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30 June 2005

Mr M Young
Department of Infrastructure Planning and Natural Resources
Mining and Extractive Industries
GPO Box 39
SYDNEY NSW 2001

Dear Mike

RE: PROPOSED MODIFICATION TO

HUNTER VALLEY OPERATIONS NORTH OF THE HUNTER RIVER DEVELOPMENT CONSENT

UPGRADE OF THE HUNTER VALLEY LOAD POINT

1.0 Introduction

This letter report has been prepared to support a Section 96 (1A) application to modify Hunter Valley Operations (HVO) development consent to enable the upgrading of the Hunter Valley Load Point (HVLP). The proposed upgrade of the HVLP is required to improve efficiencies in the transfer of coal to the Port Waratah ship loading facility and will assist in improving the efficiency of the entire coal chain. The proposed upgrade of the HVLP increases the number of trains that are able to be loaded in any one day but does not increase the annual amount of coal loaded at the HVLP as this is controlled by the amount of coal produced at the Hunter Valley Coal Preparation Plant (HVCPP).

Only minor changes to existing infrastructure will be required for the upgrade. It is not proposed to disturb any new areas of ground or change the way in which coal is handled. An assessment has been undertaken of the potential impacts of this proposal and is presented in the following sections of this letter.

As the proposal constitutes a minor change to current operations and the works will have minimal environmental impacts, Coal & Allied (CNA) are seeking approval for this activity by way of a minor modification to the HVO West Pit Extension and Minor Modifications approval (DA-450-10-2003) under Section 96(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The following attachments are provided to this letter to support the application:

- Attachment A - plans showing the locality of HVO, the loading facilities and the land ownership in the vicinity of the HVLP;
- Attachment B – a copy of the development consent to be modified;
- Attachment C – a completed application form to modify the development consent under Section 96(1A) of the EP&A Act;
- Attachment D – a noise assessment conducted by Global Acoustics Pty Ltd; and
- Attachment E – an air quality assessment conducted by Holmes Air Sciences Pty Ltd.

A cheque for $500.00, being the application fee, is also enclosed.

2.0 Background

CNA currently conducts coal mining activities at HVO which is located approximately half way between Singleton and Muswellbrook (see Attachment A).

Export coal from HVO is transferred to Port Waratah at Newcastle, by rail, from two locations:
- HVLP which has consent to receive coal from the HVCPP via a conveyor or intermittent haulage along the Belt Line Road; and
- Newdell Load Point (NLP) which has consent to receive coal from the West Pit Coal Preparation Plant (WPCPP) via road haulage along Pikes Gully Road and from the HVCPP via the HVLP.

HVO also have development consent to transfer coal to Port Waratah via the:
- Mount Thorley Coal Loader (MTCL) which has consent to receive coal from the Lemington Coal Preparation Plant (LCPP) via road haulage along Jerrys Plains Road (also known as the Golden Highway); and
- The Ravensworth Coal Terminal which is managed by BHP Billiton.

HVLP and NLP are located north of the Hunter River on Pikes Gully Road, to the north of the New England Highway. The Ravensworth Coal Terminal is also located north of the Hunter River and New England Highway on Station Road. The LCPP is located south of the Hunter River near Jerrys Plains Road. The location of the loading points are shown in Figure 2 of Attachment A.

As part of the recent HVO West Pit Extension and Minor Modifications approval consent was granted for the haulage and loading of coal by the Ravensworth Coal Terminal. However, as this loading terminal is owned by another organisation it is not currently economically feasible to load coal from HVO through this facility. Due to operational costs, the LCPP has been put under care and maintenance, resulting in all coal from HVOs operations south of the Hunter River being directed to HVCPP. As a result the majority of coal from HVO is washed at HVCPP and, subsequently, the majority of product coal is handled through the HVLP.

Changes to the coal chain and cargo assembly strategies at Port Waratah have resulted in a requirement to improve the efficiency of existing loading facilities to meet the coal chain requirements. The Hunter Valley Coal Chain Logistics Team (HVCCLT) is comprised of representatives of coal mines, Pacific National and Port Waratah. Its purpose is to increase the capacity of the coal chain through improvements in the transfer of coal from the Hunter Valley to the Port of Newcastle and reduce congestion and delays in the loading of vessels. The HVCCLT in establishing a pathway to increase the capacity of the Port to 120 Mtpa, conducted a detailed analysis of the coal chain. This work identified requirements for improvement across the system (port, rail and load points) to initially achieve 95 Mtpa throughput. Four load points were identified as significantly constraining system capacity. HVLP was one of the four and the most significant due to the amount of coal exported from HVO.

3.0 Hunter Valley Load Point Approvals

The development consent for HVLP was granted on 8 September 1981, by the then Minister for Planning and Environment (Hon Eric Bedford MP). It was granted subject to nine conditions.

The consent was modified in August 2003 to enable to the transfer of coal between the HVLP and the NCPP. The original consent and subsequent modification was consolidated into the West Pit Extension and Minor Modifications approval which was approved by the Minister for Infrastructure and Planning and Natural Resources on 12 June 2004. The West Pit Extension and Minor Modifications approval consolidated all of HVOs approvals north of the Hunter River and is also referred to as the HVO North of the Hunter River development consent. A copy of the 2004 development consent is contained in Attachment B.

The West Pit Extension and Minor Modifications Environmental Impact Statement (EIS) considered a loading rate for the HVLP of 4000 tph and the loading rate of the NLP of 5.3 Mtpa. Other activities related to coal handling and the loading points described in the EIS were:

- The processing of 20 mtpa run-of-mine (ROM) coal at the HVCPP;
- The transfer of coal via road haulage between the HVLP and NLP at a rate of 25,000 tpd;
- The construction of a conveyor between the HVLP and NLP if economically feasible;
- The transfer of coal via road haulage from the NLP or HVLP to the Ravensworth Coal Terminal at a rate of 15,000 tpd;
- The transfer of coal from the HVCPP via conveyor at a rate of 2,500 tph; and
- The transfer of coal from the HVCPP via intermittent haulage at a rate of 25,000 tpd.

4.0 The Proposal

The HVLP currently loads 7 trains per day on average. To meet the requirements of the HVCCLT and increase the efficiency of the coal chain the HVLP is required to be upgraded to be able to meet a surge capacity of 18 trains per day. This requirement does not increase the annual throughput of the HVLP however, it does increase the throughput that may occur on any one day. The amount of coal produced by HVO is limited by the HVCPP which is approved to process 20 Mtpa ROM coal. The daily increase in the number of trains loaded does not increase the number of trains used by HVO to transport coal to Newcastle as the trains will be re-allocated from other loading points. The Rio Tinto Coal Australia (RTCA) Logistics team modelled the HVCCLT requirements in order to accurately determine the output required of the HVLP. The modelling determined that to meet the requirements of the HVCCLT the average load rate of the HVLP would need to be increased to approximately 5,100 tph with a peak load rate of approximately 7,200 tph. As a result the HVLP will need to be upgraded.

It is anticipated that the upgrade of the HVLP will include:

- Increasing the rate of two portal reclaimers from 2,000 tph to approximately 3,000 tph each;
- Increasing the rate of two yard conveyors from 2,000 tph to approximately, 3,600 tph each;
- Increasing the rate of the train loading conveyor from 4,000 tph to approximately 7,200 tph; and
- Installation of train speed control and automated train loading together with improved spill detection.

The increases in the rate of the portal reclaimers and conveyors will require minor changes to existing gearboxes, installation of a variable speed drive, new conveyor drives and new conveyor pulley drives. Upgrades will also be undertaken on the transfer chutes and train loading bin to cater for the increased belt speed. However, all of these changes are relatively minor and there is no change to the way in which coal is handled or the annual quantity of coal which is loaded at the HVLP.

The HVLP is one of the few loading points which does not have automatic train loading. Manual train loading is dependant on the operators experience and judgement and there is variability between operators. The outcome of inadequate loading is underloading or overloading or spillage. Implementation of an automated train loading system provides consistency and repeatability of loading, reducing over-loading and under-loading. The automatic train loading system incorporates a detection system to determine the position of wagons relative to the loading chute and automated opening and closing of the chute to fill the wagon. Automated control of the chute combined with automated wagon type identification and a selection of coal type on the control room screen will combine to minimise or eliminate over-and under-loading. The option to manually operate train loading will be retained as a back-up to the automated system.

5.0 Approvals Process

As outlined above, the proposal constitutes a minor change to current operations which have been approved by the Minister under the provisions of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*. As a result, the proposal is substantially the same development as that already approved. An assessment of the potential environmental impacts provided in the next section also indicates that the proposal will have minimal environmental impact. Therefore, a modification under Section 96(1A) of the *EP&A Act* to the West Pit Extension and Minor Modifications development consent is required. A copy of this consent is provided in Attachment B. A completed 96 (1A) development modification application form is provided in Attachment C.

6.0 Environmental Assessment and Management

The following section provides an overview of the environmental consequences of the proposal and where appropriate, mitigation measures to minimise any potential impacts identified have been developed.

Land Use
The proposal will not change the existing landuse on the site or surrounding the area.

Noise
An assessment of potential noise impacts associated with the proposed works was undertaken by Global Acoustics and is provided in Attachment D. This assessment determined the potential impact on noise levels from the upgrade of the HVLP. It is estimated that the upgrade will increase the sound power of the HVLP by 2 dB. As a result of other activities occurring in the area and the natural topography, the predicted increase overall will be 0.8 dB. This means that the 35 dB contour shown in the West Pit Extension and Minor Modifications EIS will become a 36 dB contour in the area to the north and northwest of the HVLP. Predicted noise levels around all other areas of HVO will remain unchanged. A change of 1 dB is imperceptible and therefore no residence is likely to be impacted as a result of the proposed upgrade.

Air Quality
An assessment of potential air quality impacts associated with the proposal was undertaken by Holmes Air Sciences and is provided in Attachment E. The findings of the study conclude that the dust generated by the HVLP was a very small proportion of the total dust emission in the area. The proposed upgrade of the HVLP could potentially increase dust emissions by approximately 11% on those days that the HVLP is loading 18 trains per day, however as the annual throughput is not proposed to be increased there should be no annual increase in dust emissions. Dust generated from the upgraded HVLP is not expected to extend more than a few hundred metres from the site. Given the distance of surrounding residences, which are all further than 6 km from the HVLP, it is unlikely that any residence will be impacted by the proposal. Dust monitoring in the vicinity of the HVLP will continue to be undertaken in accordance with the CNA environmental monitoring program.

Flora, Fauna and Heritage
The proposal does not involve any additional disturbance of land. No sites of Aboriginal or European heritage or rare and endangered flora and fauna have been identified in the vicinity of the HVLP. Therefore, there will be no impacts to Aboriginal or European heritage or flora and fauna.

Water Quality and Erosion Controls
The catchment area of the HVLP operations are fully contained within the water management systems already in place at HVO. The upgrade of the HVLP will not include any significant earth works however the automatic train loading system includes improved spill detection and allows better control over the loading of coal. Improved loading will result in less sediment from spills being washed into the onsite sediment dams and potentially reduce the maintenance requirements for the water management system. Water quality will continue to be monitored as part of the environmental management of the operation.

Traffic and Transport
There will be a minor increase in traffic flows along Pikes Gully Road as a result of the delivery of construction materials and additional personnel during the upgrade of the HVLP. The upgrade is anticipated to take approximately 10 days to complete and as Pikes Gully Road is predominantly used for industrial traffic the proposal is unlikely to have a significant impact on road users.

7.0 Conclusion

Changes to the coal chain and cargo assembly strategies at Port Waratah have created an imperative to improve the efficiency of existing loading facilities to meet the coal chain requirements. HVO is one of the largest single suppliers of coal for export within the Hunter Valley coal chain. The majority of HVO's coal is loaded at the HVLP which has been identified as one of the loading facilities that is significantly constraining the Hunter Valley coal chain system capacity. An upgrade of the HVLP will result in improvements in the transport of coal via rail to Port Waratah by reducing congestion in the coal chain.

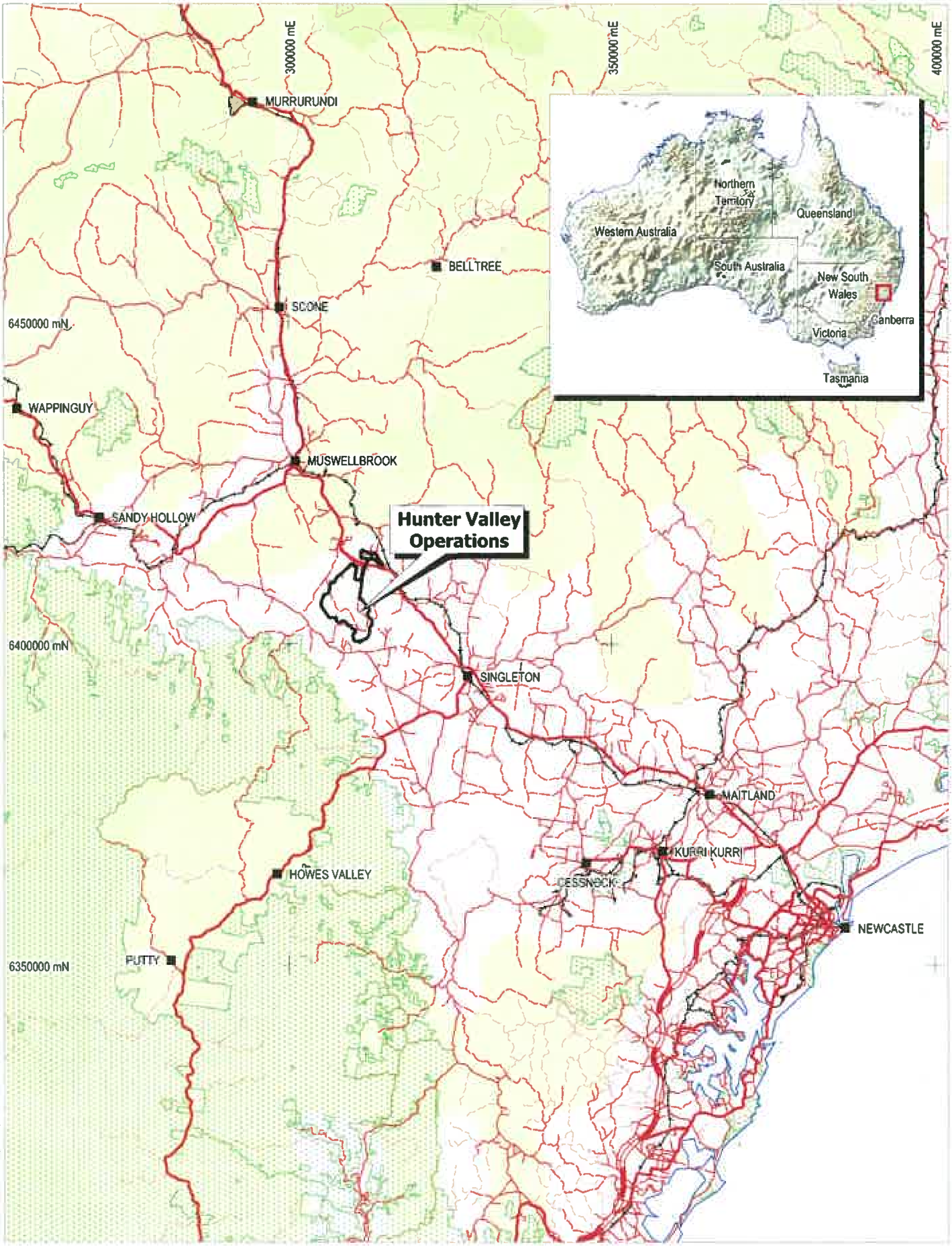
There are no other alternatives to upgrading the HVLP. Not upgrading the HVLP will result in continued congestion of the Hunter Valley Coal Chain.

The upgrade of the HVLP will not cause any significant environmental impacts with only minor increases in daily noise and dust emissions. The location of the site means that it is unlikely to impact on surrounding residents who are located approximately 6 km from the facility. The upgrade of the HVLP also includes an automated train loading system which will prevent spillage of coal and potentially reduce demand on the HVLP water management system.

Coal and Allied wish to apply for a Section 96 (1A) modification to the existing West Pit and Minor Modifications development consent to allow the upgrade of the HVLP to be undertaken. I trust this letter report and associated assessments provide you with the information you require to consider this application and we look forward to your response. In the meantime, please contact me on (02) 6578 8900 should you have any queries or wish to discuss any aspect of the proposal.

Yours sincerely

Sarah Fish
Environmental Principal



Legend
- City
- Town
- Highway
- Road
- Minor road
- River/creek
- National Park

MATRIX

Datum: AGD84
Projection TM, AGD84, zone 56

20 0 20
kilometres

HUNTER VALLEY OPERATIONS

Regional Location

Figure 1

Legend

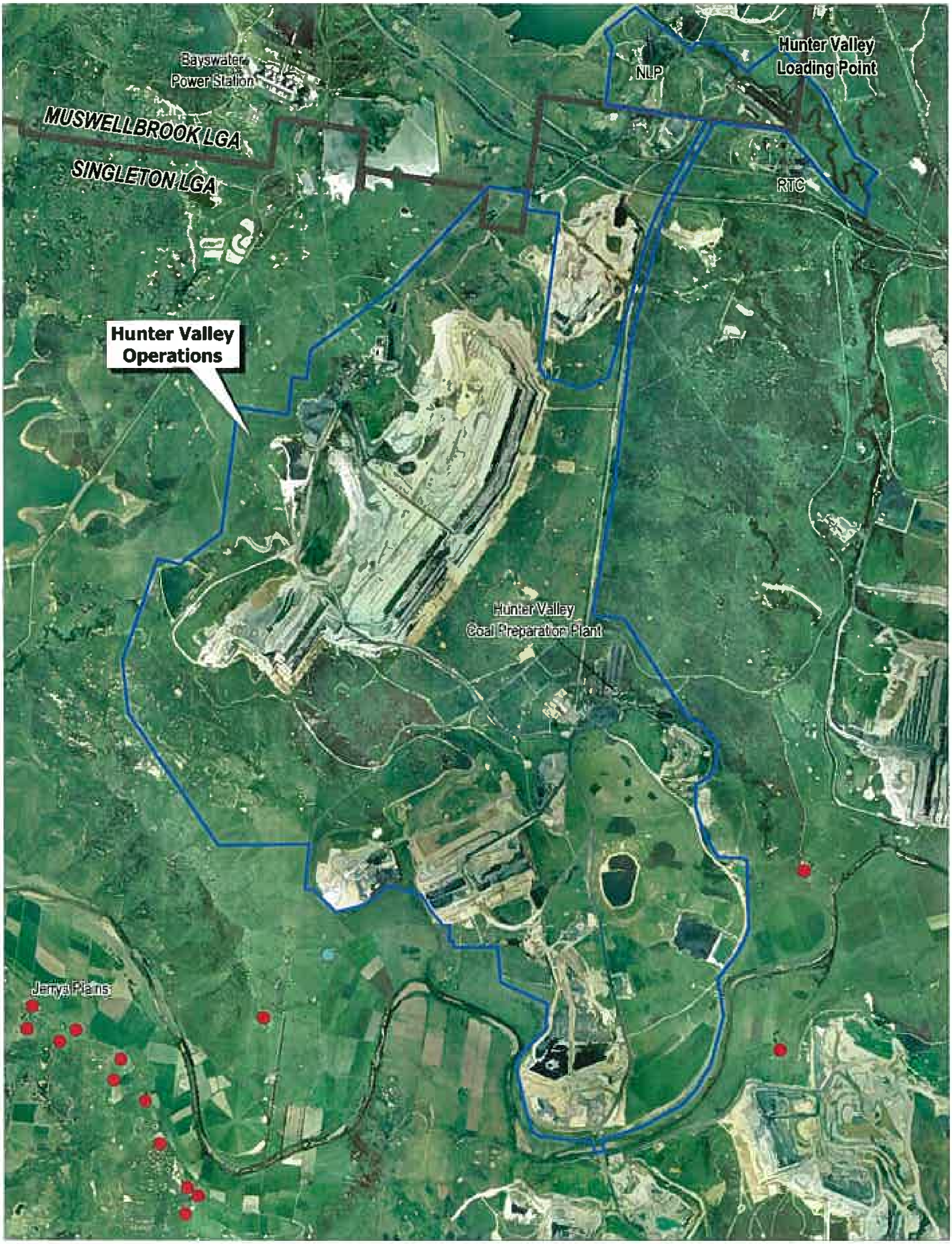
- HVO development consent boundary
- Local government boundary
- CNA owned land
- Land owned by other mining companies

Datum:
Projection:

HUNTER VALLEY OPERATIONS
Land Tenure

0 500 1000
metres

FIGURE 3



Legend

- HVO development consent boundary
- Local government boundary
- Residence owned by CNA
- Private residence

Datum: AGD84
Projection: TM, AGD84, zone 56

HUNTER VALLEY OPERATIONS
Detailed Location

0 1000 2000
metres

Figure 2

WEST PIT EXTENSION AND MINOR MODIFICATIONS

HUNTER VALLEY LOADING POINT UPGRADE MODIFICATION

Acoustic Report

Prepared For:
Matrix+ Consulting Pty Limited

June 2005
05032_Draft03_R01.doc

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Global Acoustics was engaged by Matrix+ Consulting Pty Limited to assess the potential noise impacts resulting from minor modifications to the Hunter Valley Loading Point (HVLP) located north of the Hunter River on Pikes Gully Road. The HVLP is operated by Coal & Allied (CNA) and receives coal from the Hunter Valley Coal Preparation Plant (HVCPP) located at CNA's Hunter Valley Operations.

An approval for the upgrade of HVLP is being sought as part of a plan to improve the efficiency of coal transfer from the Hunter Valley to the Port of Newcastle. HVLP has been identified as a significant constraint within the system.

The purpose of this report is to describe the acoustic environment around the site, qualitatively assess the changes in received noise from upgrades to the HVLP and changes to rail movements. The impact is considered with regard to change in received noise level rather than absolute values.

1.2 PROJECT DESCRIPTION

Upgrading the HVLP is anticipated to include the following features:

- Increasing the rate of two portal reclaimers from 2000 tph to approximately 3000 tph each;
- Increasing the rate of two conveyors from 2000 tph to approximately 3600 tph each;
- Increasing the rate of the train loading conveyor from 4000 tph to approximately 7200 tph; and
- Installation of train speed control and automated train loading together with improved spill detection.

These increases will require minor changes to existing gearboxes, installation of a variable speed drive, new conveyor drives and new conveyor pulley drives. It should be noted that these changes will be relatively minor and will not change the annual coal throughput of HVLP or the way in which coal is handled.

The upgraded infrastructure will enable the HVLP to load up to 18 trains per day. The trains operating from the HVLP (at an increased frequency) will not be additional on the rail network. Rather, this represents a different operating mode for the coal transport chain, aimed at improved coal loader (Port of Newcastle) efficiencies. As such, daily train movements on the Hunter Valley Coal Chain rail network will not change and so no assessment of rail noise is required.

Other plant located near the HVLP include:

- West Pit Coal Preparation Plant (WPCPP);
- Newdell Load Point (NLP); and
- Ravensworth Coal Terminal (RCT).

Figure 1 Locality Plan

1.3 TERMINOLOGY

Some definitions of terminology that may be used in this report are as follows:

- L_A, the A-weighted root mean squared (RMS) noise level at any instant;
- L_{A10}, the noise level which is exceeded for 10 per cent of the time, which is approximately the average of the maximum noise levels;
- L_{A90}, the level exceeded for 90 per cent of the time, which is approximately the average of the minimum noise levels. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes;
- L_{Aeq}, the average noise energy during a measurement period;
- sound power level (L_W), 10 times the logarithm of energy radiated from a source (as noise) divided by a reference power, the reference power being 1 picowatt;
- dB(A), noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise;
- sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micropascals; and
- Hertz (Hz), cycles per second, the frequency of fluctuations in pressure, sound is usually a combination of many frequencies together.

1.4 DEVELOPMENT CONSENT

Development Consent DA-450-10-2003 was granted by the Department of Infrastructure, Planning & Natural Resources (DIPNR) for the Hunter Valley Operations (HVO) West Pit Extension in June 2004. The development consent consolidates 15 existing development approvals, applying to HVO north of the Hunter River, into a single consent.

Extract from Hunter Valley West Pit consent

Noise Impact Assessment Criteria

7. The Applicant shall ensure that the noise generated by the development does not exceed the noise impact assessment criteria presented in Table 9 at any privately-owned land.

Table 9: Noise impact assessment criteria dB(A)

Day/Evening/Night $L_{Aeq(15\ minute)}$	***Night*** $L_{A1(1\ minute)}$	***Land Number***
40	*46*	*4 – Muller (from year 1 to year 7)* *7 – Stapleton* *Jerrys Plains Village – represented by residence locations 13 and 14 on Figure 24, volume 4 of the EIS (years 20 & 21)* *1 – Hayes (years 20 & 21)* *18 – Bennet (years 20 & 21)* *51 – Nicholls (years 20 & 21)* *52 – Old – (years 20 & 21)*
39	*46*	*2 – Skinner* *3 – Elisnore* *11 – Fisher* *19 – Biralee Feeds* *31 – Cooper* *36 – Garland* *54 – Skinner*
38	*46*	*1 – Hayes (from year 1 to year 19)* *18 – Bennet (from year 1 to year 19)* *51 – Nicholls (from year 1 to year 19)* *52 – Old (from year 1 to year 19)*
36	*46*	*4 – Muller (from year 8 to year 21)*
35	*46*	*All other residential or sensitive receptors, excluding the receptors listed in condition 1 above.*

Notes:
(a) The years referenced in Table 9 are to be considered as the position of mining operations as set out in the EIS for that year. If mining operations are delayed or accelerated from the planned location as shown in the EIS for a particular year, then the noise assessment criteria will be adjusted in accordance with the location of actual mining operations. The location of actual mining operations in relation to locations predicted in the EIS, will be indicated in the AEMR (see schedule 6, condition 5).
(b) The noise limits in Table 9 are for the noise contribution of the West Pit extension and all Hunter Valley Operations north of the Hunter River and coal haulage identified in the EIS from the south side of the Hunter River.

(c) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary.
(d) To determine compliance with the LAeq(15 minute) noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DEC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
(e) Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the LA1(1 minute) noise limits in the above table.
(f) The noise emission limits identified in the above table do not apply under meteorological conditions of:
i wind speeds in excess 3 m/s at 10 metres above ground level; and/or
ii temperature inversion conditions in excess of 3°C/100m, and wind speeds in excess of 2 m/s at 10 metres above ground level.

Land Acquisition Criteria
8. If the noise generated by the development exceeds the criteria in Table 10, the Applicant shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 9-11 of schedule 5.

Table 10: Land acquisition criteria dB(A)

Day/Evening/Night $L_{Aeq(15\ minute)}$	***Property***
43	*11 – Fisher*
42	*7 – Stapleton*
41	*All residential or sensitive receptors, excluding the receptors listed in condition 1 above*

CHAPTER 2

METHODOLOGY

2.1 ASSESSMENT METHOD

Predicted noise levels in the *Hunter Valley Operations West Pit Extension and Minor Modifications* EIS (ERM, 2003) were examined and the likely change to these due to the HVLP upgrade determined by consideration of likely sound power changes.

The EIS results were sets of noise contours for the entire operation, which comprises "*...all of CNA's operations at HVO north of the Hunter River, including operations at North Pit/the Alluvial Lands, Carrington and the existing West Pit (including Mitchell & Wilton Pits)*" and:

- *coal truck haulage from south of the Hunter River to the HVCPP (17 haul trucks were dedicated to these activities);*
- *auxiliary coal haulage can occur intermittently using road trucks to transport coal between the HVCPP and HVLP and between the HVLP, to NLP and RCT (conservatively 8 trucks were dedicated to this activity);*
- *Belt Line Conveyor – this conveyor system spans several kilometres between the HVCPP and HVLP;*
- *conveyor from WPCPP to Bayswater Power Station;*
- *HVCPP and WPCPP; and*
- *HVLP, NLP and RCT.*

Whilst the RCT is nominated as a source above, it appears not to have been included in the EIS noise model and is accordingly not included in this assessment.

The EIS noise contours are predominantly the result of open cut mining activity.

However, sections of these contours to the northeast are essentially due only to the combined operation of the NLP, HVLP and, a truck and dozer in proximity to the NLP. As these are all operating in a confined area in relation to the extent of noise contours, particularly the Industrial Noise Policy (INP) L_{Aeq} 35 dB contour (see figure 5.10, Part J of the EIS); all these could be considered as a combined source for the purpose of this assessment.

Therefore, the increase in sound power of some components of the HVLP can then be quantified as the increase in total sound power of all plant in that general area. This in turn allows the increase in noise contour values to be estimated.

2.2 CRITERIA

From the consent extract reproduced in Section 1.4 of this report, it can be seen that the limiting criteria are $L_{Aeq,15minute}$ 35 and 41 dB for general compliance and acquisition respectively. An additional $L_{A1,1minute}$ criterion of 46 dB is applicable at night.

As activities at the HVLP are very constant in terms of noise emission it is considered most unlikely that these would ever generate levels anywhere near the $L_{A1,1minute}$ criterion if the much lower general consent limit of $L_{Aeq,15minute}$ 35 dB was being met.

Accordingly the $L_{Aeq,15minute}$ 35 dB criterion has been adopted for this assessment.

CHAPTER 3

RESULTS

3.1 RESULTS

Based on proposed changes to conveyor drives and gearboxes at the HVLP, the sound power is estimated to increase by a maximum of 2 dB. To put this into perspective, a duplication of the entire facility would result in a sound power increase of only 3 dB.

Source sound powers used in our calculations were either from the EIS (Table D.1, Part J of the EIS) or where not specified in the EIS, obtained from consultants Environmental Resource Management (ERM).

The total sound power of plant operating in the general area of the load points before and after the HVLP upgrade are shown in Table 1 and Table 2 respectively.

Table 1 CURRENT LOAD POINT SOUND POWERS, dB(A)

Item	L_W
HVLP	112
NLP	112
Dozer (NLP)	110
Truck (NLP)	103
Total	116

Table 2 PREDICTED LOAD POINT SOUND POWERS, dB(A)

Item	L_W
HVLP	114
NLP	112
Dozer (NLP)	110
Truck (NLP)	103
Total	117

The predicted increase is only 0.8 dB overall on the basis of a 2 dB increase in HVLP L_W. These increases will apply to the north and northeast of the load point area only. Predicted noise levels around all other areas of HVO will remain unchanged.

CHAPTER 4

DISCUSSION AND CONCLUSION

4.1 DISCUSSION

The dominant contributor to HVO noise contours produced for the West Pit Extension EIS (ERM, 2003) is mining operations.

Sections of these contours to the immediate northeast are essentially due only to the combined operation of the NLP, HVLP and associated plant.

Calculations indicate the night time $L_{Aeq,15minute}$ 35 dB contour in the region northeast of the HVLP will be closer to an $L_{Aeq,15minute}$ 36 dB contour after the proposed upgrade; this is only a small section of the entire contour. Most of the $L_{Aeq,15minute}$ 35 dB noise contour around HVO will remain unchanged.

For an average person, a change in sound level of 3 dB is just perceptible (Bies & Hansen, 1997). Therefore, a change in level of 1 dB would be indiscernible.

4.2 CONCLUSION

The HVLP upgrade involves minor changes to existing infrastructure, primarily conveyor gearboxes and drives. This should only cause minor increases in noise levels to the immediate northeast of the HVLP.

The predicted change is less than 1 dB and will be indiscernible. Therefore, no residence is likely to be impacted as a result of the proposal.

Prepared by:	
Date:	29 June 2005

AIR QUALITY ASSESSMENT:
PROPOSED MODIFICATION TO HUNTER VALLEY OPERATIONS NORTH OF THE RIVER CONSENT – UPGRADE OF THE HUNTER VALLEY LOAD POINT

June 2005

Prepared for
Matrix+ Consulting Pty Limited

by

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1 INTRODUCTION

This report has been prepared by Holmes Air Sciences on behalf of Matrix+ Consulting Pty Limited. Its purpose is to provide information on the effects on air quality of modifying the Hunter Valley Load Point (HVLP), which is operated under the development consent for *Hunter Valley Operation's (HVO) North of the Hunter River.* The modifications will allow improved efficiency in the handling of coal and transferring of coal to the Port Waratah Coal Loader at Newcastle. This will allow an increased rate of throughput for the HVLP, but will not increase annual quantity of coal exported through the facility.

This assessment of air quality effects of the proposal has been prepared to support a Section 96(1A) modification to the existing *HVO North of the Hunter River Development Consent.*

The need for the improved efficiency and the nature of the required changes has been determined by the Hunter Valley Coal Chain Logistics Team (HVCCLT), which is comprised of representatives of coalmines, Pacific National and Port Waratah. The history of the changes to the development consents for HVLP, and the details as to why the changes to the operations are required, are discussed in detail in the main text and only a very brief discussion is provided in this report. This report's focus is on those aspects of the proposal that are relevant to air quality. It provides estimates of dust emissions under operations involving maximum throughput, under the existing consent and compares these with estimates of dust emissions under maximum throughput conditions for the modified operations.

For convenience, the report provides a brief description of the local setting and existing air quality, a brief description of the existing and proposed operations and estimates of the dust emissions that apply under the existing and would apply under the proposed operations.

2 LOCAL SETTING AND IDENTIFICATION OF ISSUES

Figure 1 shows the location of HVLP and surrounding facilities. The surrounding land is devoted primarily to coal mining and associated activities. It comprises undulating open land and supports some grazing as well as the industrial uses associated with coal mining. From an air quality perspective the most significant issue is the potential for dust emissions from the management of stockpiles, loading of coal to stockpile, unloading from the stockpiles and loading of coal to trains to adversely affect air quality on neighbouring land not used for mining.

3 EXISTING AIR QUALITY

In its guidelines the NSW Department of Environment and Conservation (DEC) (**DEC, 2001**) specifies air quality assessment criteria relevant for assessing impacts from mining. These cover criteria for annual average dust (insoluble solids) deposition levels, annual average concentrations of total suspended particulate matter (TSP), and annual average and 24-hour average concentration of particles with aerodynamic diameters less than 10 µm (PM_{10}).

While the area shown in **Figure 1** includes monitoring of all these parameters, the monitoring around the HVLP is confined to monitoring of dust deposition levels. Data from two gauges are relevant, DG15 and DCL (see **Figure 1**). The results from these two gauges are shown in **Table 1**. To assess the significance of these measurements they may be compared with the DEC's assessment criterion for dust (insoluble solids) deposition, which is 4 g/m²/month (annual average) for cumulative dust deposition for residential areas. The two gauges are located in an industrial area and are well removed from residences.

Table 1 shows that the annual average dust deposition levels at D15 have been within the DEC's annual average criterion of 4 g/m²/month since 2001. The annual average deposition levels at DCL have ranged from 3.8 to 4.6 g/m²/month over the same period with levels in 2004 and 2003 being less than 4 g/m²/month.

The data indicate that the effect of current operations is not so great as to cause exceedances of the DEC's dust deposition criteria beyond a few hundred metres from the HVLP loading facility and since these gauges measure the contribution of dust from all sources, the conclusion holds when the cumulative effects of other mining operations and non-mining activities are included.

While there is no relevant monitoring data that would allow firm conclusions to be made concerning compliance with the DEC's criteria for TSP and PM_{10} concentrations it may be noted that dust deposition levels and TSP concentrations are related. Generally, compliance with the deposition level criterion of 4 g/m²/month implies compliance with the DEC's annual average criterion of 90 µg/m³ for TSP concentrations. The relationship between PM_{10} concentrations and deposition levels is much more variable and it is not possible reliably to infer PM_{10} concentrations from deposition levels.

Table 1: Dust (insoluble solids) deposition data for relevant gauges - g/m²/month

Gauge ID → Date ↓	D15	DCL
Jan-01	1.4	
Feb-01	1.7	
Mar-01	3.2	
Apr-01	1.5	6.0
May-01	1.4	3.1
Jun-01	2.9	3.1
Jul-01	2.1	3.2
Aug-01	4.5	4.8
Sep-01	2.1	1.7
Oct-01	2.2	3.1
Nov-01	1.9	8.0
Dec-01	1.8	6.1
Average 2001	**2.2**	**4.3**
Jan-02	2.7	8.9
Feb-02	2.9	8.5
Mar-02	1.8	1.2
Apr-02	2.3	3.6
May-02	2.1	2.9
Jun-02	2.5	3.7
Jul-02	1.5	1.0
Aug-02	7.4	4.6
Sep-02	10.8	2.0
Oct-02	2.2	4.1

Gauge ID → Date ↓	D15	DCL
Nov-02	3.7	12
Dec-02	4.4	2.5
Average 2002	**3.7**	**4.6**
Jan-03	1.9	3.6
Feb-03	2.9	4.5
Mar-03	2.4	1.7
Apr-03	1.9	8.7
May-03	2.6	6.7
Jun-03	3.0	
Jul-03		2.8
Aug-03	2.3	1.9
Sep-03		1.2
Oct-03	2.6	2.1
Nov-03	4.4	3.5
Dec-03	2.6	4.7
Average 2003	**2.7**	**3.8**
Jan-04	7	3.2
Feb-04	4.2	11.2
Mar-04	0.7	3.3
Apr-04	2.6	3.9
May-04	2.4	7.8
Jun-04	1.0	6.1
Jul-04	1.1	1.9
Aug-04	1.6	1.8
Sep-04	0.9	1.1
Oct-04	1.2	1.6
Nov-04	2.4	2.1
Dec-04	1.0	1.7
Average 2004	**2.2**	**3.8**

4 METEOROLOGY

Wind speed and wind direction data are the two most important parameters for determining the area where dust emissions will be transported. Data are available from a number of different sites including two meteorological stations operated by Coal and Allied. The most relevant station is the HVO Meteorological Station shown on **Figure 1**. An annual and four seasonal wind roses compiled from data collected from the HVO station and covering the twelve-month period 1 January 2002 to 31 December 2002 are presented in **Figure 2**. A total of 8,736 hours of data were available for this period. This corresponds to 99.7% of the data potentially available in a year. This is the same data set as used in the original consent. The distribution of winds for this year of data was consistent with the distribution for 2003 and 2004 and with long-term patterns observed in the central parts of the Hunter Valley.

In summer, winds are generally from the southeast and in winter from the northwest. This means that most of the dust emissions from operations at HVLP would be transported to the southeast (winter) or northwest (summer). (The HVO station was selected for this purpose because it is the closest to the HVLP, however data from the other meteorological stations in the area show similar patterns of winds.)

The mean annual wind speed in 2002 was 3.0 m/s.

5 DESCRIPTION OF EXISTING AND PROPOSED FACILITIES AND OPERATIONS

The HVLP currently loads seven trains per day on average. To meet the requirements of the HVCCLT and increase the efficiency of the coal chain the HVLP, is required to be upgraded to meet a surge capacity of 18 trains per day. This upgrade will not increase the amount of coal produced by HVO. This is limited by the HVCPP which is approved to process 20 Mtpa ROM coal. The increase in the number of trains able to be loaded per day does not increase the number of trains used by HVO to transport coal to Newcastle as the trains will be re-allocated from other loading points.

The Rio Tinto Coal Australia (RTCA) Logistics team modelled the HVCCLT requirements to determine accurately the output required of the HVLP. The modelling showed, that to meet the requirements of the HVCCLT, the average load rate of the HVLP would need to be increase to 5100 tph with a peak load rate of 7200 tph. As a result, the HVLP will need to be upgraded. The upgrade of the HVLP is anticipated to include:

- Increasing the rate of two portal reclaimers from 2000 tph to approximately 3000 tph each;
- Increasing the rate of two yard conveyors from 2000 tph to approximately 3600 tph each ;
- Increasing the rate of the train loading conveyor from 4000 tph to approximately 7200 tph; and
- Installation of train speed control and automated train loading together with spill detection under the wagon.

The changes required for the upgrade are relatively minor and will not change the way in which coal is handled.

The HVLP does not currently use automatic train loading. Manual train loading is dependent on the operators experience and judgement and there is variability between operators. The outcome of inadequate loading is underloading or overloading or spillage. Implementation of an automated train loading provides consistency and repeatability of loading reducing over-loading and under-loading.

The automatic train loading system incorporates a detection system to determine the position of wagons relative to the loading chute and automated opening and closing of the chute to fill the wagon. Automated control of the chute combined with automated wagon type identification and a selection of coal type on the control room screen will combine to minimise or eliminate over- and under-loading. The option to manually operate train loading will be retained as a back-up to the automated system.

6 ESTIMATED EMSSIONS OF PARTICULATE MATTER

Product coal is delivered to the HVLP stockpiles via conveyor (or intermittently by road) and stacked on one of the two rectangular shaped stockpiles. The stacking operation will generate dust and dust will also be liberated via wind erosion. Coal is reclaimed via a twin boom reclaim system and loaded to trains via a bin loading system. The reclaiming of the coal and loading coal to trains will also be a source of dust emission. In summary the main sources of dust associated with the HVLP are:

➤ Stacking coal to the stockpiles;

- Wind erosion from stockpiles;
- Reclaiming coal from stockpiles, and;
- Loading coal from the bin to trains.

Emissions from these activities can be estimated using emission factor equations provided in the **US EPA's (1985)** (and subsequent updates) publication referred to as AP-42 and from project information provided by HVO.

Estimated TSP emissions in the following text have been presented to an accuracy of one kilogram. This is done to assist in checking that the mathematics has been followed through correctly. It should not be used to infer that the accuracy of the estimated TSP emission is to within one kilogram. The accuracy of TSP emissions from individual activities is essentially unquantifiable. However, based on model validation studies (**Dames and Moore, 1983**) it can be assumed that overall, 80% of predicted long-term deposition rates will lie within ± 40% of measured rates.

Estimated emissions are presented for all significant dust generating activities associated with the project.

6.1 Wind erosion from stockpiles at HVLP

The total area of the two rectangular stockpiles, including the pad around the stockpile and the area between the stockpiles, has been estimated (from the aerial photograph shown in **Figure 1**) to be 7.5 ha.

The TSP emission can be calculated using **Equation 1 (US EPA 1985 and updates)** as follows.

Equation 1

$$E_{TSP} = 1.9 \times \left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right) \quad \text{kg/day/ha}$$

where,

s = silt content of material (%)

p = number of days with more than 0.25 mm of precipitation

f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s at the mean height of the stockpile.

For the HVO meteorological station (2002 data) the hourly average wind speed exceeded 5.4 m/s for 10.2% of the hours. The number of days with rainfall above 0.25 mm at Jerrys Plains (approximately 20 km to the west) is 86 (**Bureau of Meteorology, 2004**). Conservatively assuming that the silt content of the product coal is 15%, the emission factor for TSP emissions is estimated by Equation 1 to be 15.3 kg/day/ha. The annual uncontrolled TSP emission is estimated to be 41,884 kg/y [7.5 ha x 15.3 kg/day/ha x 365 days/year]. Assuming 50% control (**Dames and Moore, 1984**) due to the use of water sprays the emission is estimated to 20,942 kg/y.

These emissions will not change as a result of the modifications.

6.2 *Loading coal to the stockpiles at HVLP*

The TSP emission from each tonne of material loaded will depend on the wind speed and the moisture content of the coal. **Equation 2** shows the relationship between these variables.

Equation 2

$$E_{TSP} = k \times 0.0016 \times \left(\frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \right) \qquad \text{kg/t}$$

where,
k = 0.74
U = wind speed (m/s)
M = moisture content (%)
[where $0.25 \leq M \leq 4.8$]

The mean wind speed for the HVO meteorological data set in 2002 was 3.0 m/s.

Assuming a moisture content of 11% and using the maximum value of moisture content for which the equation has been tested (namely 4.8%) the uncontrolled TSP emission factor is therefore 0.00052 kg/t.

Currently the consented throughput capacity of the HVLP is approximately 14 Mtpa. Assuming 50% control through the use of water sprays (**Dames & Moore, 1984**), the emissions from loading coal to the stockpile is estimated to give rise to a TSP emission of 3,640 kg/y [0.5 x 0.00052 kg/t x 14,000,000 t/y].

CNA is not proposing to load more than 14 Mtpa as this is the amount that the HVCPP produces (equivalent to processing of 20 Mta ROM coal) nor does the upgrade involve increasing the capacity of the conveyor delivering coal from the mine to the HVLP so it will be assumed that emissions from this activity remain the same both on an annual and daily basis.

6.3 *Reclaiming coal from the stockpiles at HVLP*

The TSP emission from each tonne of material reclaimed from the stockpile can be calculated from **Equation 3** (**Dames & Moore, 1984**) presented below.

Equation 3

$$E_{TSP} = 0.0009 \times \left(\frac{\left(\frac{S}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{3}\right)}{\left(\frac{M}{2}\right)^{2}} \right) \qquad \text{kg/t}$$

where,
S = silt content of coal (%)
U = wind speed (m/s)
H = drop height after reclaim (m)
M = moisture content (%).

Note: there is no maximum value specified for M in Equation 3.

The mean wind speed for the HVO meteorological data set in 2002 was 3.0 m/s.

Assuming a moisture content of 11%, silt content of 15%, and drop height of 1 m, the uncontrolled TSP emission factor is therefore 0.00004 kg/t.

Currently the consented throughput capacity of the HVLP is 14 Mtpa. The estimated TSP emissions from reclaiming coal from the stockpile is estimated to give rise to a TSP emission of 560 kg/y [0.00004 kg/t x 14,000,000 t/y].

As noted previously, CNA is not proposing the load anymore than 14 Mtpa as this is the amount that the HVCPP produces. However, the upgrade will allow the daily rate at which coal is loaded to be increased and therefore, although the annual TSP emission rate will not increase the daily rate could increase. Based on the possibility that up to 18 trains could be loaded per day, compared with the current average of seven trains per day, the daily emission due to this operation, could be 2.6 [18/7] times greater than the current daily average emission. The current daily average emission is 1.5 kg/day and the future maximum daily average emission from reclaiming coal from the stockpile is estimated to be 3.9 kg/day.

6.4 *Loading coal to trains*

The TSP emission from each tonne of coal loaded will depend on the wind speed and the moisture content of the material in the same way as for **Equation 2**. Again assuming a moisture content of 11%, and using the maximum value of moisture content for which the equation has been tested (namely 4.8%), the TSP emission factor is 0.00052 kg/t. The consented annual throughput capacity for HVLP is 14 Mtpa. Assuming that the controlled nature of the loading operation (i.e. the small drop distance and the partial enclosure of the wagons being loaded) gives rise to a control of approximately 50%[1] this would give rise to a TSP emission of 3,640 kg/y [0.5 x 0.00052 kg/t x 14,000,000 t/y]. Since the annual load out rate will not increase there will be no change in the annual emission. However, the upgraded facility could load up to 2.6 times as many trains as are currently loaded in an average day. The daily average TSP emission from loading trains is estimated to be 10 kg/day and the maximum daily emission from the upgraded facility is estimated to be 26 kg/day.

6.5 *Summary*

It should be noted that all emission sources will remain the same when averaged over a year. However the maximum daily emission from some activities could increase because the upgraded facility will be able to load up to 18 trains per day compared with the current average of seven trains per day.

The estimated total annual emissions and maximum daily emissions from the main dust generating operations are shown in **Table 2**.

Table 2. Summary of estimated emission from existing and upgraded HVLP

[1] This estimate is based on an extrapolation of information provided by **Dames & Moore (1984)** which suggests 75% control can be provided by a telescopic chute and that reducing drop distances will give 25% control.

Activity/source	Current annual emissions (assuming 14 Mtpa capacity) – kg/y	Future annual emissions after upgrade (assuming 14 Mtpa capacity) – kg/y	Current 24-hour emission (assuming seven trains per day) – kg/day	Future 24-hour emissions (assuming 18 trains per day) – kg/day
Wind erosion	20,942	20,942	57.4	57.4
Loading coal to stockpiles	3,640	3,640	99.7	99.7
Recovering coal from stockpiles	560	560	1.5	3.9
Loading coal to trains	3,640	3,640	10	26
Total	**28,792**	**28,792 i.e. unchanged**	**168.6**	**187.0**

Total annual TSP emissions from the upgraded HVLP is estimated to be 28,792 kg/y. This is the same as the estimated annual TSP emissions from the current HVLP.

Maximum daily TSP emissions will stay the same for sources such as wind erosion and for load-in operations but will increase on days when the increased capacity of the facility is used. The daily TSP emissions are estimated to increase from 168.6 kg/day to 187.0 kg/day when the HVLP is operated at its maximum surge capacity, which would allow 18 trains to be loaded per day. This is an 11% increase in TSP emissions over the existing situation.

Dust concentration and dust deposition levels measured at the two monitoring sites are due to the cumulative effects of all emission sources and so the dust deposition and concentration levels would not be expected to increase by this same factor. In practice, the changes in air quality would not be likely to be detectable at these monitoring sites and the proposal would certainly not give rise to air quality impacts in the closest residential areas, which are approximately 6 km away.

7 CONCLUSIONS

The proposal will allow an increase in the rate at which trains are loaded. It does not result in an increase in the quantity of TSP liberated over the year, but it has the potential to increase daily TSP emissions by approximately 11%.

A reasonable appreciation of the significance of the emissions from the HVLP (in a regional sense) may be obtained by comparing the estimated emission with the estimated emission from the area more generally. A typical open cut coalmine in the Hunter Valley will generate between 0.5 and 2 kg of TSP per tonne of ROM coal produced. The mining of the 10 Mtpa of ROM coal would produce 5,000,000 to 20,000,000 kg of TSP over a year. Thus, the emission from the HVLP is a very small fraction of the total dust emission in the area. Since nearby dust sensitive areas are well removed from the HVLP, the contribution that emissions from HVLP will make to regional or cumulative air pollution levels is very small.

Emissions from HVLP will be controlled using current methods which include the use of water sprays (applied when required), partial enclosure of conveyors and conveyor transfer points and partial enclosure of the train loading point. This represents best practice for this type of operation in the Hunter Valley and is an appropriate level of control for the circumstances.

8 REFERENCES

Bureau of Meteorology (2004)
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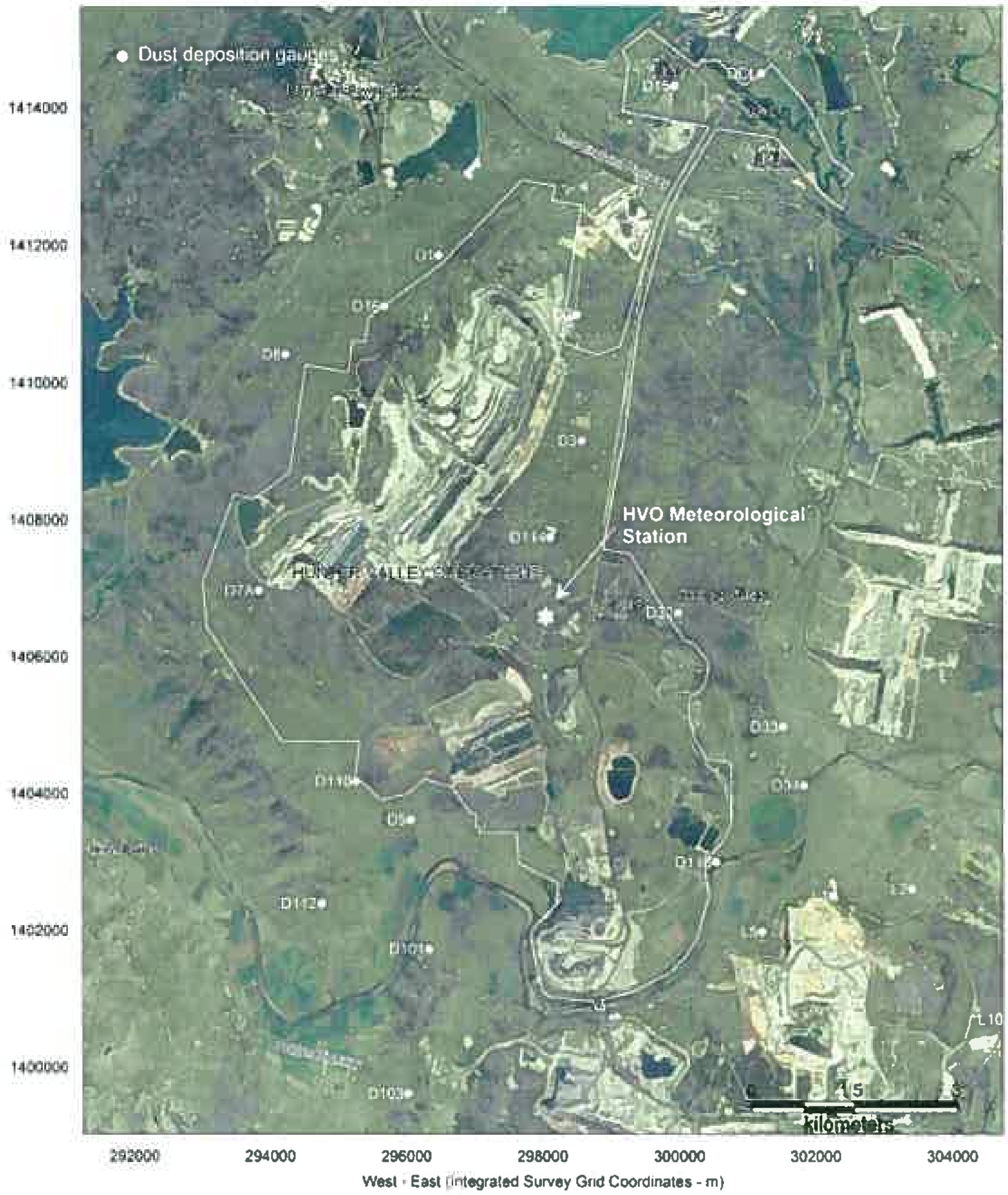
"Technical guide for estimating fugitive dust impacts from coal handling operations" Report Number DOE/RG/10312-1(Volume 2) (DE85010939), Report prepared for US Department of Energy, Office of Fuels Programs, Division of Coal and Electricity, 1000 Independence Avenue, SW Washington, DC 20585.

NSW EPA(2001)
"Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW", NSW EPA, 56-61 Goulburn Street, Sydney, NSW 2000.

US EPA (1985 and updates)
"Compilation of Air Pollutant Emission Factors", AP-42, Fourth Edition United States Environmental Protection Agency, Office of Air and Radiation Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711. (Note this now a web based source of data).

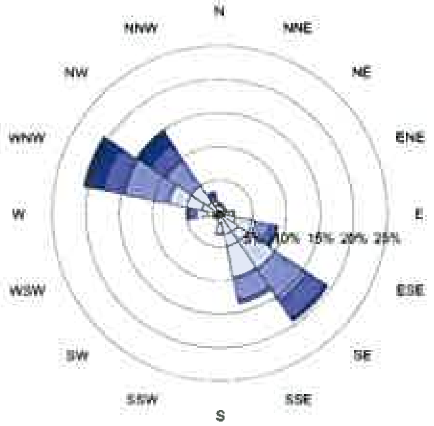
FIGURES



Location and monitoring sites

Figure 1

Annual and Seasonal Windroses for HVO Meteorological Station for 2002



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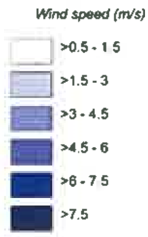

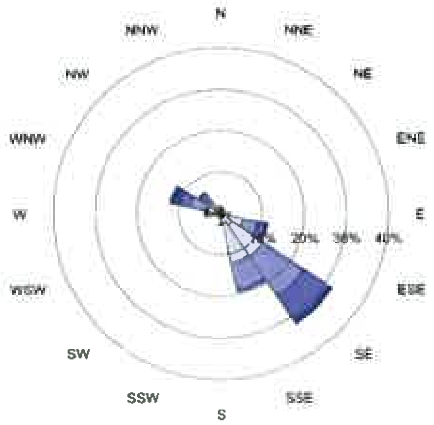

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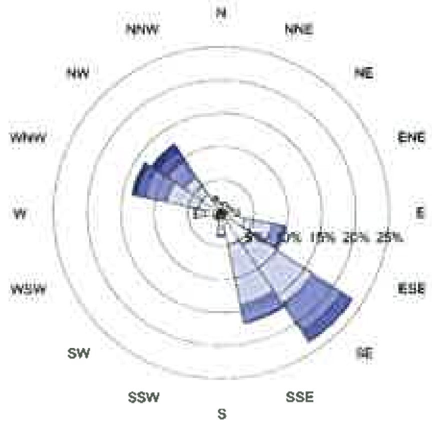

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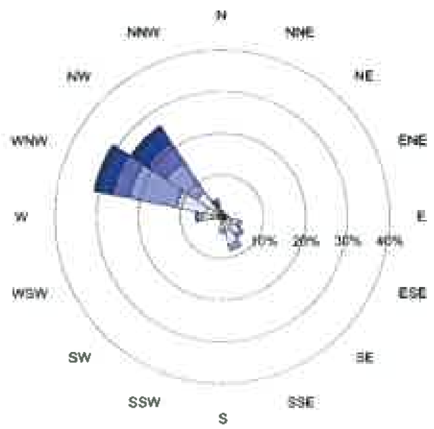

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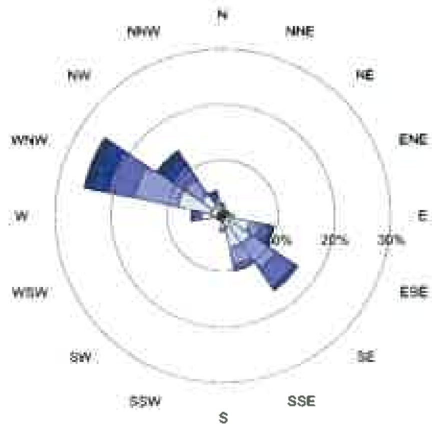

Spring
Calms = 0.0%

Figure 2