg/$m^3$ and does not represent a significant impact as a result of the Project.
- 24-Hour $PM_{2.5}$ – Vipac (2018b) predicted no exceedances of the 24-Hour $PM_{2.5}$ criteria with a maximum concentration of 24.8µg/m3 predicted at 1034 Clarence Town Road. As with other parameters, this is considered to be largely driven by the assumed background levels.
- Annual average $PM_{2.5}$ – Vipac (2018b) assumed a background annual average $PM_{2.5}$ concentration of 8.1µg/$m^3$. This already exceeds the $PM_{2.5}$ annual average criterion of 8µg/$m^3$. In this instance, Vipac (2018b) considered the incremental change in $PM_{2.5}$ for each stage and concluded that only minor changes (up to 0.89µg/$m^3$) in annual average $PM_{2.5}$ would occur under the Project.
- Respirable Crystalline Silica (RCS) – Vipac (2018b) predicted a maximum RCS concentration is 0.73µg/$m^3$ with an assumed background concentration of 0.7µg/$m^3$ included in the predictions. This is well within the adopted assessment criteria of 3µg/$m^3$.
- Deposited Dust – Vipac (2018b) predicted that the maximum incremental increase in dust deposition would be 0.30g/$m^2$/month and that once the assumed background level of 2.1g/$m^2$/month is taken into account 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.


Figure 19
PREDICTED CUMULATIVE 24-HOUR $PM_{10}$ CONCENTRATION (CURRENT AND STAGE 1)

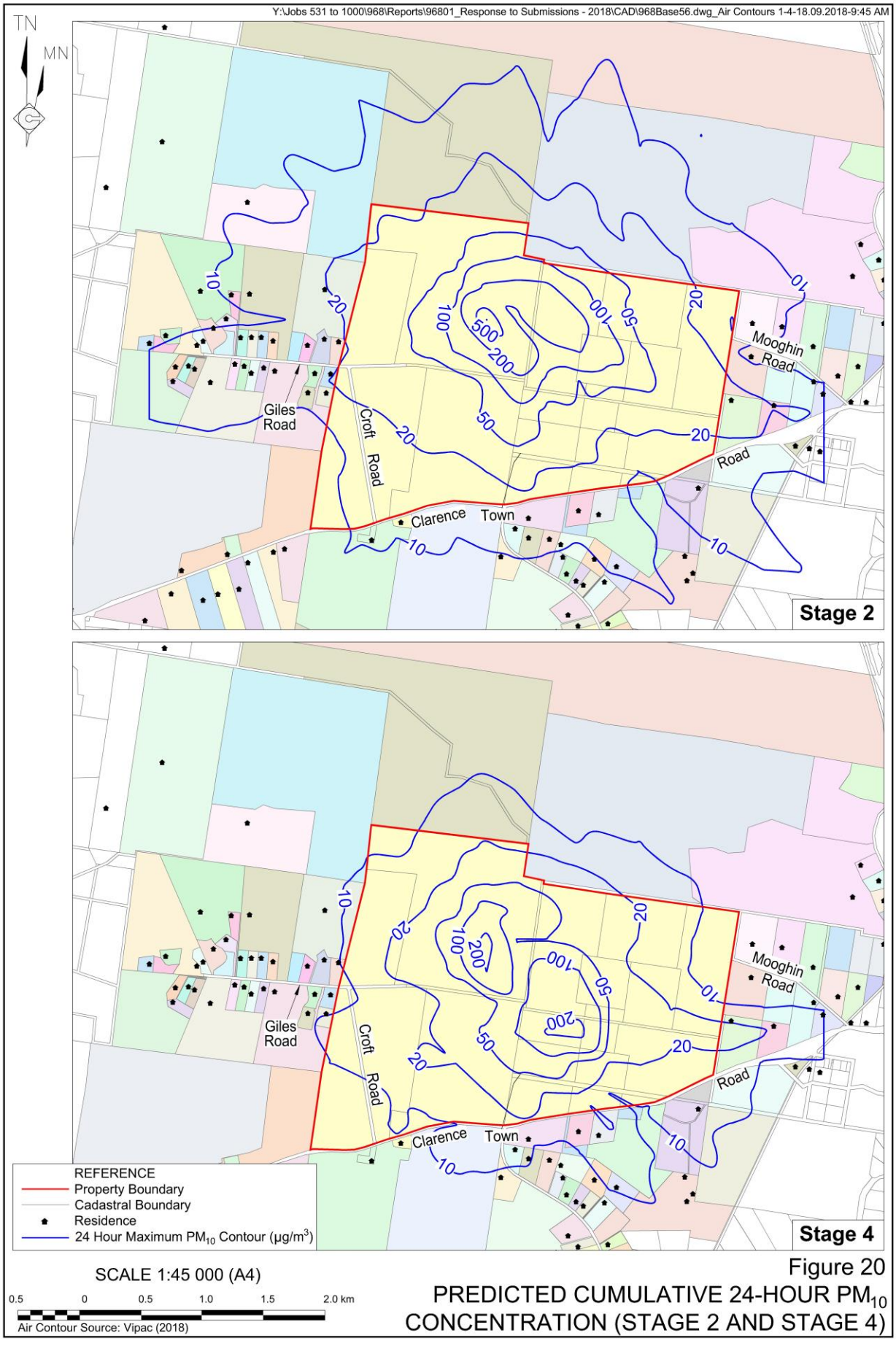



Figure 20
PREDICTED CUMULATIVE 24-HOUR $PM_{10}$ CONCENTRATION (STAGE 2 AND STAGE 4)


Figure 21
PREDICTED ANNUAL $PM_{10}$ CONCENTRATION
(CURRENT AND STAGE 1)


Figure 22
PREDICTED ANNUAL $PM_{10}$ CONCENTRATION
(STAGE 2 AND STAGE 4)


Figure 23
PREDICTED CUMULATIVE 24-HOUR $PM_{2.5}$ CONCENTRATION (CURRENT AND STAGE 1)


Figure 24
PREDICTED CUMULATIVE 24-HOUR $PM_{2.5}$ CONCENTRATION (STAGE 2 AND STAGE 4)


Figure 25
PREDICTED CUMULATIVE ANNUAL $PM_{2.5}$ CONCENTRATION (CURRENT AND STAGE 1)


Figure 26
PREDICTED CUMULATIVE ANNUAL $PM_{2.5}$ CONCENTRATION (STAGE 2 AND STAGE 4)


Figure 27
PREDICTED CUMULATIVE ANNUAL AVERAGE TSP CONCENTRATION (CURRENT AND STAGE 1)


Figure 28
PREDICTED CUMULATIVE ANNUAL AVERAGE TSP CONCENTRATION (STAGE 2 AND STAGE 4)

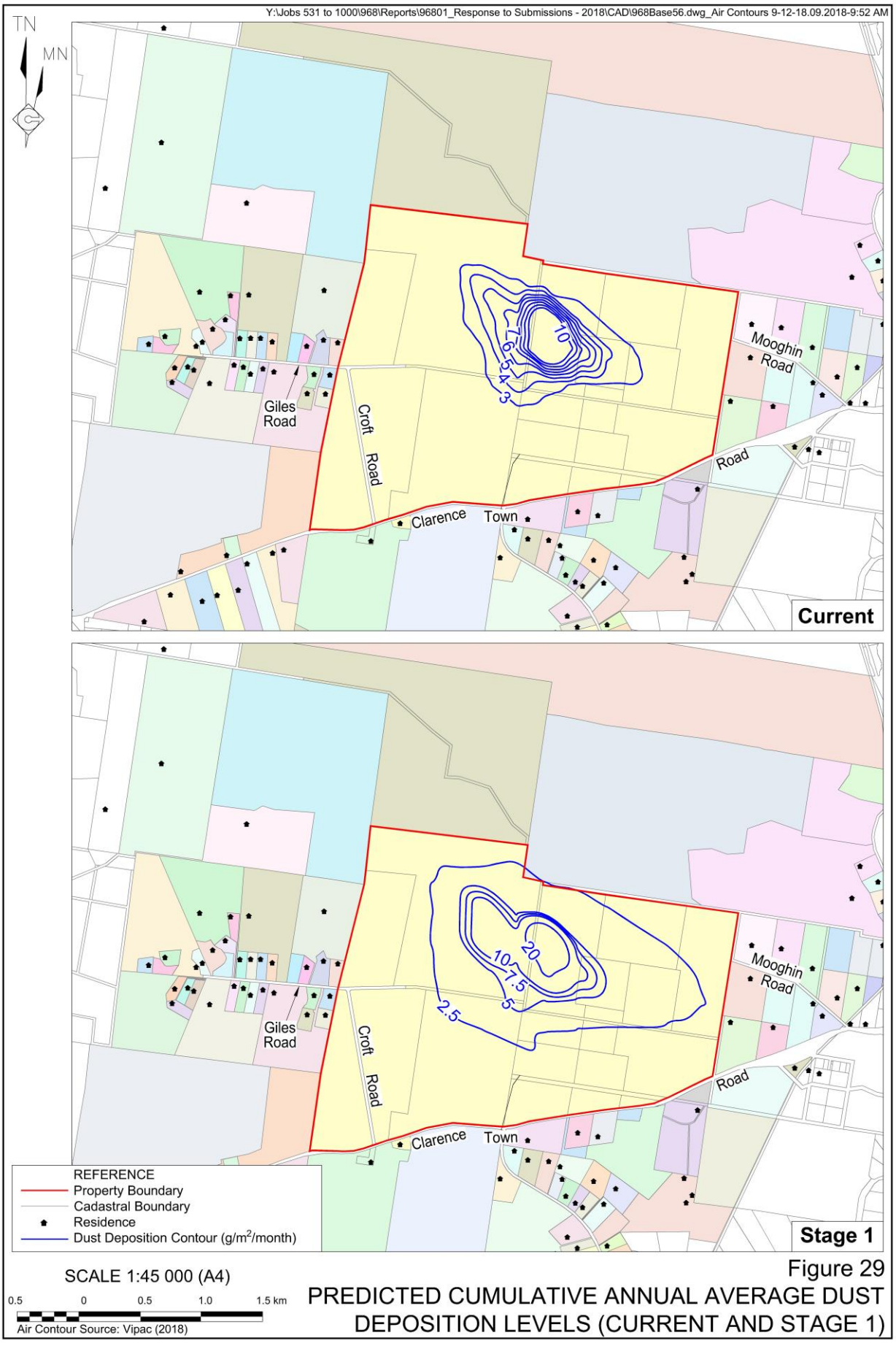



Figure 29
PREDICTED CUMULATIVE ANNUAL AVERAGE DUST DEPOSITION LEVELS (CURRENT AND STAGE 1)

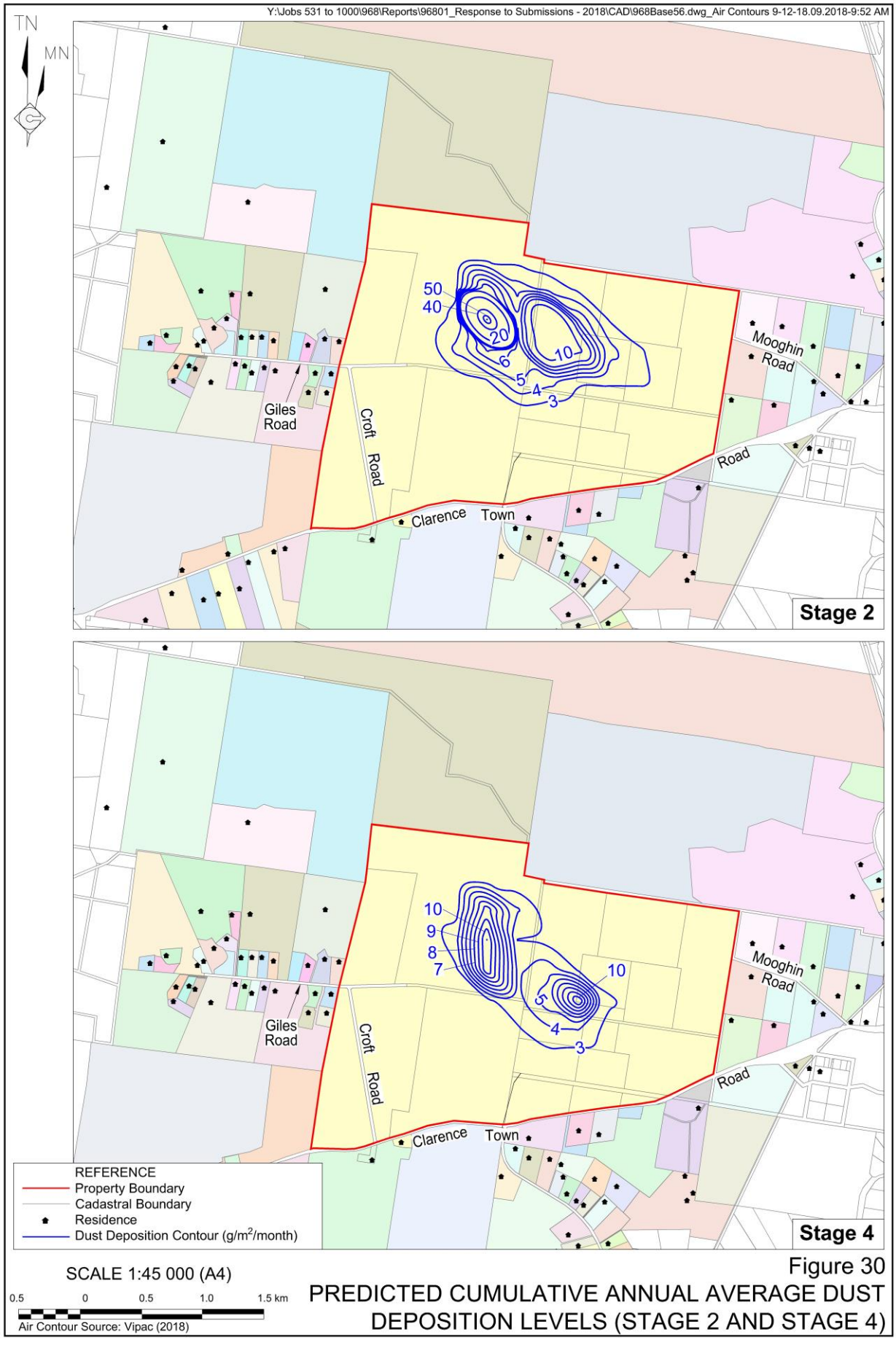



Figure 30
PREDICTED CUMULATIVE ANNUAL AVERAGE DUST DEPOSITION LEVELS (STAGE 2 AND STAGE 4)

**Table 16** presents the maximum predicted particulate matter concentrations for each operational stage that was modelled.

**Table 16**
**Summary of Air Quality Modelling Predictions**

| Pollutant | Period | Criteria | Assumed Background | Maximum Predicted Concentrations at Any Receptor | | | |
|---|---|---|---|---|---|---|---|
| | | | | Existing | Stage 1 | Stage 2 | Stage 4 |
| TSP (µg/m$^3$) | Annual | 90 | 41.8 | 58.9 | 54.8 | 54.6 | 48.5 |
| $PM_{10}$ (µg/m$^3$) | 24 Hour | 50 | Variable | 47.3 | 59.5 | 60.2 | 50.9 |
| | Annual | 25 | 20.9 | 26.5 | 25.3 | 25.5 | 22.8 |
| $PM_{2.5}$ (µg/m$^3$) | 24 Hour | 25 | Variable | 23.8 | 23.0 | 23.0 | 24.8 |
| | Annual | 8 | 8.1 | 8.99 | 8.99 | 8.97 | 8.67 |
| Dust Deposition (g/m$^2$/month) | Monthly Total | 4 | 2.1 | 2.8 | 2.4 | 2.3 | 2.2 |
| | Monthly Increase | 2 | | 0.7 | 0.3 | 0.2 | 0.1 |
| RCS (µg/m$^3$) | Annual | 3 | 0.7 | 0.72 | 0.73 | 0.73 | 0.72 |

It is noted from this summary that relatively high concentrations have been predicted to occur but are considered to be driven principally by the adopted background concentrations available at the Beresfield monitoring station. In addition, for most parameters, mitigation assumed in modelling results in particulate matter concentrations that are lower than the existing levels even with an assumed production increase from 0.7Mtpa to 1.5Mtpa (i.e. more than double). Predicted particulate matter concentrations also decrease as the development progresses which is indicative of elevated particulate matter concentrations during the construction of the amenity barrier for a short period in Stage 1 of operations and the benefit of enclosing all fixed processing plant in Stage 4 of operations.

Vipac (2018b) predicted that the highest incremental change in particulate matter concentrations would be experienced at residences along Clarence Town Road. However, due to the limitations of the CALPUFF predictive modelling software, the earthen amenity barriers could not be modelled as a mitigation measure and the mitigation is therefore not included in the impact assessment. Vipac (2018b) notes that, as the height of the conveyors and the relocated fixed plant would not protrude above the amenity barrier, the emissions are expected to be significantly reduced at sensitive receptors along Clarence Town Road.

As Vipac (2018b) has predicted potential exceedances of the 24-hour $PM_{10}$ criteria (albeit as a result of conservative background level assumptions), Hanson would implement continuous monitoring of $PM_{10}$ at a location between the Quarry and Clarence Town Road under the Project. 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.

### 2.7.6 Blast Fume Assessment

A review of potential impacts from blast fume emissions is presented in Section 10 of the Updated Air Quality Assessment (Vipac, 2018b – **Appendix 6**). Historic blasting activities and particularly the bulk load of explosive used was reviewed. It is assumed that the size of individual blasts 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.

Vipac (2018b) predicted the following emissions as a result of blasting activities.

- $NO_X$ – 2,407 kg/blast or 28.9 tonnes/annum; and
- CO – 204,600 kg/blast or 2,455.2 tonnes/annum

Predicted blast fume emissions at privately-owned residences under existing operation and during Stage 4 of operations are presented in **Table 17** and compared to ambient air quality criteria specified in Table 7.1 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2016). These results confirm that emissions would remain consistent with or below existing operations and well within the relevant assessment criteria at privately-owned residences in the vicinity of the Quarry Site

**Table 17**
**Predicted Blast Fume Impacts**

| | Current Stage Predictions (µg/m³) | | | | | Stage 4 Predictions (µg/m³) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CO | | | NOx | | CO | | | NOx | |
| **Residential Address** | **15 min** | **1 hour** | **8 hour** | **1 hour** | **1 year** | **15 min** | **1 hour** | **8 hour** | **1 hour** | **1 year** |
| 122B Dunns Creek Road | 1243 | 942 | 257 | 11 | 0.07 | 682 | 517 | 254 | 6 | 0.04 |
| 16 Uffington Road | 1164 | 882 | 286 | 11 | 0.03 | 733 | 555 | 159 | 7 | 0.02 |
| 60 Green Wattle Creek Road | 1123 | 851 | 399 | 10 | 0.11 | 671 | 509 | 222 | 6 | 0.07 |
| 34 Timber Top Road | 1283 | 972 | 537 | 12 | 0.05 | 852 | 646 | 228 | 8 | 0.03 |
| 35 Timber Top Road | 978 | 741 | 409 | 9 | 0.05 | 520 | 394 | 177 | 5 | 0.03 |
| 36 Timber Top Road | 1143 | 866 | 485 | 11 | 0.05 | 619 | 469 | 179 | 6 | 0.03 |
| 13 Mooghin Road | 5012 | 3798 | 939 | 46 | 0.83 | 2910 | 2205 | 673 | 28 | 0.65 |
| 14 Mooghin Road | 3773 | 2859 | 968 | 35 | 0.64 | 2272 | 1722 | 716 | 22 | 0.45 |
| 13 Giles Road | 4839 | 3667 | 2066 | 45 | 0.65 | 3182 | 2411 | 1760 | 30 | 0.39 |
| 13B Giles Road | 3898 | 2954 | 1503 | 35 | 0.69 | 2314 | 1754 | 1235 | 22 | 0.47 |
| 866 Clarence Town Road | 2277 | 1726 | 825 | 20 | 0.35 | 1223 | 927 | 463 | 12 | 0.29 |
| 1034 Clarence Town Road | 2000 | 1516 | 499 | 18 | 0.22 | 1473 | 1116 | 419 | 14 | 0.19 |
| 994 Clarence Town Road | 2507 | 1900 | 629 | 23 | 0.22 | 1964 | 1489 | 525 | 18 | 0.18 |
| 1060 Clarence Town Road | 2301 | 1744 | 580 | 21 | 0.22 | 1898 | 1439 | 550 | 18 | 0.18 |
| 1094 Clarence Town Road | 2453 | 1859 | 426 | 22 | 0.24 | 2066 | 1566 | 483 | 19 | 0.20 |
| 1189 Clarence Town Road | 6873 | 5209 | 2479 | 62 | 1.45 | 3599 | 2727 | 1210 | 34 | 0.95 |
| 1203 Clarence Town Road | 4912 | 3723 | 2178 | 45 | 1.06 | 3026 | 2293 | 1086 | 28 | 0.72 |
| Criteria* | 100,000 | 30,000 | 10,000 | 246 | 62 | 100,000 | 30,000 | 10,000 | 246 | 62 |

* Criteria source – Table 7.1 of the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2016)

Source: Vipac (2018b) – Table 10.2

## 2.8 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 to the floor of the extraction area in Stage 5 where the majority of blasting would occur. This error has been corrected in an Updated Blast Impact Assessment prepared by Vipac (2018c) and provided as **Appendix 7**.

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 (2018c) 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 18** presents the 95$^{th}$ percentile predictions of blast-related impacts at the closest privately-owned residences.

**Table 18**
**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 (2018c) – Table 2 | | | | | |

## 2.9 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 OEH 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 DPE submission in Section 2.1.7. The Biodiversity Assessment Report (Biosis, 2018) has been updated to reflect the additional survey and results and is included as **Appendix 8**.

## 2.10 SOCIAL IMPACT ASSESSMENT

### 2.10.1 Introduction

Hanson included a Socio-Economic Impact Assessment as Appendix 17 of the EIS (Hanson, 2017). The DPE request for a *Response to Submissions* included feedback from internal (DPE) 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**.

### 2.10.2 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 DPE 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.

## 2.10.3 Regional and Local Setting

### 2.10.3.1 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.

### 2.10.3.2 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.

### 2.10.3.3 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 $1.44 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 11**).

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.

### 2.10.4 Social Research

#### Submission Review

A comprehensive review of the social amenity issues raised in the submissions provided to DPE 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 DPE) 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 DPE on 22 March 2017. While not primary research, comprehensive notes were made available by DPE 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.

### 2.10.5 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 demand for 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.

### 2.10.6 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 impact without mitigation and with mitigation is considered where impacts are predicted to be significant. The following key conclusions are presented by Key Insights (2018).

- Amenity – 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.

- 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.
- 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.
- 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.
- 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.
- 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.
- Environmental – 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.

### 2.10.7 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.

### 2.10.8 Ongoing Community Engagement

One of the key recommendations of the Social Impact Assessment is for ongoing community engagement and communication. 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 to 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 evident with 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. The following recommendations relate to ongoing engagement with the local community, some of which have been implemented since the completion of the Social Impact Assessment.

- Formalisation of the CCC
- Establishment of communication mechanisms through or beyond the CCC, with local businesses and other residents, particularly near neighbours.
- Preparation of a "community sponsorship" policy.
- Easily accessible reporting on monitoring data.

- Quarry management documents available online (such as the Drivers Code of Conduct).
- Revision of the complaints management policy with firm commitment to feedback and closing investigations.
- Implementation of a Stakeholder Engagement Plan.

### 2.10.9 Social Mitigation and Management

Key Insights (2018) reviewed the mitigation proposed in the Socio-Economic Impact Assessment (Hanson, 2017) and developed a range of amended strategies taking into account the assessment of social impacts that was undertaken. The amended mitigation strategies that have been accepted by Hanson include the following.

- Hanson would 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 would provide training and certification to ensure suitable applicants can improve or acquire the necessary skills for their employment.
- Hanson would manage transportation operations to limit night time product despatch as much as practical. It is noted that it is difficult to predict demand, however delivery to Hanson or Hymix concrete batching plants would be coordinated to occur during daytime or evening periods as much as possible.
- Hanson has reiterated 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.
- Hanson would 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.
- Driver behaviour would 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 would be informed of any relevant traffic concerns for the local community through the code of conduct and regular 'toolbox' style meeting. 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.

Additional mitigation strategies recommended by Key Insights and accepted by Hanson include the following.

- Formalise the CCC to formally establish a communication channel with the local community. This recommendation has been implemented.
- Design a mechanism for oversight of the 'Statement of Commitments' and Voluntary Planning Agreement (VPA). Hanson propose that ongoing contributions would continue to be provided to Council directly, however with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. Oversight of performance against the Statement of Commitments may also be a function of this committee, however it is noted that this function would be undertaken by DPE and reporting in *Annual Review* documents each year.
- Additional mitigation to be included as agenda items for the CCC including the following.
  - Lobbying of relevant road authorities to reduce the speed limit on Clarence Town Road (see **Appendix 9**).
  - Make the Drivers Code of Conduct available to the CCC and review and update it as necessary (see **Appendix 10**).
  - Review number of truck movements during school bus operating times.
  - Publish a map of where noise and dust monitors are currently located and make available the data from those monitors. Provide an easily accessed location for this data such as the Hanson website.
  - Monitor night time Quarry operations and consider limitations to prevent sleep disturbance while permitting for some flexibility in peak demand times.
  - 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.
  - 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.
  - Develop a community donations / sponsorship policy that is fair and consistent across the whole community. Hanson has prepared a Community Support & Sponsorship Policy for the Quarry (provided as **Appendix 11**) that 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.

  - Consult beyond the CCC to include local business, school groups and sporting organisations.
  - Review Quarry closure strategies and appropriate post-operations land uses and involve the local community by seeking feedback from the community.

  It is noted that the majority of these strategies are in the process of being implemented, would be required under any approval or would be a focus of the community-based committee appointed to oversee road maintenance contributions.

- Review engagement with the community and adopt a Stakeholder Engagement Plan that includes the following.
  - Links to Quarry information on the Hanson website that is regularly updated.
  - A newsletter that is published on-line, or via mail for those who prefer this option.
  - Publish the location of all monitoring equipment and provide regular reporting through the website and to the CCC.
  - Publish key operational documents on the Hanson website consistent with current practice for State Significant Development.

### 2.10.10 Conclusion

The Social Impact Assessment prepared by Key Insights (2018) has been informed by review of the issues raised in the submissions received by DPE 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 2.6.3 and a copy provided as **Appendix 10**.

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, with some components now included in the Project.

Finally, 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 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.

# 3. RESPONSE TO SUBMISSIONS

## 3.1 INTRODUCTION

This section provides a response to the submissions received by DPE during the public exhibition of the EIS and supporting documents for the Project. 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, however reference is also made to the EIS or specialist consultant assessments presented as appendices to the EIS.

## 3.2 ABORIGINAL HERITAGE

### 3.2.1 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 4).

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

### 3.2.2 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 NSW Office of Environment and Heritage (OEH) Aboriginal Heritage Management System (AHIMS) database detected 16 previously recorded Aboriginal archaeological sites within a 10 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 4).

Historic heritage is discussed in Section 3.11.

### 3.2.3 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.

## 3.3 AIR QUALITY

### 3.3.1 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. This assessment and additional information requested in various submissions are reported in an Updated Air Quality Assessment (**Appendix 3**) with the outcomes of this additional assessment summarised in Section 2.7.

### 3.3.2 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, Vipac (2018b) considered deposited dust monitoring results between September 2013 and August 2014 and noted that the annual average dust levels were between 0.5g/$m^2$/month and 2.1g/$m^2$/month. This is well within the 12-month rolling average criteria of 4g/$m^2$/month. A review of more recent data is provided in Section 1.6.2 and demonstrates that results remain consistent with these assumptions.

It is also worth noting that Vipac (2018b) adopted background particulate matter monitoring from the OEH 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 most 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 2.7 and the Updated Air Quality Assessment (Vipac, 2018b) presented in **Appendix 3**. 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 lower than the existing levels even with an assumed production increase from 0.7Mtpa to 1.5Mtpa (i.e. more than double). Predicted particulate matter concentrations also decrease as the development progresses which is indicative of elevated particulate matter concentrations during the construction of the amenity barrier during Stage 1 of operations and the benefit of enclosing all fixed processing plant in Stage 4 of operations

As Vipac (2018b) has predicted potential exceedances of the 24-hour $PM_{10}$ criteria (albeit as a result of conservative background level assumptions), Hanson would implement continuous monitoring of $PM_{10}$ at a location between the Quarry and Clarence Town Road under the Project. 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.

### 3.3.3 Air Quality Assessment Criteria

**Representative Comment(s)**

*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 Updated Air Quality 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, 2016). It should be noted that at the time that the Director-General's Requirements and the 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 2.7.5 and concluded that minor exceedances of annual average $PM_{10}$ may occur at a single residence (1189 Clarence Town Road) with a maximum annual average of 25.5µg/$m^3$ predicted, which is 0.5µg/$m^3$ above the adopted criteria. This is largely driven by the assumed background level of 20.9µg/$m^3$ 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.

### 3.3.4 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 Updated Air Quality Assessment has been undertaken by Vipac (2018b) 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 Vipac (2018b). Vipac 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 B of Vipac (2018b) (**Appendix 3**).

It is common practice to adopt publicly available data for background air quality for the purpose of assessment. As described in Section 2.7.1, 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 Updated Air Quality Assessment indicates that dust dispersion would generally reduce under the Project and over the life of the Project due to the mitigation assumed for assessment.

### 3.3.5 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 2.7.5 summarises the Updated Air Quality Assessment (Vipac, 2018b) which describes the results of predictive dispersion modelling of $PM_{10}$, $PM_{2.5}$ and 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 and is predicted to decrease over the life of the operation. This is principally due to the design and operational controls (such as enclosure of fixed 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 17** to **Figure 28** in Section 2.7.5 and as Appendix C of the Updated Air Quality Assessment.

### 3.3.6 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, 2014). 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 Updated Air Quality Assessment in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2014). In summary, Vipac (2018b) predicted that air quality at vacant land located to the north of the Quarry Site 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).

### 3.3.7 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 2.7.6 and Section 10 of the Updated Air Quality Assessment (Vipac, 2018b – **Appendix 3**). 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 at privately-owned residences under existing operation and during Stage 4 of operations are presented in **Table 12** and confirm that emissions would remain consistent with or below existing operations and 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 2.7.5.

### 3.3.8 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 2.7.4 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 Updated Air Quality Assessment (Vipac, 2018b – **Appendix 3**), it is predicted that, with the proposed design and operational controls, particulate matter concentrations would remain consistent with 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.

### 3.3.9 $PM_{2.5}$

**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 Updated Air Quality Assessment (Vipac, 2018b – **Appendix 3**) are presented in Section 2.7.5 including the assessment of $PM_{2.5}$.

The assessment of 24-Hour $PM_{2.5}$ concluded that there is not likely to be exceedances of the assumed assessment criteria with a maximum concentration of 24.8µg/m$^3$ predicted at 1 034 Clarence Town Road. This prediction is close to the assessment criteria of 25.0µg/m$^3$, however is a worst-case prediction and is considered to be driven by the assumed background concentration.

Assessment of annual average $PM_{2.5}$ was limited by an adopted annual average background concentration of 8.1µg/m$^3$, which already exceeds the assessment criteria level of 8.0µg/m$^3$. Vipac (2018b) considered the incremental change in $PM_{2.5}$ for each stage and concluded that only minor changes (up to 0.89µg/m$^3$) in annual average $PM_{2.5}$ would occur under the Project.

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.

### 3.3.10 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 fixed processing equipment.

Diesel emissions are incorporated in predictive dispersion modelling with diesel emission incorporated into source emission estimates for Total Suspended Particulates (TSP) and $PM_{10}$. Separate diesel emission estimates are incorporated for $PM_{2.5}$ and presented in Table 8.4 of the Updated Air Quality Assessment (Vipac, 2018b). Incremental changes to annual average $PM_{2.5}$ concentrations at privately-owned residences are predicted to be no greater than $0.89\mu g/m^3$.

## 3.4 BIODIVERSITY

### 3.4.1 Introduction

A Biodiversity Assessment Report was prepared by Biosis and presented as Appendix 7 of the EIS. OEH 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 2.8. The updated Biodiversity Assessment Report (Biosis, 2018) is provided as **Appendix 5**.

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

### 3.4.2 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 19,** 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 3.4.5 in the response to the DPE submission. No Rusty Greenhood Orchids individuals were identified during the survey.

## Table 19
## 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:<br>*Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004)<br>*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 and 13 August 2014 and 12 and 13 November 2014 | 6 nights | In accordance with the recommended survey effort and methods outlined in the following guidelines:<br>*Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004)<br>*Threatened species survey and assessment guidelines: field survey methods – Amphibians* (DECC 2009)<br>*Survey guidelines for Australia's threatened amphibians, birds and mammals* (Commonwealth of Australia 2010) |
| **Ultrasonic call recording** | Microbat species | Calls recorded were then analysed by a qualified and experienced ecologist, using appropriate software and call reference libraries. | 12 and 13 November 2014 | 2 nights | In accordance with the recommended survey effort and methods outlined in the following guidelines:<br>*Threatened Biodiversity Survey and Assessment Guidelines* (DECC 2004) |

**Table 19 (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.<br><br>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".<br><br>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.<br><br>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:<br><br>EPBC Act Referral Guidelines for the vulnerable koala (DoE 2014).<br><br>The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus (Phillips and Callaghan 2011).<br><br>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:<br><br>*EPBC Act referral guidelines for the vulnerable koala* (DoE 2014). |

**Table 19 (Cont'd)**
**Updated Summary of Fauna Survey Effort**



| Survey Method | Target Species | Description of Survey Methodology | Date | Survey Effort | Adequacy against Relevant Guidelines |
|---|---|---|---|---|---|
| **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.<br>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 |

### 3.4.3 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

**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 (2018)) 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 (2018) updated to accurately report survey conditions.

### 3.4.4 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 5**. 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 OEH. 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.

### 3.4.5 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 Office of Environment and Heritage (OEH) 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 OEH 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 OEH 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 OEH 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. This species is therefore not considered further in impact assessment for the Project. The Biodiversity Assessment Report (Biosis, 2018) has been updated to reflect the additional survey and results.

### 3.4.6 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 OEH, 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 (2018) concluding that the Project will result in a significant impact to the Koala 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 also indicates the following.

- It is unlikely that extension of the Quarry to the south would result in a significant barrier to Koala movement in the wider locality.
- The Quarry Site does not feature a breeding population of Koala.

The biodiversity assessment concluded that 1 191 Koala species credits would be required to be purchased and retired to offset the predicted impacts to the Koala, while 2 651 ecosystem credits would be required for native vegetation that is habitat for the Koala. 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 BAR 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.

In addition, as described in the comments provided by the OEH, 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 Project will result in the loss of some Koala habitat at the locality, the removal of habitat is not expected to result in significant fragmentation effects and will be offset in accordance with the NSW Biodiversity Offset Scheme.

### 3.4.7 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 OEH 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 2018). 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 2018). 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.

### 3.4.8 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 (2018) 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.

### 3.4.9 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 3.4.6, OEH 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 OEH.

### 3.4.10 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 OEH guidelines and adequate to detect Brush-tailed Phascogale.

### 3.4.11 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.

### 3.4.12 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, 2018 – **Appendix 5**).

The Project would not result in any physical removal of riparian vegetation along Deadmans Creek or Barties Creek. As described in Section 3.21.6 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.

### 3.4.13 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.

### 3.4.14 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.

OEH 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.

### 3.4.15 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.

## 3.4.16 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 OEH and, as can be seen in **Table 20**, there is no overall change in credit requirements as a result of the requested changes.

**Table 20**
**Updated Ecosystem Credits Requirements (HU816, HU812 and HU798)**

| | Current | With OEH changes |
|---|---|---|
| **PCT 1602 (HU816)** | 1491 | 1491 |
| **PCT 1598 (HU812)** | 111 | 111 |
| **PCT 1584 (HU798)** | 103 | 103 |

The Biodiversity Assessment Report has been updated to reflect the changes and is attached as **Appendix 5**.

## 3.5 BLASTING AND VIBRATION

### 3.5.1 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 more accurate distance estimates between privately-owned residences and the extraction activities. An Updated Blast Impact Assessment (Vipac, 2018c) is presented as **Appendix 6** and the outcomes of this assessment summarised in Section 2.10.

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

### 3.5.2 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).

### 3.5.3 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 4.4.1 and 4.4.2.

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

### 3.5.4 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 6** and the outcomes of the assessment are summarised in Section 2.10. 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 2.8).
- 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.

### 3.5.5 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 3.5.4, 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 not expected that these cracks have 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.

### 3.5.6 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).

## 3.6 BUSH FIRE MANAGEMENT

### 3.6.1 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.

### 3.6.2 Bush Fire Protection

#### 3.6.2.1 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.

## 3.7 CONCRETE RECYCLING

### 3.7.1 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.

### 3.7.2 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 initially 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 1** to **Figure 3**. 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.

Returned concrete washout material would be allowed to set becoming hardened concrete, which has the same properties as normal concrete and is generally free of contaminants. Hardened returned concrete can be handled and stored with little risk of contaminated water runoff. Waste 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, it would be transformed from a liquid waste to a solid waste. 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 current concrete facilities includes.

- Washout pits are 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.

### 3.7.3 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.

## 3.8 CUMULATIVE IMPACTS

### 3.8.1 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 3.20.11 to address concerns regarding the cumulative impact of traffic associated with the proposed Martins Creek Extension Project.

### 3.8.2 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 21** summarises the results of this assessment.

**Table 21**
**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 3.20.11.

## 3.9 ECONOMIC IMPACTS

### 3.9.1 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.

### 3.9.2 Economic Benefits

#### 3.9.2.1 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. 24-hour product delivery is considered just one solution to remove trucks from busy roads during peak periods.

### 3.9.3 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.

### 3.9.4 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.

### 3.9.5 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 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.

### 3.9.6 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, 2014). The provisions of this policy are addressed in Section 3.3.6 and Section 3.14.5 and conclude that this policy is not triggered under the Project.

## 3.10 HAZARDOUS MATERIAL MANAGEMENT

### 3.10.1 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.

### 3.10.2 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 ground water. 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.

### 3.10.3 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.

## 3.11 HISTORIC HERITAGE

### 3.11.1 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.

## 3.12 HOURS OF OPERATION

### 3.12.1 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 2.2, 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. 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 night time 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 22** 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, 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.

**Table 22**
**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 |
| Sales and Despatch | Any day | 24 Hours |
| Maintenance | Any day | 24 Hours |

Similar to current operations, Hanson would retain the flexibility to operate extended hours for some operations, however the need to rely on this flexible arrangement would continue to 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 involve the load and haul of blasted material to the processing plant, where it is sized 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 load and haul as well as processing operations.

- Hanson delivers the majority of the material produced at the Quarry to the Hanson and Hymix concrete batching plants. Approximately 60% of deliveries provide aggregates to these locations for concrete production and eventual use in construction and infrastructure development. Additionally, Hanson supplies both large and small road upgrade projects as well as supplying the needs of customers that have their own fleet of trucks and may require a relatively small volume of material with short notice. In order to optimise the use of its transport fleet or the transport fleet employed by its clients, Hanson may plan deliveries during the night time period. Traffic congestion is also avoided by planning transport activities in this manner.

  The need to meet client requirements around the timing of delivery requires that Hanson have the flexibility to despatch trucks over 24 hours each day.

- 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.

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 2.4. The results of additional assessments undertaken by Vipac are provided in Appendix 2.
- 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 2).
- 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. Assessment of potential noise impacts indicates that noise from the operations and from road transport will not result in annoyance or sleep disturbance during the night time period.

**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.

## 3.13 HUMAN HEALTH

### 3.13.1 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.

### 3.13.2 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 this submission would eventuate. Each of the matters raised in this submission 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. For residences located close to the road, sleep disturbance may occur due to any heavy vehicle passing by (not just Hanson vehicles). However, Hanson would reduce the speed of heavy vehicles (to no more than 60km/hr) on Brandy Hill Drive to improve road safety and road noise. It is therefore considered that noise from Quarry-related vehicles would be lower than all other heavy vehicles using the road.
- 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. It is hoped that under the guidance of the community-based committee described in Section 3.18 some progress may be made to direct funding for this infrastructure.
- 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. Infrastructure needs would be reviewed by the community-based committee guiding road maintenance contributions. 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 Updated Air Quality Impact Assessment has provided predictive modelling of dust dispersion and concluded that in most instances, due to the additional mitigation that has been proposed, air quality impacts would remain consistent with existing concentrations and may improve under the Project compared to the existing local environment.

**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 24-hour operations and the proposed increase to traffic levels. It is noted that reference to 24-hour operations does not necessarily entail operating 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 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.

### 3.13.3 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 23**. 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.

**Table 23**
**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.

While it is difficult to directly compare **Table 23** 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.

## 3.14 NOISE

### 3.14.1 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 5** and summarised in Section 2.4 and Section 2.6. The following subsections should be reviewed in conjunction with Updated Noise Impact Assessment (Vipac, 2018a).

### 3.14.2 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 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 A of Vipac (2018a) (see Appendix 5).

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 2.4. 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 2.4.3.

As described in Section 2.4.4, 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 2.4.2 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 A 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.

### 3.14.3 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 DPE. 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 DPE) include the following (summarised from Section 2.4.3 and Section 2.6.3).

- All operations would be undertaken in accordance with the approved hours of operation.
- The existing processing plant equipment would be enclosed to mitigate noise generated by this equipment. The processing plant constructed for Stage 4 of operations would also be enclosed as is standard practice for newly constructed equipment.
- 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.
- A reduction to the speed limit of all heavy vehicles involved in transportation activities to 60km/hr on Brandy Hill Drive.
- 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 2.4.3 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 DPE.

### 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, excluding Screen 1 and Screen 5. All fixed processing plant would be enclosed from Stage 4 and Stage 5.
- 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 2.4.3.

It is noted that noise mitigation at nearby residences is guided by the *Voluntary Land Acquisition and Mitigation Policy 2014*. The provisions of this policy are discussed in Section 3.14.5, 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).

### 3.14.4 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 2.2 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 2.4.3 and Section 3.14.3. 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 13** to **Figure 18** in Section 2.4.4 and as Appendix C of the Updated Noise Impact Assessment.

### 3.14.5 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 3.3.6 (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, 2014).

Vacant land has been addressed specifically in Section 7.1.3 of the Updated Noise Impact Assessment (Vipac, 2018a) in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (NSW Government, 2014). 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.

### 3.14.6 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 5**).

- 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.

### 3.14.7 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

**Response**

The potential for operational sleep disturbance was assessed in Section 7.1.4 of Vipac (2018a) and summarised in Section 2.5. In summary, review of operational sleep disturbance criteria provided in the NPI (EPA, 2017) indicates the following.

- In all instances, the Project Specific Noise Levels 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. As described previously, exceedances of the operational noise level assessment criteria of 1dB(A) to 2dB(A) has been predicted under worst case conditions, however this is considered to be a negligible impact.

- Vipac (2018a) concluded that the maximum short-term noise levels from some of the operational noise sources may be up to 10dB to 15dB higher than the assumed sound power levels used in the predictive modelling. However, with this increase, short term maximum noise levels would remain below the 52dB(A) $L_{Amax}$ criterion at the nearest receivers and would not result in sleep disturbance

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 perceived 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.

### 3.14.8 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 committed to reducing 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.

### 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 3.19.3, 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 3.19.3). 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 5** and presents the outcomes of the amended road noise assessment. Section 2.6 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 2.6.5. 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 and would implement a reduced speed limit for all Quarry-related heavy vehicles on Brandy Hill Drive to reduce potential road noise impacts. 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 2.6.1.3, 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

As described in Section 3.19.12, 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 2.6 factors in an appropriate contribution from the Martins Creek Quarry. It should be noted that as this development is not approved, 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.

A proposal to manage road infrastructure and maintenance contributions is presented in Section 3.17 in response to Port Stephens Council. Hanson propose that ongoing contributions would be provided with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. This arrangement would be established through the Voluntary Planning Agreement. The community-based committee would operate independent of Hanson and the Company would not be involved in nominating or approving members or providing input to the allocation of contributions.

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. Further to this comment and based on the existing physical limit to hourly product despatch, which would remain, Hanson has committed to limit speed on Brandy Hill Drive to 60km/hr. Hanson considers it likely that $L_{MAX}$ levels generated by Quarry-related transportation would be lower than noise levels generated by all other heavy vehicles. Therefore, each Quarry-related heavy vehicle travelling on Brandy Hill Drive is likely to generate less noise than other trucks using the road. For the assessment of road traffic noise, Vipac (2018a) conservatively assumed that trucks from the Brandy Hill Quarry would represent approximately 60% of heavy vehicle traffic on Brandy Hill Drive during the period from 7:00am to 10:00pm. Therefore, this 60% of heavy vehicles from the Quarry would be generate less noise than the remaining 40%.

It should be noted that traffic generated by the Quarry would contribute approximately 32.5% of total traffic using this road during the day time.

**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[2]. 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) should be considered.

### 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.

[2] 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.

### 3.14.9 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 3.14.2. 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 2.4.4.

### 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 2.4.2 and presented in **Table 3**. 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 2.5, in all instances the Project Specific Noise Levels (referred to in Section 2.4.2) 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 2.6.5 and Section 3.14.8.

### 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 2.4.4.

### 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 7** to **Figure 12** and discussed in Section 2.4.2. 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 2.4.2 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 2.4.4 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 2.4.4 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 13** to **Figure 18** 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 DPE 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 2.6 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 2.6.4 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 5**).

*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 12** and the outcomes of the predictive modelling displayed in **Figure 18**. 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 2.4.3 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 (2018c) (provided as **Appendix 7**) 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).

## 3.15 PRE-COAT PLANT

### 3.15.1 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

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. The information requested from the EPA regarding 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. 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).

## 3.16 REHABILITATION

### 3.16.1 Introduction

The proposed rehabilitation of the Quarry is described in detail in Appendix 18 of the EIS. 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 DPE.

### 3.16.2 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**

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 Port Stephens Council, the Department of Industry – Water and the Office of Environment and Heritage.

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 addition to this, the landform may be developed to permit selective land uses. 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. The general objectives of rehabilitation include ensuring that the landform is safe, stable, secure and non-polluting. However, as detailed in Appendix 18 of the EIS, Hanson's rehabilitation objectives would also involve minimising the visual impact of the final landform and enhancing the surrounding biodiversity values.

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.

Given the design and elevation of extraction within the Quarry, it is likely that a void would remain in the final landform. This is likely to slowly fill with water over a number of years. **Figure 31** 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 not anticipated that any waterbody would be saline or stagnant and 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.

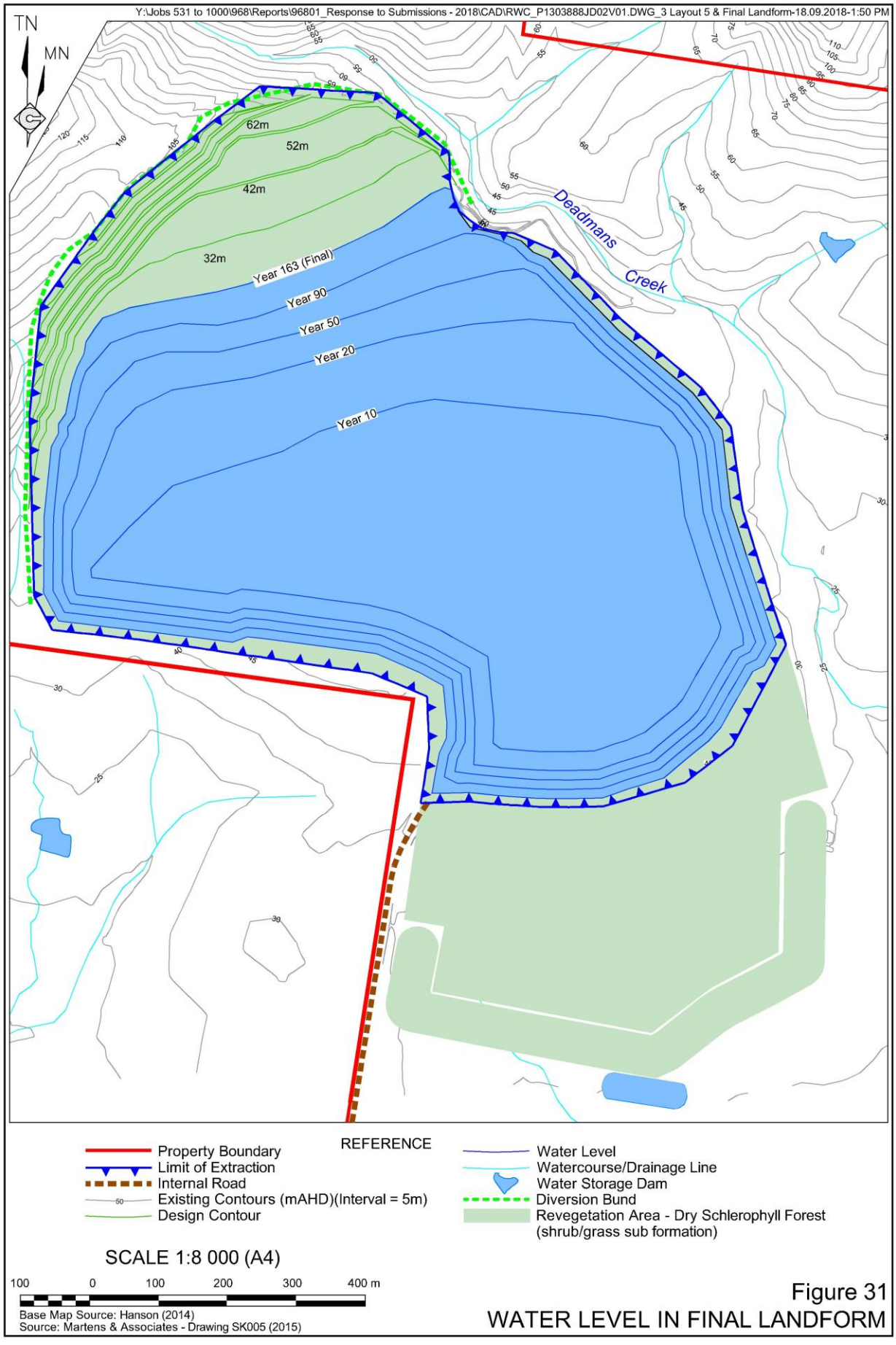



Figure 31
WATER LEVEL IN FINAL LANDFORM

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.

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 *Soil Survey and Land Resource Assessment* undertaken by Martens and discussed in detail in Section 5, Appendix 6 of the EIS.

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 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.

### 3.16.3 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.

### 3.16.4 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 3.17.2, 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 DPE 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.

## 3.17 DEVELOPER CONTRIBUTIONS

### 3.17.1 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. With regards the proposed transport routes and restrictions suggested by Port Stephens Council, it is not practical to limit transport routes as suggested. 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 6**. 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.

As described in Section 2.2, Hanson is proposing to continue paying contributions to Port Stephens Council in accordance with Section 7.11 of the EP&A Act though a Voluntary Planning Agreement. 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. Port Stephens Shire Council, to date, have not provided evidence on how these road contributions have been expended on the local roads used by Quarry-related vehicles. This is despite requests from the members of the CCC in this regard.

Hanson received assessment requirements for the Brandy Hill Quarry Extension in April 2013 (this application). Since that time Hanson has paid $1.44 million towards road infrastructure and maintenance through contributions. Hanson and the CCC are yet to be provided evidence of how these road contributions have been expended. 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 propose that ongoing contributions would continue to be provided to Council directly, however with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. This arrangement would be established through the Voluntary Planning Agreement. The community-based committee may initially be made up of members of the CCC, however it should be clear that Hanson would not be involved in nominating or approving members or providing input to the allocation of contributions.

While the following is provided as a draft only, once the VPA is in place, it may operate under the following key terms of agreement.

- Contributions would be paid every six months and would be based on weighbridge records of the quantity of extractive material transported from the Quarry on local or regional roads within the Port Stephens Council local government area;

- The parties to the VPA would meet prior to the contribution being finalised to review the following.
  - Matters outstanding from previous meetings.
  - Contribution amounts for the period in accordance with weighbridge records.
  - A review of the allocation of funds to date under the agreement.
  - Road infrastructure or maintenance needs identified by the community.
  - Council programs or community initiatives that may be the subject of funding from the contributions.

For example, it may be that it is determined the 100% of the contributions would be directed towards a fund that would be established to pay for the construction of a pedestrian walkway on Brandy Hill Drive, if this matter is given the highest priority.

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 that would effectively be managed through the Voluntary Planning Agreement.

**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 would be comfortable to discuss any such arrangement with Maitland City Council, as long as contributions are based on tonnes per kilometre travelled consistent with contributions paid to Port Stephens Council.

## 3.18 SOCIAL AMENITY

### 3.18.1 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 DPE, 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 2.10. The following subsections present a response to various submissions that incorporated social impact concerns.

### 3.18.2 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 2.10.4. 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 proposed to reduce 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.

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 transport levels are much lower than perceived 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 this is also not considered reasonable. However, as noted in Section 3.17, Hanson has paid $1.44 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 propose to continue providing contributions to Port Stephens Council, however given past uncertainty over funding allocation, is proposing that a community-based committee be formed to oversee and direct funding. More information regarding this proposal is provided in Section 3.17. Such a proposal would give Hanson and the community a greater level of confidence in the road construction and maintenance contributions process.

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 3.4.4) 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 taken into consideration the community concerns regarding health and wellbeing. Review of the Project has included reducing the proposed hourly traffic levels and reducing 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. A review of predicted dust dispersion modelling results indicates that dust dispersion would be consistent with or less than existing dust dispersion over the life of the Project. Health aspects of the Project have been addressed in more detail in Section 3.13.

Based on the modifications to the Project identified in Section 2.2, 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 3.9.5 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 a Stakeholder Engagement Plan that would be a condition of consent and approved by relevant parties. This plan would outline ongoing communication and engagement and describe the connections that would be established between the Quarry operation and the local community.

### 3.18.3 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 2.10. 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.
- Proposing a mechanism to resolve the issue of road infrastructure and maintenance through a community-based committee that would provide oversight on funding allocations.
- Committing to longer-term consultation through a 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 11**). Under this policy, Hanson would contribute up to $15,000 each year to community-based projects.

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 4). 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 2.10.4 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.

**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 throughout Section 2 and summarised in Section 4 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.

### 3.18.4 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 9** presents the correspondence between Hanson and RMS initiating review of speed limits in the vicinity of the Quarry. Hanson has already committed to reduce heavy vehicle speed limits on Brandy Hill Drive to 60km/hr for all Quarry-product despatch activities. It is anticipated that the pending RMS review of the sign-posted speed limit on Clarence Town Road would reduce the speed limit to 80km/hr.

### 3.18.5 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 proposed Stakeholder Engagement Plan.

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.

## 3.19 TRAFFIC AND TRANSPORT

### 3.19.1 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 the results of this assessment are presented in **Appendix 4** and are summarised in Section 2.3. 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 2.2.

### 3.19.2 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.

### 3.19.3 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 2.10.4 and **Appendix 5**), 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 2.2, in light of the submissions received, Hanson has reviewed the proposed transportation operations. Hanson has committed to limiting the speed of all Quarry-related product despatch vehicles to 60km/hr on Brandy Hill Drive and requested that the RMS review the sign-posted speed limit on Clarence Town Road as the current 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 and it is now proposed that the contributions process be overseen by a community committee appointed to provide direction on where road infrastructure and maintenance work is most needed. This process would be specified in a Voluntary Planning Agreement. The community-based committee may initially be made up of members of the CCC, however it should be clear that Hanson would not be involved in nominating or approving members or providing input to the allocation of contributions.

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 3.2.6.

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 3.19.6.
- Noise impacts of the Project – Section 3.14.
- Dust impacts of the Project – Section 3.3.

### 3.19.4 Transport Levels

**Representative Comment(s)**

---

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 2.6 and the Updated Noise Impact Assessment provided as **Appendix 5**). 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 2.6.4. 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.

### 3.19.5 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.

### 3.19.6 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 through a Voluntary Planning Agreement, however modifying the existing agreement so that a nominated community-based committee provides oversight and direction on where road infrastructure and maintenance work is most needed. Council would be required to provide feedback to the community on the allocation of funds.
- Managing the speed of heavy vehicles including limiting the speed of all trucks delivering Quarry material and returning to the Quarry along Brandy Hill Drive to 60km/hr, where it is safe and sensible to do so. Although not a commitment, Hanson has also requested that RMS review the current speed limit on Clarence Town Road to reduce the approved speed limit of 100km/hr in the vicinity of the Quarry to 80km/hr. Feedback from RMS on this matter is presented in **Appendix 9.**
- 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 and has a speed limit of 100km/hr in the vicinity of the Quarry. 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.

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 3.2.1.1. 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 though a Voluntary Planning Agreement.

Hanson is proposing that these contributions would continue to be provided to Council directly, however with a community-based committee appointed to provide oversight and direction on where road infrastructure and maintenance work is most needed. It is acknowledged that the

allocation of contributions by Port Stephens Council would have a whole of community element. However, under a revised agreement, Council would be required to provide feedback on the allocation of funds to the community. This would ensure that, within reason, Hanson's contributions for the use of the local road network are used to improve and maintain the local road network. 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 10**).

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 proposes to implement 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. 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. However, Hanson considers this risk is minor compared to the benefits of this policy.

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 Brandy Hill Drive on 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 been in contact with 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 9**. While it is understood that RMS is required to refer to the *NSW Speed Zoning Guidelines* in reviewing and setting speed limits, it is considered that there is sufficient community support for a review of the speed limit on Clarence Town Road between Seaham and Woodville.

#### 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 10** and the matters included in the code summarised in Section 3.19.11. 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.

### 3.19.7 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 transport route currently used by the majority of vehicles to deliver Quarry products is presented in **Figure 6**. This route has been used for the purpose of assessment with particular focus on Brandy Hill Drive given the majority (approximately 75%) of Quarry-related product despatch would use the route between the Quarry and Raymond Terrace to access the Pacific Motorway. 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 (2018) and provided as **Appendix 3**. The results of the assessment are summarised in Section 2.3.

- Raymond Terrace Road / Seaham Road give way controlled rural seagull;
- William Bailey Street / Port Stephens Street / Newline Road roundabout; and
- Adelaide Street / William Bailey Street signalised intersection.

In summary, it has been confirmed that product transportation activities under the Project would not significantly impact the local and state road network. Intersect Traffic (2018) has identified that given the estimated increase in background traffic and use of the Raymond Terrace Road / Seaham Road rural seagull intersection, the intersection would need to be upgraded to a roundabout by 2024. This upgrade does not result directly from use of the intersection by Quarry-related vehicles but is caused by increasing background traffic. Road maintenance and upgrade contributions negotiated with Port Stephens Council and implemented through the Voluntary Planning Agreement may be used to contribute to this upgrade. However, Hanson's contribution should be relative to the proportion of Quarry traffic using this intersection.

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

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 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 6**. 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.

### 3.19.8 Road Degradation

**Representative Comment(s)**

*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 3.17, 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*. However, given the apparent lack of attention to local road condition, and as described in Section 3.17, Hanson propose that the road maintenance contributions for the ongoing operations be made with oversight by a community committee to ensure that road infrastructure and maintenance work is directed where it is most needed.

### 3.19.9 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 normal growth of background traffic levels.

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 through a Voluntary Planning Agreement to fund local road or intersection upgrades. However, as described in Section 3.17, these contributions are proposed to continue with the oversight of a community-based committee. Port Stephens Council would also need to report on the allocation of these funds to the committee.

**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 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.

### 3.19.10 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.

Generally, a Traffic Management Plan would incorporate a Drivers Code of Conduct which is described in more detail in Section 2.19.11.

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 150 laden vehicles per day. 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 3.18, however, in summary, would be comfortable to discuss a contribution with Maitland City Council to be agreed under a Voluntary Planning Agreement.

- 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.

### 3.19.11 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 10** 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, RMS and the local community consultative committee.

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 order.

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* reporting for State significant extractive industry developments.

Hanson is aware of community concerns regarding the existing speed limits. A request for review of the speed limit on Clarence Town Road was sent to RMS on 31 May 2018 and a response received on 8 August 2018 (see **Appendix 9**). The response from RMS indicates that a review of speed limits in the area is underway, however it is not clear if this includes Seaham Road.

Policing of speed limits remains a matter for RMS or the NSW police, however Hanson is comfortable to assist where reasonable.

### 3.19.12 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.

It should also be noted that the proposed extension to the Martins Creek Quarry is yet to be assessed by DPE and therefore should be considered a possible contribution to traffic based on approval of both the Martins Creek Quarry Expansion Project and the Project.

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 32** 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.

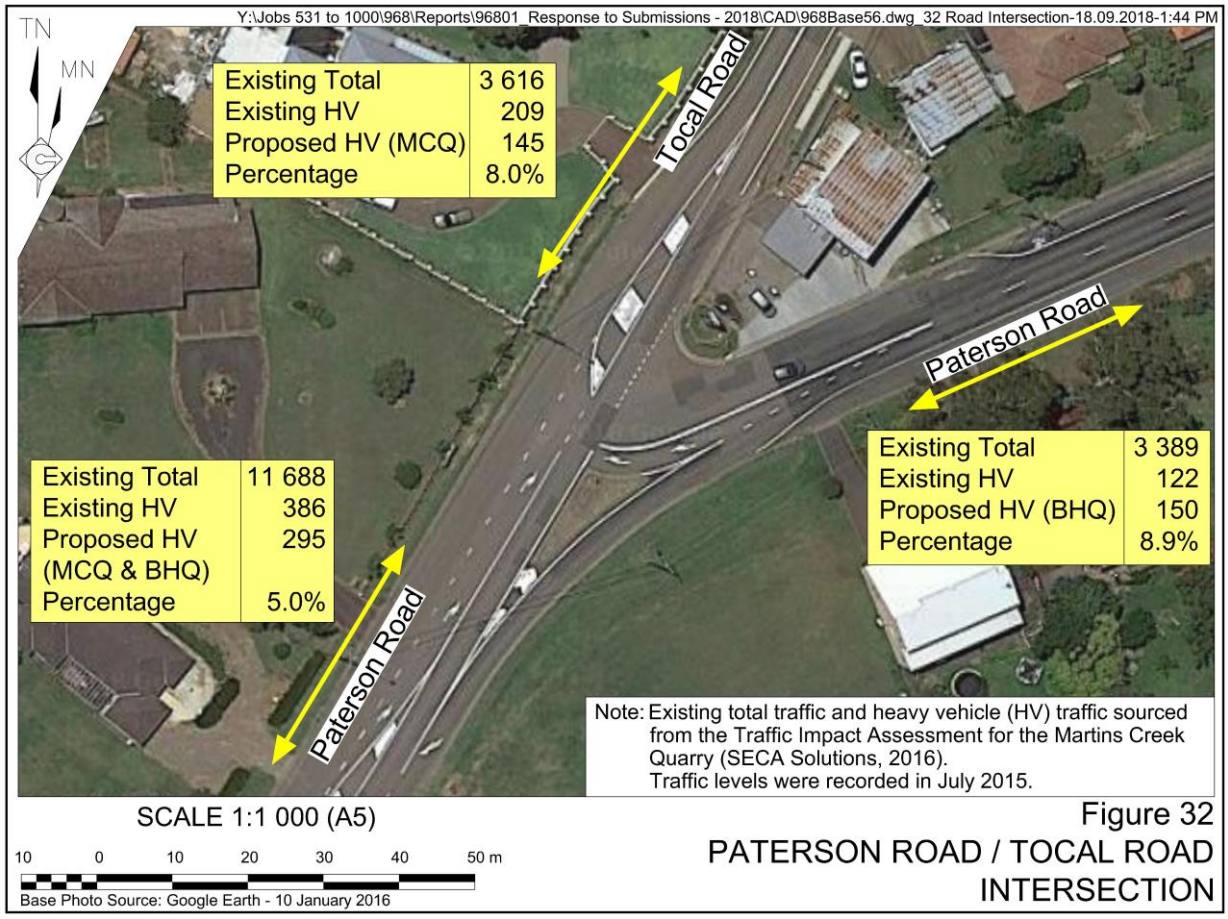



Figure 32
PATERSON ROAD / TOCAL ROAD INTERSECTION

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 is currently reviewing submissions received for its proposal and therefore traffic levels remain indicative 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 and should be incorporated into conditions of consent for both operations.

### 3.19.13 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 (Stages 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 2**). 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 2.2, Section 3.12 and **Table 22**, 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.

## 3.19.14 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 has approached the RMS about reducing the speed limit on Clarence Town Road (currently 100km/hr) to 80km/hr similar to the speed limit on Brandy Hill Drive. The proposed change to the speed limit is supported by the local community (as expressed during CCC meetings). It is noted that a reduction to the speed limit would also reduce 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. However, should RMS wish to improve safety at this intersection (as well as along Clarence Town Road generally) it is recommended that the community-supported reduction in the speed limit be considered.

### 3.19.15 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 DPE 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 2.9 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.

## 3.20 WATER RESOURCES

### 3.20.1 Introduction

The submission provided by the Department of Primary Industries (now Department of Industry) 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 the Department of Industry 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 Deadman's 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 the Department of Industry 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.

### 3.20.2 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

### Response

Section 3.9 of the Surface Water Assessment (Martens & Associates, 2016 – Appendix 13 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 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. 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 the Department of Industry – Water) in correspondence dated 20 May 2015 (refer to Attachment I of the Surface Water Assessment).

## 3.20.3 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 24**. This assessment is consistent with the methodology detailed in the Surface Water Assessment, and all assumptions are detailed as notes below **Table 24.** 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 Deadman's 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.

**Table 24**
**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.

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*.

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.

### 3.20.4 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 24** 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 25**
**'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 2**).
4. DP1 is relocated during Stage 4 of works. Refer to Section 3.6 of the Surface Water Assessment.

Source: Modified after Martens (2015) – Table 5

### 3.20.5 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 25**, 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 90$^{th}$ 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 90$^{th}$ 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.

### 3.20.6 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 26** 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 26**
**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 3.45 $m^3/s$, or 3 450 L/s. The largest flow rate in **Table 26** is 98.6 L/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 2** displays the existing conditions at discharge point DP3.

**Plate 2 Discharge Point DP3**
**(photo date 26 Oct 2017 REF E968B_032)**

## 3.20.7 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 3.20.6 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 90$^{th}$ 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 3.20.4), 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 2**). 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 1**). 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.

### 3.20.8 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.

### 3.20.9 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.

### 3.20.10 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**

The *Wastewater Assessment* (Martens & Associates, 2016) 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, be the responsibility of Port Stephens Council.

### 3.20.11 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 3.20.7 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.

## 3.21 VISUAL / LIGHTING

### 3.21.1 Introduction

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.

### 3.21.2 Visibility

**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.

### 3.21.3 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 4).

# 4. 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 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 000m3 per annum using an on-site concrete batching plant. Up to 20 000t per annum of 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 3, 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 (Figure 1), excluding Screen 1 and Screen 5. All fixed processing equipment would be enclosed from Stage 4 and Stage 5 (see Figure 2 and Figure 3).
- Partially enclose conveyor transfer points after Stage 4 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 for the following levels.
  - No more than 301 laden loads during the daytime (7:00am to 10:00pm).
  - No more than 58 laden loads during the night time (10:00pm to 7:00am).
- Construct an earthen amenity barrier between 18m and 20m high to the south of the relocated Processing and Stockpiling Area (see Figure 1).
- 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 Stakeholder Engagement Plan to provide a channel of communication, demonstrate environmental management performance and accountability and build trust with the local community.
- Design a mechanism for oversight of the 'Statement of Commitments' and Voluntary Planning Agreement (VPA) through a community-based committee.
- 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.
- 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.
- Manage transportation operations to mitigate the scale of night time product despatch, as much as practical.

- 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 DPE, 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 dry and windy 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 and/or monitoring program 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 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.

### 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 year prior to the cessation of quarrying activities.
- Stockpile organic top-soils for rehabilitation and landscaping uses. Top-soil 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. The strategy is outlined in Section 5.5 of the EIS and subject to approval by the DPE.
- 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 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.

**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.
- Reduce 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, with approval from DPE.
- 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 OEH'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 OEH and 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 OEH 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 annually.
- 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.

# 5. CONCLUDING STATEMENT

Hanson and its consultants have undertaken a comprehensive review of the submissions received by DPE during the public exhibition of the EIS for the Project. In light of the concerns raised by Government agencies, community groups and private individuals, the Project has been modified to reduce the risks associated with changes to social amenity and way of life for the local community. Concerns regarding these risks have been expressed through submissions commenting on the potential for excessive heavy vehicle levels, and associated noise and dust impacts, and the impact this change may have on the ability for people to enjoy the local setting.

Hanson considers that while the Project would modify the existing rate of production and increase the total number of heavy vehicle movements required, the proposed transportation levels would not result in the impacts expected by the local community as expressed in the various submissions. It is noted that this may be a factor of a misunderstanding of proposed traffic levels presented in the EIS.

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 and confirmed that it is not proposed to change the currently experienced hourly maximum laden vehicle despatch from 30 trucks per hour.
- Hanson and Intersect Traffic remain confident that 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 propose that ongoing road construction and maintenance contributions would be overseen by a community-based committee that would provide direction on where road infrastructure and maintenance work is most needed. Under this arrangement Port Stephens Council would need to provide feedback on the allocation of funds paid by Hanson.

  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 that would effectively be managed through the Voluntary Planning Agreement.
- 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 implemented a reduced speed limit for trucks on Brandy Hill Drive to ensure that Quarry-related product delivery vehicles generate less noise than other vehicles on the road.

- Predictive modelling of dust dispersion from the Quarry has indicated that dust dispersion is likely to remain consistent or lower than existing operations. This is principally the result of design controls including enclosure of fixed 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 survey for the Rusty Greenhood Orchid within the areas proposed for disturbance failed to identify the species indicating it does not grow within the Quarry. It is also noted that potential impacts to Koala habitat would be managed in accordance with the *Biodiversity Conservation Act 2016* and would not result in a significant impact to the local population of this species. Hanson has also proposed to implement additional management of hollows salvaged from hollow-bearing trees to ensure that this habitat feature is available in surrounding vegetation.

- Hanson commissioned Key Insights to undertake a program of consultation and, based on the outcomes of that program to prepare, a Social Impact Assessment for the Project. Key Insights assessed potential social impacts and 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.

  The need for Hanson to proactively engage with the community on an ongoing basis was 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.

- 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.

Review of the various submissions highlights the interaction between perceptions of impacts from road traffic, operational and road noise and to a lesser extent other operational impacts in overall impacts to amenity. This has also been perceived as potentially changing 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 community feels it has not been consulted. This *Response to Submissions* has demonstrated that potential amenity impacts from noise and dust would be consistent with expectations expressed in the relevant guidelines. In addition, transport levels would be limited to no more than 30 heavy vehicles per hour which is consistent with current experience. The frequency of heavy vehicle use of the road network would increase, however this would remain within levels that avoid or mitigate potential environmental impacts. 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, but actions here would need to be renewed. 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.

Given the size and location of the resource at the Quarry, it would be 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.

# 6. REFERENCES

**Australian and New Zealand Environment and Conservation Council (ANZECC) (1990).** *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration – September 1990.*

**Austroads (2009).** *Guide to Road Design*.

**Biosis Pty Ltd (2015).** *Biosis Pty Ltd (2018). Biodiversity Assessment Report.* Prepared for Hanson Construction Materials Pty Ltd and included as Appendix 12 to the Environmental Impact Statement for the Brandy Hill Extension Project.

**Biosis Pty Ltd (2018).** *Biodiversity Assessment Report.* Provided as Appendix 8 in this document.

**Commonwealth of Australia (2010).** *Survey guidelines for Australia's threatened birds.*

**Commonwealth of Australia (2010).** *Survey guidelines for Australia's threatened amphibians, birds and mammals.*

**Department of Environment & Climate Change NSW (DECC) (2008).** *Managing Urban Stormwater Soils & Construction Volume 2E Mines and Quarries.*

**Department of Environment & Conservation. (2016).** *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

**Department of Environment and Climate Change (NSW) (DECC) (2009).** *Threatened species survey and assessment guidelines: field survey methods – Amphibians.*

**Department of Environment and Conservation (NSW) (2004).** *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft November 2004*.

**Department of Environment and Conservation (NSW) (DEC) (2004).** *Threatened Biodiversity Survey and Assessment Guidelines.*

**Department of Environment, Climate Change and Water NSW (DECCW) (2000).** *Interim Construction Noise Guideline.*

**Department of Environment, Climate Change and Water NSW (DECCW) (2011).** *Road Noise Policy.*

**Department of Land and Water Conservation (DLWC) (2000).** *Soil and Landscape Issues in Environmental Impact Assessment.*

**Department of Planning & Environment (DPE) (2016).** *Hunter Regional Plan 2036.*

**Department of Sustainability, Environment, Water, Population and Communities (2012).** *National Pollutant Inventory - Emissions Estimation Technique Manual for Mining*.

**enHealth (2004).** *The Health Effects of Environmental Noise (other than hearing loss).*

**Environmental Protection Authority (EPA) (1998).** *Action for Air*. Sydney: Environmental Protection Authority (NSW).

**Environmental Protection Authority (EPA) (2000).** *Industrial Noise Policy.*

**Environmental Protection Authority (EPA) (2017).** *Noise Policy for Industry.*

**Environmental Protection Authority (EPA) Victoria. (2007).** *Protocol for Environmental Management - Mining and Extractive Industries*.

**Hanson Construction Materials Pty Ltd (Hanson) (2017).** *Environmental Impact Statement.*

**Intersect Traffic Pty Ltd (2015).** *Transport Impact Assessment.* Prepared for Hanson Construction Materials Pty Ltd and included as Appendix 8 to the Environmental Impact Statement for the Brandy Hill Extension Project.

**Intersect Traffic Pty Ltd (2017).** *Traffic Impact Assessment.*

**Intersect Traffic Pty Ltd (2018).** *Additional Intersection Analysis and Response to Submissions – Brandy Hill Quarry Expansion.* Provided as Appendix 4 in this document.

**Key Insights Pty Ltd (2018).** *Social Impact Assessment.* Provided as Appendix 3 in this document.

**Landcom (2004).** *Managing Urban Stormwater: Soils & Construction*

**Marlow et al (2015).** *Assessing the impact of 1080 Pro-baits on wild brush- tailed phascogales (Phascogale tapoatafa) during an operational fox baiting campaign.* 9. 259-266.

**Martens and Associates Pty Ltd (2015).** *Surface Water Assessment.* Prepared for Hanson Construction Materials Pty Ltd and included as Appendix 13B to the Environmental Impact Statement for the Brandy Hill Extension Project.

**Martens and Associates Pty Ltd (2016).** Wastew*ater Assessment.*

**NSW Government (2014).** *The Voluntary Land Acquisition and Mitigation Policy 2014*

**NSW Health (2016).** *NSW Health Private Water Supply Guidelines 2016*

**NSW Rural Fire Service (2006).** *Planning for Bush Fire Protection*.

**Office and Environment and Heritage (OEH) (2014).** *BioBanking Assessment Methodology.*

**Office and Environment and Heritage (OEH) (2016).** *NSW Guide to Surveying Threatened Plants.*

**Phillips S. and Callaghan J. (2011).** *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus***.** Australian Zoologist, 35 (3): 774-780.

**Port Stephens Council with the Australian Koala Foundation (2002).** *Port Stephens Council Comprehensive Koala Plan of Management*

**Seca Solutions Pty Ltd (2016).** *Traffic Impact Assessment for the Martins Creek Quarry.*

**Vipac Engineers & Scientists Ltd (Vipac) (2015).** Noise and Vibration Impact Assessment. Prepared for Hanson Construction Materials Pty Ltd and included as Appendix 9 to the Environmental Impact Statement for the Brandy Hill Extension Project.

**Vipac Engineers & Scientists Ltd (Vipac) (2018a).** Updated Noise Impact Assessment. Provided as Appendix 5 in this document.

**Vipac Engineers & Scientists Ltd (Vipac) (2018b).** Updated Air Quality Assessment. Provided as Appendix 6 in this document.

**Vipac Engineers & Scientists Ltd (Vipac) (2018c).** Updated Blast Impact Assessment. Provided as Appendix 7 in this document.

**WorleyParsons Limited (2015)**. *Hydrology Report Relating to the April 2015 Hunter Valley Weather Event*

This page has intentionally been left blank